DSR-250/250P

RMT-811

SERVICE MANUAL

Ver 1.3 2003. 01

US Model
Canadian Model
DSR-250

AEP Model
Chinese Model
DSR-250P

Self Diagnosis Supported model

DVCAM™

DV Digital Video Cassette

Mini DV Digital Video Cassette

Cassette Memory

MEMORY STICK



Photo : DSR-250
RMT-811

R MECHANISM

NTSC model : DSR-250
PAL model : DSR-250P

SPECIFICATIONS

Video camera recorder

System

Video recording system
2 rotary heads
Helical scanning system
Audio recording system
Rotary heads, PCM system
Quantization: Fs32 kHz (12 bits, channels 1/2, channels 3/4), Fs48 kHz (16 bits, channels 1/2)
Video signal
NTSC color, EIA standards (DSR-250), PAL colour, CCIR standards (DSR-250P)
Usable cassette
DVCAM cassette with the DVCAM mark printed
Mini DVCAM cassette with the DVCAM mark printed
DV cassette with the DV mark printed
Mini DV cassette with the Mini DV mark printed
Tape speed
DVCAM format:
Approx. 28.218 mm/s
DV format SP mode: Approx. 18.812 mm/s
Recording/playback time
DVCAM format: 184 min (using cassette PDV-184ME)
DV format SP mode: 270 min (using cassette PDV-184ME)
Fast-forward/rewind time
Approx. 45 s (using cassette DVM60/PDVM-40ME)
Approx. 2 min 30 s (using cassette PDV-184ME)

Viewfinder
Electric viewfinder (B&W)
Image device
1/3 type CCD (3 Charge Coupled Device) Approx. 380 000 pixels (Effective: Approx. 340 000 pixels) (DSR-250), Approx. 450 000 pixels (Effective: Approx. 400 000 pixels) (DSR-250P)
Lens
Combined power zoom lens
Filter diameter 58 mm (2 3/8 in)
12× (Optical), 48× (Digital)
F1.6 - 2.4
Focal length
6 - 72 mm (1/4 - 2 7/8 in)
When converted to a 35 mm still camera
43.2 - 518.4 mm (1 3/4 - 20 1/2 in)
Colour temperature
Auto, Indoor (3 200 K), Outdoor (5 800 K), (A, B)
Minimum illumination
2 lux (F1.6)

Input/Output connectors

VIDEO IN/OUT
Input/output auto switch
RCA pin-jack, 1 Vp-p, 75 ohms, unbalanced, sync negative
S VIDEO
Input/output auto switch
4-pin mini DIN
Luminance signal: 1 Vp-p, 75 ohms, unbalanced
Chrominance signal: 0.286 Vp-p (DSR-250), 0.3 Vp-p (DSR-250P), 75 ohms, unbalanced

AUDIO IN/OUT CH-1/CH-2
Input/output auto switch
RCA pin-jack, 245 mV, (at output impedance more than 47 kilohms)
Output impedance with less than 2.2 kilohms
Input impedance more than 47 kilohms
AUDIO IN CH1/CH2
XLR 3-pin, female
–60 dBu: 6.8 kilohms,
+4 dBu: 6.8 kilohms
(0 dBu = 0.775 Vrms)
PHONES
Stereo minijack (ø 3.5 mm)
LANC control jack
Stereo mini-minijack (ø 2.5 mm)
MIC IN +48V
XLR 3-pin, female
VF
20-pin
LIGHT
2-pin
DV IN/OUT
6-pin connector
Speaker
Dynamic speaker (ø 20 mm)
DC IN 12V
XLR 4-pin, female
DC OUT 12V
4-pin, male

LCD screen

Picture
2.5 type measured diagonally
49.9 × 37.3 mm (2 × 1 1/2 in)
Total dot number
200 640 (880 × 228)

General

Peak inrush current (DSR-250P)
(1) Hot switching inrush current, measured in accordance with European standard EN55103-1: 6.3 A (230 V)
Power requirements
14.4 V (Lithium-ion battery pack)
12 to 17 V (AC power adaptor)
Average power consumption
(when using the battery pack)
During camera recording using LCD
12.1 W
Viewfinder
10.5 W
Operating temperature
0 °C to 40 °C (32 °F to 104 °F)
Storage temperature
–20 °C to +60 °C (–4 °F to +140 °F)
Dimensions (approx.)
242 × 251 × 509 mm (9 5/8 × 10 × 20 1/8 in) (w/h/d)
Mass (approx.)
3.5 kg (7 lb 11 oz)
main unit only
4.9 kg (10 lb 13 oz)
including the BP-L40 (A) battery pack, cassette PDV-184ME, microphone, viewfinder, and hood cap
Supplied accessories
See page 2.

— Continued on next page —

DVCAM™ DIGITAL CAMCORDER

SONY®

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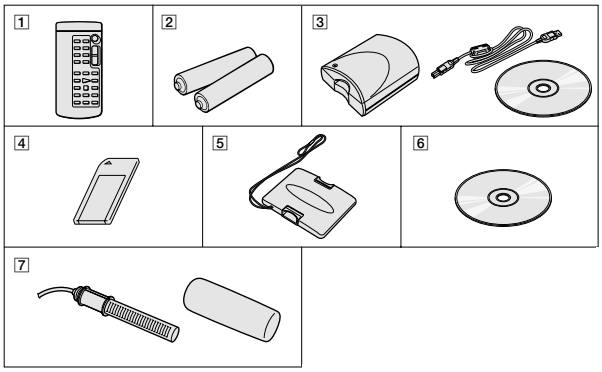
"Memory Stick"

Memory
Flash memory
4MB: MSA-4A
Operating voltage
2.7 V -3.6 V
Power consumption
Approx. 45 mA in the operating mode
Approx. 130 µA in the standby mode
Dimensions (approx.)
50 × 2.8 × 21.5 mm
(2 × 1/8 × 7/8 in) (w/h/d)
Mass (approx.)
4 g (0.14 oz)

Design and specifications are subject to change without notice.

• SUPPLIED ACCESSORIES

Check that the following accessories are supplied with your camcorder.



1 **Wireless Remote Commander** (1)
2 **R6 (Size AA) battery for Remote Commander** (2)
3 **Memory Stick Reader/Writer** (1), **USB cable** (1), **Driver software (CD ROM)** (1)
4 **"Memory Stick"** (1)
5 **Hood cap** (1)
6 **Application software: PictureGear 4.1Lite (CD ROM)** (1)
7 **Microphone** (1), **Wind screen** (1)
8 **Operating instructions** (2)

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ 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.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFÉS PAR UNE MARQUE ⚠ SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈSES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPÉMENTS PUBLIÉS PAR 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, through functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.
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.

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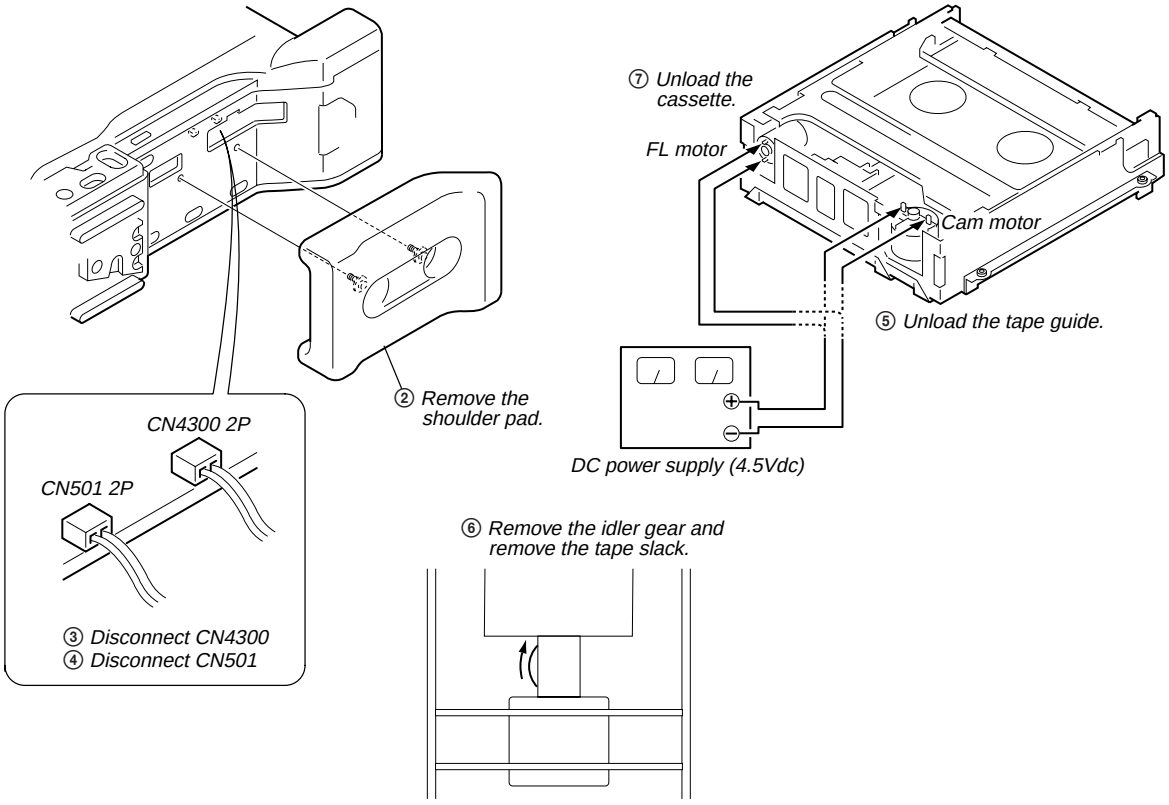
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* Color reproduction frame is shown on page 387.

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1. TO TAKE OUT A CASSETTE WHEN NOT EJECT (FORCE EJECT)

① Refer to 2-6. to remove the cabinet (L) assembly.
② Remove the shoulder pad.
③ Remove the CN4300 (2P) of VI-156 board.
④ Remove the CN501 (2P) of VI-156 board.
⑤ Supply +4.5V from the DC power supply to the cam motor and unload the tape guide.
⑥ Rotate the idler gear by your finger to the clockwise and remove the tape slack.
⑦ Supply +4.5V from the DC power supply to the FL motor (Cassette motor) and unload the cassette.



What to do when a user forgets a password

This camcorder has the forced log insertion function. A password is inputted, and this function is set up. When this function was set up, this camcorder doesn't move if the memory stick which memorize a correct logo isn't inserted. To release the forced logo function, the correct password must be input.
This password is memorized in the IC1105 (EEPROM) on VI-156 board. Therefore, when a user forgets the password, replace the IC1105. This IC1105 memorizes the HRS METER data (Hour meter data: page A, address 00 to 13), too. Therefore, replace the IC1105 in the following order to copy the HRS METER data.

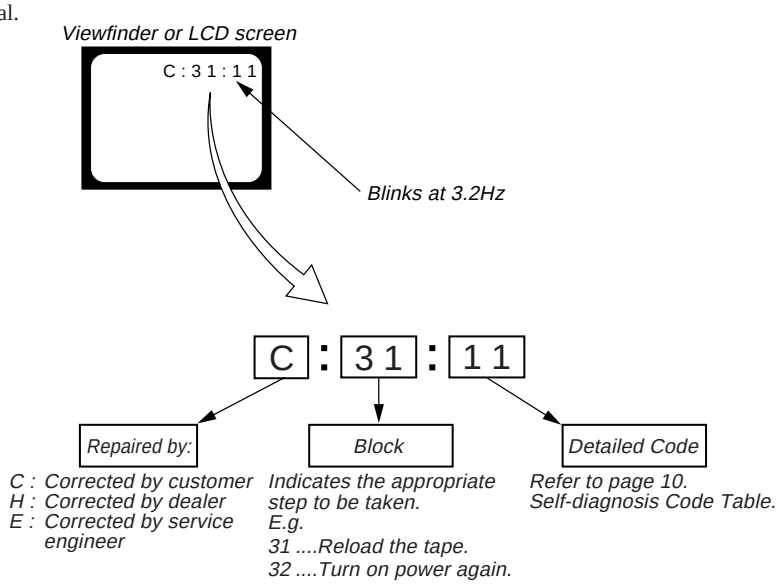
Replacing procedure:

1) Note down the data of page A, address 00 to 13.
2) Replace IC1105 (EEPROM) on VI-156 board.
3) To page A, address 00 to 13, input the data noted down.
   (Refer to "HRS METER (Hours meter)" of "5-4. SERVICE MODE")

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1. SELF-DIAGNOSIS FUNCTION

When problems occur while the unit is operating, the self-diagnosis function starts working, and displays on the viewfinder or LCD screen what to do. This function consists of two display; self-diagnosis display and service mode display.
Details of the self-diagnosis functions are provided in the Instruction manual.



2. SELF-DIAGNOSIS DISPLAY

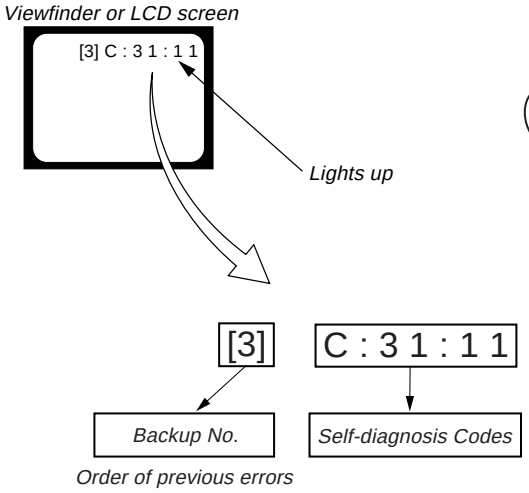
When problems occur while the unit is operating, the counter of the viewfinder or LCD screen consists of an alphabet and 4-digit numbers, which blinks at 3.2 Hz. This 5-character display indicates the "repaired by:", "block" in which the problem occurred, and "detailed code" of the problem.

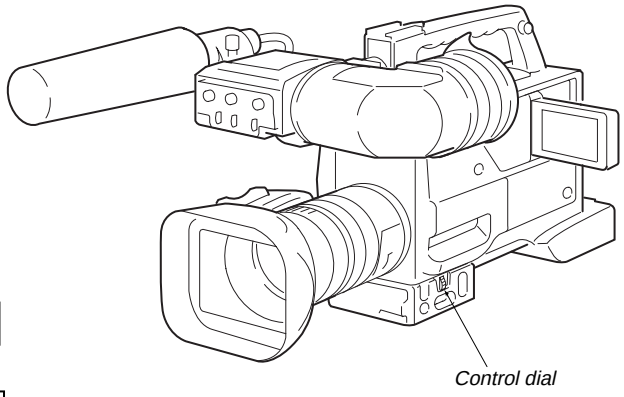
3. SERVICE MODE DISPLAY

The service mode display shows up to six self-diagnosis codes shown in the past.

3-1. Display Method

While pressing the "STOP" key, set the POWER switch from OFF to ON, and continue pressing the "STOP" key for 5 seconds continuously. The service mode will be displayed, and the counter will show the backup No. and the 5-character self-diagnosis codes.





3-2. Switching of Backup No.

By rotating the control dial, past self-diagnosis codes will be shown in order. The backup No. in the [] indicates the order in which the problem occurred. (If the number of problems which occurred is less than 6, only the number of problems which occurred will be shown.)

[1] : Occurred first time
[2] : Occurred second time
[3] : Occurred third time
[4] : Occurred fourth time
[5] : Occurred fifth time
[6] : Occurred the last time

3-3. End of Display

Turning OFF the power supply will end the service mode display.

Note: The "self-diagnosis display" data will be backed up by the coin-type lithium battery (BT501) of the cabinet (R) assembly (SW-343 board). When the cabinet (R) assembly is removed, the "self-diagnosis display" data will be lost by initialization.

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4. SELF-DIAGNOSIS CODE TABLE

Self-diagnosis Code				Symptom/State	Correction
Repaired by:	Block Function		Detailed Code		
C	2	1	0 0	Condensation.	Remove the cassette, and insert it again after one hour.
C	2	2	0 0	Video head is dirty.	Clean with the optional cleaning cassette.
C	3	1	1 0	LOAD direction. Loading does not complete within specified time	Load the tape again, and perform operations from the beginning.
C	3	1	1 1	UNLOAD direction. Loading does not complete within specified time	Load the tape again, and perform operations from the beginning.
C	3	1	2 0	T reel side tape slacking when unloading.	Load the tape again, and perform operations from the beginning.
C	3	1	2 1	Winding S reel fault when counting the rest of tape.	Load the tape again, and perform operations from the beginning.
C	3	1	2 2	T reel fault.	Load the tape again, and perform operations from the beginning.
C	3	1	2 3	S reel fault.	Load the tape again, and perform operations from the beginning.
C	3	1	2 4	T reel fault.	Load the tape again, and perform operations from the beginning.
C	3	1	3 0	FG fault when starting capstan.	Load the tape again, and perform operations from the beginning.
C	3	1	4 0	FG fault when starting drum.	Load the tape again, and perform operations from the beginning.
C	3	1	4 2	FG fault during normal drum operations.	Load the tape again, and perform operations from the beginning.
C	3	1	1 0	LOAD direction loading motor time-out.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	1	1 1	UNLOAD direction loading motor time-out.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	2 0	T reel side tape slacking when unloading.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	2 1	Winding S reel fault when counting the rest of tape.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	2 2	T reel fault.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	2 3	S reel fault.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	2 4	T reel fault.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	3 0	FG fault when starting capstan.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	4 0	FG fault when starting drum	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	4 2	FG fault during normal drum operations	Remove the battery or power cable, connect, and perform operations from the beginning.
E	6	1	0 0	Difficult to adjust focus (Cannot initialize focus.)	Inspect the lens block focus reset sensor (Pin ㉕ of CN001 on VI-156 board) when focusing is performed when the focusing is rotated in the focus manual mode, and the focus motor drive circuit (IC140 of VI-156 board) when the focusing is not performed.
E	6	1	1 0	Zoom operations fault (Cannot initialize zoom lens.)	Inspect the lens block zoom reset sensor (Pin ㉒ of CN001 on VI-156 board) when zooming is performed when the zoom lever is operated and the zoom motor drive circuit (IC140 of VI-156 board) when zooming is not performed.
E	6	2	0 0	Steadyshot function does not work well. (With pitch angular velocity sensor output stopped.)	Inspect pitch angular velocity sensor (SE601 of SE-116 board) peripheral circuits.
E	6	2	0 1	Steadyshot function does not work well. (With yaw angular velocity sensor output stopped.)	Inspect yaw angular velocity sensor (SE600 of SE-116 board) peripheral circuits.

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SECTION 1
GENERAL

This section is extracted from instruction manual. (DSR-250P)

— Getting started —

Using this manual

As you read through this manual, buttons and settings on your camcorder are shown in capital letters.

e.g. Set the POWER switch to ON.

When you carry out an operation, you can hear a beep or a melody sound to indicate that the operation is being carried out.

Note on cassette memory

Your camcorder is based on the DVCAM/DV format. We recommend that you use a tape with cassette memory CM.

The functions which require different operations depending on whether or not the tape has cassette memory are:
- Searching the end point of the recording – end search (p. 29, 33)
- Searching a recording by index – index search (p. 77)
- Searching a recording by date – date search (p. 80)
- Searching for a photo – photo search (p. 82).

The functions you can operate only with cassette memory are:
- Searching the boundaries of recorded tape by title – title search (p. 79)
- Superimposing a title (p. 110)
- Making your own titles (p. 114)
- Labelling a cassette (p. 116).

For details, see page 158.

CM only — You see this mark in the introduction of the features that are operated only with cassette memory.

Tapes with cassette memory are marked with CM (Cassette Memory).

Note on TV colour systems

TV colour systems differ from country to country.
To view your recordings on a TV, you need a PAL system-based TV.

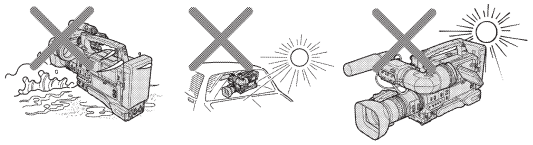
Copyright precautions

Television programs, films, video tapes, and other materials may be copyrighted. Unauthorized recording of such materials may be contrary to the provision of the copyright laws.

Precautions on camcorder care

- **The LCD screen and the viewfinder are manufactured using high-precision technology. Effective ratio of pixels is 99.99% or more. However, there may be some tiny black points and/or bright points (red, blue, green or white) that constantly appear on the LCD screen and in the viewfinder. These phenomena are not malfunctions. These points do not affect the recorded picture in any way.**
- Do not let your camcorder get wet. Keep your camcorder away from rain and sea water. Letting your camcorder get wet may cause your camcorder to malfunction. Sometimes this malfunction cannot be repaired **[a]**.
- Never leave your camcorder exposed to temperatures above 60 °C (140 °F), such as in a car parked in the sun or under direct sunlight **[b]**.
- Do not place your camcorder so as to point the viewfinder or the LCD screen or lens toward the sun. The inside of the viewfinder, LCD screen, or lens may be damaged **[c]**.
- The use of the radio communication equipment such as cellular phones or transceivers near the unit may cause a malfunction and can affect the audio/video signals. The cellular phones or transceivers near the unit should be switched off.

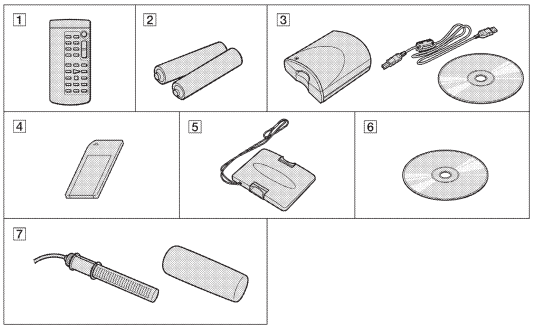
[a] **[b]** **[c]**



Contents of the recording cannot be compensated if recording or playback is not made due to a malfunction of the camcorder, video tape, etc.

Checking supplied accessories

Make sure that the following accessories are supplied with your camcorder.

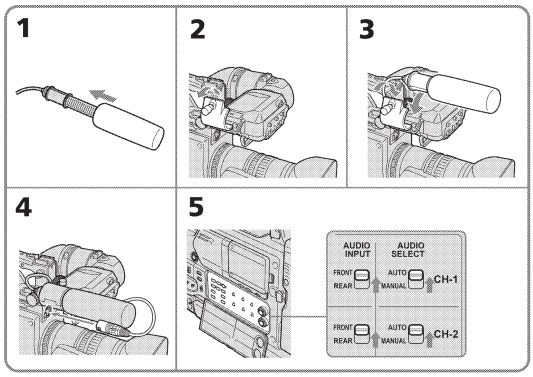


1 **Wireless Remote Commander** (1) (p. 188)
2 **R6 (Size AA) battery for Remote Commander** (2) (p. 189)
3 **Memory Stick Reader/Writer** (1), **USB cable** (1), **Driver software (CD ROM)** (1)
4 **"Memory Stick"** (1) (p. 129)
5 **Hood cap** (1) (p. 15)
6 **Application software: PictureGear 4.1Lite (CD ROM)** (1) (p. 145)
7 **Microphone** (1) (p. 7), **Wind screen** (1) (p. 7)
8 **Operating instructions** (2)

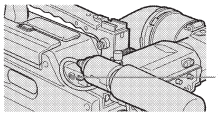
Step 1 Installing the microphone

Install the supplied microphone. Be sure to connect the microphone plug to the MIC IN +48V connector.

(1) Attach the wind screen to the microphone.
(2) Loosen the microphone holder screw and open the cover.
(3) Place the microphone into the holder with the model name (ECM-NV1) facing upward, close the cover, and tighten the screw.
(4) Connect the plug of the microphone to the MIC IN +48V connector.
(5) Set the AUDIO INPUT switches to FRONT, and the AUDIO SELECT switches to AUTO, for both channels 1 and 2.
When you manually adjust the audio level, see "Adjusting the recording level manually – Sound recording level" on page 54.



When the wind is blowing hard
When inputting the sound via the MIC IN +48V connector, you can reduce the wind noise. Set the MIC LOW CUT switch to ON. This is only activated for the front microphone.



When you unplug the microphone plug
Unplug it while pressing the PUSH button.

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Step 2 Preparing the power supply

The following power supplies can be used with the camcorder.
- BP-L40 (A)/L60A/L90A lithium-ion battery pack
- NP-1B Ni-Cd Battery Pack (The DC-L1Battery Adaptor is required.)
- BP-90A Ni-Cd Battery Pack (The DC-L90 Battery Adaptor is required.)
- AC power (The AC-550CE, AC-DN1/DN2A, or CMA-8ACE AC Adaptor is required.)

Alternatively, you can make combined use of internal and external batteries, by mounting one of the above batteries as an internal battery and connecting, such as a BP-90A contained in a DC-210 Battery Adaptor to the DC IN 12V connector of the camcorder as an external source.

Using a BP-L40 (A)/L60A/L90A battery pack

With a battery pack, the camcorder will operate continuously for the time shown below.
BP-L40 (A): Approx. 190 minutes
BP-L60A: Approx. 420 minutes
BP-L90A: Approx. 700 minutes
The numbers above indicate the time using only the viewfinder.

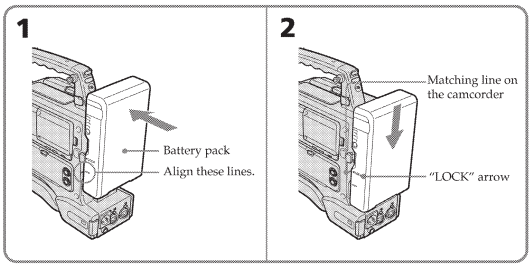
Before use, charge the battery pack with the BC-L50/L100CE Battery Charger.

Notes on using the battery pack
- A warm battery pack may not be fully recharged.
- Even when fully charged, battery packs gradually lose their charge naturally. Use the battery packs as soon as possible after recharging.
- To prolong the life of battery packs, store them in a cool place (about 20 °C (68 °F)), and charge in a place with an ambient temperature between 10 °C and 30 °C (50 °F to 86 °F).
- Before long-term storage, discharge the battery fully. This extends the battery life.
- It is recommended that the BP-L40 (A) be used at 30 W or less.
- When using the BP-L40 (A), the specified capacity may not be obtained if it is connected to the camcorder with accessories which is operated at 30 W or higher, especially when the ambient temperature is low.
- At low temperatures, the usable time of battery packs decreases. When the ambient temperature is 0 °C (32 °F), usable time decreases by about 10%. (However, the usable time is affected by the power consumption of the camcorder in addition to the usage status of the battery packs.) The usable time of battery packs increases if they are warmed to the room temperature (about 20 °C (68 °F)) before use at low temperatures.
- If you use the BP-L40 (A) at temperatures of 0 °C (32 °F) or below, when power consumption of the camcorder and accessories is 40 W or higher (due to using a video light, for example), power may break after a short time (a few minutes). To increase the usable time, store the BP-L40 (A) in a warm place, and power on the camcorder before the BP-L40 (A) cools down.
- Compared to the BP-L40 (A), the BP-L60A/L90A offer better performance at low temperatures. The BP-L60A/L90A are recommended for use at low temperatures.
- Carrying a spare battery pack is recommended.

The BP-L40 (A)/L60A/L90A is free from memory effect. There is no need to discharge it fully before recharging.

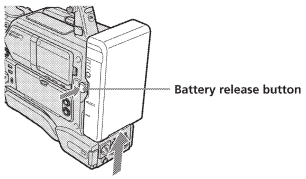
Installing the battery pack

(1) Attach the battery pack against the rear of the camcorder, aligning the side line of the battery pack with the line on the camcorder.
(2) Slide the battery pack down until its "◀LOCK" arrow points at the matching line on the camcorder.



To remove the battery pack

Holding the battery release button in, pull the battery pack up.



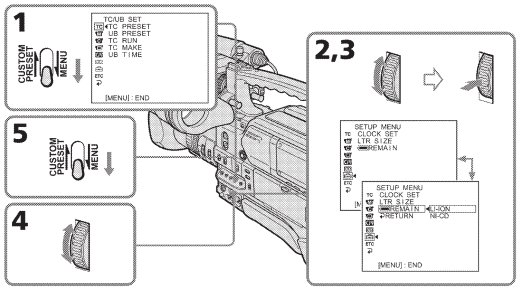
Setting up the type of the battery pack

Set up the type of the battery pack installed to the camcorder, using the menu. If you do not set the type, the battery remaining indicator will not indicate the correct capacity.

(1) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu.
(2) Turn the SEL/PUSH EXEC dial to select , then press the dial.
(3) Turn the SEL/PUSH EXEC dial to select REMAIN, then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select the type of the battery pack, then press the dial.

Setting	Meaning
LI-ION	When using a lithium-ion battery pack (BP-L40 (A)/L60A/L90A)
NI-CD	When using a nicad battery pack (NP-1B/BP-90A)

(5) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to make the menu disappear.

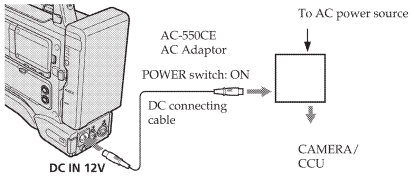


When the battery capacity is low
The BATT and REC lamps (red) in the viewfinder and the TALLY lamps on the camcorder will flash.

Using an AC adaptor

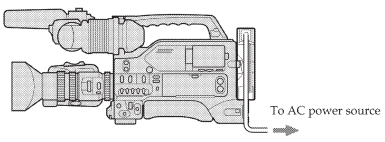
When using an AC-550CE AC Adaptor

Connect the camcorder to the AC power supply as shown in the following figure, and turn the POWER switch of the AC-550CE ON.



When using an AC-DN1 AC Adaptor

Mount the AC-DN1 on the camcorder in the same way as a battery pack, then connect to the AC power source.



Note
When total power consumption of the camcorder and accessories is 38 W or higher, or when using a video light, use the AC-DN2A AC adaptor (lower than 150 W).

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Step 2 Preparing the power supply

Avoiding breaks in operation due to dead batteries

If you use both an internal battery pack and an external battery connected to the DC IN 12V connector at the same time, you can avoid breaks in operation due to the dead batteries.

When the external battery begins to fail and an internal battery pack is installed
Remove the DC output cable of the external battery from the DC IN 12V connector. The power source will switch to the internal battery pack.

When the external battery begins to fail and an internal battery pack is not installed
First install a fully charged internal battery pack to the camcorder, then remove the DC output cable of the external battery from the DC IN 12V connector. The power source will switch to the internal battery pack. To use an external battery again, connect a fully charged external battery to the DC IN 12V connector before removing the internal battery pack. The power source will switch to the external battery.

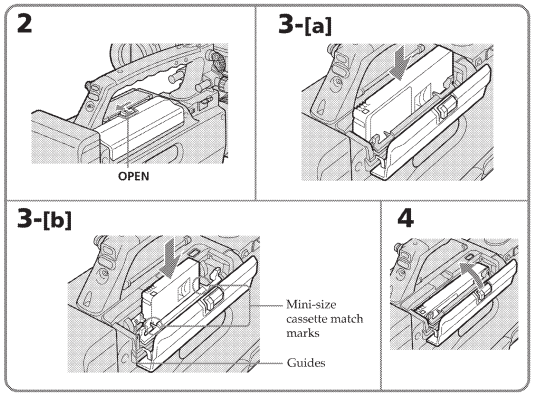
Continuous operation when operating with only an internal battery pack
First, connect a fully charged external battery to the DC IN 12V connector, then change the internal battery.

Notes
- Whenever an internal battery pack is installed and an external battery is connected to the DC IN 12V connector, the external battery is always used as the power source.
- There may be some noise on the video or audio signal at the instant the power sources are switched.
- When changing the battery pack, make sure that the POWER switch is set to OFF.
- When using the two NP-1B battery packs, be sure to change both of them at the same time.

Step 3 Inserting a cassette

The camcorder can use standard-size and mini-size DVCAM/DV cassettes.
Before inserting a cassette, make sure that no cassette is in the cassette compartment. Inserting a cassette forcibly may damage internal parts of the camcorder.

(1) Install the power source (p. 8).
(2) While sliding OPEN in the direction of the arrow, open the cassette lid.
(3) Insert the cassette with the window facing out and the REC/SAVE switch facing upward. Check for tape slack before inserting the cassette.
[a] Inserting a standard-size cassette
Insert the cassette with the cassette window (on the front) facing outward.
[b] Inserting a mini-size cassette
Insert the cassette with the cassette window (on the front) facing outward. Push the cassette between the both guides.
(4) Close the cassette lid until it clicks.



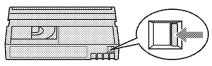
To eject a cassette
Follow the procedure above, and take out the cassette by pressing the EJECT button in step 3.

Step 3 Inserting a cassette

Note
Internal parts of the camcorder may become bent or otherwise damaged if you attempt to insert a mini-size cassette in the wrong direction (such as with the cassette turned backside front so the reel holes face the cassette holder window or with the cassette turned sideways so that a short side enters first).

When you use cassettes with cassette memory
Read the instruction about cassette memory to use this function properly (p. 158).

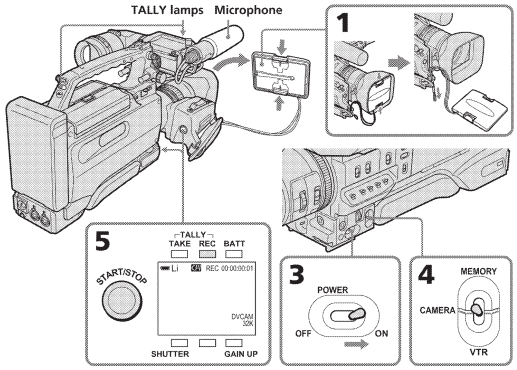
To prevent accidental erasure
Slide the REC/SAVE switch on the cassette to the SAVE position.



If flashes even if the cassette has been inserted
Insert the cassette again.

Recording a picture

Your camcorder automatically focuses for you.
(1) Remove the hood cap and pull the hood cap string to fix it.
(2) Install the power source and insert a cassette. See "Step 2" and "Step 3" for more information (p. 8 to 14).
(3) Set the POWER switch to ON.
(4) Set the MEMORY/CAMERA/VTR selector to CAMERA. Your camcorder is set to the standby mode. The picture now being shot is displayed in the viewfinder.
(5) Press START/STOP. Your camcorder starts recording. "STBY" in the viewfinder changes to "REC" and the REC lamp in the viewfinder lights up. Also, the TALLY lamps located on the front and rear of your camcorder light up. To stop recording, press START/STOP again. This camcorder is equipped with two START/STOP buttons, and you can use either of them for recording start/stop.



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To turn off the TALLY lamps

When you turn off the TALLY lamp located on the viewfinder, set the TALLY switch located on the front of the viewfinder to OFF, and when you turn off the TALLY lamp located on the rear, set the TALLY switch located below the TALLY lamp to OFF. The intensity of the front TALLY lamp can be chosen from high (HIGH) or low (LOW).

Note

Fasten the grip strap firmly.

Note on the progressive mode

If you intend to use the images on your PC or play the images back as still images, we recommend that you set PROG. SCAN to ON in the menu settings before shooting (p. 120). The picture quality improves in this mode, but if you shoot a moving subject, the image shakes when it is played back.

To enable smooth transition

Transition between the last scene you recorded and the next scene is smooth as long as you do not eject the cassette even if you turn off your camcorder. When you use a tape with cassette memory, however, you can make the transition smooth even after ejecting the cassette if you use the end search function (p. 29).
However, check the following:

- When you change the battery pack, set the POWER switch to OFF.
- Do not mix recordings in the DVCAM format and the DV format on one tape.
- If you record a tape in DV format, the transition of a tape may not be smooth. We recommend that you use DVCAM cassettes and set REC MODE to DVCAM in the menu settings to obtain reliable clear pictures.

Note on transition

The playback picture may be distorted or the time code may not be written properly between scenes when you change the recording format on one tape.

If you leave your camcorder in standby mode for five minutes

The head drum of the camcorder automatically stops rotating. This is to prevent the tape wear and save the battery power. To re-start recording, press the START/STOP button. It may take more time to start recording. However, this is not a malfunction.

Using the ND filter

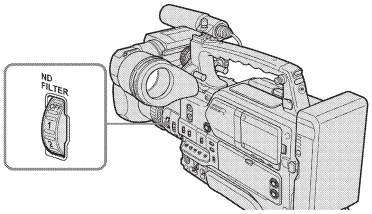
Using the ND filter (the ND filter 1 setting corresponds to 1/4 of the quantity of light and the ND filter 2 setting corresponds to 1/32 of the quantity of light), you can record a picture clearly by adjusting light amounts, even if you shoot under too bright conditions.

When the ND1 or ND2 indicator flashes on the LCD screen or in the viewfinder

The ND filter is necessary.
When ND 1 flashes, set the ND FILTER selector to 1 so that the ND 1 indicator on the LCD or viewfinder screen stops flashing and remains on.
When ND 2 flashes, set the ND FILTER selector to 2 so that the ND 2 indicator on the LCD or viewfinder screen stops flashing and remains on.

When ND OFF flashes on the LCD screen or in the viewfinder

The ND filter is not necessary. Set the ND FILTER selector to OFF so that the indicator disappears from the LCD or viewfinder screen.
The ND filter is now deactivated.



Note

If you set the ND FILTER selector to another positions during recording, the picture may be blurred or audio noise may occur. We recommend that you check the position of the ND FILTER selector before shooting.

When the DISPLAY switch located on the front of the viewfinder is set to OFF or turning off the indicators using the DISPLAY button

The ND filter indicator will disappear after you set the ND FILTER selector to the appropriate position according to the ND filter indication.

When you adjust the iris manually

The selected position is displayed, however, the recommended position of the ND FILTER selector is not indicated.

Usable cassettes

The camcorder can use standard-size and mini-size DVCAM/DV cassettes. (To ensure high-quality playback, editing, and storage of recorded contents, we recommend using highly reliable DVCAM cassettes).
The following table lists the cassettes that can be used in the camcorder.

Model name	Cassette size
PDV-64ME/64MEM/64N/94ME/124ME/124MEM /124N/184ME/184MEM/184N	Standard size
PDVM-12ME/22ME/32ME/32MEM/32N/40ME/40MEM/40N	Mini size

The numbers in the model names show maximum recording/playback time (minutes) for each model. For example, the maximum recording/playback time of the PDV-184ME is 184 minutes.

When you use a DV cassette, set REC MODE to DV SP in the menu settings. You can record on a tape 1.5 times longer than the DVCAM format.

To set the audio reference level

When using the camcorder in a editing system containing both consumer DV and professional equipment, setting the audio reference level to –12 dB is recommended. Set up the A REF LVL item in the menu settings (p. 120).
–12 dB (the default setting) : Audio reference level commonly used for DV products (The maximum level is 0 dB.)
–18 dB: Audio reference level for professional use

Notes

- You cannot record on a tape in LP mode in the DV format.
- If you insert an incorrect type of cassette, it will be automatically ejected.
- Changing the audio reference level setting from –18 dB to –12 dB increases the audio recording level by 6 dB whether the AUDIO SELECT (CH-1/CH-2) switches are set to AUTO or MANUAL.

If you use a DV cassette without setting REC MODE to DV SP

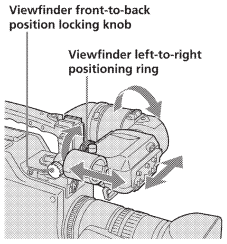
The recordable time is 2/3 time that indicated on the cassette.

Cassettes that can be played back with your camcorder

You can play back both cassettes recorded in the DVCAM format or in the DV format, however, you cannot play back cassettes that were recorded in LP mode in the DV format.

Adjusting the viewfinder position

To adjust the viewfinder left-to-right position, loosen the left-to-right positioning ring, and to adjust the front-to-back position, loosen the front-to-back position locking knob.

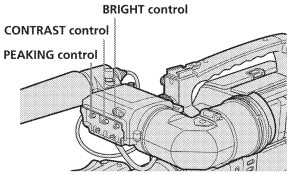


Left eye adaptor

By fitting a left eye adaptor, you can use the camcorder with your left eye to the viewfinder. For details, contact your Sony dealer.

Adjusting the viewfinder screen

The following adjustments are provided to improve the visibility of the viewfinder screen. Although these adjustments may make the viewfinder image clearer, they have no effect on the output video signal from the camcorder.

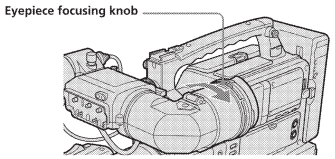


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Eyepiece focus adjustment

Depending on the eyesight of the operator — whether longsighted or shortsighted — the optimal position of the viewfinder image varies. Adjust the eyepiece focus to get the clearest viewfinder image for your eyesight. First focus the image with the lens, then adjust the eyepiece focusing knob. The adjustment range is from –3 to 0 diopters[1] (the default setting is 0 diopters).

1) Diopter: A unit to indicate the degree of convergence or divergence of a bundle of rays.



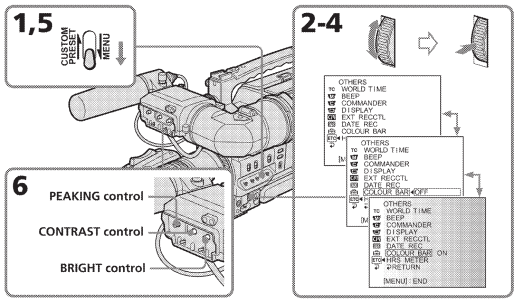
To modify the adjustment range

Using an optional part allows you to modify the adjustment range to –2 to +1 diopters or –0.5 to +3 diopters. For details, consult your Sony dealer.

Contrast and brightness adjustment

Carry out these adjustments with the color bars displayed.

(1) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu in standby or recording mode.
(2) Turn the SEL/PUSH EXEC dial to select ATC, then press the dial.
(3) Turn the SEL/PUSH EXEC dial to select COLOUR BAR, then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select ON, then press the dial.
(5) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to erase the menu display.
(6) Watching the color bars, turn the CONTRAST and BRIGHT controls to adjust the contrast and brightness.



Outline emphasis adjustment

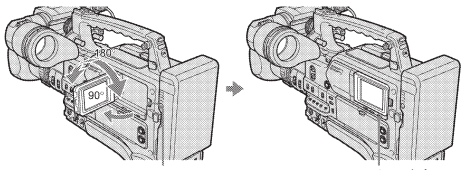
Turning the PEAKING control changes the degree of outline emphasis in the viewfinder image, to make focusing easier.

Using the LCD screen

While sliding OPEN in the direction of the battery pack, then open the LCD panel. The picture being shot is displayed on the LCD screen. To turn off the LCD screen, set the LCD switch to OFF or close the LCD panel with the LCD screen facing toward the camcorder body.

The LCD panel is opened up to 90 degrees and it rotates about 90 degrees to the battery side and about 180 degrees to the lens side.

To close the LCD panel, set it vertically and swing it into the camcorder body until it clicks.



If you turn the LCD panel over so that it faces the other way in standby or recording mode, the ☺ indicator appears on the LCD screen and in the viewfinder **(Mirror mode)**.

When you use the LCD screen outdoors in direct sunlight

The LCD screen may be difficult to see. If this happens, we recommend that you use the viewfinder.

When you adjust the angle of the LCD panel

Make sure that the LCD panel is opened up to 90 degrees.

When using both the LCD screen and the viewfinder during shooting

The usable time of the battery pack when using both the LCD screen and the viewfinder will be shorter than when using the viewfinder only.

Pictures in the mirror mode

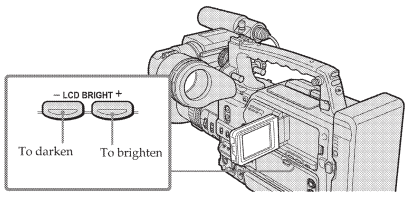
The picture on the LCD screen is a mirror-image. However, the recording picture will be normal.

Indicators in the mirror mode

The STBY indicator appears as ▮▮● and REC as ●. Some of the other indicators appear mirror-reversed and others are not displayed. However, if you close the LCD panel with the LCD screen turned over, indicators appear normally.

Adjusting the brightness of the LCD screen

To adjust the brightness of the LCD screen, press LCD BRIGHT + or –.

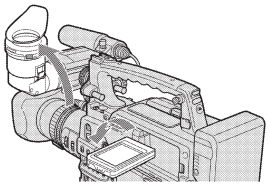


Even if you do the LCD screen adjustment using the LCD BRIGHT +/– buttons

The recorded picture will not be affected.

Recording in a low position

You can record in a low position to get an interesting recording angle. Lift up the viewfinder or rotate the LCD panel with the screen facing up to record from a low position.



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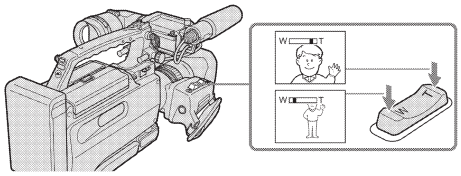
After recording

(1) Close the LCD panel.
(2) Eject the cassette.
(3) Set the POWER switch to OFF.
(4) Remove the battery pack.

Using the zoom feature

To zoom with the zoom lever

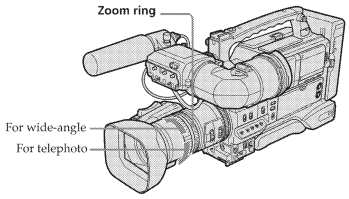
Press the power zoom lever a little for a slower zoom. Press it deeper for a faster zoom. Using the zoom function sparingly results in better-looking recordings.
"T" side: for telephoto (subject appears closer)
"W" side: for wide-angle (subject appears farther away)



When you shoot close to a subject
If you cannot get a sharp focus, press the "W" side of the power zoom lever until the focus is sharp. You can shoot a subject that is at least about 80 cm (about 2 feet 5/8 inch) away from the lens surface in the telephoto position, or about 1 cm (about 1/2 inch) away in the wide-angle position.

To zoom with the zoom ring

Using the zoom ring, you can control the zoom by your desired speed and you can make fine adjustments.
During recording, turn the zoom ring to the desired speed.

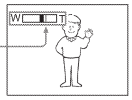


Note
If you turn the zoom ring quickly, the zoom may not respond to the zoom ring adjustment. Rotate the zoom ring with appropriate speed.

Using the digital zoom – Zoom greater than 12×

Zoom greater than 12× is performed digitally, if you set D ZOOM to 24× or 48× in the menu settings. The digital zoom function is set to OFF as a default setting (p. 120). If you use the digital zoom function, the picture quality deteriorates.

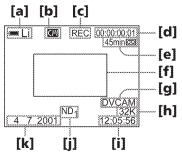
The right-ended portion of the bar shows the digital zooming zone. The digital zooming zone appears when you set D ZOOM to 24× or 48×.



You cannot use the digital zoom:
– When you set PROG. SCAN to ON in the menu settings (p. 120).
– When the MEMORY/CAMERA/VTR selector is set to MEMORY.

Indicators displayed during recording

The indicators are not recorded on the tapes.



[a] Remaining battery capacity indicator
This appears after you turn on the power and wait for a while. When REMAIN is set to LI-ION in the menu settings, "Li" is indicated, and when it is set to NI-CD, "Ni" is indicated.
[b] Cassette memory indicator
This appears when using a tape with cassette memory.
[c] STBY/REC indicator
[d] Time code/User bits
[e] Remaining tape indicator
This appears after you insert a cassette.
[f] Guide frame
[g] DVCAM format/DV format in SP mode indicator
[h] Audio mode indicator
[i] Time indicator
[j] ND filter indicator
The most suitable mode will flash regardless of the current mode. After you select the appropriate position, it will stop flashing and remain on when the DISPLAY switch located on the front of the viewfinder is set to ON, or it will disappear when the DISPLAY switch is set to OFF.
[k] Date indicator

Time code
The time code indicates the recording or playback time, "00:00:00:00" (hours : minutes : seconds : frames). You cannot rewrite only the time code. You can preset the time code. The time code can be preset or be reset during recording (p. 105).

On user bits display
You can display the user bits by setting the DISPLAY SELECT switch to U-BIT (p. 109).

Remaining tape indicator
The indicator may not be displayed accurately depending on the tape.

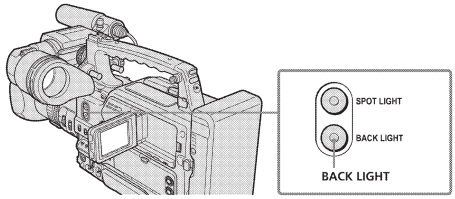
Note on the date/time indicator
Recording date/time is not displayed during shooting, however, it is automatically recorded on the tape. You can check the recording date/time during playback by pressing DATA CODE. When you want to display the date and time during shooting, set DATE REC to ON in the menu settings. However, once you record with the date and time, you cannot erase them.

On remaining battery capacity indicator
The camcorder cannot detect the type of the battery pack automatically. According to your battery pack, set up the REMAIN item properly (p. 10). A wrong setup does not indicate the correct battery capacity.

Shooting backlit subjects (BACK LIGHT)

When you shoot a subject with the light source behind the subject or a subject with a light background, use the backlight function.

Press BACK LIGHT in standby, recording, or memory mode.
The indicator appears on the LCD screen or in the viewfinder.
To cancel, press BACK LIGHT again.



If you press SPOT LIGHT when using the backlight function
The backlight function will be canceled and the spot light function will be enabled.

When you manually adjust two or more functions from the following: iris, gain, and shutter speed
You cannot use the backlight function.

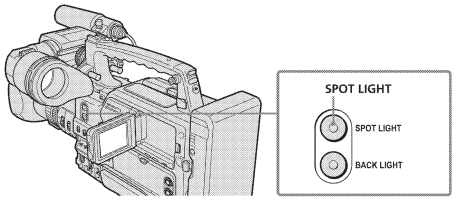
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Recording a picture

Spot light

This function prevents people's faces, for example, from appearing excessively white when shooting subjects lit by strong light, such as in the theater.

Press SPOT LIGHT in standby, recording, or memory mode.
The ✱ indicator appears on the LCD screen or in the viewfinder.
To cancel, press SPOT LIGHT again.

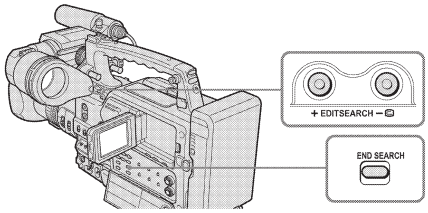


If you press BACK LIGHT when using the spot light function
The spot light function will be canceled and the backlight function will be enabled.

You cannot use the spotlight mode while in the following settings:
– Old movie
– Shutter speed value of 1/25 or smaller
– When you manually adjust two or more functions from the following: iris, gain, and shutter speed

Checking the recording – END SEARCH / EDITSEARCH / Rec Review

You can use these buttons to check the last recorded picture or shoot so that the transition between the last recorded scene and the next scene you record is smooth.



Searching the end point of the recording — END SEARCH

You can easily go to the end of the last recorded portion.

Press END SEARCH in standby mode.
The camcorder rewinds or fast-forwards the tape and the last five-second recorded picture is played back. After playback the camcorder turns to standby mode. You can monitor the sound from the speaker or headphones.

Changing the next recording start point — EDITSEARCH

You can change the next recording start point in standby mode.

Hold down the +/– side of EDITSEARCH in standby mode. The recorded picture is played back.
+: to go forward
–: to go backward
Release EDITSEARCH to stop playback. If you press START/STOP, re-recording begins from the point you released EDITSEARCH. You cannot monitor the sound.

Checking the last recorded picture — Rec Review

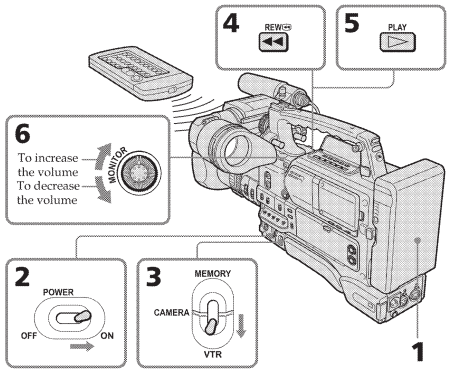
You can check the last recorded portion.

Press the –⏮ side of EDITSEARCH momentarily in standby mode.
The last few-seconds of picture is played back and the camcorder returns to standby.
You can monitor the sound from the speaker or headphones.

End search function
When you use a tape without cassette memory, the end search function does not work once you eject the cassette after you record on the tape. If you use a tape with cassette memory, the end search function works even once you eject the cassette.
If there is a blank portion at the beginning or between the recorded portions, the end search function may not work correctly (p. 158).

Playing back a tape

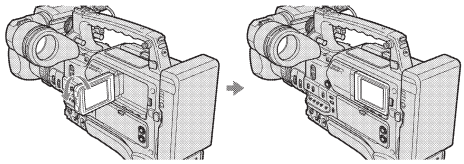
You can monitor the playback picture on the LCD screen or in the viewfinder. You can also control playback using the Remote Commander supplied with your camcorder.
(1) Install the power source.
(2) Set the POWER switch to ON and insert the recorded tape.
(3) Set the MEMORY/CAMERA/VTR selector to VTR.
(4) Press ◀◀ to rewind the tape.
(5) Press ▶ to start playback.
(6) To adjust the volume, turn the MONITOR knob.



To stop playback
Press ■.

Playing back a tape

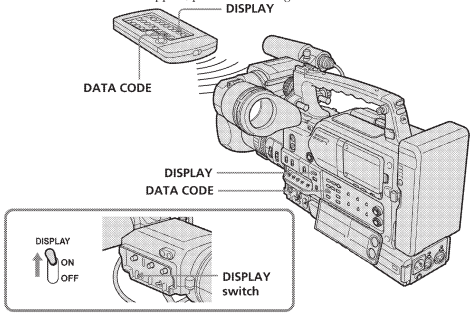
When monitoring on the LCD screen
You can turn the LCD panel over and move it back to the camcorder body with the LCD screen facing out.



To select the audio output channel via the speaker or PHONES jack
Select the channels using the AUDIO MONITOR selector.
CH-1: Channel 1 audio
MIX: Mixed audio (channels 1 and 2)
CH-2: Channel 2 audio

To control the display of the screen indicators

(1) Set the DISPLAY switch located on the front of the viewfinder to ON. If the switch is not set to ON, the DISPLAY button does not function.
(2) Press DISPLAY on the camcorder or on the Remote Commander supplied with your camcorder.
The indicators appear on the LCD screen or in the viewfinder.
To make the indicators disappear, press DISPLAY again.



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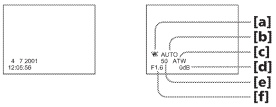
Using the data code function

Your camcorder automatically records not only images on the tape but also the recording data (date/time or various settings when recorded) **(Data code)**.

Press DATA CODE on the camcorder or on the Remote Commander supplied with your camcorder in playback mode.

The display changes as follows:
date/time → various settings (SteadyShot OFF, white balance, gain, shutter speed, aperture value, exposure mode) → no indicator

Date/time **Various settings**



[a] SteadyShot OFF indicator
[b] Exposure mode indicator
[c] White balance mode indicator
[d] Gain indicator
[e] Shutter speed indicator
[f] Aperture value

To not display the various settings
Set DATA CODE to DATE in the menu settings (p. 120).
The display changes as follows:
date/time ↔ no indicator

Recording data
Recording data is your camcorder's information when you have recorded something. In CAMERA mode, the recording data will not be displayed.

When you use the data code function, "-- -- ----" (date) or "-- : -- : --" (time) appears if:
– A blank portion of the tape is being played back.
– The tape is unreadable due to tape damage or noise.
– The tape was recorded by the camcorder without the date and time set.

Data code
When you connect your camcorder to a monitor, the data code also appears on the monitor screen (p. 35).

Note on the date/time indicator
Recording date/time is not displayed during shooting, however, it is automatically recorded on the tape. You can check the recording date/time during playback by pressing DATA CODE. When you want to display the date and time during shooting, set DATE REC to ON in the menu settings. However, once you record with the date and time, you cannot erase them.

If the aperture adjustment is set to minimum
"CLOSE" is displayed at the location of the aperture value.

Various playback modes

To operate video control buttons, set the MEMORY/CAMERA/VTR selector to VTR.

To view a still picture (playback pause)
Press ❚❚ during playback. To resume normal playback, press ► or ❚❚.

To advance the tape
Press ►► in stop mode. To resume normal playback, press ►.

To rewind the tape
Press ◄◄ in stop mode. To resume normal playback, press ►.

To change the playback direction
Press < during playback to reverse the playback direction. To resume normal playback, press ►.

To locate a scene monitoring the picture (picture search)
Keep pressing ◄◄ or ►► during playback. To resume normal playback, release the button.

To monitor the picture at high-speed while advancing or rewinding the tape (skip scan)
Keep pressing ◄◄ while rewinding or ►► while advancing the tape until the picture appears on the LCD screen or in the viewfinder. To resume rewinding or advancing, release the button.

To view the picture at slow speed (slow playback)
Press ❙► during playback. For slow playback in the reverse direction, press <, then press ❙►. To resume normal playback, press ►.

To view the picture at double speed
Press ×2 on the Remote Commander during playback. For double speed playback in the reverse direction, press <, then press ×2 on the Remote Commander. To resume normal playback, press ►.

To view the picture frame-by-frame
Press > in playback pause mode. For frame-by-frame playback in the reverse direction, press <. To resume normal playback, press ►.

To search the last scene recorded (END SEARCH)
Press END SEARCH in stop mode. The last five seconds of the recorded portion plays back and stops.

In various playback modes
• Sound is muted.
• The previous picture may remain as a mosaic image during playback.

When the playback pause mode lasts for five minutes
Your camcorder automatically enters the stop mode. To resume playback, press ►.

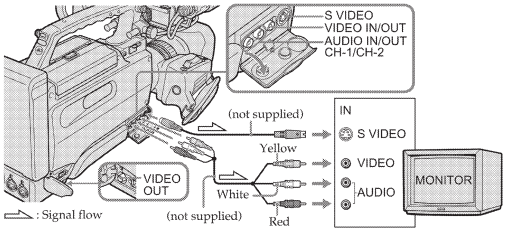
Slow playback
Slow playback can be performed smoothly on your camcorder, however, this function does not work for a signal output through the i.LINK DV IN/OUT connector.

When you play back a tape in reverse
Horizontal noise may appear at the center, or the top and bottom of the screen. This is not a malfunction.

Note on DV-formatted tapes
You can play back DV-formatted tapes on this camcorder if the tape is recorded in SP mode. "DV SP" appears on the LCD screen or in the viewfinder during playback.
You cannot play back DV-formatted tapes recorded in LP mode.

Viewing the recording on a monitor

Connect your camcorder to your monitor or VCR with the A/V connecting cable to watch the playback picture on the monitor screen. You can operate the video control buttons in the same way as when you monitor playback pictures on the LCD screen. Refer to the operating instructions of your monitor or VCR.



If your monitor is connected to a VCR

Connect your camcorder to the line input on the VCR by using the A/V connecting cable. Set the input selector on the monitor to LINE.

If your monitor or VCR is a monaural type

Connect with the monitor or VCR using the audio cable (monaural ↔ stereo) (not supplied).

If your monitor or VCR has a BNC-type connector for video input
Connect it to the VIDEO OUT connector on the side of the camcorder using a cable with BNC connectors. In this connection, you need not connect the S video cable nor the yellow (video) plug of the A/V connecting cable.

If your monitor or VCR has an S video jack
Connect using an S video cable (not supplied) to obtain high-quality pictures. With this connection, you do not need to connect the yellow (video) plug of the A/V connecting cable. Connect the S video cable (not supplied) to the S video jacks on both your camcorder and the monitor or the VCR. This connection produces higher quality DVCAM/DV format pictures.

When you adjust the monitor screen
Set the MEMORY/CAMERA/VTR selector to CAMERA, and set COLOUR BAR to ON in the menu settings (p. 120). The colour bars are displayed on the monitor screen.

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Shooting with manual adjustment

Under normal conditions, this unit automatically makes various adjustments as it shoots. However, you can adjust the following functions manually to suit your preference.

Functions you can adjust by setting the AUTO MODE switch to OFF
Iris, gain, shutter speed, and white balance

Functions you can adjust in menu settings
Deactivating the SteadyShot

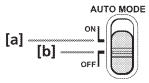
Functions you can adjust by using other selectors/rings
ND filter, zebra pattern, focus, AE shift, and zoom

The following describes how to adjust all the functions mentioned above except ND filter (p. 17), zoom (p. 24), focus (p. 45), and white balance (p. 47) .

AUTO MODE switch

ON [a]
Select this position to let the unit adjust the iris, gain, shutter speed, and white balance automatically.

OFF [b]
Select this position to adjust the iris, gain, shutter speed, or white balance manually.



Notes
- When you manually adjust two or more functions from the following during backlight or spot light mode: iris, gain, and shutter speed, the backlight or spot light function will be automatically cancelled.
- The functions (iris, gain, and shutter speed) that are not adjusted manually will be automatically adjusted according to shooting conditions.

Adjusting the iris

Adjust the iris manually under the following cases.

[a] [b]

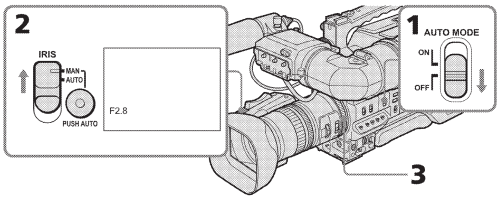




[a]
- The background is too bright (back lighting)
- Insufficient light: most of the picture is dark

[b]
- Bright subject and dark background
- To record the darkness faithfully

(1) Set the AUTO MODE switch to OFF while the camcorder is in standby, recording, or memory mode.
(2) Set the IRIS switch to MAN. The iris indicator appears on the LCD screen or in the viewfinder.
(3) Turn the IRIS ring to adjust the iris.
As you turn the ring, the F value changes as follows:
F1.6 ⟷ ... ⟷ F11 ⟷ CLOSE.
For a smaller aperture, select a higher value. The gain and shutter speed change in accordance with the selected F value.



To return to automatic iris mode
Set the IRIS switch to AUTO or set the AUTO MODE switch to ON. The iris indicator disappears from the LCD or viewfinder screen. However, when you set the AUTO MODE switch to ON, other manual adjustments (gain, shutter speed, and white balance) will be also cancelled.

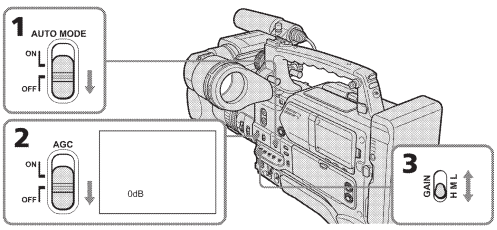
To shoot with automatic iris adjustment momentarily
Press IRIS PUSH AUTO. The automatic adjustment functions while you are pressing IRIS PUSH AUTO. When you release IRIS PUSH AUTO, the manual adjustment resumes.

About the depth of field
The depth of field is the in-focus range, measured from the distance behind a subject to the distance in front. The depth of field can vary with the iris (F value) and the focal length. Lowering the F value (large iris) reduces the depth of field. Raising the F value (small iris) provides a larger depth of field. Zooming in telephoto position offers a smaller depth of field while the depth of field in the wide-angle position is greater.

The depth of field	Shallow	Deep
Iris	Near open (Low F value)	Near close (High F value)
Zoom	Telephoto (T)	Wide (W)

Adjusting the gain

(1) Set the AUTO MODE switch to OFF while the camcorder is in standby, recording, or memory mode.
(2) Set the AGC switch to OFF. The gain indicator appears on the LCD screen or in the viewfinder.
(3) Switch the GAIN selector to select the desired gain value.
The gain value can be selected between three positions (H/M/L) and each value is select from 0 dB, 3 dB, 6 dB, 9 dB, 12 dB, 15 dB and 18 dB in 3 dB steps using the GAIN LEVEL item in the menu settings. The default setting is as follows: 18 dB (H), 9 dB (M), and 0 dB (L).

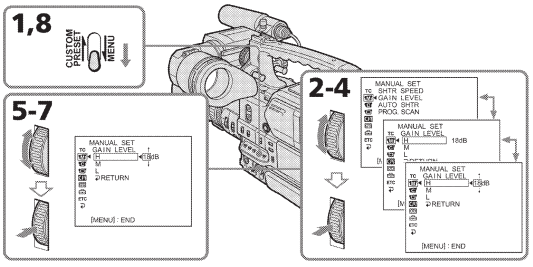


To return to automatic gain mode
Set the AGC switch to ON or set the AUTO MODE switch to ON. The gain indicator disappears from the LCD or viewfinder screen. However, when you set the AUTO MODE switch to ON, other manual adjustments (iris, shutter speed, and white balance) will be also cancelled.

When the gain value is 3 dB or higher
The GAIN UP lamp (orange) in the viewfinder lights.

Setting the gain values for the positions of the GAIN selector

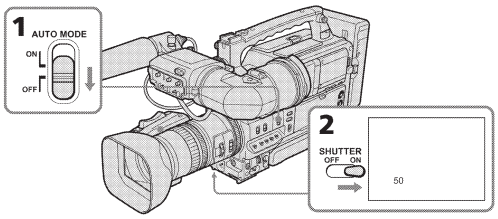
(1) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu in standby, recording, or memory mode.
(2) Turn the SEL/PUSH EXEC dial to select ☎, then press the dial.
(3) Turn the SEL/PUSH EXEC dial to select GAIN LEVEL, then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select H, then press the dial.
(5) Turn the SEL/PUSH EXEC dial to adjust the gain value for the H position.
The value changes between 0 dB and 18 dB.
(6) Press the SEL/PUSH EXEC dial.
(7) Repeat steps 4 to 6 to adjust the gain values for the M and L positions.
(8) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to erase the menu display.



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Adjusting the shutter speed

(1) Set the AUTO MODE switch to OFF while the camcorder is in standby, recording, or memory mode.
(2) Set the SHUTTER switch to ON. The shutter speed set by the SHTR SPEED item in the menu settings will be indicated on the LCD screen or in the viewfinder.



To return to automatic shutter speed mode

Set the SHUTTER switch to OFF or set the AUTO MODE switch to ON. The shutter speed indicator disappears from the LCD or viewfinder screen. However, when you set the AUTO MODE switch to ON, other manual adjustments (iris, gain, and white balance) will be also cancelled.

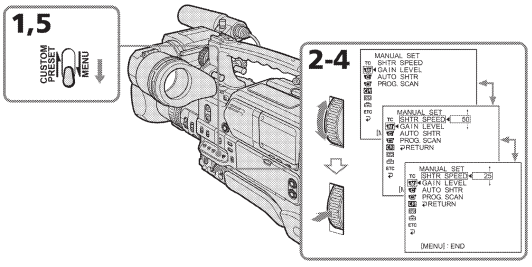
When you select the shutter speed values other than 1/50
The SHUTTER lamp (red) in the viewfinder lights.

When shooting at slow shutter speed
At slow shutter speed, automatic focus may be lost. Adjust the focus manually using a tripod.

When shooting under fluorescent light or light bulbs
When shooting under fluorescent light or light bulbs, a rare phenomenon may happen in which the screen lights up brightly depending on the shutter speed (Flicker phenomenon).

Adjusting the shutter speed value

(1) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu in standby, recording, or memory mode.
(2) Turn the SEL/PUSH EXEC dial to select ☎, then press the dial.
(3) Turn the SEL/PUSH EXEC dial to select SHTR SPEED, then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select the desired speed. As you turn the dial, the shutter speed changes as follows:
1/3 ⟷ 1/6 ⟷ 1/12 ⟷ ... ⟷ 1/3500 ⟷ 1/6000 ⟷ 1/10000
To increase the shutter speed, select a smaller setting (large value indicator on the LCD screen or in the viewfinder).
(5) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to erase the menu display.

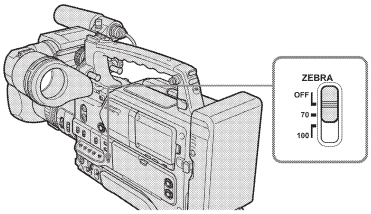


When you set the shutter speed value to 1/25 or smaller
You cannot use the spot light (p. 28) and digital effect (p. 69) functions.

Shooting with the zebra pattern

You can set the camcorder to display a zebra pattern (diagonal stripes) in the portion of the picture on the LCD screen or in the viewfinder with a subject whose brightness exceeds a certain level. The portion of the picture where zebra pattern appears is an area of high brightness and overexposure (when the ZEBRA selector is set to "100"). You can check the picture level of a subject by displaying the zebra pattern. Use the zebra pattern as a guide for adjusting the exposure and shutter speed so that you can get the desired picture.

Set the ZEBRA selector to 70 or 100 in standby or memory mode.



Setting	Meaning
70	The zebra pattern appears in the portion of the picture on the LCD screen or in the viewfinder with a subject whose brightness is about 70%.
100	The zebra pattern appears in the portion of the picture on the LCD screen or in the viewfinder with a subject whose brightness exceeds more than 100%.
OFF	The zebra pattern does not appear on the LCD screen or in the viewfinder.

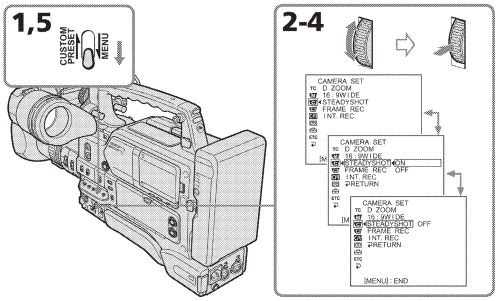
To erase the zebra pattern

Set the ZEBRA selector to OFF.

Note on shooting with the zebra pattern
Even though you see the zebra pattern on the LCD screen or in the viewfinder, the zebra pattern is not recorded.

Releasing the SteadyShot function

When the SteadyShot function is working, the camcorder compensates for camera-shake.
You can release the SteadyShot function when you do not need to use it. The ✋ indicator appears on the LCD screen or in the viewfinder. Do not use the SteadyShot function when shooting a stationary object with a tripod.
(1) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu in standby or memory mode.
(2) Turn the SEL/PUSH EXEC dial to select ☎, then press the dial.
(3) Turn the SEL/PUSH EXEC dial to select STEADYSHOT, then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select OFF, then press the dial.
(5) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to erase the menu display.



To activate the SteadyShot function again

Select ON in step 4, then press the SEL/PUSH EXEC dial.

Notes on the SteadyShot function
- The SteadyShot function will not correct excessive camera-shake.
- If you use a tele conversion lens (not supplied) or a wide conversion lens (not supplied), these lens may influence the SteadyShot function.

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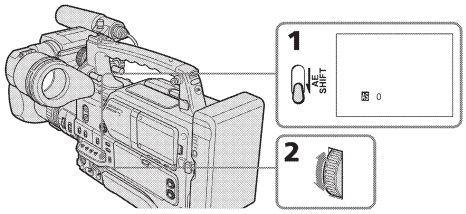
Shooting with manual adjustment

Adjusting the AE shift

You can adjust the AE shift in accordance with shooting conditions and a subject.

(1) Push the AE SHIFT switch in the direction of the arrow and release it in standby, recording, or memory mode. The AE shift indicator appears on the LCD screen or in the viewfinder.

(2) Turn the SEL/PUSH EXEC dial to adjust the brightness.



To deactivate AE shift

Set the AE shift value to 0, or push the AE SHIFT switch in the direction of the arrow and release it again.

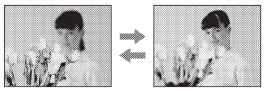
When you adjust AE shift

The –4 to +4 indicator is displayed on the LCD screen or in the viewfinder. The number varies corresponding to the AE shift level.

Focusing manually

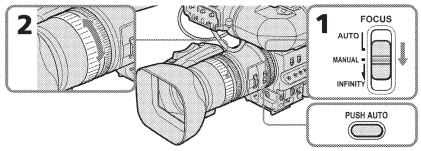
You can gain better results by manually adjusting the focus in the following cases:

- The autofocus mode is not effective when shooting
  - subjects through glass coated with water droplets
  - horizontal stripes
  - subjects with little contrast with backgrounds such as walls and sky
- When you want to change the focus from a subject in the foreground to a subject in the background
- Shooting a stationary subject when using a tripod



(1) Slide FOCUS down to MANUAL. The indicator appears on the LCD screen or in the viewfinder in recording, standby, or memory mode.

(2) Turn the focus ring to sharpen the focus.



To return to the autofocus mode

Slide FOCUS up to AUTO to turn off the or indicator.

To focus in infinity

Slide FOCUS to INFINITY. The indicator appears on the LCD screen or in the viewfinder. This function is useful when the nearer subject is focused automatically, even though you want to focus on a faraway subject.

To shoot with auto focusing momentarily

Press FOCUS PUSH AUTO. The auto focus functions while you are pressing FOCUS PUSH AUTO.

Use this button to focus on one subject and then another with smooth focusing.

When you release FOCUS PUSH AUTO, manual focusing resumes.

Focusing manually

To obtain the correct focus

First, focus on a subject manually with the zoom set toward the "T" (telephoto) side, then adjust the zoom by pressing the "W" side of the lever gradually.

When you shoot close to the subject

Focus at the end of the "W" (wide-angle) position.

changes as follows:

when recording a distant subject.

when the subject is too close to focus on.

Adjusting the white balance

White balance adjustment makes white subjects look white and allows more natural colour balance for camera recording. Normally, white balance is automatically adjusted. You can obtain better results by adjusting the white balance manually when lighting conditions change quickly or when recording outdoors: e.g., neon signs, fireworks.

Saving an appropriate white balance value in memory

You can save two white balance values in separate memories, A and B. Unless changed, the saved values are retained for approximately four months, even when the power supply is detached from the camcorder. Once a value is saved, you can automatically restore the adjustment by setting the WHITE BAL switch to the A or B position. This makes shooting under alternating lighting conditions easy.

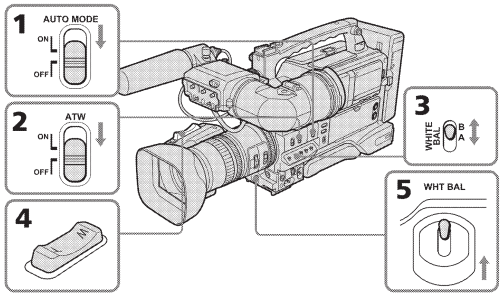
(1) Set the AUTO MODE switch to OFF while the camcorder is in standby, recording, or memory mode.

(2) Set the ATW switch to OFF.

(3) Set the WHITE BAL switch to A or B.

(4) Arrange a white subject (paper, cloth, etc.) under the same lighting conditions as for shooting, and zoom in on it so that as far as possible the whole screen is white.

(5) Push the WHT BAL switch upward and release it.
The white balance adjustment is carried out. The A or B indicator flashes quickly. When the white balance has been adjusted and stored in the memory, the indicator stops flashing. The adjustment value is automatically saved in memory A or B as selected above.
To save the white balance adjustment for different lighting conditions, repeat steps 2 to 4 above. You can save two different values for the white balance, in memories A and B.



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Adjusting the white balance

To recall a white balance value from memory

Before beginning shooting, set the WHITE BAL switch to the A or B position. This automatically sets the camcorder to the white balance adjustment saved in the corresponding memory.

Shooting when lighting conditions have changed

- When lighting conditions have changed, readjust the white balance while the camcorder is in standby mode.
- In automatic white balance mode, point your camcorder at a white subject for about 10 seconds after setting the MEMORY/CAMERA/VTR selector to CAMERA to get a better adjustment when:
  – You detach the battery for replacement.
  – You bring your camcorder outdoors from the interior of a house, or vice versa.

If the A or B indicator does not stop flashing in step 5

The white balance cannot be set. Use the automatic white balance mode.

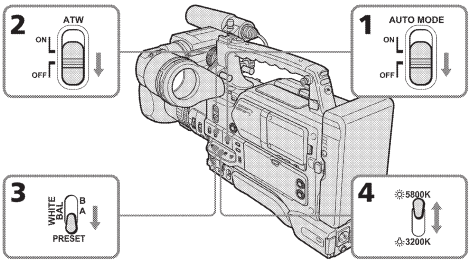
Using the preset white balance settings

The camcorder provides preset white balance settings, for instant shooting with approximately the correct adjustment.
There are also particular shooting conditions under which the preset values may give better results than the human eye adjustment.

Adjusting the white balance

(1) Set the AUTO MODE switch to OFF while the camcorder is in standby, recording, or memory mode.
(2) Set the ATW switch to OFF.
(3) Set the WHITE BAL switch to PRESET.
(4) Set the position as follows with the WHT PRESET switch.

Position	Shooting conditions
☀ 5800K (Outdoor)	• Recording a sunset/sunrise, just after sunset, just before sunrise, neon signs, or fireworks • Under a colour matching fluorescent lamp
☼ 3200K (Indoor)	• Lighting condition changes quickly • Too bright a place such as a photography studio • Under sodium lamps or mercury lamps



To return to automatic adjustment

Set the ATW switch to ON or set the AUTO MODE switch to ON. However, when you set the AUTO MODE switch to ON, other manual adjustment (iris, gain, and shutter speed) will be also cancelled.

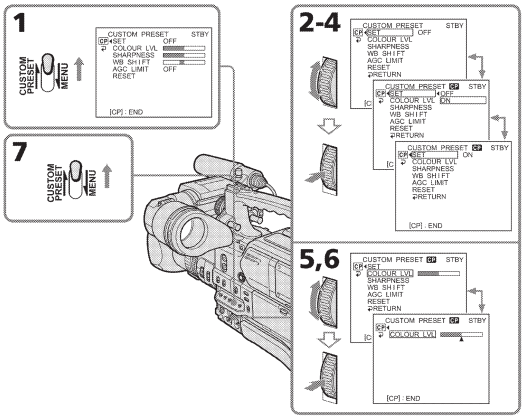
Notes on white balance

- When you shoot with studio lighting or video lighting, use the ☼ 3200K (indoor) mode.
- When you select the ☼ 3200K position, you cannot properly adjust the white balance, even if you shoot with fluorescent lighting. In such cases, readjust it manually or shoot in automatic white balance mode.

Presetting the adjustment for picture quality – Custom preset

You can preset the camcorder to record the picture with the desired picture quality. When you preset, we recommend that you check the picture quality by displaying the picture onto the monitor screen, which is connected to the camcorder.

(1) Turn the CUSTOM PRESET/MENU switch in the CUSTOM PRESET direction and release it to display the CUSTOM PRESET menu in standby or memory mode.
(2) Press the SEL/PUSH EXEC dial.
(3) Turn the SEL/PUSH EXEC dial to select SET, then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select ON, then press the dial.
(5) Turn the SEL/PUSH EXEC dial to select the desired item, then press the dial.
(6) Turn the SEL/PUSH EXEC dial to adjust the selected item, then press the dial.
(7) Turn the CUSTOM PRESET/MENU switch in the CUSTOM PRESET direction and release it .
The CUSTOM PRESET menu disappears and the indicator CP appears on the LCD screen or in the viewfinder.



Presetting the adjustment for picture quality – Custom preset

Items to be adjusted

Item	Meaning	Adjustment value
COLOUR LVL	Colour intensity	Decreases colour intensity ←→ Increases colour intensity
SHARPNESS	Sharpness	Softer ←→ Sharper
WB SHIFT	White balance	Bluish ←→ Reddish
AGC LIMIT	Auto Gain-limit	6 dB/12 dB/OFF
RESET	Sets items above to the default settings.	

To cancel using the custom preset

Select OFF in step 4, then press the SEL/PUSH EXEC dial.

To return to the standard setting

Select OK from the RESET item in step 5, then press the SEL/PUSH EXEC dial. To cancel, select RETURN, then press the SEL/PUSH EXEC dial.

To check the custom preset setting

Push the CUSTOM PRESET/MENU switch in the CUSTOM PRESET direction and release it while the camcorder is in standby, recording, or memory mode. The custom preset setting appears on the LCD screen or in the viewfinder.

About the AGC limit

When adjusting the gain manually, the level of the gain is up to 18 dB (OFF).

When you preset the desired picture quality in CAMERA or memory mode

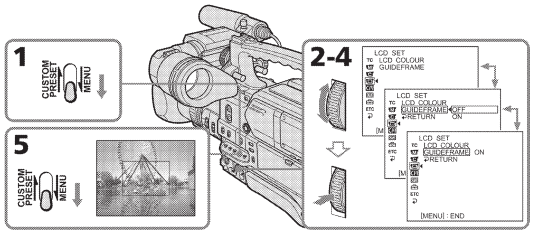
The preset is only available in each mode you preset. If you want to use a preset both in CAMERA and memory modes, you have to preset in each mode.

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Using the guide frame

You can easily make the picture be on a horizontal or vertical line using the guide frame. The guide frame is not recorded.

(1) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu in standby mode.
(2) Turn the SEL/PUSH EXEC dial to select ☎, then press the dial.
(3) Turn the SEL/PUSH EXEC dial to select GUIDEFRAME, then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select ON, then press the dial.
(5) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to erase the menu display. The guide frame is displayed on the LCD screen or in the viewfinder.



To clear the guide frame

- Select OFF in step 4, then press the SEL/PUSH EXEC dial.
- Simply press DISPLAY or set the DISPLAY switch located on the front of the viewfinder to OFF.

Note
The guide frame indicates only a rough level. The size and position of the guide frame do not affect the setting of the camcorder.

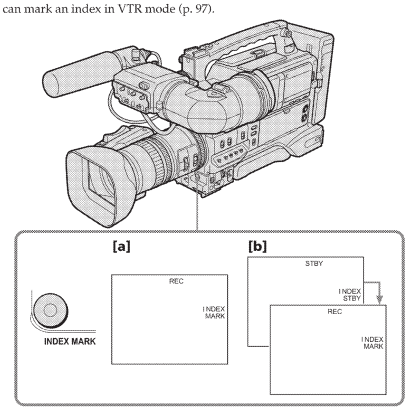
If you set GUIDEFRAME to ON
The screen indicators other than the guide frame are also displayed on the LCD screen or in the viewfinder.

When the DISPLAY switch located on the front of the viewfinder is set to OFF
The guide frame will not be displayed.

Marking an Index

If you mark an index at the scene you want to search for, you can easily search for the scene later (p. 77).

In recording mode [a]:
Press INDEX MARK.
The "INDEX MARK" indicator appears on the LCD screen or in the viewfinder for seven seconds and after the indicator disappears, the index marking is complete.
In standby mode [b]:
Press INDEX MARK.
The "INDEX STBY" indicator appears on the LCD screen or in the viewfinder. And when you press START/STOP to start recording, the "INDEX STBY" indicator changes to "INDEX MARK" and after the indicator disappears, the index marking is complete.
The camcorder starts index-marking at the 11th frame from the recording start point. A index signal will be recorded on cassette memory about 0.3 sec, and on a tape about five seconds.
You can mark an index in VTR mode (p. 97).



To cancel index marking

Press INDEX MARK again in standby mode.

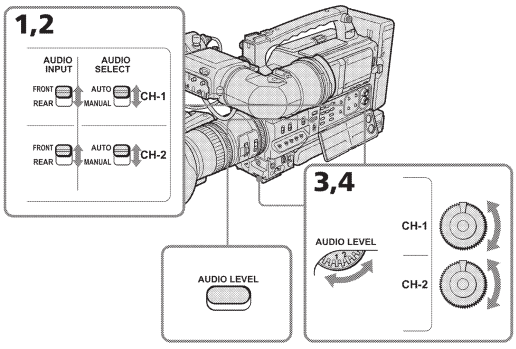
Notes on the index

- Index marks are recorded during recording, you cannot mark an index after recording.
- Index signals will be recorded both on the tape and on cassette memory. If you use cassettes without cassette memory or the cassette memory is full, the signals will be recorded only on the tape.
- When you record over the recorded tape and mark an index on the tape, we recommend that you clear all data in the cassette memory before marking an index.

Adjusting the recording level manually – Sound recording level

You can adjust the recording sound level. We recommend that you check the recording level before recording. You can adjust the channel 1 and channel 2 separately.

(1) Select the audio input using the AUDIO INPUT (CH-1/CH-2) switches.
To select the audio input for channel 1, use the AUDIO INPUT (CH-1) switch, and for channel 2, use the AUDIO INPUT (CH-2) switch.
FRONT: Inputs from the MIC IN +48V connector
REAR: Inputs from the AUDIO IN CH1/CH2 connectors
(2) Select the channel to be adjusted manually using the AUDIO SELECT (CH-1/CH-2) switches.
AUTO: Adjusts the recording level automatically
MANUAL: Adjusts the recording level manually
(3) Adjust the recording level for each channel using the AUDIO LEVEL knobs.
Use the audio level meters at the lower on the LCD screen or in the viewfinder for adjustment.



To adjust the recording level automatically

Set the AUDIO SELECT (CH-1) switch to AUTO for channel 1, and set the AUDIO SELECT (CH-2) switch to AUTO for channel 2.

To display the audio level meters
Press AUDIO LEVEL.

The sound input through the AUDIO IN/OUT CH-1/CH-2 jacks or i. DV IN/OUT connector
You cannot adjust the recording level.

Adjusting the recording level manually– Sound recording level

Notes on the recording level of the channel 1

- You can adjust the level from both the MIC IN +48V and AUDIO IN CH1 connectors.
- You can also adjust the level using the AUDIO LEVEL knob located on the front, however, when the AUDIO LEVEL knob located on the side panel is near minimum level, you cannot turn up the volume using the AUDIO LEVEL knob located on the front.

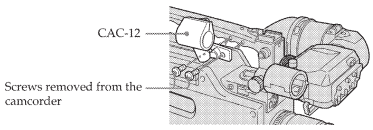
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Connecting an optional external microphone

You can also use an external 48-V microphone by connecting it to the MIC IN +48V connector. (The optional CAC-12 Microphone Holder is required.)

Installing the optional CAC-12 Microphone Holder

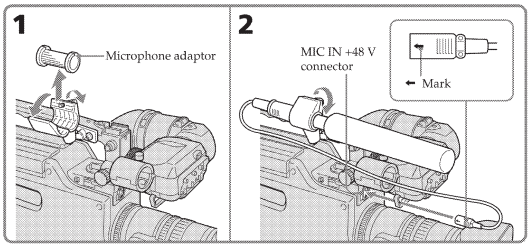
Remove the two retaining screws (M3 × 8) for the optional microphone holder, then use these screws to attach the CAC-12 Microphone Holder.



Fitting an optional microphone

Use the following procedure to attach an optional ECM-670 Microphone.

(1) Loosen the screw of the CAC-12 Microphone Holder, then open the holder and replace the microphone adaptor with the one supplied with the ECM-670 Microphone.
(2) Insert the microphone in the microphone holder, close the holder, and tighten the screw. Connect the microphone cable to the MIC IN +48 V connector.



Connecting an optional external microphone

To fit optional microphones (operable with a 48 V supply) other than the ECM-670

Use the same fitting procedure as for the ECM-670, but note the following differences with respect to the microphone adaptor.
ECM-672: no microphone adaptor required.
Slender microphones (19 mm (3/4 inch) diameter): use the microphone adaptor supplied with the CAC-12.

Note
When you use an external microphone, make sure that the wind screen does not appear on the screen, using an underscan monitor.

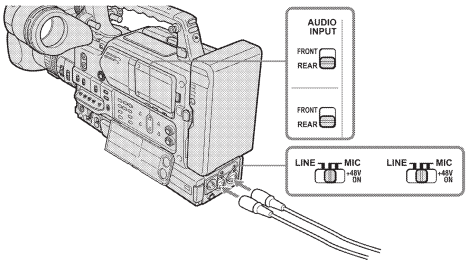
When you unplug the microphone plug
Unplug it while pressing the PUSH button.

When using a microphone which is not powered through its cable
Connect the microphone to the AUDIO IN CH1/CH2 connector and set the LINE/MIC selector to MIC.

Using an external audio system or microphone

Connect an audio mixer or other external audio system component to the AUDIO IN CH1/CH2 connectors.

(1) Connect an audio mixer or other external audio system component to the AUDIO IN CH1/CH2 connector.
(2) Set the AUDIO INPUT switch that corresponds to the channel that the cable is connected to REAR.
(3) Set up the following.
When connecting a microphone:
Set the LINE/MIC selector that corresponds to the channel that the cable is connected to MIC. If the microphone is powered through its cable, set it to +48V ON.
When connecting audio equipment:
Set the LINE/MIC selector that corresponds to the channel that the cable is connected to LINE.



Note
If you use other than the 48-V microphone with the LINE/MIC selector set to +48V ON, a malfunction of the microphone may occur.

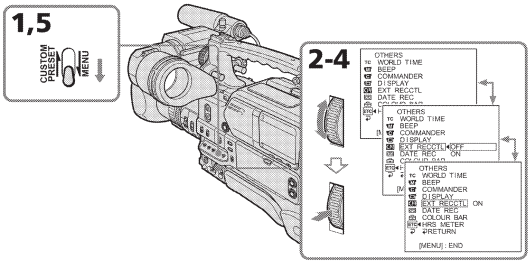
When you unplug the microphone plug
Unplug it while pressing the PUSH button.

When the external unit is compatible with 12-V power
The camcorder can supply 12-V power to the unit from the DC OUT 12V connector.

Backing up recordings to another tape

You can easily make backup copies of recordings to the VCR connected to your camcorder with the DV connecting cable (i.LINK cable). Setting EXT RECCTL in the menu settings to ON synchronizes the recording start/pause operation of the external VCR with the START/STOP button on your camcorder.

(1) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu in standby mode.
(2) Turn the SEL/PUSH EXEC dial to select ETC, then press the dial.
(3) Turn the SEL/PUSH EXEC dial to select EXT RECCTL, then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select ON, then press the dial.
(5) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to erase the menu display.



To cancel recording start/pause synchronization

Select OFF in step 4, then press the SEL/PUSH EXEC dial.

Note on the external VCR
We recommend that you turn the external VCR to recording pause before recording.

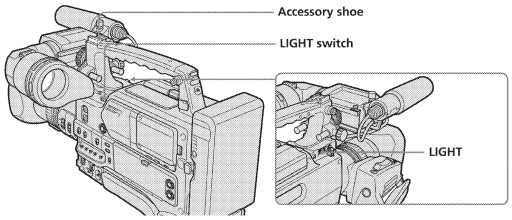
When you use one of the following functions, you cannot make backup copies to a VCR
- Tape Photo recording
- Interval recording
- Cut recording

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Using a video light

You can use the Anton Bauer Ultralight 2 or equivalent. Use a video light powered by 12 V with maximum power consumption of 30 W.

- If you connect the video light to the LIGHT connector on the camcorder and set the LIGHT switch to AUTO, you can turn the light on and off automatically as you start and stop the recording.
- The output of the LIGHT connector on the camcorder is controlled to 12 V even when the camcorder is supplied with 12 V or more power (through the DC IN 12V connector or battery pack). The brightness or colour temperature of the light will not change according to voltage increase.



(1) Attach a video light to the accessory shoe on the handle and connect the plug of the video light to the LIGHT connector.
(2) Set the LIGHT switch as follows to control the video light:
AUTO: Turns on the video light during recording if the power switch on the video light is set to on.
MAN: Allows the power switch on the video light to turn the light on and off.

Notes

- Do not use a video light with power consumption of over 30 W.
- The brightness or colour temperature of the light will change when the supplied voltage is under 12 V.

When you use one of the following functions, the video light cannot work

- Tape Photo recording
- Cut recording

When the LIGHT switch is set to AUTO

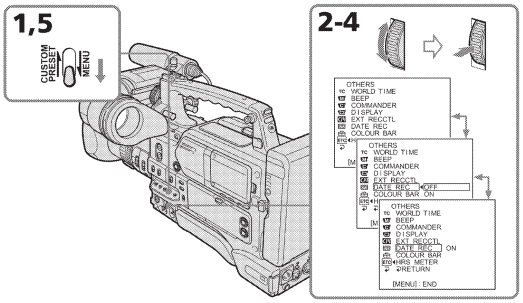
Turning on/off the video light is synchronized with the recording start/stop operation. The screen may momentarily glow in high-intensity according to recording conditions. To prevent this phenomenon from occurring, shoot in one of the following ways:

- Shoots in manual adjustment mode to fix the setting.
- Turns on the video light and shoots with the LIGHT switch on the camcorder set to MAN.

Superimposing the date and time on a picture

You can superimpose the date/time indication directly on the picture, besides the date/time display as data code.

(1) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu in standby mode.
(2) Turn the SEL/PUSH EXEC dial to select ETC, then press the dial.
(3) Turn the SEL/PUSH EXEC dial to select DATE REC, then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select ON, then press the dial.
(5) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to erase the menu display.
The date/time indicator displayed on the LCD screen or in the viewfinder.



To cancel superimposing the date/time indication

Select OFF in step 4, then press the SEL/PUSH EXEC dial.

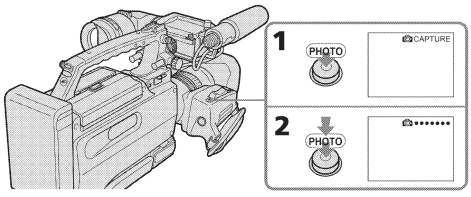
Note

You cannot erase the recorded date/time data on the picture. Before using this function, make sure that you set the date and time correctly.

Recording a still image on a tape – Tape Photo recording

You can record still images on tapes with all the pixels in the progressive mode. See page 64 for details. This mode is useful when you print images using a video printer (not supplied).
Besides the operation described here, your camcorder can record still images on a "Memory Stick" (p. 134).

(1) In standby mode, keep pressing PHOTO lightly until a picture freezes. The CAPTURE indicator appears. Recording does not start yet.
To change the image, release PHOTO, select an image again, and then press and hold PHOTO lightly.
(2) Press PHOTO deeper.
The still image on the LCD screen or in the viewfinder is recorded for about seven seconds. The sound during those seven seconds is also recorded.
The still image is displayed on the LCD screen or in the viewfinder until recording is completed.



The number of still images recordable on a cassette

	DVCAM format	DV format
DV cassette (60 minutes)	—	About 510
DV cassette (270 minutes)	—	About 2300
DVCAM cassette (40 minutes)	About 340	—
DVCAM cassette (184 minutes)	About 1570	—

Notes

- During tape photo recording, you cannot change the mode or setting.
- The PHOTO button does not work:
  – While the fader function is set or in use.
  – While the digital effect function is set or in use.
- Do not shake the camcorder during tape photo recording, the recorded image may be blurred.

Recording a still image on a tape – Tape Photo recording

To do tape photo recording using the Remote Commander

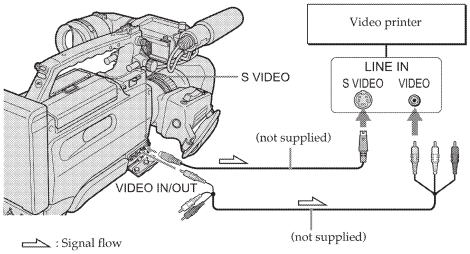
Press PHOTO on the Remote Commander. Your camcorder immediately records an image on the LCD screen or in the viewfinder.

When you do tape photo recording during normal CAMERA recording

You cannot check an image on the LCD screen or in the viewfinder by pressing PHOTO lightly. Press PHOTO deeper. The still image is then recorded for about seven seconds and your camcorder returns to standby mode.

Printing the still image

You can print a still image by using a video printer (not supplied). Connect with the video printer using the A/V connecting cable.
Connect the yellow plugs of the cable to the video input of the video printer and the VIDEO IN/OUT jack on your camcorder. Refer to the operating instructions of the video printer as well.



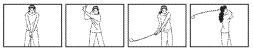
If the video printer is equipped with an S video input

Use an S video connecting cable (not supplied). Connect it to the S VIDEO jack on your camcorder and the S video input of the video printer.

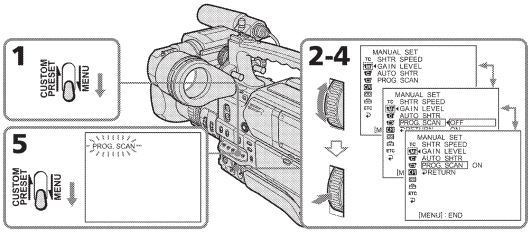
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Shooting with all the pixels – PROG. SCAN

When you handle the digital images on your PC, set PROG. SCAN to ON before shooting. You can record the images on a tape with higher resolution.
Since the image taken in progressive mode would be stabilized even in pause mode, it is especially useful when you analyze high-speed actions such as sports scenes.



(1) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu in standby mode.
(2) Turn the SEL/PUSH EXEC dial to select , then press the dial.
(3) Turn the SEL/PUSH EXEC dial to select PROG. SCAN, then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select ON, then press the dial.
(5) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to erase the menu display. The PROG. SCAN indicator lights up.



To return to normal mode

Select OFF in step 4, then press the SEL/PUSH EXEC dial.

Note on the progressive mode

A normal TV broadcast divides the screen into two finer fields and displays them in turns every 1/50 of a second. Thus, the actual image displayed in an instant covers only half of the apparent image area. Displaying the whole image simultaneously on a full screen is called displaying with all the pixels. In this mode, the resolution of the still picture is clearer than in the normal mode. This camcorder takes in an image every 2/25 of a second, which may cause the image of a moving object to go out of focus. This camcorder is originally programed to record in the normal TV format.

When shooting under fluorescent light

When shooting in progressive mode under fluorescent light or light bulbs, a rare phenomenon may happen in which the screen lights up brightly (Flicker phenomenon). This is not a malfunction. If you want to stop this phenomenon, set PROG. SCAN to OFF in the menu settings.

On digital zooming

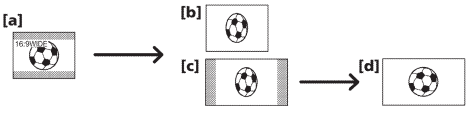
You cannot use digital zooming in this mode.

When the auto logo insert function is activated

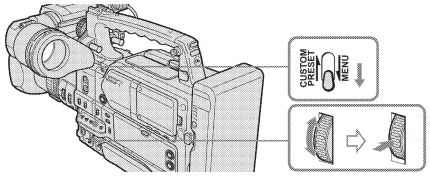
You cannot use the progressive mode. Refer to the extra operating instructions, "Auto Logo Insert for Copyright Protection."

Using the wide mode

You can record a 16:9 wide picture to watch on a 16:9 wide-screen monitor (16:9WIDE). Black bands appear on the LCD screen or in the viewfinder during recording in 16:9WIDE mode **[a]**. The picture during playback on a normal monitor **[b]** or on a wide-screen monitor **[c]** is compressed in the widthwise direction. If you set the screen mode of the wide-screen monitor to the full mode, you can watch pictures of normal images **[d]**.



In standby mode, set 16:9WIDE to ON in in the menu settings (p. 120).



To cancel the wide mode

Set 16:9WIDE to OFF in the menu settings (p. 120).

In wide mode, you cannot select the following modes:

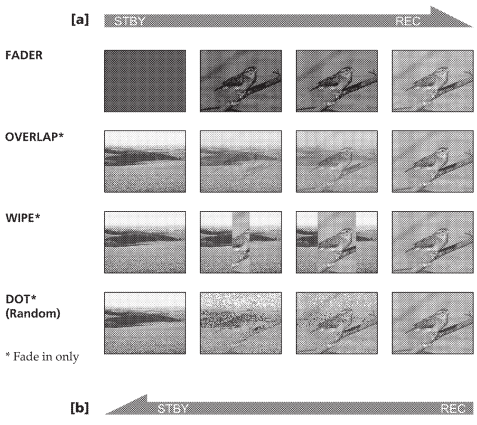
- Old movie
- Progressive mode

During recording

You cannot operate the wide mode function. When you cancel the wide mode, set your camcorder to the standby mode and then set 16:9WIDE to OFF in the menu settings.

Using the fader function

You can fade the picture in or out to give your recording a professional appearance.



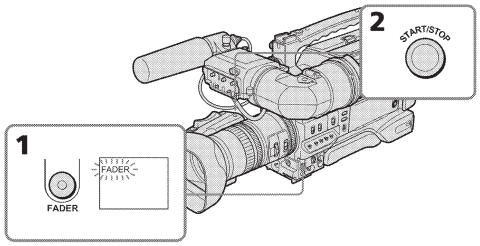
MONOTONE

When fading in, the picture gradually changes from black-and-white to colour.
When fading out the picture gradually changes from colour to black-and-white.

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Using the fader function

(1) When fading in [a]
In standby mode, press FADER until the desired fader indicator flashes.
When fading out [b]
In recording mode, press FADER until the desired fader indicator flashes.
The indicator changes as follows:
FADER → MONOTONE → OVERLAP → WIPE → DOT → no indicator
The last selected fader mode is indicated first.
(2) Press START/STOP. After the fade in/out is carried out, your camcorder automatically returns to the normal mode.



To cancel the fader function
Press FADER until the indicator disappears.

Note
You cannot use the following functions while using the fader function, and vice versa:
– Digital effect
– Tape Photo recording
– Interval recording
– Cut recording

When the OVERLAP, WIPE, or DOT indicator appears
Your camcorder automatically stores the image recorded on a tape. As the image is being stored, the fader indicator flashes fast, and the playback picture appears.

Using special effects – Digital effect

You can add special effects to recorded pictures using the various digital functions. The sound is recorded normally.

STILL
You can record a still image so that it is superimposed on a moving picture.

FLASH (FLASH MOTION)
You can record still images successively at constant intervals.

LUMI. (LUMINANCEKEY)
You can swap a brighter area in a still image with a moving picture.

TRAIL
You can record the picture so that an incidental image like a trail is left.

OLD MOVIE
You can add an old movie type atmosphere to pictures. The black bands appear on the upper and lower of the screen to change the virtual screen size to the cinemascope size, and the picture effect is set to SEPIA.

STILL



LUMI.



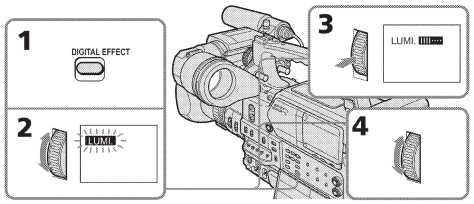
Using special effects – Digital effect

(1) In standby or recording mode, press DIGITAL EFFECT. The digital effect indicator appears.
(2) Turn the SEL/PUSH EXEC dial to select the desired digital effect mode.
The digital effect indicator changes as follows:
STILL ↔ FLASH ↔ LUMI. ↔ TRAIL ↔ OLD MOVIE
(3) Press the SEL/PUSH EXEC dial. The indicator lights up and the bar appears.
In STILL and LUMI. modes, the still image is stored in memory.
(4) Turn the SEL/PUSH EXEC dial to adjust the effect.

Items to be adjusted

STILL	The rate of the still image you want to superimpose on the moving picture
FLASH	The interval of flash motion
LUMI.	The colour scheme of the area in the still image which is to be swapped with a moving picture
TRAIL	The time until the incidental image vanishes
OLD MOVIE	No adjustment necessary

The longer the bar on the screen, the stronger the digital effect. The bar appears in the following modes: STILL, FLASH, LUMI. and TRAIL.



To cancel the digital effect
Press DIGITAL EFFECT. The digital effect indicator disappears.

Notes
• The following functions do not work in digital effect mode:
– Fader
– Tape Photo recording
– Shutter speed (1/25 or smaller) adjustment
• The following functions do not work in old movie mode:
– Wide mode
– Spot light mode

When you manually adjust the shutter speed
OLD MOVIE will be automatically cancelled.

When you turn the power off
Digital effect will be automatically cancelled.

Superimposing a still image in a "Memory Stick" on a moving picture – MEMORY MIX

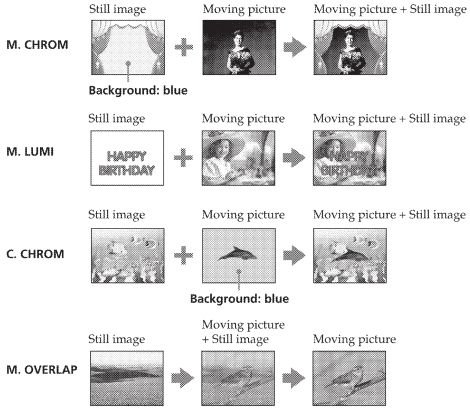
You can superimpose a still image you have recorded on a "Memory Stick" on the top of the moving picture you are recording.

M. CHROM (Memory chromakey)
You can swap a blue area of a still image such as an illustration or a frame with a moving picture.

M. LUMI (Memory luminancekey)
You can swap a brighter area of a still image such as a handwritten illustration or title with a moving picture. Record a title on a "Memory Stick" before a trip or event for convenience.

C. CHROM (Camera chromakey)
You can superimpose a moving picture on a still image that used as background. Shoot the subject against a blue background. The blue area of the moving picture will be swapped with a still image.

M. OVERLAP (Memory overlap)
You can make a moving picture fade in on top of a still image.

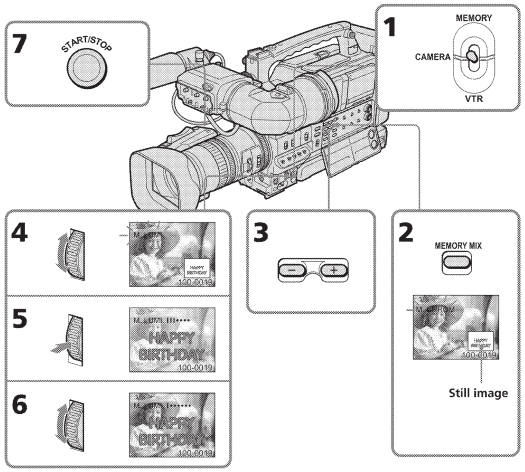


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Superimposing a still image in a "Memory Stick" on a moving picture – MEMORY MIX

Before operation
Insert a recorded "Memory Stick" and a tape to be recorded into your camcorder.

(1) Set the MEMORY/CAMERA/VTR selector to CAMERA.
(2) Press MEMORY MIX in standby mode.
The last recorded or last composed image appears on the lower part of the screen as a thumbnail image.
(3) Press MEMORY+/– or +/– on the Remote Commander to select the still image you want to superimpose.
To see the previous image, press MEMORY – or – on the Remote Commander.
To see the next image, press MEMORY+ or + on the Remote Commander.
(4) Turn the SEL/PUSH EXEC dial to select the desired mode.
The mode changes as follows:
M. CHROM ↔ M. LUMI ↔ C. CHROM ↔ M. OVERLAP
(5) Press the SEL/PUSH EXEC dial.
The still image is superimposed on the moving picture, and your camcorder is in standby mode.
(6) Turn the SEL/PUSH EXEC dial to adjust the effect.
(7) Press START/STOP to start recording.



Superimposing a still image in a "Memory Stick" on a moving picture – MEMORY MIX

Items to be adjusted

M. CHROM	The colour (blue) scheme of the area in the still picture which is to be swapped with a moving picture
M. LUMI	The colour (bright) scheme of the area in the still picture which is to be swapped with a moving picture
C. CHROM	The colour (blue) scheme of the area in the moving picture which is to be swapped with a still picture
M. OVERLAP	No adjustment necessary

As the bar is shorter, the effect is enhanced.

To change the still image to be superimposed
Do either of the following:
– Press MEMORY+/– before step 7.
– Press the SEL/PUSH EXEC dial after step 6, and repeat the procedure from step 3 (except M. OVERLAP).

To change the mode setting
Press SEL/PUSH EXEC dial after step 6, and repeat the procedure from step 4 (except M. OVERLAP).

To cancel MEMORY MIX
Press MEMORY MIX again.

During recording
You cannot change the mode setting.

The "Memory Stick" supplied with your camcorder has 20 images stored
– For M. CHROM: 18 images (such as a frame) 100-0001 to 100-0018
– For C. CHROM: two images (such as background) 100-0019 to 100-0020

Sample images
Sample images stored in the "Memory Stick" supplied with your camcorder are protected (p. 149).

If a still image to be superimposed has lots of white areas
The thumbnail image may not be displayed clearly.

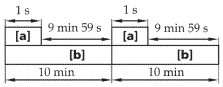
Image data modified with personal computers or shot with other equipment
You may not be able to play them back with your camcorder.

When the auto logo insert function is activated
You cannot use memory mix function. Refer to the extra operating instructions, "Auto Logo Insert for Copyright Protection."

Interval recording

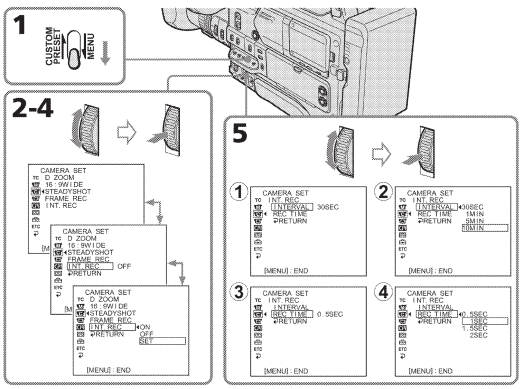
You can make a time-lapse recording by setting the camcorder to automatically record and standby sequentially. You can achieve an excellent recording for flowering, emergence, etc., with this function.

Example



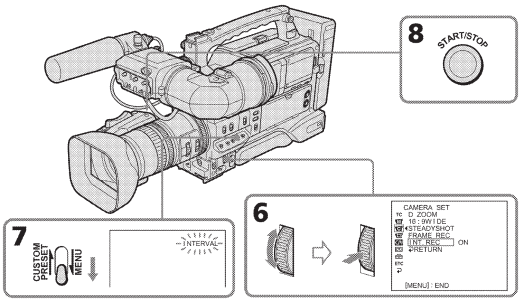
[a] Recording time
[b] Waiting time

(1) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu in standby mode.
(2) Turn the SEL/PUSH EXEC dial to select ☎, then press the dial.
(3) Turn the SEL/PUSH EXEC dial to select INT. REC, then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select SET, then press the dial.
(5) Set INTERVAL and REC TIME.
① Turn the SEL/PUSH EXEC dial to select INTERVAL, then press the dial.
② Turn the SEL/PUSH EXEC dial to select the desired interval time, then press the dial.
The time: 30SEC ↔ 1MIN ↔ 5MIN ↔ 10MIN.
③ Turn the SEL/PUSH EXEC dial to select REC TIME, then press the dial.
④ Turn the SEL/PUSH EXEC dial to select the desired recording time, then press the dial.
The time: 0.5SEC ↔ 1SEC ↔ 1.5SEC ↔ 2SEC.
⑤ Turn the SEL/PUSH EXEC dial to select ↩ RETURN, then press the dial.



Interval recording

(6) Turn the SEL/PUSH EXEC dial to select ON, then press the dial.
(7) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to erase the menu display. The interval recording indicator flashes.
(8) Press START/STOP to start interval recording. The interval recording indicator lights up.



To cancel the interval recording
• Set INT. REC to OFF in the menu settings.
• Set the MEMORY/CAMERA/VTR selector to VTR or MEMORY.

To stop the interval recording momentarily and perform normal recording
Press START/STOP. You can perform normal recording only once. To cancel the normal recording, press START/STOP again.

On recording time
There may be a discrepancy in recording time of up to +/– 6 frames from the selected time.

If you set FRAME REC to ON in standby mode
The interval recording will be cancelled.

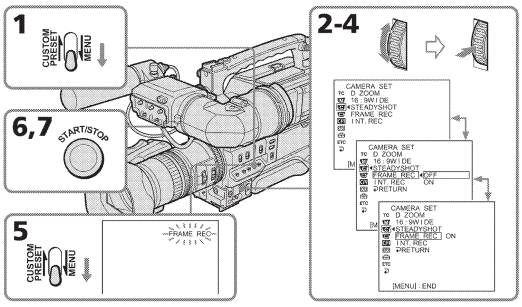
Even if you press INDEX MARK during interval recording
You cannot mark an index.

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Frame by frame recording – Cut recording

You can make a recording with a stop-motion animated effect using cut recording. To create this effect, alternately move the subject a little and make a cut recording. We recommend that you use a tripod, and operate the camcorder using the Remote Commander after step 6.

(1) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu in standby mode.
(2) Turn the SEL/PUSH EXEC dial to select , then press the dial.
(3) Turn the SEL/PUSH EXEC dial to select FRAME REC, then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select ON, then press the dial.
(5) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to erase the menu display.
The FRAME REC indicator lights up.
(6) Press START/STOP to start cut recording. The camcorder makes a recording for about six frames, and returns to recording standby.
(7) Move the subject, and repeat step 6.



To cancel the cut recording

- Set FRAME REC to OFF in the menu settings.
- Set the MEMORY/CAMERA/VTR selector to VTR or MEMORY.

Notes on cut recording

- The last recorded cut is longer than other cuts.
- The proper remaining tape time is not indicated if you use this function continuously.
- You cannot mark an index during cut recording.

If you set INT. REC to ON in standby mode
The cut recording will be cancelled.

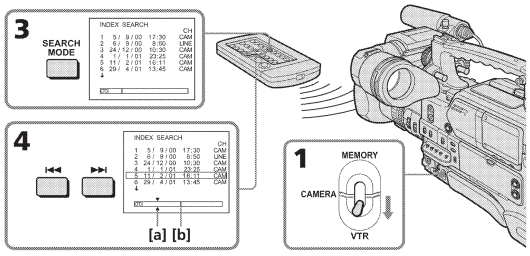
Searching for a recording by index – Index search

You can automatically search for the point where an index is marked and start playback from that point **(Index search)**. Use a tape with cassette memory for convenience. Use the Remote Commander for this operation.
Use this function to check where indexes are marked or to edit the tape at each sequence where the index is marked.

Searching for the index point using cassette memory

You can use this function only when playing back a tape with cassette memory (p. 158).

(1) Set the MEMORY/CAMERA/VTR selector to VTR.
(2) Set CM SEARCH in to ON in the menu settings (p. 120). The default setting is ON.
(3) Press SEARCH MODE on the Remote Commander repeatedly, until the index search indicator appears.
The indicator changes as follows:
INDEX SEARCH → TITLE SEARCH → DATE SEARCH → PHOTO SEARCH → PHOTO SCAN → no indicator
(4) Press I◄◄ or ►►I on the Remote Commander to select the index point for playback.
Your camcorder automatically starts playing back at the selected index point.



[a] Actual point you are trying to search for
[b] Present point on the tape

To stop searching

Press ■.

Searching for a recording by index – Index search

If a tape has a blank portion between recorded portions
The index search function may not work correctly.

If you mark an index onto an external input signal
"LINE" appears in the CH column.

The index of the recording start point when recorded from external audio equipment
The index mark is not recorded in cassette memory when recorded from external audio equipment. If you want to search for the index point, set CM SEARCH to OFF in the menu settings and search for the index point without cassette memory.

Searching for the index point without using cassette memory

(1) Set the MEMORY/CAMERA/VTR selector to VTR.
(2) Set CM SEARCH in to OFF in the menu settings (p. 120). If using a tape without cassette memory, skip this step.
(3) Press SEARCH MODE on the Remote Commander repeatedly, until the index search indicator appears.
The indicator changes as follows:
INDEX SEARCH → DATE SEARCH → PHOTO SEARCH → PHOTO SCAN → no indicator
(4) Press I◄◄ on the Remote Commander to search for the previous index point or press ►►I on the Remote Commander to search for the next index point.
Your camcorder automatically starts playback at the selected index point. Each time you press I◄◄ or ►►I, your camcorder searches for the previous or next index point.

To stop searching

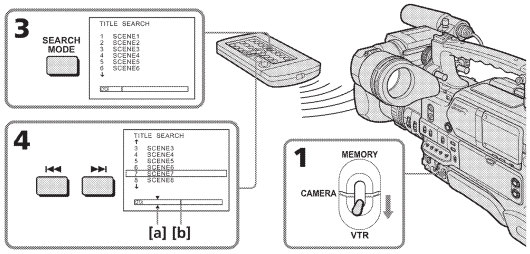
Press ■.

Searching the boundaries of recorded tape by title – Title search

CM unify

If you use a tape with cassette memory, you can search for the boundaries of recorded tape by title **(Title search)** (p. 158). Use the Remote Commander for this operation.

(1) Set the MEMORY/CAMERA/VTR selector to VTR.
(2) Set CM SEARCH in to ON in the menu settings (p. 120). The default setting is ON.
(3) Press SEARCH MODE on the Remote Commander repeatedly, until the title search indicator appears.
The indicator changes as follows:
INDEX SEARCH → TITLE SEARCH → DATE SEARCH → PHOTO SEARCH → PHOTO SCAN → no indicator
(4) Press I◄◄ or ►►I on the Remote Commander to select the title for playback.
Your camcorder automatically starts playback of the scene having the title that you selected.



[a] Actual point you are trying to search for
[b] Present point on the tape

To stop searching

Press ■.

If you use a tape without cassette memory
You cannot superimpose or search for a title.

If a tape has a blank portion between recorded portions
The title search function may not work correctly.

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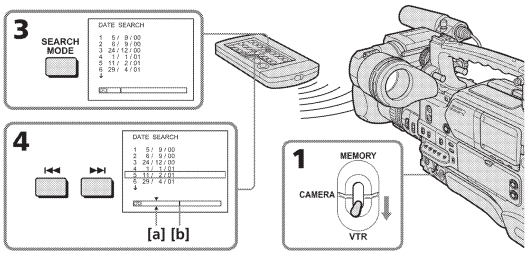
Searching a recording by date – Date search

You can automatically search for the point where the recording date changes and start playback from that point **(Date search)**. Use a tape with cassette memory for convenience. Use the Remote Commander for this operation.
Use this function to check where recording dates change or to edit the tape at each recording date.

Searching for the date using cassette memory

You can use this function only when playing back a tape with cassette memory (p. 158).

(1) Set the MEMORY/CAMERA/VTR selector to VTR.
(2) Set CM SEARCH in CM to ON in the menu settings (p. 120). The default setting is ON.
(3) Press SEARCH MODE on the Remote Commander repeatedly, until the date search indicator appears.
The indicator changes as follows:
INDEX SEARCH → TITLE SEARCH → DATE SEARCH → PHOTO SEARCH → PHOTO SCAN → no indicator
(4) Press I◄◄ or ►►I on the Remote Commander to select the date for playback.
Your camcorder automatically starts playback at the beginning of the selected date.



[a] Actual point you are trying to search for
[b] Present point on the tape

To stop searching
Press ■.

If a tape has a blank portion between recorded portions
The date search function may not work correctly.

Searching for the date without using cassette memory

(1) Set the MEMORY/CAMERA/VTR selector to VTR.
(2) Set CM SEARCH in CM to OFF in the menu settings (p. 120). If using a tape without cassette memory, skip this step.
(3) Press SEARCH MODE on the Remote Commander repeatedly, until the date search indicator appears.
The indicator changes as follows:
INDEX SEARCH → DATE SEARCH → PHOTO SEARCH → PHOTO SCAN → no indicator
(4) Press I◄◄ on the Remote Commander to search for the previous date or press ►►I on the Remote Commander to search for the next date. Your camcorder automatically starts playback at the point where the date changes. Each time you press I◄◄ or ►►I, your camcorder searches for the previous or next date.

To stop searching
Press ■.

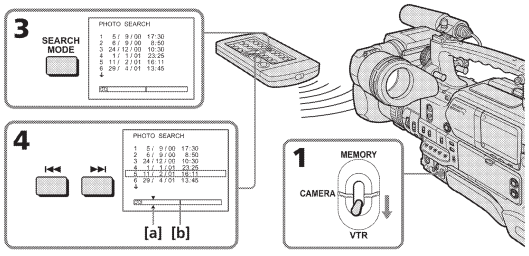
Note
If one day's recording is less than two minutes, your camcorder may not accurately find the point where the recording date changes.

Searching for a photo – Photo search/ Photo scan

You can search for a still picture you have recorded on a tape **(photo search)**.
You can also search for still pictures one after another and display each picture for five seconds automatically regardless of cassette memory **(photo scan)**. Use the Remote Commander for these operations.
Use this function to check or edit still pictures.

Searching for a photo using cassette memory

You can use this function only when playing back a tape with cassette memory (p. 158).
(1) Set the MEMORY/CAMERA/VTR selector to VTR.
(2) Set CM SEARCH in CM to ON in the menu settings (p. 120). Default setting is ON.
(3) Press SEARCH MODE on the Remote Commander repeatedly, until the photo search indicator appears.
The indicator changes as follows:
INDEX SEARCH → TITLE SEARCH → DATE SEARCH → PHOTO SEARCH → PHOTO SCAN → no indicator
(4) Press I◄◄ or ►►I on the Remote Commander to select the date for playback.
Your camcorder automatically starts playback of the photo having the date that you selected.



[a] Actual point you are trying to search for
[b] Present point on the tape

To stop searching
Press ■.

If a tape has a blank portion between recorded portions
The photo search function may not work correctly.

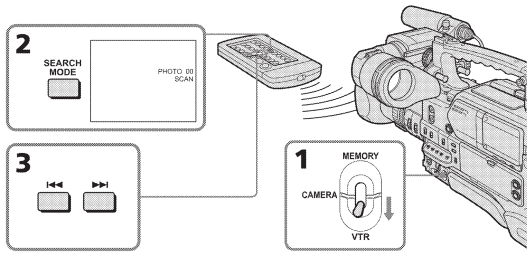
Searching for a photo without using cassette memory

(1) Set the MEMORY/CAMERA/VTR selector to VTR.
(2) Set CM SEARCH in CM to OFF in the menu settings (p. 120).
(3) Press SEARCH MODE on the Remote Commander repeatedly, until the photo search indicator appears.
The indicator changes as follows:
INDEX SEARCH → DATE SEARCH → PHOTO SEARCH → PHOTO SCAN → no indicator
(4) Press I◄◄ or ►►I on the Remote Commander to select a photo for playback.
Each time you press I◄◄ or ►►I, your camcorder searches for the previous or next photo.
Your camcorder automatically starts playback of the photo.

To stop searching
Press ■.

Scanning photo

(1) Set the MEMORY/CAMERA/VTR selector to VTR.
(2) Press SEARCH MODE on the Remote Commander repeatedly, until the photo scan indicator appears.
The indicator changes as follows:
INDEX SEARCH → TITLE SEARCH → DATE SEARCH → PHOTO SEARCH → PHOTO SCAN → no indicator
(3) Press I◄◄ or ►►I on the Remote Commander.
Each photo is played back for about five seconds automatically.



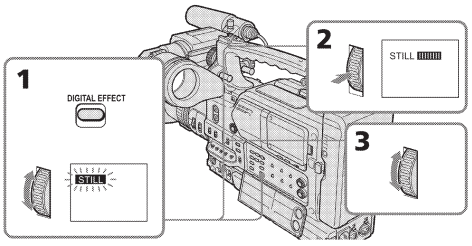
To stop scanning
Press ■.

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Playing back a tape with digital effects

During playback, you can process a scene using the digital effect functions: STILL, FLASH, LUMI. and TRAIL.

(1) In playback or playback pause mode, press DIGITAL EFFECT and turn the SEL/PUSH EXEC dial until the desired digital effect indicator (STILL, FLASH, LUMI. or TRAIL) flashes.
(2) Press the SEL/PUSH EXEC dial.
The digital effect indicator lights up and the bars appear. In STILL or LUMI. mode, the picture is captured and is stored in memory as a still picture at the time you press the SEL/PUSH EXEC dial.
(3) Turn the SEL/PUSH EXEC dial to adjust the effect.
For details of each digital effect function, see page 69.



To cancel the digital effect function

Press DIGITAL EFFECT so that the indicator disappears.

Notes

- You cannot process a picture using the digital effect function that is input from other equipment.
- To record pictures that you have processed using the digital effect function, record the pictures on the VCR, using your camcorder as a player.

Pictures processed by the digital effect function

Pictures processed by the digital effect function are not output through the i.LINK DV IN/OUT connector.

When you set the POWER switch to OFF or stop playing back

The digital effect function will be automatically cancelled.

Dubbing a tape

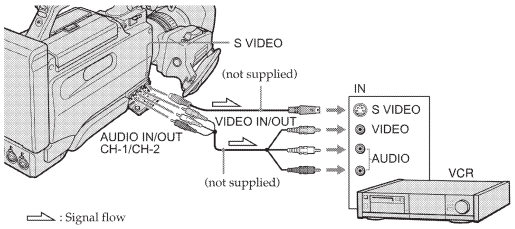
Using the A/V connecting cable

Connect your camcorder to the VCR using the A/V connecting cable. Recording quality by analog input, however, is not satisfying for professional use.

Before a dubbing

Set DISPLAY to LCD in the menu settings. (Default setting is LCD.)

(1) Insert a blank tape (or a tape you want to record over) into the VCR, and insert the recorded tape into your camcorder.
(2) Set the input selector on the VCR to LINE. For details, refer to the operating instructions of the VCR.
(3) Set the MEMORY/CAMERA/VTR selector to VTR.
(4) Play back the recorded tape on your camcorder.
(5) Start recording on the VCR. For details, refer to the operating instructions of the VCR.



: Signal flow

After you finish dubbing the tape

Press ■ on both your camcorder and the VCR.

Be sure to clear the indicators from the screen

If they are displayed, press the following buttons so as not to record the indicators on the dubbed tape:

- The DATA CODE button
- The SEARCH MODE button on the Remote Commander

You can edit on VCRs that support the following systems

8 mm, Hi8 Hi8, Digital8, VHS, S-VHS, VHSC, S-VHSC, Betamax, ED Beta ED Betamax, DVCAM DVCAM, mini DV or DV

If your VCR is a monaural type

Connect with a VCR using the audio cable (monaural ⟷ stereo) (not supplied).

Connect using an S video cable (not supplied) to obtain high-quality pictures

With this connection, you do not need to connect the yellow (video) plug of the A/V connecting cable.
Connect an S video cable (not supplied) to the S video jacks of both your camcorder and the VCR.
This connection produces higher quality DVCAM/DV format pictures.

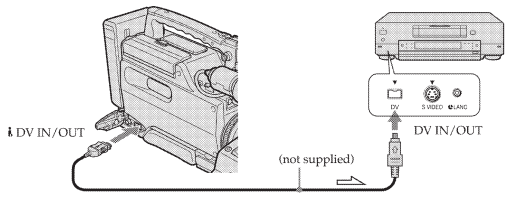
Note

You can edit precisely by connecting a LANC cable (not supplied) to this camcorder and other video equipment having a fine synchro-editing function, using this camcorder as a player.

Using a DV connecting cable (i.LINK cable)

Simply connect the DV connecting cable (i.LINK cable) (not supplied) to i DV IN/OUT and to DV IN/OUT of the DVCAM/DV products. With a digital-to-digital connection, video and audio signals are transmitted in digital form for high-quality editing. You cannot dub the titles, display indicators or the contents of cassette memory.

(1) Insert a blank tape (or a tape you want to record over) into the VCR, and insert the recorded tape into your camcorder.
(2) Set the input selector on the VCR to the DV input position if the VCR is equipped with an input selector. For details, refer to the operating instructions of the VCR.
(3) Set the MEMORY/CAMERA/VTR selector to VTR.
(4) Play back the recorded tape on your camcorder.
(5) Start recording on the VCR.



: Signal flow

When you have finished dubbing a tape

Press ■ on both your camcorder and the VCR.

You can connect only one VCR using the DV connecting cable (i.LINK cable)

Pictures processed by the digital effect function

Pictures processed by the digital effect function are not output through the i.LINK DV IN/OUT connector.

If you record a playback pause picture with the i.LINK DV IN/OUT connector

The recorded picture becomes rough. And when you play back the picture using other video equipment, the picture may jitter.

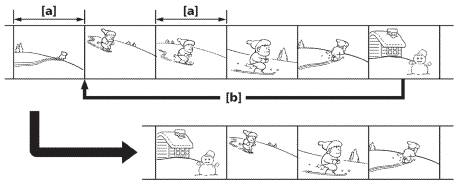
When dubbing tapes using the DSR-70P

A continuous recorded section of approximately five seconds is required before the recording start point. It is recommended to record colour bars or a similar signal beforehand at the start point of the source tape to be dubbed on the camcorder.

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Dubbing only desired scenes – Digital program editing

You can duplicate selected scenes (programs) for editing onto a tape without operating the VCR. Scenes can be selected by frame.
To use this function, a DV connecting cable (i.LINK cable) (not supplied) will be required.



[a] Undesired frame
[b] Moves the scene

To do the digital program editing

Make sure that the external VCR to be connected is equipped with the DV IN connector.
This camcorder is used as player.

Before operating the digital program editing

Preparation 1 Connecting the VCR. (below)
Preparation 2 Adjusting the synchronization of the VCR (p. 89).

When you dub using the same VCR again, you can skip Preparation 2.

Using the digital program editing function

Operation 1 Making programs. (p. 91)
Operation 2 Performing a digital program editing (Dubbing a tape). (p. 93)

Notes

- You cannot dub the titles, display indicators, or the contents of cassette memory.
- If you start recording from the very beginning of the tape, the first few seconds of the tape may not record properly. Be sure to allow about 10 seconds' lead before starting the recording.

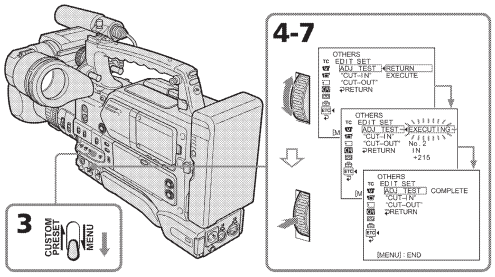
Preparation 1: Connecting the VCR

Connect your camcorder and the VCR as shown on page 86.

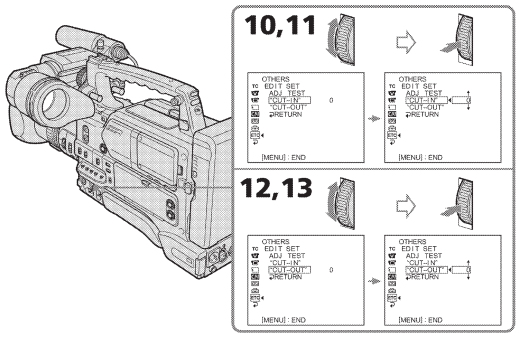
Preparation 2: Adjusting the synchronization of the VCR

You can adjust the synchronization of your camcorder and the VCR.
Remove the cassette from the camcorder beforehand. We recommend that you prepare a pen and paper for notes.

(1) Insert a recordable tape into the VCR.
(2) Set the MEMORY/CAMERA/VTR selector to VTR.
(3) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu.
(4) Turn the SEL/PUSH EXEC dial to select ETC, then press the dial.
(5) Turn the SEL/PUSH EXEC dial to select EDIT SET, then press the dial.
(6) Turn the SEL/PUSH EXEC dial to select ADJ TEST, then press the dial.
(7) Turn the SEL/PUSH EXEC dial to select EXECUTE, then press the dial.
CUT-IN and CUT-OUT are recorded on an image for five times each to calculate the numerical values for adjusting the synchronization.
The EXECUTING indicator flashes on the LCD screen or in the viewfinder.
When finished, the indicator changes to COMPLETE.
(8) Rewind the tape in the VCR, then start slow playback.
Take a note of the opening numerical value of each CUT-IN and the closing numerical value of each CUT-OUT.
(9) Calculate the average of all the opening numerical values of each CUT-IN, and the average of all the closing numerical values of each CUT-OUT.



(10) Turn the SEL/PUSH EXEC dial to select "CUT-IN," then press the dial.
(11) Turn the SEL/PUSH EXEC dial to select the average numerical value of CUT-IN, then press the dial.
The calculated start position for recording is set.
(12) Turn the SEL/PUSH EXEC dial to select "CUT-OUT," then press the dial.
(13) Turn the SEL/PUSH EXEC dial to select the average numerical value of CUT-OUT, then press the dial.
The calculated stop position for recording is set.
(14) Turn the SEL/PUSH EXEC dial to select ↩RETURN, then press the dial.



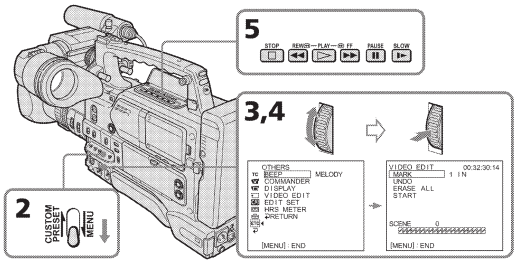
Errors in editing

If you connect your camcorder to Sony equipment with the DV jack, the range of errors is within +/– 5 frames.
The range may become wider in the following conditions:

- The interval between CUT-IN and CUT-OUT is less than five seconds (p. 92).
- CUT-IN or CUT-OUT is set at the beginning of the tape.

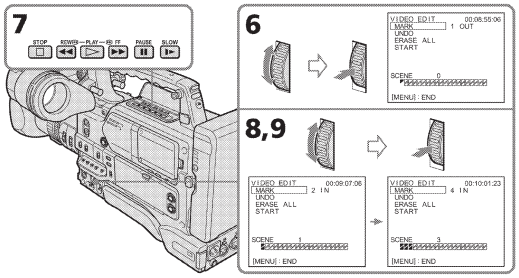
Operation 1: Making Programs

(1) Insert the tape for playback into your camcorder, and insert a tape for recording into the VCR.
(2) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu.
(3) Turn the SEL/PUSH EXEC dial to select ETC, then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select VIDEO EDIT, then press the dial.
(5) Search for the beginning of the first scene you want to insert using the video control buttons, then pause playback (p. 33).



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(6) Press the SEL/PUSH EXEC dial, or MARK on the Remote Commander.
The CUT-IN point of the first program is set, and the top part of the program mark changes to light blue.
(7) Search for the end of the first scene you want to insert using the video control buttons, then pause playback (p. 33).
(8) Press the SEL/PUSH EXEC dial, or MARK on the Remote Commander.
The CUT-OUT point of the first program is set, then the bottom part of the program mark changes to light blue.
(9) Repeat steps 5 to 8, then set PROGRAM.
When the program is set, the program mark changes to light blue.
You can set a maximum of 20 programs.



On a blank portion of the tape
You cannot set CUT-IN or CUT-OUT on a blank portion of the tape.

Erasing the last program

To change the end of the last program, delete the CUT-OUT mark.
To erase the whole program, delete both the CUT-IN and CUT-OUT marks.

(1) Turn the SEL/PUSH EXEC dial to select UNDO, then press the dial.
(2) Turn the SEL/PUSH EXEC dial to select EXECUTE, then press the dial.
The last set program mark flashes, then the setting is cancelled.

To cancel erasing
Select RETURN in step 2, then press the SEL/PUSH EXEC dial.

Erasing all programs

(1) Select VIDEO EDIT in the menu settings. Turn the SEL/PUSH EXEC dial to select ERASE ALL, then press the dial.
(2) Turn the SEL/PUSH EXEC dial to select EXECUTE, then press the dial.
All the program marks flash, then the settings are cancelled.

To cancel erasing all programs
Select RETURN in step 2, then press the SEL/PUSH EXEC dial.

To cancel a program you have set
Push the CUSTOM PRESET/MENU switch in the MENU direction and release it. The program is stored in memory until the tape is ejected.

Operation 2: Performing a digital program editing (Dubbing a tape)

(1) Select VIDEO EDIT in the menu settings. Turn the SEL/PUSH EXEC dial to select START, then press the dial.
(2) Turn the SEL/PUSH EXEC dial to select EXECUTE, then press the dial.
Search for the beginning of the first program, then start dubbing.
The EXECUTING indicator flashes.
The SEARCH indicator appears during search, and the EDIT indicator appears during editing on the LCD screen or in the viewfinder.
The PROGRAM indicator lights up after dubbing is complete.
When the dubbing ends, your camcorder and the VCR automatically stop.

To stop dubbing
Press ■ on this camcorder or on the Remote Commander.

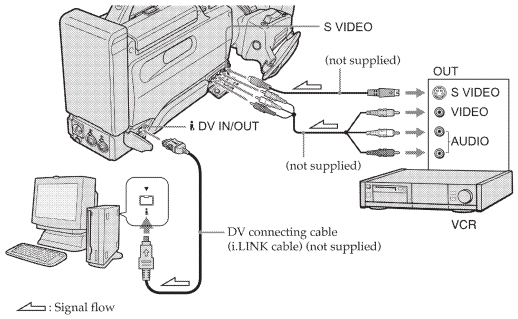
To end the digital program editing function
Your camcorder stops when the dubbing is complete. Then the display returns to VIDEO EDIT in the menu settings.
Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to end the video program editing function.

You cannot record on the VCR when:
- The cassette is not inserted.
- The tape has run out.
- The write-protect tab is set to the protect position.

NOT READY appears on the LCD screen when:
- The program to operate the digital program editing has not been made.
- A DV connecting cable (i.LINK cable) is not connected.
- The power of the connected VCR is not turned on.

Using with an analog video unit and a PC – Signal convert function

You can convert the analog input signal to the digital signal and output it from the i DV IN/OUT connector on this camcorder. You can capture images and sound from an analog video unit connecting a PC which has the i.LINK connector to your camcorder.



(1) Set the MEMORY/CAMERA/VTR selector to VTR.
(2) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu.
(3) Turn the SEL/PUSH EXEC dial to select , then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select A/V → DV OUT, then press the dial.
(5) Turn the SEL/PUSH EXEC dial to select ON, then press the dial.
(6) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to erase the menu display.
(7) Start playback on the analog video unit slightly ahead of the point from which you want to start capturing images.
(8) Start capturing procedures on your PC. The operation procedures depend on your PC and the software which you use.
For details on how to capture images, refer to the instruction manual of your PC and your software.

After capturing images and sound
Stop capturing procedures on your PC, and stop the playback on the analog video unit.

Notes
- When you edit the captured image and sound from the analog video unit by a PC, you need to install an appropriate software which can exchange video signals between the camcorder and a PC.
- Depending on the condition of the analog video signals, the PC may not be able to output the images correctly when you convert analog video signals into digital video signals via your camcorder. Depending on the analog video unit, the image may contain noise or incorrect colours.
- The camcorder cannot output the digital signal when you input the analog signal that includes a copyright protection signal.

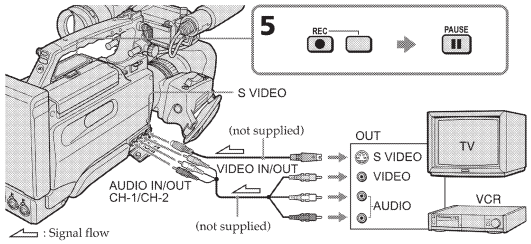
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Recording video or TV programs

Using the A/V connecting cable

You can record a tape from another VCR or a TV program from a TV that has video/audio outputs. Use your camcorder as a recorder.

(1) Insert a blank tape (or a tape you want to record over) into your camcorder. If you want to record a tape from the VCR, insert a recorded tape into the VCR.
(2) Set the MEMORY/CAMERA/VTR selector to VTR on your camcorder.
(3) Set DISPLAY in LCD to LCD in the menu settings (p. 120) or set the DISPLAY switch located on the front of the viewfinder to OFF.
(4) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to erase the menu display.
(5) Press ● REC and the button on its right simultaneously on your camcorder, then immediately press ❚❚ on your camcorder.
(6) Press ► on the VCR to start playback if you record a tape from a VCR. Select a TV program if you record from a TV. The picture from a TV or VCR appears on the LCD screen or in the viewfinder.
(7) Press ❚❚ on your camcorder at the scene from which you want to start recording.



When you have finished recording

Press ■ on both your camcorder and the VCR.

Using the Remote Commander

In step 5, press ● REC and MARK simultaneously, then immediately press ❚❚. And in step 7, press ❚❚ at the scene from which you want to start recording.

If your VCR is a monaural type

Connect with a VCR using the audio cable (monaural ←→ stereo) (not supplied).

Connect using an S video cable (not supplied) to obtain high-quality pictures

With this connection, you do not need to connect the yellow (video) plug of the A/V connecting cable.
Connect an S video cable (not supplied) to the S video jacks of both your camcorder and the VCR.
This connection produces higher quality DVCAM/DV format pictures.

If you do various playbacks on the VCR during recording

The recorded picture may be blurred.

On the commander mode

Your camcorder works in the commander mode, VTR 2. Commander modes 1, 2 and 3 are used to distinguish your camcorder from other Sony VCRs to avoid remote control misoperation. If you use another Sony VCR in the commander mode VTR 2, we recommend changing the commander mode or covering the sensor of the VCR with black paper.

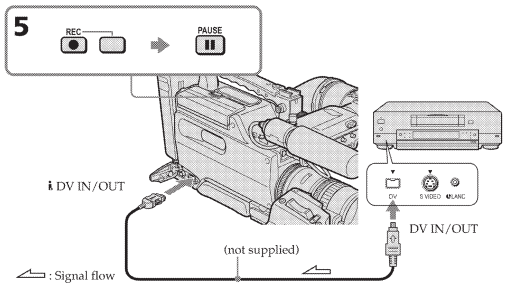
On index signal

The index is automatically marked on a tape when you start recording. If you mark the index using the INDEX MARK button during recording, "LINE" appears in the CH column on the INDEX SEARCH screen, and the index is recorded on cassette memory.

Using a DV connecting cable (i.LINK cable)

Simply connect the DV connecting cable (i.LINK cable) (not supplied) to i DV IN/OUT and to DV IN/OUT of the DVCAM/DV products. With a digital-to-digital connection, video and audio signals are transmitted in digital form for high-quality editing.

(1) Insert a blank tape (or a tape you want to record over) into your camcorder, and insert the recorded tape into the VCR.
(2) Set the MEMORY/CAMERA/VTR selector to VTR.
(3) Set DISPLAY in LCD to LCD in the menu settings (p. 120).
(4) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to erase the menu display.
(5) Press ● REC and the button on its right simultaneously on your camcorder, then immediately press ❚❚ on your camcorder.
(6) Press ► on the VCR to start playback. The picture to be recorded appears on the LCD screen or in the viewfinder.
(7) Press ❚❚ on your camcorder at the scene from which you want to start recording.



When you have finished recording

Press ■ on both your camcorder and the VCR.

Using the Remote Commander

In step 5, press ● REC and MARK simultaneously, then immediately press ❚❚. And in step 7, press ❚❚ at the scene from which you want to start recording.

You can connect only one VCR using the DV connecting cable (i.LINK cable)

When you dub a picture in digital form

The colour of the display may be uneven. However this does not affect the dubbed picture.

If you record a still picture in playback pause mode via the i DV IN/OUT connector

The recorded picture becomes rough. And when you play back the picture using your camcorder, the picture may jitter.

Before recording

Set the DISPLAY switch located on the front of the viewfinder to ON and make sure that the DV IN indicator appears on the LCD screen or in the viewfinder. The DV IN indicator may appear on both pieces of equipment.

On the commander mode

Your camcorder works in the commander mode, VTR 2. Commander modes 1, 2 and 3 are used to distinguish your camcorder from other Sony VCRs to avoid remote control misoperation. If you use another Sony VCR in the commander mode VTR 2, we recommend changing the commander mode or covering the sensor of the VCR with black paper.

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Audio dubbing

You can record an audio sound to add to the original sound on a tape by connecting audio equipment or a microphone. If you connect audio equipment, you can add sound to your recorded tape by specifying the starting and ending points. The original sound will not be erased. You can also use the Remote Commander for this operation.

The relationship between audio input and channels on which a dubbed sound will be recorded

The relationship between audio input and channels on which a dubbed sound will be recorded is as follows:

Audio input through	The position of the AUDIO INPUT switch (CH-1/CH-2)	Which audio input will be recorded on	
		Channel 3	Channel 4
AUDIO IN/OUT CH-1/CH-2	–	AUDIO IN/OUT CH-1	AUDIO IN/OUT CH-2
AUDIO IN/OUT CH-1	–	AUDIO IN/OUT CH-1	–
AUDIO IN/OUT CH-2	–	–	AUDIO IN/OUT CH-2
AUDIO IN CH1/CH2	FRONT/FRONT	–	–
	FRONT/REAR	–	AUDIO IN CH2
	REAR/FRONT	AUDIO IN CH1	–
	REAR/REAR	AUDIO IN CH1	AUDIO IN CH2
AUDIO IN CH1	FRONT/FRONT	–	–
	FRONT/REAR	–	–
	REAR/FRONT	AUDIO IN CH1	–
	REAR/REAR	AUDIO IN CH1	–
AUDIO IN CH2	FRONT/FRONT	–	–
	FRONT/REAR	–	AUDIO IN CH2
	REAR/FRONT	–	–
	REAR/REAR	–	AUDIO IN CH2
MIC IN +48V	FRONT/FRONT	MIC IN +48V	MIC IN +48V
	FRONT/REAR	MIC IN +48V	–
	REAR/FRONT	–	MIC IN +48V
	REAR/REAR	–	–

Notes
- New sound cannot be recorded on a tape already recorded in Fs48K mode (p. 125).
- You cannot dub any audio sound on a tape recorded in the DV format (SP mode), even if you recorded it in Fs32K (12-bit) mode.
- You cannot add audio with the i DV IN/OUT connector.

If you make all the connections
The audio input to be recorded will take precedence over others in the following order.
- AUDIO IN/OUT CH-1/CH-2 jacks
- AUDIO IN CH1/CH2 connectors, MIC IN +48V connector

If a DV connecting cable (i.LINK cable) (not supplied) is connected to your camcorder
You cannot add sound to a recorded tape.

If you set the REC/SAVE switch of the cassette to SAVE
You cannot record on the tape. Slide the REC/SAVE switch to REC.

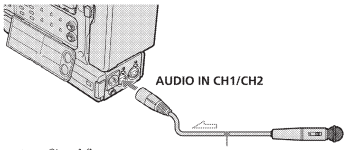
We recommend that you add new sound on a tape recorded with your camcorder
If you add new sound on a tape recorded with another camcorder (including an other DSR-250P), the sound quality may deteriorate.

When dubbing through the MIC IN +48V connector or AUDIO IN CH1/CH2 connectors
You can adjust the recording level manually (p. 54).

Notes on AUDIO MODE
- You cannot dub audio sound on a tape recorded in the Fs48K (16-bit) mode.
- When playing back a tape recorded in the Fs48K (16-bit) mode, you cannot adjust the balance in AUDIO MIX.

Dubbing with the AUDIO IN CH1/CH2 connectors

For details on setup of the AUDIO IN CH1/CH2 connectors, see “Using an external audio system or microphone” on page 58.

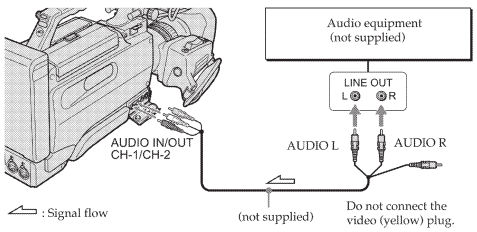


You can check the picture on a monitor by connecting the monitor to the VIDEO IN/OUT jack or VIDEO OUT connector. You can monitor the additional sound by the speaker or headphones.

Dubbing with the MIC IN +48V connector

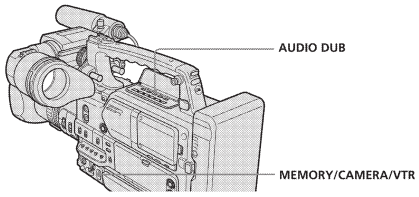
Check that a 48-V microphone is connected to the MIC IN +48V connector.

Dubbing with the AUDIO IN/OUT CH-1/CH-2 jacks



Adding an audio sound on a recorded tape

(1) Insert the recorded tape into your camcorder.
(2) Set the MEMORY/CAMERA/VTR selector to VTR on your camcorder.
(3) Locate the recording start point by pressing ►. Then press ❚❚ at the point where you want to start recording to set your camcorder to the playback pause mode.
(4) Press ➲ AUDIO DUB. The green ➲ ❚❚ indicator appears on the LCD screen or in the viewfinder.
(5) Press ❚❚ and start playing back the audio you want to record at the same time. The new sound is recorded in channels 3/4 during playback.
(6) Press ■ at the point where you want to stop recording.



Notes
- When dubbing with the AUDIO IN/OUT CH-1/CH-2 jacks, you can check the recorded picture on the LCD screen or in the viewfinder, and you can check the recorded sound by using a headphones.
- When dubbing with the supplied or an external microphone, you can check the recorded picture on the LCD screen, in the viewfinder, or on the screen of equipment connected with the VIDEO IN/OUT jack or VIDEO OUT connector, and you can check the recorded sound by using headphones.

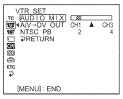
On blank portions
You cannot add an audio.

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Monitoring the new recorded sound

To play back the sound

First, select channels using the AUDIO MONITOR selector, then adjust the balance between the channels 1/2 (CH1/2) and the channels 3/4 (CH3/4) by selecting AUDIO MIX in the menu settings (p. 120).



The default setting is for original sound only.
If you set the audio balance beforehand, you can monitor both the original sound and dubbed sound during the dubbing.

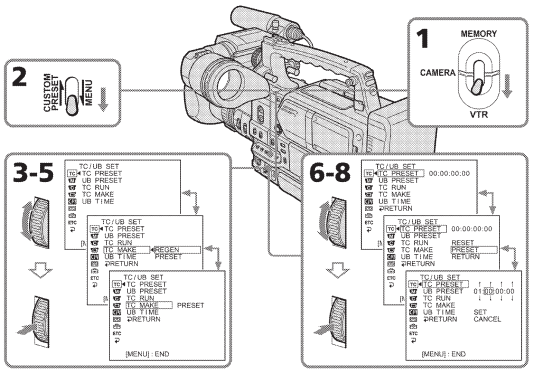
Setting time values

The camcorder uses two types of time values: time code values and user bits.
The time value is displayed on the LCD screen, in the viewfinder, or on the display window.
The user bits are convenient when using multiple cameras at the same event.
When you record the picture, time code data will be recorded automatically.

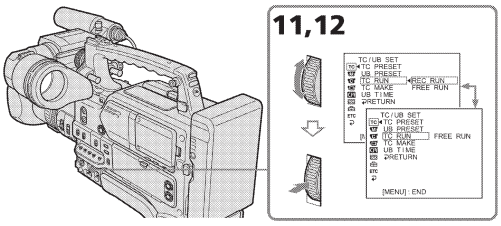
Setting the time code value

This section describes the steps for setting time code recording methods for particular shooting conditions and setting initial values.

(1) Set the MEMORY/CAMERA/VTR selector to VTR or CAMERA.
(2) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu.
(3) Turn the SEL/PUSH EXEC dial to select TC, then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select TC MAKE, then press the dial.
(5) Turn the SEL/PUSH EXEC dial to select PRESET, then press the dial.
(6) Turn the SEL/PUSH EXEC dial to select TC PRESET, then press the dial.
(7) Turn the SEL/PUSH EXEC dial to select PRESET, then press the dial.
(8) Set up the first two digits. Turn the SEL/PUSH EXEC dial to select the number, then press the dial. The time code is set between 00:00:00:00 and 23:59:59:29.
(9) Repeat step 8 to set up the other digits.



(10) Turn the SEL/PUSH EXEC dial to select SET, then press the dial.
(11) Turn the SEL/PUSH EXEC dial to select TC RUN, then press the dial.
(12) Turn the SEL/PUSH EXEC dial to select the desired running mode, then press the dial.
REC RUN: Time code value advances only while recording. When making the time code continuous at back space editing, select this setting.
FREE RUN: Time code advances freely regardless of the camcorder's current operation mode.
For more information on the running mode, see "Making the time code continuous at back space editing" on page 107.



To cancel the time code setting

Select CANCEL in step 10, then press the SEL/PUSH EXEC dial.

To reset the time code

Select RESET in step 7, then press the SEL/PUSH EXEC dial.

Note
Time data can be set only in DVCAM mode.

Making the time code continuous at back space editing

Set TC MAKE to REGEN in the menu settings to make the time code continuous when the recording has been interrupted or when the cassette tape has been removed from the camcorder between shootings.
When the camcorder is in recording pause mode, the recorded time code is read from the tape and synchronized to the internal time code generator.

Once you set TC MAKE to REGEN in the menu settings
Even if TC RUN is set to FREE RUN in the menu settings, the running mode is automatically set to REC RUN.

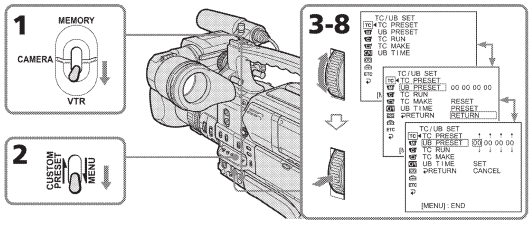
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Setting time values

Setting the user bits value

You can set the user bits as eight-digit hexadecimal values (base 16) to have the date, time, scene number, and other information inserted into the time code.

(1) Set the MEMORY/CAMERA/VTR selector to VTR or CAMERA.
(2) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu.
(3) Turn the SEL/PUSH EXEC dial to select TC, then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select UB PRESET, then press the dial.
(5) Turn the SEL/PUSH EXEC dial to select PRESET, then press the dial.
(6) Set up the first two digits. Turn the SEL/PUSH EXEC dial to select the number, then press the dial.
(7) Repeat step 6 to set up the other digits.
(8) Turn the SEL/PUSH EXEC dial to select SET, then press the dial.



To cancel the user bits setting
Select CANCEL in step 8, then press the SEL/PUSH EXEC dial.

To reset the user bits
Select RESET in step 5, then press the SEL/PUSH EXEC dial.

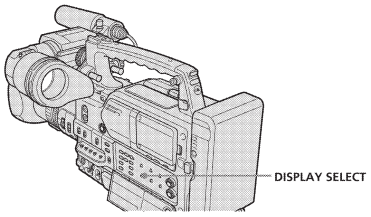
To set the user bits to the real time clock
Set UB TIME to ON in the menu settings.

Note
User bits can be set only in DVCAM mode.

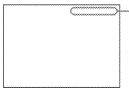
If the date and time have not been set
User bits cannot be set.

Setting time values

Switching the time value



Switch the DISPLAY SELECT switch as follows:
TC: Displays the time code. This is indicated as "00:00:00:00".
U-BIT: Displays user bits. This is indicated as "00 00 00 00".



Note
The time code and user bits cannot be displayed properly if the tape does not have time code and/or user bits recordings or if the time code was recorded using a non-compatible method.

Superimposing a title

CM only

If you use a tape with cassette memory, you can superimpose the title while recording or after recording. When you play back the tape, the title is displayed for five seconds from the point where you superimposed it.

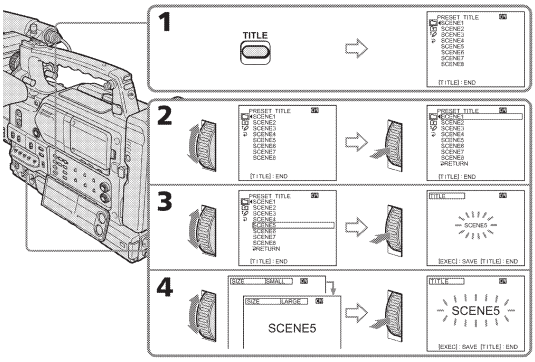
You can select one of eight preset titles and two custom titles (p. 114).



You can also select the colour, size and position of titles.

(1) Press TITLE to display the title menu in standby, recording, playback, or playback pause mode.
(2) Turn the SEL/PUSH EXEC dial to select 🗀, then press the dial.
(3) Turn the SEL/PUSH EXEC dial to select the desired title, then press the dial. The title flashes.
(4) Change the colour, size, or position, if necessary.
① Turn the SEL/PUSH EXEC dial to select the COLOUR, SIZE, or POSITION, then press the dial. The item appears.
② Turn the SEL/PUSH EXEC dial to select the desired item, then press the dial.
③ Repeat steps 1 and 2 until the title is laid out as desired.
(5) Press the SEL/PUSH EXEC dial again to complete the setting.
In playback, playback pause, or recording mode:
The "TITLE SAVE" indicator appears on the screen for five seconds and the title is set.
In standby mode:
The "TITLE" indicator appears. When you press START/STOP to start recording, "TITLE SAVE" appears on the screen for five seconds and the title is set.

Superimposing a title



If you set the REC/SAVE switch of the cassette to SAVE
You cannot superimpose or erase the title. Slide the REC/SAVE switch to REC.

To use a custom title
If you want to use the custom title, select 🗀 in step 2.

If the tape has a blank portion
You cannot superimpose a title on that portion.

If the tape has a blank portion in the middle of the recorded parts
The title may not be displayed correctly.

The titles superimposed with your camcorder
The point you superimposed the title may be detected as an index signal when searching a recording with other video equipment.

To not display titles
Set TITLE DSPL to OFF in the menu settings (p. 120).

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Title setting

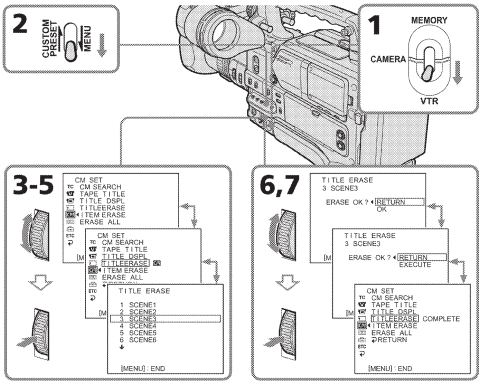
- The title colour changes as follows:
  WHITE ↔ YELLOW ↔ VIOLET ↔ RED ↔ CYAN ↔ GREEN ↔ BLUE
- The title size changes as follows:
  SMALL ↔ LARGE
  You cannot input more than 12 characters in LARGE size.
- If you select the title size "SMALL," you have nine choices for the title position.
  If you select the title size "LARGE," you have eight choices for the title position.

If the "C:01 FULL" mark appears

The cassette memory is full. If you erase the title, index data, date data, photo data, or cassette label in the cassette, you can then superimpose a title.

Erasing a title

(1) Set the MEMORY/CAMERA/VTR selector to VTR or CAMERA.
(2) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu.
(3) Turn the SEL/PUSH EXEC dial to select , then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select TITLEERASE, then press the dial.
The title erase display appears.
(5) Turn the SEL/PUSH EXEC dial to select the title you want to erase, then press the dial.
The "ERASE OK ?" indicator appears.
(6) Make sure the title is the one you want to erase, and turn the SEL/PUSH EXEC dial to select OK, then press the dial.
"OK" changes to "EXECUTE."
(7) Press the SEL/PUSH EXEC dial.
"ERASING" flashes for about two seconds and "COMPLETE" appears after erasing the title.



To cancel erasing

Select RETURN in step 6 or 7, then press the SEL/PUSH EXEC dial.

To erase all the titles

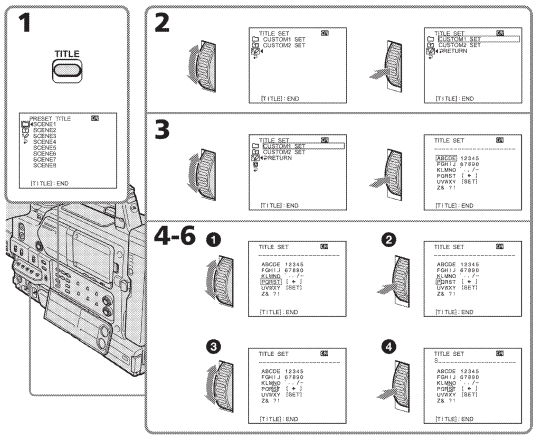
See "Erasing the cassette memory data" on page 118.

Making your own titles

CM only

You can make up to two titles and store them in cassette memory. Each title can have up to 20 characters.

(1) Press TITLE in the standby, playback, or playback pause mode.
(2) Turn the SEL/PUSH EXEC dial to select , then press the dial.
(3) Turn the SEL/PUSH EXEC dial to select CUSTOM1 SET or CUSTOM2 SET, then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select the column of the desired character, then press the dial.
(5) Turn the SEL/PUSH EXEC dial to select the desired character, then press the dial.
(6) Repeat steps 4 and 5 until you have selected all characters and completed the title.
(7) To finish making your own titles, turn the SEL/PUSH EXEC dial to select [SET], then press the dial. The title is stored in memory.
(8) Press TITLE to make the title menu disappear.



To change a title you have stored

In step 3, select CUSTOM1 SET or CUSTOM2 SET, depending on which title you want to change, then press the SEL/PUSH EXEC dial. Turn the SEL/PUSH EXEC dial to select [←], then press the dial to delete the title. The last character is erased. Enter a new title as desired.

To erase a character

Turn the SEL/PUSH EXEC dial to select [←], then press the dial. The last character is erased.

To enter a space

Select [Z& ? !], then select the blank part.

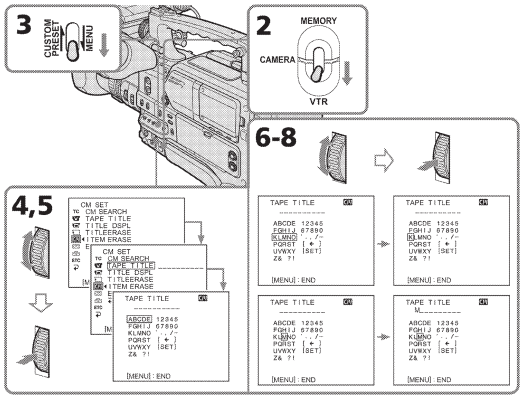
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Labelling a cassette

CM only

If you use a tape with cassette memory, you can label a cassette. The label can consist of up to 10 characters and is stored in cassette memory. When you insert the labelled cassette and set the MEMORY/CAMERA/VTR selector to VTR, CAMERA, or MEMORY, the label is displayed for about five seconds.

(1) Insert the cassette you want to label.
(2) Set the MEMORY/CAMERA/VTR selector to VTR or CAMERA.
(3) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu.
(4) Turn the SEL/PUSH EXEC dial to select CM, then press the dial.
(5) Turn the SEL/PUSH EXEC dial to select TAPE TITLE, then press the dial. The tape title display appears.
(6) Turn the SEL/PUSH EXEC dial to select the column of the desired character, then press the dial.
(7) Turn the SEL/PUSH EXEC dial to select the desired character, then press the dial.
(8) Repeat steps 6 and 7 until you finish the label.
(9) Turn the SEL/PUSH EXEC dial to select [SET], then press the dial.
The label is stored in memory.



Labelling a cassette

To change the label you have made

Insert the cassette to change the label, and operate in the same way as you do to make a new label.

If you set the REC/SAVE switch of the cassette to SAVE
You cannot label the tape. Slide the REC/SAVE switch to REC.

If you have superimposed titles in the cassette
When the label is displayed, up to four titles also appear.

When the "-----" indicator has fewer than 10 spaces
The cassette memory is full.
The "-----" indicates the number of characters you can select for the label.

To erase a character

Turn the SEL/PUSH EXEC dial to select [←], then press the dial. The last character is erased.

To enter a space

Select [Z& ? !], then select the blank part.

Erasing the cassette memory data

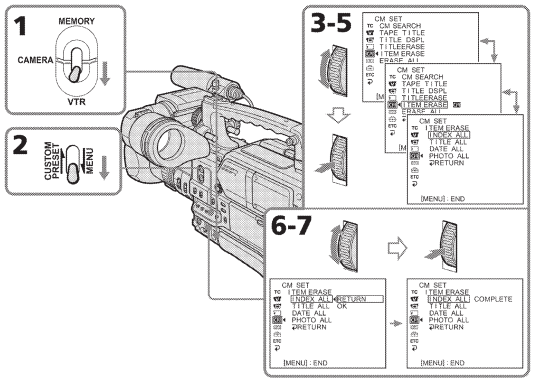
You can erase data stored in cassette memory, each item's data can be erased separately. You can also erase all items' data once.

Erasing each item's data separately

(1) Set the MEMORY/CAMERA/VTR selector to VTR or CAMERA.
(2) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu.
(3) Turn the SEL/PUSH EXEC dial to select CM, then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select ITEM ERASE, then press the dial.
(5) Turn the SEL/PUSH EXEC dial to select the item that you want to erase its data, then press the dial.

Item	Meaning
INDEX ALL	Erases all the index data.
TITLE ALL	Erases all the title data.
DATE ALL	Erases all the date data.
PHOTO ALL	Erases all the photo data.

(6) Turn the SEL/PUSH EXEC dial to select OK, then press the dial.
"OK" changes to "EXECUTE."
(7) Press the SEL/PUSH EXEC dial.
"ERASING" flashes for about two seconds and "COMPLETE" appears after erasing the selected item's data.



Erasing the cassette memory data

To cancel erasing

Select RETURN in step 6 or 7, then press the SEL/PUSH EXEC dial.

Erasing all the data in cassette memory

(1) Set the MEMORY/CAMERA/VTR selector to VTR or CAMERA.
(2) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu.
(3) Turn the SEL/PUSH EXEC dial to select CM, then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select ERASE ALL, then press the dial.
(5) Turn the SEL/PUSH EXEC dial to select OK, then press the dial.
"OK" changes to "EXECUTE."
(6) Press the SEL/PUSH EXEC dial.
"ERASING" flashes for about two seconds and "COMPLETE" appears after erasing all the data.

To cancel erasing

Select RETURN in step 5 or 6, then press the SEL/PUSH EXEC dial.

Once you execute ERASE ALL
The tape title is also erased in addition to items described on page 118.

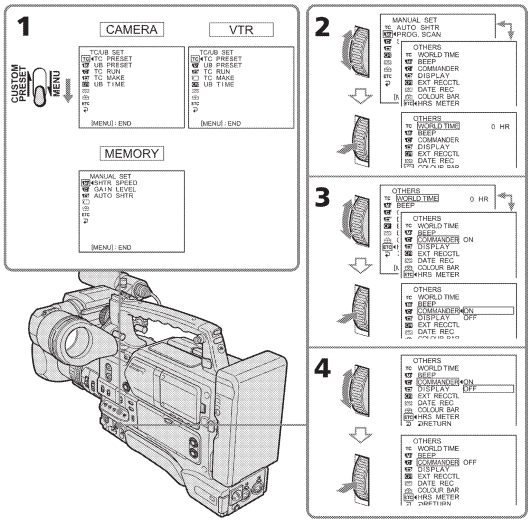
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Changing the menu settings

To change the mode settings in the menu settings, select the menu items with the SEL/PUSH EXEC dial. The default settings can be partially changed. First, select the icon, then the menu item and then the mode.

(1) In the standby, VTR, or MEMORY mode, push the CUSTOM PRESET/MENU switch in the MENU direction and release it.
(2) Turn the SEL/PUSH EXEC dial to select the desired icon, then press the dial to set it.
(3) Turn the SEL/PUSH EXEC dial to select the desired item, then press the dial to set it.
(4) Turn the SEL/PUSH EXEC dial to select the desired mode, then press the dial to set it.
(5) If you want to change other items, select ↩ RETURN and press the dial, then repeat steps 2 to 4.

For details, see "Selecting the mode setting of each item" (p. 121).



To make the menu display disappear

Push the CUSTOM PRESET/MENU switch in the MENU direction and release it.

Menu items are displayed as the following icons:

- TC/UB SET
- MANUAL SET
- CAMERA SET
- VTR SET
- LCD SET
- MEMORY SET
- CM SET
- TAPE SET
- SETUP MENU
- OTHERS

Selecting the mode setting of each item

● is the default setting.

Menu items differ depending on the position of the MEMORY/CAMERA/VTR selector. The LCD screen or viewfinder screen shows only the items you can operate at the moment.

Icon/item	Mode	Meaning	MEMORY/ CAMERA/ VTR selector
TC PRESET	—	Presets/resets the time code (p. 105).	VTR CAMERA
UB PRESET	—	Presets/resets user bits (p. 108).	VTR CAMERA
TC RUN	● REC RUN	Time code value advances only while recording. When making the time code continuous at back space editing, select this setting.	VTR CAMERA
	FREE RUN	Time code advances freely regardless of the camcorder's current operation mode. When adjusting the discrepancy between time code value and real time.	
TC MAKE	● REGEN	Makes the time code continuous at back space editing. Regardless of the TC RUN setting, the running mode is automatically set to REC RUN.	VTR CAMERA
	PRESET	Does not make the time code continuous at back space editing.	
UB TIME	● OFF	Does not set user bits to the real time clock.	VTR
	ON	Sets user bits to the real time clock.	CAMERA

Icon/item	Mode	Meaning	MEMORY/ CAMERA/ VTR selector
SHTR SPEED	—	Adjusts the shutter speed.	CAMERA MEMORY
GAIN LEVEL	—	To set gain values of H (High), M (Middle), and L (Low) positions.	CAMERA MEMORY
AUTO SHTR	● ON	To automatically adjust the electronic shutter speed.	CAMERA MEMORY
	OFF	To fix the electronic shutter speed.	
PROG. SCAN	● OFF	Records still/moving pictures in the interlace format.	CAMERA
	ON	Records still/moving pictures in progressive mode.	
D ZOOM	● OFF	To deactivate the digital zoom. Up to 12× zoom is carried out.	CAMERA
	24×	To activate the digital zoom. More than 12× zoom is performed digitally. This value goes up to 24× (p. 25).	
	48×	To activate the digital zoom. More than 12× zoom is performed digitally. This value goes up to 48× (p. 25).	
16:9WIDE	● OFF	—	CAMERA
	ON	To record a 16:9 wide picture (p. 66).	
STEADYSHOT	● ON	To compensate for camera-shake.	CAMERA
	OFF	To cancel the SteadyShot function. Natural pictures are produced when shooting a stationary object with a tripod.	MEMORY
FRAME REC	● OFF	Does not make a cut recording.	CAMERA
	ON	Makes a cut recording (p. 76).	
INT. REC	ON	Makes an interval recording (p. 74).	CAMERA
	● OFF	Does not make an interval recording.	
	SET	Sets the interval time and recording time.	

Notes on the SteadyShot function

- The SteadyShot function will not correct excessive camera-shake.
- Attachment of a conversion lens (not supplied) may influence the SteadyShot function.

If you cancel the SteadyShot function

The SteadyShot OFF indicator appears. Your camcorder prevents excessive compensation for camera-shake.

Icon/item	Mode	Meaning	MEMORY/ CAMERA/ VTR selector
AUDIO MIX	—	To adjust the balance between the channels 1/2 (CH1/2) and channels 3/4 (CH3/4) (p. 104). CH1 2 ▲ CH3 4	VTR
A/V→DV OUT	● OFF	To output analog images in digital format using your camcorder.	VTR
	ON	To output digital images in analog format using your camcorder.	
NTSC PB	● ON PAL TV	To play back a tape recorded on your camcorder on a PAL system TV.	VTR
	NTSC 4.43	To play back a tape recorded in the NTSC colour system on a TV with the NTSC 4.43 mode.	
LCD COLOUR	—	To adjust the colour on the LCD screen with the SEL/PUSH EXEC dial. To get low-intensity ▲ To get high-intensity	VTR CAMERA MEMORY
GUIDEFRAME	● OFF	Does not display the guide frame.	CAMERA
	ON	Displays the guide frame (p. 52).	MEMORY
CONTINUOUS	● OFF	Not to record continuously.	MEMORY
	ON	To record four images continuously (p. 135).	
	MULTI SCRN	To record nine images continuously (p. 135).	
QUALITY	● SUPER FINE	To record still images in the super fine image quality mode, using a "Memory Stick" (p. 132).	VTR MEMORY
	FINE	To record still images in the fine image quality mode, using a "Memory Stick" (p. 132).	
	STANDARD	To record still images in the standard image quality mode, using a "Memory Stick" (p. 132).	

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Icon/item	Mode	Meaning	MEMORY/ CAMERA/ VTR selector
PRINT MARK	● OFF	To erase print marks on still images.	VTR MEMORY
	ON	To write a print mark on the recorded still images you want to print out later.	
PROTECT	● OFF	To release protection from still images.	VTR MEMORY
	ON	To protect selected still images against accidental erasure (p. 149).	
SLIDE SHOW	—	To play back all the images as a slide show (p. 148).	MEMORY
DELETE ALL	—	To delete all unprotected images (p. 152).	MEMORY
FORMAT	● RETURN	To cancel formatting.	MEMORY
	OK	To format an inserted "Memory Stick." 1. Select FORMAT with the SEL/PUSH EXEC dial, then press the dial. 2. Turn the SEL/PUSH EXEC dial to select OK, then press the dial. 3. After "EXECUTE" appears, press the SEL/PUSH EXEC dial. "FORMATTING" appears during formatting. "COMPLETE" appears when formatting is finished.	
PHOTO SAVE	—	To duplicate images on a tape onto a "Memory Stick" (p. 140).	VTR
CM SEARCH	● ON	To search using cassette memory (p. 77, 79, 80, 82).	VTR
	OFF	To search without using cassette memory.	
TAPE TITLE	—	To label a cassette (p. 116).	VTR CAMERA
TITLE DSPL	● ON	To display the title you have superimposed.	VTR
	OFF	Not to display the title.	
TITLEERASE	—	To erase the title you have superimposed (p. 113).	VTR CAMERA

Formatting erases all information on the "Memory Stick"

Check the contents of the "Memory Stick" before formatting:

- Formatting erases sample images on the "Memory Stick."
- Formatting erases the protected image data on the "Memory Stick."

Notes on formatting

- Supplied or optional "Memory Stick"s have been formatted at the factory. Formatting with this camcorder is not required.
- While the display shows "FORMATTING," do not change the position of the MEMORY/CAMERA/VTR selector, press any button, or eject the "Memory Stick." This may cause a malfunction.
- You cannot format a "Memory Stick" if the write-protect tab on the "Memory Stick" is set to LOCK.
- Format again if the message "⚠" appears.

If formatting fails

The "⚠ FORMAT ERROR" message appears.

Icon/item	Mode	Meaning	MEMORY/ CAMERA/ VTR selector
ITEM ERASE	—	To erase each item's data in cassette memory (p. 118).	VTR CAMERA
ERASE ALL	—	To erase all the data in cassette memory (p. 119).	VTR CAMERA
REC MODE	● DVCAM	To record in the DVCAM format.	VTR
	DV SP	To record in the DV format (SP mode).	CAMERA
AUDIO MODE	● FS32K	To record in Fs32K (12-bit) mode (4-channel sounds).	VTR CAMERA
	FS48K	To record in Fs48K (16-bit) mode (2-channel sounds with high quality).	
REMAIN	● AUTO	To display the remaining tape indication: • for about eight seconds after your camcorder is turned on and calculates the remaining amount of tape • for about eight seconds after a cassette is inserted and your camcorder calculates the remaining amount of tape • for about eight seconds after ► is pressed in VTR mode • for about eight seconds after DISPLAY is pressed to display the screen indicators • for the period of tape rewinding, forwarding or picture search in the VTR mode	VTR CAMERA
	ON	To always display the remaining tape indicator.	
DATA CODE	● DATE/CAM	To display date, time and various settings during playback.	VTR
	DATE	To display date and time during playback.	
A REF LVL	● –12dB	Sets the audio reference level to –12 dB.	VTR
	–18dB	Sets the audio reference level to –18 dB.	CAMERA

Notes on AUDIO MODE

- You cannot dub audio sound on a tape recorded in the Fs48K (16-bit) mode.
- When playing back a tape recorded in the Fs48K (16-bit) mode, you cannot adjust the balance in AUDIO MIX.

Note on REC MODE

You cannot dub any audio sound on a tape recorded in the DV format (SP mode), even if you recorded it in Fs32K (12-bit) mode.

Icon/item	Mode	Meaning	MEMORY/ CAMERA/ VTR selector
CLOCK SET	—	To reset the date or time (p. 128).	CAMERA MEMORY
LTR SIZE	● NORMAL	To display selected menu items in normal size.	VTR CAMERA
	2×	To display selected menu items at twice the normal size.	MEMORY
REMAIN	● LI-ION	Selects when attaching a lithium-ion battery pack.	VTR CAMERA
	NI-CD	Selects when attaching a nicad battery pack.	MEMORY
LOGO INS	—	To always insert the still image on the moving picture. For details, refer to the operating instructions ("Auto Logo Insert for Copyright Protection") supplied with this camcorder.	CAMERA
WORLD TIME	—	To set the clock to the local time. Turn the SEL/PUSH EXEC dial to set a time difference. The clock changes by the time difference you set here. If you set the time difference to 0, the clock returns to the originally set time.	CAMERA MEMORY
BEEP	MELODY	To chime a melody in normal operations, and beep a warning sound for five seconds.	VTR CAMERA MEMORY
	● NORMAL	To beep in the following situations: turning on the power, pressing the start/stop button, and when a warning message appears.	
	OFF	To cancel the melody, beep, and shutter click sound.	
COMMANDER	● ON	To activate the Remote Commander supplied with your camcorder.	VTR CAMERA MEMORY
	OFF	To deactivate the Remote Commander to avoid remote control misoperation caused by an other VCR's remote control.	

Icon/item	Mode	Meaning	MEMORY/ CAMERA/ VTR selector
DISPLAY	● LCD	To show the display on the LCD screen and viewfinder screen.	VTR CAMERA MEMORY
	V-OUT/LCD	To show the display on a TV screen, LCD screen and viewfinder screen.	
EXT RECCTL	● OFF	Does not synchronizes the START/STOP button on this camcorder and recording/recording pause operations of the VCR connected with the DV connecting cable (i.LINK cable).	CAMERA
	ON	Synchronizes the START/STOP button on this camcorder and recording/recording pause operations of the VCR connected with the DV connecting cable (i.LINK cable).	
DATE REC	● OFF	To not superimpose the date and time on the picture.	CAMERA
	ON	To superimpose the date and time on the picture.	
COLOUR BAR	● OFF	Does not display the colour bar.	CAMERA
	ON	Displays the colour bar.	
VIDEO EDIT	—	To make programs and perform video editing (p. 91).	VTR
EDIT SET	—	To adjust and set the synchronization of your camcorder and a VCR for dubbing in edit set mode (p. 89).	VTR
HRS METER	OPERATION	The cumulative total hours of operation is displayed in 10-operation increments.	VTR CAMERA
	DRUM RUN	The cumulative total hours of drum rotation with tape threaded is displayed in 10-operation increments.	
	TAPE RUN	The cumulative total hours of tape running is displayed in 10-operation increments.	
	THREADING	The cumulative number of tape unthreading operation is displayed in 10-operation increments.	

Notes

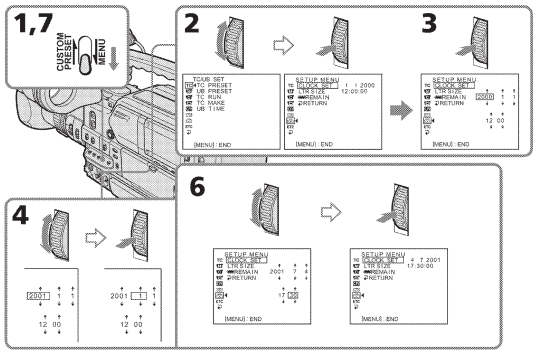
- If you press DISPLAY with DISPLAY set to V-OUT/LCD in the menu settings, the picture from a TV or VCR will not appear on the LCD screen even when your camcorder is connected to outputs on the TV or VCR (except using a DV connecting cable (i.LINK cable)).
- You cannot erase the date and time superimposed using the DATE REC function.

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Resetting the date and time

The date and time are set at the factory. Set the time according to the local time in your country. If you remove power sources from your camcorder for about four months, the date and time settings may be released because the vanadium-lithium battery installed in your camcorder will have been discharged (p. 174).
First, set the year, then the month, the day, the hour and then the minute.

(1) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu in the standby mode.
(2) Turn the SEL/PUSH EXEC dial to select , then press the dial.
(3) Turn the SEL/PUSH EXEC dial to select CLOCK SET, then press the dial.
(4) Turn the SEL/PUSH EXEC dial to adjust to the desired year, then press the dial.
(5) Set the month, day and hour by turning the SEL/PUSH EXEC dial and pressing the dial.
(6) Set the minute by turning the SEL/PUSH EXEC dial and pressing the dial by the time signal. The clock starts to move.
(7) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to make the menu settings disappear.



The year changes as follows:

1995 ····· 2000 ⟷ 2001 ····· 2079

If you do not set the date and time
"- -:- -:- -" as time, and "- - - - - - - -" as date will be recorded.

Note on the time indicator
The internal clock of this camcorder operates on a 24-hour cycle.

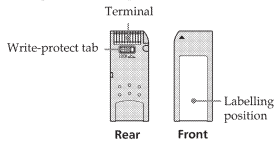
Using a "Memory Stick" – introduction

You can record and play back still images on the "Memory Stick" supplied with your camcorder. You can easily play back, record or delete still images. You can exchange image data with other equipment such as a personal computer etc., using the Memory Stick Reader/Writer supplied with your camcorder or a PC card adaptor for Memory Stick (not supplied).

On file format (JPEG)
Your camcorder compresses image data in JPEG format (extension .jpg).

Typical image data file name
100-0001: As displayed on the LCD screen or in the viewfinder of the camcorder.
Dsc00001.jpg: As displayed on your PC screen.

Before using a "Memory Stick"



- You cannot record or erase still images when the write-protect tab on the "Memory Stick" is set to LOCK.
- We recommend backing up important data.
- Image data may be damaged in the following cases:
  – If you remove the "Memory Stick," turn the power off, or detach the battery for replacement when the access lamp is flashing.
  – If you use a "Memory Stick" near static electricity or magnetic fields.

Notes
- Prevent metallic objects or your finger from coming into contact with the metal parts of the connecting section.
- Do not attach any other material than the supplied label onto the label space.
- Do not bend, drop or apply strong shock to a "Memory Stick."
- Do not disassemble or modify a "Memory Stick."
- Do not let the "Memory Stick" get wet.
- Do not use or keep a "Memory Stick" in locations that are:
  – Extremely hot such as in a car parked in the sun or under the scorching sun.
  – Under direct sunlight.
  – Very humid or subject to corrosive gases.
- When you carry or store a "Memory Stick," put it in its case.

A "Memory Stick" formatted by a computer

A "Memory Stick" formatted by the Windows OS or Macintosh computers does not have a guaranteed compatibility with this camcorder.

Notes on image data compatibility

- Image data files recorded on a "Memory Stick" by your camcorder conform to the Design Rules for Camera File Systems universal standard (DCF98 standard) established by the JEIDA (Japan Electronic Industry Development Association). You cannot play back on your camcorder still images recorded on other equipment (DCR-TRV890E/TRV900/TRV900E or DSC-D700/D770) that does not conform to this universal standard. (These models are not sold in some areas.)
- If you cannot use a "Memory Stick" that is used with other equipment, format it with this camcorder (p. 124). However, formatting erases all information on the "Memory Stick."

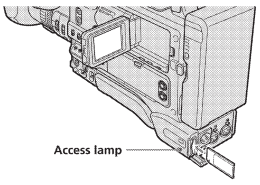
"Memory Stick" and are trademarks of Sony Corporation.

- Windows is a registered trademark licensed to Microsoft Corporation, registered in the U.S.A. and other countries.
- Macintosh and Mac OS are trademarks of Apple Computer, Inc.
- All other product names mentioned herein may be the trademarks or registered trademarks of their respective companies.

Furthermore, "™" and "®" are not mentioned in each case in this manual.

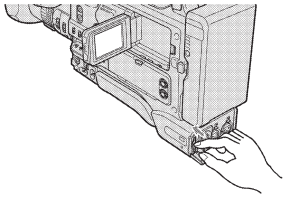
Inserting a "Memory Stick"

Open the "Memory Stick" cover, and insert the "Memory Stick" with the Sony logo pointing toward the LCD panel and the ◄ mark pointing inward.



To eject a "Memory Stick"

Open the "Memory Stick" cover, and push the "Memory Stick" inward, then release your finger. The "Memory Stick" comes out a little.



When the access lamp is lit or flashing
Never shake or strike your camcorder. Do not turn the power off , eject a "Memory Stick" or remove the battery pack. Otherwise, image data breakdown may occur.

If the "MEMORY STICK ERROR" indicator appears
The "Memory Stick" is broken. Use another "Memory Stick."

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Selecting the image quality mode

You can select the image quality mode in still picture recording. The default setting is SUPER FINE.

(1) Set the MEMORY/CAMERA/VTR selector to VTR or MEMORY.
(2) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu.
(3) Turn the SEL/PUSH EXEC dial to select , then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select QUALITY, then press the dial.
(5) Turn the SEL/PUSH EXEC dial to select the desired image quality, then press the dial.

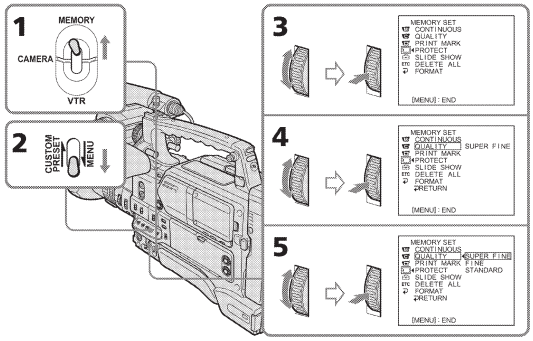


Image quality settings

Setting	Meaning
SUPER FINE	This is the highest image quality in this camcorder. The number of still images you can record is fewer than FINE. The image is compressed to about 1/3.
FINE	Use this mode when you want to record high quality images. The image is compressed to about 1/6.
STANDARD	This is the standard image quality. The image is compressed to about 1/10.

Note
In some cases, changing the image quality mode may not affect the image quality, depending on the types of images you are shooting.

Differences in image quality mode
Recorded images are compressed in JPEG format before being stored in memory. The memory capacity allotted to each image varies depending on the image quality mode selected. Details are shown in the table below.

Image quality mode	Memory capacity
SUPER FINE	Approx. 190 KB
FINE	Approx. 100 KB
STANDARD	Approx. 60 KB

Note on the image quality mode indicator
This is only displayed during recording.

The approximate number of images you can record on a “Memory Stick”

The approximate number of images you can record on a “Memory Stick” that is formatted using this camcorder varies depending on which image quality mode you select and the complexity of the subject.

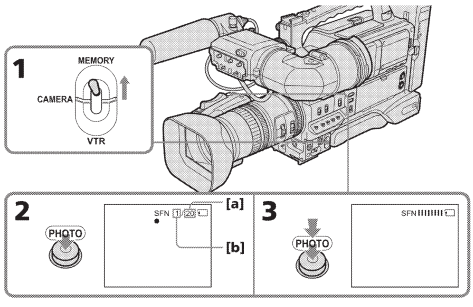
	Image quality mode		
	SUPER FINE	FINE	STANDARD
4 MB type (supplied)	20 images	40 images	60 images
8 MB type (not supplied)	40 images	81 images	122 images
16 MB type (not supplied)	82 images	164 images	246 images
32 MB type (not supplied)	164 images	329 images	494 images
64 MB type (not supplied)	329 images	659 images	988 images

Recording still images on a “Memory Stick” – Memory Photo recording

You can record still images on a “Memory Stick.”

Before operation
Insert a “Memory Stick” into your camcorder.

(1) Set the MEMORY/CAMERA/VTR selector to MEMORY.
(2) Keep pressing PHOTO lightly until the desired still picture appears. The green ● mark stops flashing, then lights up. The brightness of the picture and focus are re-adjusted, being targeted for the middle of the picture and are fixed. Recording does not start yet.
(3) Press PHOTO deeply. The shutter clicks and the image is frozen. The image displayed on the screen will be recorded on the “Memory Stick.” Recording is complete when the bar scroll indicator disappears.



[a] The number of images that can be recorded on the “Memory Stick”
[b] The number of recorded images

When the MEMORY/CAMERA/VTR selector is set to MEMORY
The following functions do not work: wide TV mode, digital effect, title, digital zoom, fader, and shutter speed (1/25 or smaller) adjustment .

Note
When you press the PHOTO button lightly at step 2, the focus of the image seems to be momentarily out.

When the auto logo insert function is activated
You cannot do memory photo recording. Refer to the extra operating instructions, “Auto Logo Insert for Copyright Protection.”

While you are recording a still image
You can neither turn off the power nor press PHOTO.

When you press PHOTO on the Remote Commander
Your camcorder immediately records the image that is on the screen when you press the button.

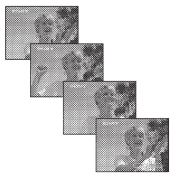
Recording images continuously

You can record still images continuously. Select one of the two modes described below before recording.

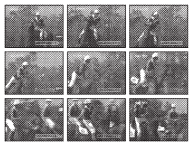
Continuous mode [a]
You can record four still images continuously. The number of images is in accordance with remaining capacity of the “Memory Stick.”

Multi screen mode [b]
You can record nine still images continuously and display them on a single page.

[a]



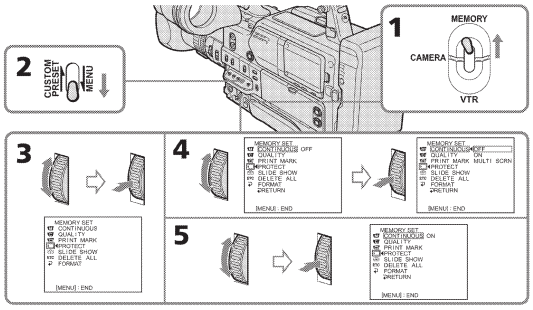
[b]



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Recording still images on a "Memory Stick" – Memory Photo recording

(1) Set the MEMORY/CAMERA/VTR selector to MEMORY.
(2) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu.
(3) Turn the SEL/PUSH EXEC dial to select , then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select CONTINUOUS, then press the dial.
(5) Turn the SEL/PUSH EXEC dial to select the desired setting, then press the dial.



Continuous shooting settings

Setting	Meaning (indicator on the screen)
OFF	Your camcorder shoots one image at a time. (no indicator)
ON	Your camcorder shoots up to four still images at about 0.5 sec intervals. ( )
MULTI SCRN	Your camcorder shoots nine still images at about 0.5 sec intervals and displays the images on a single page divided into nine boxes. ( )

If the capacity of the "Memory Stick" becomes full

" FULL" appears on the screen, and you cannot record still pictures on this "Memory Stick."

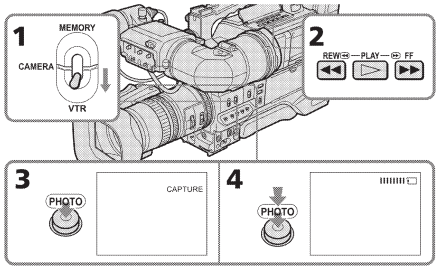
The number of images in continuous shooting
The number of images you can shoot continuously varies depending on the remaining capacity of the "Memory Stick." The shutter always clicks four times, however, the number of images recordable may be less than four.

Recording an image from a tape as a still image

Your camcorder can read moving picture data recorded on a tape and record it as a still image on a "Memory Stick." Your camcorder can also take in moving picture data through the input connector and record it as a still image on a "Memory Stick."

Before operation
Insert a recorded tape and a "Memory Stick" into your camcorder.

(1) Set the MEMORY/CAMERA/VTR selector to VTR.
(2) Press ►. The picture recorded on the tape is played back.
(3) Keep pressing PHOTO lightly until the picture from the tape freezes. "CAPTURE" appears on the LCD screen or in the viewfinder. Recording does not start yet.
(4) Press PHOTO deeper. The image displayed on the screen will be recorded on a "Memory Stick." Recording is complete when the bar scroll indicator disappears.



When the access lamp is lit or is flashing
Never shake or strike the unit. Also, do not turn the power off , eject a "Memory Stick" or remove the battery pack. Otherwise, image data breakdown may occur.

If " " appears on the LCD screen or in the viewfinder
The inserted "Memory Stick" is incompatible with your camcorder because its format does not conform to that of your camcorder. Check the format of the "Memory Stick."

If you press PHOTO lightly in the playback mode
The playback pauses momentarily.

Sound recorded on a tape
You cannot record the sound from a tape.

When the auto logo insert function is activated
You cannot use this function. Refer to the extra operating instructions, "Auto Logo Insert for Copyright Protection."

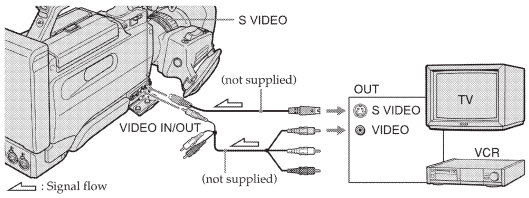
Titles that are already recorded on tapes
You cannot record the titles on a "Memory Stick."

When you press PHOTO on the Remote Commander
Your camcorder immediately records the image that is on the screen when you press the button.

Recording a still image from other equipment

(1) Set the MEMORY/CAMERA/VTR selector to VTR and set DISPLAY in to LCD in the menu settings.
(2) Play back the recorded tape, or turn the monitor on to see the desired program. The picture from the other equipment appears on the LCD screen or in the viewfinder.
(3) Follow steps 3 and 4 on page 137.

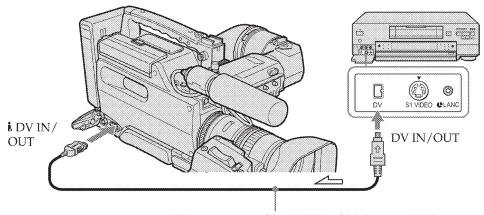
When recording an image through the VIDEO IN/OUT jack



Connect the yellow plug of the A/V connecting cable to the video jack on the VCR or TV.

Connect using an S video cable (not supplied) to obtain high-quality pictures
With this connection, you do not need to connect the yellow (video) plug of the A/V connecting cable.
Connect an S video cable (not supplied) to the S video jacks of both your camcorder and the VCR/TV.
This connection produces higher quality DVCAM/DV format pictures.

When recording the image through the i DV IN/OUT connector



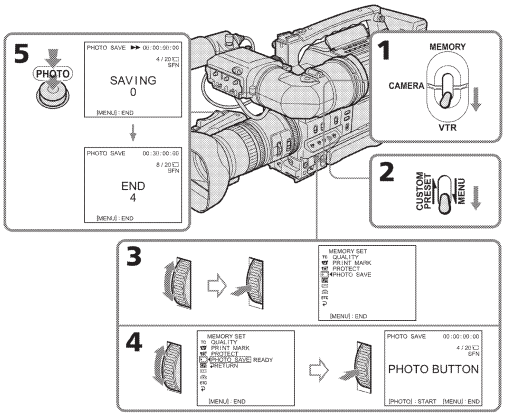
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Copying still images from a tape – Photo save

Using the search function, you can automatically take in still images from tapes and record them on a "Memory Stick" in sequence.

Before operation
- Insert a recorded tape into your camcorder and rewind the tape.
- Insert a "Memory Stick" into your camcorder.

(1) Set the MEMORY/CAMERA/VTR selector to VTR.
(2) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu.
(3) Turn the SEL/PUSH EXEC dial to select , then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select PHOTO SAVE, then press the dial. "PHOTO BUTTON" appears on the LCD screen or in the viewfinder.
(5) Press PHOTO deeply. The still image from the tape is recorded on the "Memory Stick." The number of still images copied is displayed. "END" is displayed when copying is completed.



Copying still images from a tape – Photo save

To cancel copying
Push the CUSTOM PRESET/MENU switch in the MENU direction and release it again.

When the memory of the "Memory Stick" is full
"MEMORY FULL" appears on the LCD screen or in the viewfinder, and the copying stops. Insert another "Memory Stick" and repeat the procedure from step 2.

Note
You can copy only still images to a "Memory Stick" and cannot change the order of still images copied.

When the access lamp is lit or flashing
Never shake or strike your camcorder. Also, do not turn the power off, eject the "Memory Stick" or remove the battery pack. Otherwise, the image data breakdown may occur.

To record all the images recorded on the tape
Rewind the tape all the way back and start copying.

If the write-protect tab on the "Memory Stick" is set to LOCK
"NOT READY" appears when you select the item in the menu settings.

When you change the "Memory Stick" in the middle of copying
Your camcorder resumes copying from the last image recorded on the previous "Memory Stick."

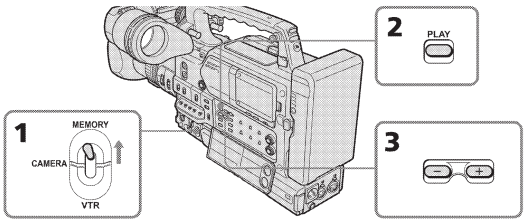
When the auto logo insert function is activated
You cannot use the photo save function. Refer to the extra operating instructions, "Auto Logo Insert for Copyright Protection."

Viewing a still picture – Memory Photo playback

You can play back still images recorded on a "Memory Stick." You can also play back six images at a time by selecting the index screen.

Before operation
Insert a "Memory Stick" into your camcorder.

(1) Set the MEMORY/CAMERA/VTR selector to VTR or MEMORY.
(2) Press MEMORY PLAY. The last recorded image is displayed.
(3) Press MEMORY +/– or +/– on the Remote Commander to select the desired still image. To see the previous image, press MEMORY – or – on the Remote Commander. To see the next image, press MEMORY + or + on the Remote Commander.



To stop memory photo playback
Press MEMORY PLAY again.

To play back recorded images on a monitor screen
- Connect your camcorder to the monitor with the A/V connecting cable before operation.
- When operating memory photo playback on a monitor or on the LCD screen, the image quality may appear to have deteriorated. This is not a malfunction. The image data is as good as ever.
- Turn the audio volume of the monitor down before operation, or noise (howling) may be output from the TV speakers.

When no images are recorded on the "Memory Stick"
The message " NO FILE" appears.

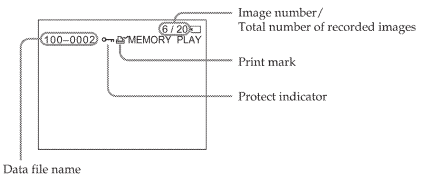
Image data modified with personal computers or shot with other equipment
You may not be able to play them back with your camcorder.

Note on the date/time indicator
Recording date/time is not displayed, however, it is automatically recorded on the "Memory Stick." You can check the recording date/time while in memory playback mode by pressing DATA CODE.

Viewing a still picture – Memory Photo playback

When the auto logo insert function is activated
You cannot do memory photo playback. Refer to the extra operating instructions, "Auto Logo Insert for Copyright Protection."

Screen indicators during still image playback



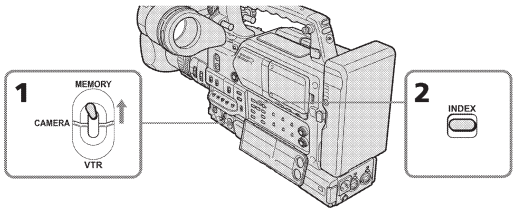
On data file name
- When the hyphen is indicated between the directory and the file number, this data file name means that this file corresponds to the DCF98 standard.
- When the underbar is indicated between the directory and the file number, this data file name means that this file does not correspond to the DCF98 standard.
- The directory is not indicated if the file structure in the "Memory Stick" does not correspond to the DCF98 standard.
- The " DIRECTORY ERROR" message may appear if the file structure in the "Memory Stick" does not correspond to the DCF98 standard. In this case, you cannot record on that "Memory Stick," however, you can play back images in the "Memory Stick."
- When the data file name is flashes, the file may be broken or the file format does not correspond to your camcorder.

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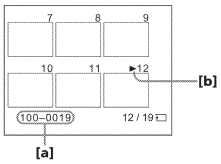
Playing back six recorded images at a time (index screen)

You can play back six recorded images at a time. This function is especially useful when searching for a particular image.

(1) Set the MEMORY/CAMERA/VTR selector to VTR or MEMORY.
(2) Press MEMORY INDEX to display the index screen.



A red ▶ mark appears above the image that is displayed before changing to the index screen mode.
MEMORY – : to display the previous six images
MEMORY + : to display the following six images



[a] File name
[b] ▶ mark

To return to the normal playback screen (single screen)

Press MEMORY +/– to move the ▶ mark to the image you want to display on full screen, then press MEMORY PLAY.

Files modified with personal computers
These files may not be displayed on the index screen. Image files shot with other equipment may not be displayed on the index screen either.

Note
When displaying the index screen, a number appears above each image. This indicates the order in which images are recorded on the "Memory Stick." These numbers are different from the data file names.

Viewing the recorded images using a personal computer

The image data recorded with your camcorder is compressed in the JPEG format. If you use the application software, "PictureGear 4.1Lite" supplied with your camcorder, you can see images recorded on a "Memory Stick" on a computer screen. Use the Memory Stick Reader/Writer supplied with your camcorder, the Memory Stick/PC card kit or PC card adaptor for Memory Stick (not supplied) for this operation. For detailed instructions on operation, refer to the operating instructions of the Memory Stick Reader/Writer, Memory Stick/PC card kit or PC card adaptor for Memory Stick and your application software. For details, refer to the operating instructions of your accessory.

- Do not modify the directory of the file that corresponds to the DCF98 standard. The modified file will not be read.
- If you use the new "Memory Stick," be sure to use it first with this camcorder.

Recommended Windows environment

- OS: Microsoft Windows 98 standard installation
  Operation in an environment upgraded to Windows 98 is not assured.
- CPU: MMX Pentium 200 MHz or faster

Recommended Macintosh environment

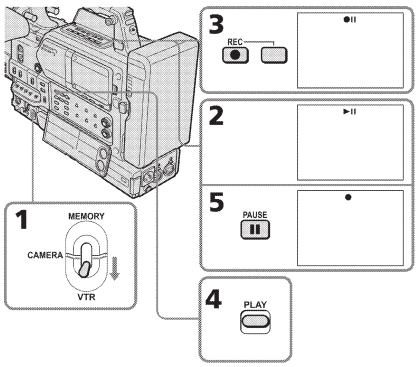
- OS: Mac OS system 8.5/8.6 standard installation
- Model: iMac/G3

Copying an image recorded on a "Memory Stick" to tapes

You can copy still images or titles recorded on a "Memory Stick" and record them to a tape.

Before operation
Insert a tape for recording and a "Memory Stick" for playback into your camcorder.

(1) Set the MEMORY/CAMERA/VTR selector to VTR.
(2) Using the video control buttons, search for a point where you want to record the desired still image. Set the tape to playback pause mode.
(3) Press ● REC and the button on its right simultaneously on your camcorder. The tape is set to the recording pause mode.
(4) Press MEMORY PLAY to play back the still image you want to copy.
(5) Press ❚❚ to start recording and press ❚❚ again to stop.
(6) If you have more to copy, repeat steps 4 and 5.



To stop copying in the middle

Press ■.

During copying

- You cannot operate the following buttons:
  MEMORY PLAY, MEMORY INDEX, MEMORY DELETE, MEMORY +, MEMORY –, and MEMORY MIX.
- If you continue copying, do not use EDITSEARCH to search for the point where you want to record the desired still image. If you do, the playback image disappears from the screen.

Note on the index screen
You cannot record the index screen.

Image data modified with personal computers or shot with other equipment
You may not be able to copy them with your camcorder.

If you press DISPLAY in standby or recording mode
You can see memory playback and the file name indicators in addition to the indicators pertinent to tapes, such as the time code indicator. However, when you set the DISPLAY switch located on the front of the viewfinder to OFF, these indicators will not be displayed.

When the auto logo insert function is activated
You cannot use this function. Refer to the extra operating instructions, "Auto Logo Insert for Copyright Protection."

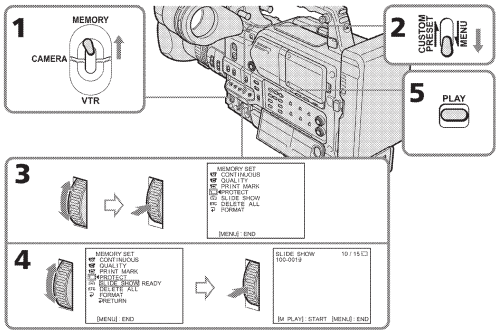
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Playing back images continuously – SLIDE SHOW

You can automatically play back images in sequence. This function is useful especially when checking recorded images or during a presentation.

Before operation
Insert a "Memory Stick" into your camcorder.

(1) Set the MEMORY/CAMERA/VTR selector to MEMORY.
(2) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu.
(3) Turn the SEL/PUSH EXEC dial to select , then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select SLIDE SHOW, then press the dial.
(5) Press MEMORY PLAY. Your camcorder plays back the images recorded on the "Memory Stick" in sequence.



To stop or end the slide show
Push the CUSTOM PRESET/MENU switch in the MENU direction and release it.

To pause during a slide show
Press MEMORY PLAY.

To start the slide show from a particular image
Select the desired image using MEMORY +/– buttons before step 2.

To view the recorded images on a monitor
Connect your camcorder to a monitor with the A/V connecting cable before operation.

If you change the "Memory Stick" during operation
Be sure to follow the steps again from the beginning.

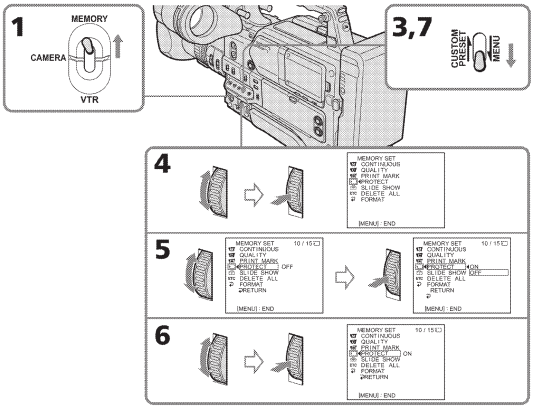
When the auto logo insert function is activated
You cannot use this function. Refer to the extra operating instructions, "Auto Logo Insert for Copyright Protection."

Preventing accidental erasure – Image protection

To prevent accidental erasure of important images, you can protect selected images.

Before operation
Insert a "Memory Stick" into your camcorder.

(1) Set the MEMORY/CAMERA/VTR selector to MEMORY or VTR.
(2) Play back the image you want to protect (p. 142).
(3) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu.
(4) Turn the SEL/PUSH EXEC dial to select , then press the dial.
(5) Turn the SEL/PUSH EXEC dial to select PROTECT, then press the dial.
(6) Turn the SEL/PUSH EXEC dial to select ON, then press the dial.
(7) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to erase the menu display. The "O–n" mark is displayed beside the data file name of the protected image.



To cancel image protection
Select OFF in step 6, then press the SEL/PUSH EXEC dial.

Preventing accidental erasure – Image protection

Note
Formatting erases all information on the "Memory Stick," including the protected image data. Check the contents of the "Memory Stick" before formatting.

If the write-protect tab on the "Memory Stick" is set to LOCK
You cannot carry out image protection.

When the auto logo insert function is activated
You cannot use this function. Refer to the extra operating instructions, "Auto Logo Insert for Copyright Protection."

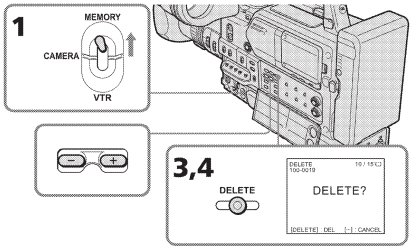
Deleting images

You can delete images stored in a "Memory Stick."

Deleting selected images

Before operation
Insert a "Memory Stick" into your camcorder.

(1) Set the MEMORY/CAMERA/VTR selector to MEMORY or VTR.
(2) Play back the image you want to delete (p. 142).
(3) Press MEMORY DELETE. "DELETE?" appears on the LCD screen or in the viewfinder.
(4) Press MEMORY DELETE again. The selected image is deleted.



To cancel deleting an image
Press MEMORY – in step 4.

To delete an image displayed on the index screen
Press MEMORY +/– to move the ▶ indicator to the desired image and follow steps 3 and 4.

Notes
• To delete a protected image, first cancel image protection.
• Once you delete an image, you cannot restore it. Check the images to be deleted carefully before deleting them.

While "DELETING" appears
Do not change the position of the MEMORY/CAMERA/VTR selector or press any buttons.

If the write-protect tab on the "Memory Stick" is set to LOCK
You cannot delete any image.

When the auto logo insert function is activated
You cannot use this function. Refer to the extra operating instructions, "Auto Logo Insert for Copyright Protection."

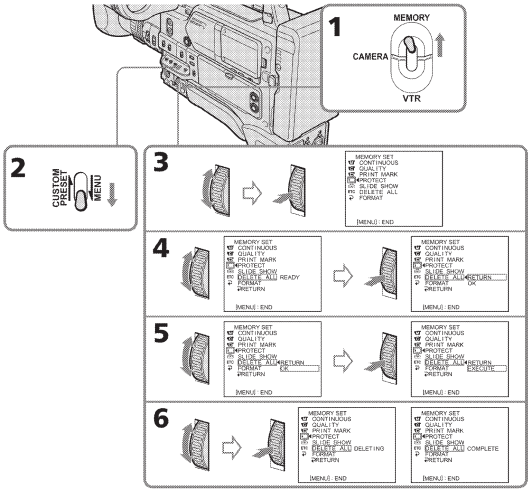
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Deleting all the images

You can delete all the unprotected images in a "Memory Stick."

Before operation
Insert a "Memory Stick" into your camcorder.

(1) Set the MEMORY/CAMERA/VTR selector to MEMORY.
(2) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu.
(3) Turn the SEL/PUSH EXEC dial to select , then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select DELETE ALL, then press the dial.
(5) Turn the SEL/PUSH EXEC dial to select OK, then press the dial. "OK" changes to "EXECUTE."
(6) Press the SEL/PUSH EXEC dial. "DELETING" appears on the LCD screen or in the viewfinder. When all the unprotected images are deleted, "COMPLETE" is displayed.



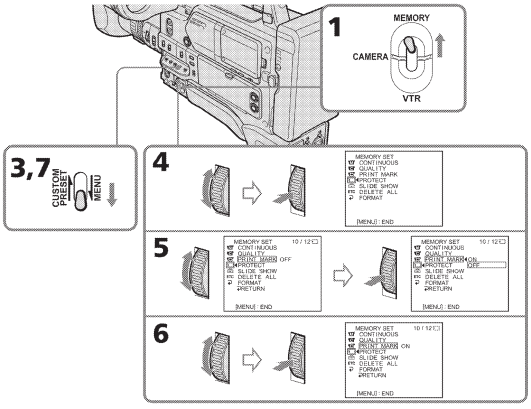
To cancel deleting all the images in the "Memory Stick"
Select RETURN in step 5, then press the SEL/PUSH EXEC dial.

Writing a print mark – Print mark

You can specify the recorded still image to be printed out. This function is useful for printing out still images later.
Your camcorder conforms with the DPOF (Digital Print Order Format) standard for specifying the still images to print out.

Before operation
Insert a "Memory Stick" into your camcorder.

(1) Set the MEMORY/CAMERA/VTR selector to MEMORY or VTR.
(2) Play back the image to be printed out (p. 142).
(3) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu.
(4) Turn the SEL/PUSH EXEC dial to select , then press the dial.
(5) Turn the SEL/PUSH EXEC dial to select PRINT MARK, then press the dial.
(6) Turn the SEL/PUSH EXEC dial to select ON, then press the dial.
(7) Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to erase the menu display. The "✓" mark is displayed beside the data file name of an image with a print mark.



To cancel writing print marks
Select OFF in step 6, then press the SEL/PUSH EXEC dial.

If the write-protect tab on the "Memory Stick" is set to LOCK
You cannot write print marks on still images.

When the auto logo insert function is activated
You cannot use this function. Refer to the extra operating instructions, "Auto Logo Insert for Copyright Protection."

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Compatibility of DVCAM and DV formats

DVCAM format is developed as a more reliable and higher end format than consumer DV format. Here explained are the differences, compatibility, and limitations on editing about DVCAM and DV formats.

Differences between DVCAM and DV formats

Item	DVCAM	DV
Track pitch	15 µm	10 µm
Audio sampling frequency	12 bit: 32 kHz 16 bit: 48 kHz	12 bit: 32 kHz 16 bit: 32 kHz, 44.1 kHz, 48 kHz
Audio recording mode [1]	Lock mode	Unlock mode

[1] There are two modes for audio recording, lock mode and unlock mode. In lock mode, the sampling frequencies of audio and video are synchronized. In unlock mode, which consumer DV format adopts, the two sampling frequencies are independent. Therefore, lock mode is more effective than unlock mode in digital processing and smooth transition during audio editing.

DVCAM and DV cassettes

The recording format of picture is defined according to recorder's format as described below.

Recorder's format	Cassette's format	Recording format
DVCAM	DVCAM	DVCAM
	DV	DVCAM
DV	DVCAM	DV
	DV	DV

This digital camcorder complies with DVCAM format. Though DV cassettes can be used for recording, we recommend you to use DVCAM cassettes to get the most out of high reliability of DVCAM format. The recording time of DV cassettes is 2/3 shorter than that indicated on the DV cassettes.

Compatibility on playback

Some tapes cannot be played back on DVCAM or DV video equipment.

Tape	On DV video equipment	On DVCAM video equipment
DV-formatted	Can be played back	Can be played back (only when recorded in SP mode)
DVCAM-formatted	Some equipment may be able to play back	Can be played back

Compatibility on editing using DV connectors

When this digital camcorder is connected to other DVCAM or DV video equipment using DV connectors, the recording format of edited tapes is defined according to recorder's format as described below.

Source tape	Player's format	Recorder's format	Recording format
DVCAM-formatted [2] [3]	DVCAM	DVCAM	DVCAM
DVCAM-formatted	DVCAM	DV	DV [4]
DVCAM-formatted [2]	DV [5]	DVCAM	DVCAM [7]
DVCAM-formatted	DV [5]	DV	DV [4]
DV-formatted [6]	DVCAM	DVCAM	DVCAM [1]
DV-formatted [6]	DVCAM	DV	DV
DV-formatted	DV	DVCAM	DVCAM [1]
DV-formatted	DV	DV	DV

[1] When using the DVCAM video equipment to carry out DV dubbing of a tape recorded in DV format, the tape produced will be in DVCAM format as follows:
– Audio recording mode will be unlock mode.
– The time code format will be partly maladjusted. (There will be no effect on the recorded picture except in certain case.)

[2] If the tape is to be dubbed is DVCAM formatted tape as in 1), the tape produced will be in DVCAM format as follows:
– Audio recording mode will be unlock mode.
– The time code format will be partly maladjusted.

[3] Depending on signal conditions of the source tape, you may not be able to edit the tape using the DV connectors.

[4] Audio recording mode of the edited tape is lock mode.

[5] Some DV video equipment may be able to play back a DVCAM-formatted tape. Even if the tape is played back, contents of the playback cannot be guaranteed.

[6] DV-formatted tapes recorded in SP mode only can be used as source tapes.

[7] Depending on model of video equipment, you may not be able to edit.

Limitations on editing

You will find the following limitations when editing.

- Due to the difference of a track pitch, you cannot record or edit on DV-formatted tapes using DVCAM video equipment.
- Depending on signal conditions, you may not be able to record or edit on DVCAM-formatted tapes.

In these cases, do the following:

- Edit using audio/video jacks.
- Dub a DV-formatted tape using audio/video jacks, then use the dubbed tape as a source tape.

Usable cassettes

Selecting cassette types

You can use the DVCAM DVCAM cassette*, DVCAM mini DVCAM cassette*, DV DV cassette*, and mini DV mini DV cassette* in this camcorder. You cannot use any other 8 8 mm, Hi8 Hi8, Digital 8 Digital 8, VHS VHS, S-VHS S-VHS, VHSC VHSC, S-VHSC S-VHSC, Betamax Betamax or ED Beta ED Betamax cassette.

* There are two types of DVCAM/DV cassettes: with cassette memory and without cassette memory. Tapes with cassette memory have C-M (Cassette Memory) mark. Sony recommends that you use a tape with C-M mark to enjoy your camcorder fully.

The IC memory is built in the cassette with cassette memory. Using this IC memory, your camcorder can read, write, and search data such as the date of recording or titles. The functions using the cassette memory require successive signals recorded on the tape. If the tape has a blank portion in the beginning or between the recorded portions, a title may not be displayed properly or the search functions may not work correctly. Not to make any blank portion on the tape, press END SEARCH to return to the end of the recorded portion before you begin the next recording when:
– You have ejected the cassette while recording.
– You have played back the tape in VTR mode.
If there is a blank portion or discontinuous signal on your tape, re-record from the beginning to the end of the tape concerning above.
When you record, using a digital video camera recorder without a cassette memory function, on a tape recorded by one with the cassette memory function, the same result may occur.

C-M 16K mark on the cassette

The memory capacity of tapes marked with C-M 16K is 16Kb. Your camcorder can accommodate up to 16Kb.

The number of data recordable on cassette memory (when using 16 Kb/2 048 bytes cassette memory)

Data	Numbers
INDEX	135 (15 bytes/1 data)
TITLE	106
DATE	24 (10 bytes/1 data)
PHOTO	48 (10 bytes/1 data)
CASSETTE LABEL	1

The numbers above is as a guide.

Copyright signal

When you play back

When you connect your camcorder to any other video camera recorder to dub a tape that has recorded copyright control signals for copyright protection, you may not record the tape that played back on your camcorder.

When you record

You cannot record software on your camcorder that contains copyright control signals for copyright protection of software.

"COPY INHIBIT" appears on the LCD screen, in the viewfinder or on the TV screen if you try to record such software.
Your camcorder does not record copyright control signals on the tape when it records.

Audio mode

Fs32K (12-bit) mode: The original sound can be recorded in channels 1 and 2, and the new sound in channels 3 and 4 in 32 kHz. The balance between channels 1/2 and channels 3/4 can be adjusted by selecting AUDIO MIX in the menu settings during playback and audio dubbing. Both sounds can be played back. You can monitor the sound during audio dubbing.
Fs48K (16-bit) mode: A new sound cannot be recorded but the original sound can be recorded in high quality using two channels. The audio mode can be indicated on the LCD screen or in the viewfinder.
You may not add a sound on a DVCAM-formatted tape which does not comply with the condition of the DVCAM format as described on page 156 or when you recorded on a DV-formatted tape. In this case, "NS" appears on the LCD screen or in the viewfinder.

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Usable cassettes

Notes on the DVCAM/DV cassette

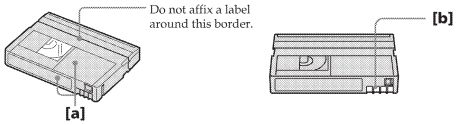
When affixing a label on the DVCAM/DV cassette
Be sure to affix a label only on the locations as illustrated below **[a]** so as not to cause malfunction of your camcorder.

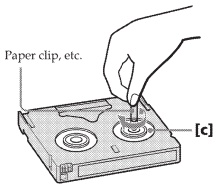
After using the DVCAM/DV cassette
Rewind the tape to the beginning, put the cassette in its case, and store it in an upright position.

If the cassette memory function does not work
Reinsert a cassette a few times. The gold-plated connector of DVCAM/DV cassettes may be dirty or dusty.

Cleaning the connector
If the gold-plated connector of DVCAM/DV cassettes is dirty or dusty, you may not operate the function using cassette memory. Clean up the gold-plated connector with cotton-wool swab, about every 10 times ejection of a cassette. **[b]**

Checking the tape for slack
Turn the reel **[c]** gently in the direction shown by the arrow. If the reel does not move, there is no slack. (Do not turn the reel hard.) Insert the cassette into the cassette holder, close the cassette holder, and after about 10 seconds take it out.





About i.LINK

Your camcorder is equipped with the DV input/output connector based on i.LINK (IEEE1394) standard.
This section explains the specifications and features of i.LINK.

What is i.LINK?
i.LINK is a digital serial interface designed to integrate the devices equipped with i.LINK connector. By connecting i.LINK devices, i.LINK allows your device to:
– Transmit and receive data such as digital audio and digital video signals in two ways
– Control other i.LINK devices
– Easily connect with another device using just an i.LINK cable.
Your i.LINK device is capable of connecting AV devices and perform various operations and data transfer. Further availability for connections with versatile equipment and operations will be planned in the future.
Other advantages include the following feature. When connecting multiple i.LINK devices, your device cannot only perform operations and data transfer with the directly connected device but also perform them with any of the devices that are connected via other devices. Therefore, you will not need to concern the order of connecting devices. However, depending on the features and specifications of the connected devices, you may need to operate certain functions differently or may not be able to perform certain operations or data transfer.

Note
Your camcorder can be connected to one device with the i.LINK cable (DV cable). When you connect with a device that has two or more i.LINK connectors, refer to the operating instructions supplied with the connected device.

Tips
- i.LINK, a nickname for IEEE 1394 that Sony proposed, is a trademark supported by a majority of companies worldwide.
- IEEE 1394 is an international standard defined by IEEE, The Institute of Electrical and Electronics Engineers, Inc.

About data transfer speed of i.LINK
i.LINK defines a maximum data transfer speed of approximately 100, 200 and 400 Mbps* that are described as S100, S200 and S400 respectively.
For i.LINK devices, a maximum data transfer speed that the device supports is identified on "specifications" page of the operating instructions supplied with the device or near its i.LINK connector.
With a device that does not identify the data transfer speed, the maximum data transfer speed that the device supports is S100.
When connecting with the device that support different data transfer speed, the actual data transfer speed may be different from those described on the i.LINK connectors.

***What is Mbps?**
Mega bits per second. A measure of the rate at which data is transmitted per second. In case of 100 Mbps, 100 Mega bits of data can be transmitted per second.

i. LINK operation with your camcorder
For details on dubbing your camcorder to your VCR equipped with DV input/output connector , see pages 86, 98.
Your camcorder is available for use with other devices equipped with Sony i.LINK (DV) connector. For details on connection with i.LINK cable and necessary software, refer to the operating instructions supplied with the connected device.

Use Sony i.LINK cables
Use Sony i.LINK cables to connect the i.LINK devices.
6 pins ⟷ 6 pins (For dubbing)
6 pins ⟷ 4 pins (For dubbing)

i.LINK and **i** are trademarks.

Troubleshooting

If you run into any problem using your camcorder, use the following table to troubleshoot the problem. If the problem persists, disconnect the power source and contact your Sony dealer or local authorized Sony service facility. If "C:□□:□□" appears on the LCD screen or in the viewfinder, the self-diagnosis display function has worked. See page 168.

In the recording mode

Symptom	Cause and/or Corrective Actions
START/STOP does not operate.	• The MEMORY/CAMERA/VTR selector is not set to CAMERA. → Set it to CAMERA. (p. 15) • The tape has run out. → Rewind the tape or insert a new one. (p. 13, 33) • The REC/SAVE switch on the cassette is set to SAVE. → Use a new tape or set the switch to REC. (p. 14) • The auto logo insert function is activated. → Refer to the operating instructions ("Auto Logo Insert for Copyright Protection") supplied with this camcorder. • The tape is stuck to the drum (moisture condensation). → Remove the cassette and leave your camcorder for at least one hour to acclimatize. (p. 172)
The power goes off.	• The battery pack is dead or nearly dead. → Install a charged battery pack. (p. 9)
The image on the viewfinder screen is not clear.	• The viewfinder lens is not adjusted. → Adjust the viewfinder lens. (p. 20)
The SteadyShot function does not work.	• STEADYSHOT is set to OFF in the menu settings. → Set it to ON. (p. 120)
The autofocusing function does not work.	• The camcorder is in manual focus mode. → Turn to auto focus mode. (p. 45) • Shooting conditions are not suitable for autofocus. → Adjust focus manually. (p. 45)
The fader function does not work.	• The digital effect function is working. → Cancel it. (p. 69)
A vertical band appears when you shoot a subject such as lights or a candle flame against a dark background.	• The contrast between the subject and background is too high. This is not a malfunction.
Vertical streaks appear when you shoot a very bright subject.	• This is called the smear phenomenon. This is not a malfunction.

Troubleshooting

In the playback mode

Symptom	Cause and/or Corrective Actions
Some tiny white spots appear on the LCD screen or in the viewfinder.	• When the shutter speed is too low.
The click of the shutter does not sound.	• BEEP is set to OFF in the menu settings. → Set it to MELODY or NORMAL. (p. 120)
The image is not bright even if you use the video light.	• The manual adjustment is not suitable for the situations. → Set the AUTO MODE switch to ON, or cancel the manual adjustment. (p. 36)
Audio recording is not possible.	• The AUDIO LEVEL (CH-1/CH-2) knobs are set to the minimum level. → Adjust the setting of the AUDIO LEVEL (CH-1/CH-2) knobs. (p. 54) • The AUDIO LEVEL knob on the front is set to the minimum level. → Adjust the setting of the AUDIO LEVEL knob. (p. 54)

Symptom	Cause and/or Corrective Actions
The tape does not move when a video control button is pressed.	• The MEMORY/CAMERA/VTR selector is not set to VTR. → Set it to VTR. (p. 30)
The playback button does not function.	• The tape has run out. → Rewind the tape. (p. 33)
There are horizontal lines on the picture or the playback picture is not clear or does not appear.	• The video head may be dirty. → Clean the heads using the Sony DVM12CL cleaning cassette (not supplied). (p. 173)
No sound or only a low sound is heard when playing back a tape.	• The volume is turned to minimum. → Turn up the volume. (p. 30) • AUDIO MIX is set to the CH3/4 side in the menu settings. → Adjust AUDIO MIX. (p. 120)
The title search function does not work.	• The tape has no cassette memory. → Use a tape with cassette memory. (p. 79, 158) • CM SEARCH is set to OFF in the menu settings. → Set it to ON. (p. 120) • There is no title in the tape. → Superimpose the titles. (p. 110) • The tape has a blank portion in the recorded portion. (p. 79)
Displaying the recorded date, date search function does not work.	• The tape has no cassette memory. → Use a tape with cassette memory. (p. 80, 158) • CM SEARCH is set to OFF in the menu settings. → Set it to ON. (p. 120) • The tape has a blank portion in the recorded portion. (p. 81)

(continued on the following page)

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Symptom	Cause and/or Corrective Actions
The new sound now being added, or that has been added to the recorded tape is not heard.	• AUDIO MIX is set to the CH1/2 side in the menu settings. → Set it to the side you want to monitor. (p. 120)
The title is not displayed.	• TITLE DSPL is set to OFF in the menu settings. → Set it to ON. (p. 120)
The sound is muted or images do not appear when monitoring images through a monitor.	→ Pull out the A/V connecting cable from the AUDIO IN/OUT CH-1/CH-2 and VIDEO IN/OUT jacks, then connect it again.
The recorded sound is distorted.	• The audio level is too high. → Adjust the setting of the AUDIO LEVEL (CH-1/CH-2) knobs, and record again. (p. 54)

In the recording and playback modes

Symptom	Cause and/or Corrective Actions
The power does not turn on.	• The battery pack is not installed, or is dead or nearly dead. → Install a charged battery pack. (p. 9) • The AC power adaptor is not connected, or it is not turned on. → Connect the AC power adaptor. (p. 11)
The camcorder does not work even if the MEMORY/CAMERA/VTR selector is set to CAMERA or VTR.	• The battery pack is not installed, or is dead or nearly dead. → Install a charged battery pack. (p. 9) • The AC power adaptor is not connected, or it is not turned on. → Connect the AC power adaptor. (p. 11) • The POWER switch is set to OFF. → Set it to ON. (p. 15, 30)
The end search function does not work.	• The tape was ejected after recording when using a tape without cassette memory. (p. 29, 33) • You have not recorded on the new cassette yet. (p. 29, 33)
The end search function does not work correctly.	• The tape has a blank portion in the beginning or middle. (p. 29)
The battery pack is quickly discharged.	• The operating temperature is too low. • The battery pack is not fully charged. → Charge the battery pack fully. • The battery pack is completely dead, and cannot be recharged. → Replace with a new battery pack. (p. 9) • The setup of the REMAIN item in the menu settings is not proper to the installed battery pack. → Set it properly according to the installed battery pack.

Symptom	Cause and/or Corrective Actions
The cassette cannot be removed from the holder.	• The power source is disconnected. → Connect it firmly. (p. 9, 11) • The battery is dead. → Use a charged battery pack. (p. 9)
The ▮ and ⏏ indicators flash and no functions except for cassette ejection work.	• Moisture condensation has occurred. → Remove the cassette and leave your camcorder for at least one hour to acclimatize. (p. 172)
CM indicator does not appear when using a tape with cassette memory.	• The gold-plated connector of the cassette is dirty or dusty. → Clean the gold-plated connector. (p. 160)
Remaining tape indicator is not displayed.	• The CM REMAIN is set to AUTO in the menu settings. → Set it to ON to always display the remaining tape indicator. (p. 120)

When operating using the "Memory Stick"

Symptom	Cause and/or Corrective Actions
Operations do not function.	• The MEMORY/CAMERA/VTR selector is set to CAMERA. → Set it to MEMORY or VTR. • The "Memory Stick" is not inserted. → Insert a "Memory Stick." (p. 131) • The auto logo insert function is activated. → Refer to the extra operating instructions ("Auto Logo Insert for Copyright Protection").
Recording does not function.	• The "Memory Stick" has already been recorded to its full capacity. → Erase unnecessary images and record again. (p. 134, 151) • The "Memory Stick" formatted incorrectly is inserted. → Format the "Memory Stick" or use another "Memory Stick." (p. 124) • The write-protect tab on the "Memory Stick" is set to LOCK. → Set the tab to write. (p. 129)
The image cannot be deleted.	• The image is protected. → Cancel image protection. (p. 149) • The write-protect tab on the "Memory Stick" is set to LOCK. → Set the tab to write. (p. 129)
You cannot format the "Memory Stick."	• The write-protect tab on the "Memory Stick" is set to LOCK. → Set the tab to write. (p. 129)
Deleting all the images cannot be carried out.	• The write-protect tab on the "Memory Stick" is set to LOCK. → Set the tab to write. (p. 129)
You cannot protect the image.	• The write-protect tab on the "Memory Stick" is set to LOCK. → Set the tab to write. (p. 129) • The image to be protected is not being played back. → Press MEMORY PLAY to play back the image. (p. 142)

(continued on the following page)

Symptom	Cause and/or Corrective Actions
You cannot write a print mark on the still image.	• The write-protect tab on the "Memory Stick" is set to LOCK. → Set the tab to write. (p. 129) • The image that you will write a print mark is not being played back. → Press MEMORY PLAY to play back the image. (p. 142)
The photo save function does not work.	• The write-protect tab on the "Memory Stick" is set to LOCK. → Set the tab to write. (p. 129) • The battery pack is dead. → Install a charged battery pack or use the AC power adaptor instead of the battery pack. (p. 9, 11)

Others

Symptom	Cause and/or Corrective Actions
The title is not recorded.	• The cassette has no cassette memory. → Use a cassette with cassette memory. (p. 110, 158) • The cassette memory is full. → Erase some data. (p. 118) • The REC/SAVE switch on the cassette is set to SAVE. → Set the switch to REC. (p. 14) • Nothing is recorded in that position on the tape. → Superimpose the title to the recorded position. (p. 111)
The cassette label is not recorded.	• The cassette has no cassette memory. → Use a cassette with cassette memory. (p. 116, 158) • The cassette memory is full. → Erase some data. (p. 118) • The REC/SAVE switch on the cassette is set to SAVE. → Set the switch to REC. (p. 14)
While editing using the DV connecting cable (i.LINK cable), recording picture cannot be monitored.	→ Disconnect the DV connecting cable (i.LINK cable), and connect it again. (p. 86)
Digital program editing does not function.	• The input selector on the VCR is not set correctly. → Check the connection and set up the selector position. (p. 85) • Setting program on a blank portion of the tape is attempted. → Set the program again on a recorded portion. (p. 92) • Your camcorder and the VCR are not synchronized. → Synchronize them. (p. 89) • The camcorder and VCR are not connected with a DV connecting cable (i.LINK cable). → Connect the camcorder and VCR with a DV connecting cable (i.LINK cable). • The VCR is not turned on. → Turn on the VCR.

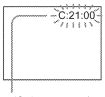
Symptom	Cause and/or Corrective Actions
The Remote Commander supplied with your camcorder does not work.	• COMMANDER is set to OFF in the menu settings. → Set it to ON. (p. 120) • Something is blocking the infrared rays. → Remove the obstacle. • The batteries are inserted in the battery holder with the + – polarities incorrectly. → Insert the batteries with the correct polarity. (p. 189) • The batteries are dead. → Insert new ones. (p. 189)
The input picture does not appear on the LCD screen or in the viewfinder when your camcorder is connected to outputs on the TV or VCR.	• DISPLAY is set to V-OUT/LCD in the menu settings. → Set it to LCD. (p. 120)
The melody or beep sounds for five seconds.	• Moisture condensation has occurred. → Remove the cassette and leave your camcorder for at least one hour to acclimatize. (p. 172) • Some troubles have occurred in your camcorder. → Remove the cassette and insert it again, then operate your camcorder.
No function works though the power is on.	• Disconnect the mains lead of the AC power adaptor or remove the battery pack, then reconnect it after about one minute. Turn the power on. If the functions still do not work, press the RESET button located below the DISPLAY SELECT switch using a sharp-pointed object. (If you press the RESET button, all the settings including the date and time return to the default.) (p. 11, 180)

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Self-diagnosis display

Your camcorder has a self-diagnosis display function.
This function displays the current condition of your camcorder as a 5-digit code (a combination of a letter and figures) on the LCD screen or in the viewfinder. If a 5-digit code is displayed, check the following code chart. The last two digits (indicated by □□) will differ depending on the state of your camcorder.

On the LCD screen or in the viewfinder



Self-diagnosis display
•C:□□:□□
You can service your camcorder yourself.
•E:□□:□□
Contact your Sony dealer or nearest local authorized Sony service facility.

Five-digit display	Cause and/or Corrective Actions
C:21:□□	• Moisture condensation has occurred. → Remove the cassette and leave your camcorder for at least one hour to acclimatize. (p. 172)
C:22:□□	• The video heads are dirty. → Clean the heads using the Sony DVM12CL cleaning cassette (not supplied). (p. 173)
C:31:□□ C:32:□□	• A malfunction other than the above. → Remove the cassette and insert it again, then operate your camcorder. → Disconnect the mains lead of the AC power adaptor or remove the battery pack. After reconnecting the power source, operate your camcorder.
E:61:□□ E:62:□□	• A malfunction that you cannot service has occurred. → Contact your Sony dealer and inform them of the 5-digit code. (example: E:61:10)

If you are unable to rectify the problem even if you try corrective actions a few times, contact your Sony dealer or nearest local authorized Sony service facility.

Warning indicators and messages

If indicators and messages appear on the LCD screen or in the viewfinder, check the following:
See the page in parentheses "( )" for more information.

Warning indicators

The battery is dead or nearly dead
Slow flashing:
• The battery is nearly dead.
Depending on conditions, the indicator may flash, even if there are five to 10 minutes remaining.
Fast flashing:
• The battery is dead (p. 10).
• The battery is completely dead.

Warning indicator as to tape
Slow flashing:
• The tape is near the end.
• No tape is inserted (p. 13).*
• The REC/SAVE switch on the cassette is set to REC (p. 14).*
Fast flashing:
• The tape has run out (p. 33).*

You need to eject the cassette
Slow flashing:
• The REC/SAVE switch on the cassette is set to REC (p. 14).*
Fast flashing:
• Moisture condensation has occurred (p. 172).*
• The tape has run out (p. 33).*
• The self-diagnosis display function is activated (p. 168).*

Moisture condensation has occurred*
Fast flashing:
• Eject the cassette, turn off your camcorder, and leave it for about one hour with the cassette compartment open (p. 172).

Warning indicator as to cassette memory
Slow flashing:
• No tape with cassette memory is inserted (p. 158).*

Self-diagnosis display (p. 168)

The still image is protected
Slow flashing:
• The still image is protected (p. 149).*

Warning indicator as to "Memory Stick"*
Slow flashing:
• No "Memory Stick" is inserted (p. 131).
Fast flashing:
• Unreadable "Memory Stick" is inserted (p. 131).

100-0001 "(Warning indicators) Memory Stick" file error*
Slow flashing:
• File is broken.
• File has no compatibility.

"Memory Stick" format error*
Fast flashing:
• There are two directories or more.
• Data is broken.
• "Memory Stick" is not formatted correctly (p. 124).

Warning messages

• CLOCK SET	Reset the date and time (p. 128).
• MEMORY FULL	The "Memory Stick" is full in photo save function (p. 141).
• CLEANING CASSETTE	The video heads are dirty (p. 173).**
• FULL	The tape cassette memory is full (p. 112).*
• 48K	AUDIO MODE is set to 48K.* You cannot dub new sound (p. 125).
• REC MODE	REC MODE is set to DV SP.* You cannot dub new sound (p. 125).
• TAPE	There is no recorded portion on the tape.* You cannot dub new sound (p. 103).
• "i.LINK" CABLE	i.LINK cable is connected (p. 101).* You cannot dub new sound.
• FULL	The "Memory Stick" is full (p. 136).*
•	The write-protect tab on the "Memory Stick" is set to LOCK (p. 129).*
• NO FILE	No still image is recorded on the "Memory Stick" (p. 142).*
• NO MEMORY STICK	No "Memory Stick" is inserted (p. 131).*
• MEMORY STICK ERROR	The "Memory Stick" data is corrupted (p. 131).*
• FORMAT ERROR	(p. 124)*
• DIRECTORY ERROR	(p. 143)*
• COPY INHIBIT	The tape contains copyright control signals for copyright protection of software (p. 159).*
• TAPE END	The tape has reached the end of the tape (p. 33).*
• NO TAPE	Insert a cassette tape (p. 13).*
• LOGO NOT INSERTED	The logo is not inserted properly, or the "Memory Stick" is not inserted that has the logo data. Check if the "Memory Stick" is inserted properly, or insert the "Memory Stick" with logo data.
• LOGO SYSTEM ERROR	The data setting of the logo insert system is corrupted. Consult your Sony dealer or local authorized Sony service facility.

* You hear the melody or beep sound.
** and the message appear alternately.

Using your camcorder abroad

Using your camcorder abroad

You can use your camcorder in any country or area with the optional AC power adaptor within 100 V to 240 V AC, 50/60 Hz.

Your camcorder is a PAL system-based camcorder. If you want to view the playback picture on a TV, it must be a PAL system-based TV equipped with audio/video input jacks.

Check the following list.

PAL system
Australia, Austria, Belgium, China, Czech Republic, Denmark, Finland, Germany, Great Britain, Holland, Hong Kong, Italy, Kuwait, Malaysia, New Zealand, Norway, Portugal, Singapore, Slovak Republic, Spain, Sweden, Switzerland, Thailand, etc.

PAL-M system
Brazil

PAL-N system
Argentina, Paraguay, Uruguay

NTSC system
Bahama Islands, Bolivia, Canada, Central America, Chile, Colombia, Ecuador, Jamaica, Japan, Korea, Mexico, Peru, Surinam, Taiwan, the Philippines, the U.S.A., Venezuela, etc.

SECAM system
Bulgaria, France, Guyana, Hungary, Iran, Iraq, Monaco, Poland, Russia, Ukraine, etc.

Simple setting of clock by time difference

You can easily set the clock to the local time by setting a time difference. Select WORLD TIME in the menu settings. See page 120 for more information.

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Maintenance information and precautions

Moisture condensation

If your camcorder is brought directly from a cold place to a warm place, moisture may condense inside your camcorder, on the surface of the tape, or on the lens. In this condition, the tape may stick to the head drum and be damaged or your camcorder may not operate correctly. If there is moisture inside your camcorder, the beep sounds and the indicator flashes. When the ⏏ indicator flashes at the same time, the cassette is inserted in your camcorder. If moisture condenses on the lens, the indicator will not appear.

If moisture condensation occurred

None of the functions except cassette ejection will work. Eject the cassette, turn off your camcorder, and leave it for about one hour with the cassette compartment open. Your camcorder can be used again if the indicator does not appear when the power is turned on again.

Note on moisture condensation

Moisture may condense when you bring your camcorder from a cold place into a warm place (or vice versa) or when you use your camcorder in a hot place as follows:

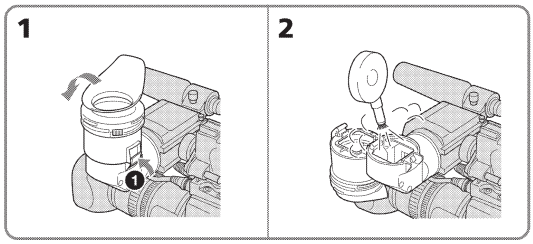
- You bring your camcorder from a ski slope into a place warmed up by a heating device.
- You bring your camcorder from an air-conditioned car or room into a hot place outside.
- You use your camcorder after a squall or a shower.
- You use your camcorder in a high temperature and humidity place.

How to prevent moisture condensation

When you bring your camcorder from a cold place into a warm place, put your camcorder in a plastic bag and tightly seal it. Remove the bag when the air temperature inside the plastic bag has reached the surrounding temperature (after about one hour).

Removing Dust from Inside the Viewfinder

(1) While holding down the Eyepiece release catch ❶, hinge up the eyecup.
(2) Clean the surface with a commercially available blower.



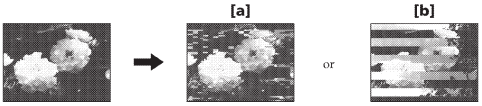
Maintenance information

Cleaning the video head

To ensure normal recording and clear pictures, clean the video heads. The video head may be dirty when:

- mosaic-pattern noise appears on the playback picture.
- playback pictures do not move.
- playback pictures do not appear.
- the ⊗ indicator and "CLEANING CASSETTE" message appear one after another on the LCD screen or in the viewfinder.

If the above problem, **[a]** or **[b]** occurs, clean the video heads for 10 seconds with the Sony DVM12CL cleaning cassette (not supplied). Check the picture and if the above problem persists, repeat cleaning.



Cleaning the LCD screen

If fingerprints or dust make the LCD screen dirty, we recommend using a LCD Cleaning Cloth (not supplied) to clean the LCD screen.

Charging the vanadium-lithium battery in your camcorder

Your camcorder is supplied with a vanadium-lithium battery installed so as to retain the date and time, etc., regardless of the setting of the POWER switch. The vanadium-lithium battery is always charged as long as you are using your camcorder. The battery, however, will get discharged gradually if you do not use your camcorder. It will be completely discharged in about four months if you do not use your camcorder at all. Even if the vanadium-lithium battery is not charged, it will not affect the camcorder operation. To retain the date and time, etc., charge the battery if the battery is discharged.

Charging the vanadium-lithium battery:

- Connect your camcorder to mains using the AC power adaptor (not supplied), and leave your camcorder with the POWER switch set to OFF for more than 24 hours.
- Or install the fully charged battery pack in your camcorder, and leave your camcorder with the POWER switch set to OFF for more than one hour.

Precautions

Camcorder operation

- Operate your camcorder on 12 V to 17 V DC.
- For DC or AC operation, use the accessories recommended in this operating instructions.
- If any solid object or liquid get inside the casing, unplug your camcorder and have it checked by a Sony dealer before operating it any further.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the POWER switch set to OFF when you are not using your camcorder.
- Do not wrap your camcorder with a towel, for example, and operate it. Doing so might cause heat to build up inside.
- Keep your camcorder away from strong magnetic fields or mechanical vibration. Noise may appear on the image.
- Do not touch the LCD screen with a sharp-pointed object.
- If your camcorder is used in a cold place, a residual image may appear on the LCD screen. This is not a malfunction.
- While using your camcorder, the back of the LCD screen may heat up. This is not a malfunction.

On handling tapes

- Do not insert anything into the small holes on the rear of the cassette. These holes are used to sense the type and thickness of the tape and if the recording tab is in or out.
- Do not open the tape protect cover or touch the tape.
- Avoid touching or damaging the terminals. To remove dust, clean the terminals with a soft cloth.

Camcorder care

- Remove the tape, and periodically turn on the power, operate the CAMERA and VTR sections and play back a tape for about three minutes when your camcorder is not to be used for a long time.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on the lens, remove them with a soft cloth.
- Clean the camcorder body with a dry soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

- Do not let sand get into your camcorder. When you use your camcorder on a sandy beach or in a dusty place, protect it from the sand or dust. Sand or dust may cause your camcorder to malfunction, and sometimes this malfunction cannot be repaired.

Notes on dry batteries

To avoid possible damage from battery leakage or corrosion, observe the following:

- Be sure to insert the batteries with the + – polarities matched to the + – marks.
- Dry batteries are not rechargeable.
- Do not use a combination of new and old batteries.
- Do not use different types of batteries.
- Current flows from batteries when you are not using them for a long time.
- Do not use leaking batteries.

If batteries are leaking

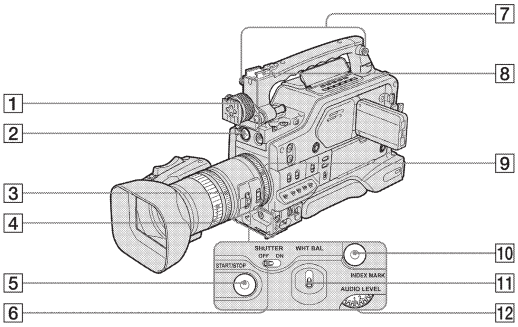
- Wipe off the liquid in the battery compartment carefully before replacing the batteries.
- If you touch the liquid, wash it off with water.
- If the liquid get into your eyes, wash your eyes with a lot of water and then consult a doctor.

If any problem occurs, unplug your camcorder and contact your nearest Sony dealer.

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Identifying the parts and controls

Camcorder



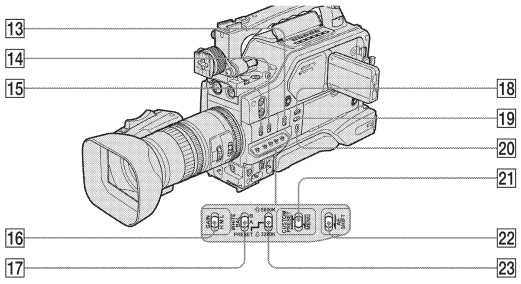
1 **VF connector** (p. 187)
2 **MIC IN +48V connector** (p. 7)
3 **Zoom ring** (p. 25)
4 **Focus ring** (p. 45)
5 **START/STOP button** (p. 15)
6 **SHUTTER switch** (p. 40)
7 **Shoulder strap fitting**
8 **Accessory shoe**
9 **IRIS ring** (p. 37)
10 **INDEX MARK button** (p. 53)
11 **WHT BAL switch** (p. 47)
12 **AUDIO LEVEL knob** (p. 54)

This mark indicates that this product is a genuine accessory for Sony video products.
When purchasing Sony video products, Sony recommends that you purchase accessories with this "GENUINE VIDEO ACCESSORIES" mark.

DVCAM Mini DV Digital Video Cassette DV Digital Video Cassette Cassette Memory

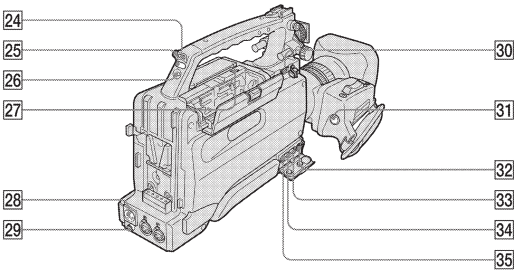
These are trademarks.

Identifying the parts and controls



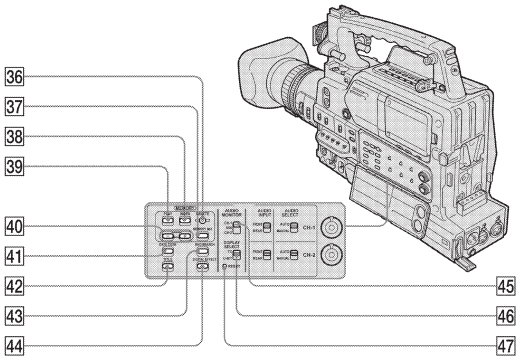
13 **AUTO MODE switch** (p. 36)
14 **ATW switch** (p. 47)
15 **AGC switch** (p. 38)
16 **GAIN selector** (p. 38)
17 **WHITE BAL switch** (p. 47)
18 **DISPLAY button** (p. 31)
19 **AUDIO LEVEL button** (p. 54)
20 **ZEBRA selector** (p. 42)
21 **CUSTOM PRESET/MENU switch** (p. 120)
22 **AE SHIFT switch** (p. 44)
23 **WHT PRESET switch** (p. 48)

Identifying the parts and controls



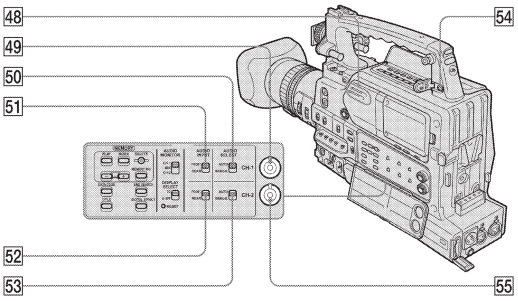
24 **Remote sensor**
25 **TALLY lamp** (p. 16)
26 **TALLY switch** (p. 16)
27 **EJECT button** (p. 13)
28 **DC IN 12V connector** (p. 11)
29 **DC OUT 12V connector** (p. 58)
30 **LIGHT connector** (p. 60)
31 **START/STOP button** (p. 15)
32 **S VIDEO (ID-2) jack** (p. 35, 63, 85, 96, 138)
33 **VIDEO (ID-2) IN/OUT jack** (p. 35, 63, 85, 96, 138)
34 **AUDIO IN/OUT CH-1 jack** (p. 35, 85, 96, 102)
35 **AUDIO IN/OUT CH-2 jack** (p. 35, 85, 96, 102)

Identifying the parts and controls

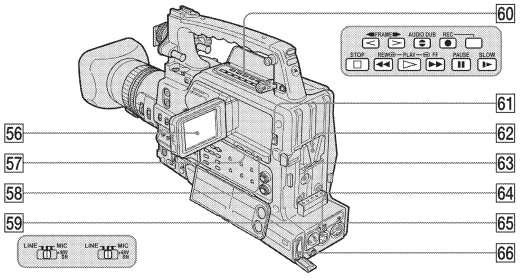


36 **MEMORY DELETE button** (p. 151)
37 **MEMORY MIX button** (p. 71)
38 **MEMORY INDEX button** (p. 144)
39 **MEMORY PLAY button** (p. 142)
40 **MEMORY +/– buttons** (p. 71, 142)
41 **DATA CODE button** (p. 31)
42 **TITLE button** (p. 110)
43 **END SEARCH button** (p. 29)
44 **DIGITAL EFFECT button** (p. 69)
45 **AUDIO MONITOR selector** (p. 31)
46 **DISPLAY SELECT switch** (p. 109)
47 **RESET button** (p. 167)

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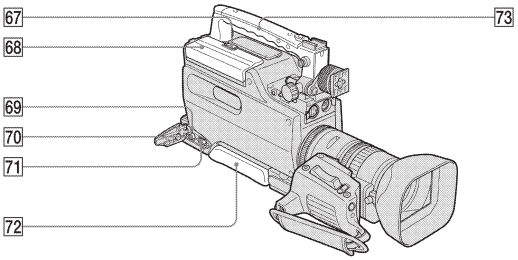


48 **Speaker**
49 **AUDIO LEVEL (CH-1) knob** (p. 54)
50 **AUDIO SELECT (CH-1) switch** (p. 7)
51 **AUDIO INPUT (CH-1) switch** (p. 7)
52 **AUDIO INPUT (CH-2) switch** (p. 7)
53 **AUDIO SELECT (CH-2) switch** (p. 7)
54 **PHONES jack** (p. 31)
55 **AUDIO LEVEL (CH-2) knob** (p. 54)



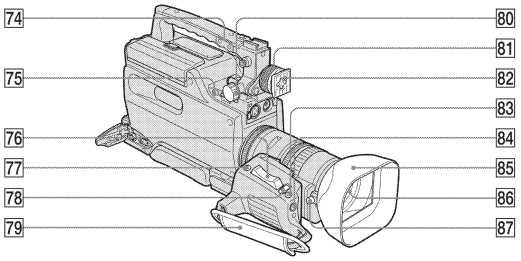
56 **LCD screen** (p. 22)
57 **LCD BRIGHT +/– buttons** (p. 23)
58 **LCD switch** (p. 22)
59 **LINE/MIC (CH1/CH2) selectors** (p. 58)
60 **Video control buttons** (p. 30, 33, 96)
61 **OPEN button** (p. 22)
62 **Battery attachment interface**
63 **BREAKER button**
64 **AUDIO IN CH1 connector** (p. 58, 102)
65 **AUDIO IN CH2 connector** (p. 58, 102)
66 **"Memory Stick" slot** (p. 131)

On BREAKER (breaker reset) button
If an excessive current flows in the internal circuits, the internal circuit breaker shuts off the power supply. Push this button after eliminating the cause of the excessive current.



67 **OPEN button** (p. 13)
68 **Cassette lid** (p. 13)
69 **LANC jack**
LANC stands for Local Application Control Bus System. The LANC control jack is used for controlling the tape transport of video equipment and peripherals connected to it. This jack has the same function as the jack indicated as CONTROL L or REMOTE.
70 **VIDEO OUT connector** (p. 35)
71 **DV IN/OUT connector** (p. 86, 98, 139)
This "i.LINK" mark is a trademark of Sony Corporation and indicates that this product is in agreement with IEEE 1394-1995 specifications and their revisions.

The DV IN/OUT connector is i.LINK compatible.
72 **Shoulder pad**
73 **Carrying handle**

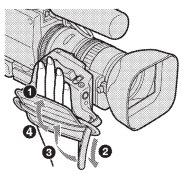


74 **Fixing screws for optional microphone holder** (p. 56)
75 **MIC LOW CUT switch** (p. 7)
76 **Power zoom lever** (p. 24)
77 **PHOTO button** (p. 62, 134)
78 **IRIS switch** (p. 37)
79 **Grip strap**
80 **Viewfinder front-to-back position locking knob** (p. 19)
81 **Viewfinder left-to-right positioning ring** (p. 19)
82 **Viewfinder fitting shoe** (p. 187)
83 **IRIS PUSH AUTO button** (p. 38)
84 **Remote sensor**
85 **Lens hood**
You can attach a wide teleconversion lens (not supplied) by removing the lens hood.
86 **Lens**
87 **Lens hood fixing screw**

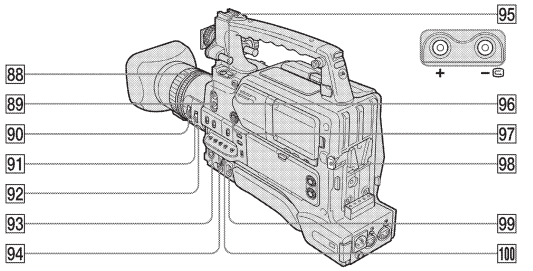
Removing the lens hood
To remove the lens hood for attachment of the wide teleconversion lens, etc., loosen the lens hood fixing screw, and unscrew the lens hood counterclockwise.

When using additional filters
We recommend that you use the Sony made filters having the genuine accessory mark.

Fastening the grip strap
Fasten the grip strap firmly.

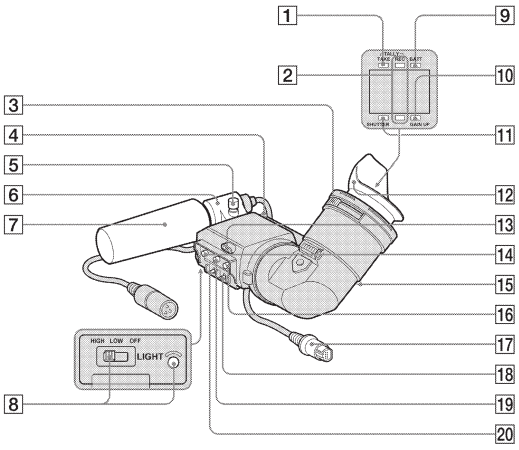


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88 **SPOT LIGHT button** (p. 28)
89 **BACK LIGHT button** (p. 27)
90 **ND FILTER selector** (p. 17)
91 **FOCUS selector** (p. 45)
92 **FOCUS PUSH AUTO button** (p. 45)
93 **FADER button** (p. 67)
94 **POWER switch** (p. 15)
95 **EDITSEARCH buttons** (p. 29)
96 **LIGHT switch** (p. 60)
97 **MONITOR knob** (p. 30)
98 **Battery release button** (p. 9)
99 **MEMORY/CAMERA/VTR selector** (p. 15)
100 **SEL/PUSH EXEC dial** (p. 120)

Viewfinder

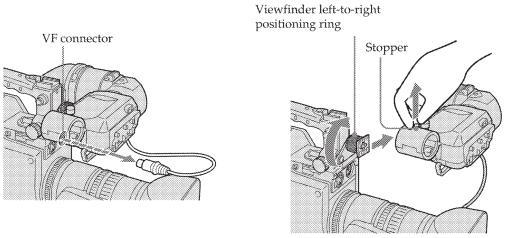


1 **TAKE/TALLY lamp**
This lamp is not used with the camcorder.
2 **REC/TALLY lamps** (p. 15)
The below REC lamp is not used with the camcorder.
3 **Eyepiece focusing knob** (p. 20)
4 **Stopper** (p. 187)
5 **Microphone holding screw**
6 **Microphone holder**
7 **Microphone**
8 **LIGHT switch and light**
9 **BATT lamp** (p. 10)
10 **GAIN UP lamp** (p. 39)
11 **SHUTTER lamp** (p. 40)
12 **Eye cup**
13 **Tally lamp**
14 **PEAKING control** (p. 19)
15 **Eyepiece release catch** (p. 173)
16 **BRIGHT control** (p. 19)
17 **Viewfinder connector**
18 **TALLY switch** (p. 16)
19 **CONTRAST control** (p. 19)
20 **DISPLAY switch** (p. 31)

Removing the viewfinder

Remove any microphone from the viewfinder before beginning.

(1) Pull the viewfinder connector out of the VF connector on the front.
(2) Loosen the viewfinder left-to-right positioning ring, then pulling up the stopper, slide the viewfinder out.

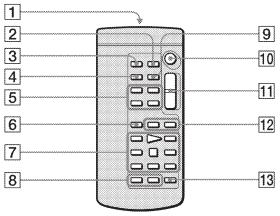


To fit the viewfinder

Reverse the removal procedure. (You need not hold the viewfinder stopper up.)

Remote Commander

The buttons that have the same name on the Remote Commander as on your camcorder function identically to the buttons on your camcorder.

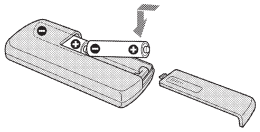


1 **Transmitter**
Point toward the remote sensor to control your camcorder after turning on your camcorder.
2 **ZERO SET MEMORY button**
This button does not function.
3 **PHOTO button** (p. 62, 134)
4 **DISPLAY button** (p. 31)
5 **Memory control buttons** (p. 71, 142)
6 **SEARCH MODE button** (p. 77, 79, 80, 82)
7 **Video control buttons** (p. 33)
8 **REC button** (p. 96)/**MARK button** (p. 91)
9 **DATA CODE button** (p. 32)
10 **START/STOP button** (p. 15)
11 **Power zoom button** (p. 24)
12 **I◄◄ /►►I buttons** (p. 77, 79, 80, 82)
13 **AUDIO DUB button** (p. 103)

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To prepare the Remote Commander

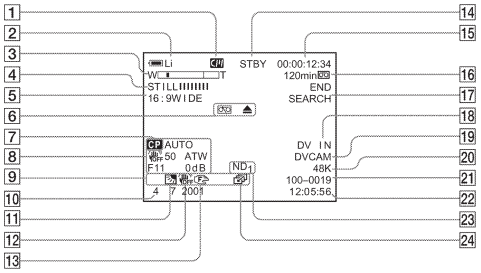
Insert two R6 (size AA) batteries by matching the + and – polarities on the batteries to the + – marks inside the battery compartment.



Notes on the Remote Commander

- Point the remote sensor away from strong light sources such as direct sunlight or overhead lighting. Otherwise, the Remote Commander may not function properly.
- Your camcorder works in the commander mode VTR 2. Commander modes 1, 2 and 3 are used to distinguish your camcorder from other Sony VCRs to avoid remote control misoperation. If you use another Sony VCR in the commander mode VTR 2, we recommend changing the commander mode or covering the sensor of the VCR with black paper.

Operation indicators



1 **Cassette memory indicator** (p. 26)

2 **Remaining battery capacity indicator** (p. 26)

3 **Zoom indicator** (p. 24)/**Data file name indicator** (p. 129)

4 **Digital effect indicator** (p. 69)/**FADER indicator** (p. 67)/**MEMORY MIX indicator** (p. 71)

5 **16:9WIDE indicator** (p. 66)/**PROG. SCAN indicator** (p. 64)

6 **Warning indicators** (p. 169)

7 **Custom preset indicator** (p. 50)

8 **Data code indicator** (p. 32)/**AE SHIFT indicator** (p. 44)/**GAIN indicator** (p. 38)/**IRIS indicator** (p. 37)/**SteadyShot OFF indicator** (p. 32)/**White balance mode indicator** (p. 47)/**Shutter speed indicator** (p. 40)

9 **LCD bright indicator** (p. 23)/**Volume indicator** (p. 30)

10 **Date indicator** (p. 32)

11 **Backlight indicator** (p. 27)/**Spot light indicator** (p. 28)

12 **SteadyShot OFF indicator** (p. 43)

13 **Manual focus/Infinity indicator** (p. 45)

14 **Standby/Recording indicator** (p. 26)/**Video control mode indicator** (p. 33)/**Image quality mode indicator** (p. 132)

15 **Time code indicator** (p. 26)/**Self-diagnosis indicator** (p. 168)/**Photo mode indicator** (p. 62)/**Image number indicator** (p. 143)/**User bits** (p. 108)

16 **Remaining tape indicator** (p. 26)/**Memory playback indicator** (p. 143)

17 **END SEARCH indicator** (p. 29)/**FRAME REC indicator** (p. 76)/**Interval recording indicator** (p. 74)

18 **DV IN indicator** (p. 99)/**AV→DV OUT indicator**

19 **DVCAM format indicator**/**DV format SP mode indicator** (p. 26)

20 **Audio mode indicator** (p. 125)

21 **Data file name indicator**
This indicator appears when the MEMORY MIX functions work.

22 **Audio input level**/**Time indicator** (p. 26)

23 **ND filter indicator** (p. 17)

24 **Continuous mode indicator** (p. 135)

Quick Function Guide

Functions to adjust exposure (in the recording mode)

• Adjusting lights amount for shooting	ND filter (p. 17)
• Shooting backlit subjects	BACK LIGHT (p. 27)
• In spotlight, such as at the theater or a formal event	Spotlight mode (p. 28)

Functions to give images more impact (in the recording mode)

• Smooth transition between scenes	FADER (p. 67)
• Taking a still picture	PHOTO (p. 62, 134)
• Digital processing of images	DIGITAL EFFECT (p. 69)
• Superimposing a title	TITLE (p. 110)

Functions to give a natural appearance to your recordings (in the recording mode)

• Preventing deterioration of picture quality in digital zoom	D ZOOM [MENU] (p. 120)
• Focusing manually	Manual focus (p. 45)

Functions to be used in editing (in the recording mode)

• Adding new sounds on the recorded tape.	Audio dubbing (p. 100)
• Watching the picture on a wide-screen TV	Wide mode (p. 66)
• Viewing images using a personal computer	"Memory Stick" (p. 129)
	Progressive mode (p. 64)

Functions to be used after recording (in the playback mode)

• Digital processing of recorded images	DIGITAL EFFECT (p. 84)
• Displaying the date/time or various settings when you recorded	Data code (p. 32)
• Searching for scenes having a title	Title search (p. 79)
• Searching for scenes recorded in the photo mode	Photo search (p. 82)
• Scanning scenes recorded in the photo mode	Photo scan (p. 83)

You can insert the selected logo or mark on the moving picture being shot. For details, refer to the operating instructions ("Auto Logo Insert for Copyright Protection") supplied with this camcorder.

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This section is extracted from instruction manual.
(Auto Logo Insert for Copyright Protection)

SONY

3-062-061-**12** (1)

DSR-PD150/PD150P/250/250P

Auto Logo Insert

for Copyright Protection

Operating Instructions ..... GB
Mode d'emploi ..... FR
Bedienungsanleitung ..... DE
Istruzioni per l'uso ..... IT

DSR-PD150/PD150P
DSR-250/250P

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Introduction - Auto Logo Insert

The auto logo insert function is designed for copyright protection. Using this function, a registered still image is always inserted on a moving picture to assure copyright protection.

Once you set the auto logo insert function to active:
- You can insert a still image recorded in a "Memory Stick" onto a moving picture.
- You cannot shoot if you remove the "Memory Stick" that the registered logo file is stored in.
- You need your password to deactivate this function.

You can secure a copyright of a picture shot by your camcorder on the functions above.

Before using this function

Do not forget your password!
If you forget your password, the memory of the camcorder must be formatted. There is a charge for it even if your camcorder is still under guarantee.

Do not remove the battery pack, the AC power adaptor, or the "Memory Stick" while registering the logo!
Otherwise, the "Memory Stick," image data, or setting information on the LOGO INS item may be damaged, and moreover, this will cause serious damage of the camcorder.

The following functions do not work when the auto logo insert function is active:
– Progressive mode
– Memory mix
– All the functions in memory mode
– Even though you set the POWER switch to MEMORY, the camcorder works in CAMERA mode (DSR-PD150/PD150P)
– Even though you set the MEMORY/CAMERA/VTR selector to MEMORY, the camcorder works in CAMERA mode (DSR-250/250P)
– All the functions that are used with the "Memory Stick" in VCR mode (DSR-PD150/PD150P) or in VTR mode (DSR-250/250P)

The DSR-PD150/PD150P is the model used for illustration purposes. Any differences in operation are clearly indicated in the text, for example, "DSR-PD150/PD150P only."

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Introduction – Auto Logo Insert 2
Preparing a logo file 3
Registering your password 4
Registering a still image to be used as a logo 6
Deactivating the auto logo insert function 10
Changing or resetting the setup 11
Precautions concerning the auto logo insert function 13

Preparing a logo file

To insert a logo file on a moving picture, there are two ways: one uses the luminancekey setting and the other uses the chroma setting.

Preparation 1 Creating a logo file

Create a logo file at 640 × 480 dots (VGA size).

Luminancekey (LUMINANCE)
Makes a brighter portion of a still image transparent, then records a moving picture on that portion. When you use luminancekey to insert a logo file, the background (transparent portion) of the logo file must be created in white, and the ratio setting of the RGB signal must be as follows: R=255, G=255, and B=255. If an image has a brighter portion other than the background, that portion may be transparent.

Chroma (CHROMA)
Makes a blue portion of a still image transparent, then records a moving picture on that portion. When you use chroma to insert a logo file, the background (transparent portion) of the logo file must be created in blue, and the ratio setting of an RGB signal must be as follows: R=0, G=0, and B=255. If an image has a blue portion other than the background, that portion may be made transparent.

Preparation 2 Saving a logo file in the "Memory Stick" format

Convert a logo file format to the "Memory Stick" format, and save it in the 100msdcf folder, using the supplied application, PictureGear.



Notes
- The portion of a still image that is displayed on the LCD screen or in the viewfinder is 90 % of the original image. So, the portion near the edges may not be displayed.
- The resolution of a still image that is created using the chromakey setting is about 360 × 480 dots.

Usable file formats for a logo file
You can only use JPEG format files of 640 × 480 dots (VGA size) that correspond to the "Memory Stick" format. However, you can use the following file format images by converting them to "Memory Stick" format files using the supplied application, PictureGear: TIFF, BITMAP, GIF, PNG, and DVF.

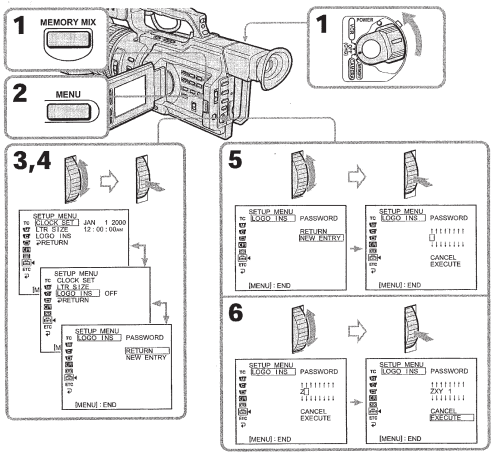
Registering your password

You have to register your password (maximum eight digits) before using the auto logo insert function. Once you set your password, you need to enter your password to access LOGO INS in the menu setting, and to set, change, or deactivate the setting.

(1) **DSR-PD150/PD150P:** While holding down MEMORY MIX, set the POWER switch from OFF (CHG) to CAMERA. Keep pressing MEMORY MIX for about five seconds.
DSR-250/250P: Set the MEMORY/CAMERA/VTR selector to MEMORY and while holding down MEMORY MIX, set the POWER switch to ON. Keep pressing MEMORY MIX for about five seconds.
(2) **DSR-PD150/PD150P:** Press MENU to display the menu.
DSR-250/250P: Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu.
(3) Turn the SEL/PUSH EXEC dial to select [camera], then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select LOGO INS, then press the dial.
(5) Turn the SEL/PUSH EXEC dial to select NEW ENTRY, then press the dial.
(6) Turn the SEL/PUSH EXEC dial to select the desired character, then press the dial. The character you select is entered, and the cursor moves to the next column.
(7) Repeat step 6 to enter characters into other columns.
(8) Turn the SEL/PUSH EXEC dial to select EXECUTE, then press the dial.

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Registering your password



To cancel the setting of the password

Select CANCEL in step 8, then press the SEL/PUSH EXEC dial.

Do not forget your password

If you forget your password, you cannot change the LOGO INS setting. In this case, the memory of the camcorder must be formatted. Formatting must be done by qualified personnel only and there is a charge for it even if your camcorder is still under guarantee. For details consult your Sony dealer or local authorized Sony service facility.

On password characters

Do not select an easy password. A password must be difficult to unscramble.

When accessing the LOGO INS item

You cannot do any recording.

On characters you can use as your password

- Each time you turn the SEL/PUSH EXEC dial, the character changes as follows: (blank) ↔ A ↔ B ↔ ... ↔ Z ↔ (blank) ↔ 0 ↔ 1 ↔ ... ↔ 9 ↔ (blank) ↔ ...
- You cannot set all eight columns to blank. If you do, "ALL BLANK" appears on the LCD screen or in the viewfinder.

5 6

Registering a still image to be used as a logo

Select a still image from a "Memory Stick."

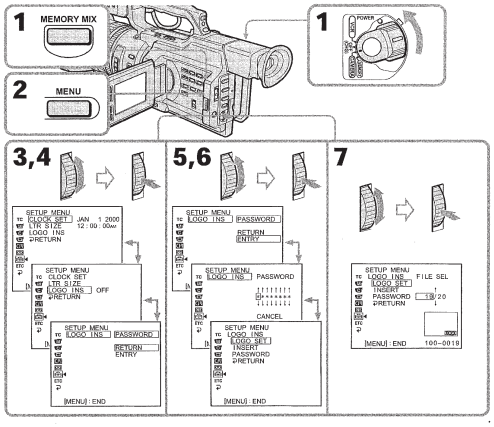
Selecting a still image

Before operating

Insert the "Memory Stick" on which the desired still image is recorded, into your camcorder.

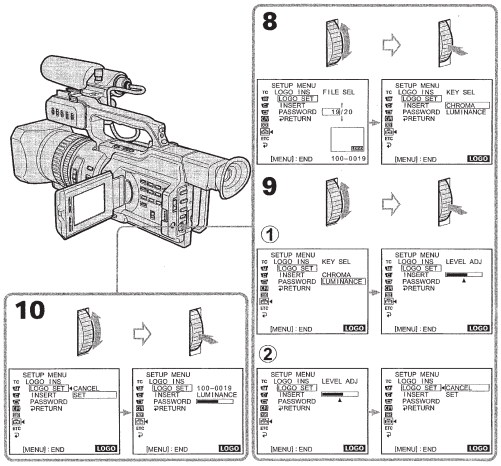
(1) **DSR-PD150/PD150P:** While holding down MEMORY MIX, set the POWER switch from OFF (CHG) to CAMERA. Keep pressing MEMORY MIX for about five seconds.
DSR-250/250P: Set the MEMORY/CAMERA/VTR selector to MEMORY and while holding down MEMORY MIX, set the POWER switch to ON. Keep pressing MEMORY MIX for about five seconds.
(2) **DSR-PD150/PD150P:** Press MENU to display the menu.
DSR-250/250P: Push the CUSTOM PRESET/MENU switch in the MENU direction and release it to display the menu.
(3) Turn the SEL/PUSH EXEC dial to select [camera], then press the dial.
(4) Turn the SEL/PUSH EXEC dial to select LOGO INS, then press the dial.
(5) Turn the SEL/PUSH EXEC dial to select ENTRY, then press the dial.
(6) Enter your password. Turn the SEL/PUSH EXEC dial to select EXECUTE, then press the dial.
(7) Turn the SEL/PUSH EXEC dial to select LOGO SET, then press the dial.

Registering a still image to be used as a logo



Registering a still image to be used as a logo

(8) Turn the SEL/PUSH EXEC dial to select the desired image, then press the dial.
The selected image is displayed on the LCD screen or in the viewfinder at full size.
(9) Set up CHROMA or LUMINANCE. Select CHROMA when the background of the image is blue, and select LUMINANCE when the background is white.
① Turn the SEL/PUSH EXEC dial to select CHROMA or LUMINANCE, then press the dial.
② Turn the SEL/PUSH EXEC dial to set up LEVEL ADJ, then press the dial.
(10) Turn the SEL/PUSH EXEC dial to select SET, then press the dial.
The data file name of the image, the level of CHROMA/LUMINANCE, and the indication of CHROMA or LUMINANCE are displayed on the LCD screen or in the viewfinder.



7 8

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Registering a still image to be used as a logo

To cancel registering the logo
Select CANCEL in step 10, then press the SEL/PUSH EXEC dial.

Once you register the logo
INSERT is automatically set to ON in the menu settings, and the logo will be inserted.

Notes
- Do not remove the battery pack, the AC power adaptor, or the "Memory Stick" while registering the logo data. Otherwise, the "Memory Stick" or image data in it may be damaged, and moreover, this will cause serious damage of the camcorder.
- The setting of the auto logo insert function will be kept until you set LOGO INS to OFF in the menu settings.
- When INSERT is set to ON, you cannot do any recording if the "Memory Stick" in which the registered logo is recorded is not inserted, and the following mode and functions will not be active:
  – Progressive mode
  – Memory mix
  – All the functions in memory mode
  – All the functions that are used with the "Memory Stick" in VCR mode (DSR-PD150/PD150P) or in VTR mode (DSR-250/250P).
- Even though you set the POWER switch to MEMORY, the camcorder works in CAMERA mode (DSR-PD150/PD150P).
- Even though you set the MEMORY/CAMERA/VTR selector to MEMORY, the camcorder works in CAMERA mode (DSR-250/250P).

If you enter an incorrect password
"INCORRECT PASSWORD" will be displayed.

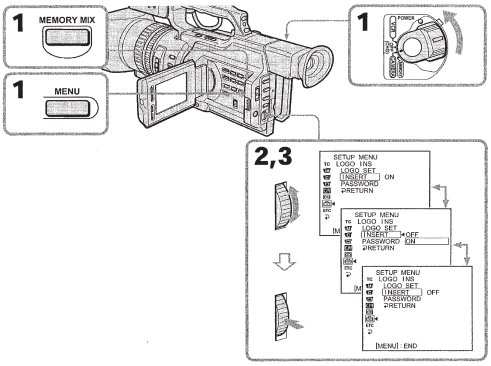
When the selected image cannot be displayed
"FILE OPEN ERROR" will be displayed.

Depending on the background color of the image
Choose "CHROMA" when the background color is blue, or "LUMINANCE" when the background color is white.

Deactivating the auto logo insert function

Once you set LOGO INS to ON in the menu settings, information on the LOGO INS setup will be retained until you set it to OFF.

(1) Follow steps 1 to 6 on page 6.
(2) Turn the SEL/PUSH EXEC dial to select INSERT, then press the dial.
(3) Turn the SEL/PUSH EXEC dial to select OFF, then press the dial.

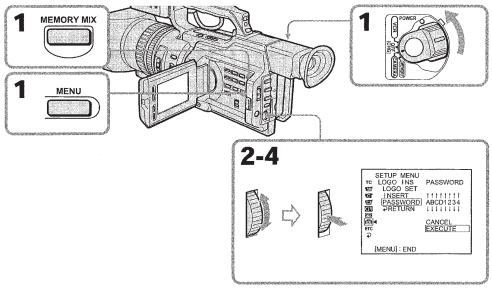


To insert the logo
Select ON in step 3, then press the SEL/PUSH EXEC dial.

Changing or resetting the setup

Changing your password

(1) Follow steps 1 to 6 on page 6.
(2) Turn the SEL/PUSH EXEC dial to select PASSWORD, then press the dial.
(3) Turn the SEL/PUSH EXEC dial to select CHANGE, then press the dial.
(4) Enter the new password, and turn the SEL/PUSH EXEC dial to select EXECUTE, then press the dial.



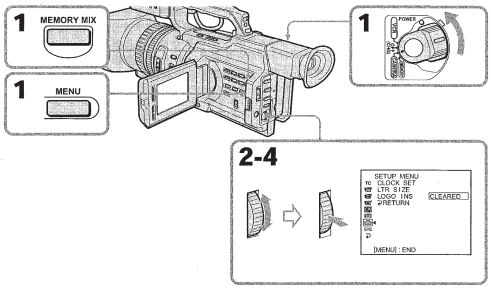
To cancel changing your password
Select CANCEL in step 4, then press the SEL/PUSH EXEC dial.

Note
If you enter "CLEARALL" in step 4, the entire setup will be cleared (p. 12).

Resetting the entire setup for the auto logo insert function

This procedure resets the entire setup for LOGO INS.

(1) Follow steps 1 to 6 on page 6.
(2) Turn the SEL/PUSH EXEC dial to select PASSWORD, then press the dial.
(3) Turn the SEL/PUSH EXEC dial to select CHANGE, then press the dial.
(4) Enter "CLEARALL," and turn the SEL/PUSH EXEC dial to select EXECUTE, then press the dial. "CLEARED" is indicated on the screen, and the entire setup will be reset.



To cancel resetting
Select CANCEL in step 3, then press the SEL/PUSH EXEC dial.

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Precautions concerning the auto logo insert function

Follow the precautions below.

- Do not forget your password. If you forget your password, the memory of the camcorder must be formatted. There is a charge for it even if your camcorder is still under guarantee.
- Do not remove the battery pack, the AC power adaptor, or the "Memory Stick" while registering the logo. Otherwise, the "Memory Stick," image data, or setting information on the LOGO INS item may be damaged, and moreover, this will causes serious damage of the camcorder.
- Do not break or lose the "Memory Stick" that the registered logo is recorded. We recommend that you make a backup copy and save it to another "Memory Stick" or to your PC.
- We recommend that you set the write-protect tab on the "Memory Stick" to LOCK.

On the warning messages

When the following messages appear on the LCD screen or in the viewfinder, their probable causes and remedies are as follows:

LOGO NOT INSERTED

The logo is not inserted properly, or the "Memory Stick" is not inserted that has the logo data.

→ Check if the "Memory Stick" is inserted properly, or insert the "Memory Stick" with logo data.

LOGO SYSTEM ERROR

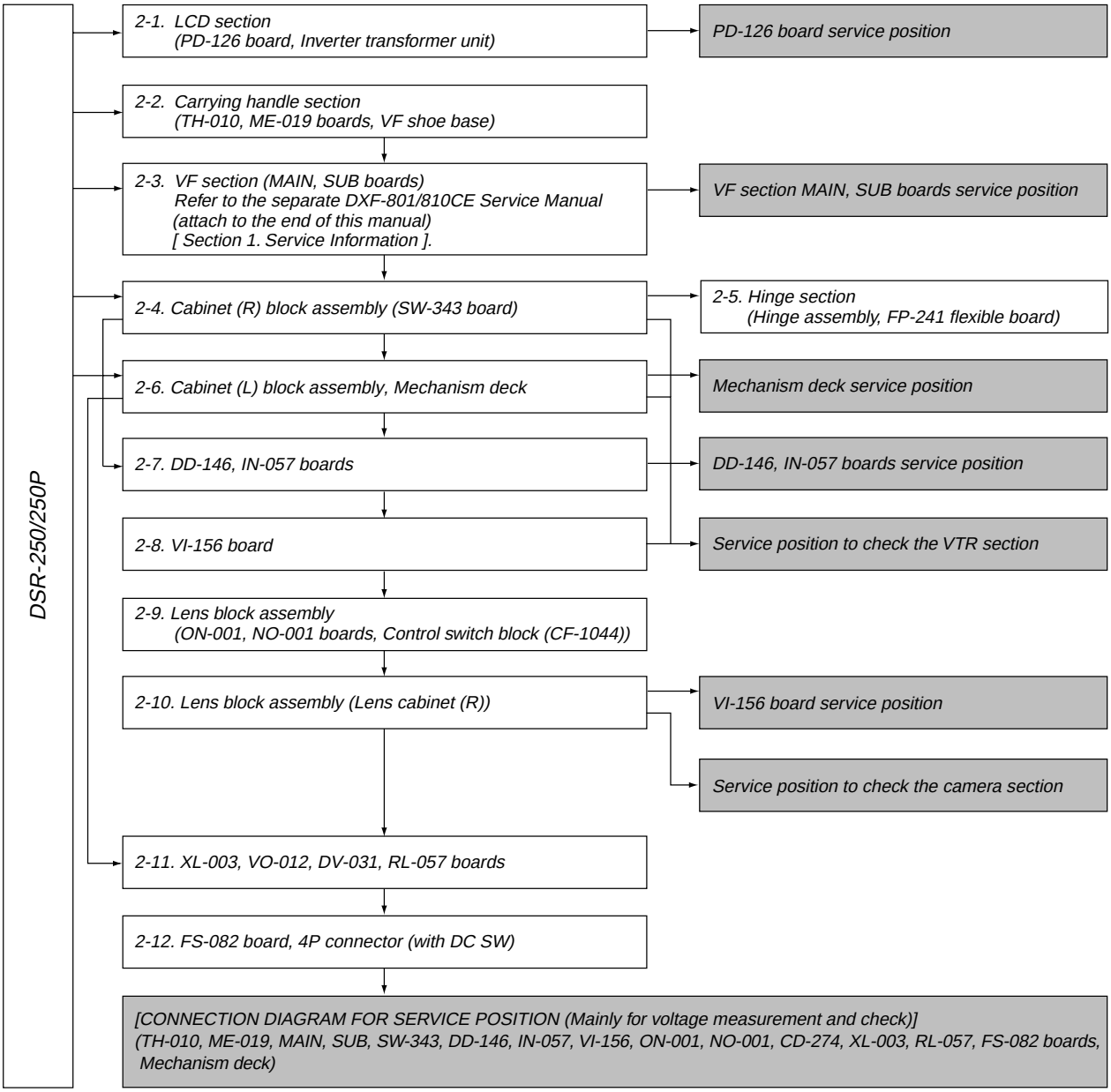
The data setting of the logo insert system is corrupted.

→ Consult your Sony dealer or local authorized Sony service facility.

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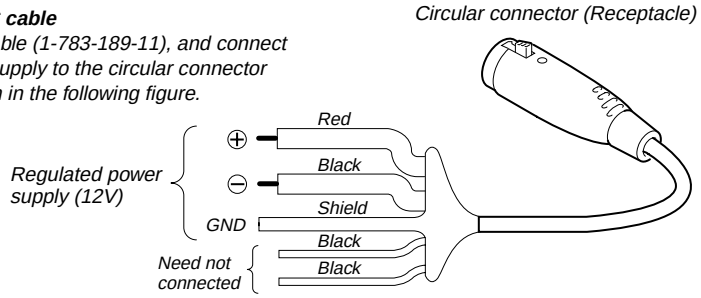
SECTION 2
DISASSEMBLY

The following flow chart shows the disassembly procedure.



How to make the DC cable

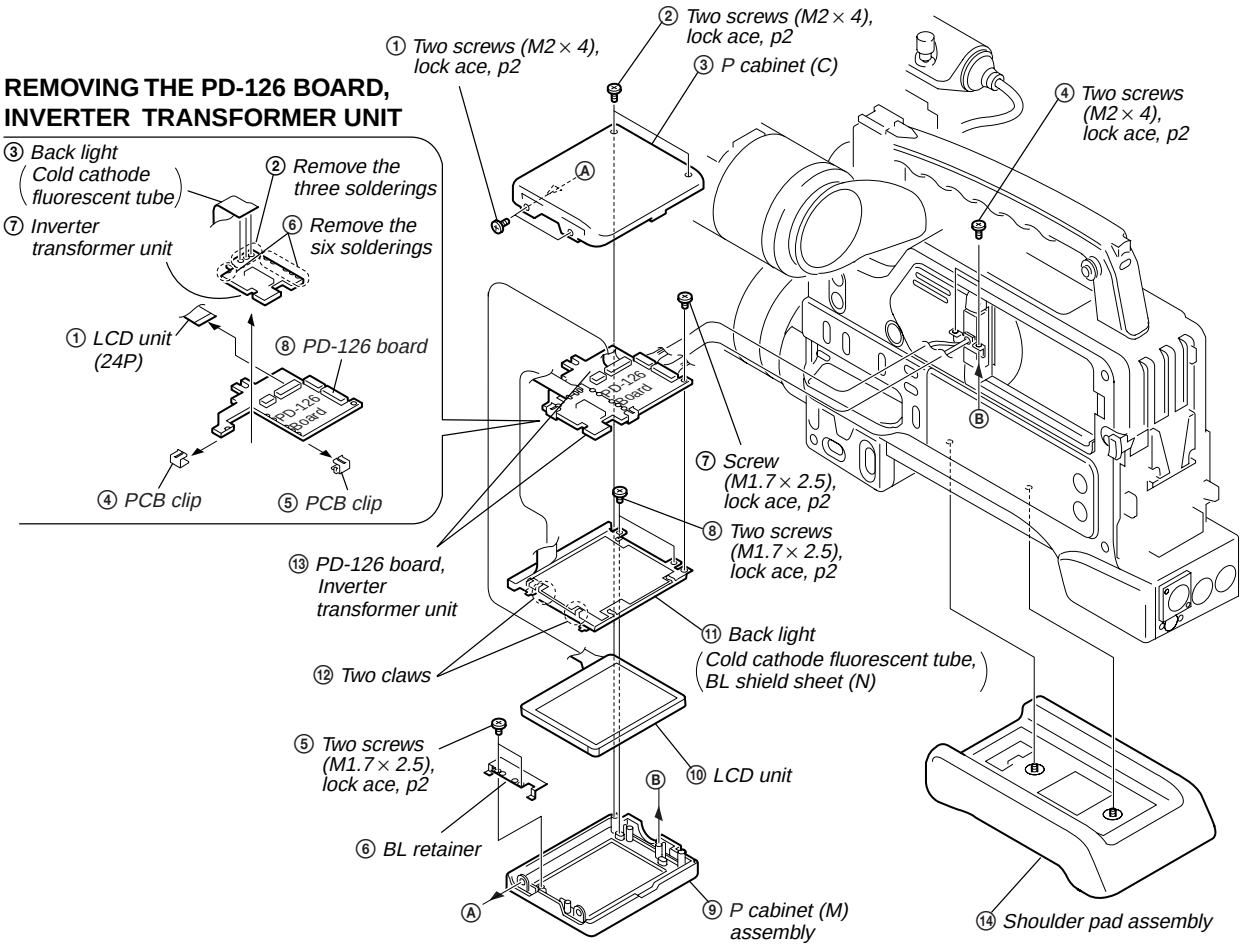
Cut the connecting cable (1-783-189-11), and connect the regulated power supply to the circular connector (receptacle) as shown in the following figure.



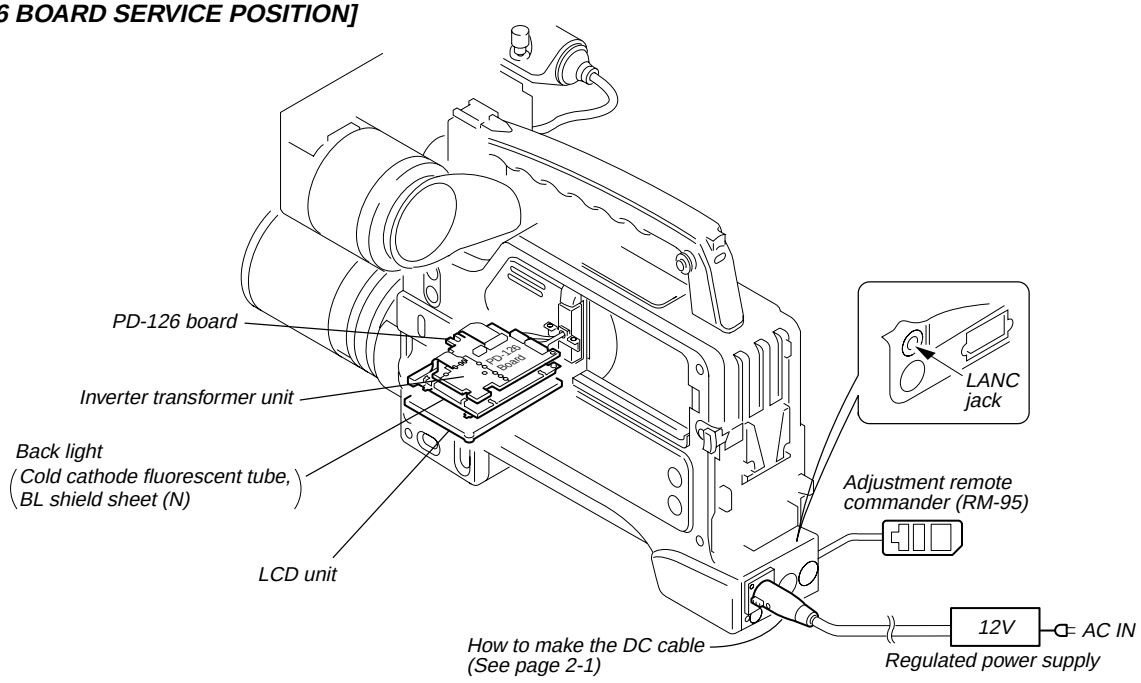
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NOTE: Follow the disassembly procedure in the numerical order given.

2-1. LCD SECTION (PD-126 BOARD, INVERTER TRANSFORMER UNIT)

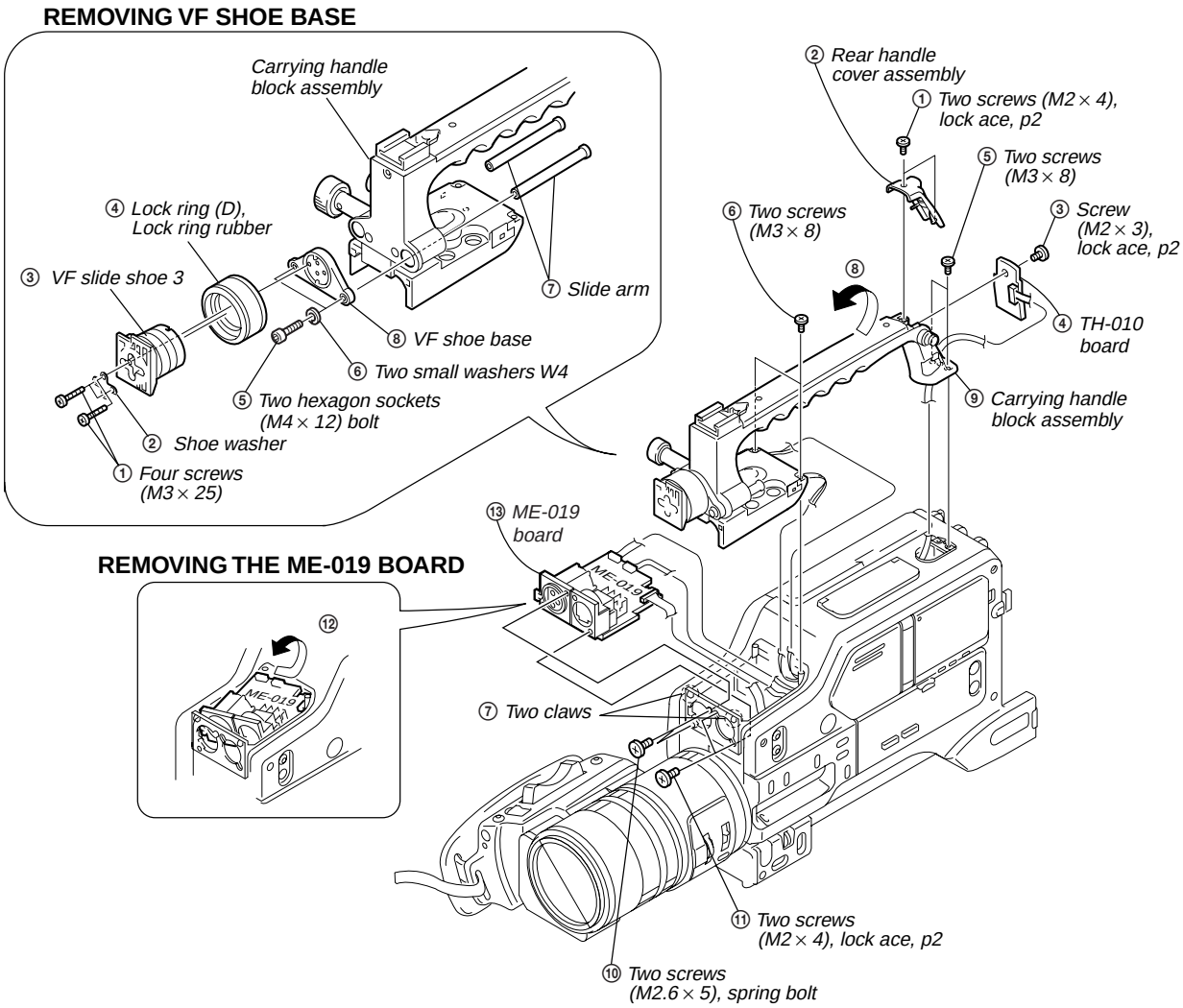


[PD-126 BOARD SERVICE POSITION]



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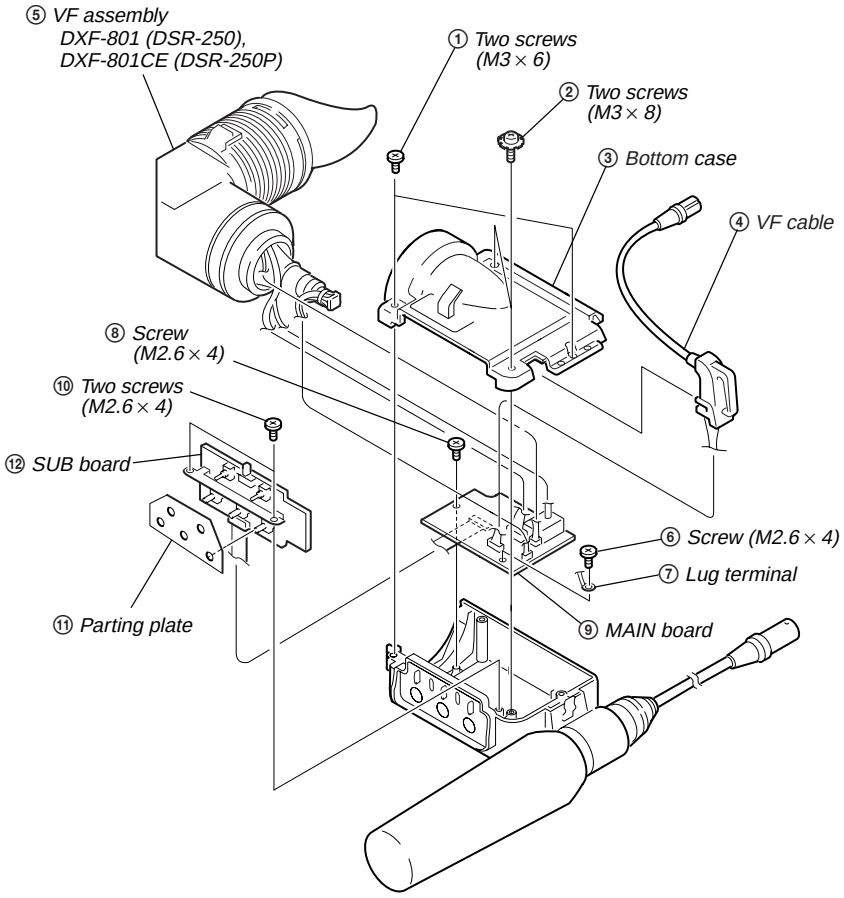
2-2. CARRYING HANDLE SECTION (TH-010, ME-019 BOARDS, VF SHOE BASE)



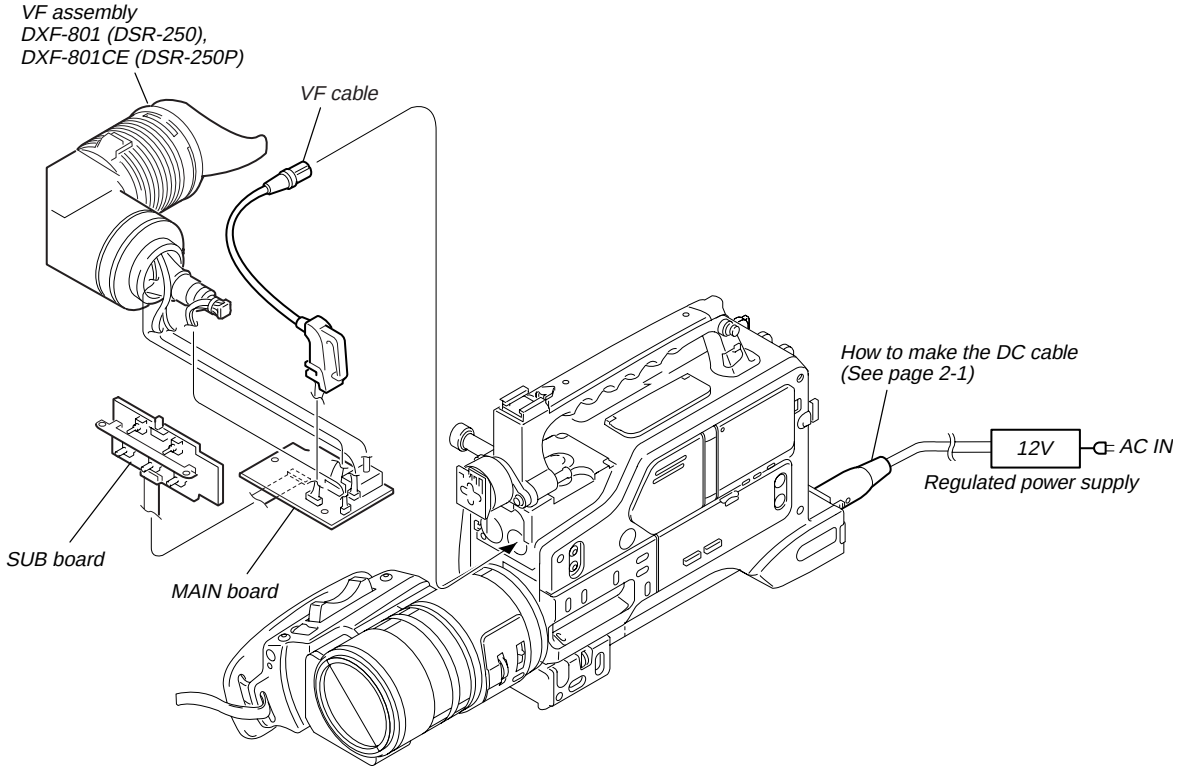
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2-3. VF SECTION (MAIN, SUB BOARDS)

Refer to the separate DXF-801/810CE Service Manual (attach to the end of this manual) [Section 1. Service Information].

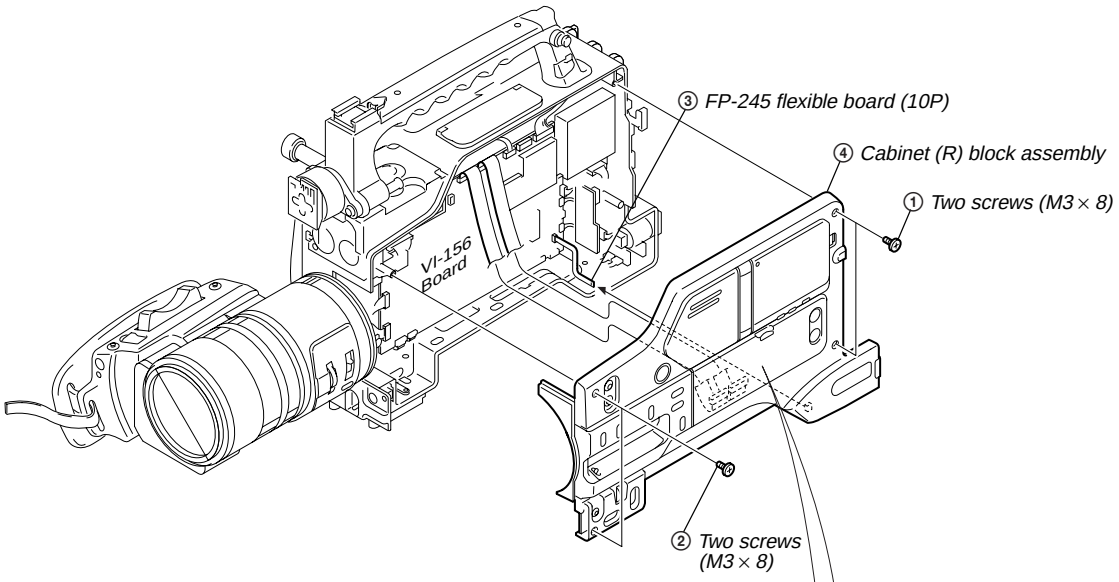


[VF SECTION MAIN, SUB BOARDS SERVICE POSITION]

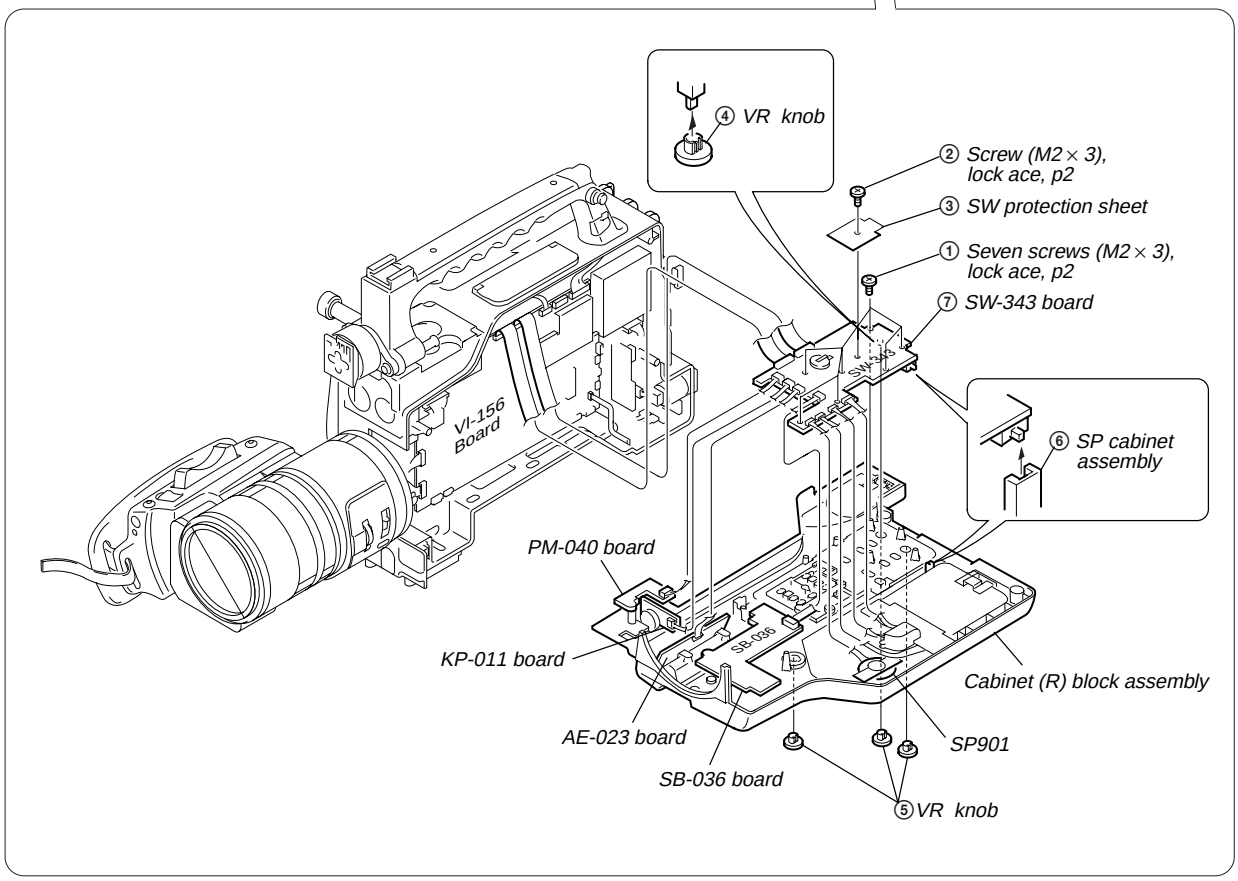


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2-4. CABINET (R) BLOCK ASSEMBLY (SW-343 BOARD)

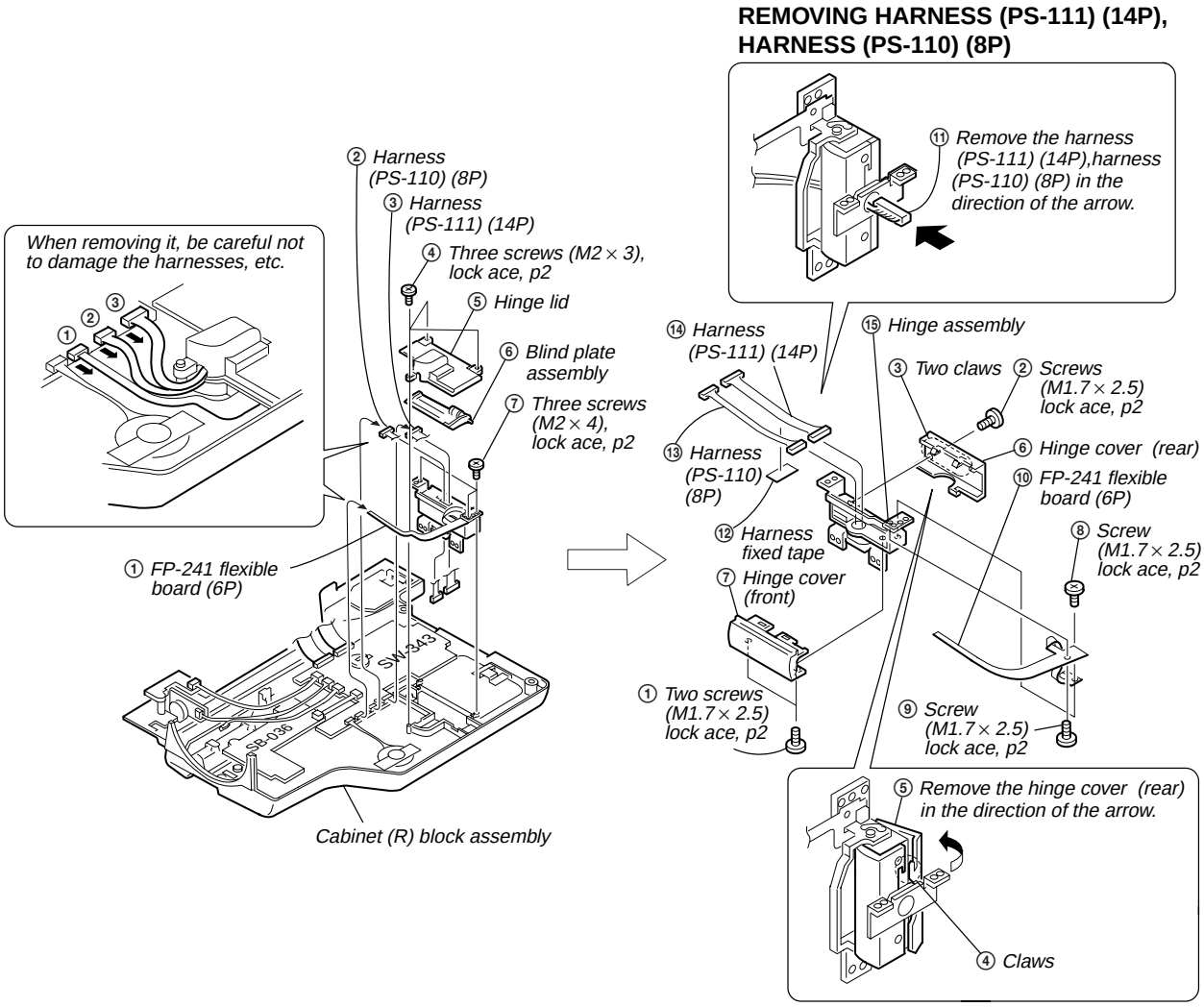


REMOVING THE SW-343 BOARD



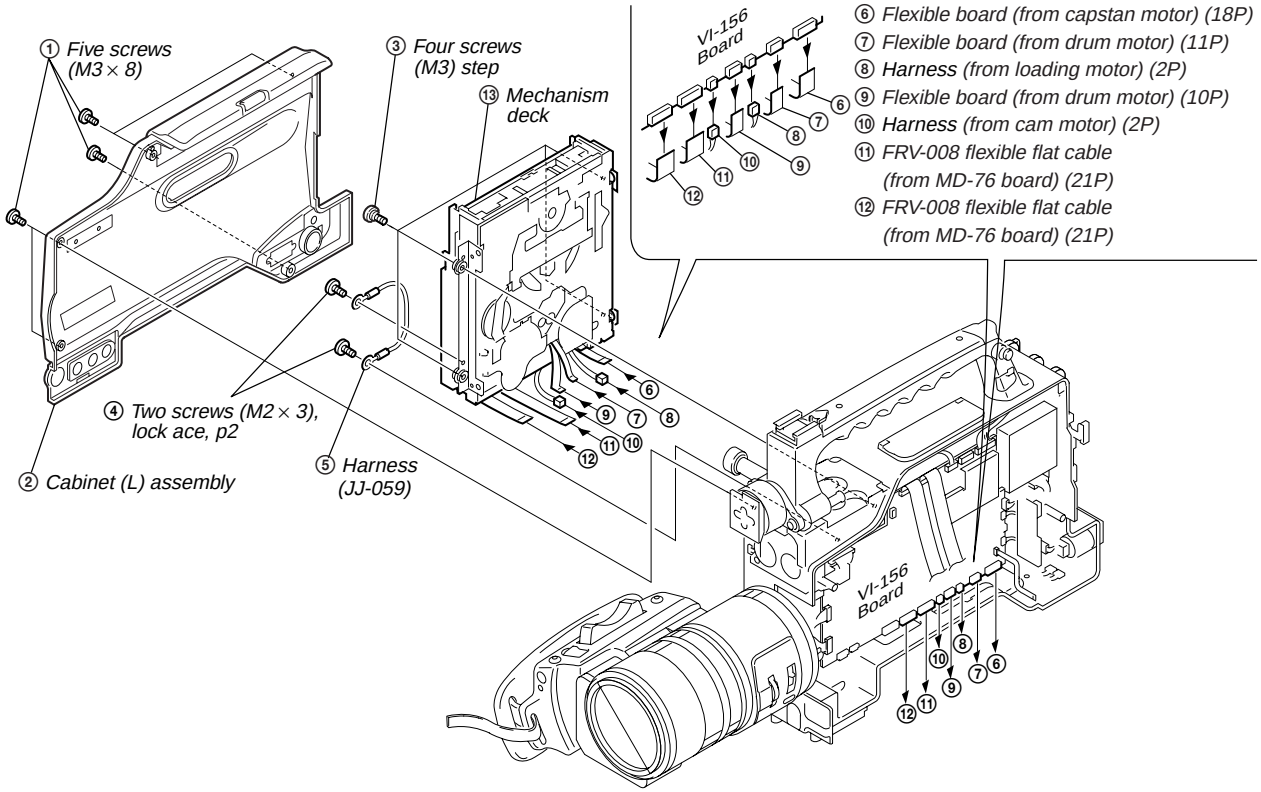
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2-5. HINGE SECTION (HINGE ASSEMBLY, FP-241 FLEXIBLE BOARD)

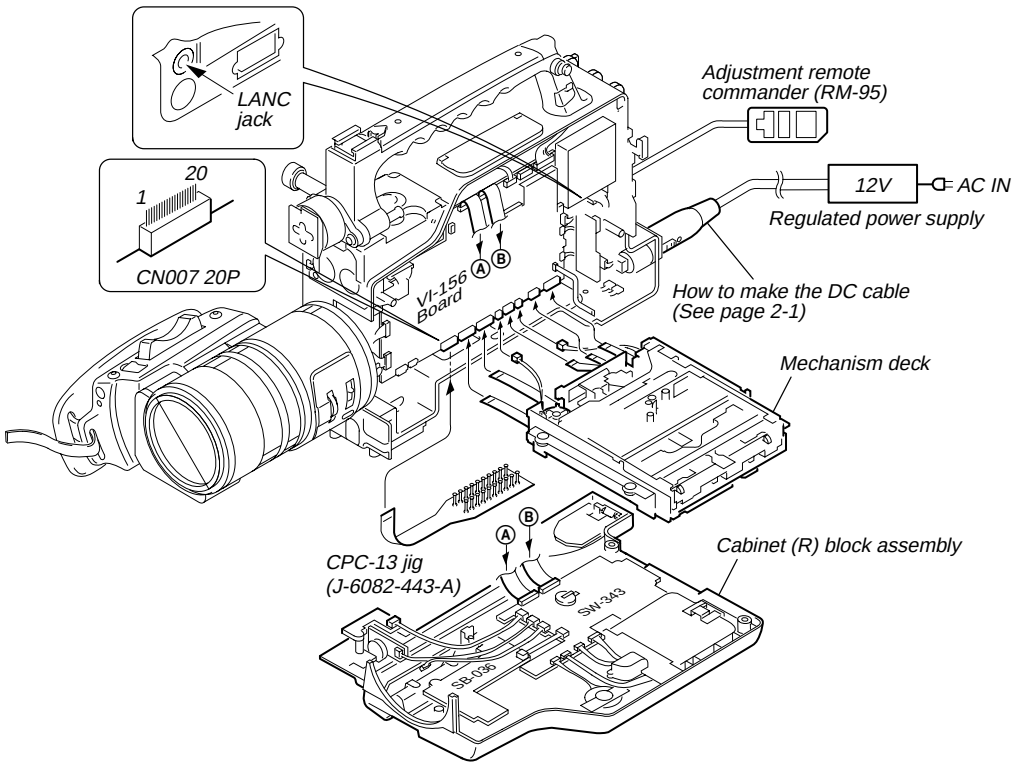


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2-6. CABINET (L) ASSEMBLY, MECHANISM DECK

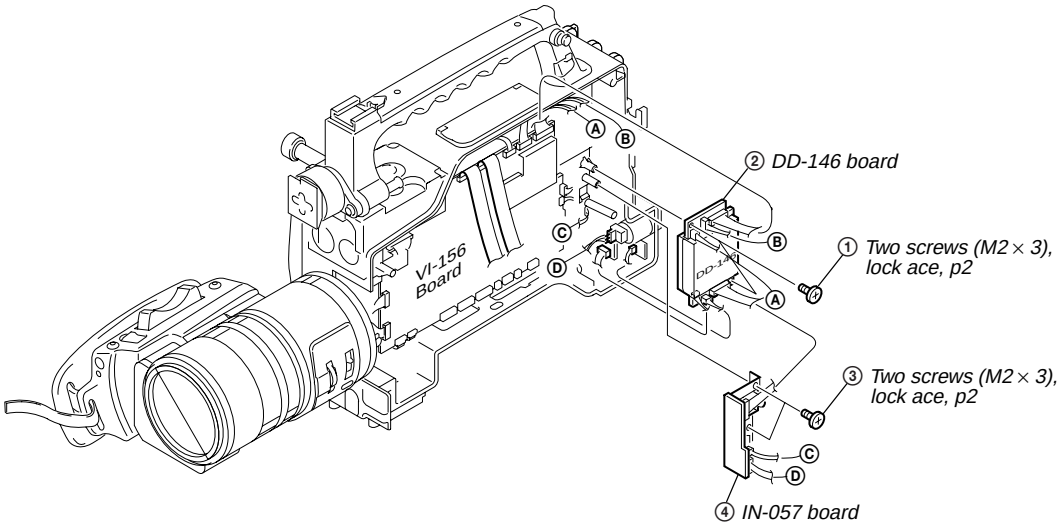


[MECHANISM DECK SERVICE POSITION]

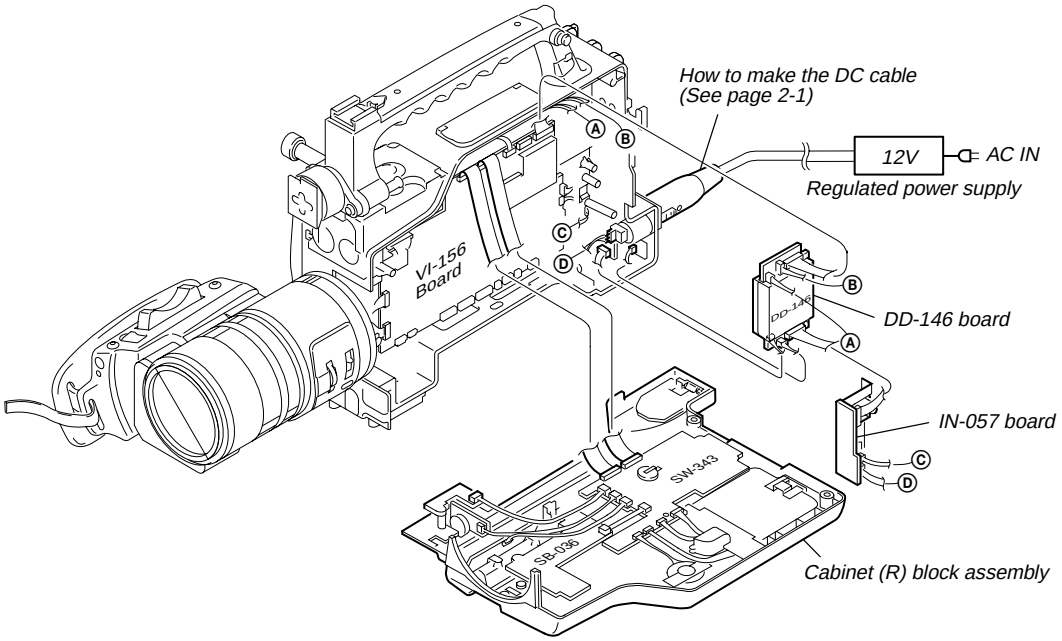


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2-7. DD-146, IN-057 BOARDS

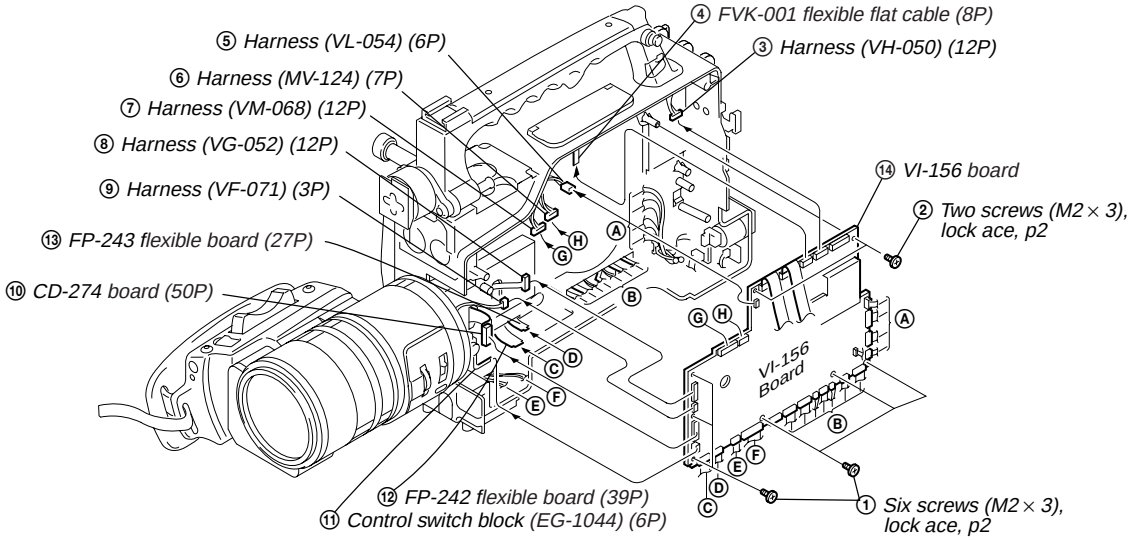


[DD-146, IN-057 BOARDS SERVICE POSITION]



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2-8. VI-156 BOARD



[SERVICE POSITION TO CHECK THE VTR SECTION]

Connection to Check the VTR Section

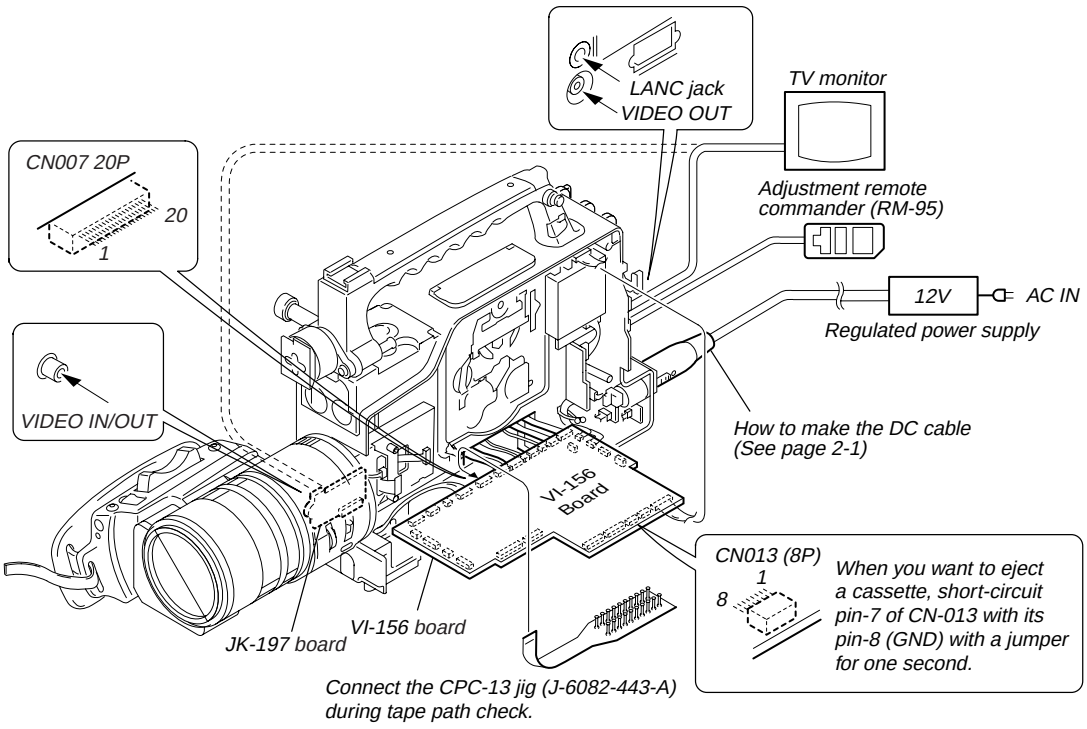
To check the VTR Section, set the VTR to the "forced VTR power ON" mode.
Operate the VTR functions using the adjustment remote commander (with the HOLD switch set in the OFF position)
(However, connect the cabinet (L) assembly when cassette is going to be ejected only.)

Setting the "Forced VTR Power ON" mode

1) Select page: 0, address: 01, and set data: 01.
2) Select page: D, address: 10, set data: 02, and press the PAUSE button of the adjustment remote commander.

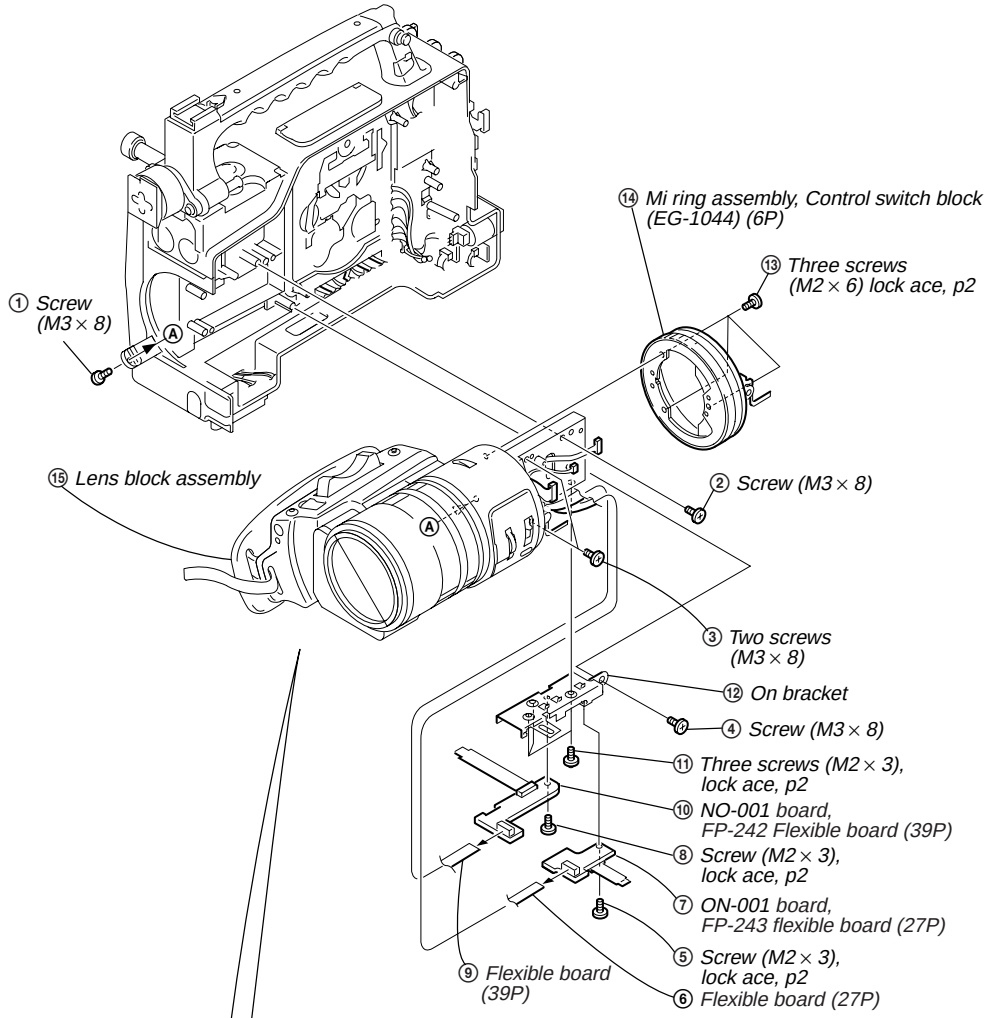
Exiting the "Forced VTR Power ON" mode

1) Select page: 0, address: 01, and set data: 01.
2) Select page: D, address: 10, set data: 00, and press the PAUSE button of the adjustment remote commander.
3) Select page: 0, address: 01, and set data: 00.

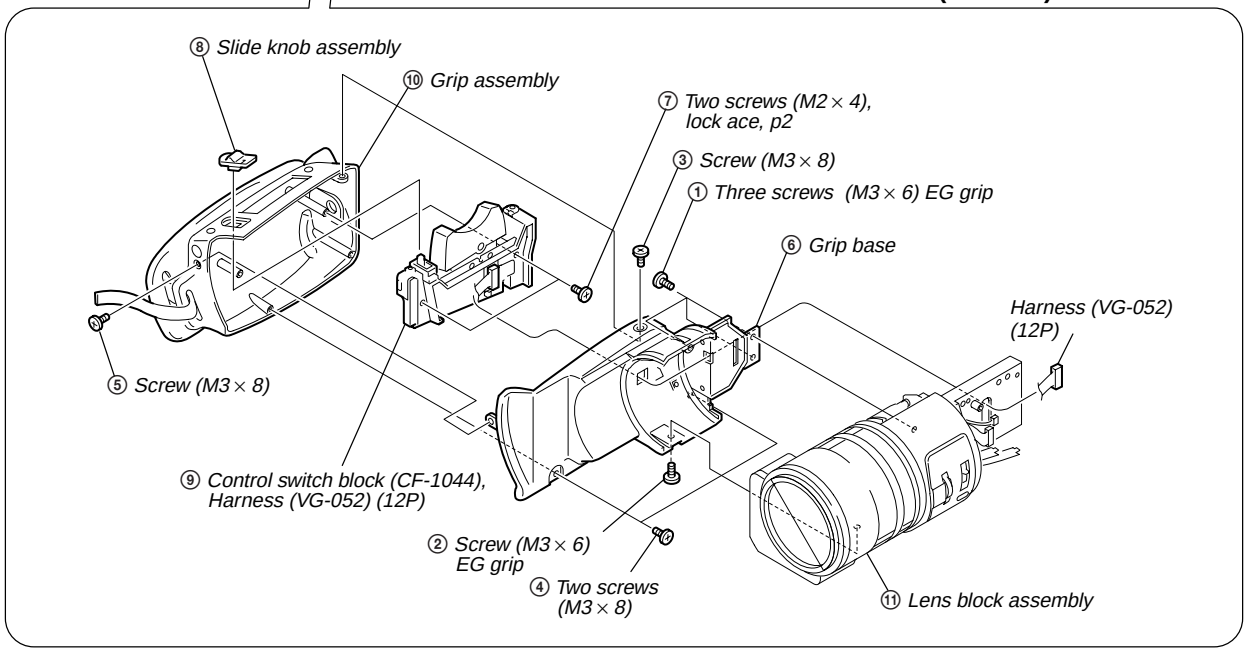


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2-9. LENS BLOCK ASSEMBLY
(ON-001, NO-001 BOARDS, CONTROL SWITCH BLOCK (CF-1044))

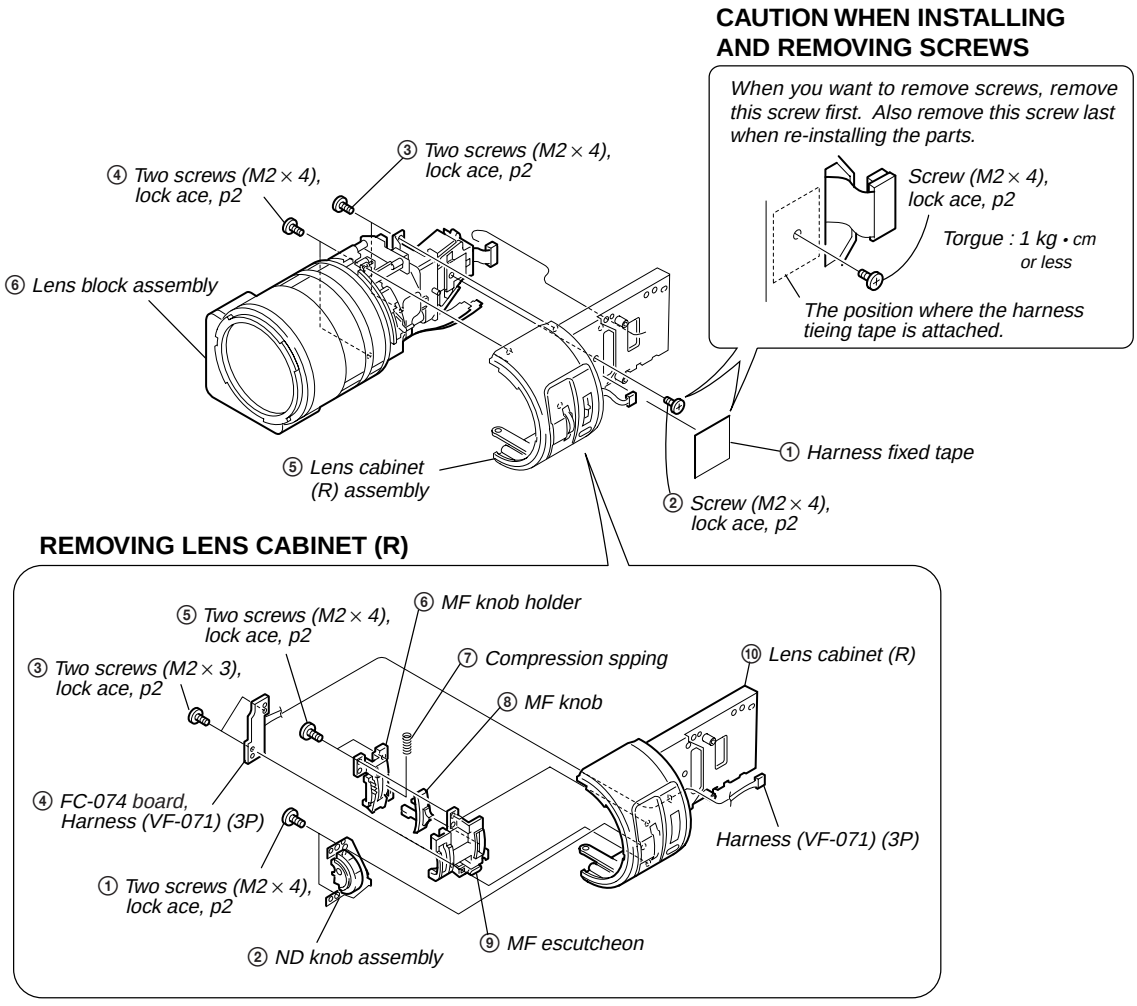


REMOVING CONTROL SWITCH BLOCK (CF-1044)

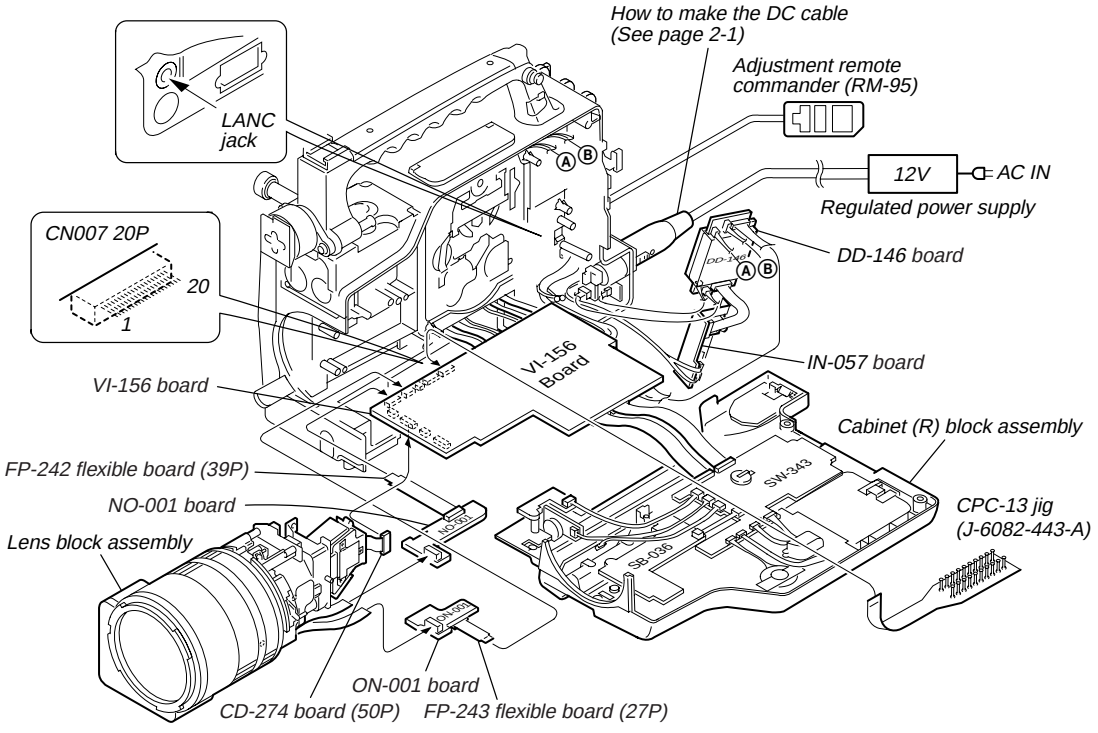


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2-10. LENS BLOCK ASSEMBLY (LENS CABINET (R))



[VI-156 BOARD SERVICE POSITION]



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[SERVICE POSITION TO CHECK THE CAMERA SECTION]

Connection to Check the CAMERA Section

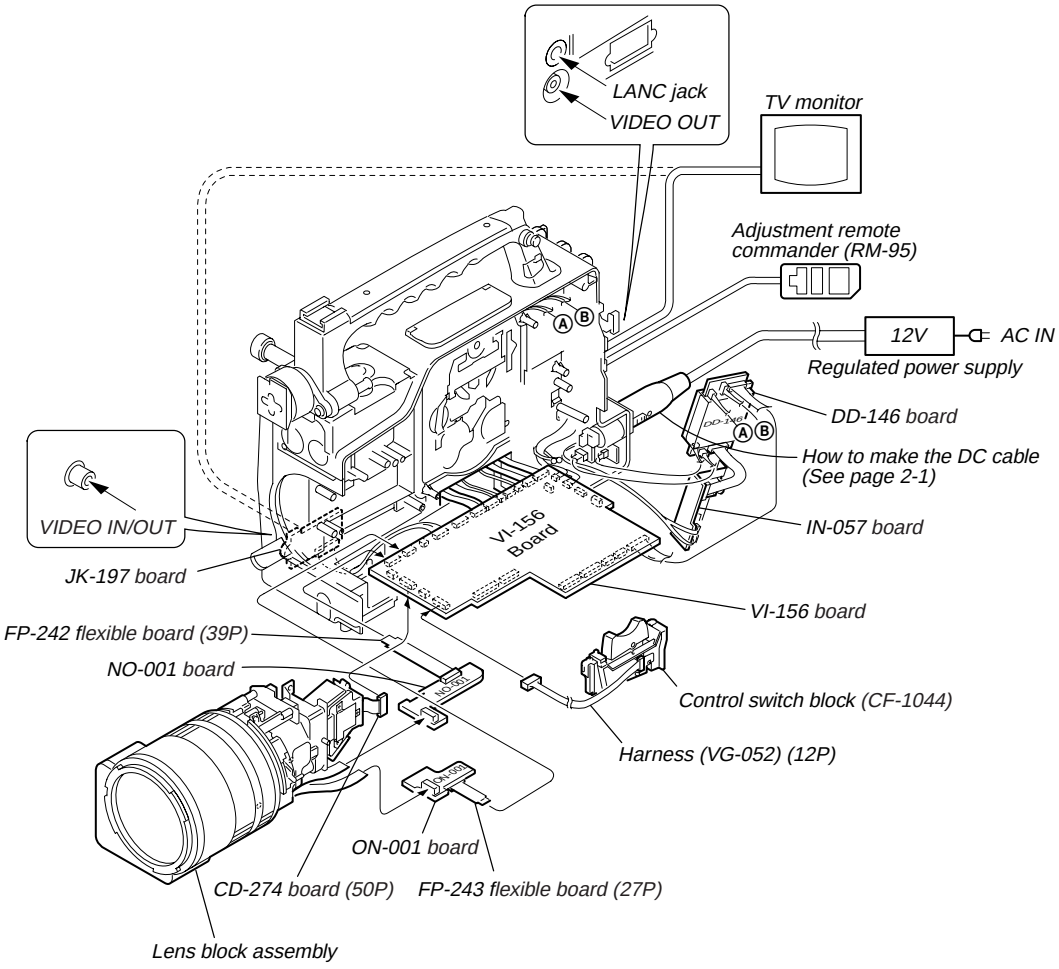
To check the CAMERA Section, set the CAMERA to the "forced CAMERA power ON" mode.

Setting the "Forced CAMERA Power ON" mode

1) Select page: 0, address: 01, and set data: 01.
2) Select page: D, address: 10, set data: 01, and press the PAUSE button of the adjustment remote commander.

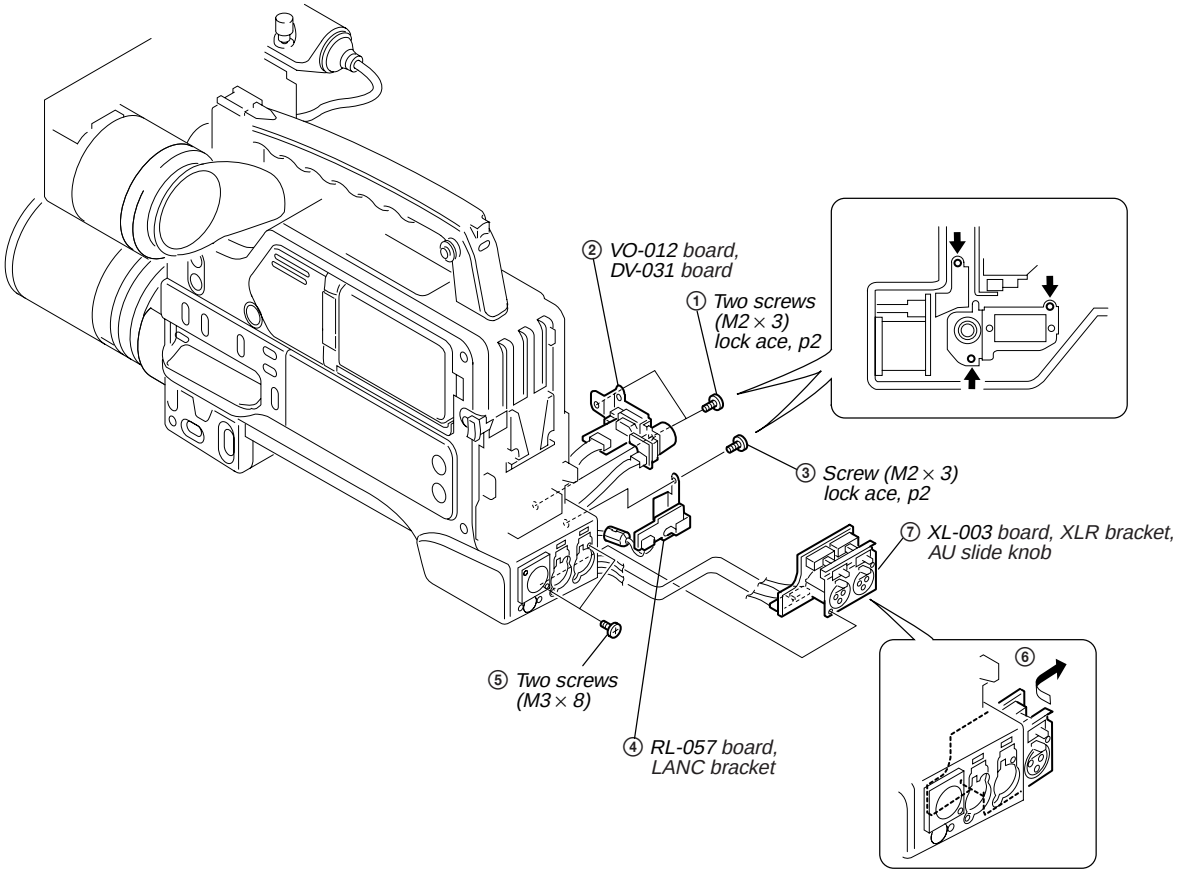
Exiting the "Forced CAMERA Power ON" mode

1) Select page: 0, address: 01, and set data: 01.
2) Select page: D, address: 10, set data: 00, and press the PAUSE button of the adjustment remote commander.
3) Select page: 0, address: 01, and set data: 00.



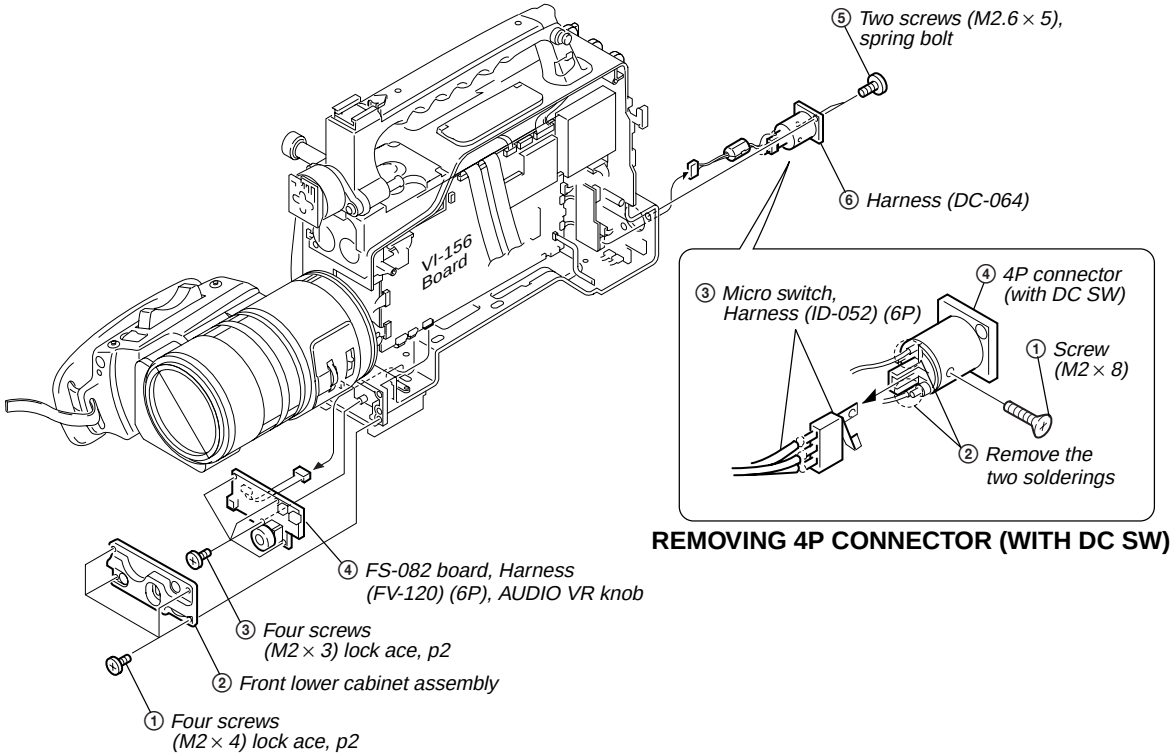
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2-11. XL-003, VO-012, DV-031, RL-057 BOARDS



REMOVING XL-003 BOARD

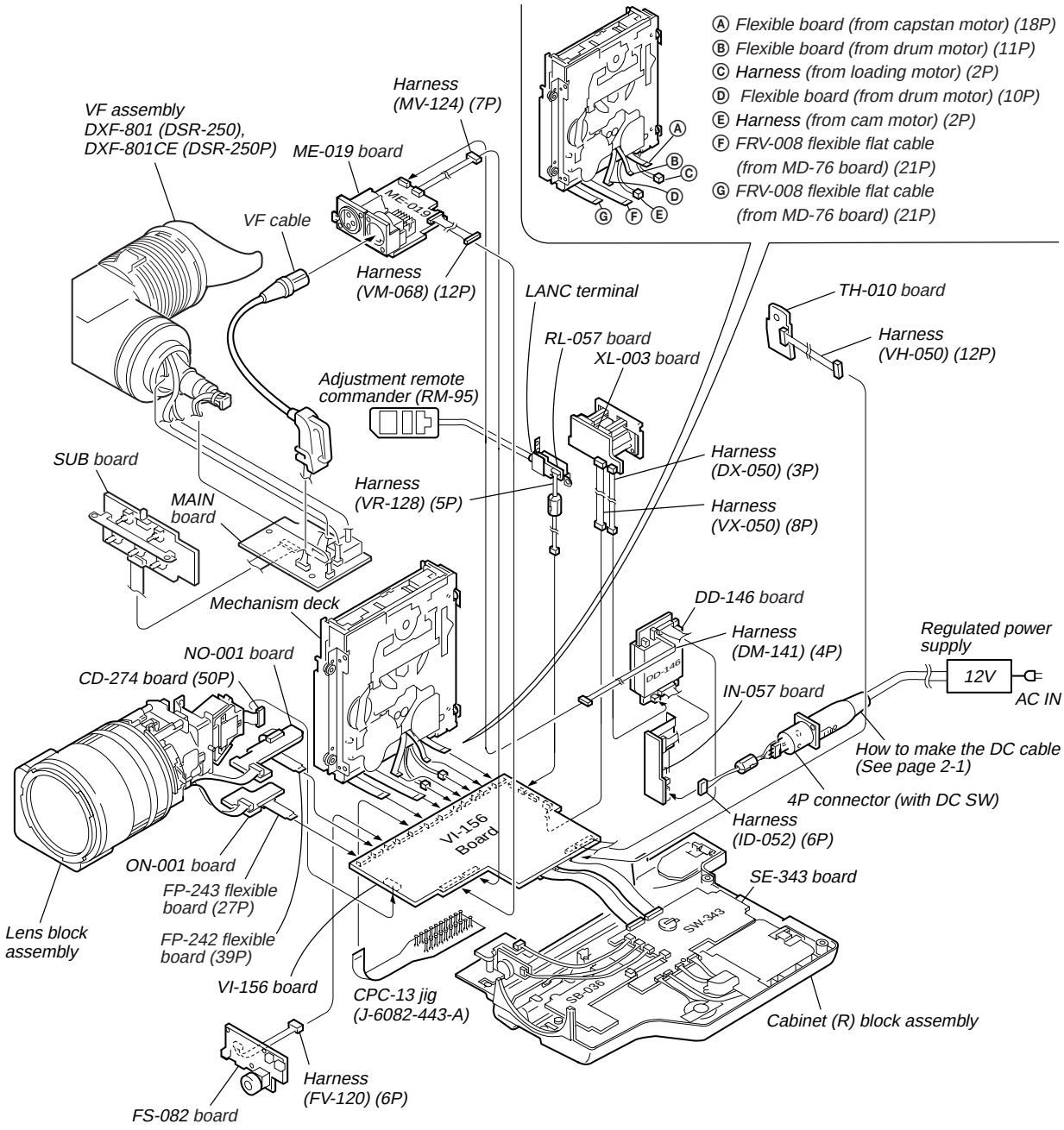
2-12. FS-082 BOARD, 4P CONNECTOR (WITH DC SW)



REMOVING 4P CONNECTOR (WITH DC SW)

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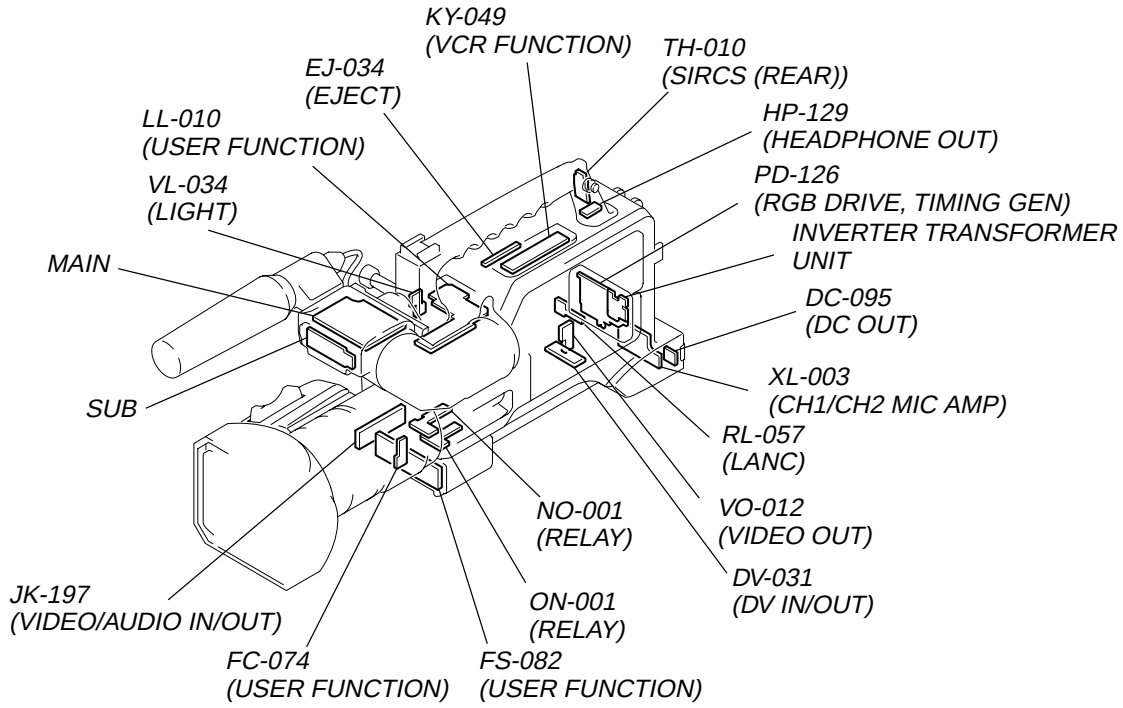
[CONNECTION DIAGRAM FOR SERVICE POSITION (Mainly for voltage measurement and check)]
(TH-010, ME-19, MAIN, SUB, SW-343, DD-146, IN-057, VI-156, ON-001, NO-001, CD-274, XL-003, RL-057, FS-082 boards, Mechanism deck)

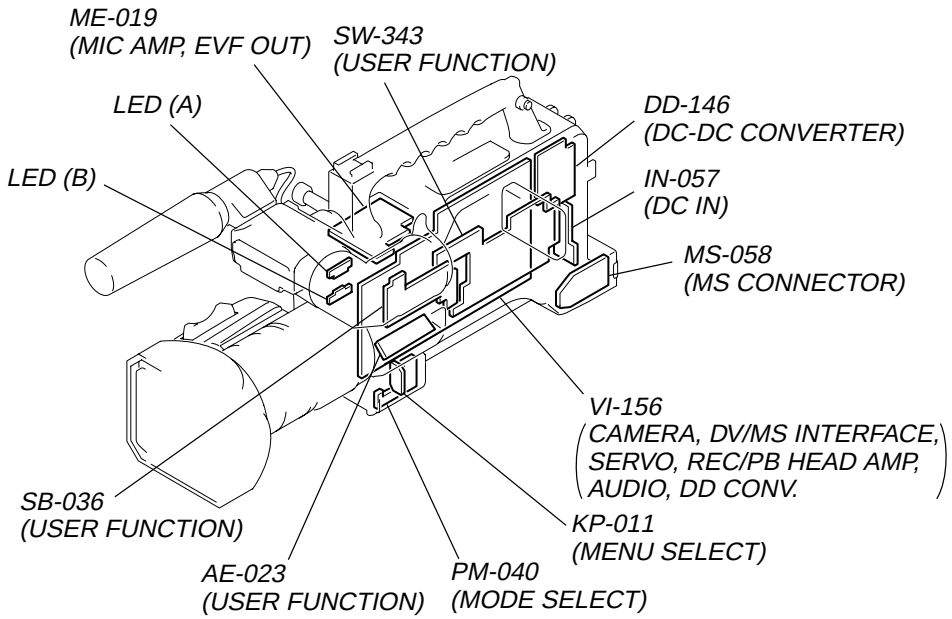


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2-13. CIRCUIT BOARDS LOCATION

The circuit boards contained in the mechanism deck and that in the zoom lens are not shown.

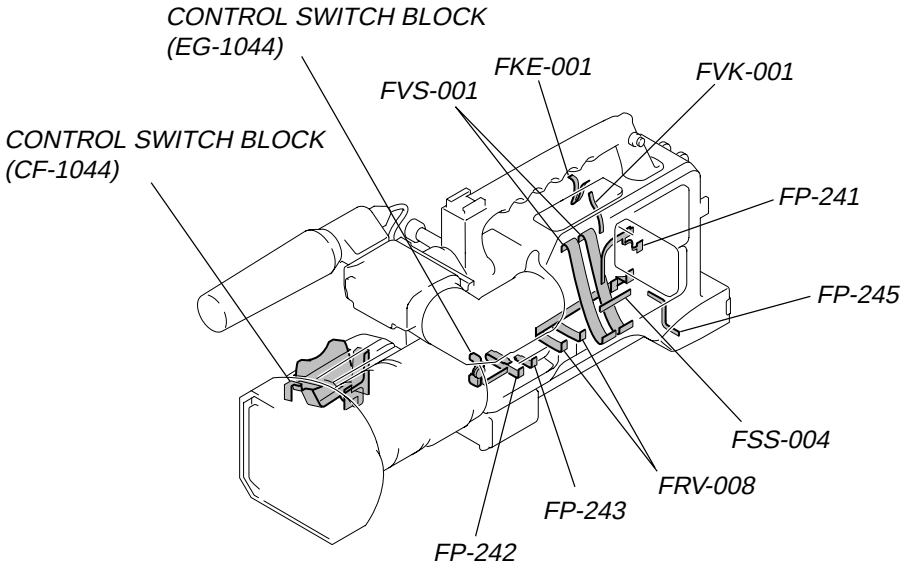




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2-14. FLEXIBLE BOARDS LOCATION

The flexible boards contained in the mechanism deck and that in the zoom lens are not shown.

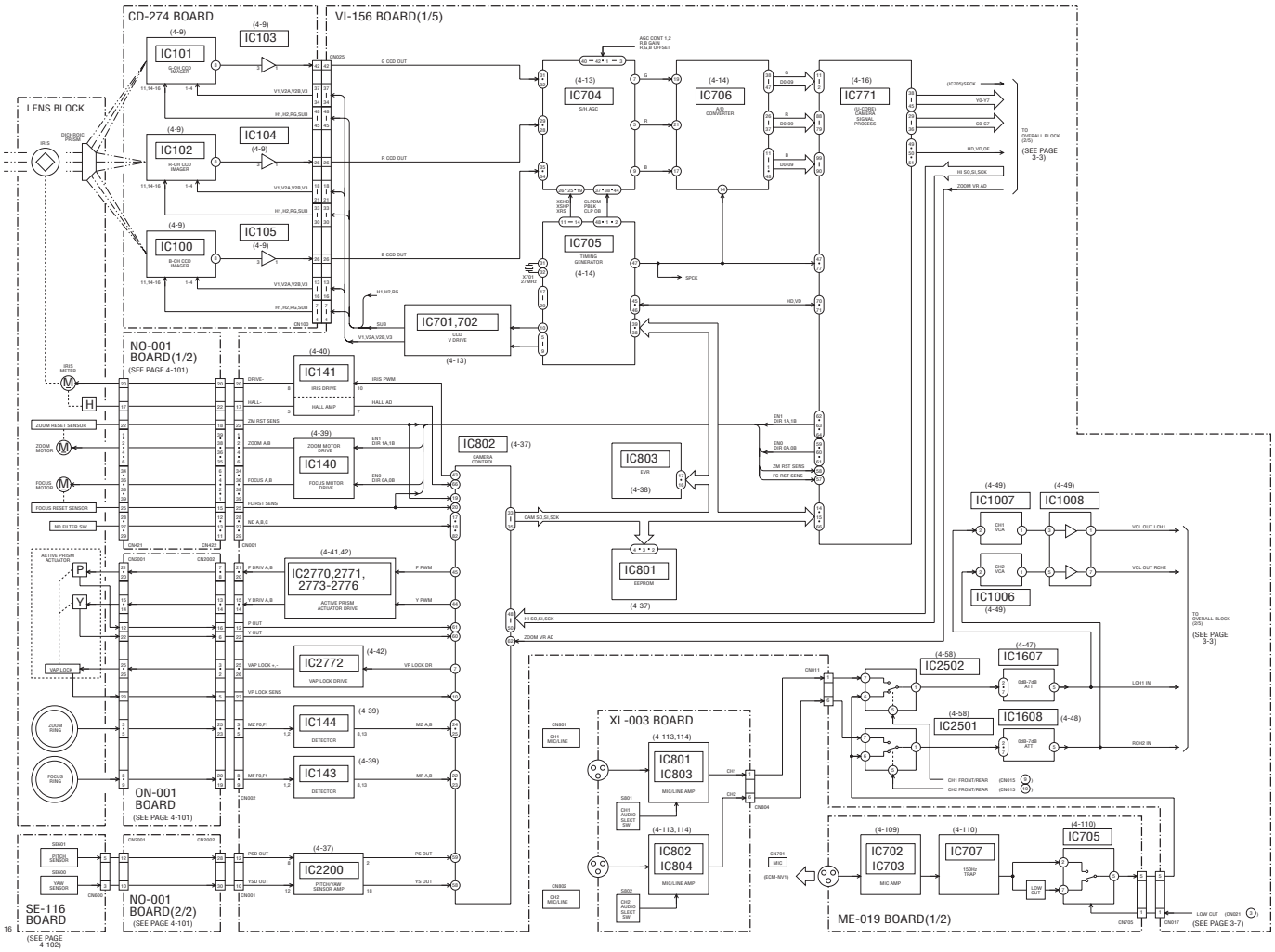


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SECTION 3
BLOCK DIAGRAMS

3-1. OVERALL BLOCK DIAGRAM (1/5)

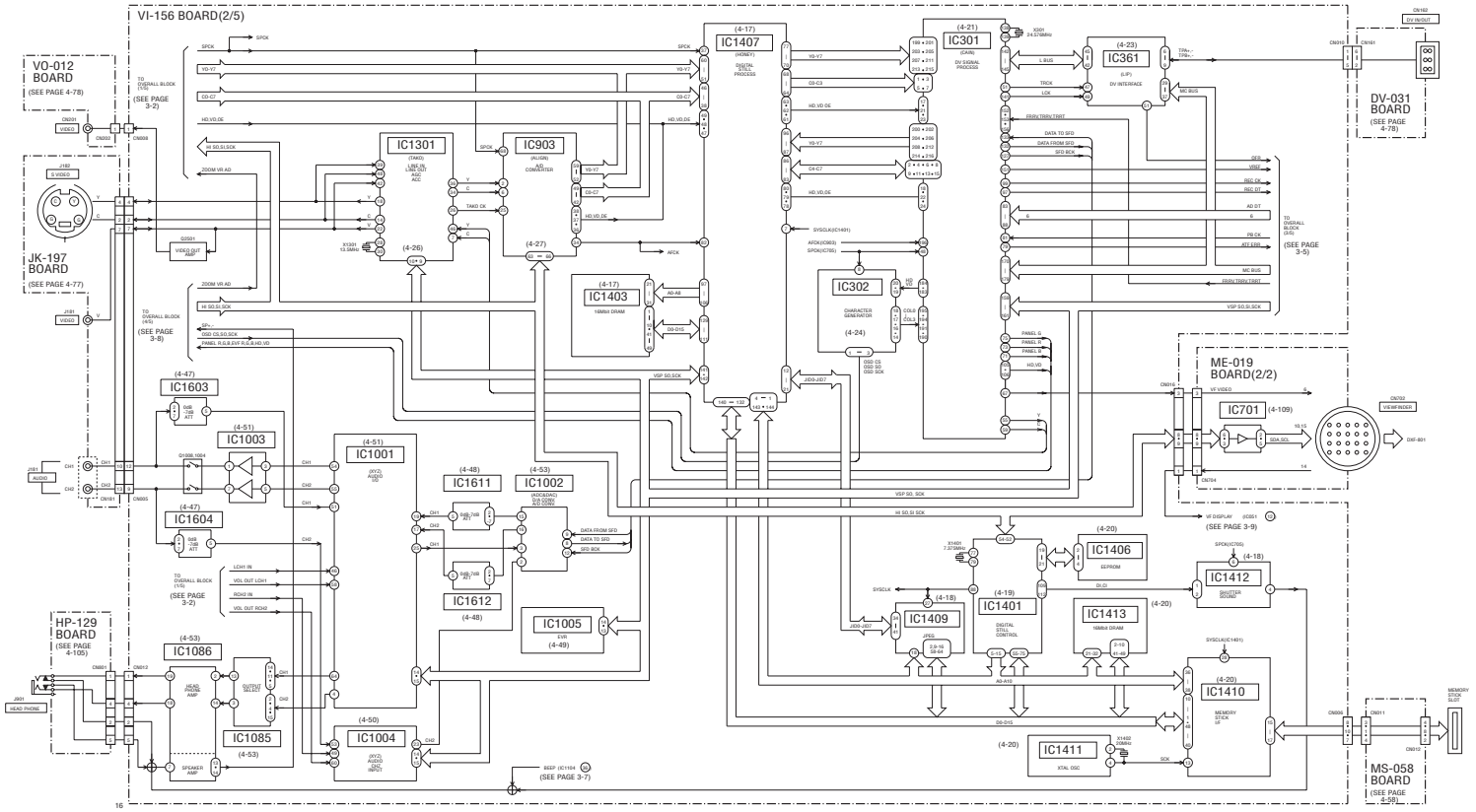
( ) : Page No. shown in ( ) indicates the page to refer on the schematic diagram.



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3-2. OVERALL BLOCK DIAGRAM (2/5)

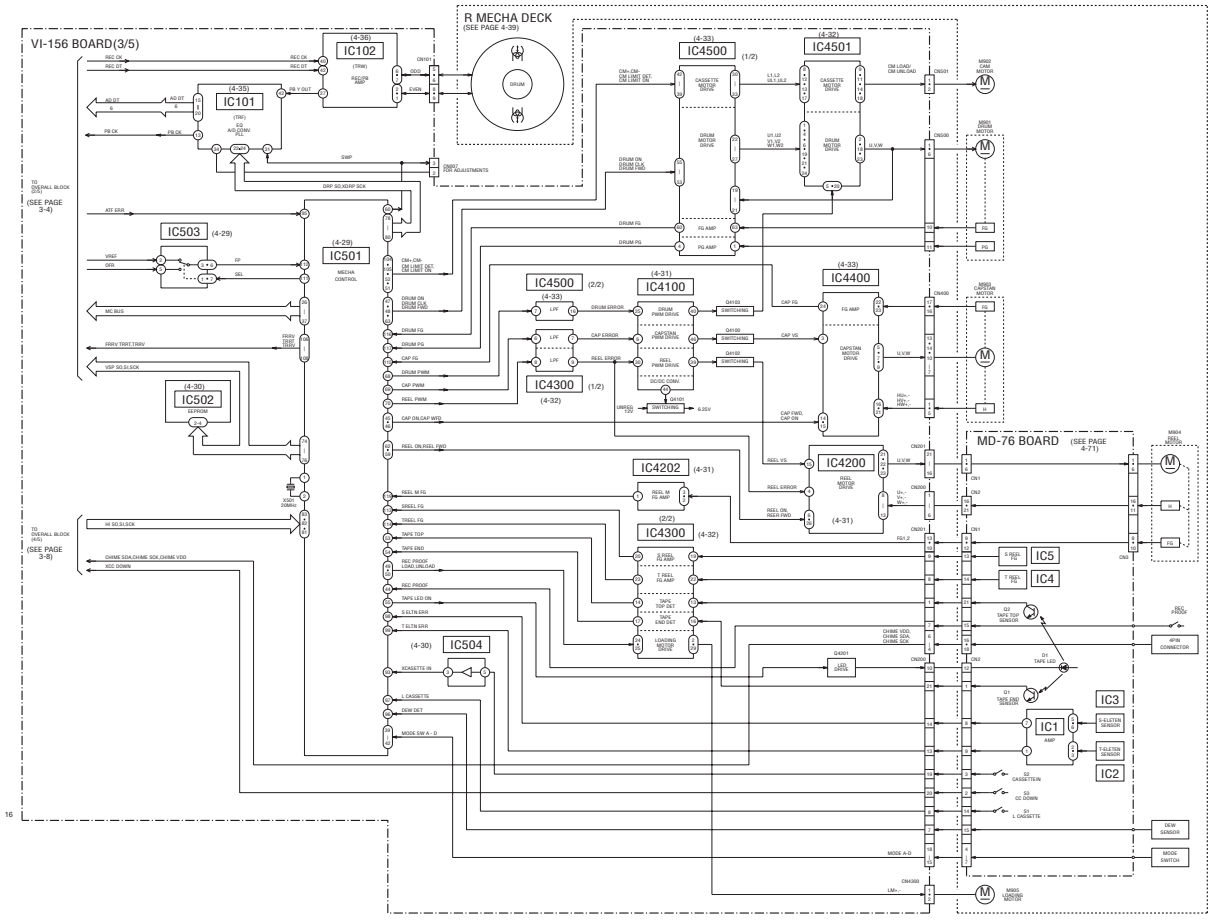
( ) : Page No. shown in ( ) indicates the page to refer on the schematic diagram.



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3-3. OVERALL BLOCK DIAGRAM (3/5)

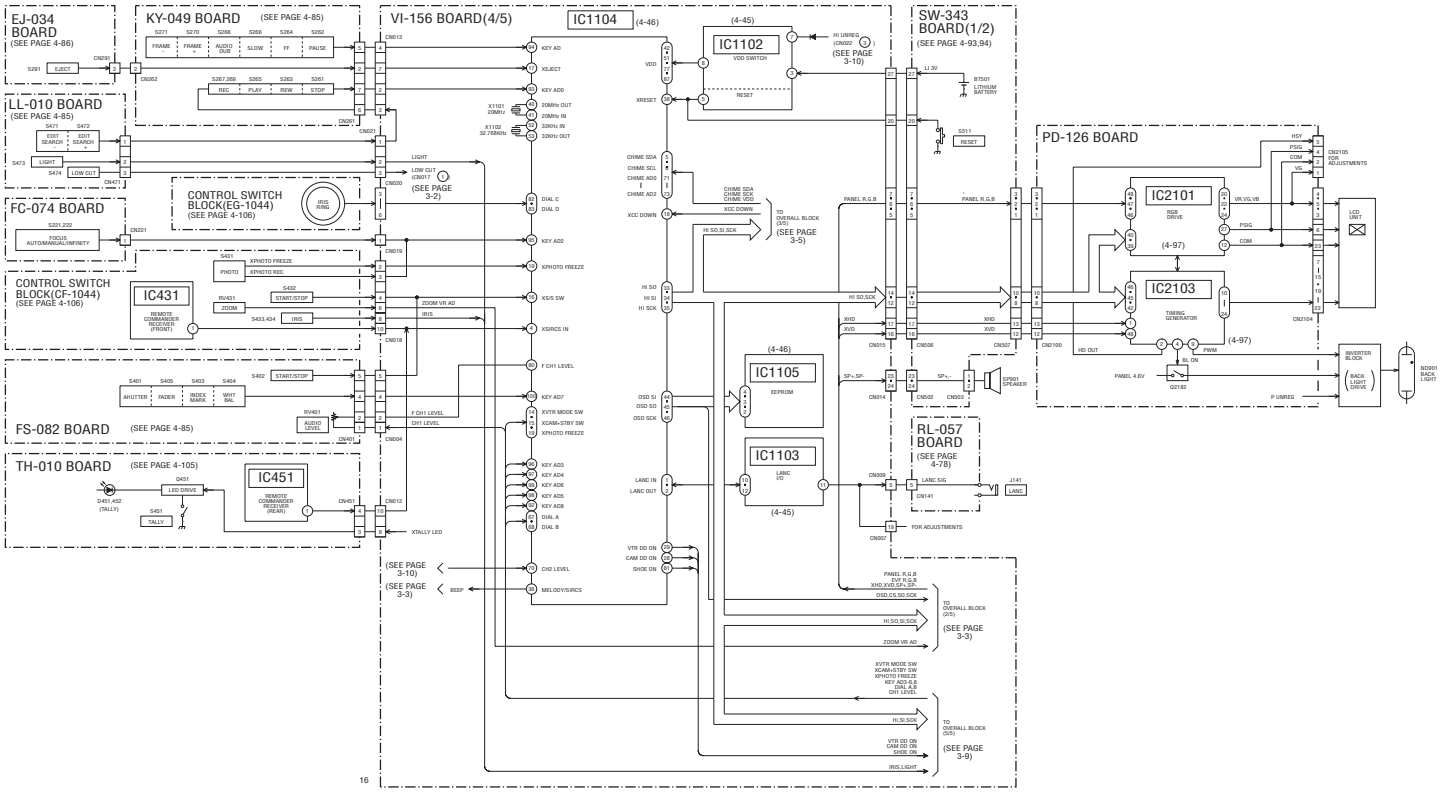
( ) : Page No. shown in ( ) indicates the page to refer on the schematic diagram.



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3-4. OVERALL BLOCK DIAGRAM (4/5)

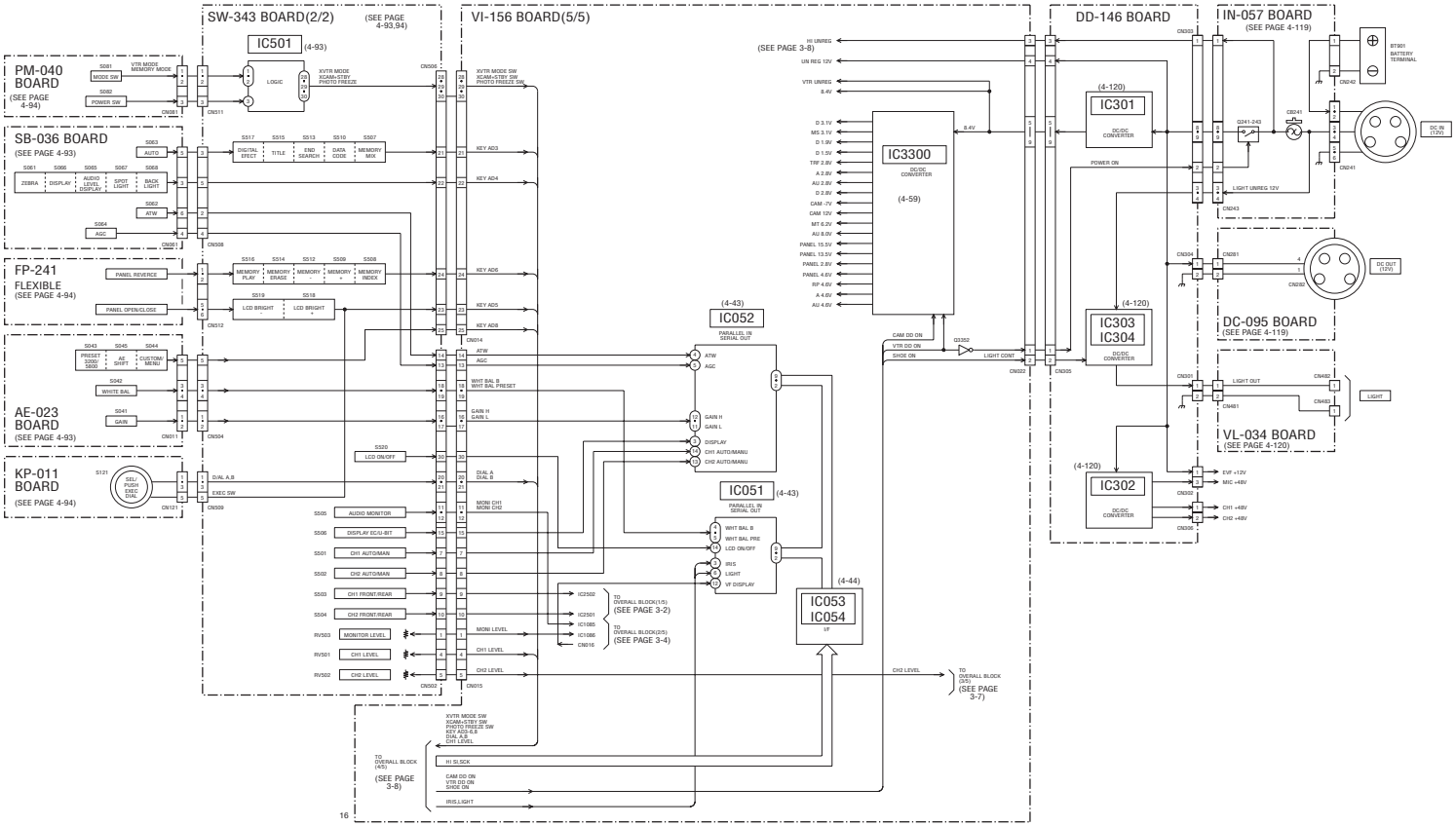
( ) : Page No. shown in ( ) indicates the page to refer on the schematic diagram.



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3-5. OVERALL BLOCK DIAGRAM (5/5)

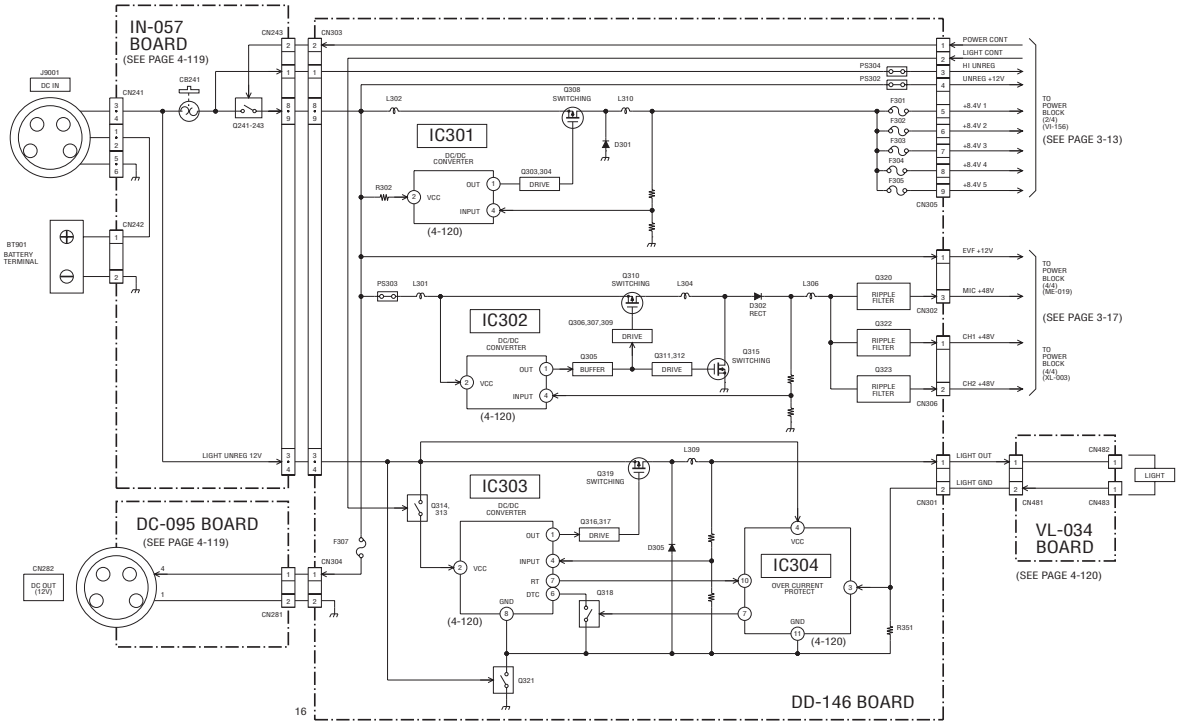
( ) : Page No. shown in ( ) indicates the page to refer on the schematic diagram.



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3-6. POWER BLOCK DIAGRAM (1/4)

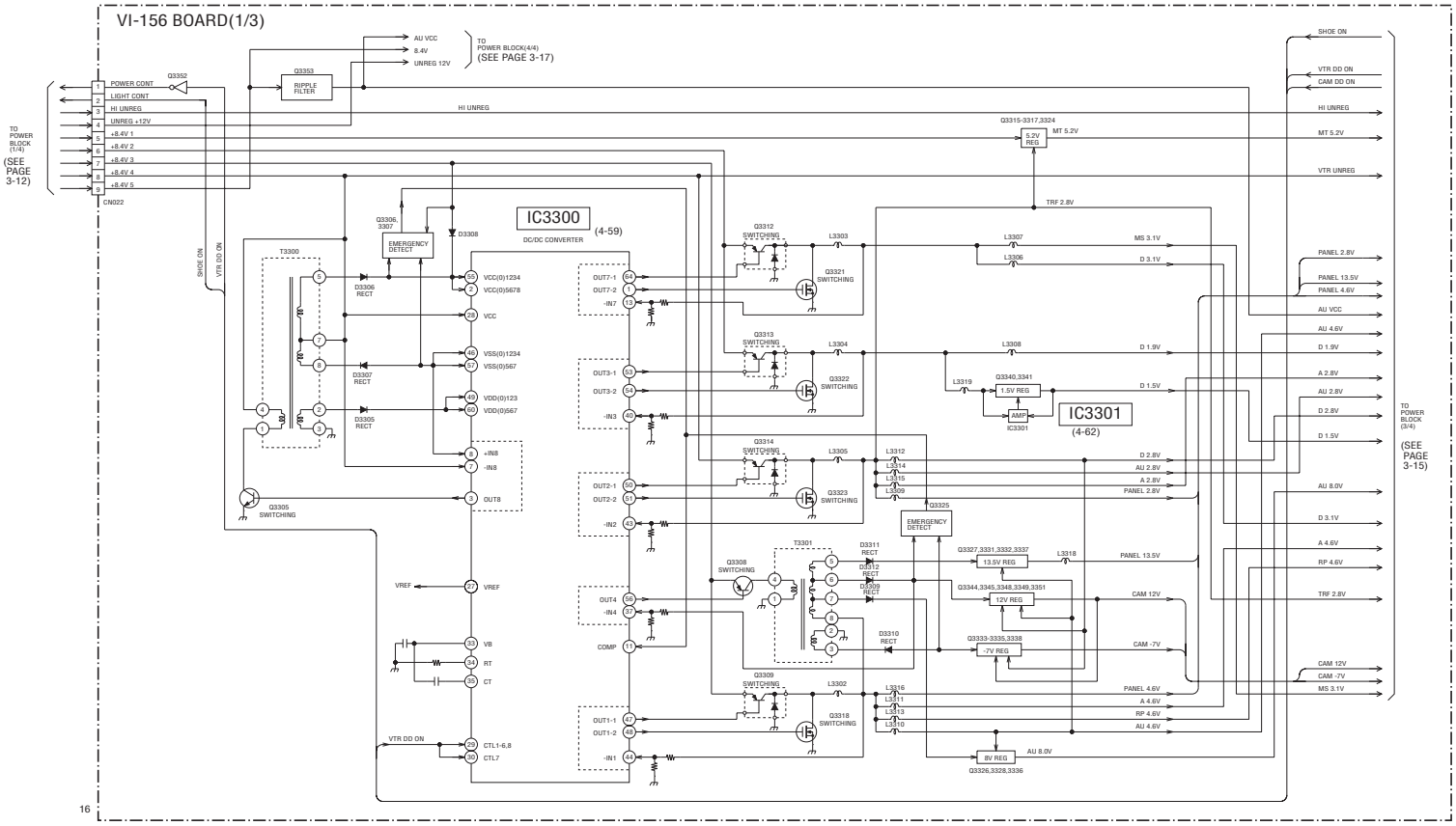
( ) : Page No. shown in ( ) indicates the page to refer on the schematic diagram.



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3-7. POWER BLOCK DIAGRAM (2/4)

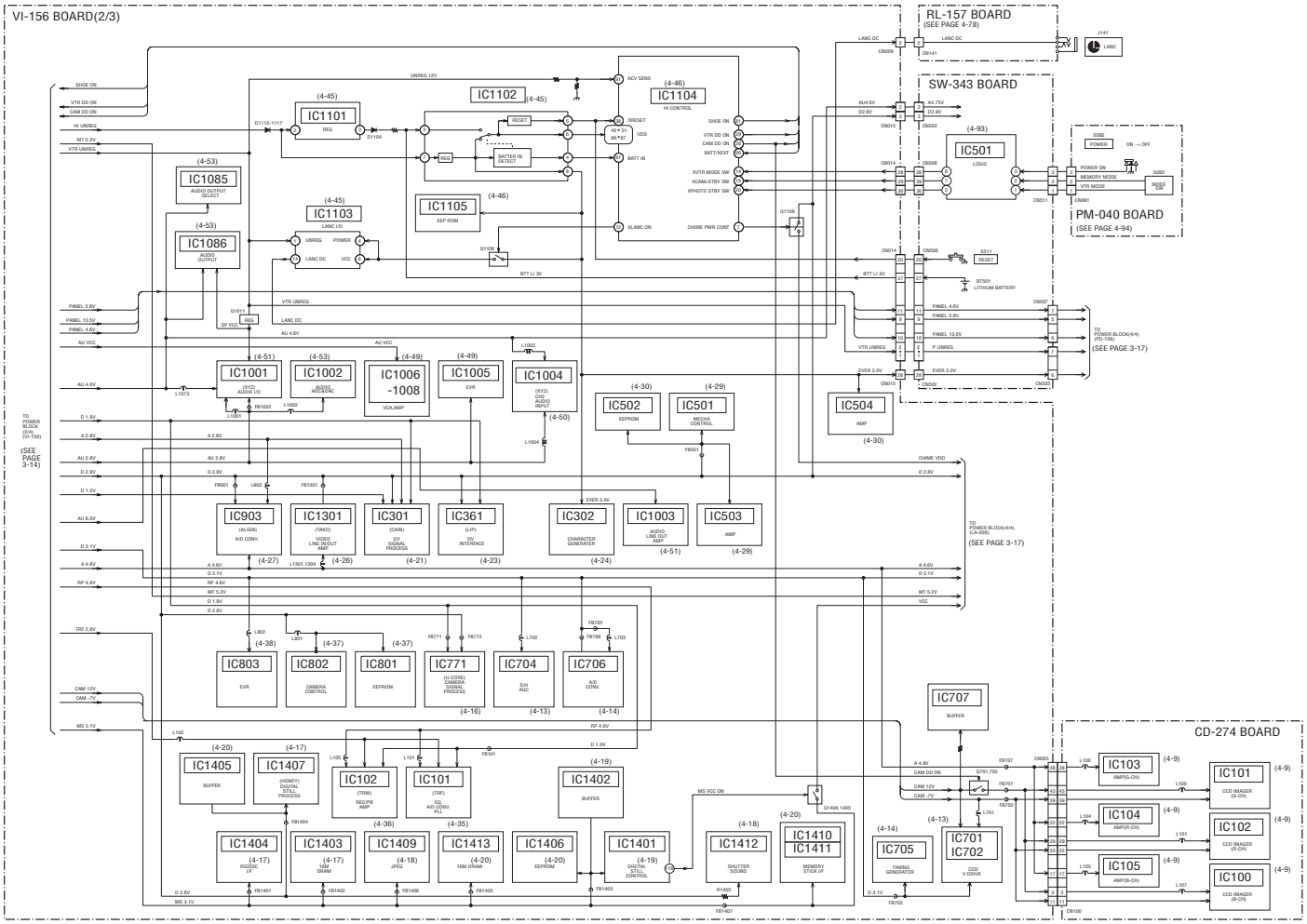
( ) : Page No. shown in ( ) indicates the page to refer on the schematic diagram.



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3-8. POWER BLOCK DIAGRAM (3/4)

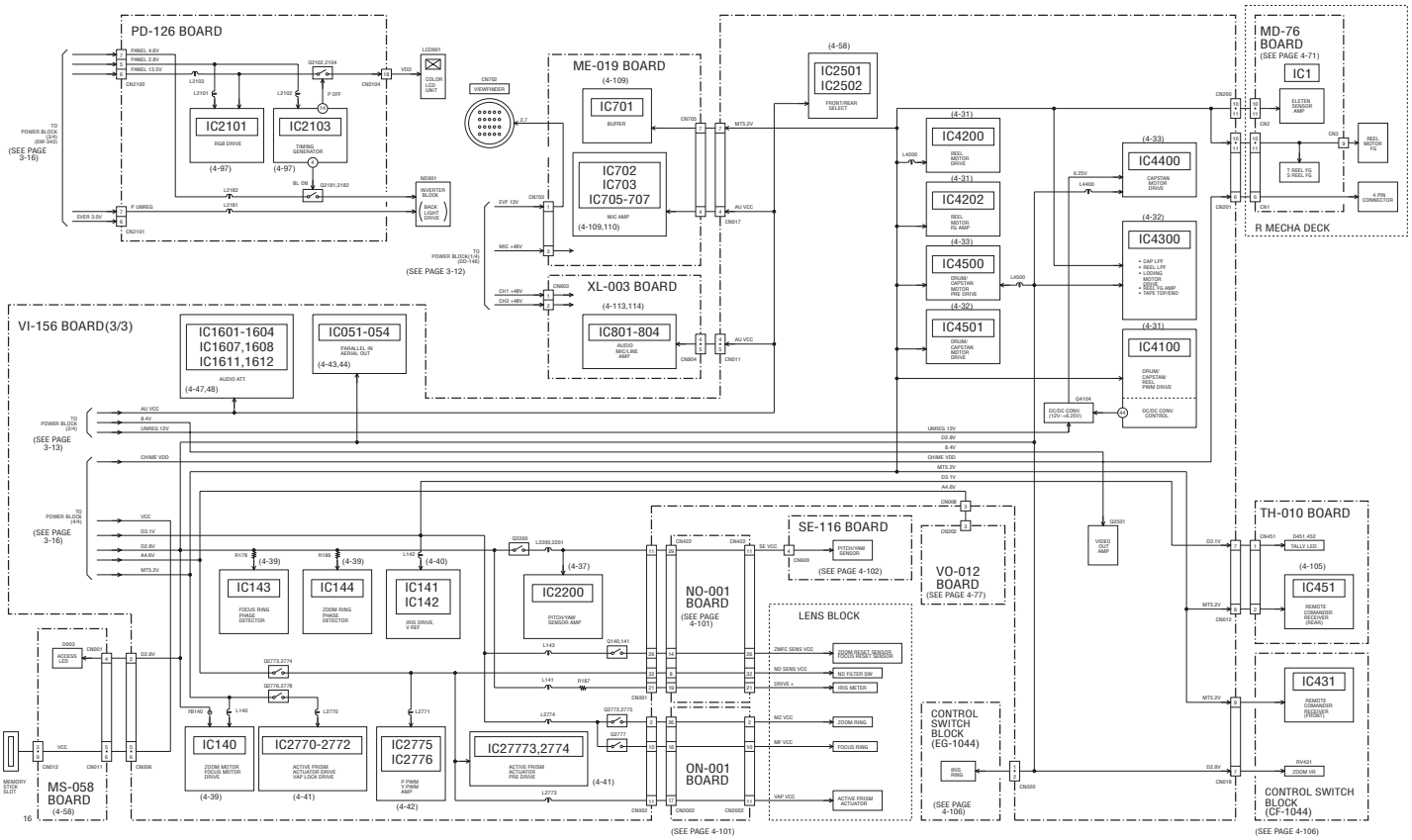
( ) : Page No. shown in ( ) indicates the page to refer on the schematic diagram.



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3-9. POWER BLOCK DIAGRAM (4/4)

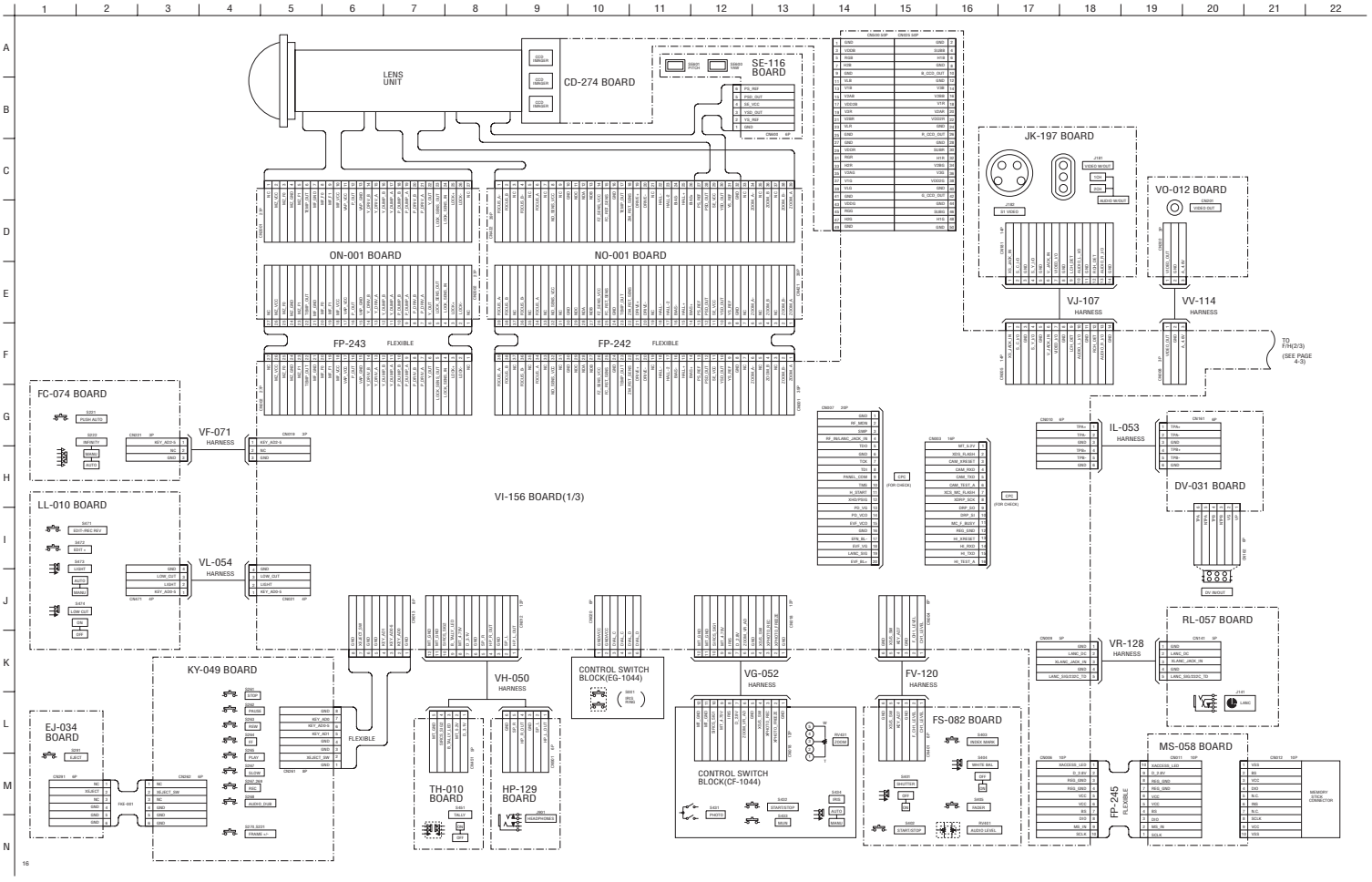
( ) : Page No. shown in ( ) indicates the page to refer on the schematic diagram.



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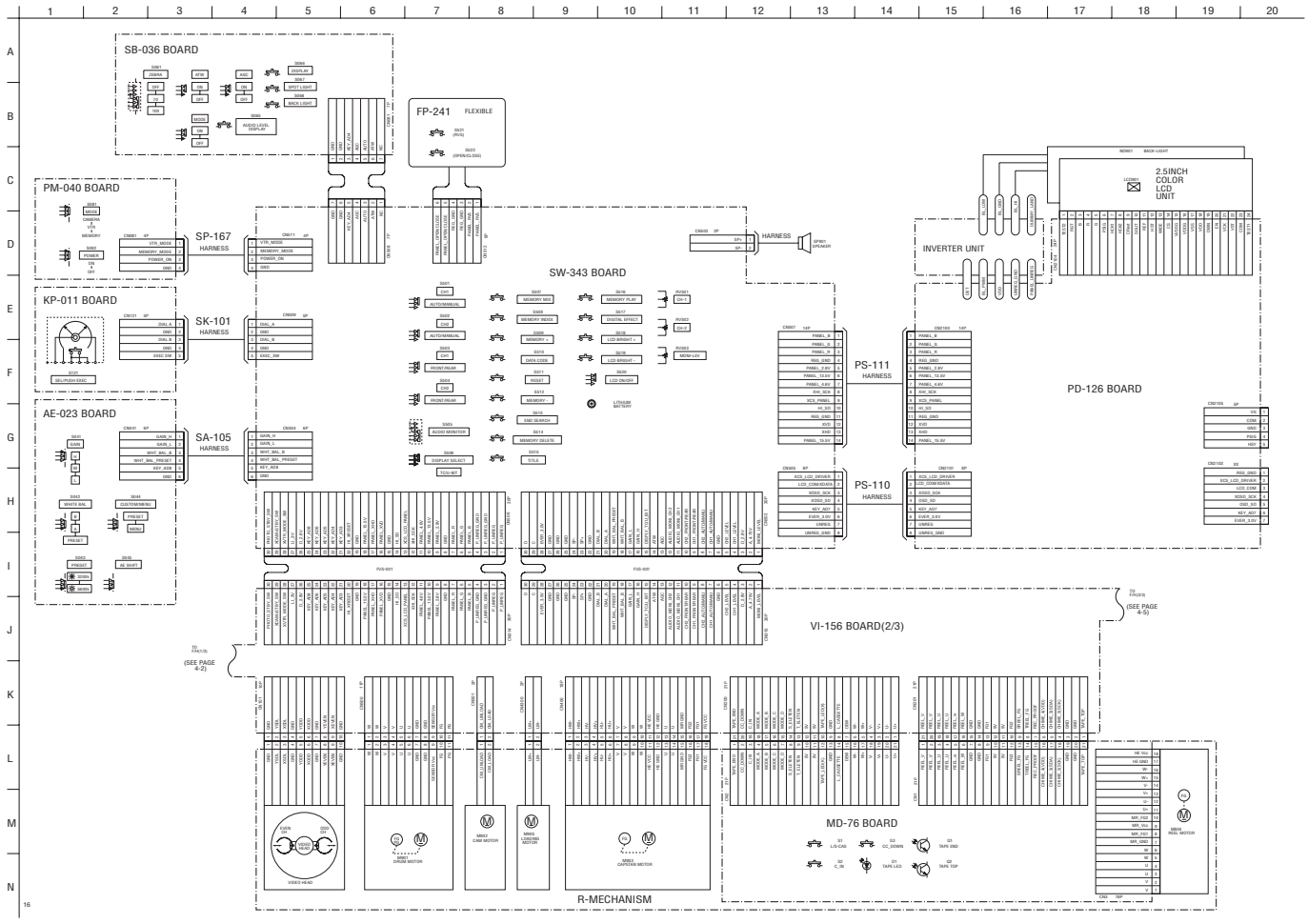
SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM (1/3)



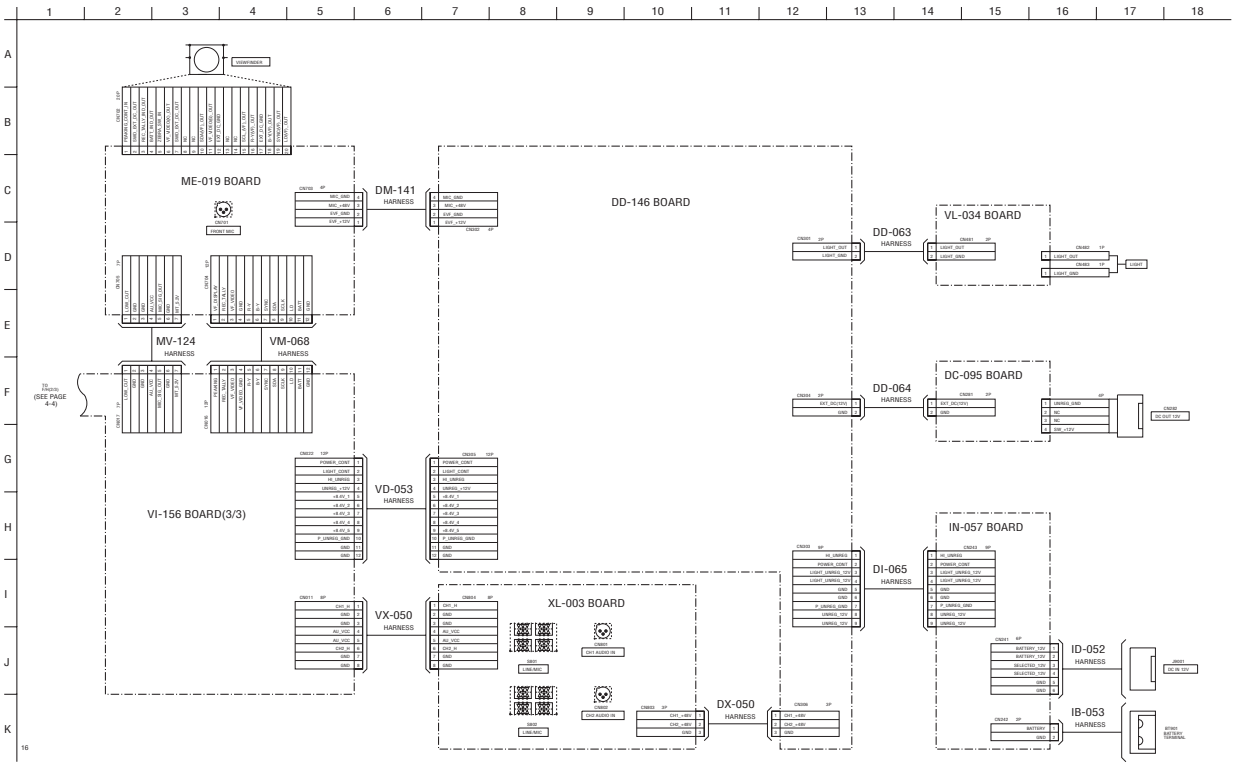
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FRAME SCHEMATIC DIAGRAM (2/3)



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FRAME SCHEMATIC DIAGRAM (3/3)



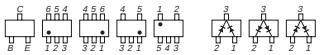
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4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

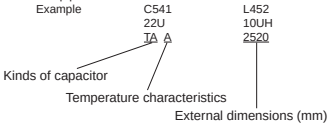
THIS NOTE IS COMMON FOR WIRING BOARDS AND SCHEMATIC DIAGRAMS
(In addition to this, the necessary note is printed in each block)

(For printed wiring boards)
- ▒▒▒: Pattern from the side which enables seeing.
  (The other layers' patterns are not indicated.)
- Through hole is omitted.
- Circled numbers refer to waveforms.
- There are few cases that the part printed on diagram isn't mounted in this model.
- Chip parts.

Transistor Diode



(For schematic diagrams)
- All capacitors are in mF unless otherwise noted. pF : m mF. 50V or less are not indicated except for electrolytics and tantalums.
- Chip resistors are 1/10W unless otherwise noted.
  kW=1000W, MW=1000kW.
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, Because it is damaged by the heat.
- Some chip part will be indicated as follows.



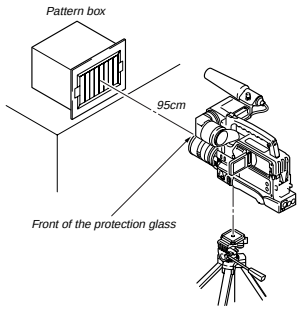
- Constants of resistors, capacitors, ICs and etc with XX indicate that they are not used.
  In such cases, the unused circuits may be indicated.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- Signal name
  XEDIT → $\overline{\text{EDIT}}$ PB/XREC → PB/$\overline{\text{REC}}$
- : non flammable resistor
- : fusible resistor
- : panel designation
- : B+ Line *
- : B– Line *
- : IN/OUT direction of (+,–) B LINE. *
- : adjustment for repair. *
- Circled numbers refer to waveforms. *

* Indicated by the color red.

Note :	**Note :**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

(Measuring conditions voltage and waveform)
- Voltages and waveforms are measured between the measurement points and ground when camera shoots color bar chart of pattern box. They are reference values and reference waveforms. *
  (VOM of DC 10 MΩ input impedance is used.).
- Voltage values change depending upon input impedance of VOM used.) *

1. Connection



2. Adjust the distance so that the output waveform of Fig. a and the Fig. b can be obtain.

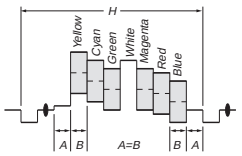


Fig. a (Video output terminal output waveform)

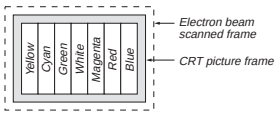
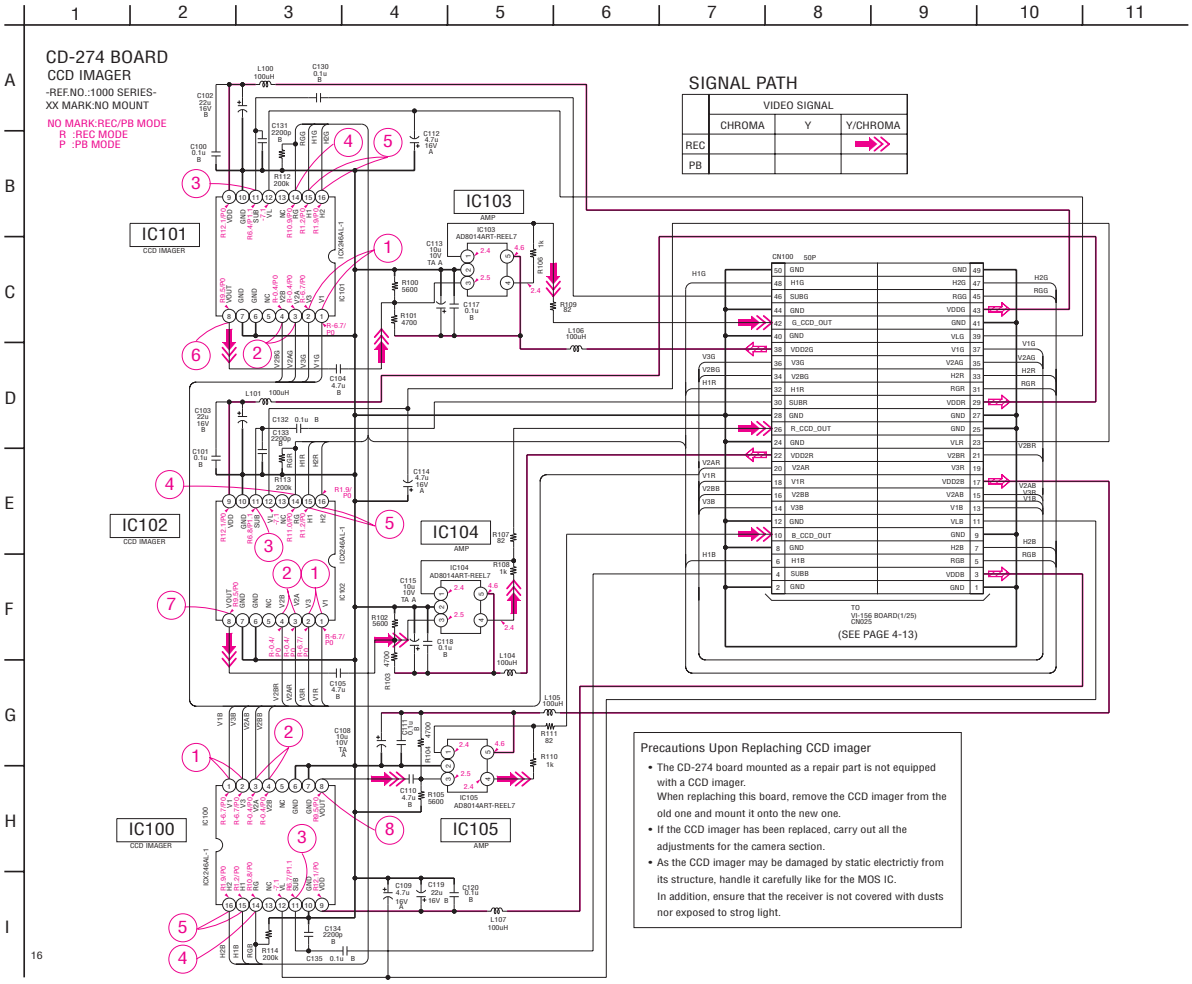


Fig.b (Picture on monitor TV)

When indicating parts by reference number, pleas include the board name.

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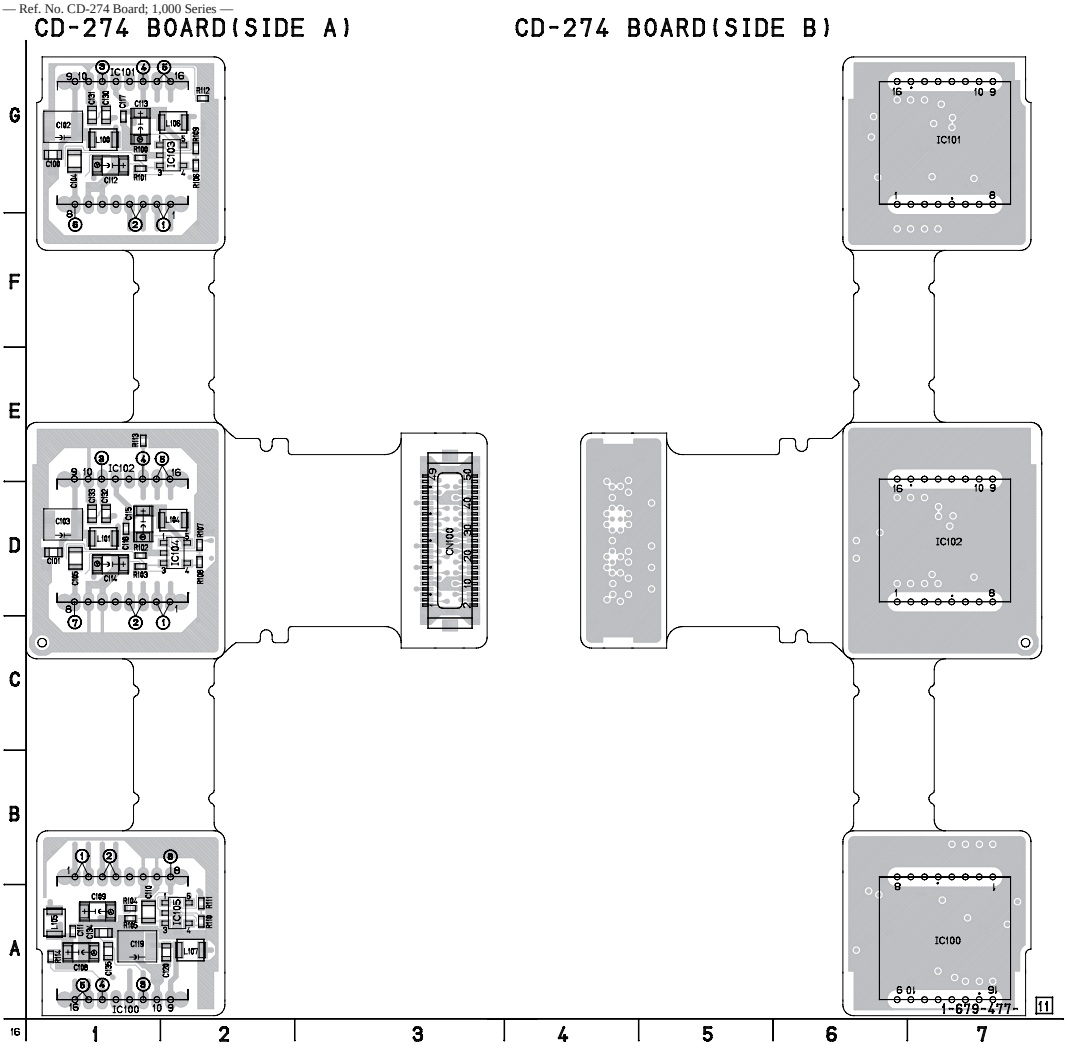
For Schematic Diagram
- Refer to page 4-11 for printed wiring board.
- Refer to page 4-121 for waveforms.



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CD-274 (CCD IMAGER) PRINTED WIRING BOARD

— Ref. No. CD-274 Board; 1,000 Series —



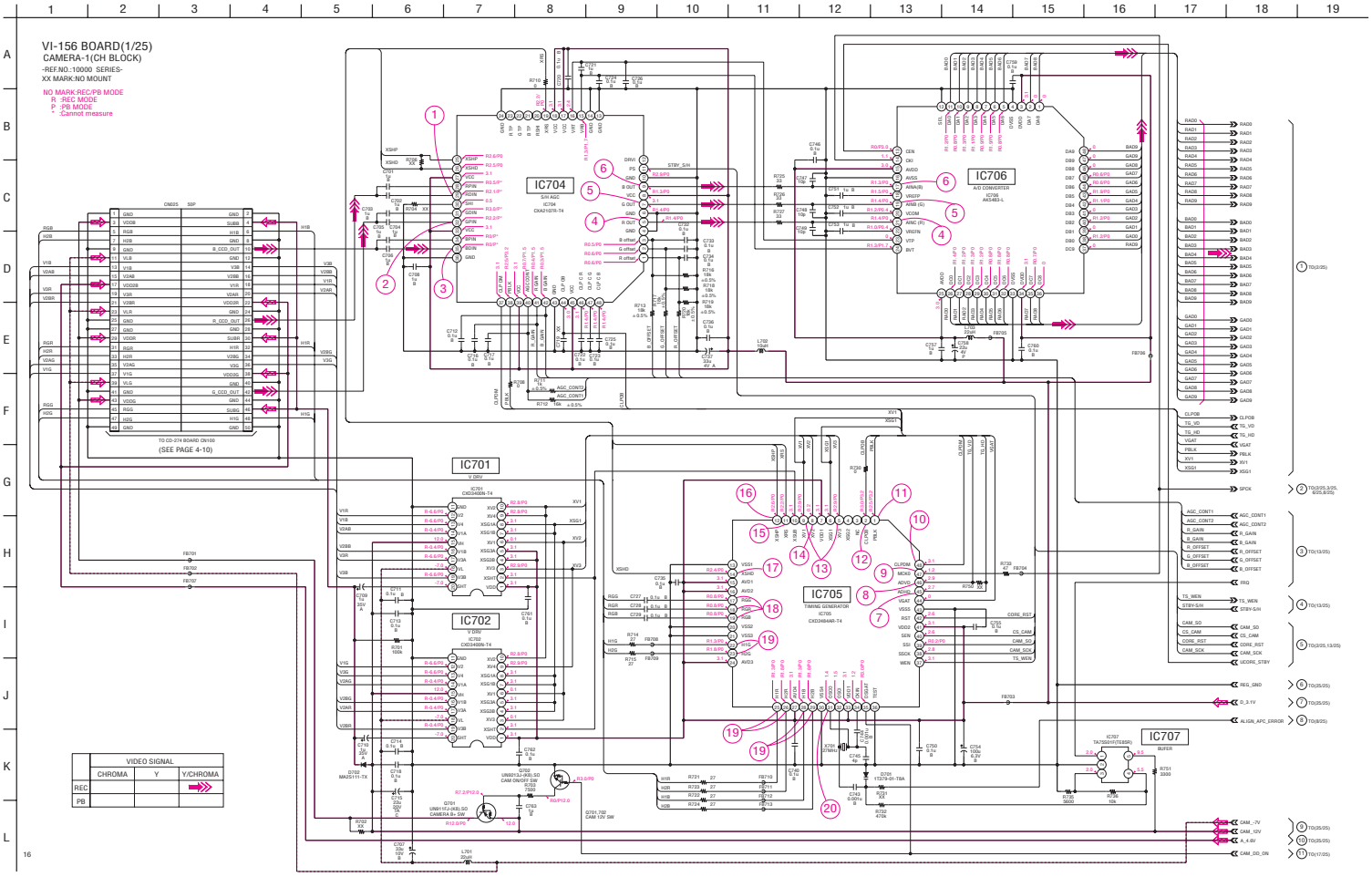
For printed wiring board

- Refer to page 4-125 for parts location.
- CD-274 board consists of multiple layers. However, only the sides (layers) A and B are shown.

There are few cases that the part printed on this diagram isn't mounted in this model.

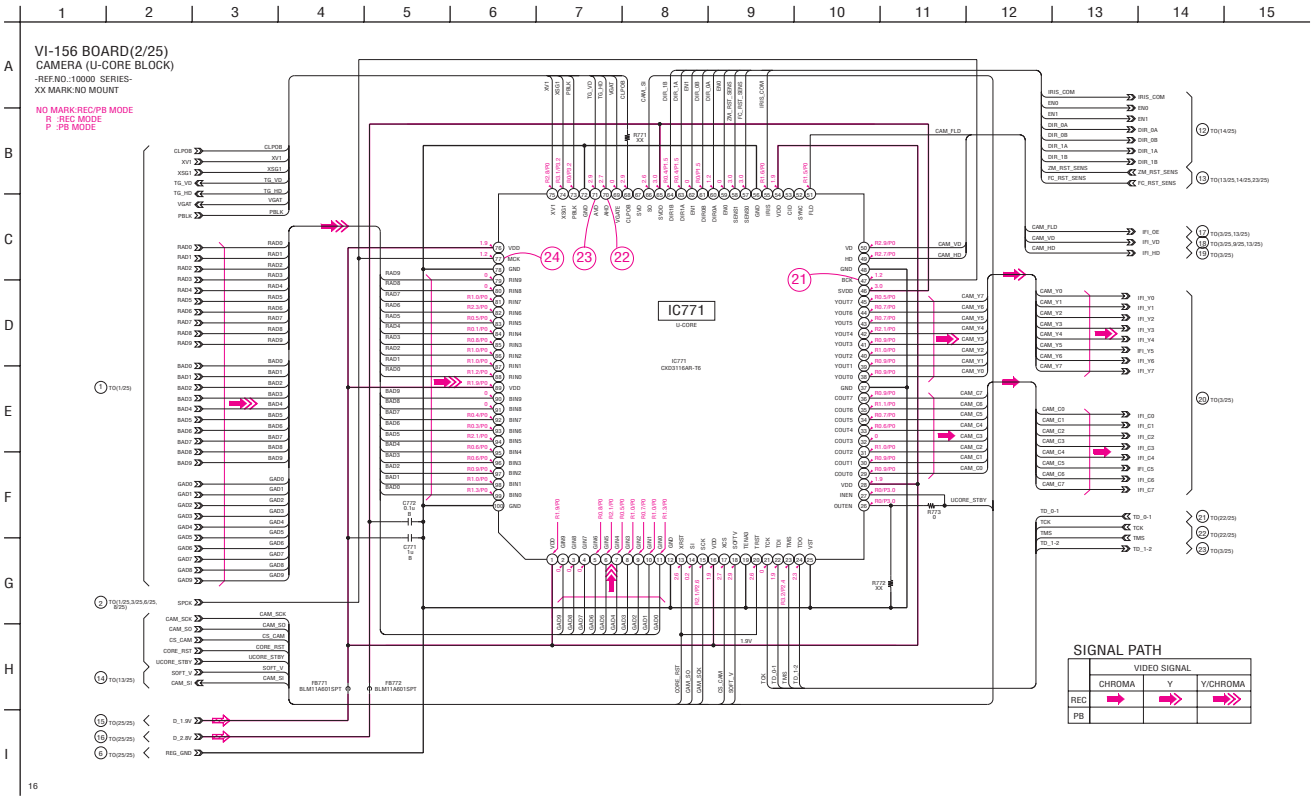
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For Schematic Diagram
- Refer to page 4-63 for printed wiring board.
- Refer to page 4-121 for waveforms.



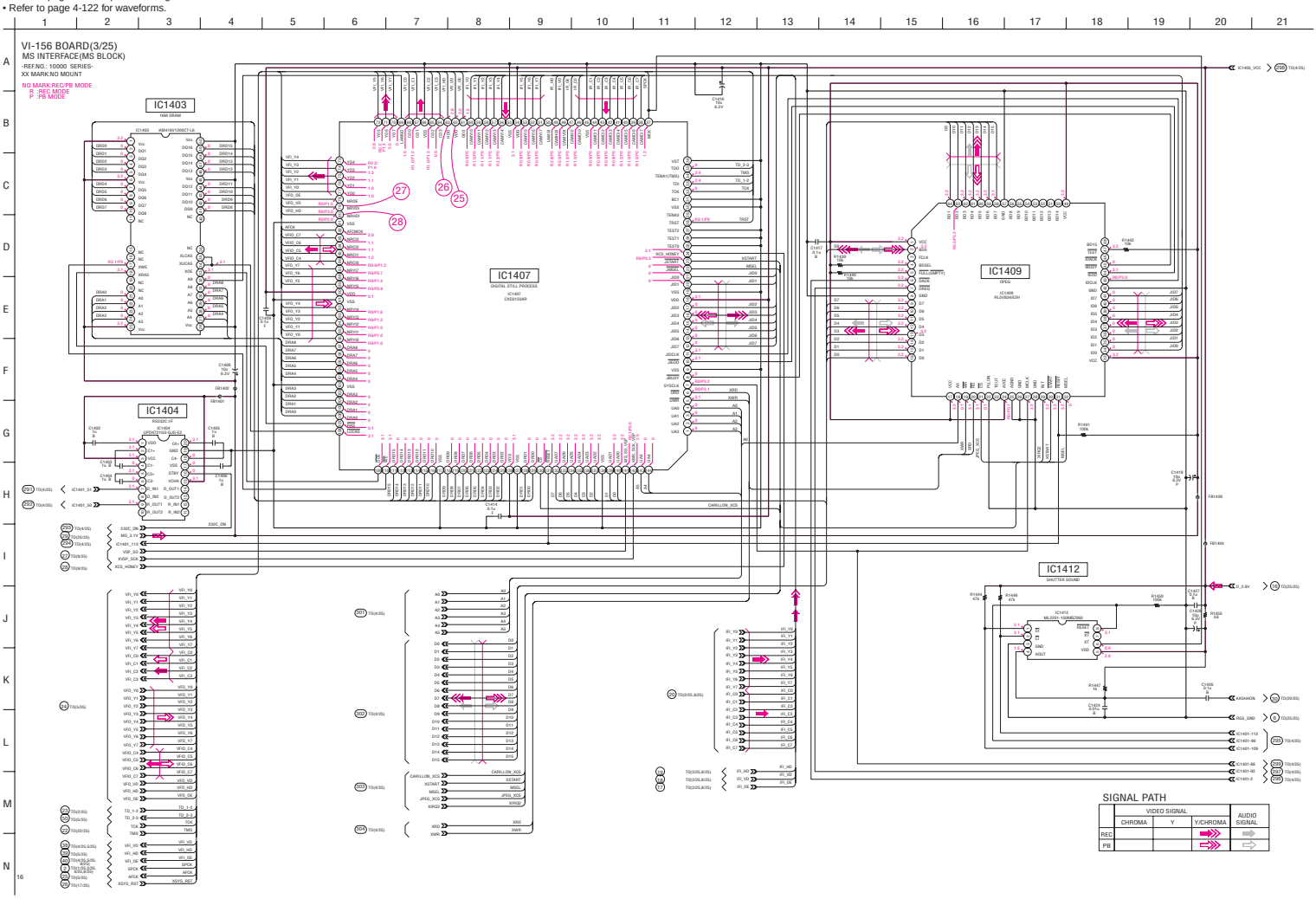
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For Schematic Diagram
- Refer to page 4-63 for printed wiring board.
- Refer to page 4-122 for waveforms.



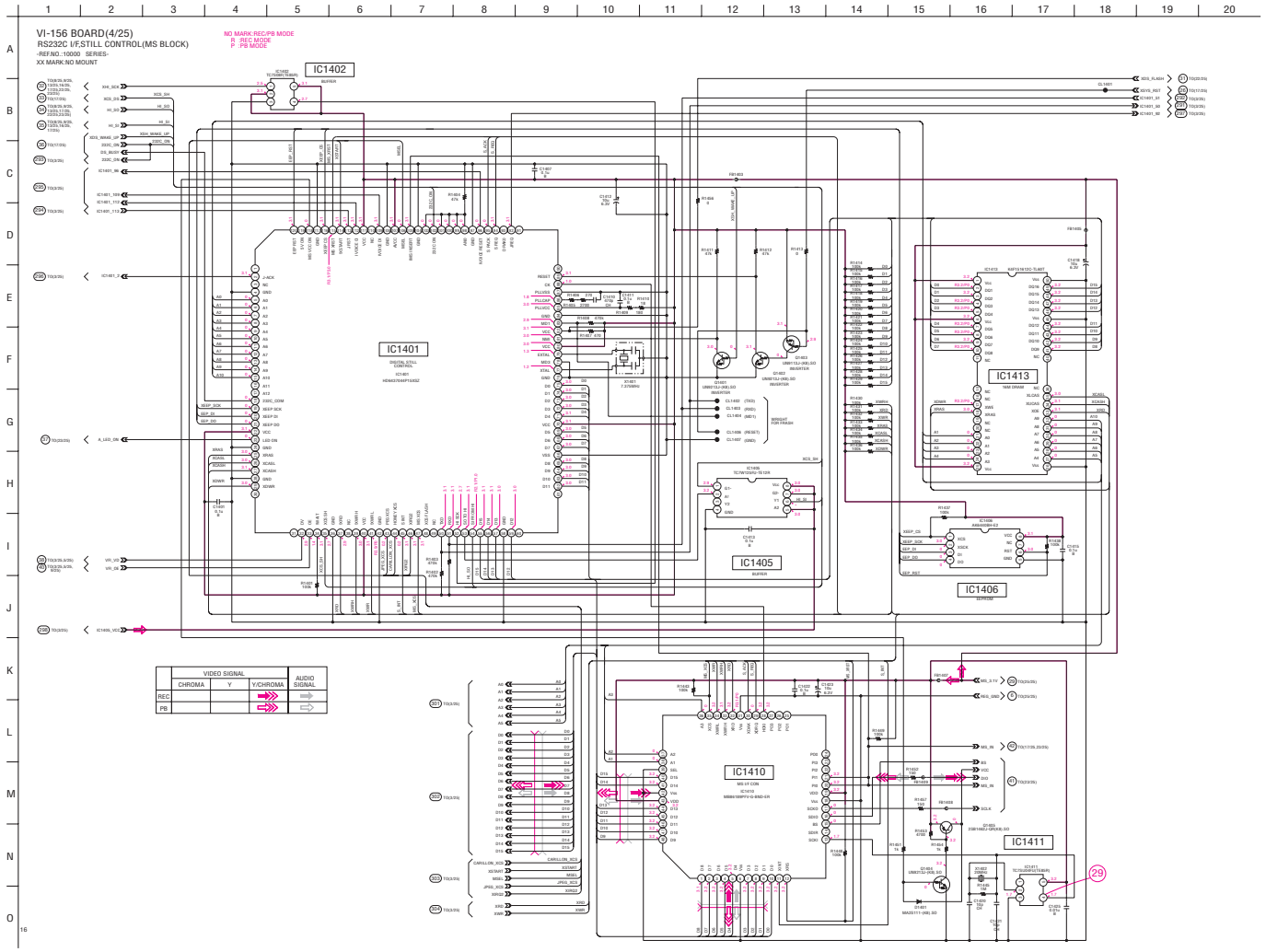
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For Schematic Diagram
- Refer to page 4-63 for printed wiring board.
- Refer to page 4-122 for waveforms.



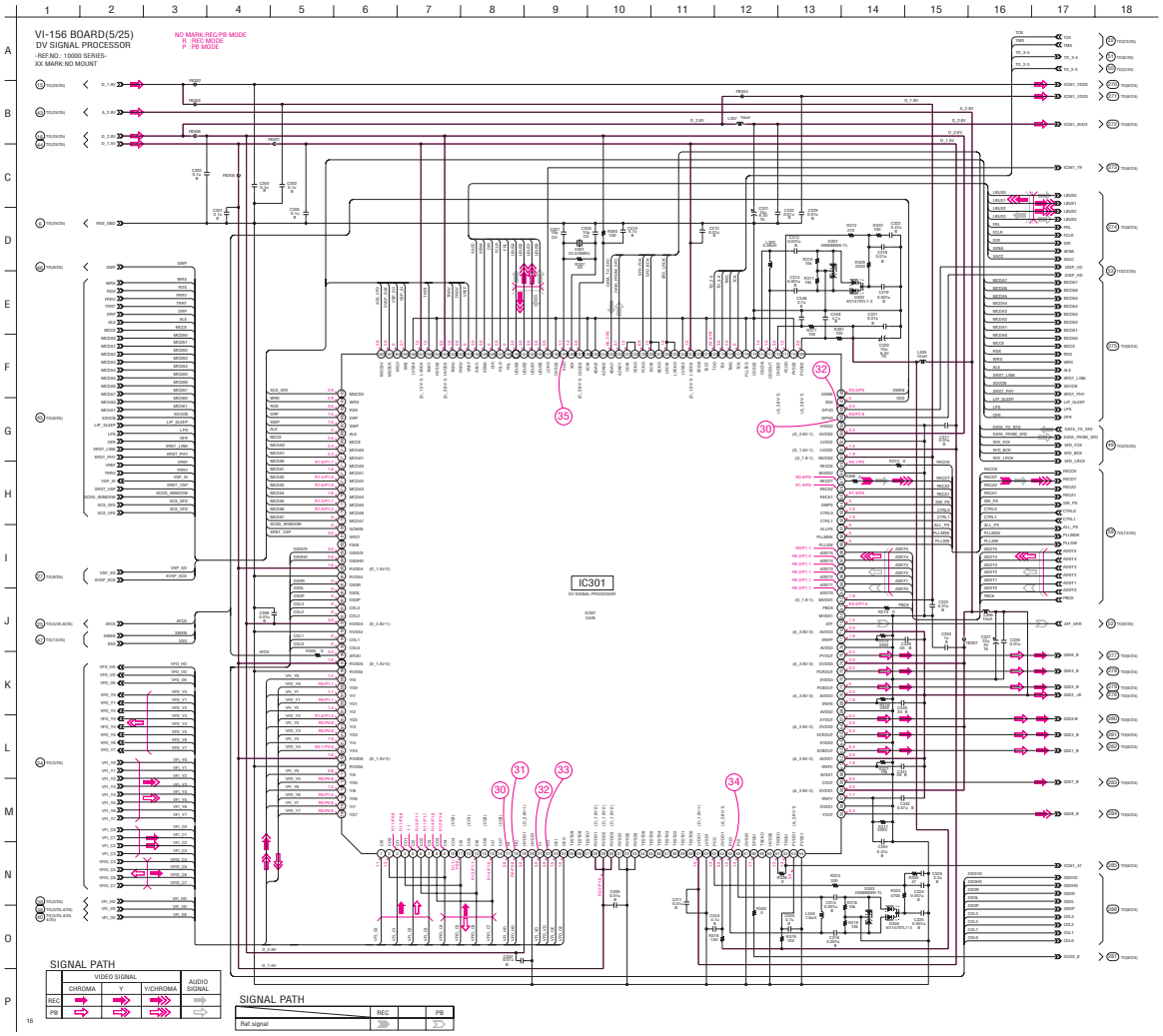
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For Schematic Diagram
- Refer to page 4-63 for printed wiring board.
- Refer to page 4-122 for waveform.



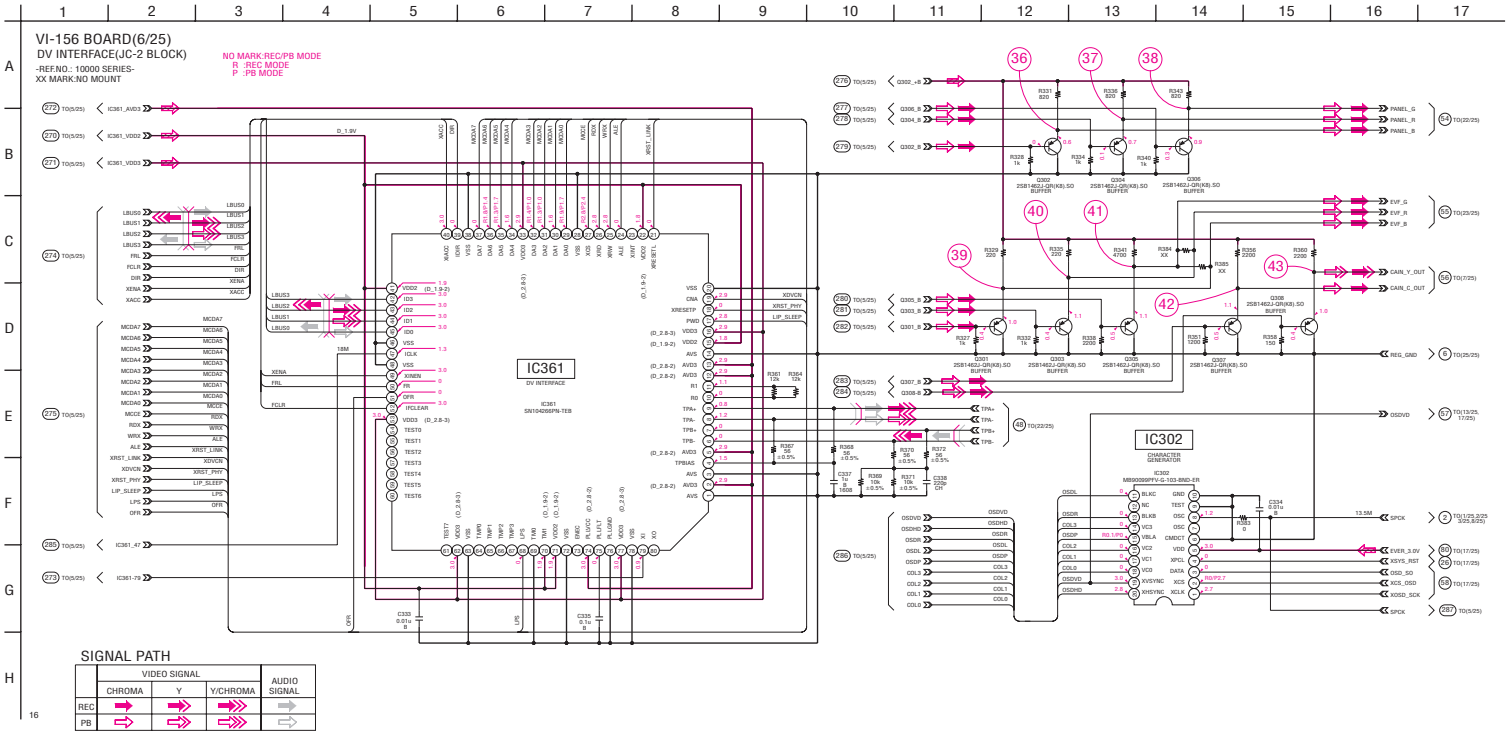
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For Schematic Diagram
- Refer to page 4-63 for printed wiring board.
- Refer to page 4-122 for waveforms.



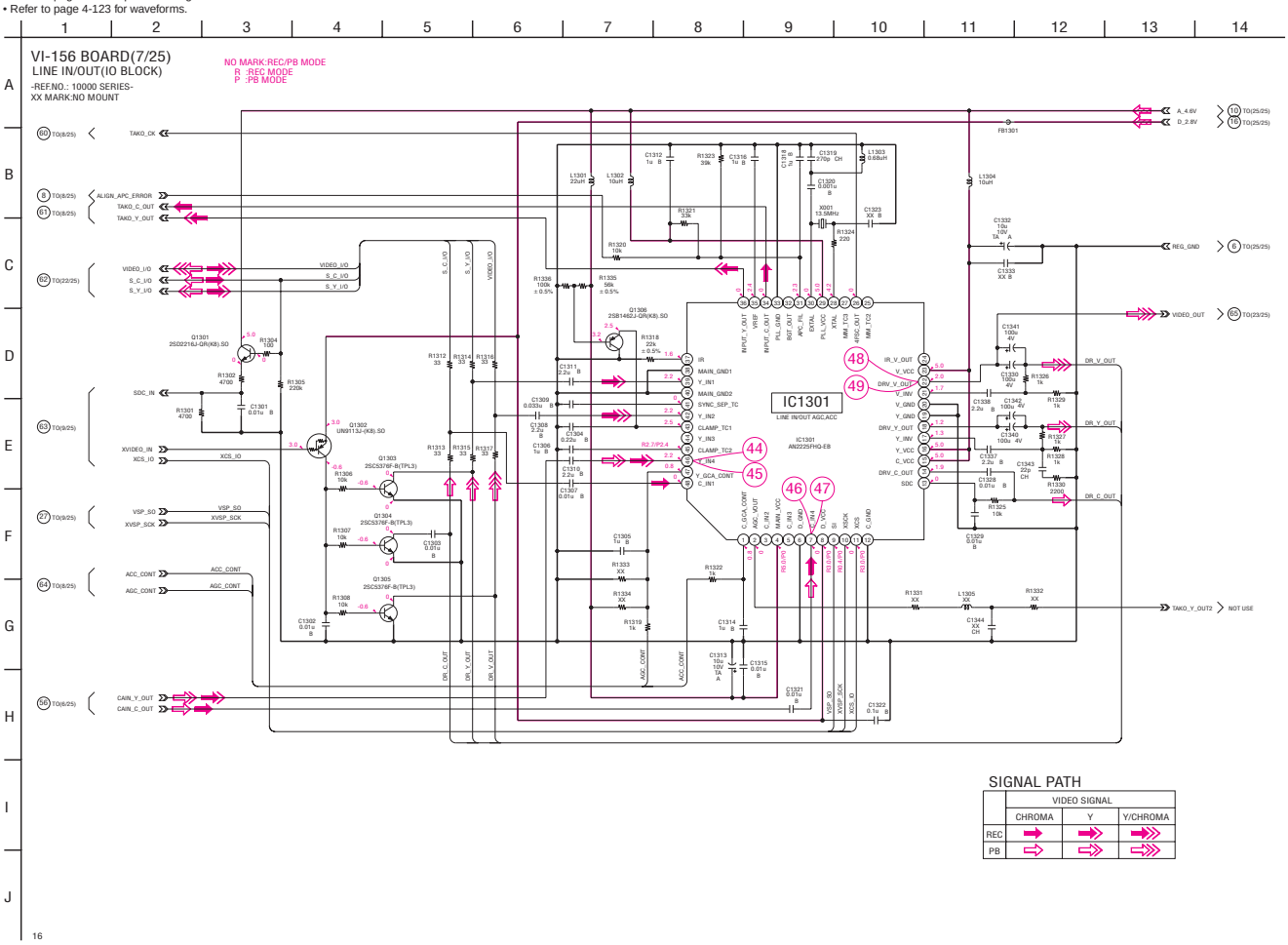
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For Schematic Diagram
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- Refer to page 4-122 for waveforms.



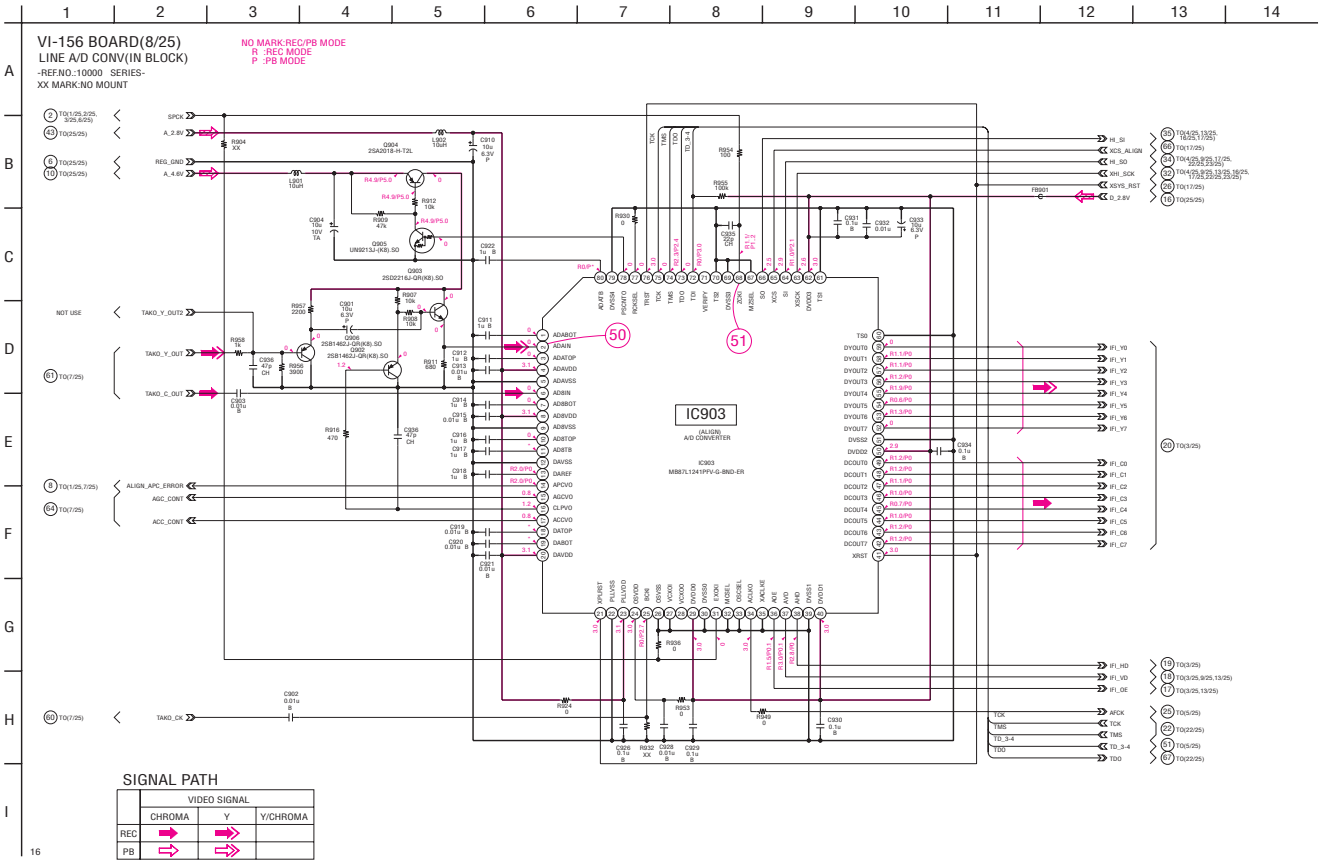
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For Schematic Diagram
- Refer to page 4-63 for printed wiring board.
- Refer to page 4-123 for waveforms.



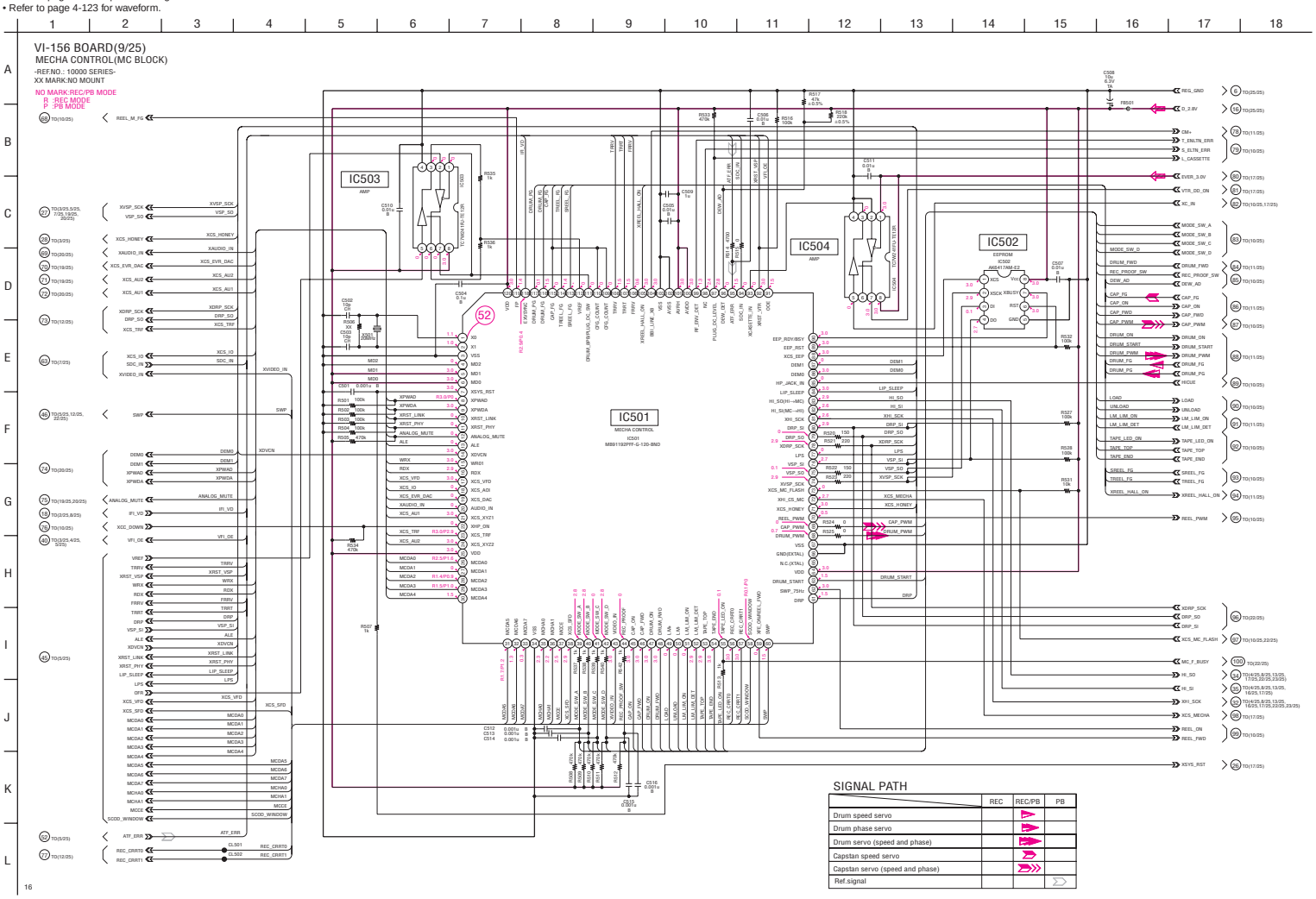
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For Schematic Diagram
- Refer to page 4-63 for printed wiring board.
- Refer to page 4-123 for waveforms.



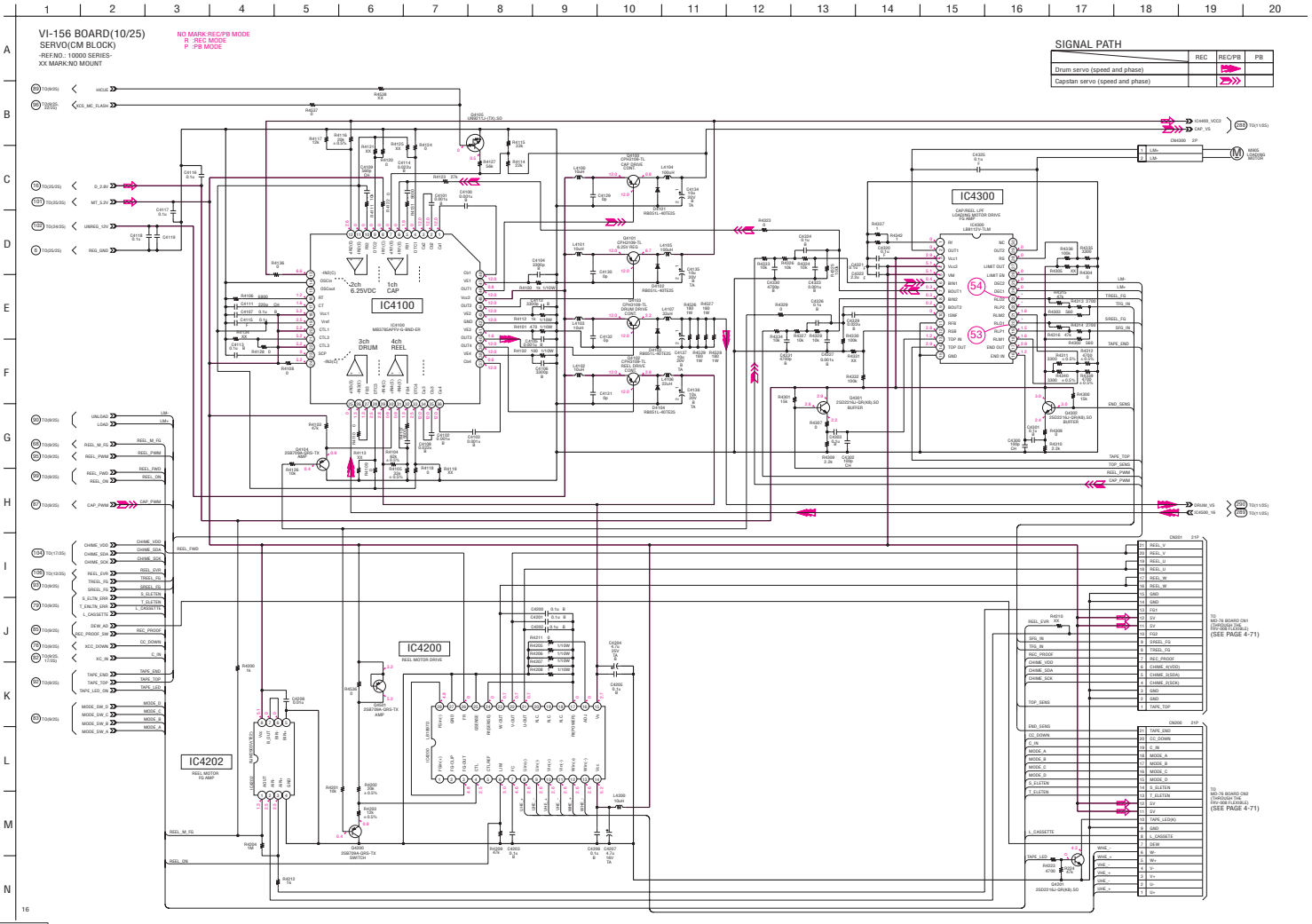
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For Schematic Diagram
- Refer to page 4-63 for printed wiring board.
- Refer to page 4-123 for waveform.



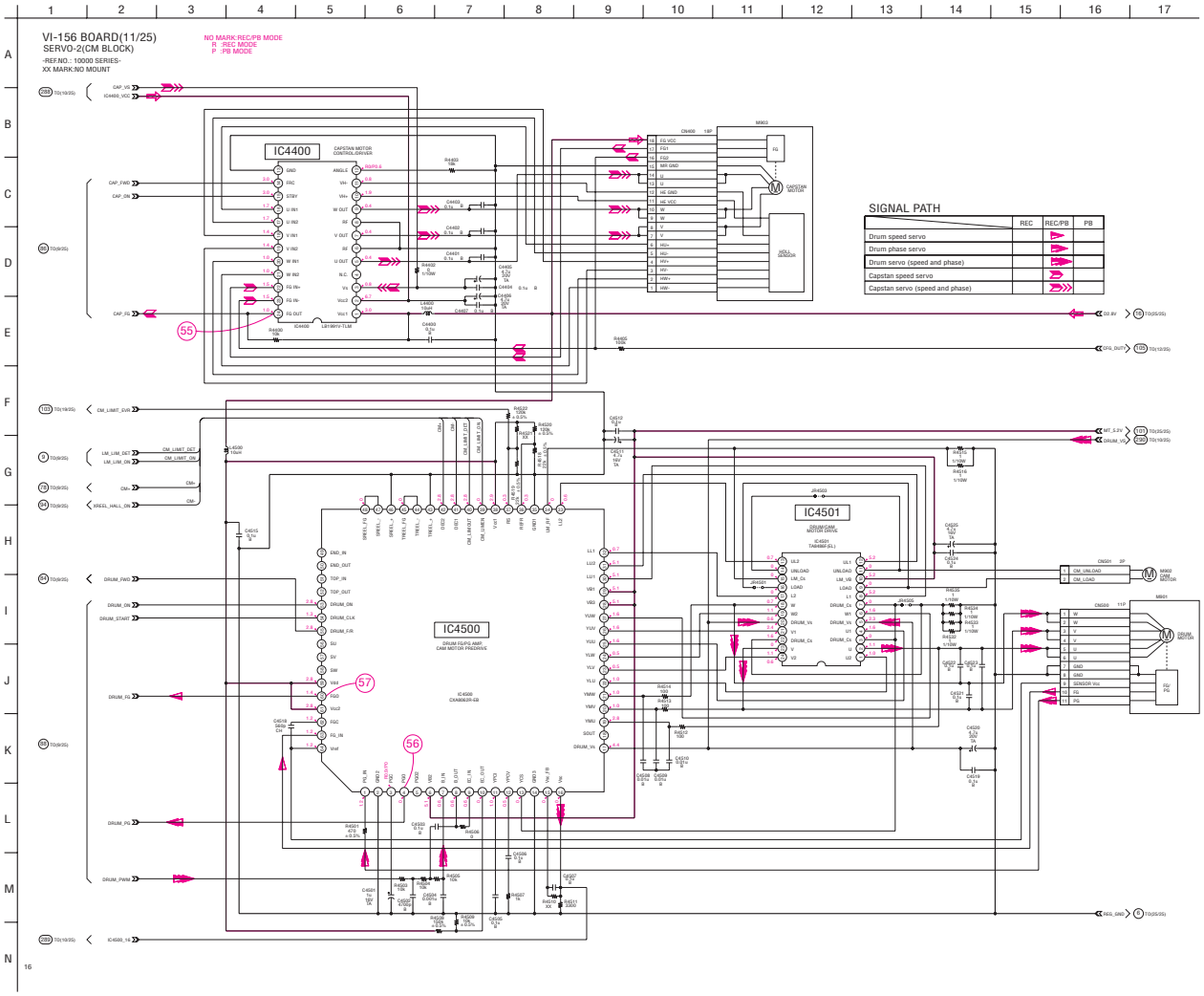
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For Schematic Diagram
- Refer to page 4-63 for printed wiring board.
- Refer to page 4-123 for waveforms.



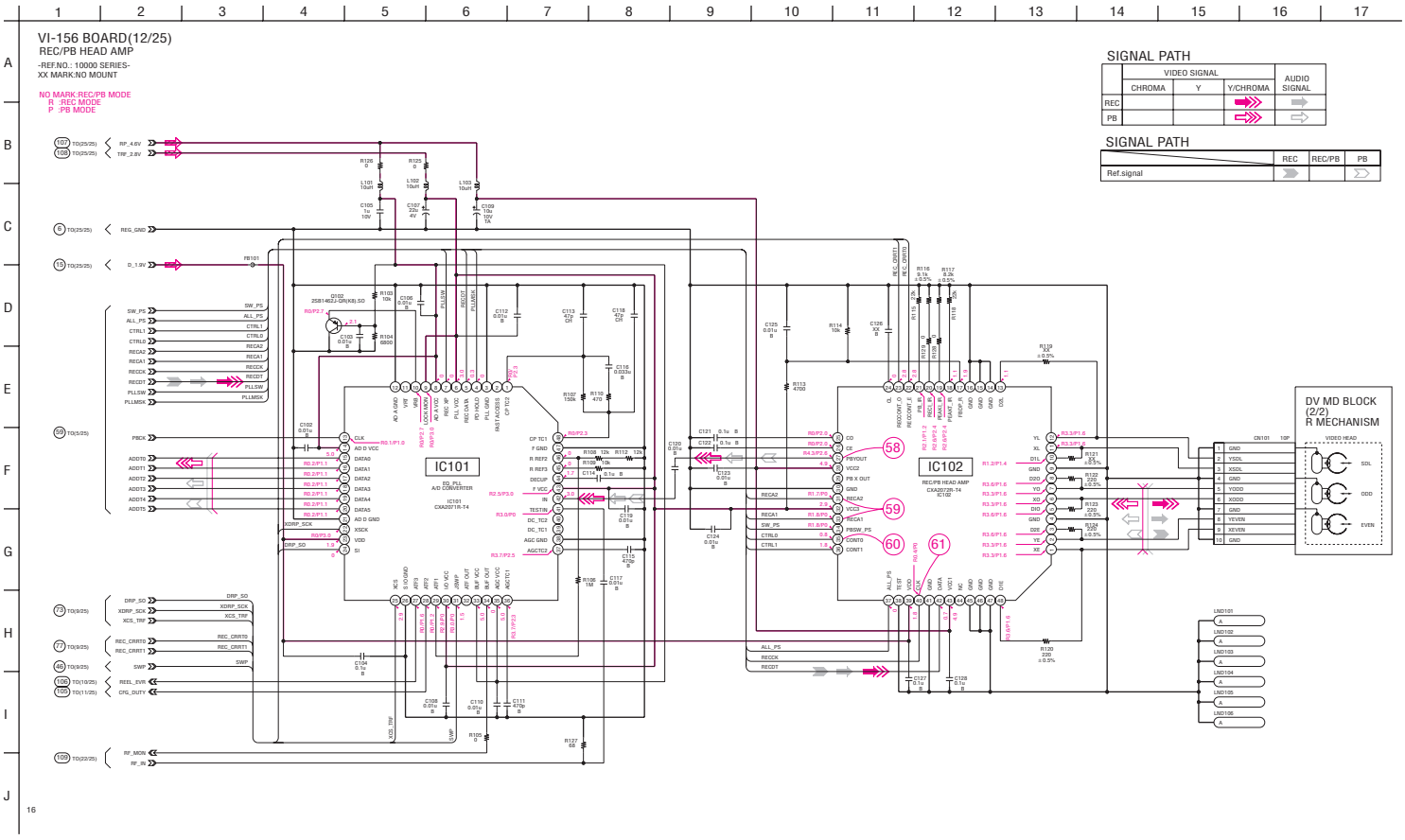
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For Schematic Diagram
- Refer to page 4-63 for printed wiring board.
- Refer to page 4-123 for waveforms.



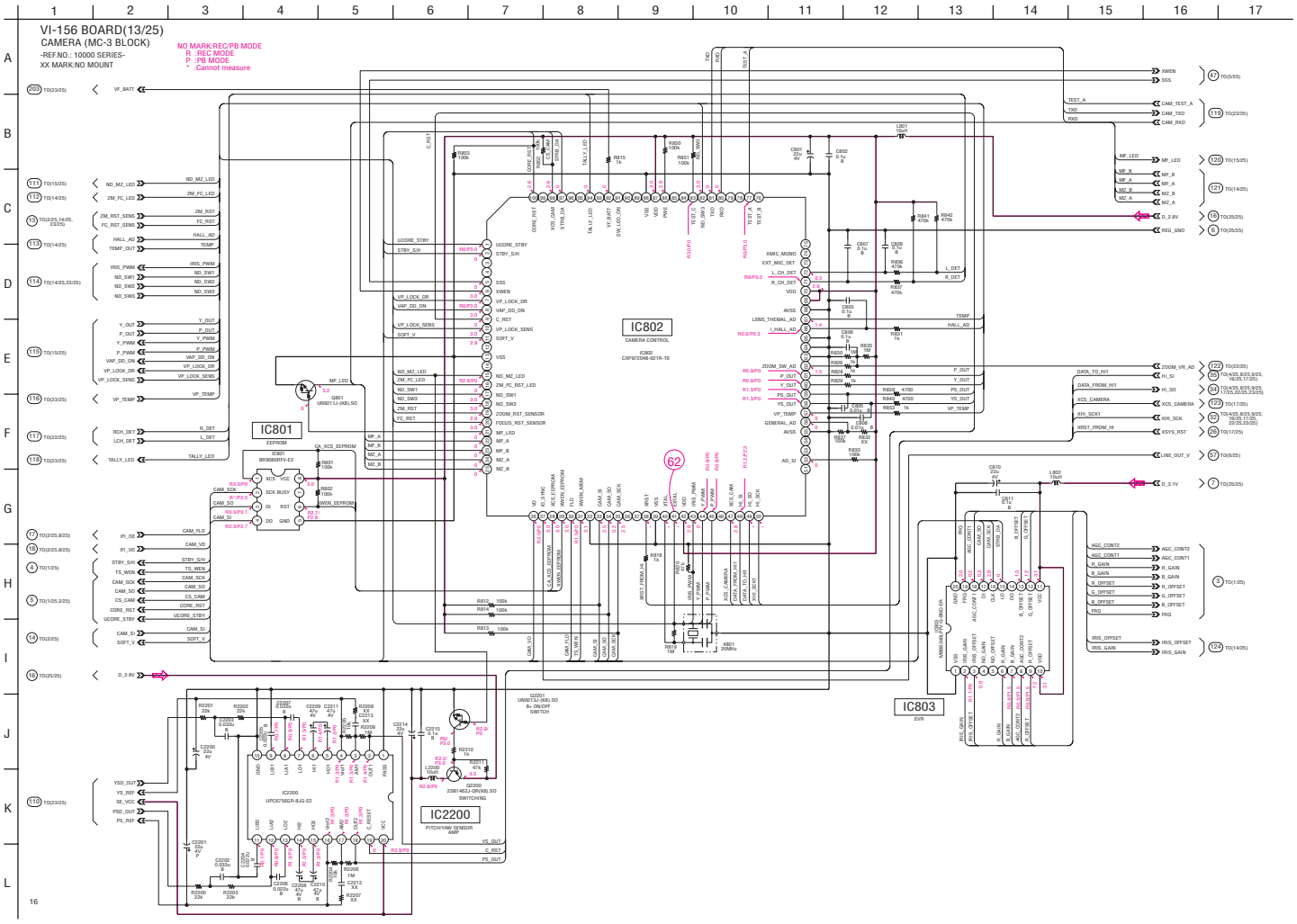
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For Schematic Diagram
- Refer to page 4-63 for printed wiring board.
- Refer to page 4-123 for waveforms.



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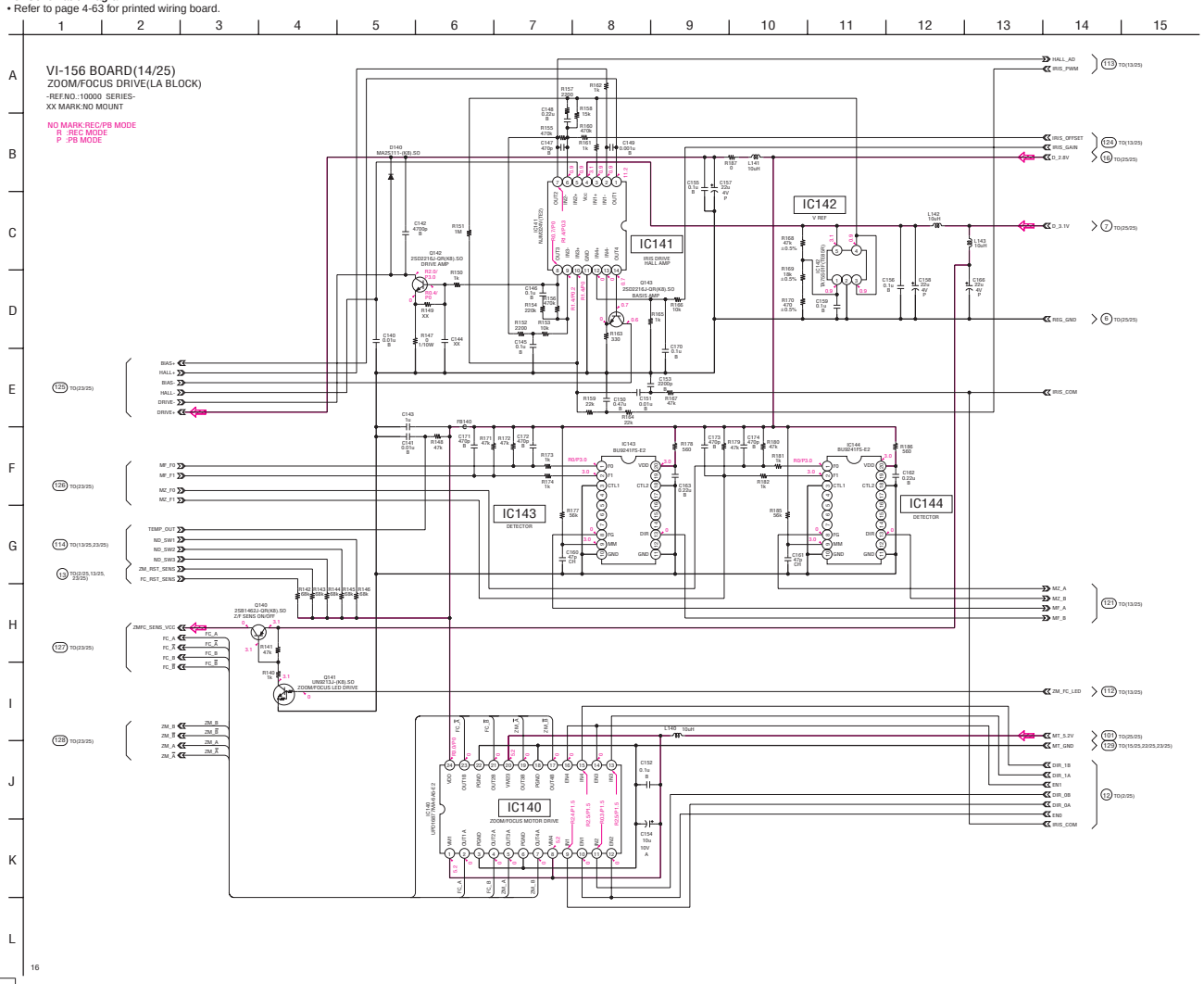
For Schematic Diagram
- Refer to page 4-63 for printed wiring board.
- Refer to page 4-123 for waveforms.



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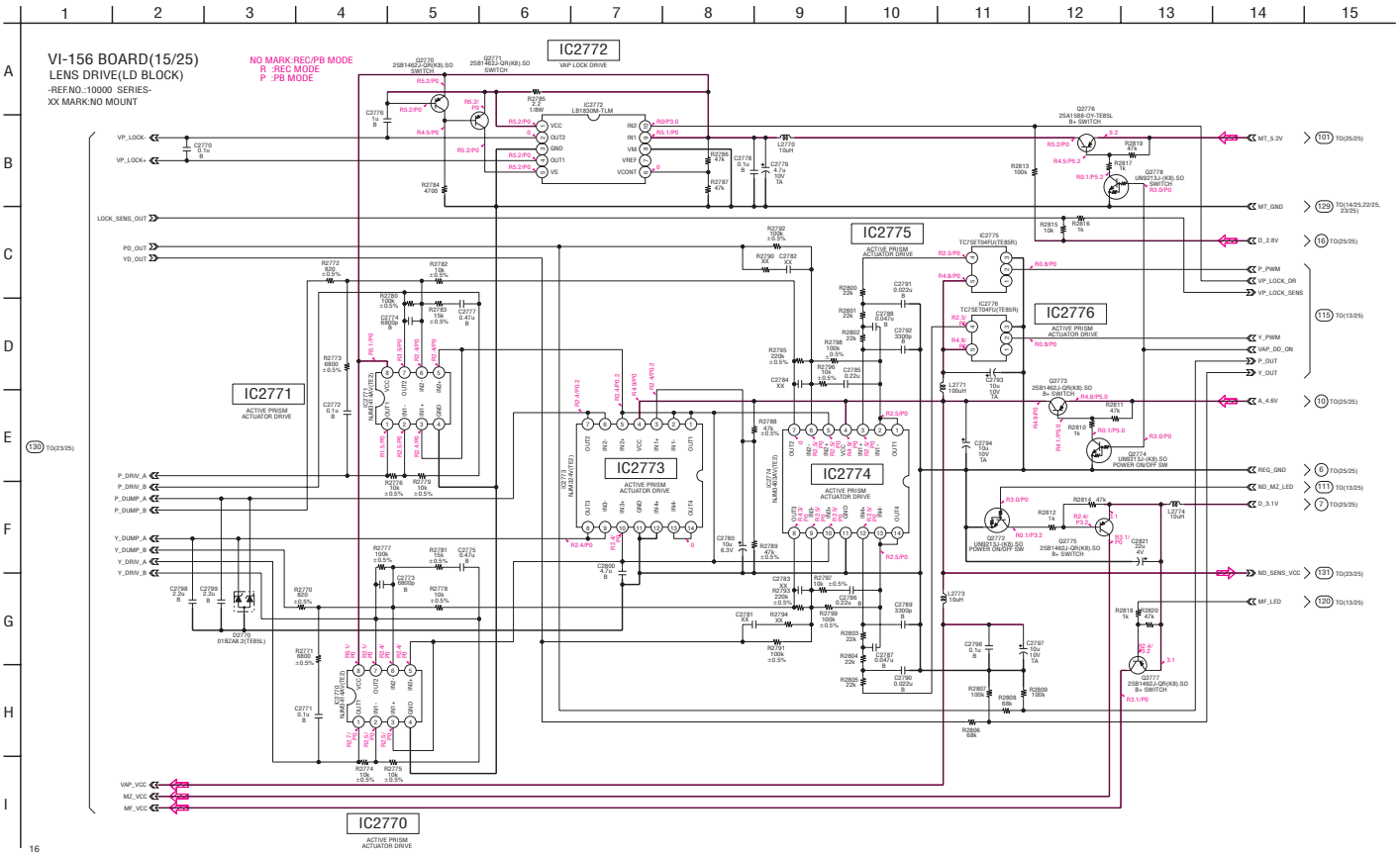
For Schematic Diagram

• Refer to page 4-63 for printed wiring board.



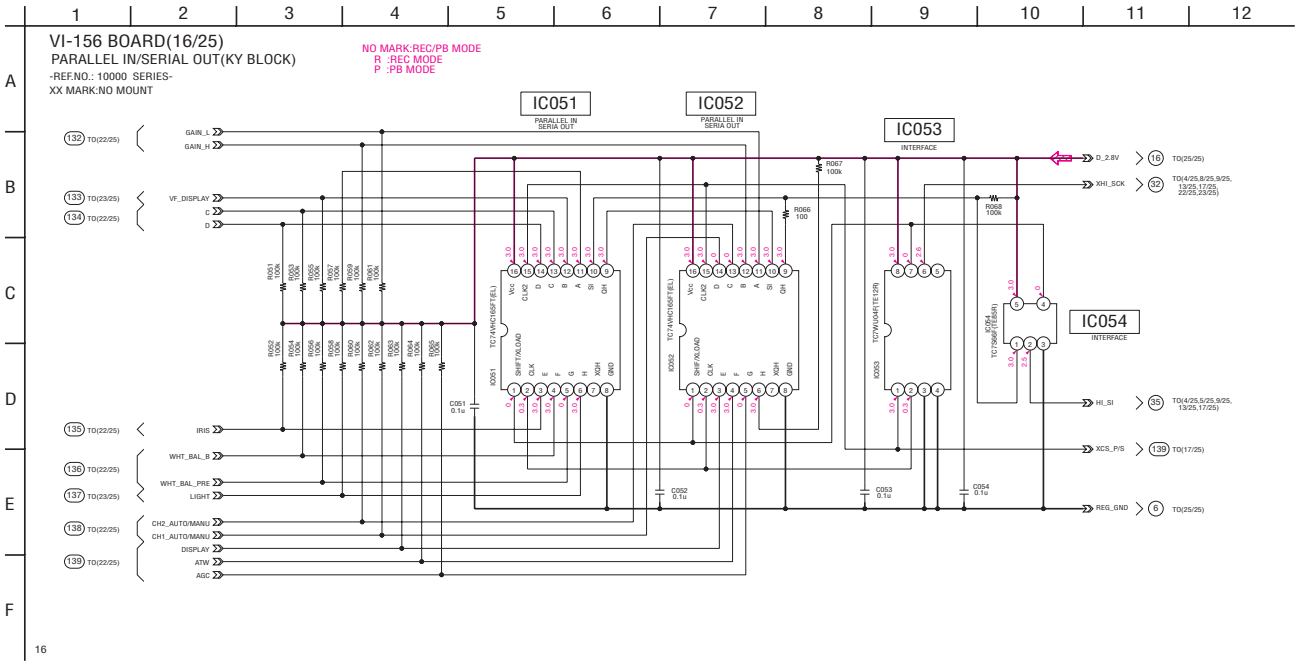
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For Schematic Diagram
• Refer to page 4-63 for printed wiring board.



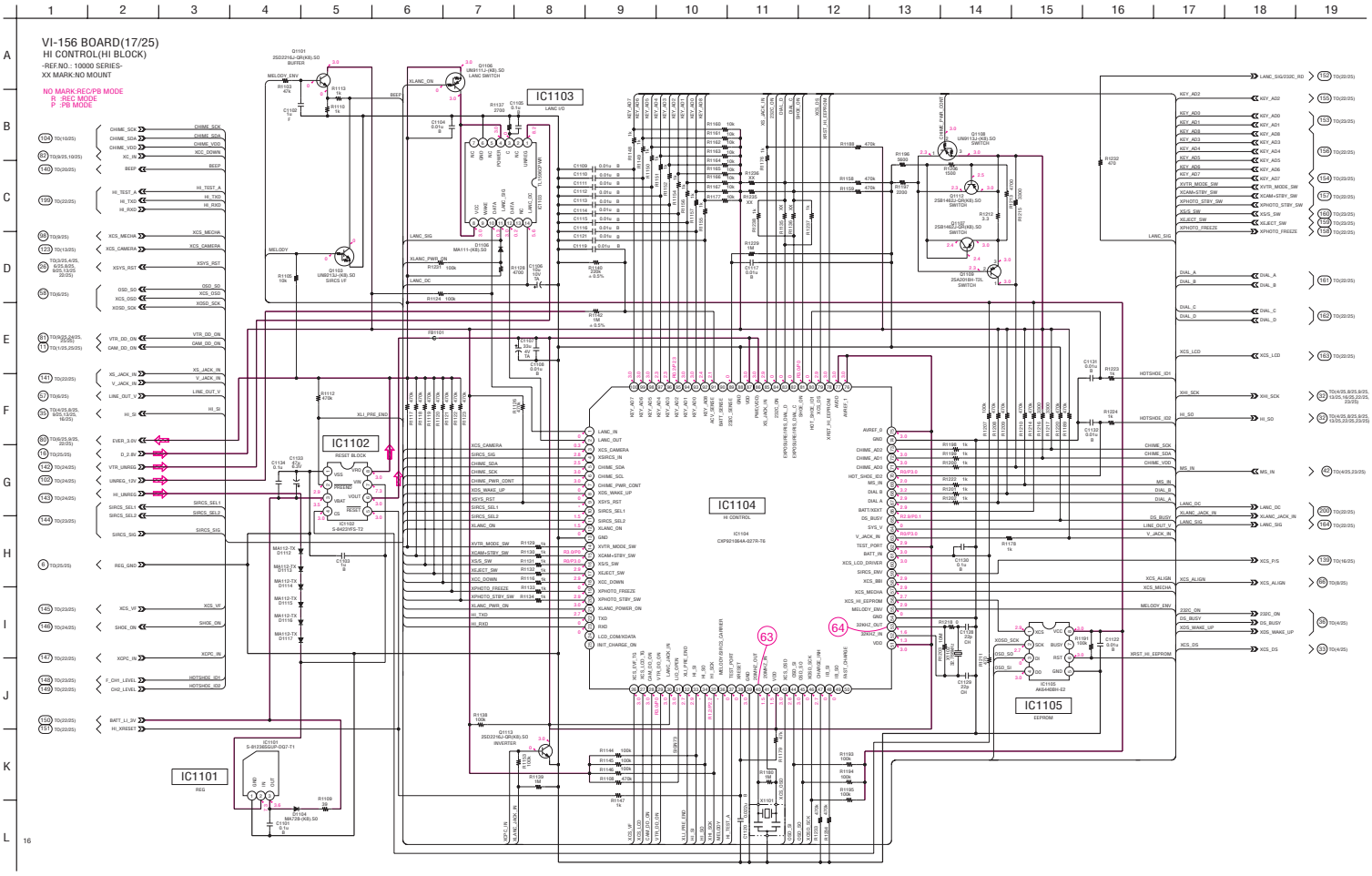
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For Schematic Diagram
• Refer to page 4-63 for printed wiring board.



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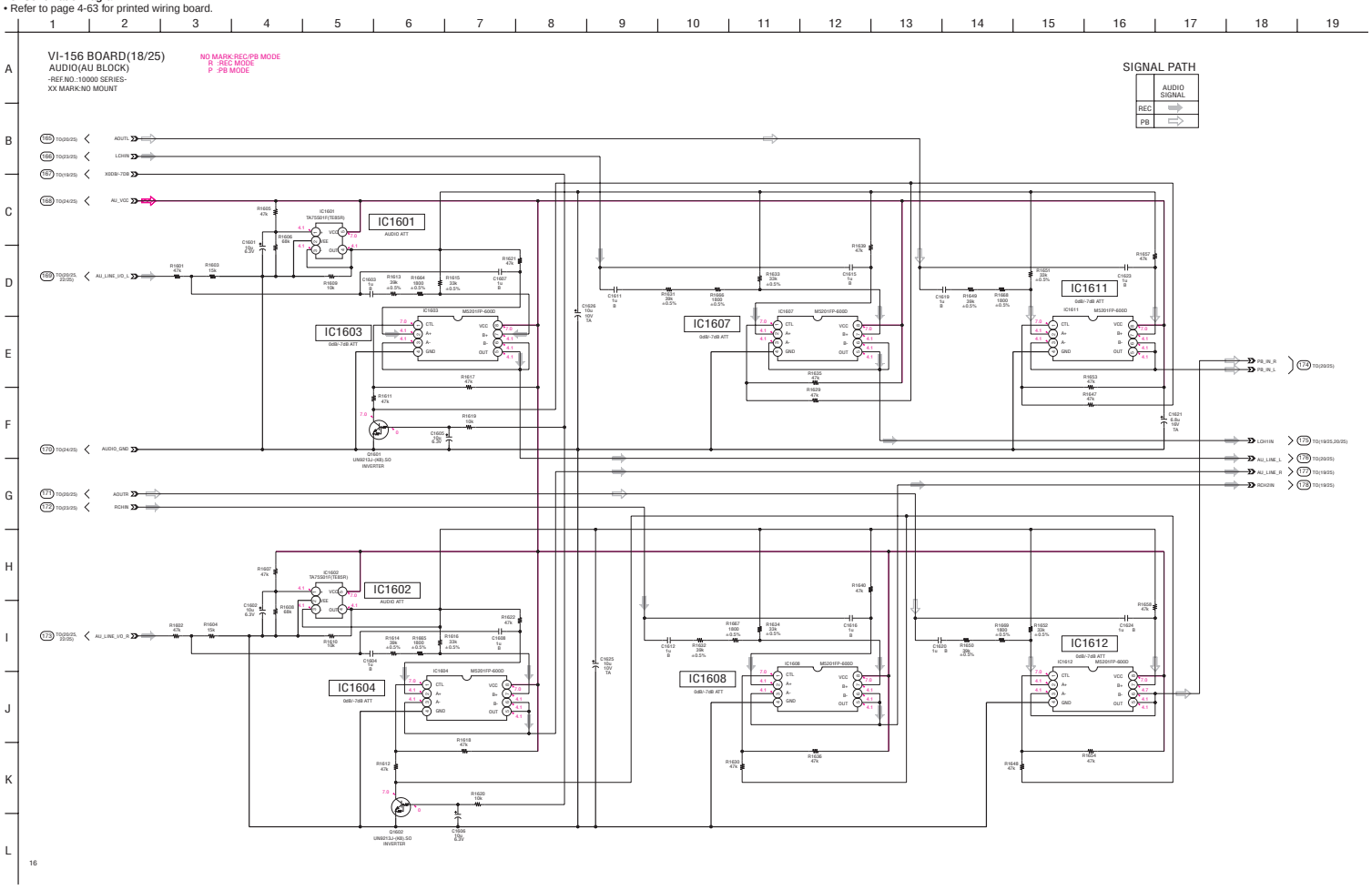
For Schematic Diagram
- Refer to page 4-63 for printed wiring board.
- Refer to page 4-123 for waveforms.



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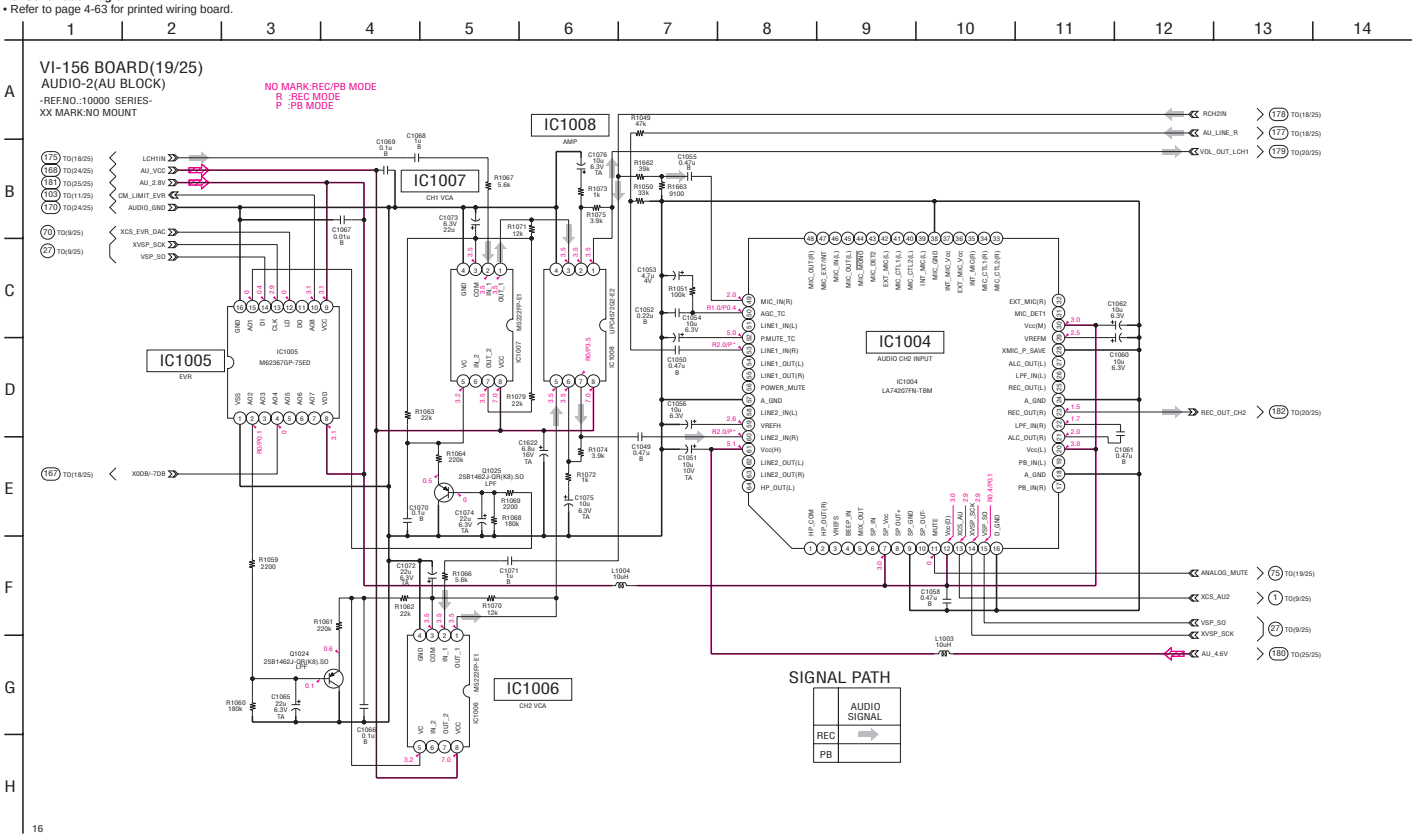
For Schematic Diagram

• Refer to page 4-63 for printed wiring board.



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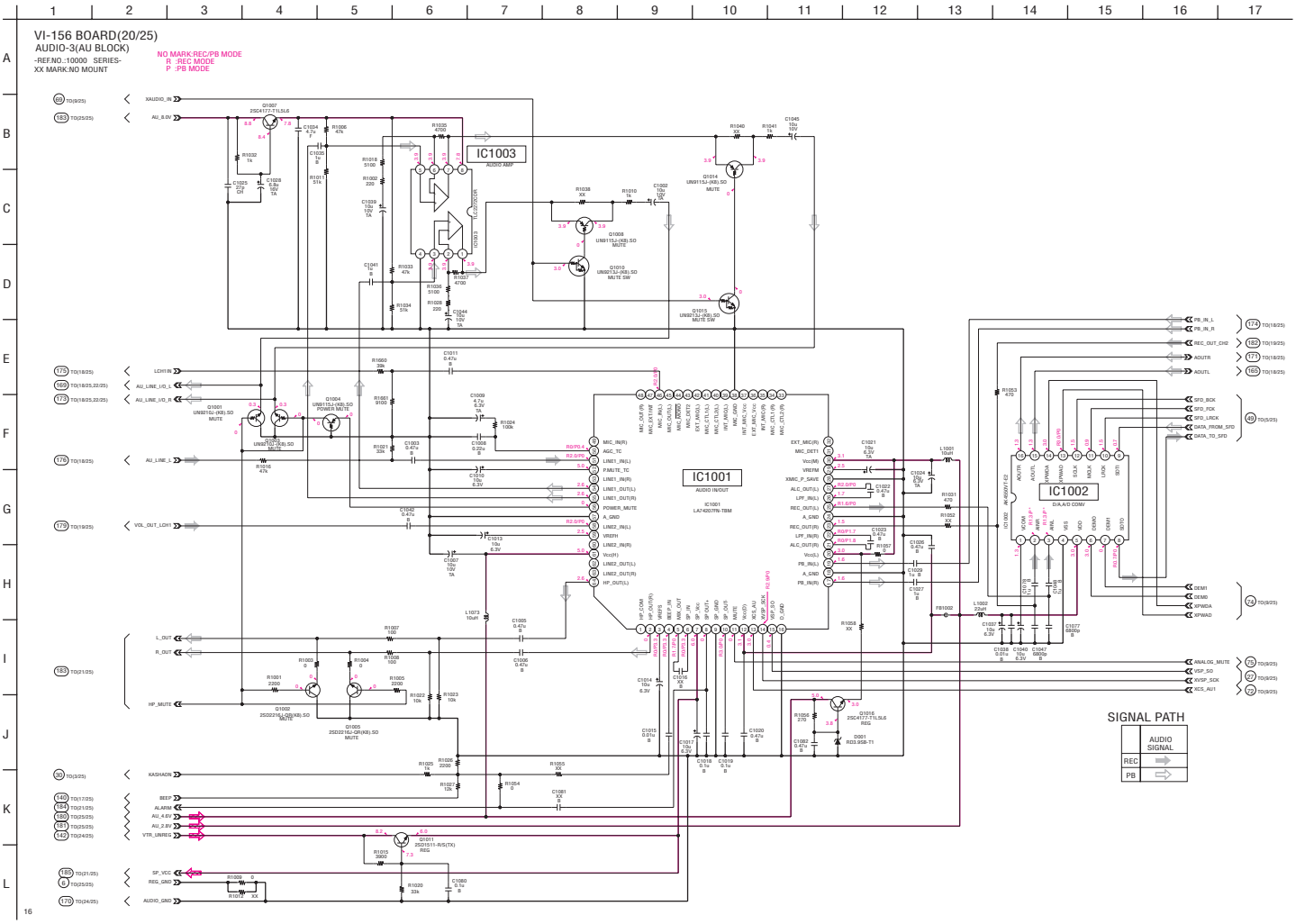
For Schematic Diagram
• Refer to page 4-63 for printed wiring board.



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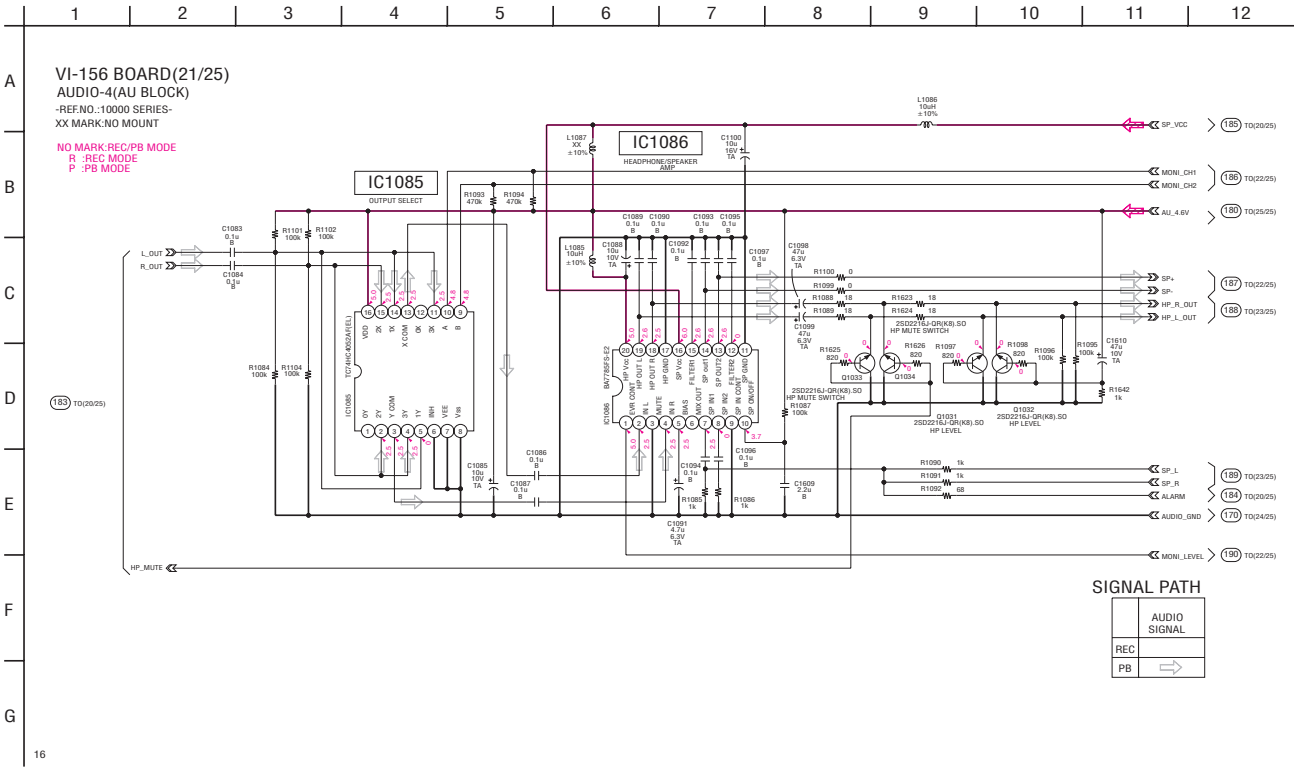
For Schematic Diagram

• Refer to page 4-63 for printed wiring board.



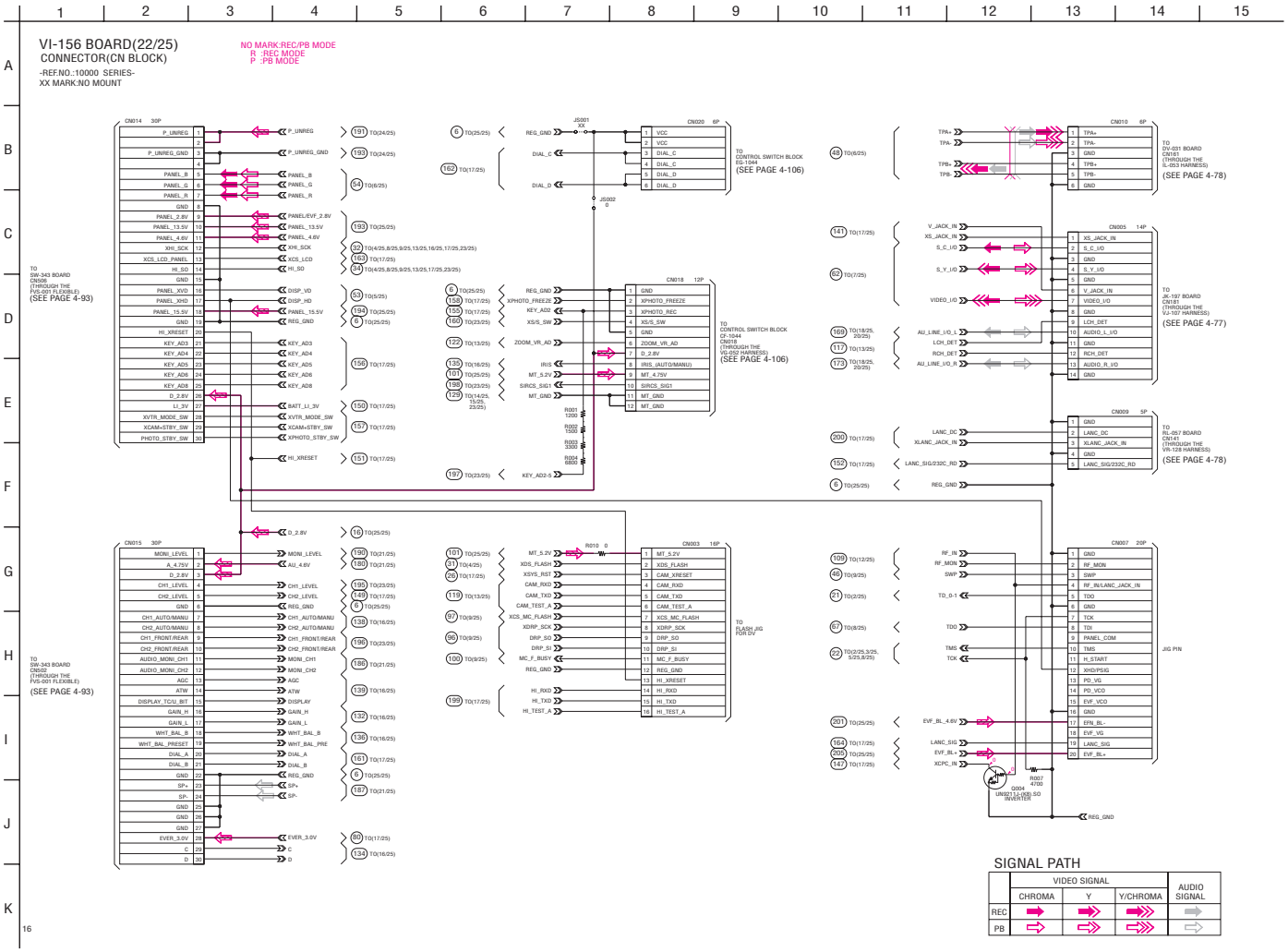
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For Schematic Diagram
• Refer to page 4-63 for printed wiring board.



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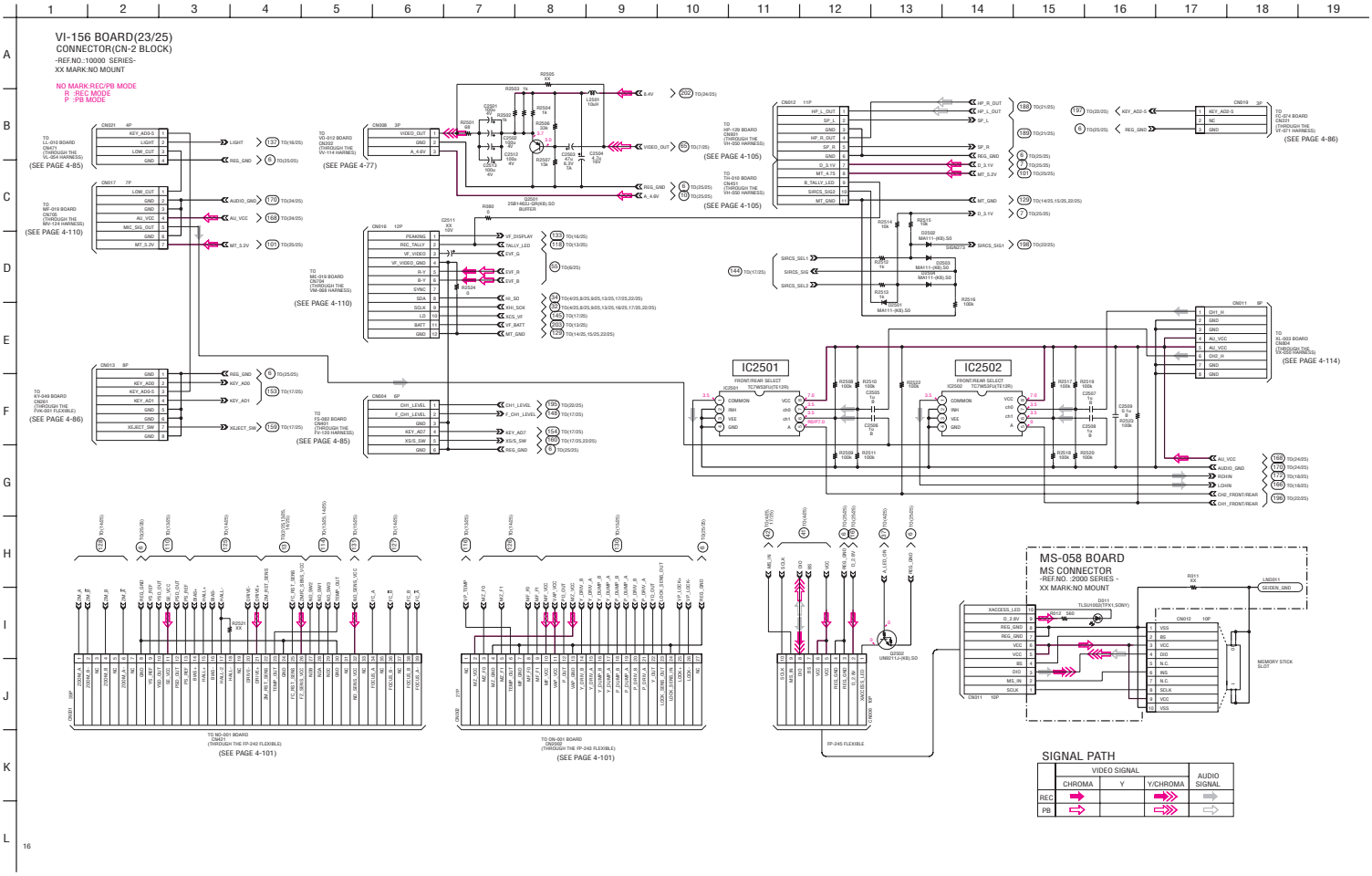
For Schematic Diagram
• Refer to page 4-63 for printed wiring board.



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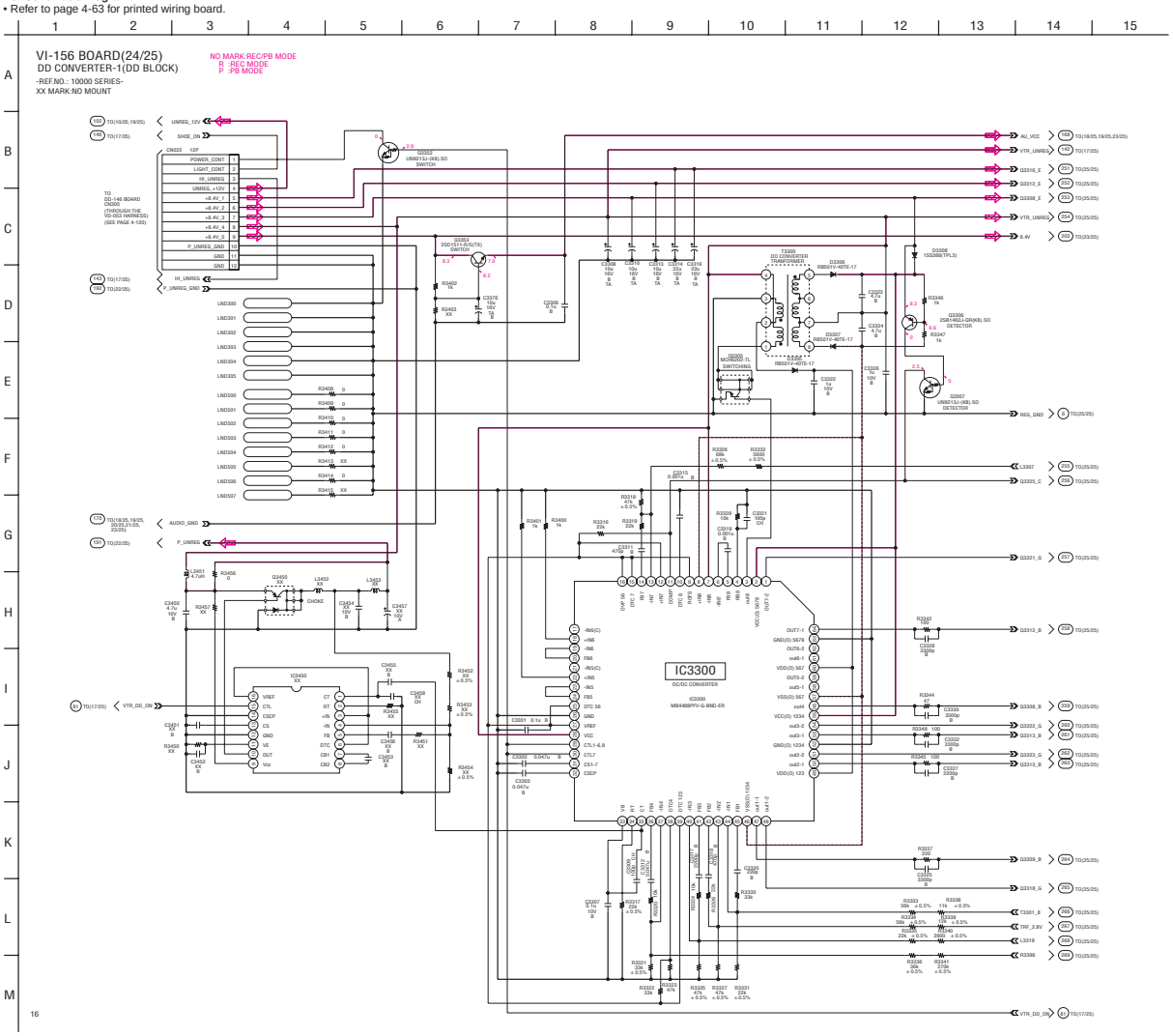
For Schematic Diagram

- Refer to page 4-63 for printed wiring board.
- Refer to page 4-67 for MS-058 printed wiring board.



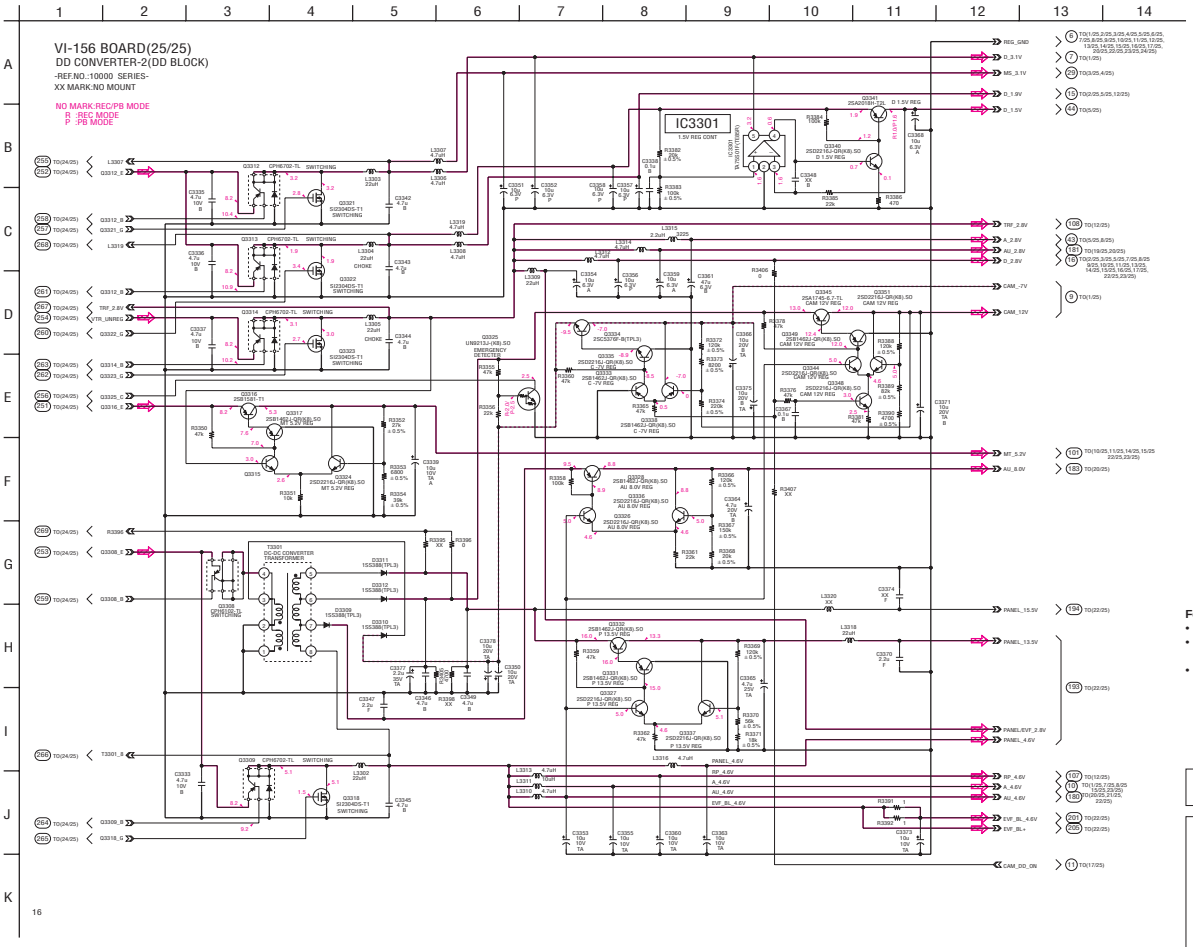
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For Schematic Diagram
• Refer to page 4-63 for printed wiring board.

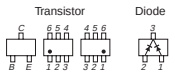


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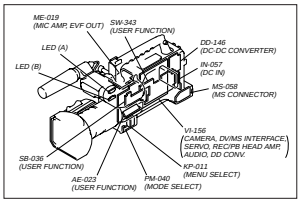
For Schematic Diagram
• Refer to page 4-63 for printed wiring board.



For printed wiring board
• Refer to pages 4-125 to 127 for parts location.
• VI-156 board consists of multiple layers. However, only the sides (layers) A and B are shown.
• Chip parts



There are few cases that the part printed on this diagram isn't mounted in this model.



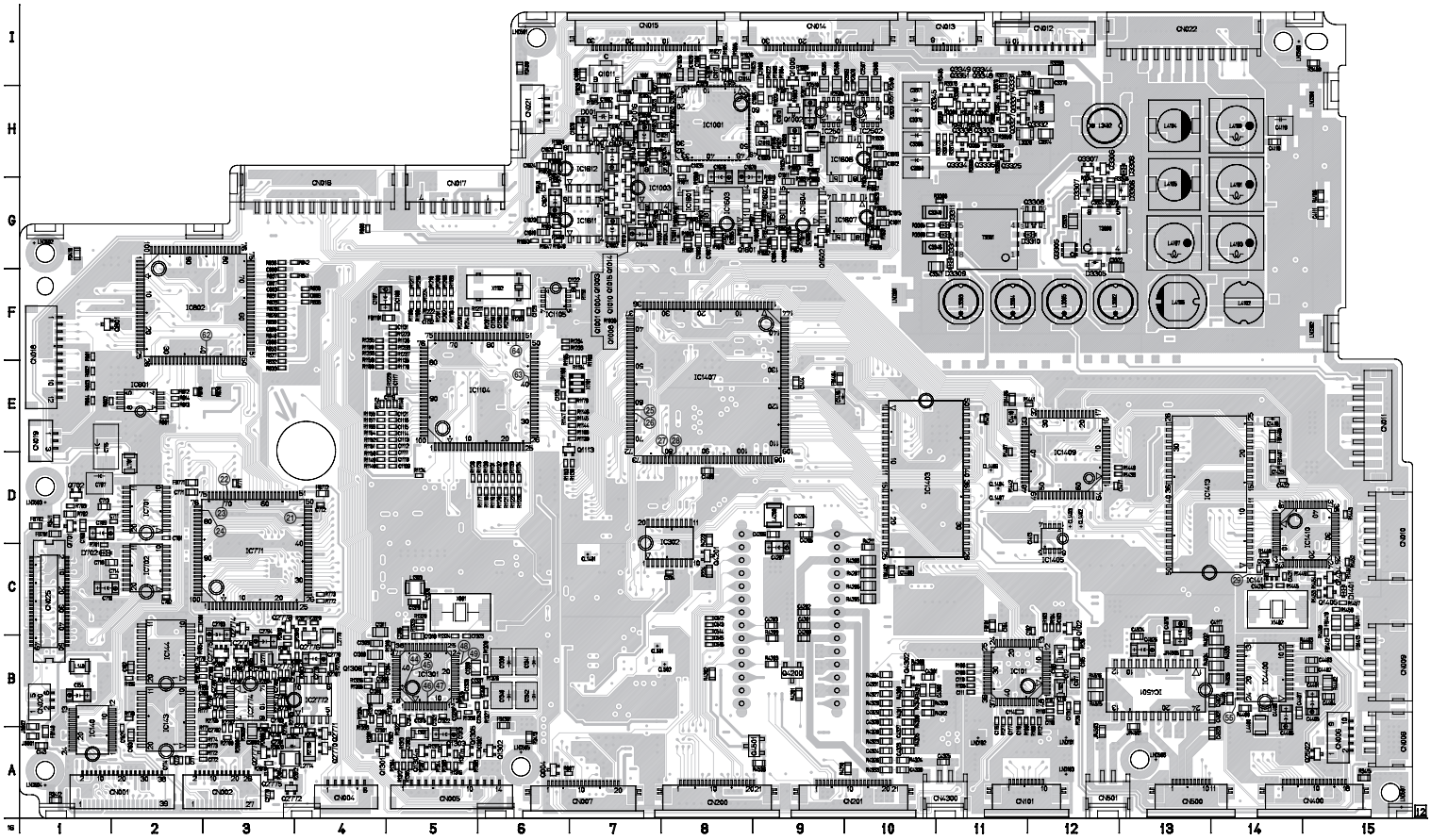
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VI-156 (CAMERA, DV/MS INTERFACE, SERVO, REC/PB HEAD AMP, AUDIO, DD CONV.) PRINTED WIRING BOARD

— Ref. No. VI-156 Board; 10,000 Series —

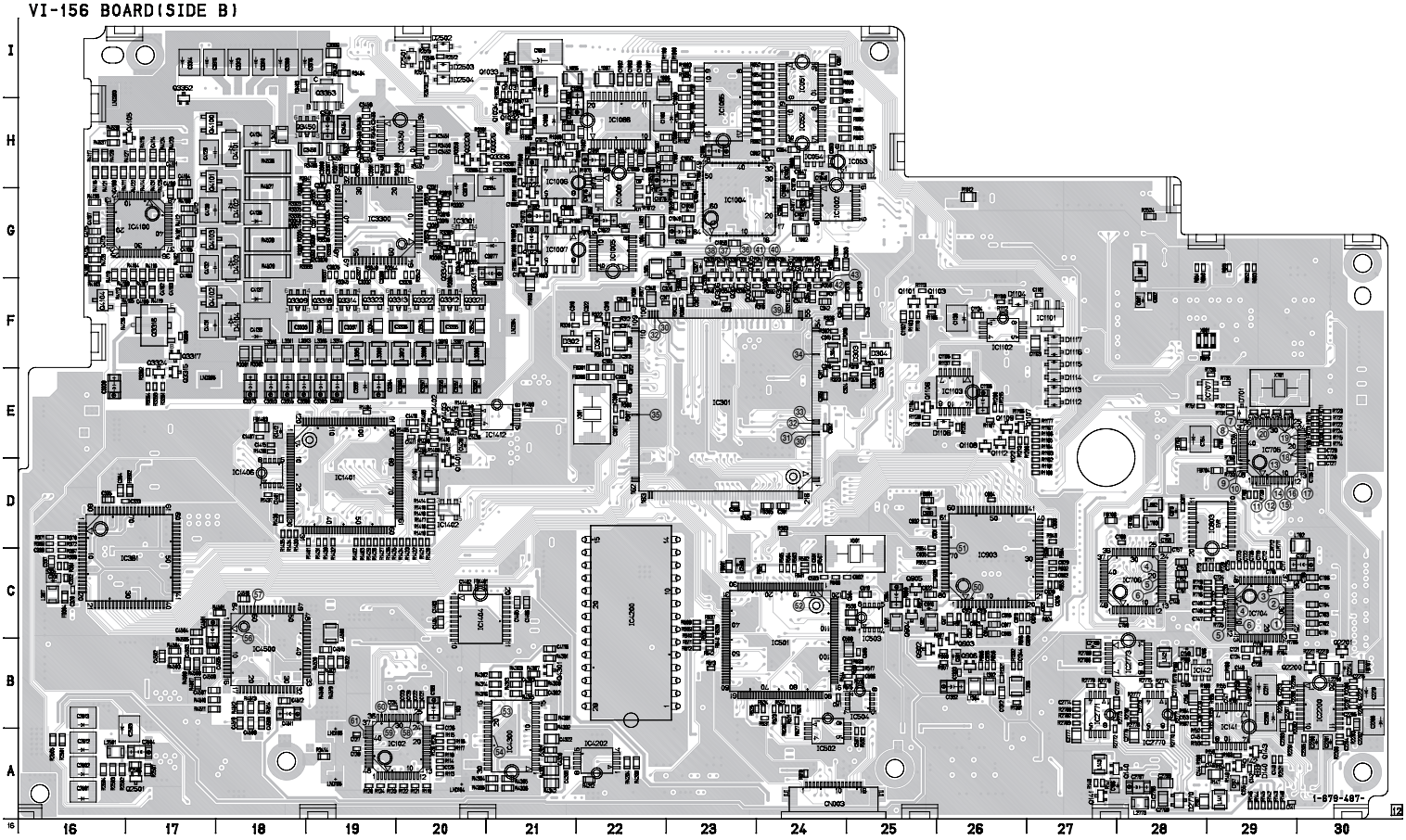
• Refer to page 4-62 for Note and Circuit boards location.

VI-156 BOARD(SIDE A)



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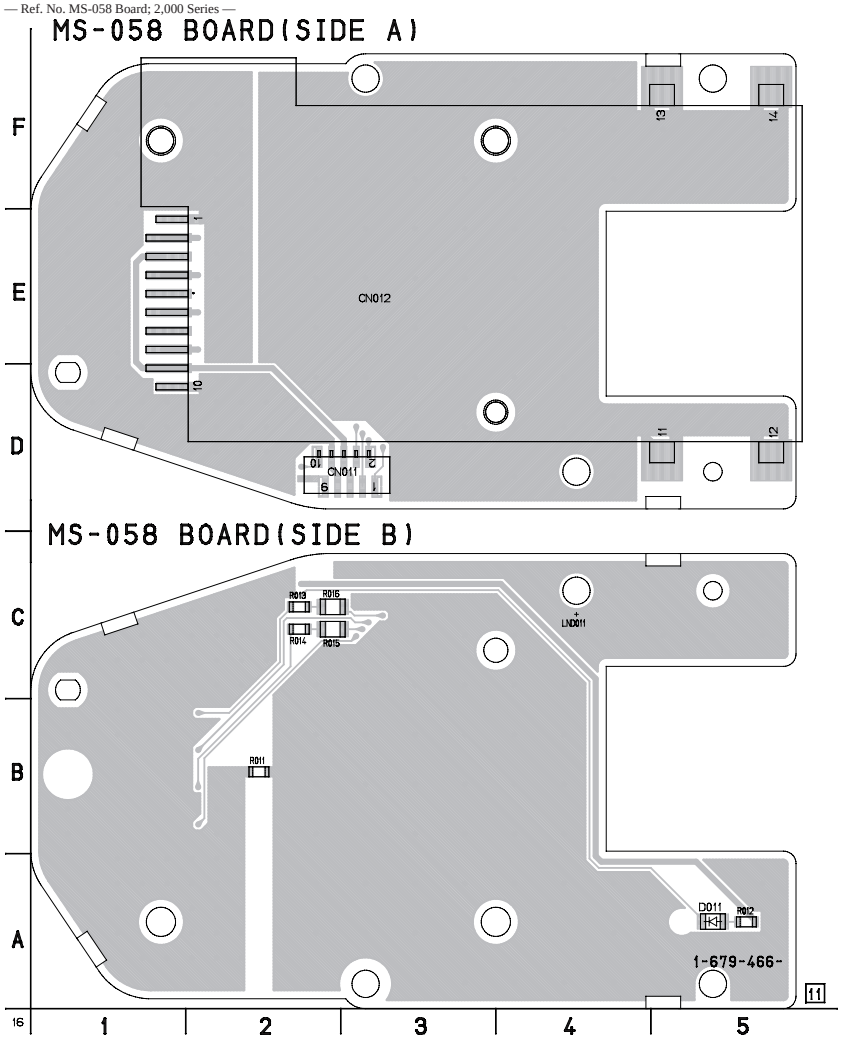
VI-156 BOARD(SIDE B)



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MS-058 (MS CONNECTOR) PRINTED WIRING BOARD

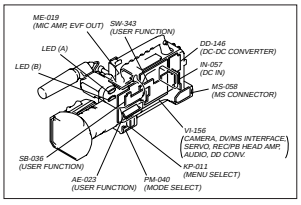
— Ref. No. MS-058 Board; 2,000 Series —



For printed wiring board

- Refer to page 4-128 for parts location.
- MS-058 board consists of multiple layers. However, only the sides (layers) A and B are shown.

There are few cases that the part printed on this diagram isn't mounted in this model.

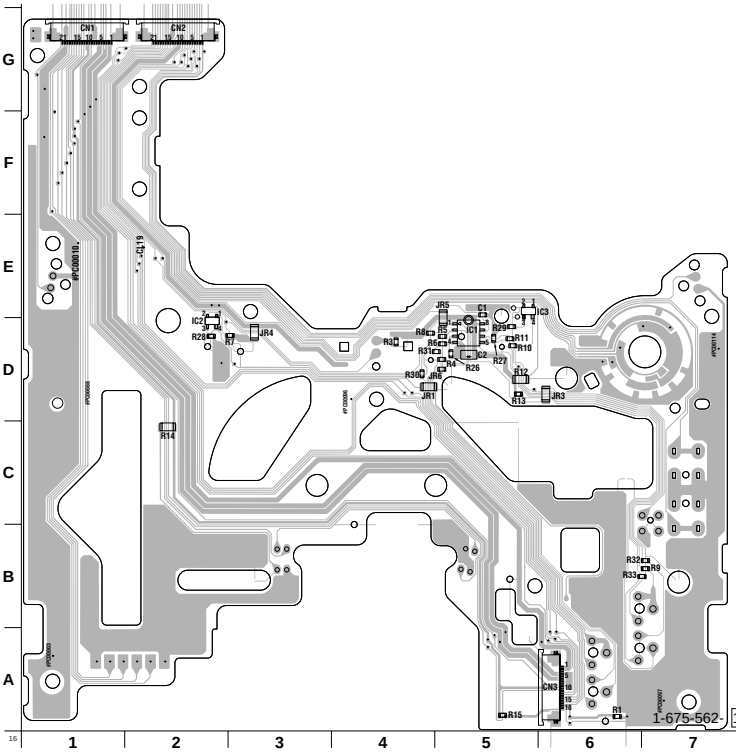


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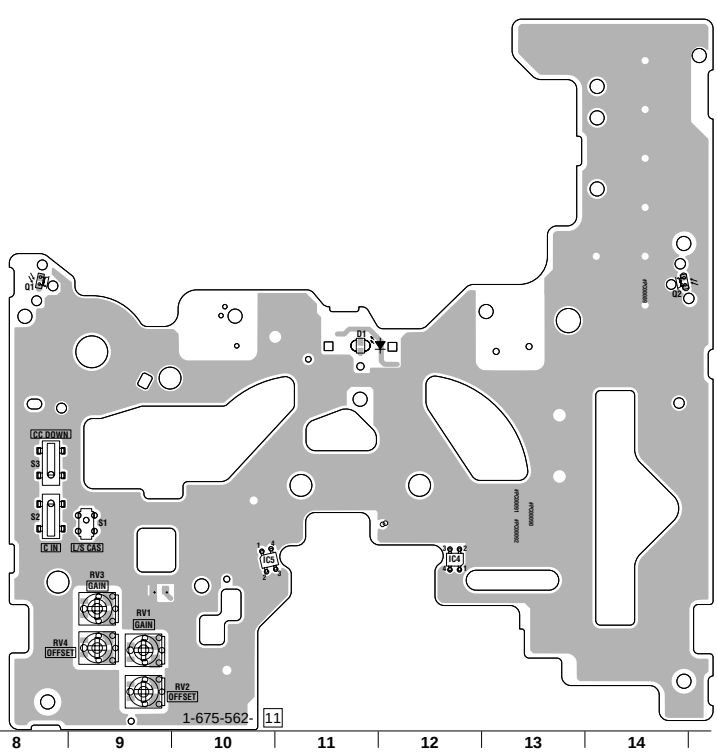
MD-76 (MODE SENSOR) PRINTED WIRING BOARD

— Ref. No. MD-76 Board; 3,000 Series —

MD-76 BOARD (SIDE A)



MD-76 BOARD (SIDE B)



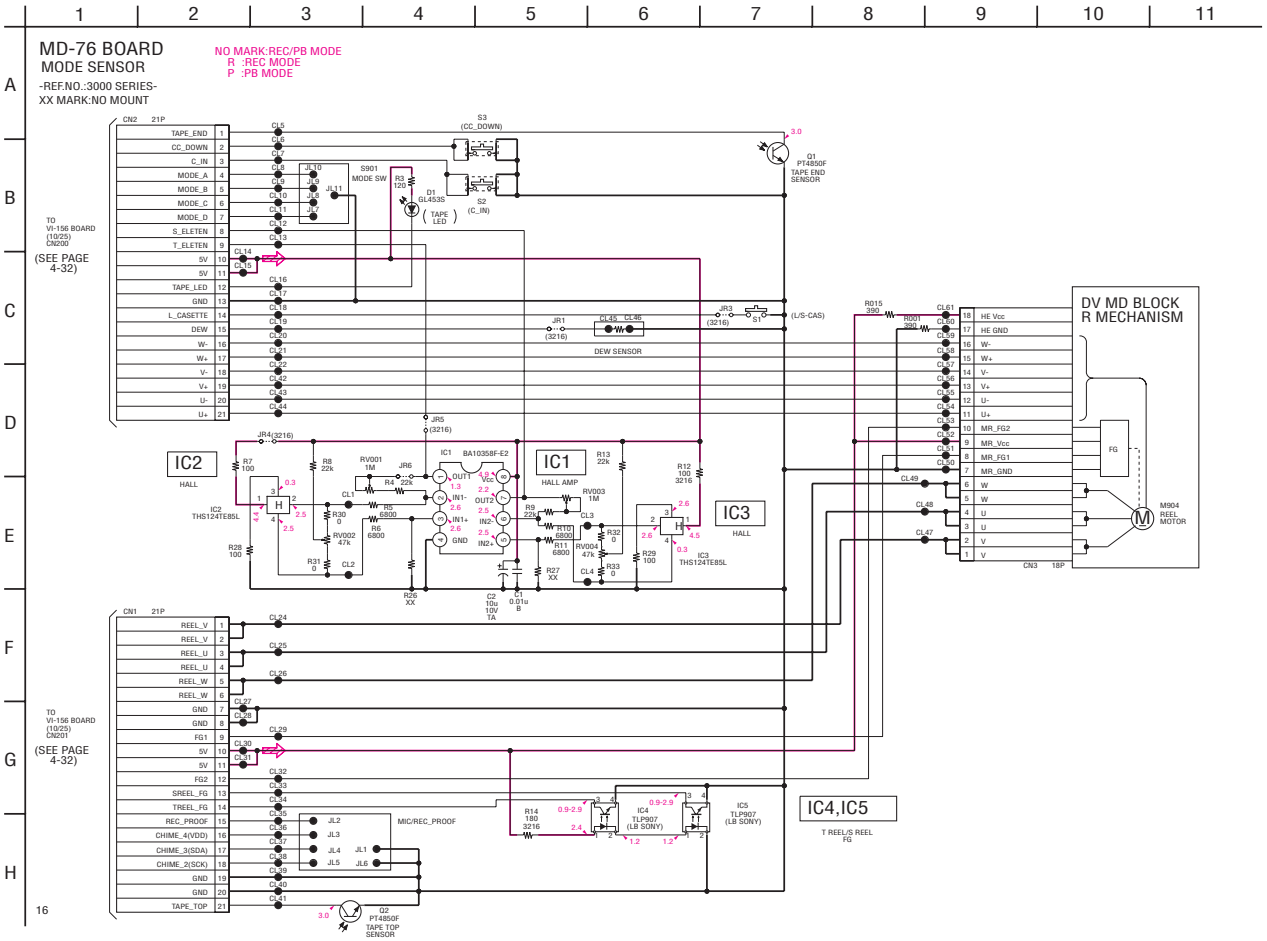
For printed wiring board

- Refer to page 4-128 for parts location.
- MD-76 board consists of multiple layers. However, only the sides (layers) A and B are shown.

There are few cases that the part printed on this diagram isn't mounted in this model.

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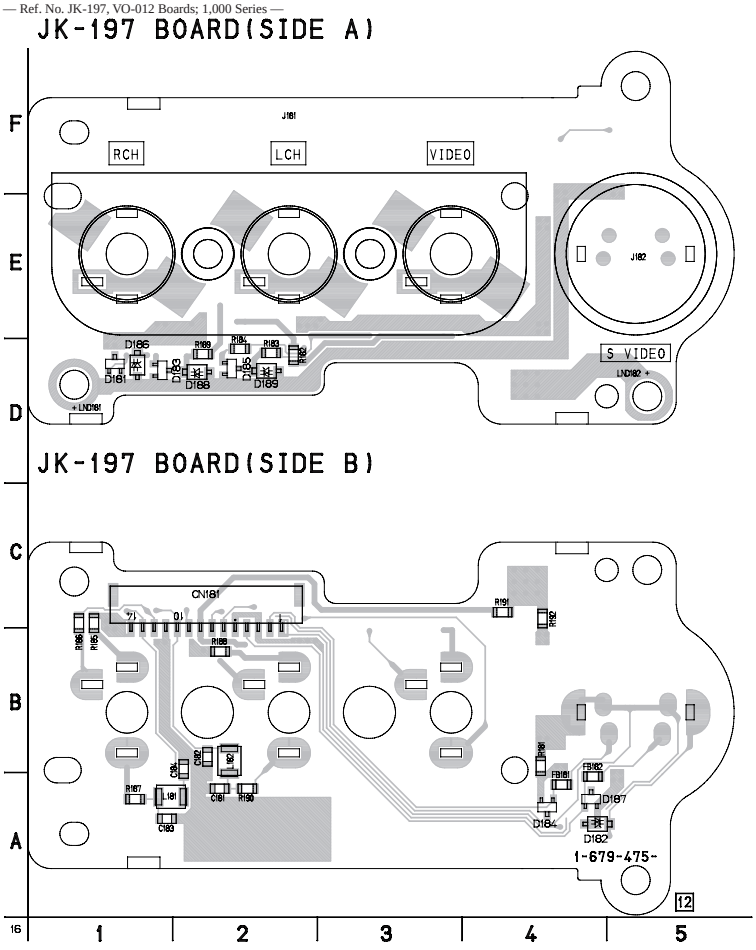
For Schematic Diagram
• Refer to page 4-69 for printed wiring board.

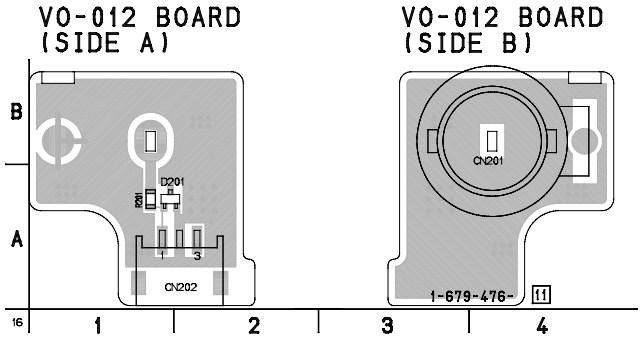


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JK-197 (VIDEO/AUDIO IN/OUT), VO-012 (VIDEO OUT) PRINTED WIRING BOARDS

— Ref. No. JK-197, VO-012 Boards; 1,000 Series —





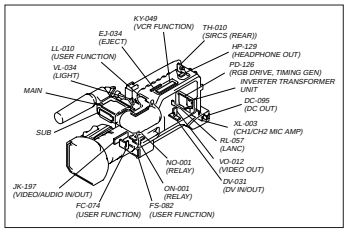
For printed wiring board

- Refer to page 4-128 for parts location.
- JK-197, VO-012 boards consists of multiple layers. However, only the sides (layers) A and B are shown.
- Chip parts

Diode



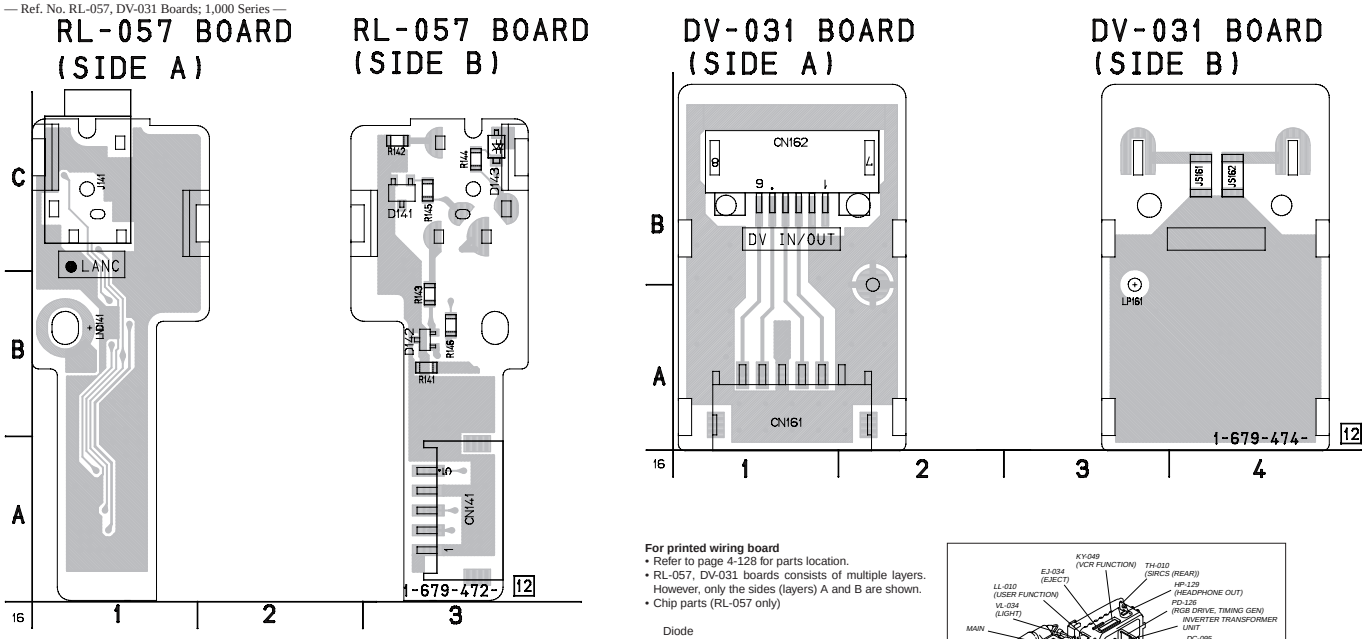
There are few cases that the part printed on this diagram isn't mounted in this model.



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RL-057 (LANC), DV-031 (DV IN/OUT) PRINTED WIRING BOARDS

— Ref. No. RL-057, DV-031 Boards; 1,000 Series —



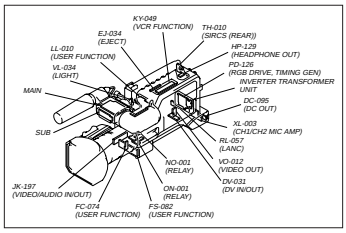
For printed wiring board

- Refer to page 4-128 for parts location.
- RL-057, DV-031 boards consists of multiple layers. However, only the sides (layers) A and B are shown.
- Chip parts (RL-057 only)

Diode

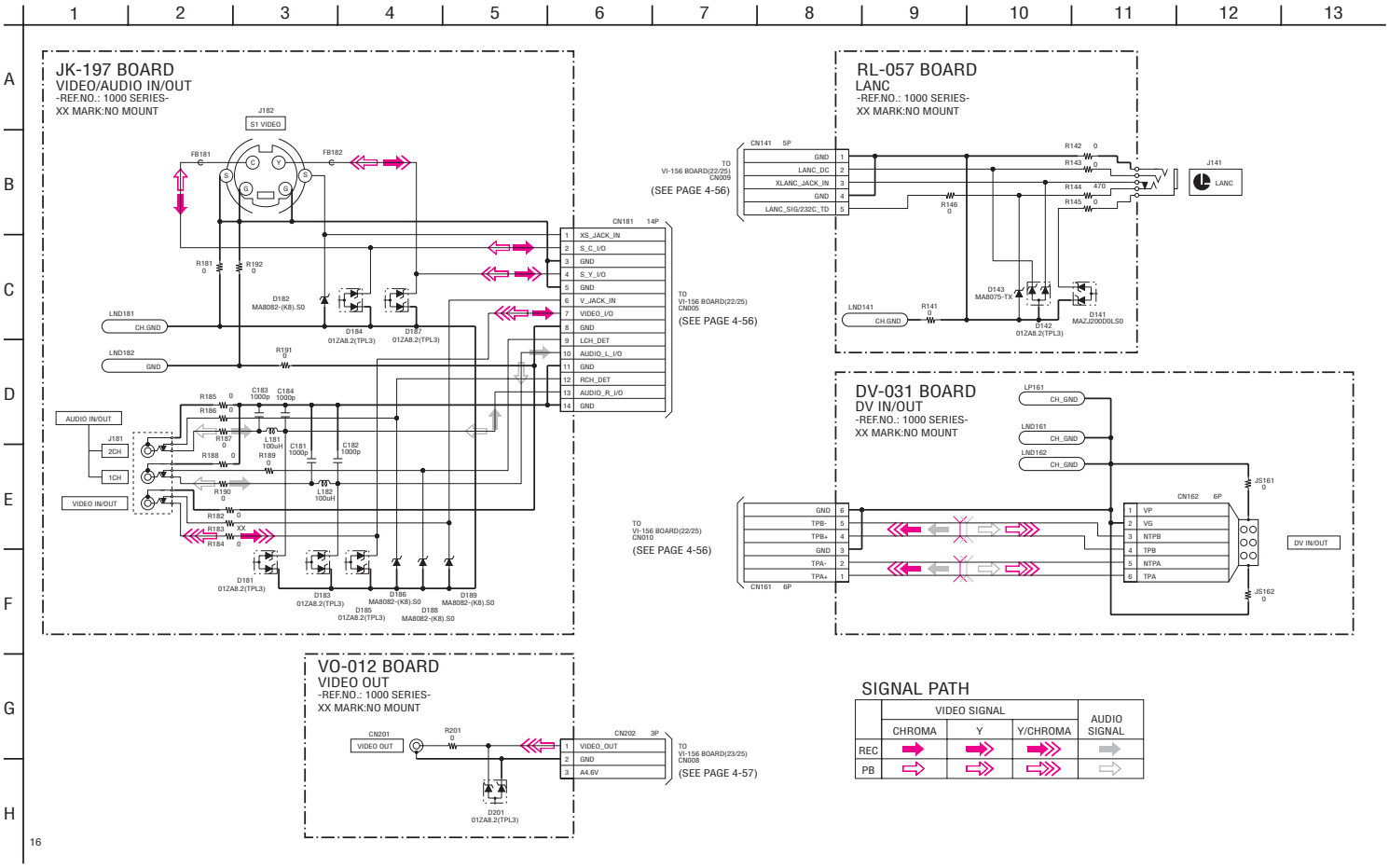


There are few cases that the part printed on this diagram isn't mounted in this model.



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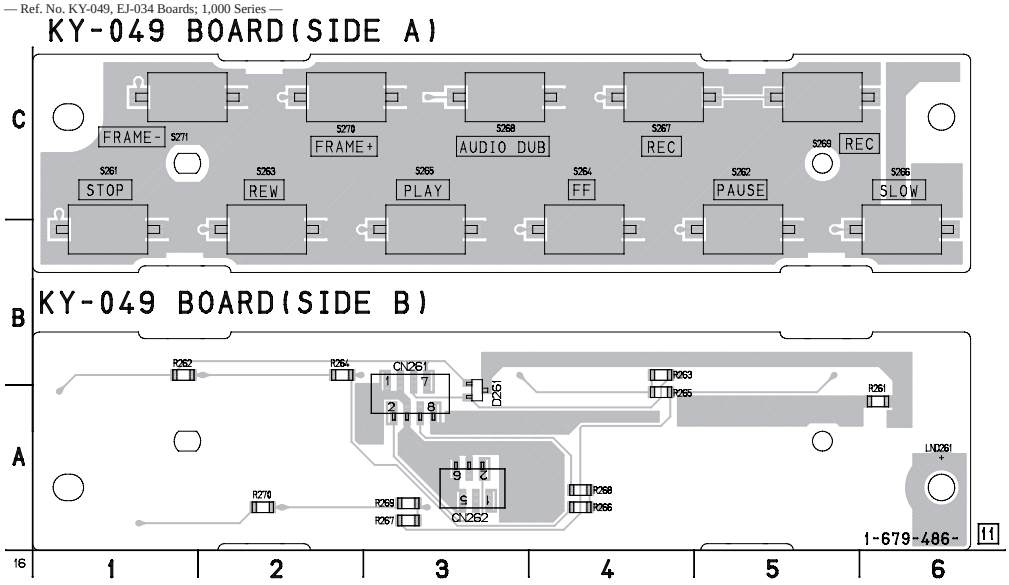
For Schematic Diagram
- Refer to page 4-73 for JK-197 printed wiring board.
- Refer to page 4-74 for VO-012 printed wiring board.



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KY-049 (VCR FUNCTION), EJ-034 (EJECT) PRINTED WIRING BOARDS

— Ref. No. KY-049, EJ-034 Boards; 1,000 Series —



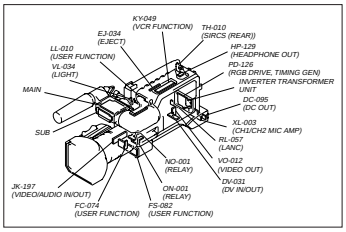
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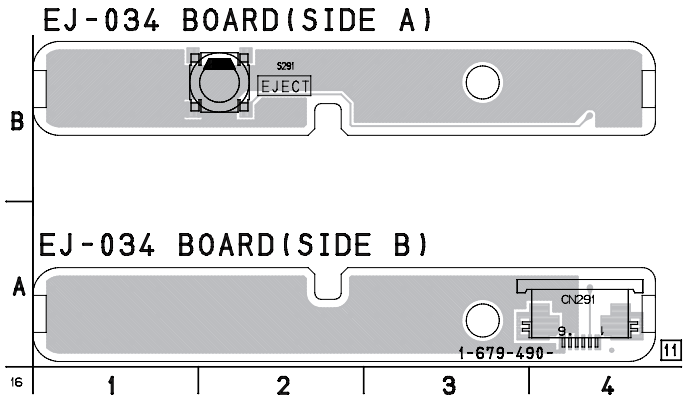
- Refer to page 4-128 for parts location.
- KY-049, EJ-034 boards consists of multiple layers. However, only the sides (layers) A and B are shown.
- Chip parts (KY-049 only)

Diode



There are few cases that the part printed on this diagram isn't mounted in this model.

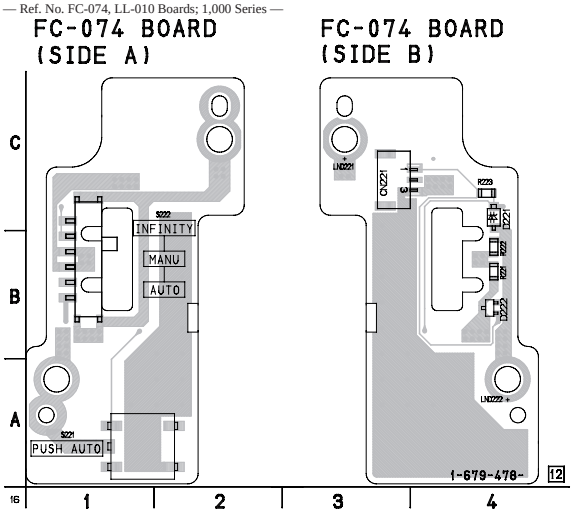




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FC-074 (USER FUNCTION), LL-010 (USER FUNCTION) PRINTED WIRING BOARDS

— Ref. No. FC-074, LL-010 Boards; 1,000 Series —



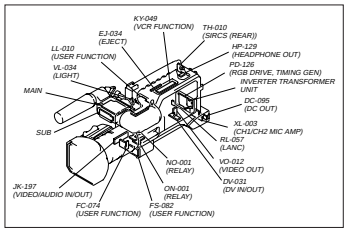
For printed wiring board

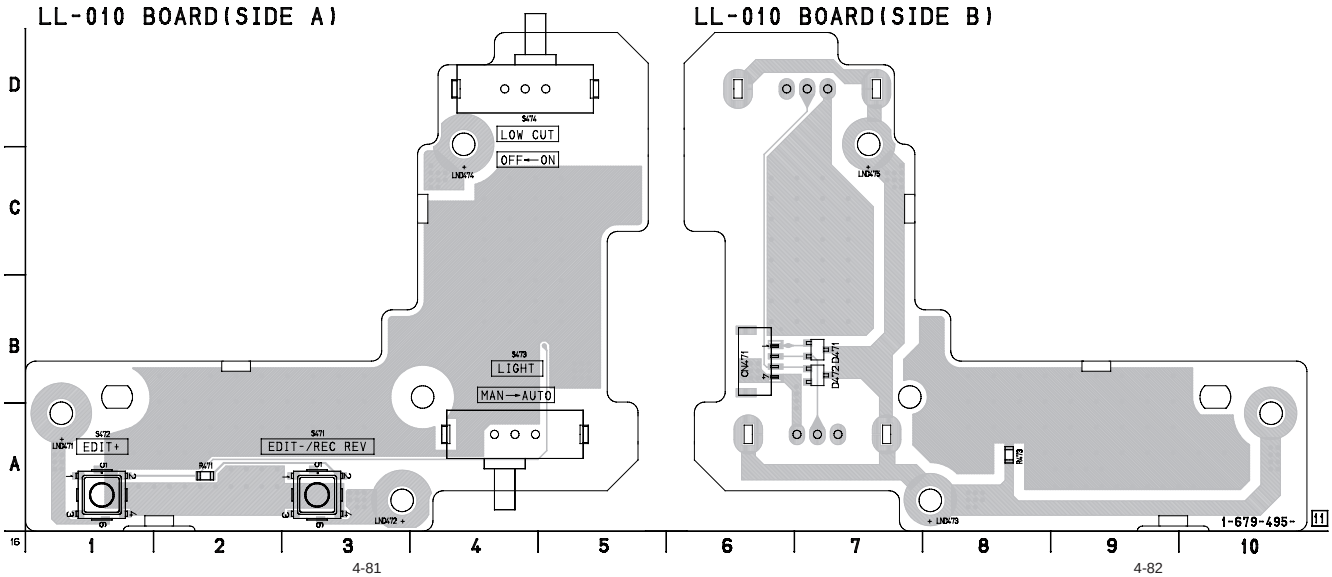
- Refer to page 4-128 for parts location.
- FC-074, LL-010 boards consists of multiple layers. However, only the sides (layers) A and B are shown.
- Chip parts

Diode



There are few cases that the part printed on this diagram isn't mounted in this model.

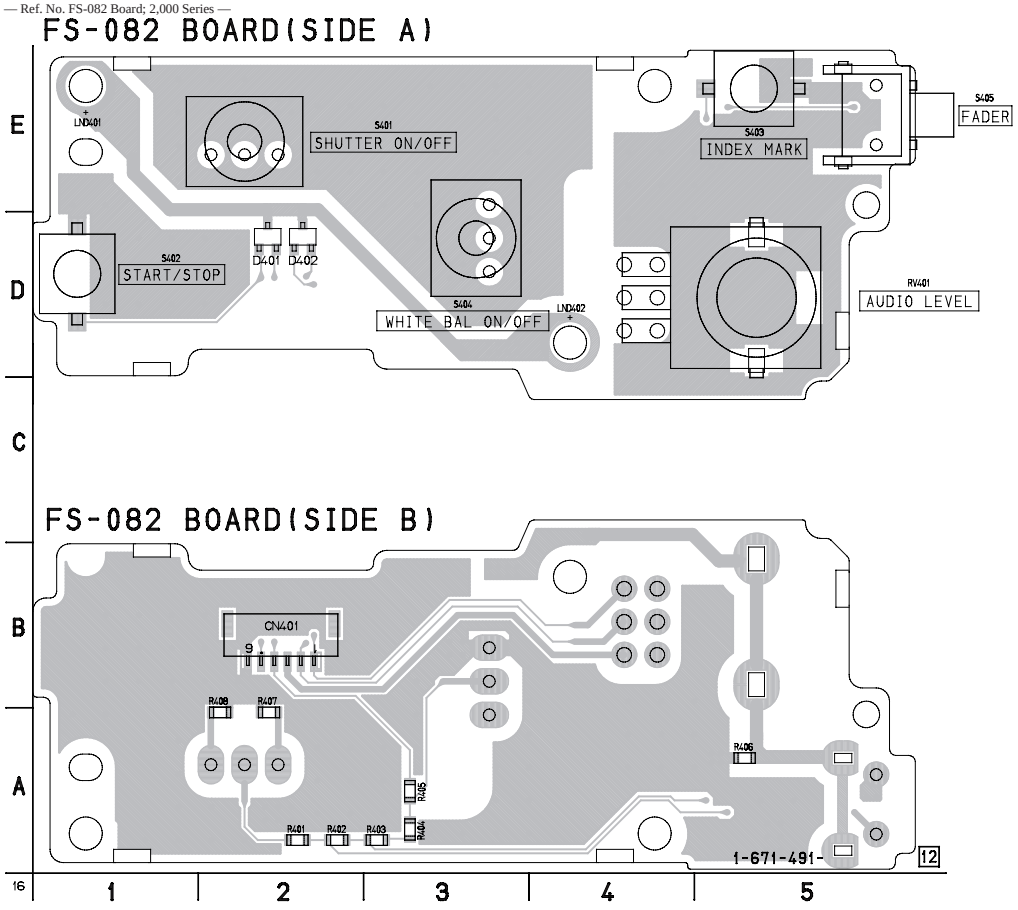




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FS-082 (USER FUNCTION) PRINTED WIRING BOARD

— Ref. No. FS-082 Board; 2,000 Series —



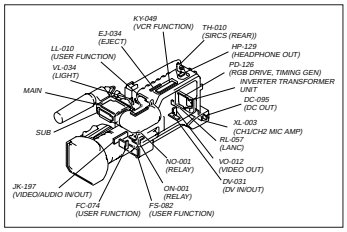
For printed wiring board

- Refer to page 4-128 for parts location.
- FS-082 board consists of multiple layers. However, only the sides (layers) A and B are shown.
- Chip parts

Diode

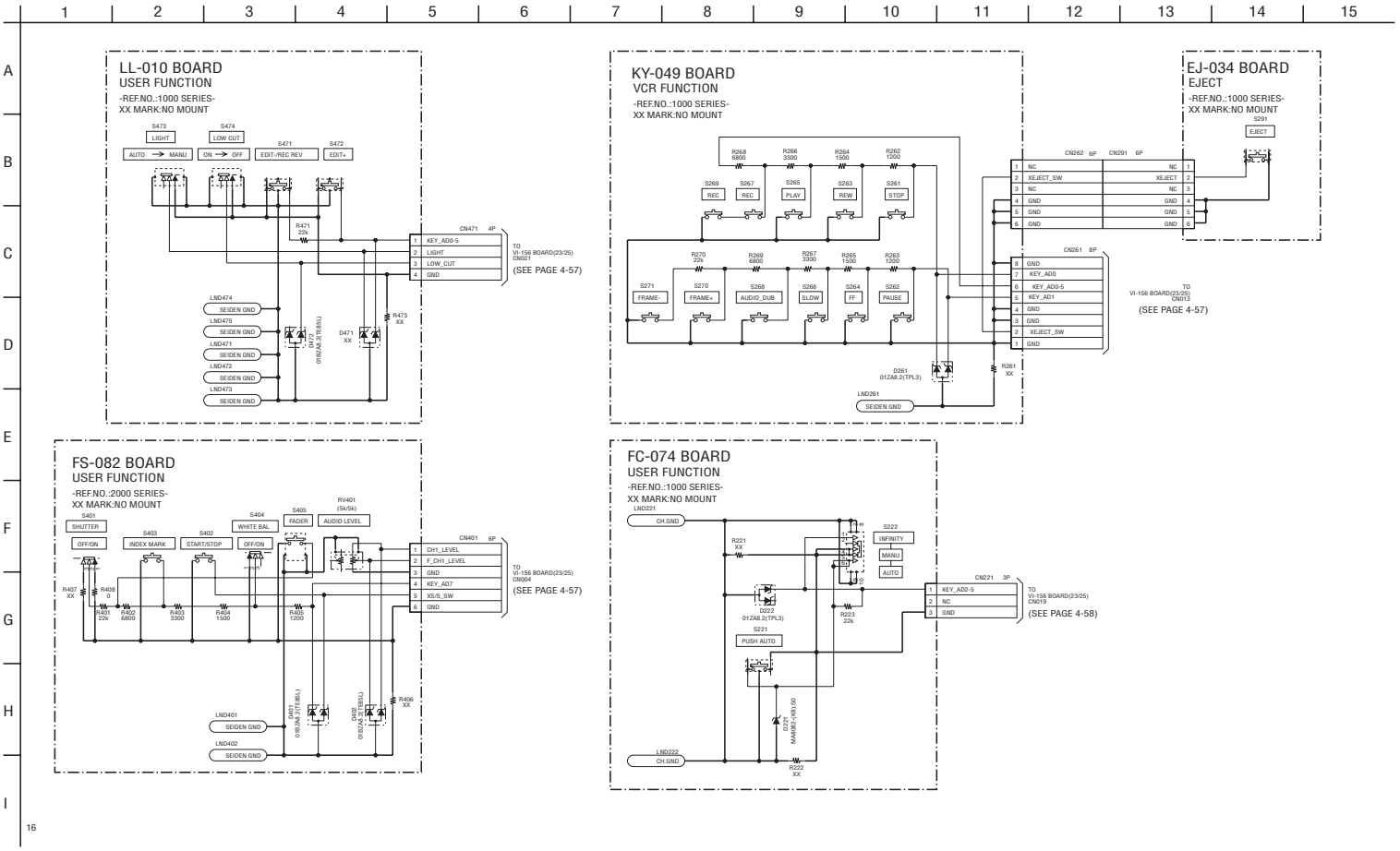


There are few cases that the part printed on this diagram isn't mounted in this model.



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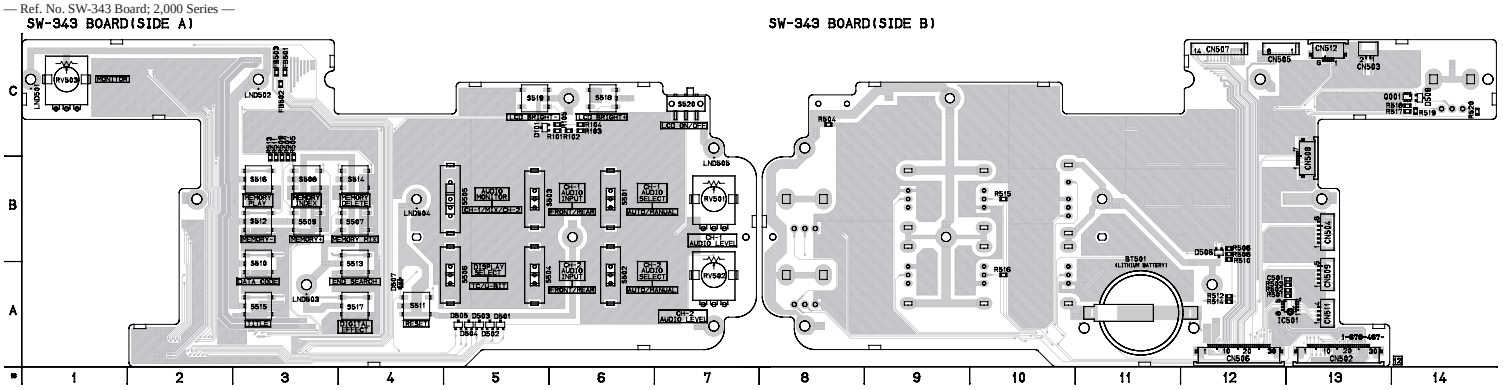
For Schematic Diagram
• Refer to page 4-79 for KY-049, EJ-034 printed wiring boards.
• Refer to page 4-81 for FC-074, LL-010 printed wiring boards.



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SW-343 (USER FUNCTION) PRINTED WIRING BOARD

— Ref. No. SW-343 Board; 2,000 Series —



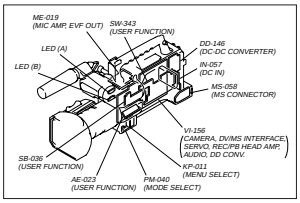
For printed wiring board

- Refer to page 4-129 for parts location.
- SW-343 board consists of multiple layers. However, only the sides (layers) A and B are shown.
- Chip parts

Diode



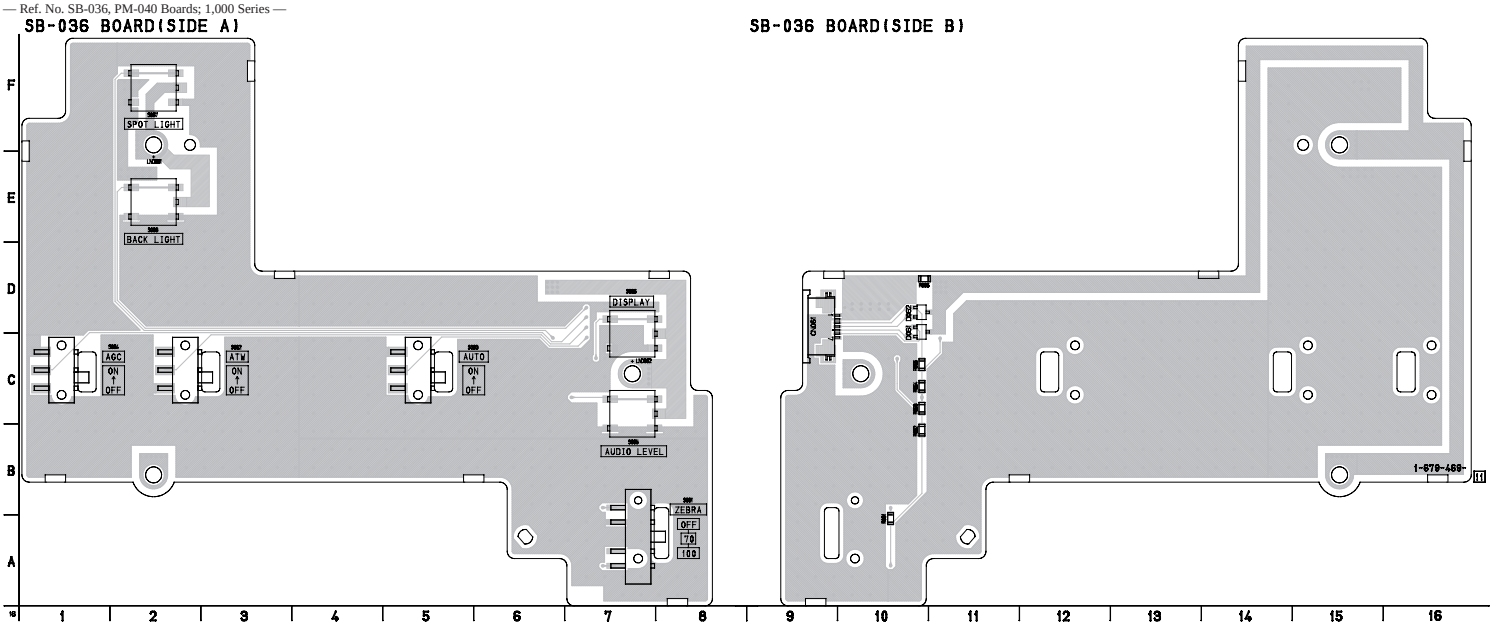
There are few cases that the part printed on this diagram isn't mounted in this model.

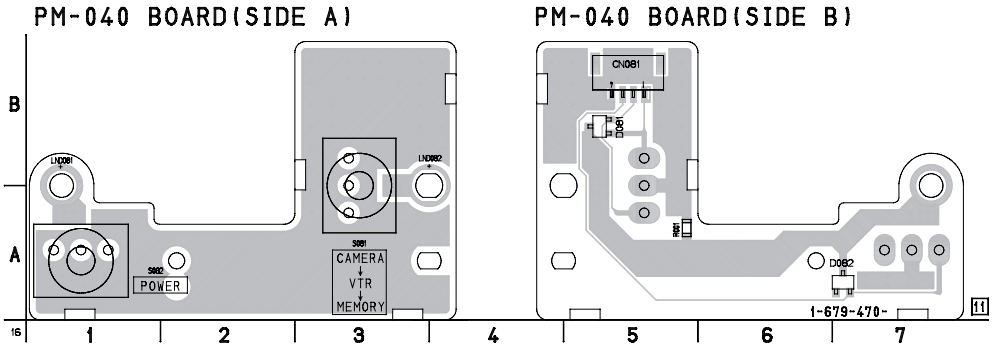


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SB-036 (USER FUNCTION), PM-040 (MODE SELECT) PRINTED WIRING BOARDS

— Ref. No. SB-036, PM-040 Boards; 1,000 Series —





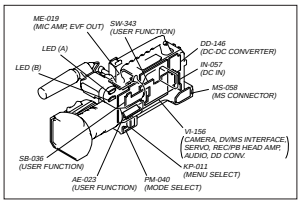
For printed wiring board

- Refer to page 4-129 for parts location.
- SB-036, PM-040 boards consists of multiple layers. However, only the sides (layers) A and B are shown.
- Chip parts

Diode



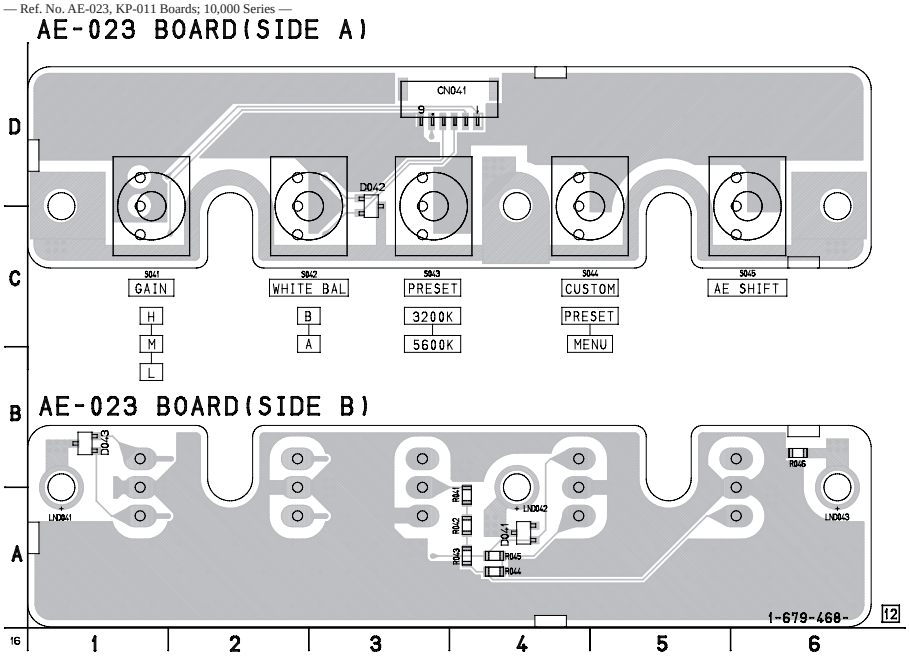
There are few cases that the part printed on this diagram isn't mounted in this model.

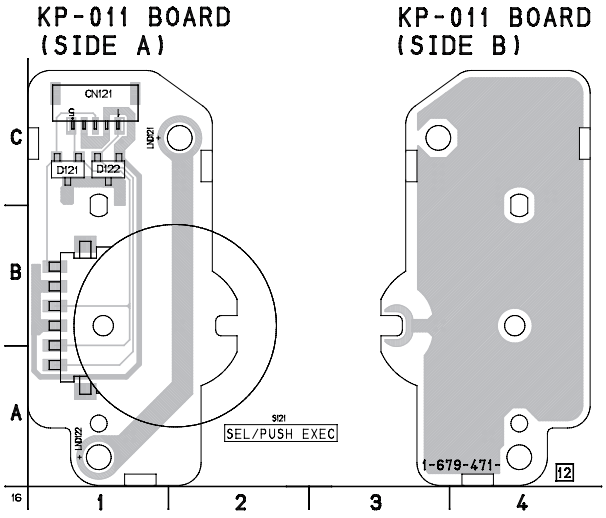


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AE-023 (USER FUNCTION), KP-011 (MENU SELECT) PRINTED WIRING BOARDS

— Ref. No. AE-023, KP-011 Boards; 10,000 Series —





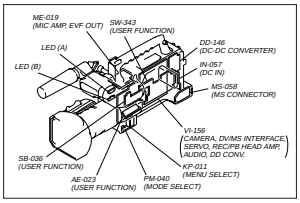
For printed wiring board

- Refer to page 4-129 for parts location.
- AE-023, KP-011 boards consists of multiple layers. However, only the sides (layers) A and B are shown.
- Chip parts

Diode



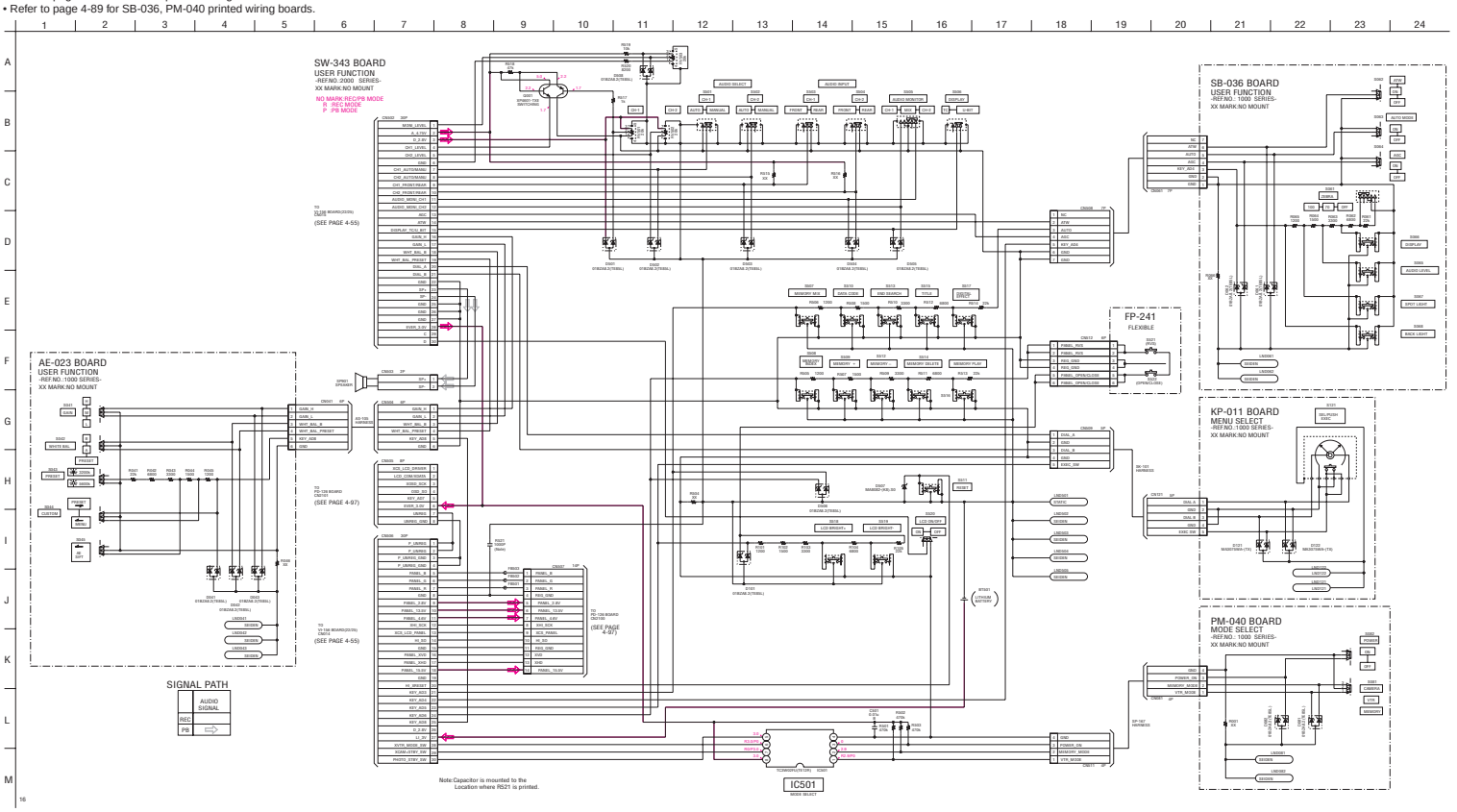
There are few cases that the part printed on this diagram isn't mounted in this model.



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For Schematic Diagram

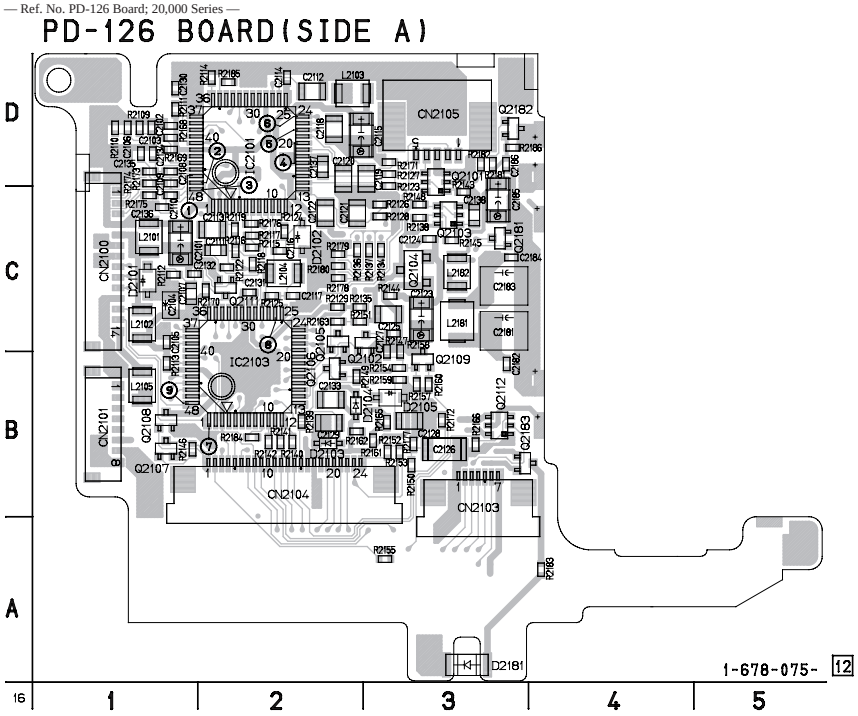
- Refer to page 4-87 for SW-343 printed wiring board.
- Refer to page 4-89 for SB-036, PM-040 printed wiring boards.



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PD-126 (RGB DRIVE/TIMING GEN) PRINTED WIRING BOARD

— Ref. No. PD-126 Board; 20,000 Series —



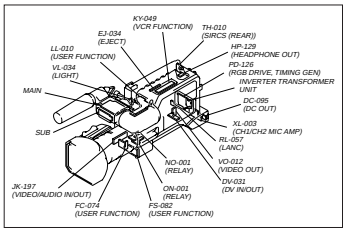
For printed wiring board

- Refer to page 4-129 for parts location.
- PD-126 board consists of multiple layers. However, only the sides (layers) A and B are shown.
- Chip parts

Transistor



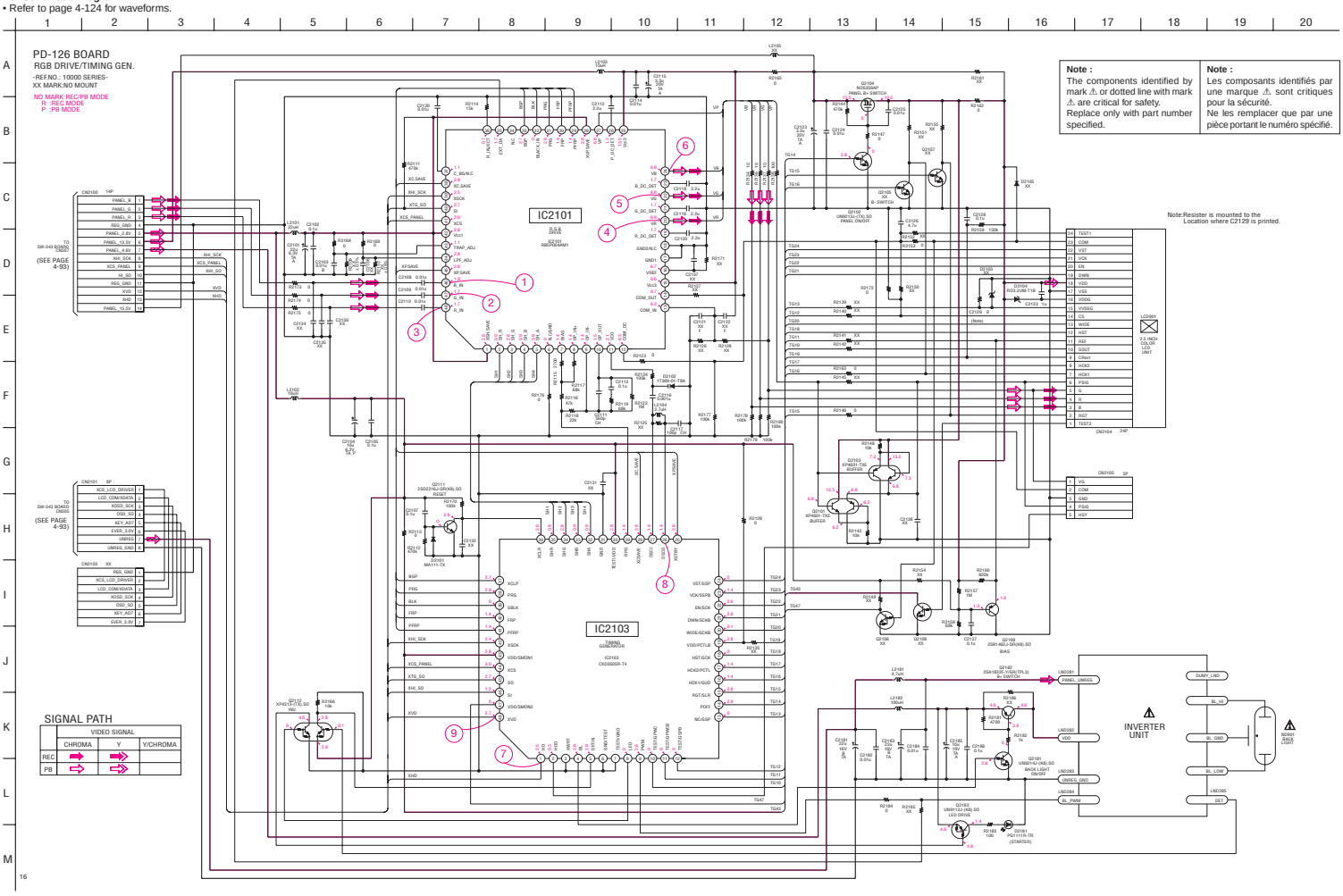
There are few cases that the part printed on this diagram isn't mounted in this model.



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For Schematic Diagram

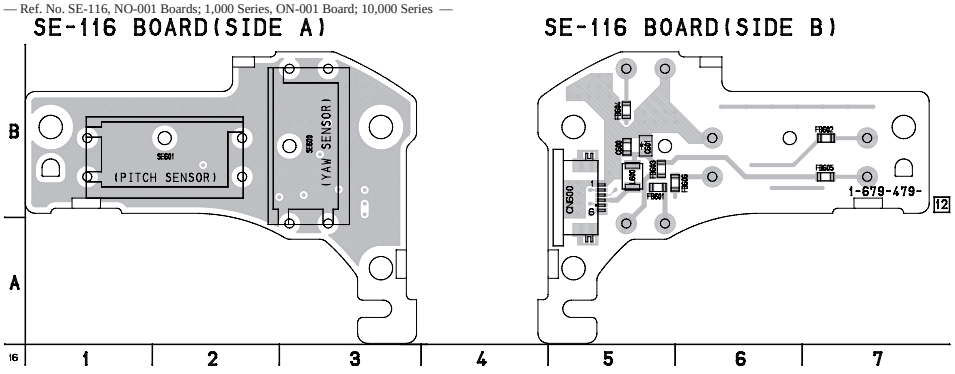
• Refer to page 4-124 for waveforms.

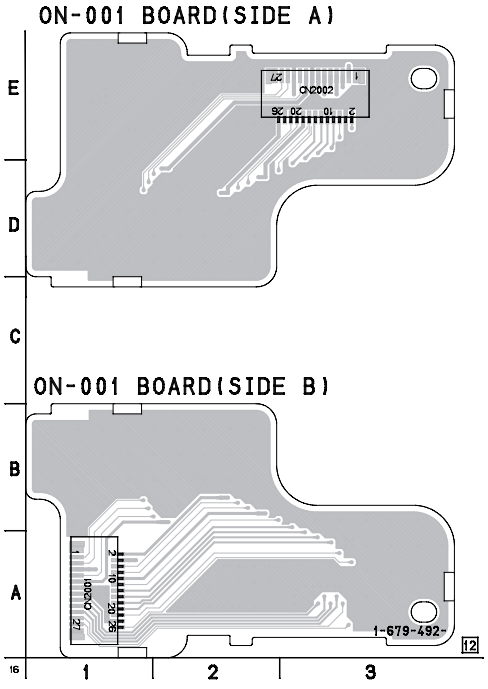


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SE-116 (VAP SENSOR), ON-001 (RELAY), NO-001 (RELAY) PRINTED WIRING BOARDS

— Ref. No. SE-116, NO-001 Boards; 1,000 Series, ON-001 Board; 10,000 Series —

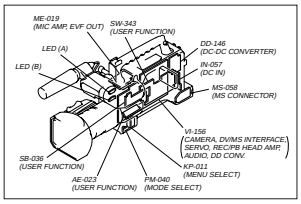


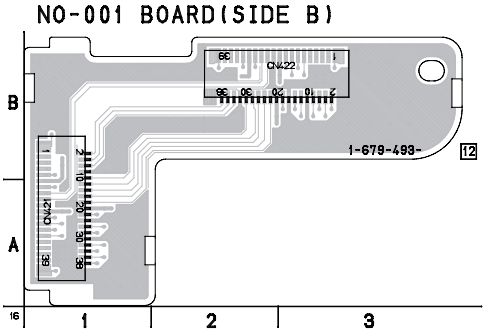


For printed wiring board

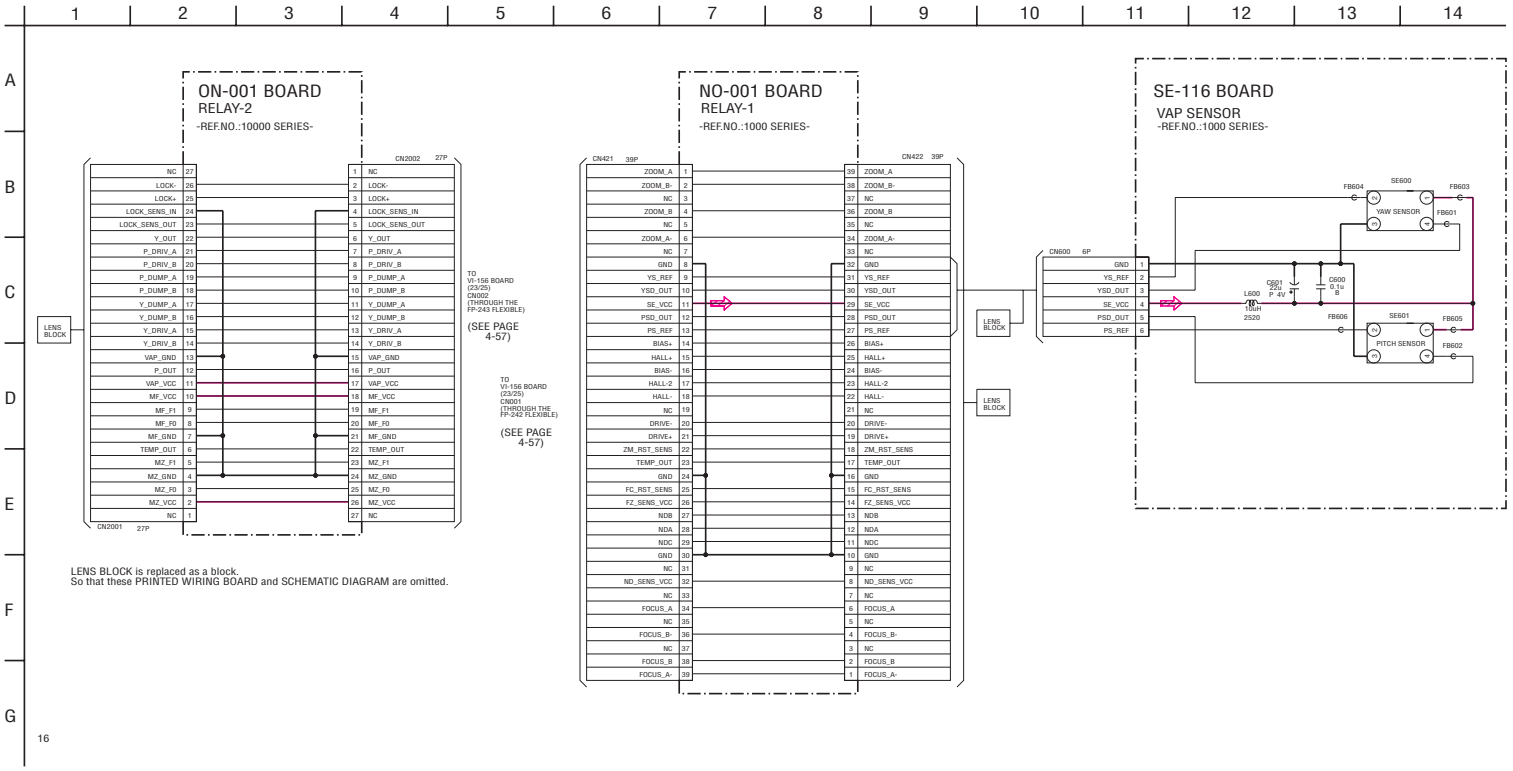
- Refer to page 4-130 for parts location.
- SE-116, ON-001, boards consists of multiple layers. However, only the sides (layers) A and B are shown.
- NO-001 board consists of multiple layers. However, only the side (layer) B is shown.

There are few cases that the part printed on this diagram isn't mounted in this model.





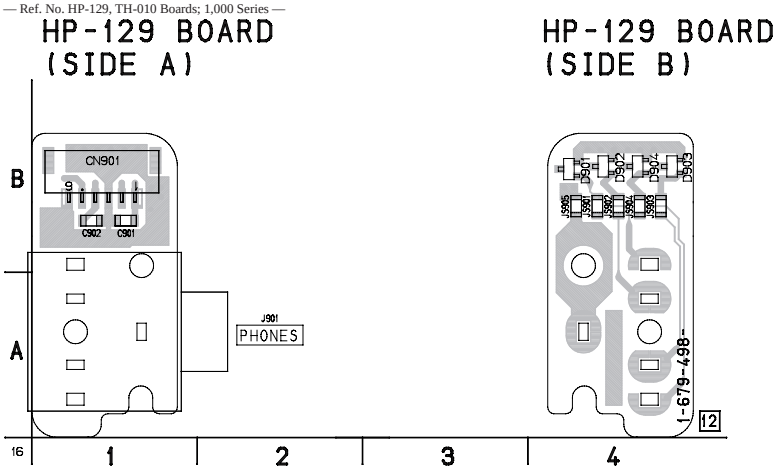
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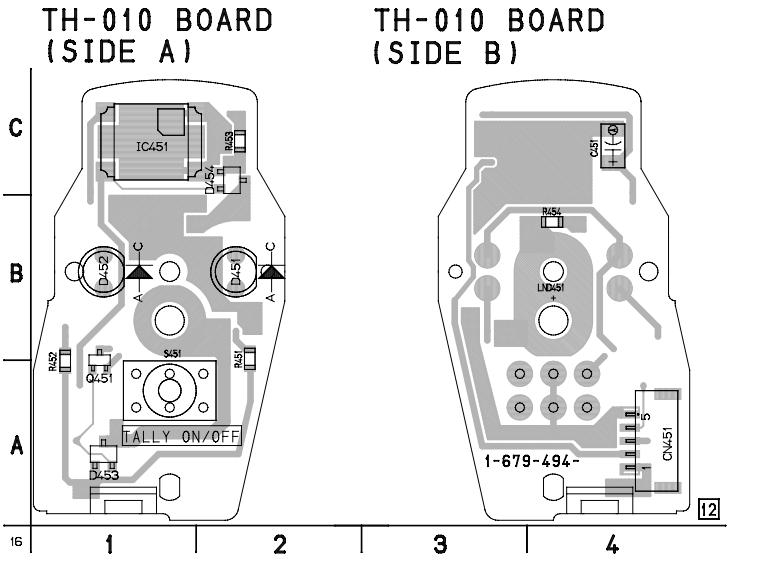


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HP-129 (HEADPHONE OUT), TH-010 (SIRCS (REAR)) PRINTED WIRING BOARDS

— Ref. No. HP-129, TH-010 Boards; 1,000 Series —

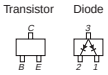




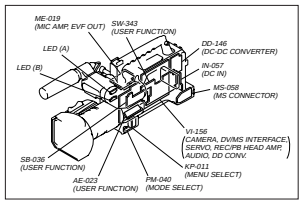
For printed wiring board

- Refer to page 4-130 for parts location.
- HP-129, TH-010 boards consists of multiple layers. However, only the sides (layers) A and B are shown.
- Chip parts

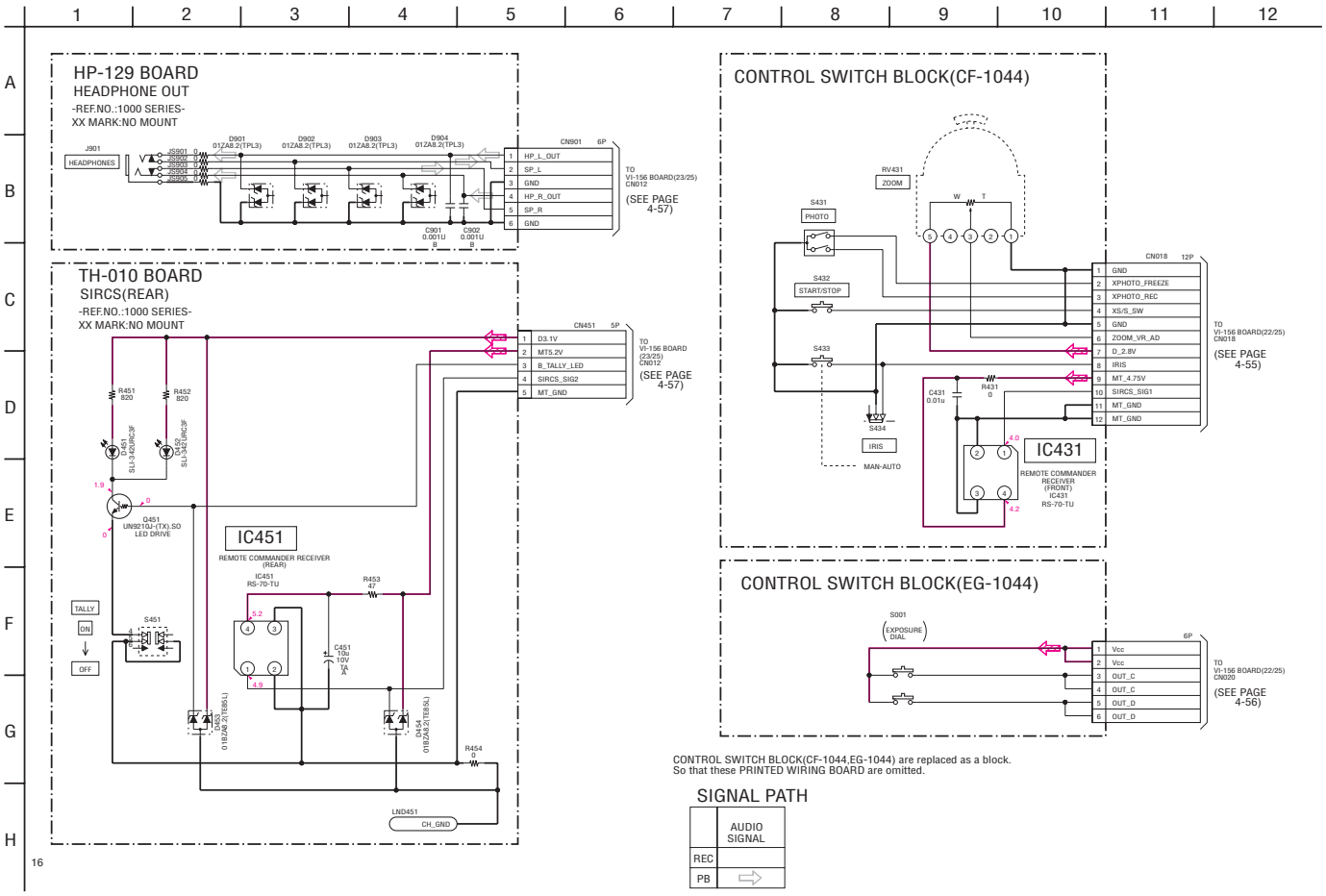
Transistor Diode



There are few cases that the part printed on this diagram isn't mounted in this model.



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CONTROL SWITCH BLOCK(CF-1044,EG-1044) are replaced as a block.
So that these PRINTED WIRING BOARD are omitted.

SIGNAL PATH

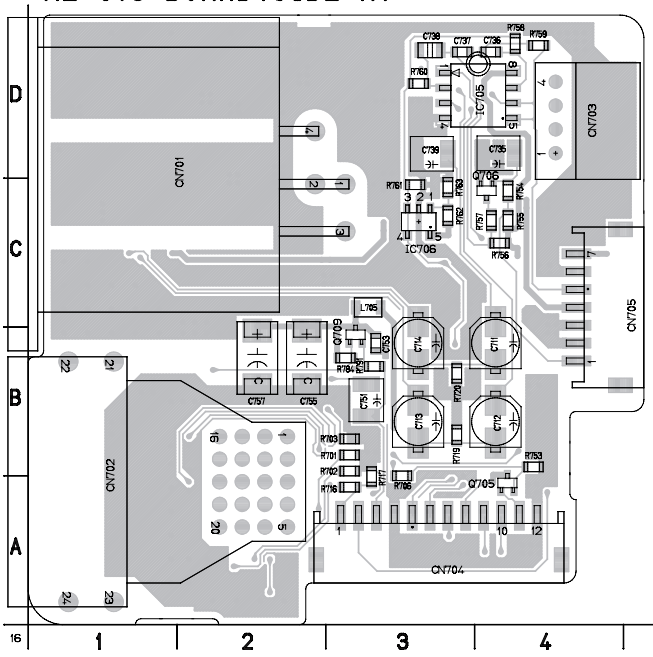
	AUDIO SIGNAL
REC	
PB	⇨

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ME-019 (MIC AMP, EVF OUT) PRINTED WIRING BOARD

— Ref. No. ME-019 Board; 1,000 Series —

ME-019 BOARD(SIDE A)



ME-019 BOARD(SIDE B)



1-679-481-11

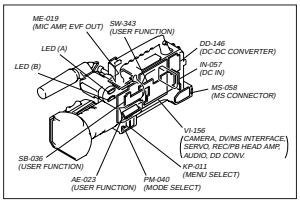
For printed wiring board

- Refer to page 4-130 for parts location.
- ME-019 board consists of multiple layers. However, only the sides (layers) A and B are shown.
- Chip parts

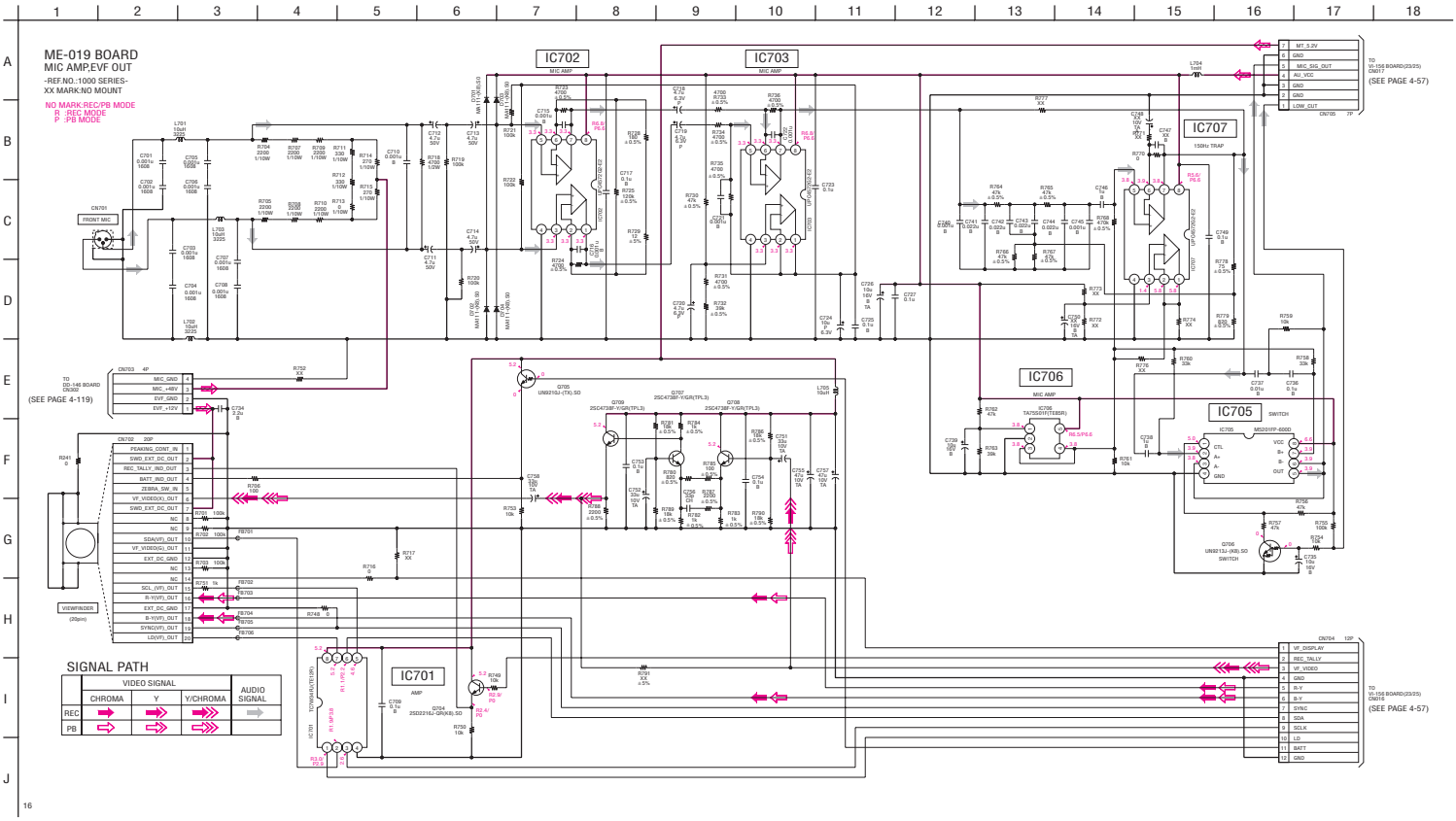
Transistor



There are few cases that the part printed on this diagram isn't mounted in this model.



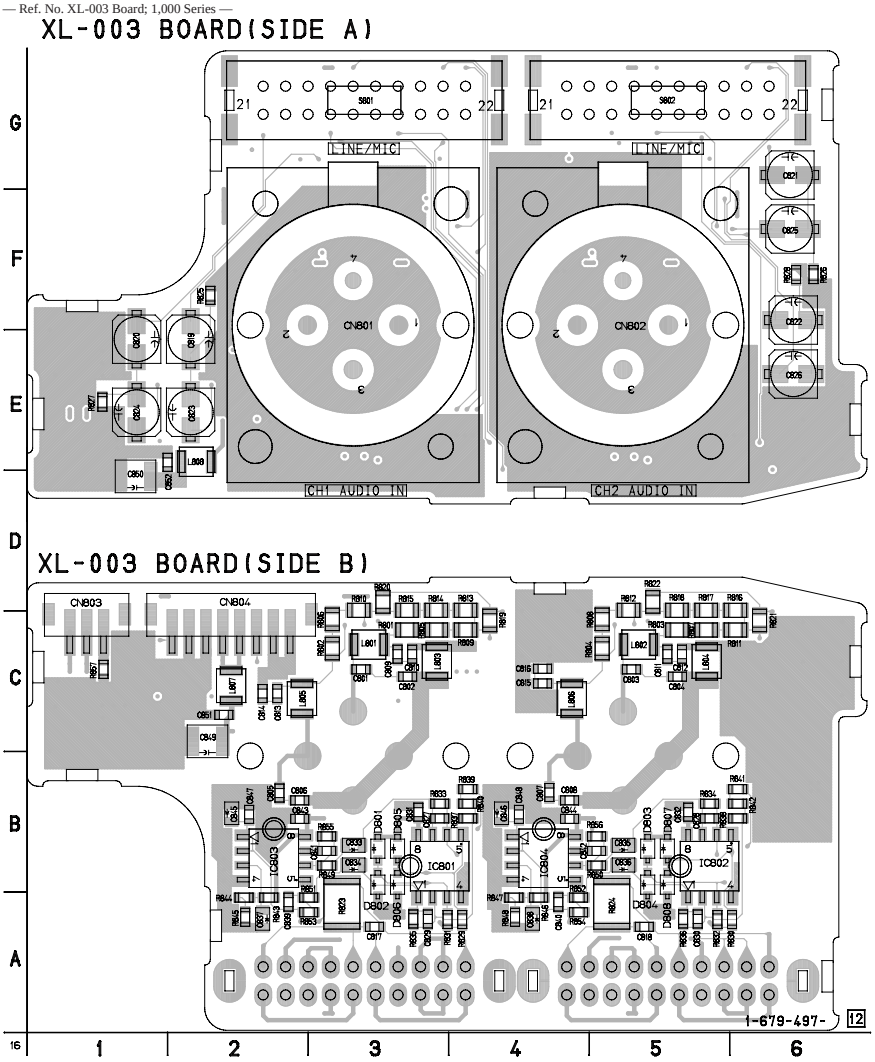
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XL-003 (CH1/CH2 MIC AMP) PRINTED WIRING BOARD

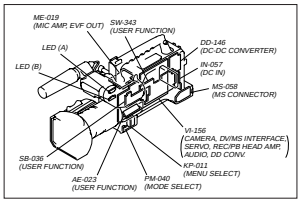
— Ref. No. XL-003 Board; 1,000 Series —



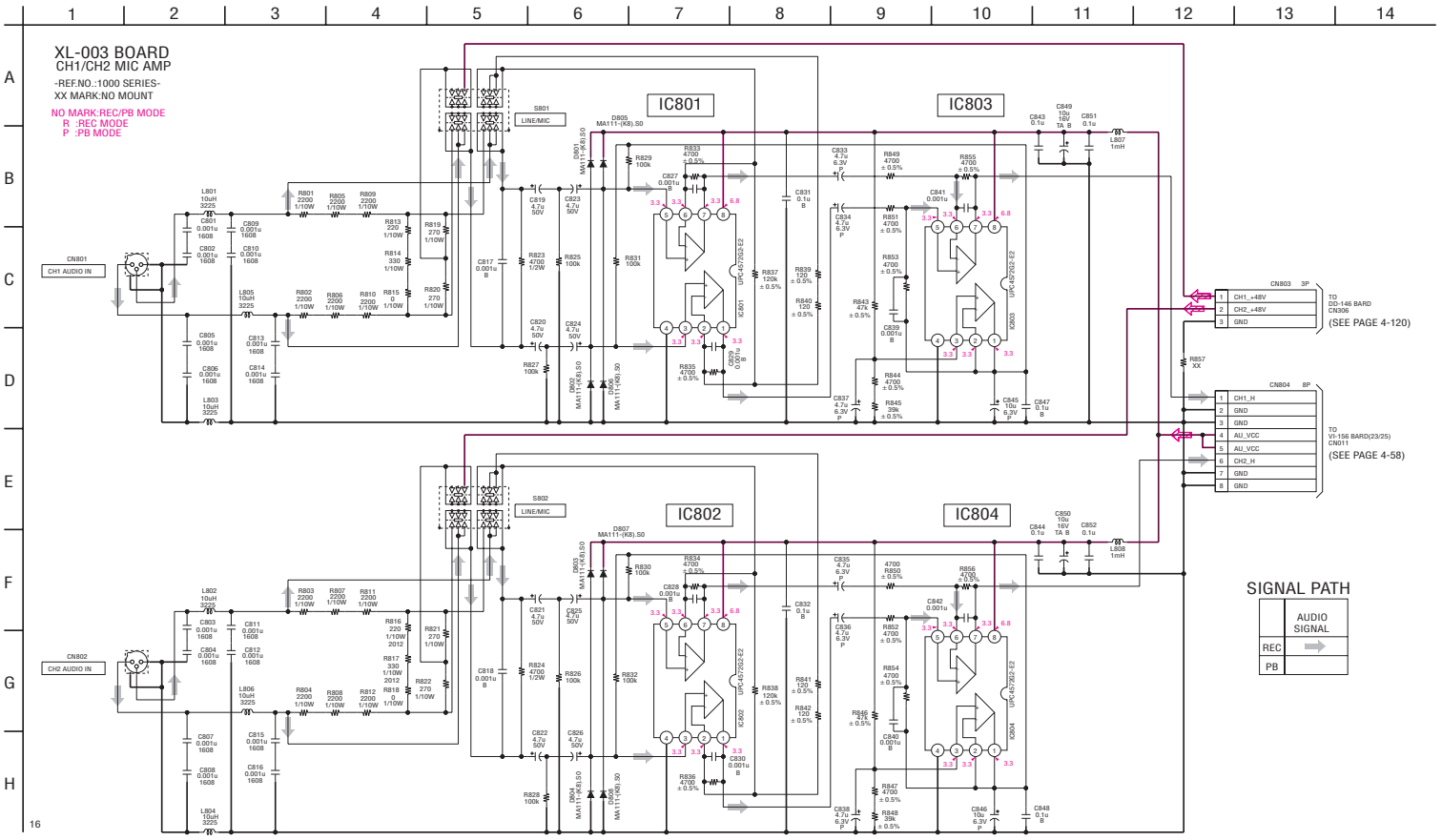
For printed wiring board

- Refer to page 4-131 for parts location.
- XL-003 board consists of multiple layers. However, only the sides (layers) A and B are shown.

There are few cases that the part printed on this diagram isn't mounted in this model.



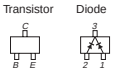
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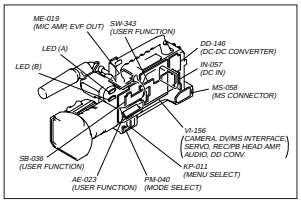
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For printed wiring board
- Refer to page 4-131 for parts location.
- DD-146 board consists of multiple layers. However, only the sides (layers) A and B are shown.
- Chip parts

Transistor Diode

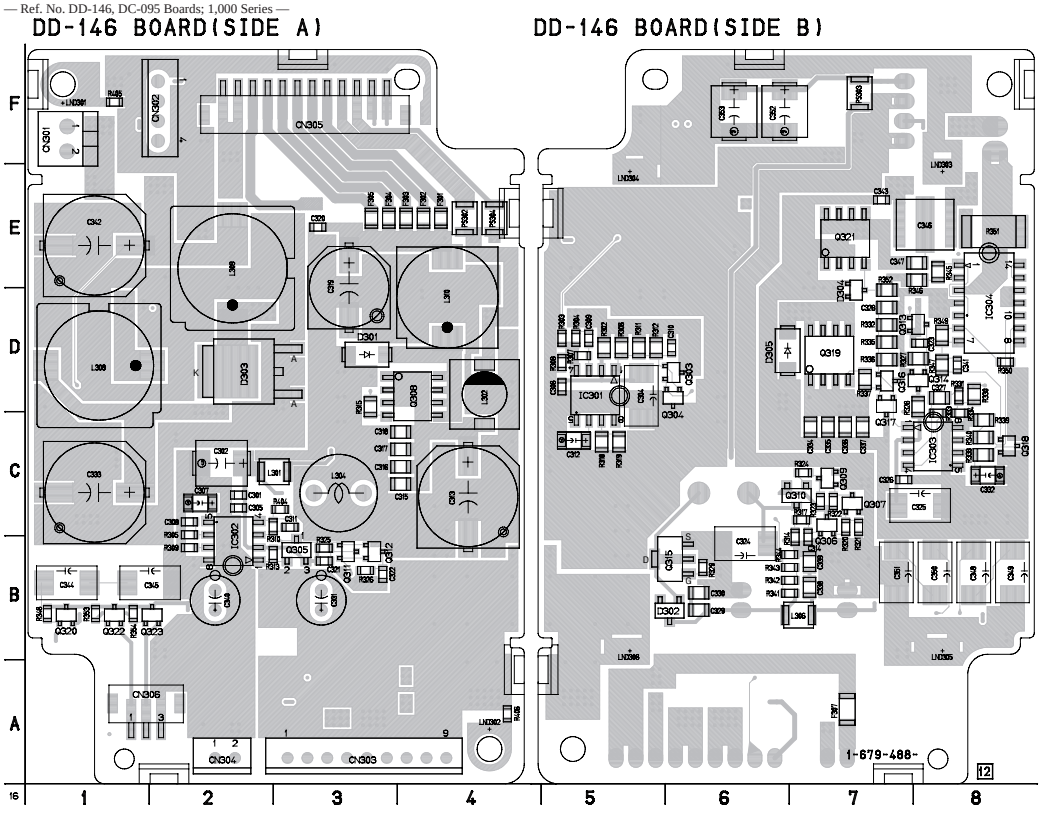


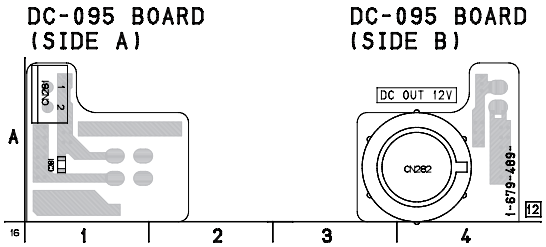
There are few cases that the part printed on this diagram isn't mounted in this model.



DD-146 (DC-DC CONVERTER), DC-095 (DC OUT) PRINTED WIRING BOARDS

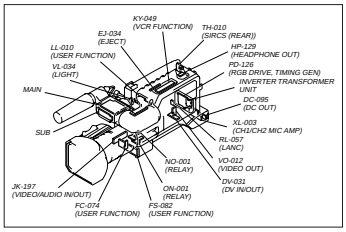
— Ref. No. DD-146, DC-095 Boards; 1,000 Series —





For printed wiring board
- Refer to page 4-132 for parts location.
- DC-095 board consists of multiple layers. However, only the sides (layers) A and B are shown.

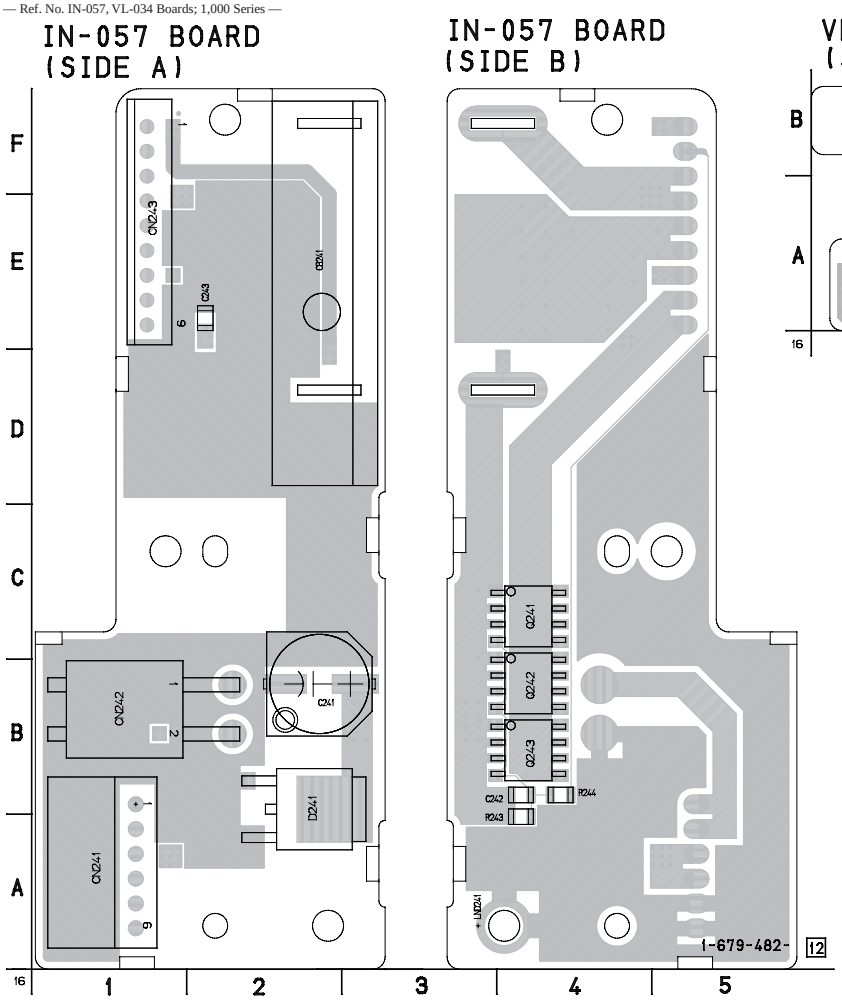
There are few cases that the part printed on this diagram isn't mounted in this model.

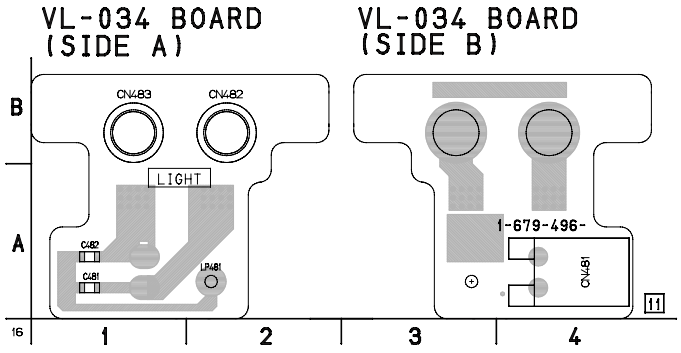


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IN-057 (DC IN), VL-034 (LIGHT) PRINTED WIRING BOARDS

— Ref. No. IN-057, VL-034 Boards; 1,000 Series —





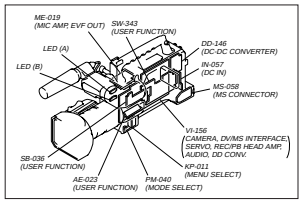
For printed wiring board

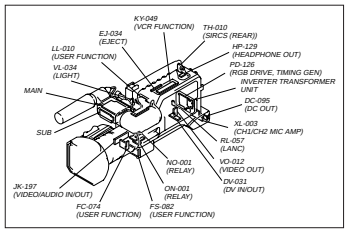
- Refer to page 4-132 for parts location.
- IN-057, VL-034 boards consists of multiple layers. However, only the sides (layers) A and B are shown.
- Chip parts (IN-057 only)

Diode



There are few cases that the part printed on this diagram isn't mounted in this model.



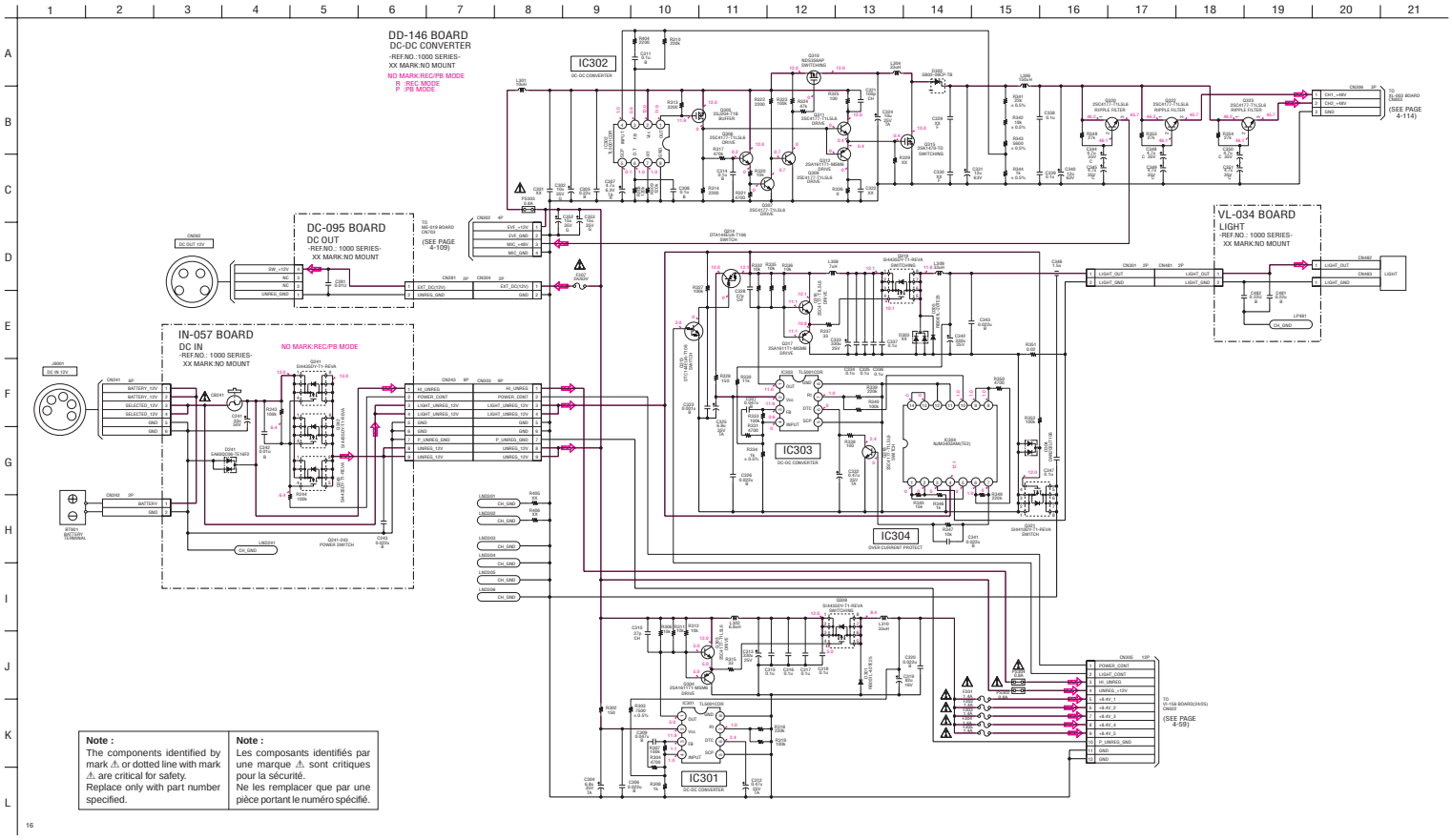


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DSR-250/250P

For Schematic Diagram

- Refer to page 4-115 for DD-146, DC-095 printed wiring boards.
- Refer to page 4-117 for IN-057 printed wiring board.
- Refer to page 4-118 for VL-034 printed wiring board.



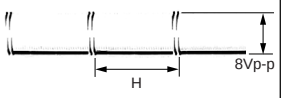
Note :	Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

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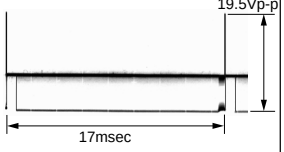
4-3. WAVEFORMS

CD-274 BOARD
REC

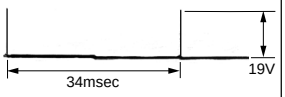
① IC100, 101, 102 ①,②



② IC100, 101, 102 ③,④



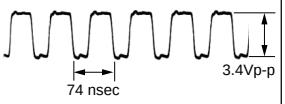
③ IC100, 101, 102 ⑪



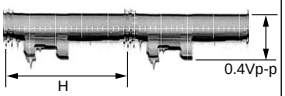
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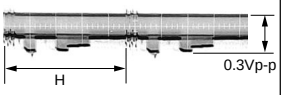
⑤ IC100, 101, 102 ⑮,⑯



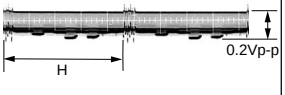
⑥ IC101 ⑧



⑦ IC102 ⑧

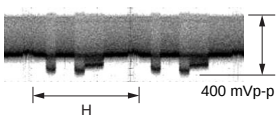


⑧ IC100 ⑧

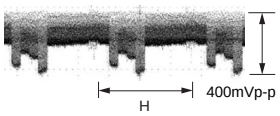


VI-156 BOARD (1/25)
REC

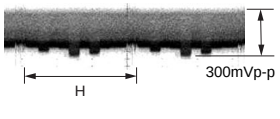
① IC704 ㉙



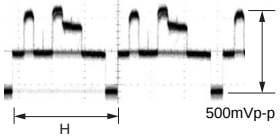
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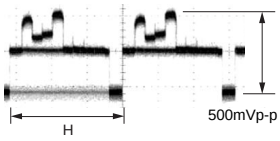
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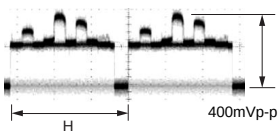
④ IC704 ⑤, IC706 ㉑



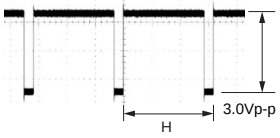
⑤ IC704 ⑦, IC706 ⑲



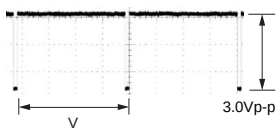
⑥ IC704 ⑨, IC706 ⑰



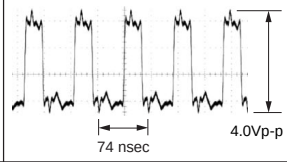
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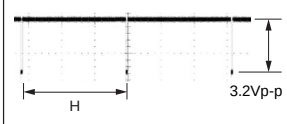
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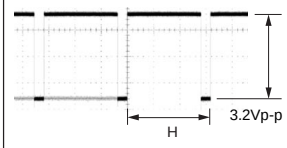
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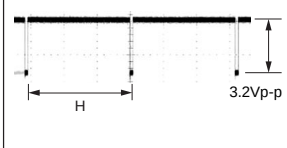
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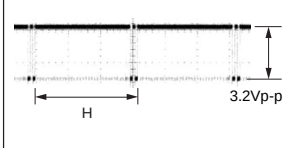
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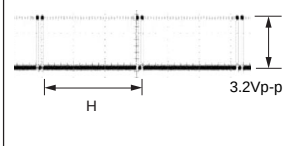
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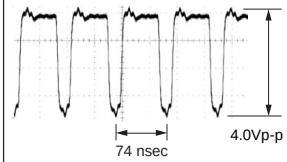
⑬ IC705 ⑤,⑨



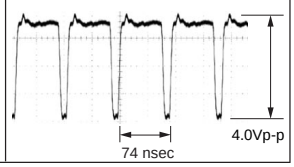
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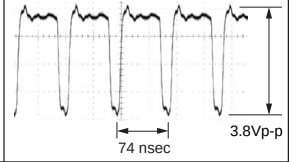
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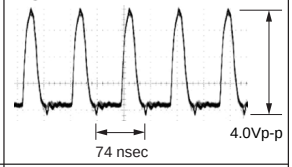
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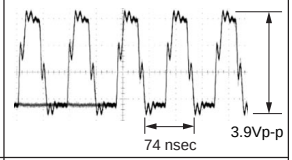
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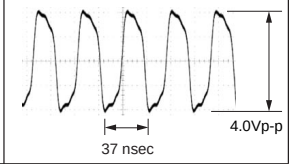
⑱ IC705 ⑰,⑱,⑲



⑲ IC705 ㉒,㉓,㉕,㉖,㉘,㉙



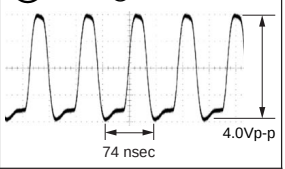
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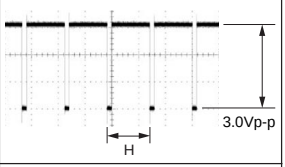
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VI-156 BOARD (2/25) REC/PB

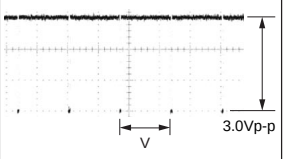
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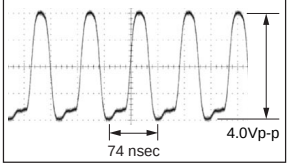
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㉓ IC771 ㊶

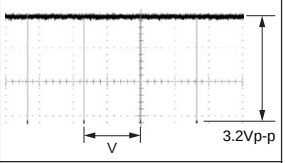


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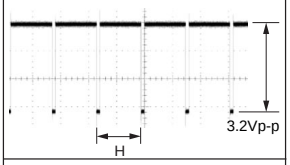


VI-156 BOARD (3/25)

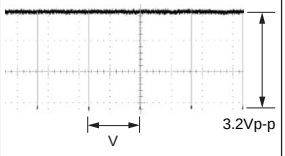
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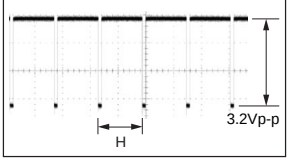
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㉗ IC1407 ㊾ PB

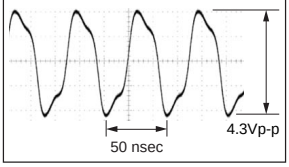


㉘ IC1407 ㊿ PB



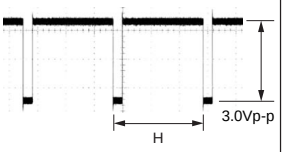
VI-156 BOARD (4/25) REC/PB

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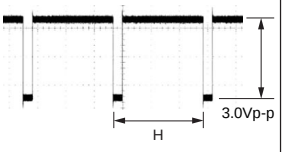


VI-156 BOARD (5/25)

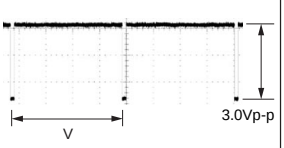
㉚ IC301 ⑰,⑯⑤ REC/PB



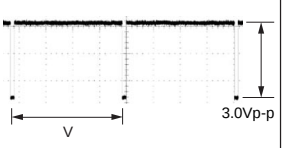
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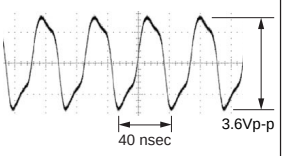
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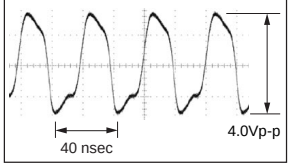
㉝ IC301 ㉒ PB



㉞ IC301 ㊺ REC/PB

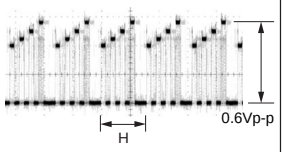


㉟ IC301 ⑲ REC/PB

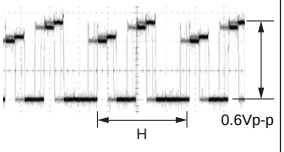


VI-156 BOARD (6/25)

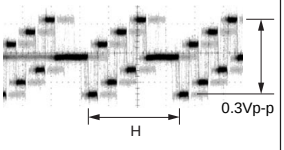
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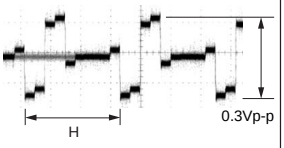
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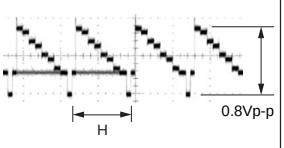
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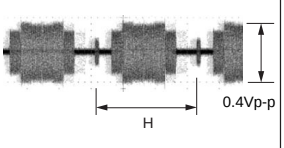
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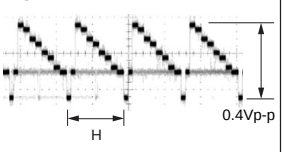
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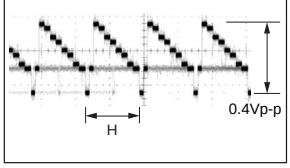
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㊷ Q307 Ⓔ PB



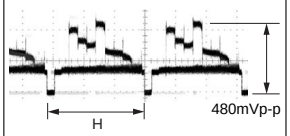
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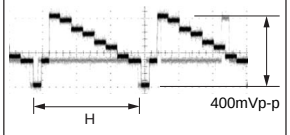
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VI-156 BOARD (7/25)

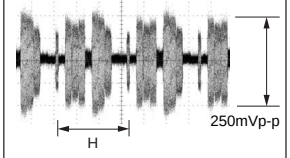
(44) IC1301 (46) REC



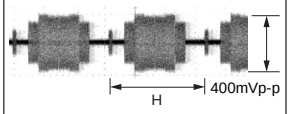
(45) IC1301 (46) PB



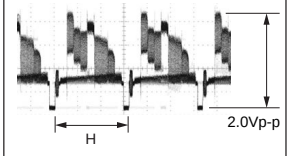
(46) IC1301 (7) REC



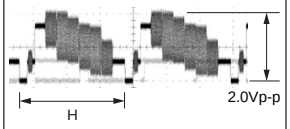
(47) IC1301 (7) PB



(48) IC1301 (22) REC

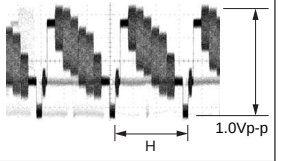


(49) IC1301 (22) PB

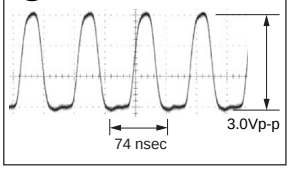


VI-156 BOARD (8/25)

(50) IC903 (2) LINE REC

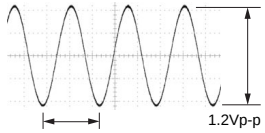


(51) IC903 (68) REC/PB



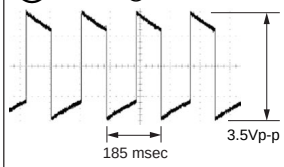
VI-156 BOARD (9/25) REC/PB

(52) IC501 (1) (C502)

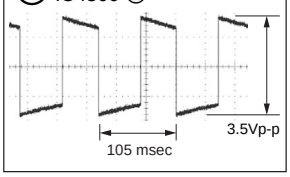


VI-156 BOARD (10/25) REC/PB

(53) IC4300 (20)

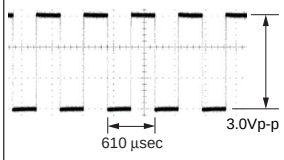


(54) IC4300 (23)

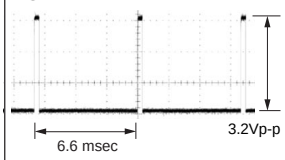


VI-156 BOARD (11/25) REC/PB

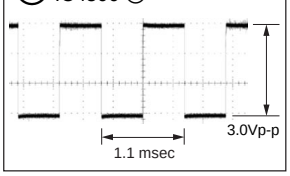
(55) IC4400 (24)



(56) IC4500 (4)

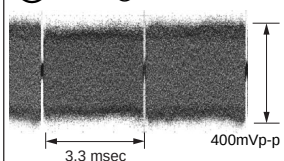


(57) IC4500 (60)

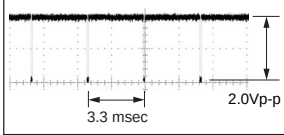


VI-156 BOARD (12/25)

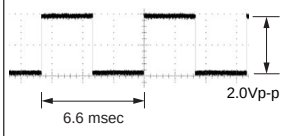
(58) IC102 (27) PB ONLY



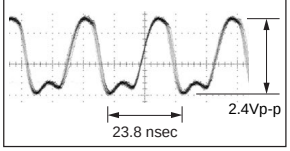
(59) IC102 (31),(33) REC ONLY



(60) IC102 (35) REC/PB

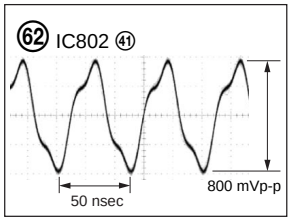


(61) IC102 (40) REC ONLY



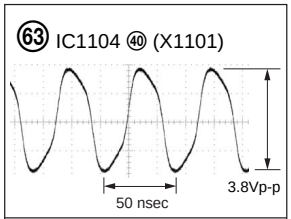
VI-156 BOARD (13/25) REC/PB

(62) IC802 (41)

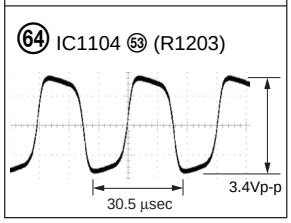


VI-156 BOARD (17/25) REC/PB

(63) IC1104 (40) (X1101)



(64) IC1104 (53) (R1203)

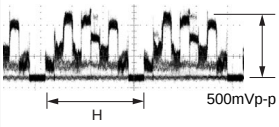


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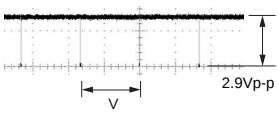
PD-126 BOARD

REC/PB

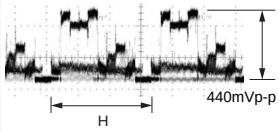
① IC2101 ㊻



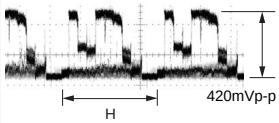
⑨ IC2103 ㊽



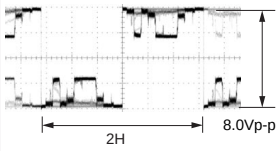
② IC2101 ㊼



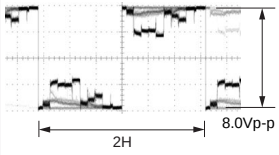
③ IC2101 ㊽



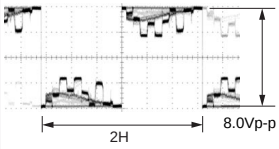
④ IC2101 ⑳



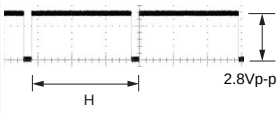
⑤ IC2101 ㉒



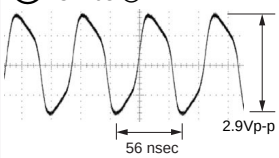
⑥ IC2101 ㉔



⑦ IC2103 ①



⑧ IC2103 ㉖



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4-4. MOUNTED PARTS LOCATION

CD-274 BOARD (SIDE A)

C100	G-1	IC103	G-2
C101	D-1	IC104	D-2
C102	G-1	IC105	A-2
C103	D-1		
C104	G-1	L100	G-1
C105	D-1	L101	D-1
C108	A-1	L104	D-2
C109	A-1	L105	A-1
C110	A-1	L106	G-2
C111	A-1	L107	A-2
C112	G-1		
C113	G-1	R100	G-1
C114	D-1	R101	G-1
C115	D-1	R102	D-1
C117	G-1	R103	D-1
C118	D-1	R104	A-1
C119	A-1	R105	A-1
C120	A-2	R106	G-2
C130	G-1	R107	D-2
C131	G-1	R108	D-2
C132	D-1	R109	G-2
C133	D-1	R110	A-2
C134	A-1	R111	A-2
C135	A-1	R112	G-2
		R113	E-1
CN100	D-4	R114	A-1

CD-274 BOARD (SIDE B)

IC100	A-7
IC101	G-7
IC102	D-7

VI-156 BOARD (SIDE A)

C102	C-12	C1080	I-7	C2506	I-9	CN011	E-15	IC2775	B-3	Q3332	H-11		
C103	C-12	C1081	I-8	C2507	I-10	CN012	I-12	IC2776	B-3	Q3333	H-11		
C104	C-11	C1082	H-7	C2508	I-10	CN013	I-11	IC4400	B-14	Q3334	H-11		
C105	B-12	C1107	F-4	C2509	H-10	CN014	I-9	IC4501	B-13	Q3335	H-11		
C106	B-12	C1108	F-5	C2770	A-3	CN015	I-7			Q3337	H-11		
C107	B-12	C1109	D-5	C2776	A-3	CN016	G-4	JR4501	A-13	Q3338	H-11		
C108	B-11	C1110	D-5	C2778	B-4	CN017	G-5	JR4503	A-12	Q3344	I-11		
C110	B-11	C1111	E-5	C2779	B-4	CN018	E-1	JR4505	B-13	Q3345	H-11		
C111	B-11	C1112	E-5	C2781	A-3	CN019	E-1			Q3348	I-11		
C112	B-12	C1113	E-5	C2782	A-3	CN020	B-1	JS001	A-1	Q3349	I-11		
C113	B-12	C1114	E-5	C2783	B-3	CN021	H-6	JS002	A-1	Q3351	I-11		
C114	B-11	C1115	E-5	C2784	B-3	CN022	I-13			Q4200	B-9		
C115	B-11	C1116	E-5	C2785	B-3	CN025	C-1	L101	B-12	Q4201	C-8		
C116	B-12	C1117	E-5	C2786	B-3	CN101	A-11	L102	B-12	Q4302	B-10		
C117	B-11	C1119	E-5	C2787	B-3	CN200	A-8	L130	A-5	Q4501	A-8		
C118	B-12	C1120	E-6	C2788	B-3	CN201	A-10	L140	B-1				
C119	B-11	C1121	E-5	C2789	B-3	CN400	A-15	L1001	I-7	R001	F-1		
C143	A-1	C1122	F-7	C2790	B-3	CN500	A-13	L1073	H-9	R002	E-1		
C152	A-2	C1128	F-6	C2791	B-3	CN501	A-12	L1303	C-5	R003	E-1		
C154	B-1	C1129	F-6	C2792	B-3	CN4300	A-11	L701	D-2	R004	E-1		
C160	B-2	C1130	F-6	C2793	B-3			L2770	B-4	R007	A-6		
C161	C-2	C1131	F-5	C2794	B-3	D001	H-7	L2774	A-3	R008	G-4		
C163	A-2	C1132	F-5	C2800	A-3	D702	C-1	L3302	F-12	R103	C-12		
C171	A-2	C1301	A-4	C2821	A-3	D1401	C-15	L3303	F-11	R104	C-12		
C172	A-2	C1302	A-5	C3322	G-12	D3305	G-12	L3304	F-11	R105	B-11		
C173	A-2	C1304	B-4	C3323	G-12	D3306	G-12	L3305	F-12	R106	B-11		
C174	A-2	C1305	B-4	C3324	G-12	D3307	G-12	L3318	I-11	R107	B-12		
C334	C-8	C1306	B-4	C3326	G-12	D3308	H-12	L3320	H-11	R108	B-12		
C512	C-8	C1307	B-5	C3346	G-10	D3309	G-11	L3452	H-12	R109	B-11		
C513	C-8	C1308	B-4	C3347	G-10	D3310	G-11	L4100	H-14	R110	B-12		
C514	C-8	C1309	B-4	C3349	G-10	D3311	G-11	L4101	H-14	R112	B-12		
C515	B-8	C1310	B-4	C3350	H-10	D3312	G-11	L4102	F-14	R125	B-12		
C516	B-8	C1311	B-4	C3365	H-12			L4103	G-14	R126	B-12		
C707	D-1	C1313	A-5	C3366	H-10	FB101	C-11	L4104	H-13	R127	B-11		
C709	D-1	C1314	B-5	C3370	I-12	FB140	A-1	L4105	H-13	R171	A-2		
C710	C-1	C1315	B-5	C3371	H-10	FB701	D-1	L4106	F-13	R172	A-2		
C711	D-2	C1316	B-5	C3374	H-12	FB702	D-1	L4107	G-13	R173	A-2		
C713	D-1	C1318	B-5	C3375	H-10	FB771	D-2	L4200	D-9	R174	A-2		
C714	C-2	C1319	C-5	C4111	G-15	FB772	D-4	L4400	B-14	R177	B-2		
C715	E-1	C1320	C-5	C4117	C-14	FB1002	I-7			R178	B-2		
C718	C-1	C1321	B-5	C4118	H-14	FB1101	F-4	Q004	A-6	R179	B-2		
C761	D-2	C1322	B-5	C4119	H-14	FB1301	A-6	Q102	C-12	R180	B-2		
C762	C-2	C1323	B-5	C4200	B-9	FB1402	C-10	Q701	D-1	R181	B-2		
C763	D-1	C1328	B-5	C4201	C-9	FB1404	E-9	Q702	D-1	R182	B-2		
C771	D-2	C1329	B-5	C4202	C-9	FB1405	E-14	Q801	F-1	R185	B-2		
C772	D-4	C1330	B-6	C4203	C-9	FB1406	E-11	Q1001	G-7	R186	B-2		
C803	F-3	C1337	B-5	C4204	D-9	FB1407	E-14	Q1002	H-9	R224	C-8		
C805	F-3	C1338	B-5	C4205	D-9	FB1410	C-15	Q1003	G-7	R701	C-1		
C806	F-4	C1340	B-6	C4206	D-9	FB1411	C-15	Q1004	G-7	R702	D-1		
C807	F-3	C1341	B-6	C4207	C-9	FB1412	B-15	Q1005	I-9	R703	D-1		
C808	F-3	C1342	B-6	C4300	B-10	FB1413	B-15	Q1007	H-7	R771	D-3		
C809	G-3	C1343	B-5	C4301	B-10			Q1008	G-7	R772	C-4		
C1002	G-7	C1408	C-10	C4323	A-10	IC101	B-11	Q1010	G-7	R773	C-4		
C1003	H-9	C1409	D-8	C4324	A-10	IC140	A-1	Q1011	I-7	R801	E-2		
C1005	H-9	C1413	D-12	C4325	A-11	IC143	B-2	Q1014	H-7	R802	E-1		
C1006	I-9	C1414	E-9	C4326	B-10	IC144	B-2	Q1015	G-7	R812	E-2		
C1007	H-9	C1416	E-9	C4327	A-10	IC302	D-8	Q1016	H-7	R813	E-2		
C1008	H-9	C1417	D-12	C4329	B-10	IC701	D-2	Q1113	E-6	R814	E-2		
C1009	H-9	C1418	E-14	C4330	A-10	IC702	C-2	Q1301	A-4	R818	E-2		
C1010	H-9	C1419	E-11	C4331	B-10	IC771	C-3	Q1302	A-6	R820	E-3		
C1011	H-9	C1420	C-14	C4400	B-14	IC801	E-2	Q1303	A-5	R826	F-3		
C1013	H-9	C1421	C-14	C4401	B-15	IC802	F-2	Q1304	A-5	R827	F-3		
C1014	I-8	C1422	D-14	C4402	B-15	IC1001	H-8	Q1305	A-5	R828	F-3		
C1015	I-8	C1423	D-14	C4403	B-15	IC1003	G-7	Q1306	B-4	R829	F-3		
C1016	I-8	C1425	C-14	C4404	B-15	IC1104	E-5	Q1404	C-15	R830	F-4		
C1017	I-8	C1601	G-8	C4405	B-15	IC1105	F-6	Q1405	C-15	R831	F-3		
C1018	I-8	C1603	G-8	C4406	B-14	IC1301	B-5	Q1601	G-8	R832	F-3		
C1019	I-8	C1604	G-9	C4407	B-14	IC1403	D-10	Q1602	G-9	R833	E-3		
C1020	I-8	C1605	G-8	C4519	C-13	IC1405	D-12	Q2502	A-15	R835	F-4		
C1021	H-7	C1606	G-9	C4520	C-13	IC1407	E-8	Q2770	A-4	R836	G-3		
C1022	H-8	C1607	G-8	C4521	B-14	IC1409	E-12	Q2771	A-4	R837	F-3		
C1023	H-8	C1608	G-9	C4522	B-14	IC1410	D-14	Q2772	A-3	R839	F-3		
C1024	H-8	C1611	G-10	C4523	A-14	IC1411	C-14	Q2773	B-3	R840	F-3		
C1025	H-7	C1612	H-10	C4524	C-13	IC1413	D-13	Q2774	C-3	R841	F-3		
C1026	I-8	C1615	G-10	C4525	B-13	IC1601	G-8	Q2775	A-3	R842	G-3		
C1027	H-8	C1616	H-10			IC1602	G-9	Q2776	B-4	R853	F-3		
C1028	H-7	C1619	G-6	CN001	A-2	IC1603	G-8	Q2777	A-3	R1001	I-9		
C1029	H-8	C162	B-2	CN002	A-3	IC1604	G-9	Q2778	C-3	R1002	H-7		
C1034	H-7	C1620	H-6	CN004	A-4	IC1607	G-9	Q3305	G-12	R1003	H-9		
C1035	H-8	C1621	G-6	CN005	A-5	IC1608	H-9	Q3306	H-12	R1004	I-9		
C1039	H-7	C1623	G-6	CN006	A-15	IC1611	G-7	Q3307	H-12	R1005	I-9		
C1041	G-8	C1624	H-6	CN007	A-7	IC1612	H-7	Q3308	G-11	R1006	H-7		
C1042	H-9	C1625	H-8	CN008	A-15	IC2501	H-9	Q3325	H-11	R1007	H-9		
C1044	G-7	C1626	H-8	CN009	B-15	IC2502	H-10	Q3327	H-11	R1008	I-9		
C1045	H-7	C2505	I-9	CN010	D-15	IC2772	B-4	Q3331	I-11	R1010	G-7		

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R1026	I-8	R1220	F-5	R1635	G-10	R3378	I-11
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R1031	H-7	R1224	F-5	R1640	H-10	R3389	H-11
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R1054	I-8	R1306	A-5	R1661	H-9	R3411	D-1
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R1155	E-4	R1459	C-15	R2808	A-3	R4534	B-14
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R1159	F-4	R1604	G-9	R2812	A-3	T3300	G-12
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C054	H-24	C511	B-24	C1051	G-23	C2213	B-29
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C120	B-20	C702	C-30	C1053	H-22	C2215	B-30
C121	B-20	C703	C-30	C1054	H-23	C2501	A-16
C122	B-20	C704	C-30	C1055	H-22	C2502	A-16
C123	B-20	C705	C-30	C1056	G-23	C2503	A-17
C124	B-19	C706	C-30	C1058	G-23	C2504	A-17
C125	A-20	C708	C-29	C1060	H-24	C2512	A-16
C126	B-20	C712	C-29	C1061	G-24	C2513	B-16
C127	A-19	C716	C-29	C1062	H-24	C2771	B-28
C128	A-19	C717	C-29	C1065	H-21	C2772	B-28
C140	A-29	C719	C-29	C1066	G-21	C2773	B-28
C141	A-29	C720	B-29	C1067	G-22	C2774	B-27
C142	A-29	C721	B-29	C1068	G-21	C2775	A-28
C144	A-28	C722	C-29	C1069	G-22	C2777	A-27
C145	A-28	C723	C-29	C1070	G-21	C2780	B-27
C146	A-29	C724	B-29	C1071	H-21	C2796	A-28
C147	B-29	C725	C-29	C1072	H-21	C2797	A-28
C148	B-29	C726	B-29	C1073	G-21	C2798	A-28
C149	B-29	C727	E-30	C1074	G-21	C2799	A-28
C150	B-28	C728	E-30	C1075	G-22	C3301	H-19
C151	B-28	C729	E-30	C1076	G-22	C3302	H-19
C153	B-28	C732	C-29	C1077	G-24	C3303	H-19
C155	A-29	C733	C-29	C1078	H-24	C3306	I-21
C156	B-28	C734	C-29	C1083	I-23	C3307	H-19
C157	A-29	C735	E-30	C1084	H-23	C3308	I-18
C158	B-28	C736	C-29	C1085	H-23	C3309	H-19
C159	B-28	C737	C-30	C1086	H-23	C3310	I-18
C166	A-27	C740	E-29	C1087	H-23	C3311	G-20
C170	B-28	C743	E-29	C1088	I-22	C3312	G-19
C301	D-24	C744	E-29	C1089	I-21	C3313	I-18
C302	F-23	C745	E-29	C1090	H-21	C3314	I-17
C303	E-22	C746	C-28	C1091	H-22	C3315	G-20
C304	D-16	C747	C-29	C1092	I-22	C3316	I-18
C305	F-22	C748	C-29	C1093	I-22	C3317	G-19
C306	D-23	C749	C-29	C1094	H-22	C3318	G-19
C307	E-22	C750	E-29	C1095	I-22	C3319	G-20
C308	E-22	C751	C-28	C1096	H-22	C3320	G-19
C309	E-24	C752	C-28	C1097	I-22	C3321	G-20
C310	E-22	C753	C-28	C1098	H-21	C3325	G-19
C311	E-24	C754	E-28	C1099	I-21	C3327	G-19
C312	F-22	C755	E-29	C1100	H-23	C3328	G-20
C313	F-22	C757	D-28	C1101	F-27	C3330	G-19
C314	F-22	C758	D-28	C1102	F-25	C3332	G-19
C315	F-24	C759	C-28	C1103	F-27	C3333	F-18
C316	F-24	C760	D-28	C1104	E-25	C3335	F-20
C317	F-23	C801	F-28	C1105	F-26	C3336	F-20
C318	F-22	C802	F-28	C1106	E-26	C3337	F-19
C319	F-22	C810	D-28	C1133	F-26	C3338	G-20
C320	F-23	C811	D-28	C1134	F-26	C3339	E-16
C321	G-23	C901	B-26	C1312	B-26	C3342	F-20
C322	F-22	C902	C-27	C1332	B-26	C3343	F-20
C323	F-23	C903	C-26	C1333	B-26	C3344	F-19
C324	E-24	C904	C-25	C1344	B-26	C3345	F-19
C325	F-25	C908	C-27	C1401	D-18	C3348	G-20
C326	E-25	C910	C-25	C1402	C-20	C3351	E-20
C327	G-23	C911	C-26	C1403	C-20	C3352	E-20
C328	G-23	C912	C-26	C1404	C-20	C3353	E-18
C329	C-16	C913	C-26	C1405	C-21	C3354	E-19
C331	C-16	C914	C-26	C1406	C-21	C3355	E-18
C332	C-16	C915	C-26	C1407	E-18	C3356	E-20
C333	D-17	C916	C-26	C1410	E-20	C3357	E-20
C335	D-16	C917	C-26	C1411	E-20	C3358	E-20
C337	C-16	C918	C-26	C1412	E-18	C3359	E-19
C338	C-16	C919	C-26	C1415	E-18	C3360	E-19
C339	G-23	C920	C-27	C1424	E-20	C3361	E-19
C340	F-24	C921	C-27	C1426	E-20	C3363	E-19
C341	F-24	C922	C-25	C1427	E-20	C3364	H-21
C342	F-24	C926	C-27	C1428	E-20	C3368	G-21
C343	F-25	C928	C-27	C1609	H-22	C3373	E-18
C345	F-25	C929	C-27	C1610	I-21	C3376	I-19
C346	F-22	C930	D-27	C1622	G-22	C3377	G-21
C348	F-22	C931	D-25	C2200	A-30	C3378	H-20
C352	E-24	C932	D-25	C2201	A-30	C3450	H-19
C353	G-24	C933	D-25	C2202	B-30	C3451	H-20
C354	F-24	C934	D-26	C2203	B-29	C3452	H-20
C501	C-24	C935	C-25	C2204	A-30	C3453	H-19
C502	C-25	C936	B-26	C2205	A-30	C3454	H-19
C503	C-24	C1037	G-24	C2206	B-30	C3455	H-19
C505	B-25	C1038	G-24	C2207	B-29	C3456	H-19
C506	B-25	C1040	H-24	C2208	B-30	C3457	H-19
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C4102	G-17	FB713	E-30	L3310	F-18	R052	I-24	R329	F-24	R724	E-30	R1137	F-26	R2504	A-16	R3456	H-19
C4103	G-17	FB901	D-25	L3311	F-18	R053	I-24	R331	G-23	R725	C-29	R1160	D-27	R2505	A-16	R3457	H-20
C4104	H-17	FB1401	C-20	L3312	F-20	R054	I-24	R332	F-24	R726	C-29	R1161	D-27	R2506	A-17	R4100	G-17
C4105	G-17	FB1403	E-18	L3313	F-19	R055	I-24	R334	F-23	R727	C-29	R1162	E-27	R2507	A-17	R4101	G-17
C4106	G-17			L3314	F-19	R056	I-24	R335	G-24	R730	D-29	R1163	E-27	R2512	I-20	R4102	G-17
C4107	G-17	IC051	I-24	L3315	F-19	R057	I-24	R336	G-23	R731	E-29	R1164	E-27	R2513	I-20	R4103	G-17
C4108	F-17	IC052	H-24	L3316	F-19	R058	I-24	R338	F-24	R732	E-29	R1165	E-27	R2514	I-20	R4104	G-17
C4112	G-17	IC053	H-25	L3319	F-20	R059	H-24	R340	F-23	R733	D-29	R1166	E-27	R2515	I-20	R4105	F-17
C4113	G-17	IC054	H-24	L3451	H-18	R060	H-24	R341	G-24	R735	E-29	R1167	E-27	R2516	I-20	R4107	G-17
C4114	H-17	IC102	A-19	L3453	H-19	R061	H-24	R343	G-23	R736	E-29	R1177	E-27	R2521	A-29	R4108	G-17
C4115	G-17	IC141	B-29	L4500	C-19	R062	H-24	R351	F-24	R750	E-29	R1196	E-26	R2524	G-28	R4109	H-16
C4116	B-21	IC142	B-28			R063	H-25	R356	G-24	R751	E-28	R1197	E-26	R2770	B-28	R4109	G-17
C4129	H-18	IC0301	E-23	LND104	A-20	R064	H-25	R358	F-24	R803	G-29	R1200	E-26	R2772	B-28	R4110	G-17
C4130	G-18	IC361	C-17	LND105	A-19	R065	H-25	R360	G-24	R815	G-29	R1206	E-27	R2773	B-28	R4111	H-17
C4131	F-18	IC501	C-24	LND106	A-19	R066	H-24	R361	C-16	R819	F-28	R1212	E-26	R2774	B-28	R4112	G-17
C4132	G-18	IC502	A-24	LND303	H-16	R067	H-25	R364	C-16	R850	G-28	R1213	E-26	R2775	B-28	R4113	F-17
C4134	H-18	IC503	C-25	LND304	F-21	R068	H-24	R367	C-16	R851	G-28	R1215	E-26	R2776	B-27	R4114	H-17
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C4322	A-21	IC1002	G-24	Q302	G-23	R120	A-19	R379	F-25	R916	C-26	R1403	D-19	R2788	B-27	R4122	H-17
C4501	C-17	IC1002	A-20	Q303	G-24	R121	A-20	R380	E-22	R924	C-27	R1404	E-19	R2789	B-27	R4123	H-17
C4502	B-17	IC1004	G-23	Q304	G-23	R122	A-20	R381	F-22	R930	C-25	R1405	E-20	R3316	G-20	R4124	H-17
C4503	B-17	IC1005	G-22	Q305	G-24	R123	A-19	R382	F-24	R932	C-27	R1406	E-20	R3317	H-19	R4125	H-17
C4504	C-17	IC1006	H-21	Q306	G-23	R124	A-19	R383	D-24	R936	C-27	R1408	E-20	R3318	G-20	R4126	F-17
C4505	B-17	IC1007	G-21	Q307	G-24	R128	A-20	R384	G-24	R949	D-27	R1409	E-20	R3319	G-20	R4127	H-17
C4506	B-17	IC1008	G-22	Q308	G-24	R129	A-20	R385	G-24	R953	C-27	R1410	E-20	R3320	G-19	R4128	G-17
C4507	B-17	IC1085	H-23	Q902	B-25	R140	A-27	R501	C-24	R954	D-25	R1411	E-20	R3321	G-19	R4131	H-17
C4508	B-18	IC1086	H-22	Q903	C-26	R141	A-27	R502	C-24	R955	C-25	R1412	E-20	R3322	G-19	R4134	G-17
C4509	B-18	IC1101	F-27	Q904	C-25	R142	A-29	R503	C-24	R956	B-26	R1414	D-20	R3323	G-19	R4136	G-17
C4510	B-18	IC1102	F-26	Q905	C-25	R143	A-29	R504	C-24	R957	B-26	R1415	D-20	R3324	G-19	R4200	A-22
C4511	B-18	IC1103	E-26	Q906	B-26	R144	A-29	R505	C-24	R958	B-26	R1416	D-20	R3325	G-19	R4204	A-22
C4512	B-18	IC1401	D-19	Q1024	G-21	R145	A-29	R506	C-24	R1009	F-21	R1417	D-20	R3326	H-21	R4212	A-22
C4515	B-19	IC1402	D-20	Q1025	G-21	R146	A-29	R507	C-24	R1012	G-26	R1418	D-20	R3327	G-19	R4301	B-21
C4518	C-18	IC1404	C-20	Q1031	I-21	R147	A-29	R508	C-23	R1049	G-23	R1419	D-20	R3328	G-20	R4302	B-21
C4535	G-18	IC1406	D-18	Q1032	H-21	R148	A-29	R509	C-23	R1050	G-23	R1420	D-20	R3329	G-20	R4304	A-21
		IC1412	E-21	Q1033	I-21	R149	A-29	R510	C-23	R1059	H-21	R1421	D-20	R3330	G-19	R4305	A-21
CN003	A-24	IC2200	B-30	Q1034	H-21	R150	A-28	R511	B-23	R1060	H-21	R1422	D-20	R3331	G-19	R4307	B-21
		IC2770	B-28	Q1101	F-25	R151	B-28	R512	B-23	R1061	G-21	R1423	D-20	R3332	G-20	R4309	B-21
D140	A-29	IC2771	B-27	Q1103	F-25	R152	B-28	R513	B-23	R1062	G-21	R1424	D-20	R3333	G-19	R4313	B-21
D301	F-22	IC2773	B-28	Q1106	E-25	R153	A-28	R514	B-25	R1063	G-21	R1425	D-20	R3334	G-19	R4314	B-21
D302	F-22	IC3300	G-19	Q1107	E-26	R154	A-29	R515	B-25	R1064	G-21	R1426	D-19	R3335	G-19	R4315	B-21
D303	F-25	IC3301	G-20	Q1108	E-26	R155	B-29	R516	B-25	R1066	H-21	R1427	D-19	R3336	G-19	R4316	B-21
D304	F-25	IC3450	H-20	Q1109	E-26	R156	A-29	R517	B-25	R1067	G-21	R1428	D-19	R3337	G-19	R4331	B-21
D701	E-29	IC4100	G-17	Q1112	E-26	R157	B-29	R518	B-25	R1068	G-21	R1429	D-19	R3338	G-19	R4332	B-21
D1104	F-26	IC4200	C-22	Q1401	D-20	R158	B-29	R520	B-24	R1069	G-21	R1430	D-19	R3339	G-19	R4335	A-21
D1106	E-26	IC4202	A-22	Q1402	E-20	R159	B-28	R521	B-24	R1070	H-21	R1431	D-19	R3340	G-19	R4336	A-21
D1112	E-27	IC4300	A-21	Q1403	E-20	R160	B-29	R522	B-24	R1071	G-21	R1432	D-19	R3341	H-19	R4337	A-21
D1113	E-27	IC4500	B-18	Q2200	B-30	R161	B-29	R523	B-24	R1072	G-22	R1433	D-18	R3342	G-20	R4342	A-21
D1114	E-27			Q2201	B-30	R162	B-29	R524	B-24	R1073	H-22	R1434	D-18	R3344	G-20	R4501	C-18
D1115	F-27	L103	B-20	Q2501	A-17	R163	A-29	R525	B-24	R1074	G-22	R1435	D-18	R3345	G-19	R4503	B-17
D1116	F-27	L141	A-29	Q3309	F-18	R164	B-28	R527	B-24	R1075	H-22	R1436	D-18	R3349	G-19	R4504	B-17
D1117	F-27	L142	B-28	Q3312	F-20	R165	B-28	R528	B-24	R1079	G-22	R1437	D-18	R3350	F-17	R4505	B-17
D2501	I-20	L143	A-27	Q3313	F-20	R166	B-28	R531	B-24	R1084	H-23	R1438	E-18	R3351	E-17	R4506	B-17
D2502	I-20	L303	F-22	Q3314	F-19	R167	B-28	R532	B-25	R1085	H-22	R1444	E-20	R3352	E-17	R4507	B-17
D2503	I-20	L304	F-24	Q3315	E-17	R168	B-28	R533	B-25	R1086	H-22	R1446	E-20	R3353	E-17	R4508	B-17
D2504	I-20	L305	G-22	Q3316	F-17	R169	B-28	R534	C-24	R1087	H-23	R1447	E-20	R3354	E-17	R4509	B-17
D2770	A-28	L306	G-23	Q3317	F-17	R170	B-28	R535	C-25	R1088	H-21	R1450	E-21	R3358	H-20	R4510	B-17
D4101	H-18	L307	C-16	Q3318	F-19	R181	A-28	R536	C-25	R1089	I-21	R1455	E-20	R3361	H-21	R4511	B-17
D4102	G-18	L702	D-30	Q3321	F-20	R305	D-23	R537	C-23	R1090	H-21	R1456	E-20	R3366	H-20	R4512	B-18
D4103	G-18	L703	D-28	Q3322	F-20	R306	F-23	R538	C-23	R1091	H-21	R1501	H-23	R3367	H-21	R4513	B-18
D4104	F-18	L801	G-28	Q3323	F-19	R307	E-22	R539	C-23	R1092	H-22	R1623	H-21	R3368	H-21	R4514	B-18
		L802	D-28	Q3324	E-17	R310	F-22	R540	B-23	R1093	I-23	R1624	I-21	R3382	G-20	R4518	B-19
FB301	F-22	L901	C-25	Q3326	H-21	R311	F-22	R542	B-23	R1094	I-23	R1625	I-21	R3383	G-20	R4519	B-19
FB302	D-17	L902	C-25	Q3328	H-20	R312	F-22	R704	B-29	R1094	I-23	R1626	I-21	R3384	G-19	R4520	B-19
FB303	F-23	L1002	G-24	Q3336	H-21	R313	F-23	R706	C-29	R1095	H-21	R1642	I-21	R3385	G-20	R4521	B-19
FB304	C-16	L1003	G-22	Q3340	G-20	R314	F-23	R708	D-29	R1096	I-21	R2200	A-30	R3386	G-20	R4522	B-19
FB305	D-24	L1004	G-22	Q3341	G-20	R315	F-23	R710	B-29	R1097	I-21	R2201	A-29	R3391	F-18	R4526	H-18
FB306	E-22	L1035	B-26	Q3352	I-17	R316	F-24	R711	C-29	R1098	H-21	R2202	B-29	R3392	F-18	R4527	H-18
FB307	G-24	L1085	I-22	Q3353	I-19	R317	F-24	R712	C-29	R1099	I-23	R2203	B-30	R3400	H-20	R4528	G-18
FB501	C-23	L1086	I-23	Q3450	H-19	R318	F-25	R713	C-29	R1100	I-23	R2204	B-30	R3401	H-19	R4529	G-18
FB703	E-28	L1087	I-22	Q4100	H-18	R319	F-25	R714	E-30	R1101	I-23	R2205	B-29	R3402	I-19	R4537	H-16
FB704	D-29	L1302	B-26	Q4101	H-18	R320	F-22	R715	E-30	R1102	H-23	R2206	B-30	R3403	I-19	R4538	H-16
FB705	D-28	L1304	B-26	Q4102	F-18	R321	F-24	R716	C-29	R1103	F-25	R2207	B-30	R3404	I-19		
FB706	D-27	L2200	B-30	Q4103	G-18	R322	F-22	R717	C-29	R1104	H-23	R2208	B-29	R3414	A-19	X301	E-22
FB707	B-30	L2501	A-16	Q4104	F-16	R323	E-24	R718	C-29	R1105	F-25	R2209	B-29	R3450	H-20	X501	C-25
FB708	E-30	L2773	A-28	Q4105	H-17	R324	F-25	R719	C-29	R1109	F-26	R2210	B-30	R3451	H-19	X701	E-29
FB709	E-30	L3306	F-20	Q4301	B-21	R325	E-25	R720	C-29	R1110	F-25	R2211	B-30	R3452	H-19	X801	F-28
FB710	E-30	L3307	F-20			R326	F-24	R721	E-30	R1112	F-26	R2501	A-16	R3453	H-19	X1401	D-20

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MS-058 BOARD (SIDE A)

CN011	D-3
CN012	E-3

MS-058 BOARD (SIDE B)

D011	A-5
R011	B-2
R012	A-5
R013	C-2
R014	C-2
R015	C-2
R016	C-2

MD-76 BOARD

C1	E-5
C2	D-5
CN1	E-5
CN2	D-5
CN3	A-6
IC1	D-5
IC2	D-2
IC3	E-5
JR1	D-4
JR3	D-6
JR4	D-3
JR5	E-5
JR6	D-5
R1	A-6
R3	D-4
R4	D-5
R5	D-5
R6	D-5
R7	D-3
R8	D-4
R9	B-7
R10	D-5
R11	D-5
R12	D-5
R13	D-5
R14	C-2
R15	A-5
R28	D-2
R29	D-5
R30	D-4
R31	D-5
R32	B-7
R33	B-7

JK-197 BOARD (SIDE A)

D181	D-1
D183	D-1
D185	D-2
D186	D-1
D188	D-2
D189	D-2
J181	E-2
J182	E-5
R182	D-2
R183	D-2
R184	D-2
R189	D-2

JK-197 BOARD (SIDE B)

C181	A-2
C182	B-2
C183	A-1
C184	A-2
CN181	C-2
D182	A-4
D184	A-4
D187	A-4
FB181	A-4
FB182	A-4
L181	A-1
L182	B-2
R181	B-4
R185	C-1
R186	C-1
R187	A-1
R188	B-2
R190	A-2
R191	C-4
R192	C-4

VO-012 BOARD (SIDE A)

CN202	A-2
D201	A-1
R201	A-1

VO-012 BOARD (SIDE B)

CN201	B-4

RL-057 BOARD

CN141	A-3
D141	C-3
D142	B-3
D143	C-3
J141	C-1
R141	B-3
R142	C-3
R143	B-3
R144	C-3
R145	C-3
R146	B-3

DV-031 BOARD

CN161	A-1
CN162	B-1
JS161	B-4
JS162	B-4
LP161	A-4

KY-049 BOARD (SIDE A)

S261	B-1
S262	B-5
S263	B-2
S264	B-4
S265	B-3
S266	B-6
S267	C-4
S268	C-3
S269	C-5
S270	C-2
S271	C-1

KY-049 BOARD (SIDE B)

CN261	A-3
CN262	A-3
D261	A-3
R261	A-6
R262	A-1
R263	A-4
R264	A-2
R265	A-4
R266	A-4
R267	A-3
R268	A-4
R269	A-3
R270	A-2

EJ-034 BOARD

CN291	A-4
S291	B-2

FC-074 BOARD

CN221	3-C
D221	B-4
D222	B-4
R221	B-4
R222	B-4
R223	C-4
S221	A-1
S222	B-1

LL-010 BOARD (SIDE A)

R471	A-2
S471	A-3
S472	A-1
S473	A-4
S474	D-4

LL-010 BOARD (SIDE B)

CN471	B-6
D471	B-7
D472	B-7
R473	A-8

FS-082 BOARD (SIDE A)

D401	D-2
D402	D-2
RV401	D-5
S401	E-2
S402	D-1
S403	E-5
S404	D-3
S405	E-5

FS-082 BOARD (SIDE B)

CN401	B-2
R401	A-2
R402	A-2
R403	A-3
R404	A-3
R405	A-3
R406	A-5
R407	A-2
R408	A-2

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SW-343 BOARD (SIDE A)

D101	C-5
D501	A-5
D502	A-5
D503	A-5
D504	A-5
D505	A-5
D507	A-4
FB501	C-3
FB502	C-3
FB503	C-3
R101	C-6
R102	C-6
R103	C-6
R104	C-6
R105	C-6
R505	B-3
R507	B-3
R509	B-3
R511	B-3
R513	B-3
RV501	B-7
RV502	A-7
RV503	C-1
S501	B-6
S502	B-12
S503	B-5
S504	A-5
S505	B-5
S506	A-5
S507	B-4
S508	B-3
S509	B-3
S510	A-3
S511	A-4
S512	B-3
S513	A-4
S514	B-4
S515	A-3
S516	B-3
S517	A-4
S518	C-6
S519	C-5
S520	C-7

SW-343 BOARD (SIDE B)

BT501	A-11
C501	A-13
CN502	A-13
CN503	C-13
CN504	B-13
CN505	C-12
CN506	A-12
CN507	C-12
CN508	B-13
CN509	A-13
CN511	A-13
CN512	C-13
D506	B-12
D508	C-14
IC501	A-13
Q001	C-14
R501	A-13
R502	A-13
R503	A-13
R504	C-8
R506	B-12
R508	B-12
R510	B-12
R512	A-12
R514	A-12
R515	B-10
R516	A-10
R517	C-14
R518	C-14
R519	C-14
R520	C-14

SB-036 BOARD (SIDE A)

S061	A-7
S062	C-2
S063	C-5
S064	C-1
S065	C-7
S066	C-7
S067	F-2
S068	E-2

SB-036 BOARD (SIDE B)

CN061	C-9
D061	C-10
D062	D-10
R061	A-10
R062	B-10
R063	C-10
R064	C-10
R065	C-10
R066	D-10

PM-040 BOARD

CN081	B-5
D081	B-5
D082	A-7
R001	A-5
S801	B-3
S802	A-1

AE-023 BOARD (SIDE A)

CN041	D-3
D042	C-3
S041	C-1
S042	C-2
S043	C-3
S044	C-4
S045	C-6

AE-023 BOARD (SIDE B)

D041	A-4
D043	B-1
R041	A-4
R042	A-4
R043	A-4
R044	A-4
R045	A-4
R046	B-6

KP-011 BOARD (SIDE A)

CN121	C-1
D121	C-1
D122	C-1
S121	B-1

PD-126 BOARD (SIDE A)

C2101	C-1
C2102	D-1
C2103	D-1
C2104	C-1
C2105	C-1
C2106	D-1
C2107	C-1
C2108	D-1
C2109	D-1
C2110	C-1
C2111	C-2
C2112	D-2
C2113	C-2
C2114	D-2
C2115	D-3
C2116	C-2
C2117	C-2
C2118	D-2
C2119	D-3
C2120	D-2
C2121	C-2
C2122	C-2
C2123	C-3
C2124	C-3
C2125	C-3
C2126	B-3
C2127	C-3
C2128	B-3
C2129	B-2
C2130	D-1
C2131	C-2
C2132	C-1
C2133	B-2
C2134	D-1
C2135	D-1
C2136	C-1
C2137	D-2
C2138	C-3
C2181	C-3
C2182	B-3
C2183	C-3
C2184	C-3
C2185	C-3
C2186	D-3
CN2100	C-1
CN2101	B-1
CN2103	B-3
CN2104	B-2
CN2105	D-3
D2101	C-1
D2102	C-2
D2103	B-2
D2104	B-2
D2105	B-3
D2181	A-3
IC2101	D-2
IC2103	B-2
L2101	C-1
L2102	C-1
L2103	D-2
L2104	C-2
L2105	B-1
L2181	C-3
L2182	C-3
Q2101	D-3
Q2102	C-3
Q2103	C-3
Q2104	C-3
Q2105	C-2
Q2106	B-2
Q2107	B-1
Q2108	B-1
Q2109	B-3
Q2111	C-2
Q2112	B-3
Q2181	C-3
Q2182	D-3
Q2183	B-3
R2109	D-1
R2110	D-1
R2111	D-1
R2112	C-1
R2113	B-1
R2114	D-2
R2115	C-2
R2116	C-2
R2117	C-2
R2118	C-2
R2119	C-2
R2122	C-2
R2123	C-3
R2124	C-2
R2125	C-2
R2126	C-3
R2127	D-3
R2128	C-3
R2129	C-2
R2134	C-3
R2135	C-2
R2136	C-2
R2137	C-3
R2138	C-3
R2139	B-2
R2140	B-2
R2141	B-2
R2142	B-2
R2144	C-3
R2145	C-3
R2146	B-1
R2147	C-3
R2148	C-3
R2149	B-2
R2150	B-3
R2151	C-2
R2152	B-3
R2153	B-3
R2154	B-3
R2155	A-3
R2157	B-3
R2158	C-3
R2159	B-3
R2160	B-3
R2161	B-3
R2162	B-2
R2163	C-2
R2165	B-3
R2166	B-3
R2168	D-1
R2169	D-1
R2170	C-2
R2171	D-3
R2172	B-3
R2173	D-1
R2174	D-1
R2175	C-1
R2176	C-2
R2177	B-3
R2178	C-2
R2179	C-2
R2180	C-2
R2181	D-3
R2182	D-3
R2183	A-4
R2184	B-2
R2185	D-2
R2186	D-3

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SE-116 BOARD

C600	B-5	R601	B-5
C601	B-5	R602	B-5
		R603	B-7
CN600	B-5	R604	B-5
FB601	B-5	SE600	B-3
FB602	B-7	SE601	B-1
L600	B-5		

ON-001 BOARD

CN2001	A-1
CN2002	E-3

NO-001 BOARD (SIDE B)

CN421	A-1
CN422	B-2

HP-129 BOARD

CN901	B-1	JS901	B-4
		JS902	B-4
D901	B-4	JS903	B-4
D902	B-4	JS904	B-4
D903	B-4	JS905	B-4
D904	B-4		
J901	A-1		

TH-010 BOARD

C451	C-4	Q451	A-1
CN451	A-4	R451	A-2
		R452	A-1
D451	B-2	R453	C-2
D452	B-1	R454	B-4
D453	A-1		
D454	C-2	S451	A-1
IC451	C-1		

ME-019 BOARD (SIDE A)

C711	B-4	R701	B-3
C712	B-4	R702	B-3
C713	B-3	R703	B-3
C714	B-3	R708	A-3
C735	D-4	R716	A-3
C736	D-4	R717	A-3
C737	D-4	R719	B-4
C738	D-3	R720	B-4
C739	D-4	R753	B-5
C751	B-3	R754	C-4
C753	B-3	R755	C-4
C755	B-3	R756	C-4
C757	B-2	R757	C-4
		R758	D-4
CN701	C-2	R759	D-5
CN702	A-1	R760	D-3
CN703	D-4	R761	C-4
CN704	A-4	R762	C-3
CN705	C-5	R763	C-4
		R784	B-3
IC705	D-4	R791	B-3
IC706	C-3		
L705	C-3		
Q705	A-4		
Q706	C-4		
Q709	B-3		

ME-019 BOARD (SIDE B)

C701	D-8		
C702	D-7	Q704	B-6
C703	D-7	Q707	B-9
C704	D-8	Q708	B-8
C705	D-7		
C706	D-7	R241	B-9
C707	D-7	R704	D-7
C708	D-7	R705	D-7
C709	A-6	R707	D-7
C710	D-7	R708	D-7
C715	D-9	R709	D-7
C716	D-9	R710	D-7
C717	C-9	R711	D-6
C718	C-9	R712	D-6
C719	C-9	R713	D-7
C720	C-9	R714	D-6
C721	C-8	R715	D-6
C722	C-8	R718	D-7
C723	C-8	R721	D-9
C724	C-8	R722	D-9
C726	C-7	R723	D-9
C727	C-7	R724	D-9
C734	C-6	R725	D-9
C734	C-6	R728	D-9
C740	C-7	R729	D-9
C741	C-7	R730	C-8
C742	C-7	R731	C-8
C743	C-7	R732	C-9
C744	C-7	R733	C-8
C745	C-7	R734	C-8
C746	C-7	R735	C-8
C747	C-6	R736	C-8
C748	C-7	R748	A-7
C749	C-7	R749	B-6
C750	B-7	R750	B-6
C752	B-8	R751	A-7
C754	B-8	R752	D-6
C756	B-8	R764	C-7
C758	B-7	R765	C-7
		R766	C-7
D701	C-9	R767	C-7
D702	C-9	R768	C-7
D703	C-9	R770	C-6
D704	C-9	R771	C-7
D725	C-8	R772	B-6
		R773	C-6
FB701	A-7	R774	B-6
FB702	A-7	R776	B-6
FB703	B-7	R777	C-7
FB704	B-7	R778	C-7
FB705	A-7	R779	C-7
FB706	A-7	R780	B-8
		R781	B-8
IC701	A-6	R782	B-8
IC702	D-9	R783	B-8
IC703	C-8	R785	B-8
IC707	C-6	R786	B-7
		R787	B-8
L701	D-7	R788	B-7
L702	D-8	R789	B-9
L703	D-7	R790	B-8
L704	C-7		

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XL-003 BOARD (SIDE A)

C819	E-2	L808	E-2
C820	E-1		
C821	G-6	R825	F-2
C822	F-6	R826	F-6
C823	E-2	R827	E-1
C824	E-1	R828	F-6
C825	F-6		
C826	E-6	S801	G-3
C850	E-1	S802	G-5
C852	E-1		
CN801	F-3		
CN802	F-5		

XL-003 BOARD (SIDE B)

C801	C-3	R801	C-3
C802	C-3	R802	C-3
C803	C-5	R803	C-5
C804	C-5	R804	C-5
C805	B-2	R805	C-3
C806	B-2	R806	C-3
C807	B-4	R807	C-5
C808	B-4	R808	C-5
C809	C-3	R809	C-4
C810	C-3	R810	C-3
C811	C-5	R811	C-5
C812	C-5	R812	C-5
C813	C-2	R813	C-4
C814	C-2	R814	C-3
C815	C-4	R815	C-3
C816	C-4	R816	C-5
C817	A-3	R817	C-5
C818	A-5	R818	C-5
C827	B-3	R819	C-4
C828	B-5	R820	C-3
C829	A-3	R821	C-6
C830	A-5	R822	C-5
C831	B-3	R823	A-3
C832	B-5	R824	A-5
C833	B-3	R829	A-4
C834	B-3	R830	A-5
C835	B-5	R831	A-3
C836	B-5	R832	A-5
C837	A-2	R833	B-3
C838	A-4	R834	B-5
C839	A-2	R835	A-3
C840	A-4	R836	A-5
C841	B-3	R836	B-6
C842	B-5	R837	B-4
C843	B-2	R839	B-4
C844	B-4	R840	B-4
C845	B-2	R841	B-6
C846	B-4	R842	B-6
C847	B-2	R843	A-2
C848	B-4	R844	A-2
C849	C-2	R845	A-2
C851	C-2	R846	A-4
		R847	A-4
CN803	C-1	R848	A-4
CN804	C-2	R849	B-3
		R850	B-5
D801	B-3	R851	A-2
D802	B-3	R852	A-4
D803	B-5	R853	A-2
D804	B-5	R854	A-4
D805	B-3	R855	B-3
D806	B-3	R856	B-5
D807	B-5	R857	C-1
D808	B-5		
IC801	B-3		
IC802	B-5		
IC803	B-2		
IC804	B-4		
L801	C-3		
L802	C-5		
L803	C-3		
L804	C-5		
L805	C-2		
L806	C-4		
L807	C-2		

DD-146 BOARD (SIDE A)

C301	C-2	IC302	B-2
C302	C-2		
C305	C-2	L301	C-2
C307	C-2	L302	D-4
C308	C-2	L304	C-3
C311	C-3	L308	D-1
C313	C-4	L309	E-2
C315	C-3	L310	D-4
C316	C-3		
C317	C-3	PS302	E-4
C318	C-3	PS304	E-4
C319	D-3		
C320	E-3	Q305	B-3
C321	B-3	Q308	D-4
C322	B-3	Q311	B-3
C331	B-3	Q312	B-3
C333	C-1	Q320	B-1
C340	B-2	Q322	B-1
C342	E-1	Q323	B-1
C344	B-1		
C345	B-1	R305	B-2
C345	B-2	R309	B-2
		R310	C-2
CN301	F-1	R313	B-2
CN302	F-2	R315	D-3
CN303	A-3	R325	B-3
CN304	A-2	R326	B-3
CN305	F-3	R348	B-1
CN306	A-1	R353	B-1
		R354	B-1
D301	D-3	R404	C-3
D303	D-2	R405	F-1
		R406	A-4
F301	E-4		
F302	E-4		
F303	E-4		
F304	E-3		
F305	E-3		

DD-146 BOARD (SIDE B)

C304	D-5	Q313	D-8
C306	D-5	Q314	D-8
C309	D-5	Q315	B-6
C310	D-6	Q316	D-7
C312	C-5	Q317	D-7
C314	B-7	Q318	C-8
C323	D-8	Q319	D-7
C324	B-6	Q321	E-7
C325	C-8		
C326	C-7	R302	D-5
C327	D-8	R303	D-5
C328	D-7	R304	D-5
C329	B-6	R306	D-5
C330	B-6	R307	D-5
C332	C-8	R308	D-5
C334	C-7	R311	D-5
C335	C-7	R312	D-5
C336	C-7	R314	B-7
C337	C-7	R317	C-7
C338	B-7	R318	C-5
C339	B-7	R319	C-5
C341	D-8	R320	C-7
C343	E-7	R321	C-7
C346	E-8	R322	C-7
C347	E-8	R323	C-7
C348	B-8	R324	C-7
C349	B-8	R327	D-8
C350	B-8	R328	D-8
C351	B-7	R329	B-6
C352	F-6	R330	D-8
C353	F-6	R331	D-8
		R332	D-7
D302	B-6	R333	C-8
D304	D-7	R334	C-8
D305	D-7	R335	D-7
		R336	D-7
F307	A-7	R337	D-7
		R338	C-8
IC301	D-5	R339	C-8
IC303	C-8	R340	C-8
IC304	D-8	R341	B-7
		R342	B-7
L306	B-7	R343	B-7
		R344	B-7
PS303	F-7	R345	E-8
		R346	E-8
Q303	D-6	R347	D-8
Q304	D-6	R349	D-8
Q306	C-7	R350	D-8
Q307	C-7	R351	E-8
Q309	C-7	R352	D-7
Q310	C-7		

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DC-095 BOARD

C281 A-1

CN281 A-1
CN282 A-4

IN-057 BOARD

C241 B-2
C242 B-4
C243 E-1

CB241 E-2

CN241 A-1
CN242 B-1
CN243 E-1

D241 A-2

Q241 C-4
Q242 B-4
Q243 B-4

R243 A-4
R244 B-4

VL-034 BOARD

C481 A-1
C482 A-1

CN481 A-4
CN482 B-2
CN483 B-1

LP481 A-2

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SECTION 5
ADJUSTMENTS

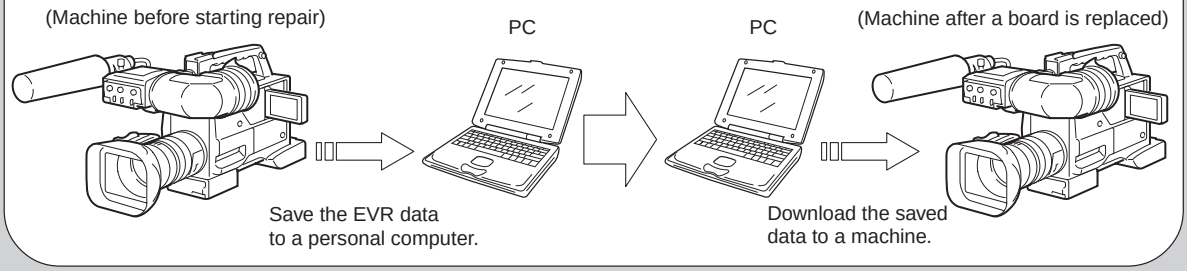
1. Before starting adjustment

EVR Data Re-writing Procedure When Replacing Board

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

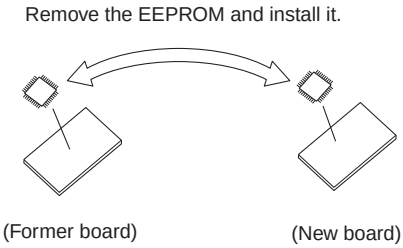
Procedure 1

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



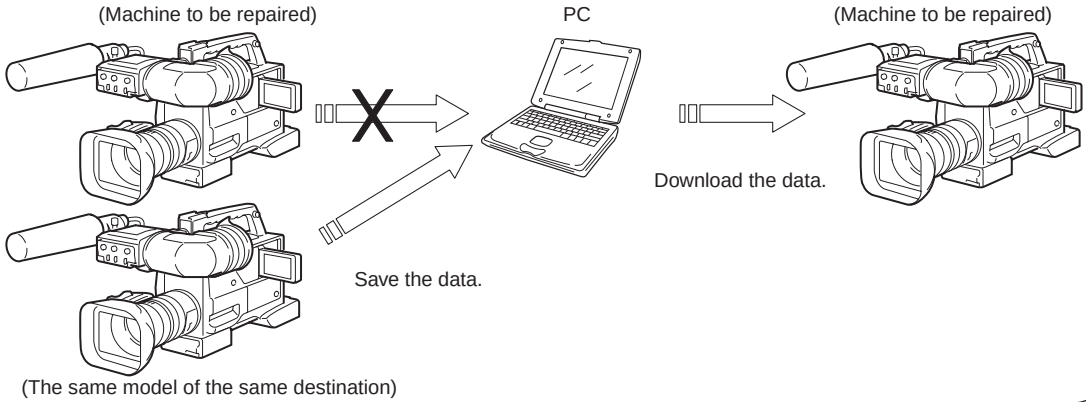
Procedure 2

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



Procedure 3

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



After the EVR data is saved and downloaded, check the respective items of the EVR data.
(Refer to page 5-3 for the items to be checked.)

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

• Adjusting items when replacing main parts

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

Adjustment Section	Adjustment	Replaced parts: Block replacement: Lens device	Prism assy (Including 3 CCD imagers)	VAP unit	Mechanism deck (Note 1)	LCD block LCD901 (LCD panel)	LCD block ND901 (Fluorescent tube)	LCD block Inverter unit	Control switch (CF-1044)	Mechanism deck M901 (Drum motor) (Note 1)	Mechanism deck M902 (Capstan motor) (Note 1)	Parts replacement: SE-116 board SE601/SE600 (PITCH/YAW sensor)	PD-126 board IC2101 (RGB driver (LCD))	PD-126 board IC2103 (Timing generator (LCD))	VI-156 board IC705, X701 (Timing generator)	VI-156 board IC704 (S/H, AGC)	VI-156 board IC706 (A/D converter)	VI-156 board IC802 (Camera micro processor)	VI-156 board IC1301 (LINE IN/OUT amp)	VI-156 board IC301 (DV signal process)	VI-156 board IC101 (EQ, A/D CONV., PLL)	VI-156 board IC102 (REC/PB amp)	VI-156 board IC803 (EVR)	MD-76 board IC2, 3, RV1 to 4
Initialization of A, B, C, D, E, F, 8 page data	Initialization of C, D, 8 page data																								
	Initialization of A page data																								
	Initialization of B page data																								
	Initialization of E, F page data																								
Camera	27MHz origin oscillation adj.														●								●		
	Zoom key center adj.								●																
	HALL adj.	●	●																						
	Offset adj.		●													●	●								
	Flange back adj.	●	●																						
	Pre-white balance data input	●	●													●	●								
	AWB standard data input	●	●													●	●								
	MAX GAIN adj.	●	●													●	●								
	LV standard data input	●	●													●	●								
	White balance ND filter 1 compensation	●	●													●	●								
	White balance ND filter 2 compensation	●	●													●	●								
	Auto white balance adj.	●	●													●	●								
	Color reproduction adj. (ND filter OFF)	●	●													●	●								
	Color reproduction adj. (ND filter 1)	●	●													●	●								
	Color reproduction adj. (ND filter 2)	●	●													●	●								
	Steady shot adj.			●								●													
LCD	VCO adj.													●											
	Bright adj.												●												
	Black limit adj.												●												
	Contrast adj.												●							●					
	Center level adj.												●												
	V COM adj.					●							●												
	White balance adj.					●	●	●					●												
System control	Serial No. input																								
	Battery end adj.																								
Servo, RF	CAP FG duty adj.				●						●														
	Switching position adj.				●					●															
	AGC center level adj.				●					●												●	●		
	APC & AEQ adj.				●					●												●	●		
	PLL f_0 & LPF f_0 adj.				●					●												●	●		
Video	Chroma BPF f_0 adj.																		●						
	S VIDEO OUT Y level adj.																		●	●					
	S VIDEO OUT Cr, Cb level adj.																		●	●					
Mechanism	Tape path adj.				●					●	●														●
	TG2/7 elec. tension reg. adj.				●																				●

Table. 5-1-1(1).

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• Adjusting items when replacing a board or EEPROM

When replacing a board or EEPROM, adjust the items indicated by ● in the following table.

Adjustment Section	Adjustment	Board replacement: CD-274 board (COMPLATE)	MD-76 board (COMPLATE)	VI-156 board (COMPLATE)	SE-116 board (COMPLATE)	PD-126 board (COMPLATE)	VI-156 board IC801 (EEPROM)	VI-156 board IC502 (EEPROM)	VI-156 board IC1406 (EEPROM)	VI-156 board IC1105 (EEPROM)(Note 2)
Initialization of A, B, C, D, E, F, 8 page data	Initialization of C, D, 8 page data			●				●		
	Initialization of A page data			●						●
	Initialization of B page data			●					●	
	Initialization of E, F page data			●			●			
Camera	27MHz origin oscillation adj.			●			●			
	Zoom key center adj.									
	HALL adj.			●			●			
	Offset adj.	●		●			●			
	Flange back adj.	●		●			●			
	Pre-white balance data input	●		●			●			
	AWB standard data input	●		●			●			
	MAX GAIN adj.	●		●			●			
	LV standard data input	●		●			●			
	White balance ND filter 1 compensation	●		●			●			
	White balance ND filter 2 compensation	●		●			●			
	Auto white balance adj.	●		●			●			
	Color reproduction adj. (ND filter OFF)	●		●			●			
	Color reproduction adj. (ND filter 1)	●		●			●			
	Color reproduction adj. (ND filter 2)	●		●			●			
	Steady shot adj.			●	●		●			
LCD	VCO adj.			●		●		●		
	Bright adj.			●		●		●		
	Black limit adj.			●		●		●		
	Contrast adj.			●		●		●		
	Center level adj.			●		●		●		
	V COM adj.			●		●		●		
	White balance adj.			●		●		●		
System control	Serial No. input			●				●		
	Battery end adj.			●				●		
Servo, RF	CAP FG duty adj.			●				●		
	Switching position adj.			●				●		
	AGC center level adj.			●				●		
	APC & AEQ adj.			●				●		
	PLL f_0 & LPF f_0 adj.			●				●		
Video	Chroma BPF f_0 adj.			●				●		
	S VIDEO OUT Y level adj.			●				●		
	S VIDEO OUT Cr, Cb level adj.			●				●		
Mechanism	Tape path adj.		●							
	TG2/7 elec. tension reg. adj.		●							

Table. 5-1-1(2).

Note1: When replacing the following parts, reset the HRS METER data (page: A, address: 00 to 13) to "00".
(Refer to "HRS METER (Hours meter)" of "5-4. SERVICE MODE")
- Mechanism deck
- Drum assembly
- Capstan motor

And when replacing the following parts, reset the data of page: 2, address: A2 to A4 to "00". (Refer to "Record of Use check" of "5-4. SERVICE MODE")
- Mechanism deck
- Drum assembly

Note2: When replacing the IC1105 by a user's having forgotten a password, copy the HRS METER data.
(Refer to "HRS METER (Hours meter)" of "5-4. SERVICE MODE")

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5-1. CAMERA SECTION ADJUSTMENT

1-1. PREPARATIONS BEFORE ADJUSTMENT (CAMERA SECTION)

1-1-1. List of Service Tools

• Oscilloscope • Color monitor • Vectorscope
• Regulated power supply • Digital voltmeter

Ref. No.	Name	Parts Code	Usage
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 (2 sheets used)
J-3	Pattern box PTB-450	J-6082-200-A	
J-4	Color chart for pattern box	J-6020-250-A	
J-5	Adjustment remote commander (RM-95 upgraded) (Note1)	J-6082-053-B	
J-6	Siemens star chart	J-6080-875-A	For checking the flange back
J-7	Clear chart for pattern box	J-6080-621-A	
J-8	CPC-13 jig	J-6082-443-A	For adjusting the video section
J-9	Mini pattern box	J-6082-353-B	For adjusting the flange back
J-10	Camera table	J-6082-384-A	For adjusting the flange back
J-11	Cleaning fluid	Y-2031-001-0	
J-12	Wiping cloth	7-741-900-53	
J-13	Super fine applicator (made by NIPPON APPLICATOR (P752D))	—	
J-14	Mirror (Small oval type)	J-6080-840-A	
J-15	Screwdriver for tape path	J-6082-026-A	Tape path for adjusting tape guide
J-16	Mode selector conversion board (R)	J-6082-460-A	
J-17	Tracking tape (XH2-1A1)(NTSC/PAL)	8-967-999-03	
J-18	Mini DV torque cassette	J-6082-360-A	For FWD torque, REV torque and FWD back tension
J-19	Mode Selector Ⅱ	J-6082-282-B	For all operating
J-20	Mode Selector Ⅱ ROM	J-6082-314-E	Corresponds to R mechanism (Note 2)
J-21	FLOIL Grease (SG-941)	7-622-601-39	
J-22	Cassette refernce plate	J-6082-330-A	
J-23	Reel reference plate	J-6082-331-A	
J-24	TG2/7 preset plate	J-6082-459-A	
J-25	Relay board for tension regulator adjustment	J-6082-461-A	
J-26	Board for tension regurator adjustment	J-6082-359-A	
J-27	Circular connector (PF, XLR4P)	1-783-189-11	For connecting the regulated power supply (Note 3)

Note1: If the micro processor IC in the adjustment remote commander is not the new micro processor (UPD7503G-C56-12), the pages cannot be switched. In this case, replace with the new micro processor (8-759-148-35).

Note 2: ROM for version upgrading to allow use of the mode selector II with the R mechanism.

Note 3: Refer to “1-1-3. How to make the DC cable”.

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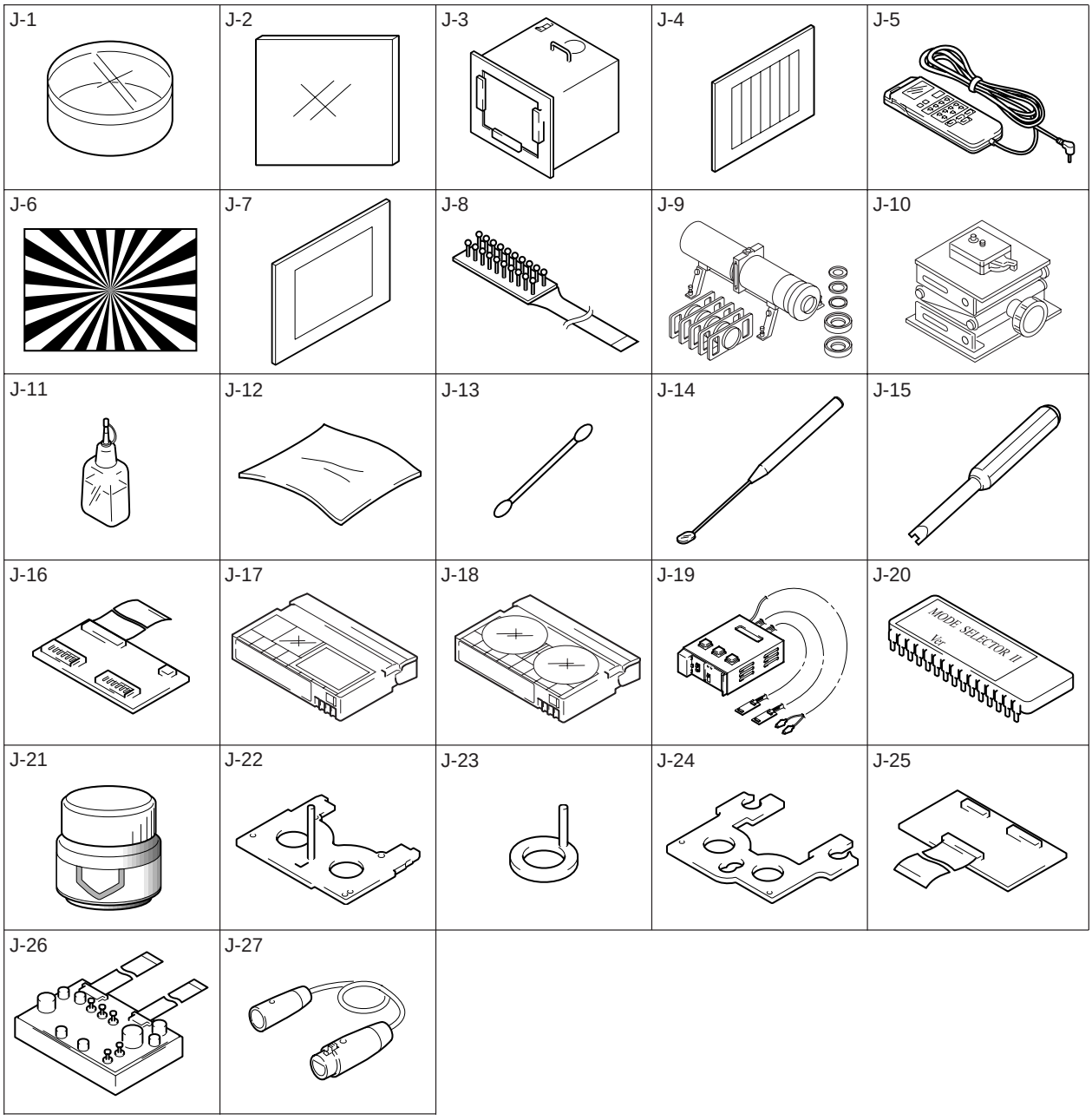


Fig. 5-1-1.

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1-1-2. Preparations

Note 1: For details of how remove the cabinet and boards, refer to "2. DISASSEMBLY".

Note 2: When performing only the adjustments, the lens block and boards need not be disassembled.

1) Connect the equipment for adjustments according to Fig. 5-1-4.

Note 3: As removing the cabinet (R) (removing the VI-156 board CN014) means removing the lithium 3V power supply (SW-343 board BT501), data such as date, time, user-set menus will be lost. After completing adjustments, reset these data. If the cabinet (R) has been removed, the self-diagnosis data, data on history of use (total drum rotation time etc.) will be lost. Before removing, note down the self-diagnosis data and the data on history use (data of page: 2, address: A2 to AA). (Refer to "SELF-DIAGNOSIS FUNCTION" for the self-diagnosis data, and to "5-4.Service Mode" for the data on the history use.)

Note 4: Setting the "Forced Camera Power ON" Mode
1) Select page: 0, address: 01, and set data: 01.
2) Select page: D, address: 10, set data: 01, and press the PAUSE button of the adjustment remote commander.
The above procedure will enable the camera power to be turned on with the cabinet (R) assembly removed. After completing adjustments, be sure to exit the "Forced Camera Power ON Mode".

Note 5: Exiting the "Forced Camera Power ON" Mode
1) Select page: 0, address: 01, and set data: 01.
2) Select page: D, address: 10, set data: 00, and press the PAUSE button of the adjustment remote commander.
3) Select page: 0, address: 01, and set data: 00.

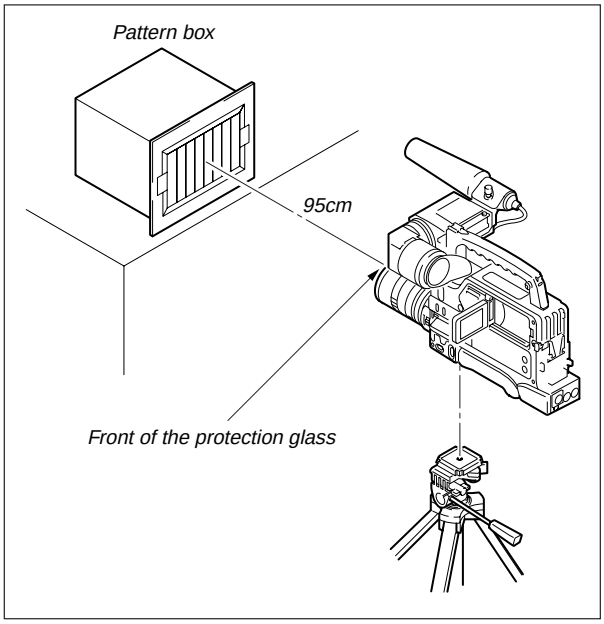


Fig. 5-1-2.

1-1-3. How to make the DC cable

Cut the connecting cable (1-783-189-11), and connect the regulated power supply to the circular connector (receptacle) as shown in the following figure.

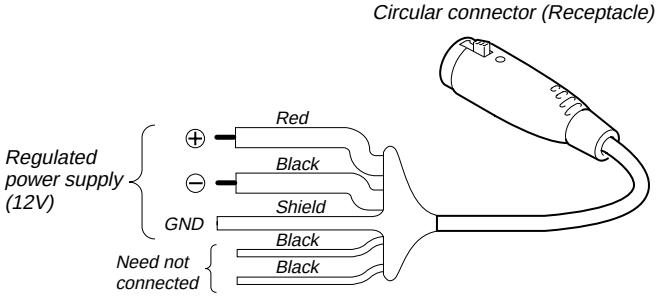


Fig. 5-1-3.

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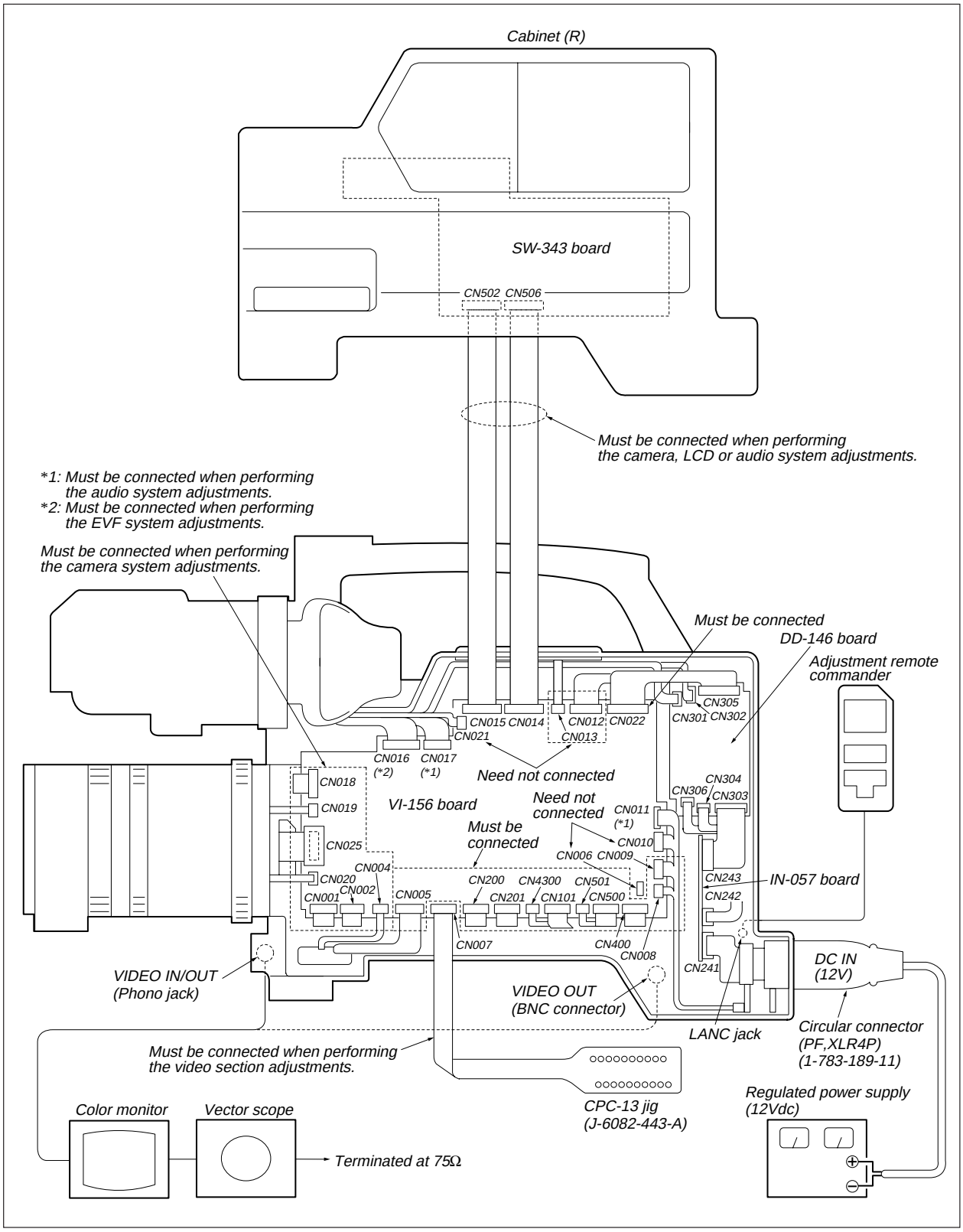


Fig. 5-1-4.

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1-1-4. Precaution

1. Setting the Switch

Unless otherwise specified, set the switches as follows and perform adjustments without loading cassette.

1. MODE switch (PM-040 board) ..... CAMERA
2. DIGITAL ZOOM (Menu display) ..... OFF
3. STEADY SHOT (Menu display) ..... OFF
4. DISPLAY (Menu display) ..... V-OUT/LCD
5. DISPLAY (SB-036 board) ..... ON
6. AUTO MODE (SB-036 board) ..... ON
7. ND FILTER (Lens block) ..... OFF
8. FOCUS switch (FC-074 board) ..... MANUAL
9. BACK LIGHT (SB-036 board) ..... OFF
10. SPOT LIGHT (SB-036 board) ..... OFF
11. CUSTOM PRESET (CUSTOM PRESET MENU) ..... OFF
12. DIGITAL EFFECT (SW-343 board) ..... OFF
13. ZEBRA (SB-036 board) ..... OFF
14. 16 : 9 WIDE (Menu display) ..... OFF
15. AUTO SHUTTER (Menu display) ..... OFF
16. PROG.SCAN (Menu display) ..... OFF
17. SET UP (Menu display) 0%

2. Order of Adjustments

Basically carry out adjustments in the order given.

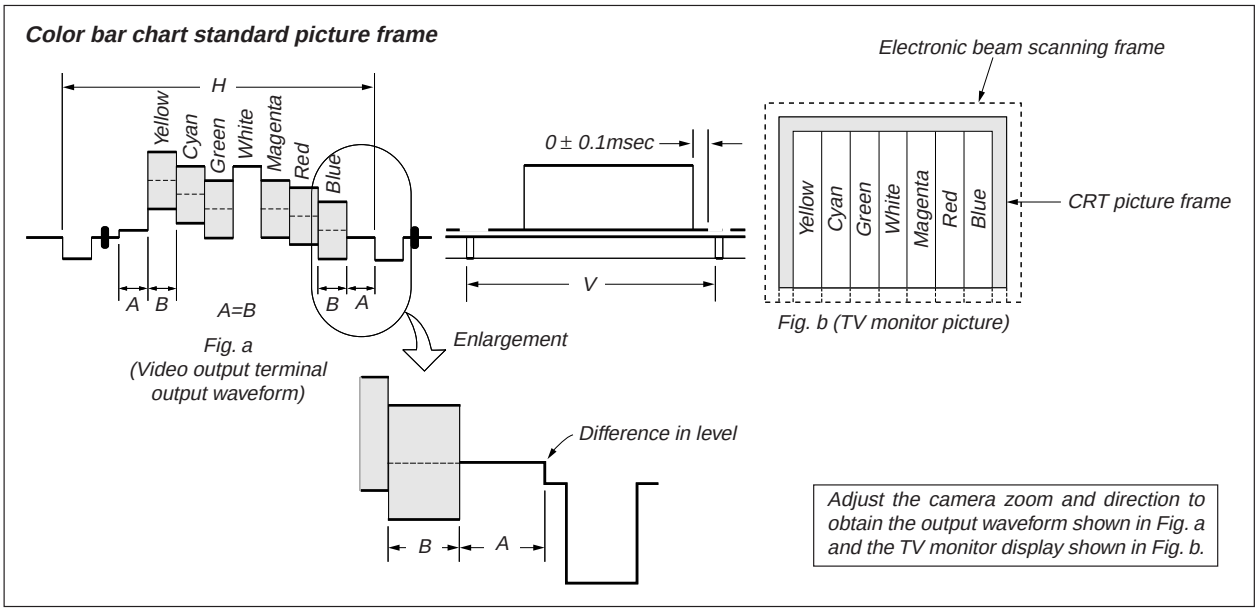


Fig. 5-1-5.

3. Subjects

1) Color bar chart (Standard picture frame).
   When performing adjustments using the color bar chart, adjust the picture frame as shown in Fig. 5-1-5. (Standard picture frame)
2) Clear chart (Standard picture frame)
   Remove the color bar chart from the pattern box and insert a clear chart in its place. (Do not perform zoom operations during this time.)
3) Flange back adjustment chart
   Make the chart shown in Fig. 5-1-6. using A0 size (1189 mm × 841 mm) black and white vellum paper.

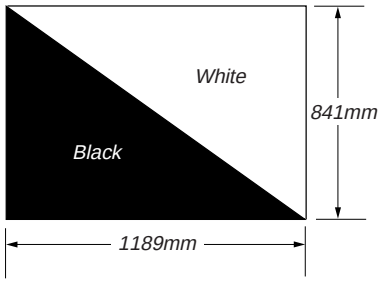


Fig. 5-1-6.

Note: Use matte vellum paper bigger than A0, and make sure the edges of the black and white paper joined together are not rough.

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1-2. INITIALIZATION OF A, B, C, D, E, F, 8 PAGE DATA

1-2-1. INITIALIZATION OF A, C, D, 8 PAGE DATA

Adjustment Page	C
Adjustment Address	10 to FF
Adjustment Page	D
Adjustment Address	10 to FF
Adjustment Page	8
Adjustment Address	00 to FF
Adjustment Page	A
Adjustment Address	00 to FF

1. Initializing the C, D, 8 Page Data

Note1: If "Initializing the C, D, 8 Page Data" is performed, all data of the C page, D page and 8 page will be initialized. (It is impossible to initialize a single page.)

Note2: If the C, D, 8 page data has been initialized, the following adjustments need to be performed again.
1) Modification of C, D, 8 page data
2) Serial No. input
3) Servo and RF system adjustments
4) Video system adjustments
5) LCD system Adjustments

Initializing Method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data
2	3	81		Check that the data is "00".
3	3	80	0A	Set the data, and press the PAUSE button.
4	3	80		Check that the data changes to "1A"
5				Perform "Modification of C, D, 8 Page Data".

2. Modification of C, D, 8 Page Data

If the C, D, 8 page data has been initialized, change the data of the "Fixed data-2" address shown in the following tables by manual input.

Modifying Method:

1) Before changing the data, select page: 0, address: 01, and set data: 01.
2) New data for changing are not shown in the tables because they are different in destination. When changing the data, copy the data built in the same model.
   Note: If copy the data built in the different model, the camcorder may not operate.
3) When changing the data, press the PAUSE button of the adjustment remote commander each time when setting new data to write the data in the non-volatile memory.
4) Check that the data of adjustment addresses is the initial value. If not, change the data to the initial value.

Processing after Completing Modification of C, D, 8 Page data

Order	Page	Address	Data	Procedure
1	2	00	29	Set the data
2	2	01	29	Set the data, and press the PAUSE button.

Note: If the following symptoms occur after completing of the "Modification of C, D, 8 page data", check that the data of the "Fixed data-2" addresses of D page are same as those of the same model of the same destination.
1) The battery end mark on the LCD or viewfinder screen is flashing.
2) The power is shut off so that unit cannot operate.

3. C Page Table

Note: Fixed data-1: Initialized data. (Refer to "1. Initializing the C, D, 8 Page Data".)
Fixed data-2: Modified data. (Refer to "2. Modification of C, D, 8 Page Data".)

Address	Initial value	Remark
00 to 0F		
10	EE	Switching position adj.
11	00	
12	00	
13	00	
14 to 15		Fixed data-1
16	E0	Cap FG duty adj.
17		Fixed data-1
18	2A	AEQ adj.
19	2A	
1A		Fixed data-1
1B	32	AEQ adj.
1C	32	
1D		Fixed data-1
1E	25	AGC center level adj.
1F	3E	PLL f_0 adj.
20	3E	
21	DC	APC adj.
22	99	LPF f_0 adj.

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Address	Initial value	Remark
23 to 24		Fixed data-1
25	88	S VIDEO out Y level adj.
26	E3	S VIDEO out Cr level adj.
27	22	S VIDEO out Cb level adj.
28	04	Chroma BPF f_0 adj.
29	20	PLL f_0 fine adj.
2A		Fixed data-1
2B		Fixed data-2
2C	03	APC adj.
2D to 3F		Fixed data-1
40		Fixed data-2
41		Fixed data-1
42		Fixed data-2
43 to 46		Fixed data-1
47		Fixed data-2
48 to 4A		Fixed data-1
4B		Fixed data-2
4C to 55		Fixed data-1
56		Fixed data-2
57 to 81		Fixed data-1
82		Fixed data-2
83 to 85		Fixed data-1
86		Fixed data-2
87		
88		
89		
8A to 99		Fixed data-1
9A		Fixed data-2
9B		
9C to A4		Fixed data-1
A5		Fixed data-2
A6		
A7		
A8 to AA		Fixed data-1
AB		Fixed data-2
AC		Fixed data-1
AD		Fixed data-2
AE		Fixed data-1
AF		Fixed data-2
B0		
B1		Fixed data-1
B2		Fixed data-2
B3		
B4		
B5		
B6		
B7		
B8		
B9		
BA to BF		Fixed data-1
C0		Fixed data-2
C1 to D5		Fixed data-1
D6		Fixed data-2
D7		
D8		
D9		

Address	Initial value	Remark
DA		Fixed data-2
DB		
DC		
DD		
DE to E5		Fixed data-1
E6		Fixed data-2
E7		Fixed data-1
E8	08	Serial No. input
E9	00	
EA	46	
EB	01	
EC	02	
ED	00	
EE	00	
EF	00	
F0 to F3		Fixed data-1
F4	00	Emergency memory address
F5	00	
F6	00	
F7	00	
F8	00	
F9	00	
FA	00	
FB	00	
FC	00	
FD	00	
FE	00	
FF	00	

Table. 5-1-2.

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4. D Page Table

Note: Fixed data-1: Initialized data. (Refer to "1. Initializing the C, D, 8 Page Data".)
Fixed data-2: Modified data. (Refer to "2. Modification of C, D, 8 Page Data".)

Address	Initial value	Remark
00 to 0F		
10	00	Test mode
11 to 12		Fixed data-1
13		Fixed data-2
14		
15		Fixed data-1
16		Fixed data-2
17		
18		
19		Fixed data-1
1A		Fixed data-2
1B		
1C		
1D		Fixed data-1
1E		Fixed data-2
1F		
20		
21		
22		
23		
24		Fixed data-1
25		Fixed data-2
26		
27		
28		
29		
2A		Fixed data-1
2B		Fixed data-2
2C		
2D		Fixed data-1
2E		Fixed data-2
2F		
30		
31 to 32		Fixed data-1
33		Fixed data-2
34		
35		
36		
37		
38 to 43		Fixed data-1
44		Fixed data-2
45		
46		Fixed data-1
47		Fixed data-2
48 to 65		Fixed data-1
66		Fixed data-2
67 to 69		Fixed data-1
6A		Fixed data-2
6B to 7A		Fixed data-1
7B		Fixed data-2
7C to 7E		Fixed data-1
7F		Fixed data-2
80 to 8D		Fixed data-1
8E		Fixed data-2
8F		
90 to 9F		Fixed data-1
A0		Fixed data-2
A1		
A2	71	VCO adj. (LCD)
A3	71	
A4	9F	V-COM adj. (LCD)
A5	AA	Bright adj.(LCD)
A6	0A	Black limit adj.(LCD)
A7		Fixed data-2
A8	85	White balance adj. (LCD)
A9	75	
AA	40	Contrast adj. (LCD)
AB	30	Center level adj.(LCD)
AC		Fixed data-2
AD		
AE		
AF		
B0		
B1 to B8		Fixed data-1
B9		Fixed data-2
BA		
BB to C3		Fixed data-1
C4		Fixed data-2
C5		Fixed data-1
C6		Fixed data-2
C7 to CF		Fixed data-1
D0		Fixed data-2
D1		
D2 to D5		Fixed data-1
D6		Fixed data-2
D7		
D8 to DA		Fixed data-1
DB		Fixed data-2
DC to EF		Fixed data-1
F0	A9	Battery end adj.
F1	AD	
F2	AE	
F3	B5	
F4	C8	
F5	D7	
F6	E7	
F7		Fixed data-1
F8	A9	Battery end adj.
F9	AD	
FA	AE	
FB	B1	
FC	B5	
FD	B9	
FE	C0	
FF		Fixed data-1

Table. 5-1-3.

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5. 8 Page Table

Note: Fixed data-1: Initialized data. (Refer to "1. Initializing the C, D, 8 Page Data".)
Fixed data-2: Modified data. (Refer to "2. Modification of C, D, 8 Page Data".)

Address	Remark
00 to 07	Fixed data-1
08	Fixed data-2
09 to 0F	Fixed data-1
10	Fixed data-2
11 to 30	Fixed data-1
31	Fixed data-2
32 to 5A	Fixed data-1
5B	Fixed data-2
5C to 72	Fixed data-1
73	Fixed data-2
74	
75 to 78	Fixed data-1
79	Fixed data-2
7A to 7D	Fixed data-1
7E	Fixed data-2
7F	
80	
81 to 8F	Fixed data-1
90	Fixed data-2
91 to 98	Fixed data-1
99	Fixed data-2
9A to FF	Fixed data-1

Table. 5-1-4.

6. Initializing the A Page Data

Note1: The HRS METER data of the menu are memorized in addresses 00 to 13.
Perform "Initializing the A Page Data" only when you don't know original values of addresses 00 to 13.
If you know original values, perform "HRS METER data re-writing procedure".
(Refer to "HRS METER" of "5-4. SERVICE MODE")

Initializing Method:

1) Before changing the data, select page: 0, address: 01, and set data: 01.
2) Input the initial value shown in the A page table to each address.
3) When inputting the data, press the PAUSE button of the adjustment remote commander each time when setting new data to write the data in the non-volatile memory.
4) After completing data inputting, turn off the power and remove the DC power supply or battery.

A Page Table

Address	Initial value	Remark
00	00	OPERATION (L)
01	00	OPERATION (H)
02	00	DRUM RUN (L)
03	00	DRUM RUN (H)
04	00	TAPE RUN (L)
05	00	TAPE RUN (H)
06	00	THREADING (L)
07	00	THREADING (H)
08	00	CHECK SUM (L)
09	00	CHECK SUM (H)
0A	00	OPERATION (L)
0B	00	OPERATION (H)
0C	00	DRUM RUN (L)
0D	00	DRUM RUN (H)
0E	00	TAPE RUN (L)
0F	00	TAPE RUN (H)
10	00	THREADING (L)
11	00	THREADING (H)
12	00	CHECK SUM (L)
13	00	CHECK SUM (H)
14 to FF	Fixed-1	

Table. 5-1-5.

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1-2-2. INITIALIZATION OF B PAGE DATA

Note: When reading the B page data, insert a "Memory Stick" into the "Memory Stick" slot.

Switch setting:

MODE ..... MEMORY

1. Initializing the B Page Data

Note: If the B page data has been initialized, the following adjustments need to be performed again.
1) Modification of B page data

Adjustment Page	B
Adjustment Address	00 to FF

Initializing Method

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	5	01	F3	Set the data, and press PAUSE button.
3	5	00	01	Set the data, and press PAUSE button.
4	5	01		Wait for three seconds.
5	5	00		Check that the data is "00".
6	5	02		Check that the data is "00".
7				Perform "Modification of B Page Data".

2. Modification of B Page Data

If the B page data has been initialized, change the data of the "Fixed data-2" address shown in the following tables by manual input.

Preparations:

Order	Page	Address	Data	Procedure
1	2	8F	00	Set the data, and press PAUSE button.
2	2	8F	03	Set the data, and press PAUSE button.
3	2	8F	00	Set the data, and press PAUSE button.

Modifying Method:

1) Before changing the data, select page: 0, address: 01, and set data: 01.
2) New data for changing are not shown in the tables because they are different in destination. When changing the data, copy the data built in the same model.
   Note: If copy the data built in the different model, the camcorder may not operate.
3) When changing the data, press the PAUSE button of the adjustment remote commander each time when setting new data to write the data in the non-volatile memory.

Processing after Completing Modification of B Page data:

Order	Page	Address	Data	Procedure
1	2	00	29	Set the data.
2	2	01	29	Set the data, and press PAUSE button.

3. B Page Table

Note: Fixed data-1: Initialized data. (Refer to "1. or 3. Initializing the B Page Data".)
Fixed data-2: Modified data. (Refer to "2. or 4. Modification of B Page Data".)

Address	Remark
00 to 34	Fixed data-1
35	Fixed data-2
36,37	Fixed data-1
38	Fixed data-2
39	
3A	
3B	
3C	
3D	
3E to 5F	Fixed data-1
60	Fixed data-2
61 to FF	Fixed data-1

Table. 5-1-6.

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1-2-3. INITIALIZATION OF E, F PAGE DATA

1. Initializing the E, F Page Data

Note1: If "Initializing the E, F Page Data" is performed, all data of the E page and F page will be initialized. (It is impossible to initialize a single page.)

Note2: If the E, F page data has been initialized, following adjustments need to be performed again.
1) Modification of E, F page data
2) Camera system adjustments

Adjustment Page	F
Adjustment Address	10 to FF
Adjustment Page	E
Adjustment Address	00 to FF

Switch setting:

MODE ..... CAMERA

Initializing Method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	6	01		Set the following data, and press PAUSE button. 2D: DSR-250 (NTSC) 2F : DSR-250P (PAL)
3	6	03	01	Set the data, and press PAUSE button.
4	6	02		Check that the data changes to "01".
5				Perform "Modification of E, F Page Data".

2. Modification of E, F Page Data

If the E, F page data has been initialized, change the data of the "Fixed data-2" address shown in the following table by manual input.

Modifying Method:

1) Before changing the data, select page: 0, address: 01, and set data: 01.
2) New data for changing are not shown in the tables because they are different in destination. When changing the data, copy the data built in the same model.
   Note: If copy the data built in the different model, the camcorder may not operate.
3) When changing the data, press the PAUSE button of the adjustment remote commander each time when setting new data to write the data in the non-volatile memory.
4) Check that the data of adjustment addresses is the initial value. If not, change the data to the initial value.

Processing after Completing Modification of E, F Page data

1) Select page: 0, address: 01, and set data: 00.
2) Turn off the power and turn on again.

3. F Page Table

Note1: Fixed data-1: Initialized data. (Refer to "1. Initializing the E, F Page Data".)
Fixed data-2: Modified data. (Refer to "2. Modification of E, F Page Data".)

Address	Initial value		Remark
	NTSC	PAL	
00 to 0F			
10 to 1B			Fixed data-1
1C	80	80	27MHz origin osc. adj.
1D			Fixed data-1
1E	60	60	HALL adj.
1F	40	60	
20	00	00	AWB standard data input
21	15	15	
22	00	00	
23	2E	2E	
24	AE	AE	Flange back adj.
25	2B	2B	
26	44	44	
27	43	43	
28	B2	B2	
29	16	16	
2A	00	00	
2B	00	00	
2C	8B	8B	MAX GAIN adj.
2D to 33			Fixed data-1
34	88	90	Auto white balance adj.
35	6C	8F	
36	D6	D6	Flange back adj.
37	E6	E6	
38	46	46	
39	45	00	
3A	3F	19	
3B	3F	00	
3C	16	27	
3D	A8	A8	
3E	38	38	LV standard data input
3F	76	76	
40			Fixed data-1
41	50	50	Steady shot adj.
42	50	50	
43			Fixed data-1
44	EB	EB	Color reproduction adj.
45	D5	D5	(ND filter OFF)
46	20	20	
47	20	20	
48 to 49			Fixed data-1
4A	00	00	WB ND filter 1 compensation
4B	00	00	
4C to 5C			Fixed data-1
5D	80	80	Zoom key center adj.
5E to 62			Fixed data-1
63			Fixed data-2
64			
65 to 6F			Fixed data-1
70	89	89	HALL adj.
71 to FF			Fixed data-1

Table. 5-1-7.

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4. E Page Table

Note1: Fixed data-1: Initialized data. (Refer to "1. Initializing the E, F Page Data".)
Fixed data-2: Modified data. (Refer to "2. Modification of E, F Page Data".)

Note2: Refer to "2. Modification of E, F Page Data" for the camera microprocessor version.

Address	Initial value		Remark
	NTSC	PAL	
00 to 29			Fixed data-1
2A	10	10	Pre-white balance data input
2B	10	10	
2C			Fixed data-1
2D	80	80	Offset adj.
2E	80	80	
2F	80	80	
30 to 61			Fixed data-1
62	EB	EB	Color reproduction adj. (ND filter 1)
63	D5	D5	
64	20	20	
65	20	20	
66 to 8D			Fixed data-1
8E	00	00	WB ND filter 2 compensation
8F	00	00	
90	EB	EB	Color reproduction adj. (ND filter 2)
91	D5	D5	
92	20	20	
93	20	20	
94 to A2			Fixed data-1
A3			Fixed data-2
A4 to FF			Fixed data-1

Table. 5-1-8.

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1-3. CAMERA SYSTEM ADJUSTMENTS

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

1. 27MHz Origin Oscillation Adjustment (VI-156 board)

Set the frequency of the clock for synchronization.
If deviated, the synchronization will be disrupted and the color will become inconsistent.

Subject	Not required
Measurement Point	Pin ㊼ of IC705 or pin ⑧ of IC302
Measuring Instrument	Frequency counter
Adjustment Page	F
Adjustment Address	1C
Specified Value	f=13500000 ± 68Hz

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	F	1C		Change the data and set the frequency (f) to the specified value.
3	F	1C		Press PAUSE button.
4	0	01	00	Set the data.

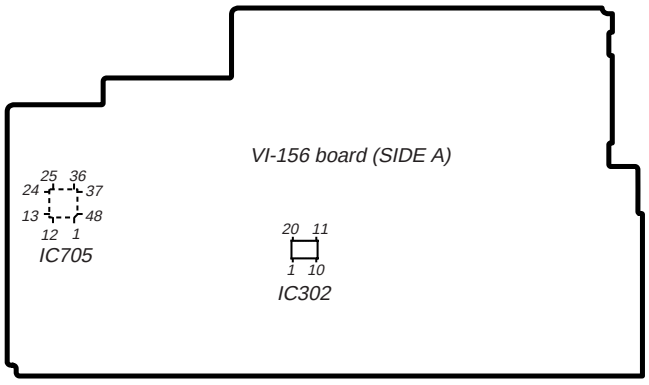


Fig. 5-1-7.

2. Zoom Key Center Adjustment

Set the A/D value center of the microprocessor to the center voltage of the zoom key.
If deviated, the zoom lens operates of itself ,even if the zoom key is the center position.

Subject	Not required
Measurement Point	Display data of page: 6, address: 50
Measuring Instrument	Adjustment remote commander
Adjustment Page	F
Adjustment Address	5D

Note: Don't touch the zoom switch during adjustment.

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	6	50		Read the data, and this data is named D_{50}.
3	F	5D	D_{50}	Set the data, and press PAUSE button.
4	0	01	00	Set the data.

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3. HALL Adjustment

For detecting the position of the lens iris, adjust AMP gain and offset.

Subject	Not required
Measurement Point	Display data of page 1 (Note1)
Measuring Instrument	Adjustment remote commander
Adjustment Page	F
Adjustment Address	1E, 1F, 70
Specified Value 1	7E to 82
Specified Value 2	13 to 17

Note1: Displayed data of page 1 of the adjustment remote commander.

1 : 00 : XX
└── IRIS display data

Note2: Check that the data of page: 6, address: 02 is "00". If not, to page: 6, address: 01, set data: 00, and press the PAUSE button.

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	6	94	80	Set the data.
3	6	95	15	Set the data.
4	6	01	6D	Set the data, and press PAUSE button.
5	6	02		Check that the data changes to "01". (Note3)
6	6	01	00	Set the data, and press PAUSE button.

Note3: The adjustment data will be automatically input to page: F, address: 1E, 1F, 70.

Checking method:

Order	Page	Address	Data	Procedure
1	6	04	03	Set the data.
2	6	01	01	Set the data, and press PAUSE button.
3	1			Check that the IRIS display data (Note1) satisfies the specified value 1.
4	6	01	03	Set the data, and press PAUSE button.
5	1			Check that the IRIS display data (Note1) satisfies the specified value.2.

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	6	01	00	Set the data, and press PAUSE button.
2	6	04	00	Set the data.
3	6	94	00	Set the data.
4	6	95	00	Set the data.
5	0	01	00	Set the data.

4. Offset Adjustment

Adjust so that the AGC OUT potential lies within the specified value of the digital clamp.

Subject	Not required
Measurement Point	DDS display data of LCD or TV monitor (Note1)
Measuring Instrument	
Adjustment Page	E
Adjustment Address	2D, 2E, 2F
Specified Value	70 to 90

Note 1: DDS display data of LCD or TV monitor.

CA 00 0000
CA 00 00XX
└── Object data

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	D	11	02	Set the data, and press PAUSE button.
3	6	01	05	Set the data, and press PAUSE button.
4	E	0C	02	Set the data, and press PAUSE button.
5	6	04	1F	Set the data.
6	E	2D		Change the data and adjust the DDS display data (Note 1) to "80". (Rch offset adjustment)
7	E	2D		Press PAUSE button.
8	6	04	20	Set the data.
9	E	2E		Change the data and adjust the DDS display data (Note 1) to "80". (Gch offset adjustment)
10	E	2E		Press PAUSE button.
11	6	04	21	Set the data.
12	E	2F		Change the data and adjust the DDS display data (Note 1) to "80". (Bch offset adjustment)
13	E	2F		Press PAUSE button.

Processing after Completing Adjustments

Order	Page	Address	Data	Procedure
1	D	11	00	Set the data, and press PAUSE button.
2	E	0C	00	Set the data, and press PAUSE button.
3	0	01	00	Set the data.
4	6	01	00	Set the data, and press PAUSE button.
5	6	04	00	Set the data.
6				Turn off the power and turn on again.

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5. Flange Back Adjustment (Using Minipattern Box)

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

Subject	Siemens star chart with ND filter for the minipattern box (Note1)
Measurement Point	Check operation on TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	24 to 2B, 36 to 3D, 5D

Note1: Dark Siemens star chart.
Note2: Check that the data of page: 6, address: 02 is "00". If not, to page: 6, address: 01, set data: 00, and press the PAUSE button.

Switch setting:

ND FILTER ..... OFF
(The data of page: 6, address: 9D is "00".)

Preparations:

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

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

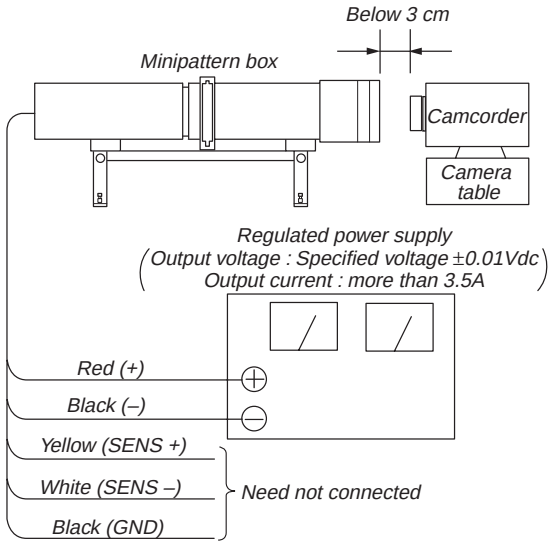


Fig. 5-1-8.

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	6	01	13	Set the data, and press PAUSE button. (Note3)
3	6	01	27	Set the data, and press PAUSE button.
4	6	02		Check that the data changes to "01". (Note4)
5	F	2A		Check that the data is "00" to "07".

Note3: Don't touch the zoom switch. If you touch the zoom switch, the zoom center adjustment data will be rewritten in the value which isn't correct.
Note4: The adjustment data will be automatically input to page: F, address:: 24 to 2B, 36 to 3D, 5D.

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	6	01	00	Set the data, and press PAUSE button.
2	6	02	00	Set the data.
3	0	01	00	Set the data.
4				Turn off the power and turn on again.
5				Perform "Flange Back Check".

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6. Flange Back Adjustment (Using Flange Back Adjustment Chart and Subject More Than 500m Away)

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

6-1. Flange Back Adjustment (1)

Subject	Flange back adjustment chart (2.0 m from the front of the protection glass) (Luminance: 230 ± 30 lux)
Measurement Point	Check operation on TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	24 to 2B, 36 to 3D, 5D

Note1: Check that the data of page: 6, address: 02 is "00". If not, to page: 6, address: 01, set data: 00, and press the PAUSE button.

Switch setting:

ND FILTER ..... OFF

(The data of page: 6, address: 9D is "00".)

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	6	01	13	Set the data, and press PAUSE button. (Note2)
3	6	01	15	Set the data, and press PAUSE button.
4	6	02		Check that the data changes to "01". (Note3)
5	F	2A		Check that the data is "00" to "07".

Note2: Don't touch the zoom switch. If you touch the zoom switch, the zoom center adjustment data will be rewritten in the value which isn't correct.

Note3: The adjustment data will be automatically input to page: F, address:: 24 to 2B, 36 to 3D, 5D.

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	6	01	00	Set the data, and press PAUSE button.
2				Turn off the power and turn on again.
3				Perform "Flange Back Adjustment (2)"

6-2. Flange Back Adjustment (2)

Perform this adjustment after performing "Flange Back Adjustment (1)".

Subject	Subject more than 500m away (Subjects with clear contrast such as buildings, etc.)
Measurement Point	Check operation on TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	24 to 2B, 36 to 3D, 5D

Note1: Check that the data of page: 6, address: 02 is "00". If not, to page: 6, address: 01, set data: 00, and press the PAUSE button.

Preparations:

1) Set the zoom lens to the TELE end and expose a subject that is more than 500 m away (subject with clear contrast such as building, etc.). (Nearby subjects less than 500 m away should not be in the screen.)

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	6	01	13	Set the data, and press PAUSE button. (Note2)
				Place a ND filter on the lens so that the optimum image is obtain.
3	6	01	29	Set the data, and press PAUSE button.
4	6	02		Check that the data changes to "01". (Note3)

Note2: Don't touch the zoom switch. If you touch the zoom switch, the zoom center adjustment data will be rewritten in the value which isn't correct.

Note3: The adjustment data will be automatically input to page: F, address:: 24 to 2B, 36 to 3D, 5D.

Processing after Completing Adjustments:

Order	Page	Address	Data	Procedure
1	6	01	00	Set the data, and press PAUSE button.
2				Turn off the power and turn on again.
3				Perform "Flange Back Check".

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7. Flange Back Check

Subject	Siemens star (2.0m from the front of the protection glass) (Luminance : approx. 300 ± 50 lux)
Measurement Point	Check operation on TV monitor
Measuring Instrument	
Specified Value	Focused at the TELE end and WIDE end.

Checking method:

1) Place the Siemens star 2.0m from the front of the protection glass.
2) To open the IRIS, decrease the luminous intensity to the Siemens star up to a point before noise appear on the image.
3) Shoot the Siemens star with the zoom TELE end.
4) Turn on the auto focus.
5) Check that the lens is focused.
6) Turn off the auto focus.
7) While observe the TV monitor, move the zoom to the WIDE end and check that the lens is focused.

8. Picture Frame Setting

Subject	Color bar chart (Color bar standard picture frame) (95cm from the front of the protection glass)
Measurement Point	Video output terminal
Measuring Instrument	Oscilloscope and TV monitor
Specified Value	A=B, C=D, t=0 ± 0.1msec

Switch setting:

1) ND FILTER ..... OFF
   (The data of page: 6, address: 9D is “00”.)
2) STEADY SHOT (Menu setting) ..... OFF

Setting method:

Order	Page	Address	Data	Procedure
1	6	2C	01	Set the data.
2	6	90	28	Set the data.
3	6	91	02	Set the data.
4	6	92	6E	Set the data.
5	6	93	49	Set the data.
6	6	01	79	Set the data, and press PAUSE button.
7				Adjust the camera direction, and set to the specified position.
8				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 standard frame”.
9	6	01	00	Set the data, and press the PAUSE button.

Check on the oscilloscope

1. Horizontal period

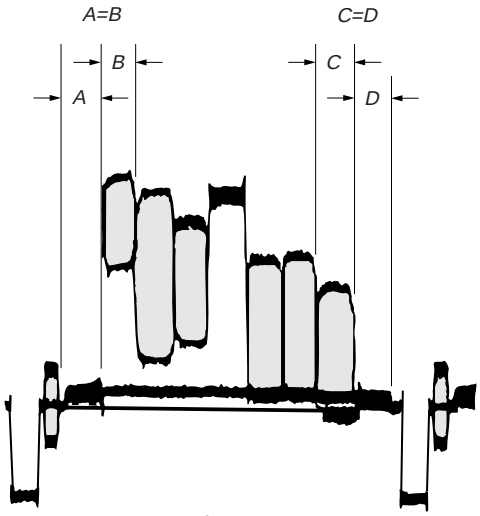


Fig. 5-1-9.

2. Vertical period

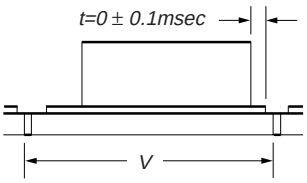


Fig. 5-1-10.

Color on the TV monitor

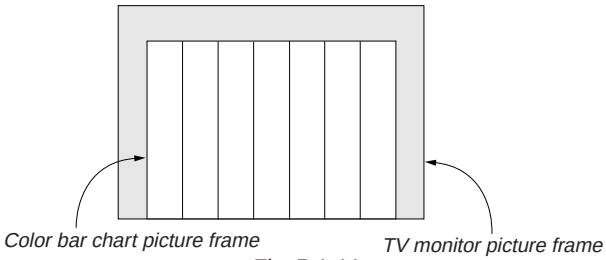


Fig. 5-1-11.

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9. Pre White Balance Data Input

At 3200k, input the pre white balance standard data.

Subject	Clear chart (Color bar standard picture frame)
Adjustment Page	E
Adjustment Address	2A, 2B

Note1: After the power is turned on, this adjustment can be done only once.

Switch setting:

ND FILTER ..... OFF

(The data of page: 6, address: 9D is "00".)

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	6	02	00	Set the data.
3	F	20	00	Set the data, and press PAUSE button.
4	F	21	15	Set the data, and press PAUSE button.
5	F	22	00	Set the data, and press PAUSE button.
6	F	23	2E	Set the data, and press PAUSE button.
7	F	16		Set the following data, and press PAUSE button. 03: DSR-250 (NTSC) 83: DSR-250P (PAL)
8	6	01	7F	Set the data, and press PAUSE button.
9	6	01	7D	Set the data, and press PAUSE button. (Note)
10	6	02		Check that the data changes to "01".

Note: The adjustment data will be automatically input to page: E, address: 2A and 2B.

Processing after Completing Adjustments

Order	Page	Address	Data	Procedure
1	6	01	00	Set the data, and press PAUSE button.
2	6	02	00	Set the data.
3	F	16		Set the following data, and press PAUSE button. 13: DSR-250 (NTSC) 93: DSR-250P (PAL)
4	0	01	00	Set the data.
5				Perform "Auto White Balance Standard Data Input".

10. Auto White Balance Standard Data Input

At 3200K, input the white balance standard data.

Subject	Clear chart (Color bar standard picture frame)
Adjustment Page	F
Adjustment Address	20 to 23

Note1: After the power is turned on, this adjustment can be done only once.

Note2: Check that the data of page: 6, address: 02 is "00". If not, to page: 6, address: 01, set data: 00, and press the PAUSE button.

Switch setting:

ND FILTER ..... OFF

(The data of page: 6, address: 9D is "00".)

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	6	01	11	Set the data, and press PAUSE button.
3	6	01	0B	Set the data, and press PAUSE button. (Note)
4	6	02		Check that the data changes to "01".

Note: The adjustment data will be automatically input to page: F, address: 20 to 23.

Processing after Completing Adjustments

Order	Page	Address	Data	Procedure
1	6	01	00	Set the data, and press PAUSE button.
2	6	02	00	Set the data.
3	0	01	00	Set the data.

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11. MAX GAIN Adjustment

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

Subject	Clear chart (Color bar standard picture frame)
Adjustment Page	F
Adjustment Address	2C

Switch setting:

ND FILTER ..... OFF
(The data of page: 6, address: 9D is “00”.)

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	6	02	00	Set the data.
3	6	96	00	Set the data.
4	6	97	65	Set the data.
5	6	01	6F	Set the data, and press PAUSE button. (Note)
6	6	02		Check that the data changes to “01”.

Note: The adjustment data will be automatically input to page: F, address: 2C.

Processing after Completing Adjustments

Order	Page	Address	Data	Procedure
1	6	96	00	Set the data.
2	6	97	00	Set the data.
3	6	01	00	Set the data, and press PAUSE button.
4	6	02	00	Set the data.
5	0	01	00	Set the data.

12. LV Standard Data Input

Adjust the normal coefficient of the light value.

Subject	Clear chart (Color bar standard picture frame)
Measurement Point	Display data of page 1 (Note2)
Measuring Instrument	Adjustment remote commander
Adjustment Page	F
Adjustment Address	3E, 3F
Specified Value	0FE0 to 1020

Note1: Check that the data of page: 6, address: 02 is “00”. If not, turn the power of the unit OFF/ON.

Note2: Displayed data of page 1 of the adjustment remote commander.

1 : XX : XX
└── LV data

Switch setting:

ND FILTER ..... OFF
(The data of page: 6, address: 9D is “00”.)

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	6	16	02	Set the data, and press PAUSE button.
3				Wait for 5 seconds.
4	6	01	0D	Set the data, and press PAUSE button. (Note3)
5	6	02		Check that the data changes to “01”.
6	6	04	1E	Set the data.
7	1			Check that the LV data (Note2) satisfies the specified value. If not, repeat from step 2.

Note3: The adjustment data will be automatically input to page: F, address: 3E and 3F.

Processing after Completing Adjustments

Order	Page	Address	Data	Procedure
1	6	01	00	Set the data, and press PAUSE button.
2	6	02	00	Set the data.
3	6	04	00	Set the data.
4	6	16	00	Set the data, and press PAUSE button.
5	0	01	00	Set the data.

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13. White Balance ND Filter 1 Compensation

Compensate the white balance deviation when ND FILTER switch is “1”.

Subject	Clear chart (Color bar standard picture frame)
Adjustment Page	F
Adjustment Address	4A, 4B

Note1: After the power is turned on, this adjustment can be done only once.

Note2: Check that the data of page: 6, address: 02 is “00”. If not, to page: 6, address: 01, set data: 00, and press the PAUSE button.

Switch setting:

ND FILTER 1

(The data of page: 6, address: 9D is “01”.)

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	6	01	11	Set the data, and press PAUSE button.
3	6	01	09	Set the data, and press PAUSE button. (Note)
4	6	02		Check that the data changes to “01”.

Note: The adjustment data will be automatically input to page: F, address: 4A and 4B.

Processing after Completing Adjustments

Order	Page	Address	Data	Procedure
1	6	01	00	Set the data, and press PAUSE button.
2	6	02	00	Set the data.
3	0	01	00	Set the data.

14. White Balance ND Filter 2 Compensation

Compensate the white balance deviation when ND FILTER switch is “2”.

Subject	Clear chart (Color bar standard picture frame)
Adjustment Page	E
Adjustment Address	8E, 8F

Note1: After the power is turned on, this adjustment can be done only once.

Note2: Check that the data of page: 6, address: 02 is “00”. If not, to page: 6, address: 01, set data: 00, and press the PAUSE button.

Switch setting:

ND FILTER 2

(The data of page: 6, address: 9D is “02”.)

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	6	01	CF	Set the data, and press PAUSE button.
3	6	01	CD	Set the data, and press PAUSE button. (Note)
4	6	02		Check that the data changes to “01”.

Note: The adjustment data will be automatically input to page: E, address: 8E and 8F.

Processing after Completing Adjustments

Order	Page	Address	Data	Procedure
1	6	01	00	Set the data, and press PAUSE button.
2	6	02	00	Set the data.
3	0	01	00	Set the data.
4				Set ND FILTER switch to “OFF”.

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15. 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	Clear chart (Color bar standard picture frame)
Filter	Filter C14 for color temperature correction
Adjustment Page	F
Adjustment Address	34, 35

Note1: After the power is turned on, this adjustment can be done only once.
Note2: Check that the data of page: 6, address: 02 is "00". If not, to page: 6, address: 01, set data: 00, and press the PAUSE button.

Switch setting:

ND FILTER ..... OFF
(The data of page: 6, address: 9D is "00".)

Adjusting method:

Order	Page	Address	Data	Procedure
1				Place the C14 filter for color temperature correction on the lens.
2	0	01	01	Set the data.
3	6	02	00	Set the data.
4	6	01	83	Set the data, and press PAUSE button.
5	6	01	81	Set the data, and press PAUSE button. (Note)
6	6	02		Check that the data changes to "01".

Note: The adjustment data will be automatically input to page: F, address: 34 and 35.

Processing after Completing Adjustments

Order	Page	Address	Data	Procedure
1	6	01	00	Set the data, and press PAUSE button.
2	6	02	00	Set the data.
3	0	01	00	Set the data.

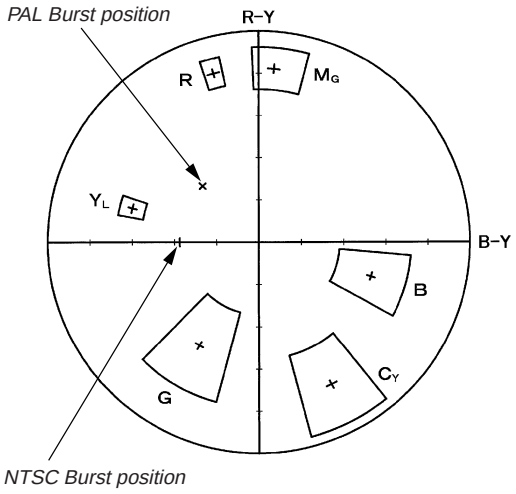


Fig. 5-1-12.

16. Color Reproduction Adjustment (ND Filter OFF)

When the ND FILTER switch is "OFF", adjust the color difference matrix coefficient so that proper color reproduction is produced.

Subject	Color bar chart (Color bar standard picture frame)
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	44, 45, 46, 47
Specified Value	All color luminance points should settle within each color reproduction frame. (Fig. 5-1-12)

Note1: After the power is turned on, this adjustment can be done only once.
Note2: Check that the data of page: 6, address: 02 is "00". If not, to page: 6, address: 01, set data: 00, and press the PAUSE button.

Switch setting:

ND FILTER ..... OFF
(The data of page: 6, address: 9D is "00".)

Adjusting method:

Order	Page	Address	Data	Procedure
1				Check that the picture frame is set to the specified position. (Refer to "8. Picture Frame Setting".)
2	0	01	01	Set the data.
3	F	5E	2D	Set the data, and press PAUSE button.
4	F	44	00	Set the data, and press PAUSE button.
5	F	45	00	Set the data, and press PAUSE button.
6	F	46	20	Set the data, and press PAUSE button.
7	F	47	20	Set the data, and press PAUSE button.
8	6	01	AB	Set the data, and press PAUSE button.
9	6	01	A9	Set the data, and press PAUSE button. (Note)
10	6	02		Check that the data changes to "01".
11				Adjust the GAIN and PHASE of the vectorscope, and adjust the burst luminance point to the burst position of the color reproduction frame. (Fig. 5-1-12)
12				Check that all color luminance points settle within each color reproduction frame. (Fig. 5-1-12)

Note: The adjustment data will be automatically input to page: F, address: 44 to 47.

Processing after Completing Adjustments

Order	Page	Address	Data	Procedure
1	6	01	00	Set the data, and press PAUSE button.
2	6	02	00	Set the data.
3	F	5E	1D	Set the data, and press PAUSE button.
3	0	01	00	Set the data.

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17. Color Reproduction Adjustment (ND Filter 1)

When the ND FILTER switch is "1", adjust the color difference matrix coefficient so that proper color reproduction is produced.

Subject	Color bar chart (Color bar standard picture frame)
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	E
Adjustment Address	62, 63, 64, 65
Specified Value	All color luminance points should settle within each color reproduction frame. (Fig. 5-1-12)

Note1: After the power is turned on, this adjustment can be done only once.
Note2: Check that the data of page: 6, address: 02 is "00". If not, to page: 6, address: 01, set data: 00, and press the PAUSE button.

Switch setting:

1) ND FILTER 1
(The data of page: 6, address: 9D is "01".)

Adjusting method:

Order	Page	Address	Data	Procedure
1				Check that the picture frame is set to the specified position. (Refer to "8. Picture Frame Setting".)
2	0	01	01	Set the data.
3	F	5E	2D	Set the data, and press PAUSE button.
4	E	62	00	Set the data, and press PAUSE button.
5	E	63	00	Set the data, and press PAUSE button.
6	E	64	20	Set the data, and press PAUSE button.
7	E	65	20	Set the data, and press PAUSE button.
8	6	01	C3	Set the data, and press PAUSE button.
9	6	01	C1	Set the data, and press PAUSE button. (Note)
10	6	02		Check that the data changes to "01".
11				Adjust the GAIN and PHASE of the vectorscope, and adjust the burst luminance point to the burst position of the color reproduction frame. (Fig. 5-1-12)
12				Check that all color luminance points settle within each color reproduction frame. (Fig. 5-1-12)

Note: The adjustment data will be automatically input to page: E, address: 62 to 65.

Processing after Completing Adjustments

Order	Page	Address	Data	Procedure
1	6	01	00	Set the data, and press PAUSE button.
2	6	02	00	Set the data.
3	F	5E	1D	Set the data, and press PAUSE button.
4	0	01	00	Set the data.

18. Color Reproduction Adjustment (ND Filter 2)

When the ND FILTER switch is "2", adjust the color difference matrix coefficient so that proper color reproduction is produced.

Subject	Color bar chart (Color bar standard picture frame)
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	E
Adjustment Address	90, 91, 92, 93
Specified Value	All color luminance points should settle within each color reproduction frame. (Fig. 5-1-12)

Note1: After the power is turned on, this adjustment can be done only once.
Note2: Check that the data of page: 6, address: 02 is "00". If not, to page: 6, address: 01, set data: 00, and press the PAUSE button.

Switch setting:

1) ND FILTER 2
(The data of page: 6, address: 9D is "02".)

Adjusting method:

Order	Page	Address	Data	Procedure
1				Check that the picture frame is set to the specified position. (Refer to "8. Picture Frame Setting".)
2	0	01	01	Set the data.
3	F	5E	2D	Set the data, and press PAUSE button.
4	E	90	00	Set the data, and press PAUSE button.
5	E	91	00	Set the data, and press PAUSE button.
6	E	92	20	Set the data, and press PAUSE button.
7	E	93	20	Set the data, and press PAUSE button.
8	6	01	CB	Set the data, and press PAUSE button.
9	6	01	C9	Set the data, and press PAUSE button. (Note)
10	6	02		Check that the data changes to "01".
11				Adjust the GAIN and PHASE of the vectorscope, and adjust the burst luminance point to the burst position of the color reproduction frame. (Fig. 5-1-12)
12				Check that all color luminance points settle within each color reproduction frame. (Fig. 5-1-12)

Note: The adjustment data will be automatically input to page: E, address: 90 to 93.

Processing after Completing Adjustments

Order	Page	Address	Data	Procedure
1	6	01	00	Set the data, and press PAUSE button.
2	6	02	00	Set the data.
3	F	5E	1D	Set the data, and press PAUSE button.
4	0	01	00	Set the data.
5				Set ND FILTER switch to "OFF".

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19. White Balance Check

Subject	Clear chart (Color bar standard picture frame)
Filter	Filter C14 for color temperature correction ND filter 1.0 and 0.3 (2 sheets)
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Specified Value	Fig. 5-1-13. A to B

Switch setting:

ND FILTER ..... OFF

(The data of page: 6, address: 9D is "00".)

Checking method:

Order	Page	Address	Data	Procedure
				Indoor white balance check
1				Check that the lens is not covered with either filter.
2	6	01	0F	Set the data, and press PAUSE button.
3				Check that the center of the white luminance point is within the circle shown Fig. 5-1-13. A.
				Outdoor white balance check
4				Place the C14 filter on the lens.
5	6	01	3F	Set the data, and press PAUSE button.
6				Check that the center of the white luminance point is within the circle shown Fig. 5-1-13. B.
7				Remove the C14 filter.
				Indoor white balance data check
8				Place the ND filter 1.6 (1.0+0.3+0.3) on the lens.
9	6	01	0F	Set the data, and press PAUSE button.
10				Wait for 2 seconds.
11	0	01	01	Set the data.
12	F	10	A1	Set the data, and press PAUSE button.
13	F	11	04	Set the data, and press PAUSE button.
14	1			Check that the second digit of the display data (Note) is an odd number. Specified value: 1 : XX : XX └── Odd number
15	6	04	06	Set the data.
16	1			Check that the display data (Note) satisfies the specified value. Specified value: 0000 to 0C50

Note: Displayed data of the adjustment remote commander.

1 : XX : XX

└── Display data

Processing after Completing Adjustments

Order	Page	Address	Data	Procedure
1	6	01	00	Set the data, and press PAUSE button.
2	6	04	00	Set the data.
3	F	10	00	Set the data, and press PAUSE button.
4	F	11	00	Set the data, and press PAUSE button.
5	0	01	00	Set the data.

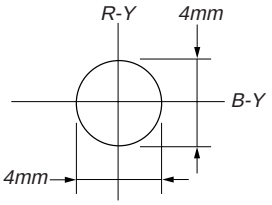


Fig. 5-1-13. (A)

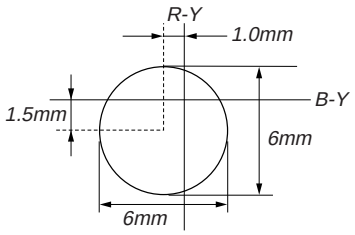


Fig. 5-1-13. (B)

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20. Steady Shot Adjustment

- This adjustment is performed only when replacing the angular velocity sensor.
  Although this adjustment need not be performed when the circuit is damaged, etc., check the operations.
- Note down the sensitivity displayed on the angular velocity sensor of the repair parts. At this time, note down also to which board it was attached to.

Be sure to check because if attached incorrectly, the screen will vibrate up and down or left and right during hand-shake correction operations.

Precautions on the Parts Replacement

There are two types of repair parts.

Type A: ENC03JA
Type B: ENC03JB

Replace the broken sensor with a same type sensor. If replace with other type parts, the image will vibrate up and down or left and right during hand-shake correction operations. After replacing, re-adjust according to the adjusting method after replacement.

Precautions on Angular Velocity Sensor

The sensor incorporates a precision oscillator. Handle it with care as if it dropped, the balance of the oscillator will be disrupted and operations will not be performed properly.

Switch setting:

STEADY SHOT (Menu) ..... ON
DIGITAL ZOOM (Menu) ..... OFF

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20-1. Steady Shot Adjustment (1)

Subject	Pattern A (1.5m from the front of the lens)
Measurement Point	Video output terminal
Measuring Instrument	Oscilloscope (V period)
Adjustment Page	F
Adjustment Address	41

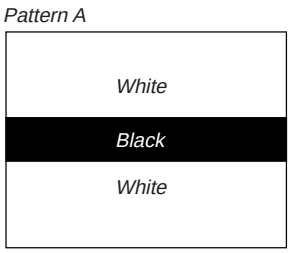


Fig.5-1-14.

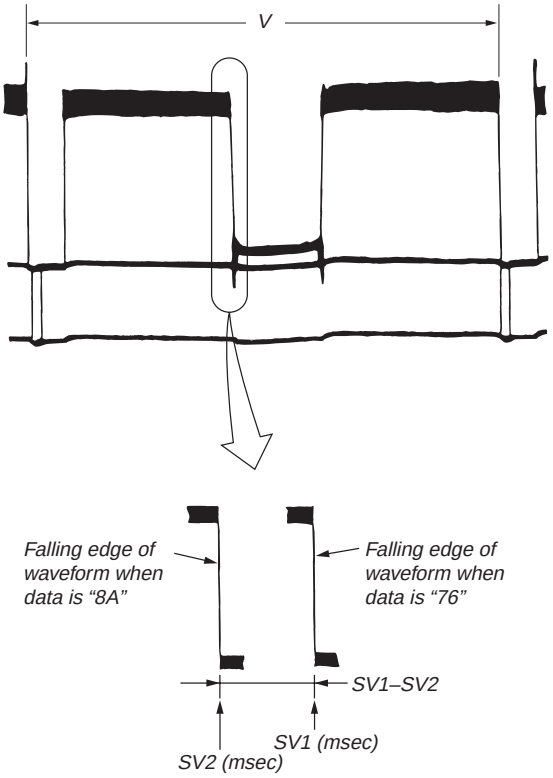


Fig. 5-1-15.

Adjusting method:

1) Select page: 0, address: 01, and set data: 01.
2) Select page: F, address: EA, set data: 76, and press the PAUSE button of the adjustment remote commander.
3) Expose pattern A with the zoom TELE end.
4) Adjust the focus.
5) Measure the vertical position SV1 (msec) of the falling edge of the waveform. (Oscilloscope is V period)
6) Select page: F, address: EA, set data: 8A, and press the PAUSE button.
7) Measure the vertical position SV2 (msec) of the falling edge of the waveform. (Oscilloscope is V period)
8) Obtain D_{41}' using the following equation (decimal calculation).
   NTSC model
   $$D_{41}' = \frac{1.53}{SV1 - SV2} \times \frac{0.6}{\text{PITCH sensor sensitivity}} \times 99$$
   PAL model
   $$D_{41}' = \frac{1.84}{SV1 - SV2} \times \frac{0.6}{\text{PITCH sensor sensitivity}} \times 99$$
   Note: PITCH sensor sensitivity (SE601 of SE-116 board) is written only on the repair parts.
9) Convert D_{41}' to hexadecimal notation, and obtain D_{41}. (Round off to one decimal place)
   (Refer to Table 5-4-1. "Hexadecimal notation-Decimal notation conversion table" of "5-4. Service Mode".)
10) Select page: F, address: 41, set data: D_{41}, and press the PAUSE button.

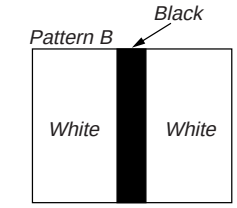
Processing after Completing Adjustments

1) Select page: F, address: EA, set data: 80, and press the PAUSE button of the adjustment remote commander.
2) Select page: 0, address: 01, and set data: 00.
3) Check that the steady shot operation is performed normally.

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20-2. Steady Shot Adjustment (2)

Subject	Pattern B (1.5m from the front of the lens)
Measurement Point	Video output terminal
Measuring Instrument	Oscilloscope (H period)
Adjustment Page	F
Adjustment Address	42



A4 size (297mm × 210mm)

Fig.5-1-16.

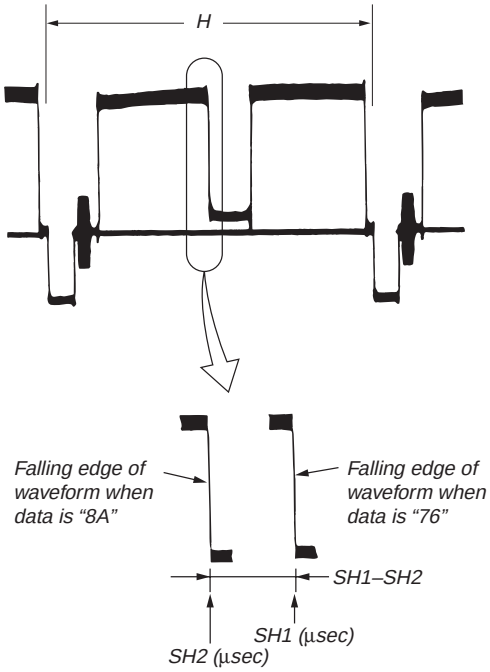


Fig. 5-1-17.

Adjusting method:

1) Select page: 0, address: 01, and set data: 01.
2) Select page: F, address: EB, set data: 76, and press the PAUSE button of the adjustment remote commander.
3) Expose pattern B with the zoom TELE end.
4) Adjust the focus.
5) Measure the horizontal position SH1 (µ sec) of the falling edge of the waveform. (Oscilloscope is H period)
6) Select page: F, address: EB, set data: 8A, and press the PAUSE button.
7) Measure the horizontal position SH2 (µ sec) of the falling edge of the waveform. (Oscilloscope is H period)
8) Obtain D_{42}' using the following equation (decimal calculation).

$$D_{42}' = \frac{3.90}{SH1 - SH2} \times \frac{0.6}{\text{YAW sensor sensitivity}} \times 99$$

Note: YAW sensor sensitivity (SE600 of SE-116 board) is written only on the repair parts.

9) Convert D_{42}' to hexadecimal notation, and obtain D_{42}. (Round off to one decimal place)
(Refer to Table 5-4-1. "Hexadecimal notation-Decimal notation conversion table" of "5-4. Service Mode".)
10) Select page: F, address: 42, set data: D_{42}, and press the PAUSE button.

Processing after Completing Adjustments

1) Select page: F, address: EB, set data: 80, and press the PAUSE button of the adjustment remote commander.
2) Select page: 0, address: 01, and set data: 00.
3) Check that the steady shot operation is performed normally.

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1-4. LCD SYSTEM ADJUSTMENT

Note 1: The back light (fluorescent tube) is driven by a high voltage AC power supply. Therefore, do not touch the back light holder to avoid electrical shock.

Note 2: When replacing the LCD unit, be careful to prevent damages caused by static electricity.

Switch setting:

LCD ..... ON

[Adjusting connector]

Most of the measuring points for adjusting the LCD system are concentrated in CN2105 of the PD-126 board. The following table shows the Pin No. and signal name of CN2105.

Pin No.	Signal Name
1	VG
2	COM
3	GND
4	PSIG
5	HSY

Table 5-1-9.

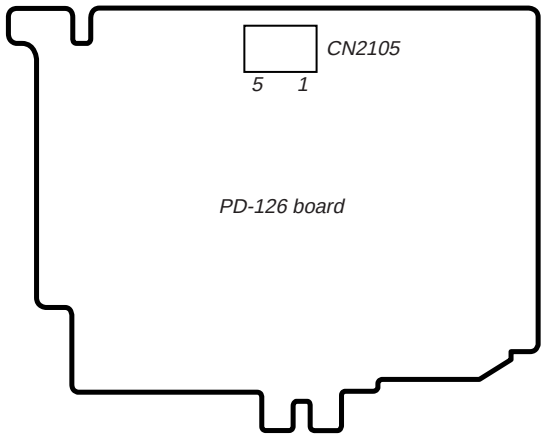


Fig. 5-1-18.

1. VCO Adjustment (PD-126 board)

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

Mode	VTR stop
Signal	No signal
Measurement Point	Pin ⑤ of CN2105 (HSY)
Measuring Instrument	Frequency counter
Adjustment Page	D
Adjustment Address	A2, A3
Specified Value	f = 15734 ± 30Hz (NTSC) f = 15625 ± 30Hz (PAL)

Note1: NTSC: DSR-250
PAL: DSR-250P

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	D	A2		Change the data and set the VCO frequency (f) to the specified value.
3	D	A2		Press PAUSE button.
4	D	A2		Read the data, and this data is named D_{A2}.
5				Convert D_{A2} to decimal notation, and obtain D_{A2}'. (Note2)
6				Calculate D_{A3}' using following equations (Decimal calculation) NTSC model: When $D_{A2}' \leqq 221$ $D_{A3}' = D_{A2}' + 34$ When $D_{A2}' > 221$ $D_{A3}' = 255$ PAL model: When $D_{A2}' \geqq 34$ $D_{A3}' = D_{A2}' - 34$ When $D_{A2}' < 34$ $D_{A3}' = 00$
7				Convert D_{A3}' to a hexadecimal number, and obtain D_{A3}. (Note2)
8	D	A3	D_{A3}	Set the data, and press PAUSE button.
9	0	01	00	Set the data.

Note2: Refer to "Table 5-4-1. Hexadecimal-decimal Conversion Table".

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2. Bright Adjustment (PD-126 board)

Set the D range of the RGB decoder used to drive the LCD to the specified value. If deviated, the LCD screen will become blackish or saturated (whitish).

Mode	VTR stop
Signal	No signal
Measurement Point	Pin ① of CN2105 (VG)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	A5
Specified Value	A = 7.8 ± 0.05V

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	D	A5		Change the data and set the voltage (A) between the reversed waveform pedestal and non-reversed waveform pedestal to the specified value.
3	D	A5		Press PAUSE button.
4	0	01	00	Set the data.

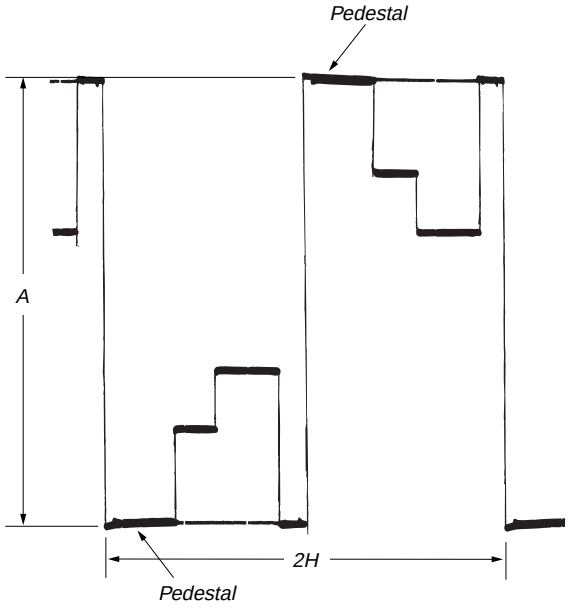


Fig. 5-1-19.

3. Black Limit Adjustment (PD-126 board)

Set the dynamic range of the LCD driver to an appropriate level. If deviated, the LCD screen will become blackish or saturated (whitish).

Mode	VTR stop
Signal	No signal
Measurement Point	Pin ④ of CN2105 (PSIG)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	A6
Specified Value	A = 8.50 ± 0.05V

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	2	0E	61	Set the data.
3	2	0F		Set the following data. 5B: DSR-250 (NTSC) 53: DSR-250P (PAL)
4	D	A6		Change the data and set the PSIG signal amplitude (A) to the specified value. (The data should be “00” to “0F”.)
5	D	A6		Press PAUSE button.
6	2	0E	00	Set the data.
7	2	0F	00	Set the data.
8	0	01	00	Set the data.

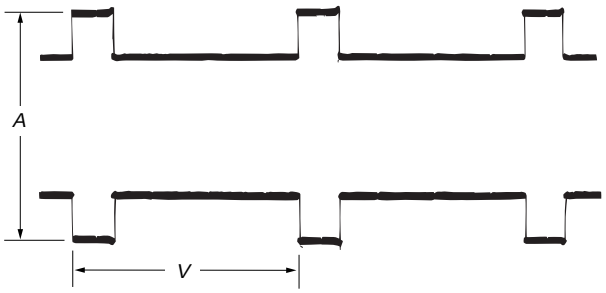


Fig. 5-1-20.

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4. Contrast Adjustment (PD-126 board)

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

Mode	VTR stop
Signal	No signal
Measurement Point	Pin ① of CN2105 (VG)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	AA
Specified Value	A = 3.10 ± 0.05V

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	D	AA		Change the data and set the voltage (A) between the 3 steps peak and pedestal to the specified value. (The data should be “00” to “7F”.)
3	D	AA		Press PAUSE button.
4	0	01	00	Set the data.
5				Check that the specified value of “Bright Adjustment” is satisfied.

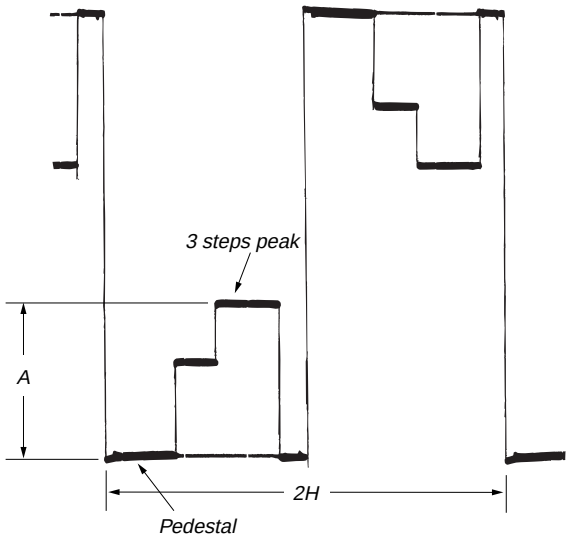


Fig. 5-1-21.

5. Center Level Adjustment (PD-126 board)

Set the video signal center level of LCD panel to an appropriate level.

Mode	VTR stop
Signal	No signal
Measurement Point	Pin ① of CN2105 (VG)
Measuring Instrument	Digital voltmeter
Adjustment Page	D
Adjustment Address	AB
Specified Value	A = 7.00 ± 0.05Vdc

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	3	0C	60	Set the data, and press PAUSE button.
3	3	22	08	Set the data, and press PAUSE button.
4	D	AB		Change the data and set the DC voltage (A) to the specified value. (The data should be “00” to “7F”.)
5	D	AB		Press PAUSE button.
6	3	0C	00	Set the data, and press PAUSE button.
7	3	22	00	Set the data, and press PAUSE button.
8	0	01	00	Set the data.

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6. V-COM Adjustment (PD-126 board)

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

Mode	VTR stop
Signal	No signal
Measurement Point	Check on LCD display
Measuring Instrument	
Adjustment Page	D
Adjustment Address	A4
Specified Value	The brightness difference between the section A and section B is minimum.

Note: Perform "Bright Adjustment", "Black Limit Adjustment", "Contrast Adjustment" and "Center Level Adjustment" before this adjustment.

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	D	B0		Write down the data.
3	D	B0	CA	Set the data, and press PAUSE button.
4	D	A4		Change the data so that the brightness of the section A and that of the section B is equal. (The data should be "80" to "BF".)
5	D	A4		Subtract 2 from the data.
6	D	A4		Press PAUSE button.
7	D	B0		Write the data that was written down in the step 2.
8	D	B0		Press PAUSE button.
9	0	01	00	Set the data.

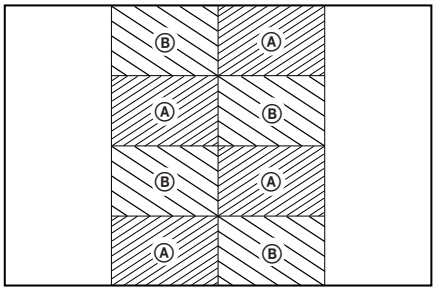


Fig. 5-1-22.

7. White Balance Adjustment (PD-126 board)

Correct the white balance.
If deviated, the reproduction of the LCD screen may degenerate.

Mode	VTR stop
Signal	No signal
Measurement Point	Check on LCD screen
Measuring Instrument	
Adjustment Page	D
Adjustment Address	A8, A9
Specified Value	The LCD screen should not be colored.

Note1: Check the white balance only when replacing the following parts. If necessary, adjust them.
1. LCD panel
2. Light induction plate
3. IC2101

Note2: Use the AC power adaptor.

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	D	A8	85	Set the data, and press PAUSE button.
3	D	A9	75	Set the data, and press PAUSE button.
4	D	A9		Check that the LCD screen is not colored. If not colored, proceed to step 10.
5	D	A8		Change the data so that the LCD screen is not colored.
6	D	A8		Press PAUSE button.
7	D	A9		Change the data so that the LCD screen is not colored.
8	D	A9		Press PAUSE button.
9	D	A9		If the LCD screen is colored, repeat steps 5 to 9.
10	0	01	00	Set the data.

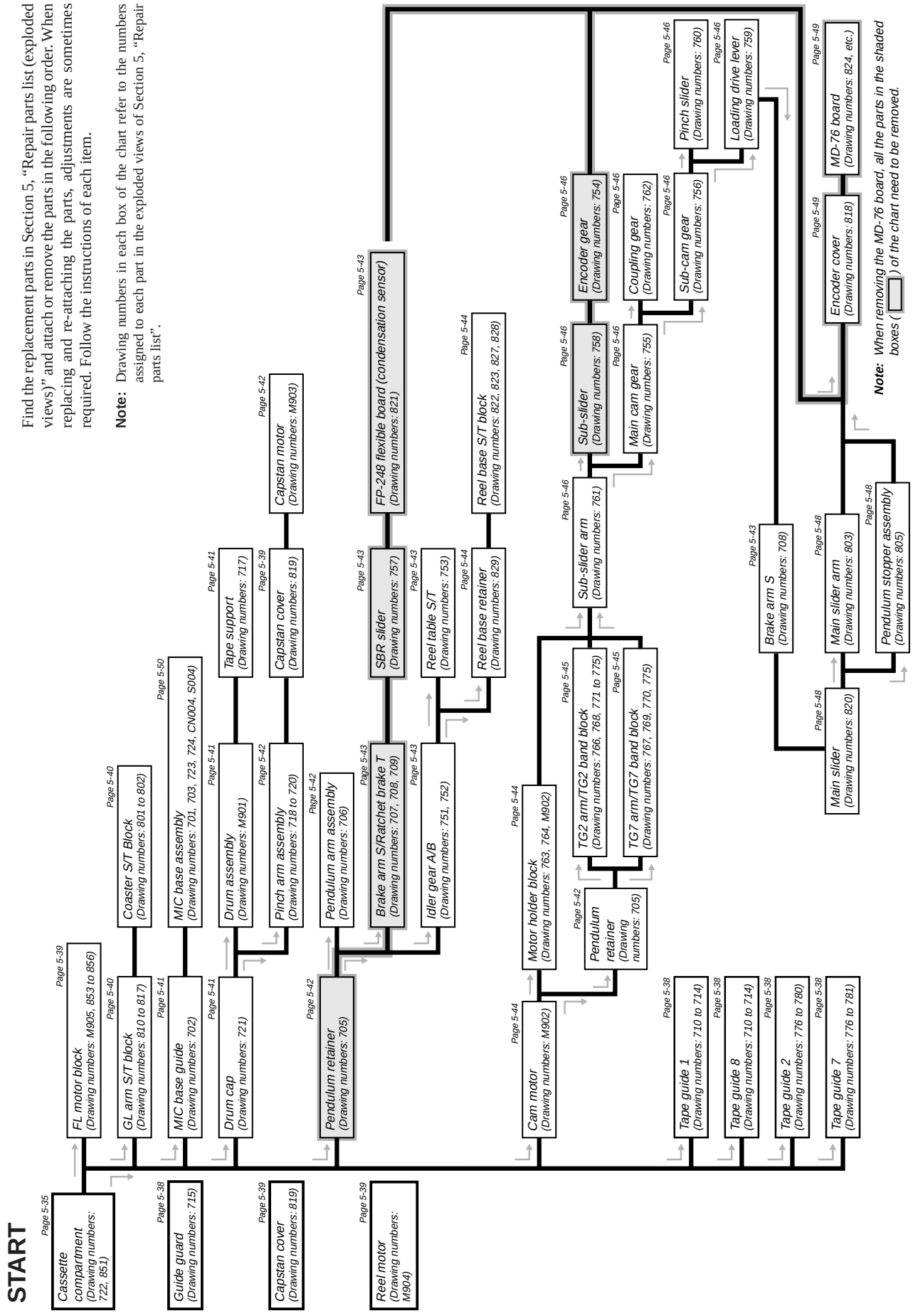
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5-2. MECHANICAL SECTION ADJUSTMENT

INFORMATION

Find the replacement parts in Section 5, "Repair parts list (exploded views)" and attach or remove the parts in the following order. When replacing and re-attaching the parts, adjustments are sometimes required. Follow the instructions of each item.

Note: Drawing numbers in each box of the chart refer to the numbers assigned to each part in the exploded views of Section 5, "Repair parts list".



Note: *When removing the MD-76 board, all the parts in the shaded boxes ( ) of the chart need to be removed.*

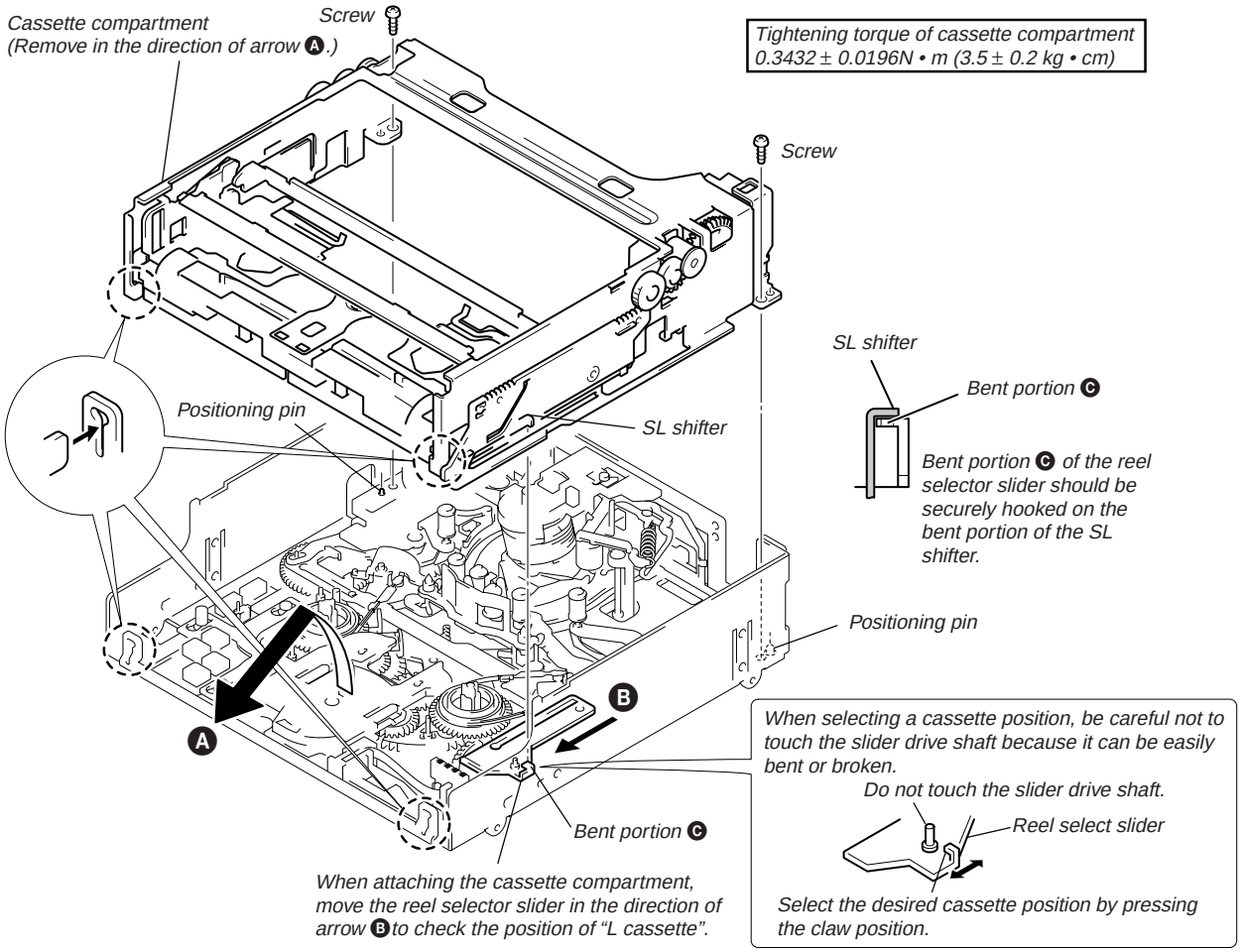
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5-2-1. PARTS REPLACEMENT AND PREPARATION FOR ADJUSTMENT

2-1-1. ASSEMBLY/DISASSEMBLY OF CASSETTE COMPARTMENT

For details on disassembling the mechanism deck (R mechanism), refer to the Service Manual of the main unit in which the R mechanism is mounted.

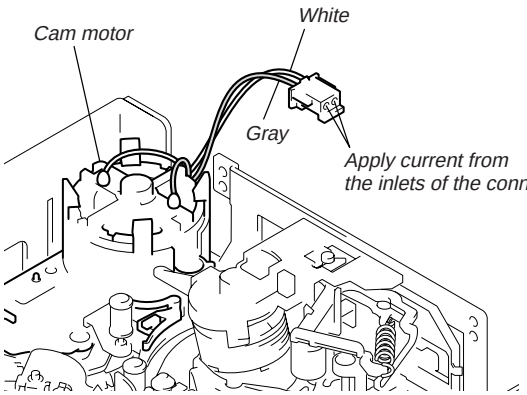
Before attaching or removing the cassette compartment, check the position of "L cassette".



2-1-2. HOW TO LOAD/UNLOAD

[Using the regulated power supply]

Note: Make sure to remove the connector of the cam motor from the board of the main unit and apply +5V current.



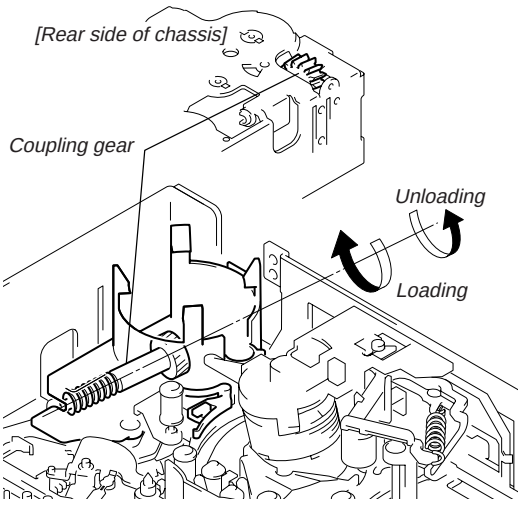
Loading : Apply positive polarity (+) of power supply to the gray wire and negative polarity (–) of power supply to the white wire.

Unloading : Apply negative polarity (–) of power supply to the gray wire and positive polarity (+) of power supply to the white wire.

[Manual: No cam motor]

Note: Remove the cam motor from the motor holder while referring to "Information" on page 5-34.

Rotate the coupling gear by hand to load or unload.



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2-1-3. About Mode Selector II

• About Mode Selector II

3-1. OUTLINE

This unit is a mechanism drive tool which supplements the maintenance of each mechanism deck. Its functions are described below.

1. Manual test
A mode which drives the motor only while the switch is ON. It enables the operator to control the motor as desired.

2. Step test
A mode which drives the motor until the current condition detected by the sensor changes to another condition. It enables the movements made by the motor in each operation to be controlled while being detected.

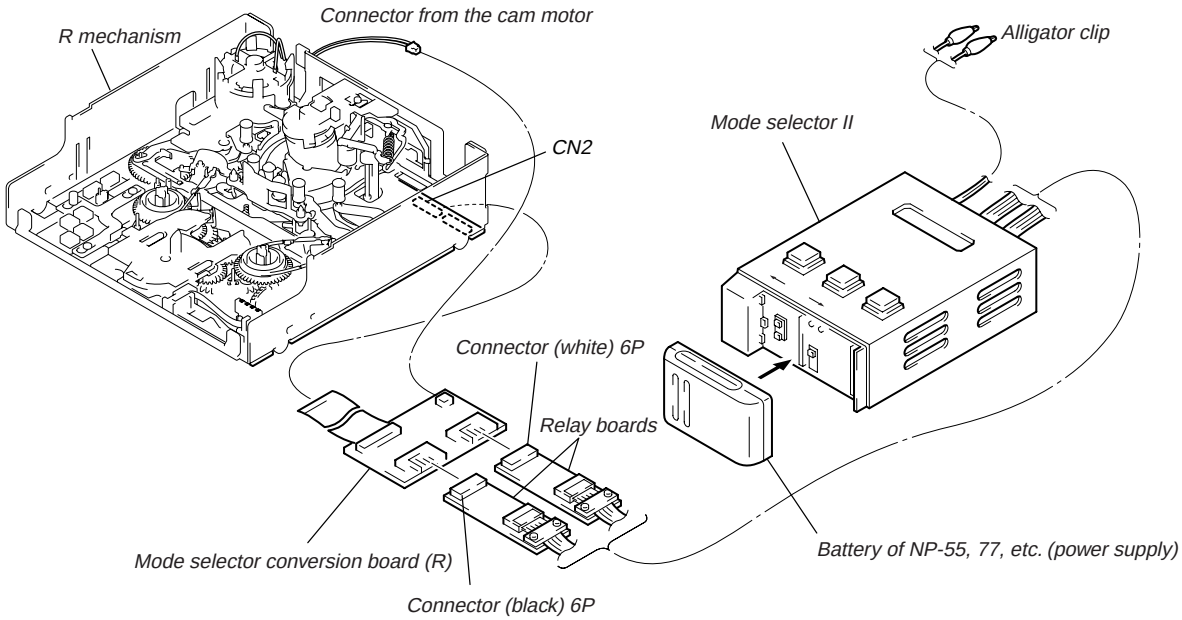
3. Auto test
A mode that checks if the mechanism operates normally according to the condition shift table recorded in the unit for each mechanism deck. All the conditions of the decks are checked through a series of operations.
An error message is displayed and operations are stopped if incorrect shifts and conditions are detected.

3-2. MECHANISM CONDITION (POSITION) SHIFTING ORDER LIST

After selecting the mechanism deck, select one of the two test modes other than the auto test, and press the RVS or FF button to specify the mechanism state (position).

Code \ MD name					R mechanism
A	B	C	D		
0	1	1	1	1	ULE
0	0	1	1	2	DEW
1	0	1	1	3	LE
1	0	0	1	4	REW
1	0	1	0	5	FF
1	1	1	0	6	STOP
1	1	0	1	7	FWD / RVS

3-3. MODE SELECTOR II CONNECTION



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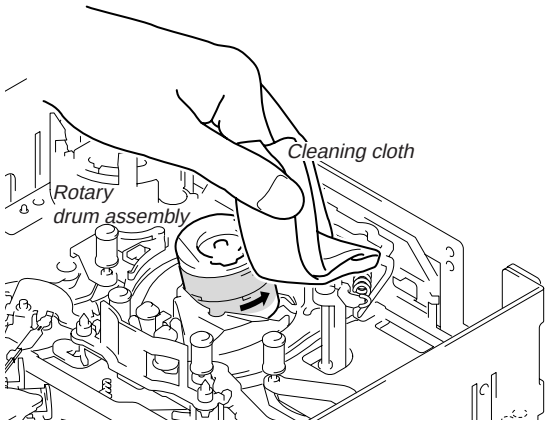
5-2-2. PERIODIC CHECK

• Carry out the following maintenance and periodic checks not only to fully display the functions and performance of the set, but also for the equipment and tape. After replacing, service the set as follows, regardless of the length of use.

2-2-1. CLEANING OF ROTARY DRUM ASSEMBLY

1. Press a wiping cloth (J-12) moistened with cleaning fluid (J-11) against the rotary drum assembly gently, and clean it while rotating the rotary drum assembly slowly with your finger in the counterclockwise direction.

Note: Do not rotate the motor on power or rotate the rotary drum assembly in the clockwise direction with your finger. The head tip will also be damaged if the wiping cloth is moved perpendicularly against it. Therefore, be sure to follow the above instructions when cleaning the rotary drum assembly.

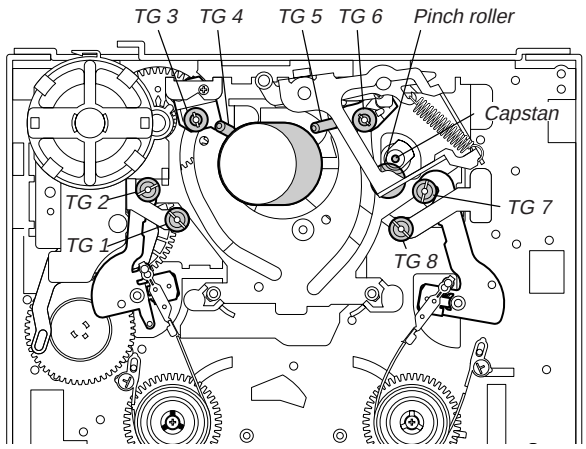


2-2-2. CLEANING OF TAPE PATH SYSTEM

1. Clean the tape path systems (TG1 to TG8 and capstan) and the lower drum using a super fine applicator (J-13) moistened with cleaning fluid.

Note: Make sure that no oil or grease of the link mechanisms sticks to the super file applicator (J-13).

Note: Do not use a applicator moistened with alcohol to the other guide cleaning. But clean the pinch roller using alcohol.



2-2-3. PERIODIC CHECKS

Location of Maintenance and Check		Hours of Use (H)										Remarks
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
	Cleaning of tape path surface	○	○	○	○	○	○	○	○	○	○	Be careful of the oil.
	Cleaning and degaussing of rotary drum assembly	○	○	○	○	○	○	○	○	○	○	Be careful of the oil.
Driving System	Capstan (Bearing)	–	◎	–	◎	–	◎	–	◎	–	◎	Make sure that no oil gets on the tape path surface.
	Gear	–	◎	–	◎	–	◎	–	◎	–	◎	
	Cam motor (worm block)	–	◎	–	◎	–	◎	–	◎	–	◎	X-3946-702-1 (M902)
Performance Confirmation	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	–	☆	–	☆	–	☆	–	☆	–	☆	
	Brake system	–	☆	–	☆	–	☆	–	☆	–	☆	
	FWD/RVS torque measurement	–	☆	–	☆	–	☆	–	☆	–	☆	

○ : Cleaning ◎ : Appling grease ☆ : Confirmation

Note: When overhauling, refer to the checks above and replace parts.

Note: Greasing

Always use the specified grease. If the viscosity differs, various problems may occur.
(Use SG-941 for all parts of the R mechanism.)

Check the quantity of grease when installing the parts which is needed to apply the grease. When replacing these parts, make sure to apply the specified amount of grease.

• FOIL (SG-941): Part No. 7-662-601-39

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5-2-3. PARTS REPLACEMENT

• Precaution

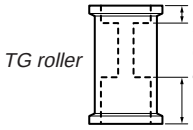
For details on disassembling the cabinets, boards and other parts, refer to “Disassembly” of the Service Manual of each model. For details on replacing parts (disassembly, assembly) of the mechanism deck, refer to “Information” on page 5-34.

2-3-1. TAPE GUIDE 1/8 AND GUIDE GUARD

Disassembly/Assembly

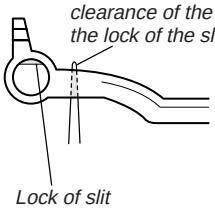
When the tape guide 1/8 is replaced or attached, perform each adjustment from Adjustment Start -2 of the flowchart on page 5-52.

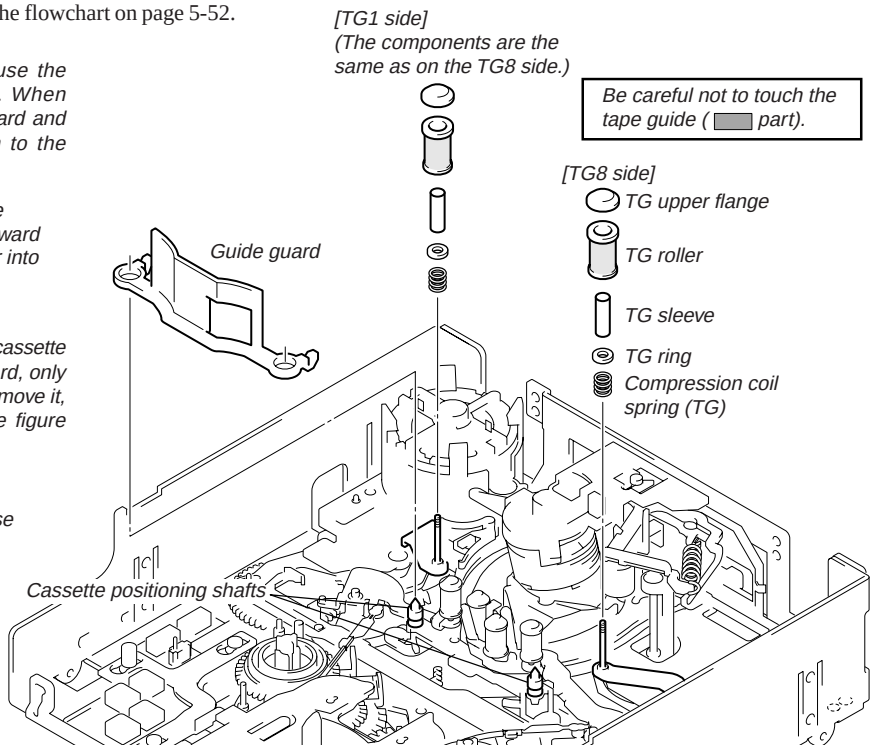
To attach or remove the tape guide, use the screwdriver for the tape path (J-15). When attaching the TG rollers, check the upward and downward directions and attach them to the chassis shaft.



Face the side of the deepest hole downward and insert the roller into the shaft.

The guide guard is fixed at each slit of the cassette positioning shaft. To attach the guide guard, only insert it into the right and left holes. To remove it, use a pair of tweezers as shown in the figure below.



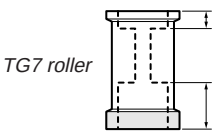


2-3-2. TAPE GUIDE 2/7

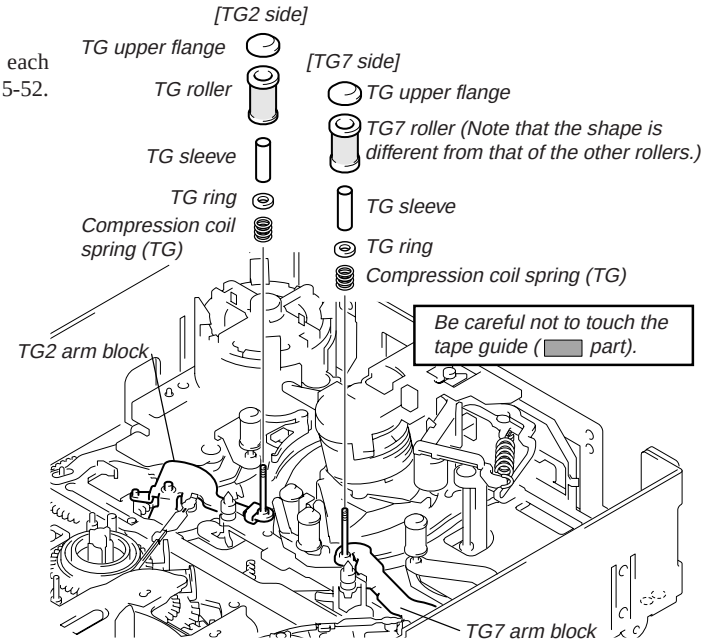
Disassembly/Assembly

When the tape guide 2/7 is replaced or attached, perform each adjustment from Adjustment Start -3 of the flowchart on page 5-52.

To attach or remove the tape guide, use the screwdriver for the tape path (J-15). When attaching the TG rollers, check the upward and downward directions and that the TG roller to be attached to the TG7 side is exclusively for the TG7 side. Then attach the TG rollers to the chassis shaft.



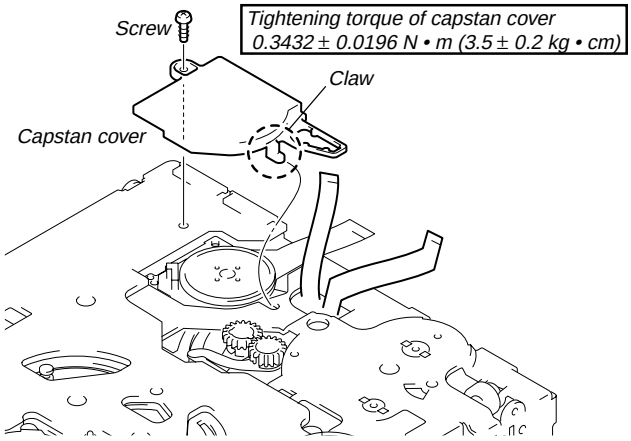
Face the side of the deepest hole downward and insert the roller into the shaft.
The lower flange of the TG7 roller is thicker than those of the TG1, 2, and 8 rollers.

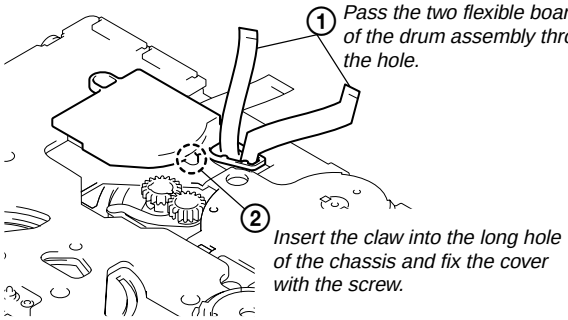


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2-3-3. CAPSTAN COVER

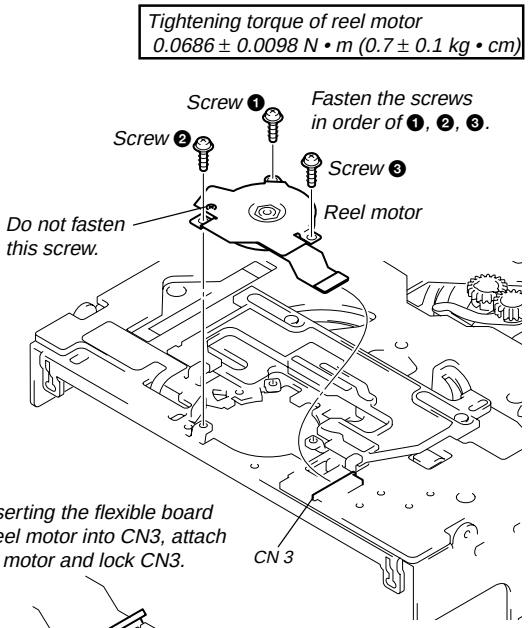
Disassembly/Assembly



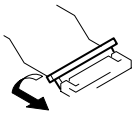


2-3-4. REEL MOTOR

Disassembly/Assembly

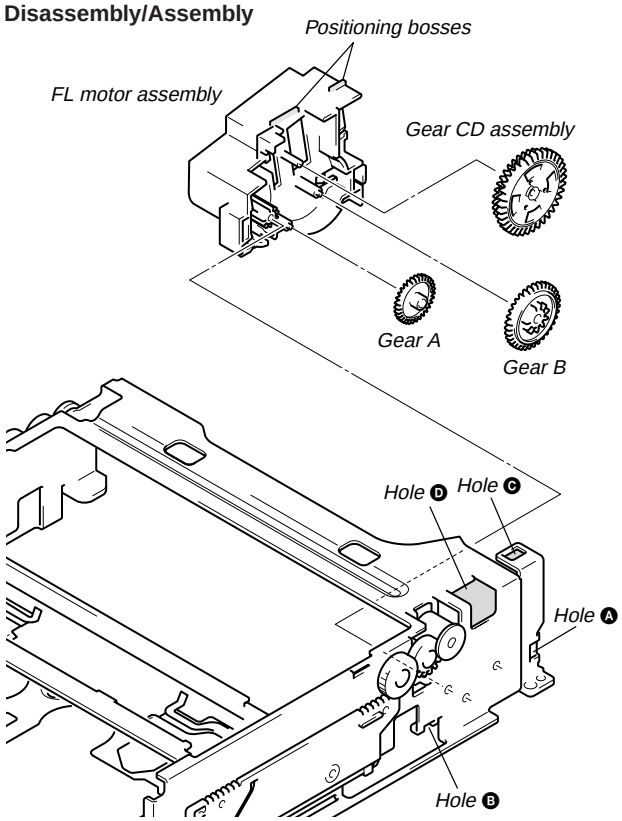


After inserting the flexible board of the reel motor into CN3, attach the reel motor and lock CN3.



2-3-5. FL MOTOR ASSEMBLY, GEAR A, GEAR B AND GEAR CD ASSEMBLY

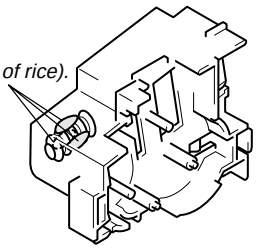
Disassembly/Assembly



Remove the claws of the FL motor assembly from hole ❸ and hole ❹ and remove the FL motor assembly. Then, remove each gear, etc. To attach them, after attaching the gears, etc. to the FL motor assembly and hook the positioning bosses of the FL motor block on holes ❷ and ❶ then fit the two claws in each hole ❸ and ❹.

The worm gears are attached inside the FL motor assembly. When attaching the FL motor assembly, apply grease there.

Apply grease
(half size of one grain of rice).

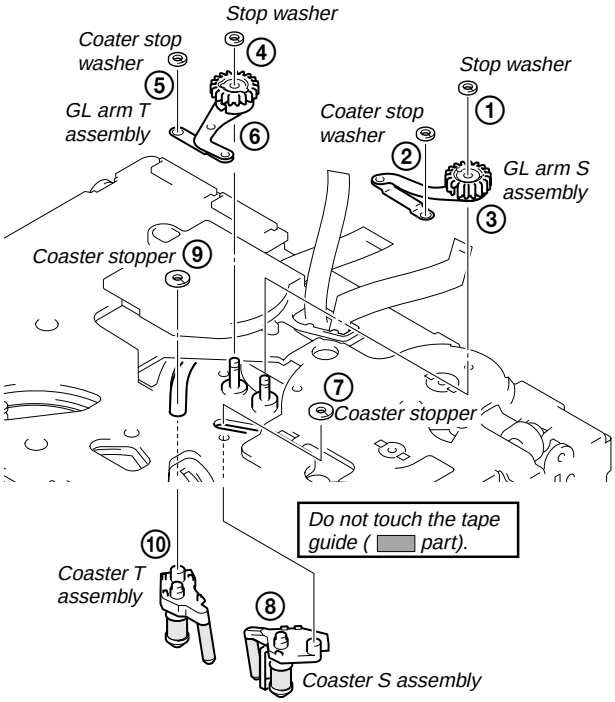


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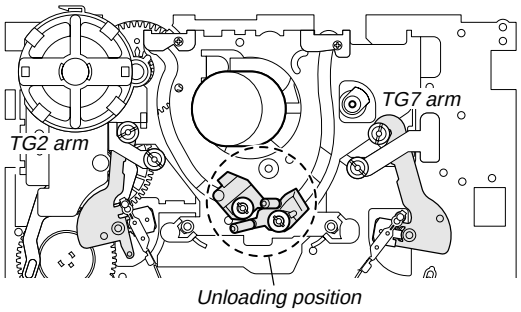
2-3-6. GL ARM S ASSEMBLY, GL ARM T ASSEMBLY, COASTER S ASSEMBLY AND COASTER T ASSEMBLY

Disassembly: Remove the parts in order of ①➡②➡③➡④➡⑤➡⑥➡⑦➡⑧➡⑨➡⑩

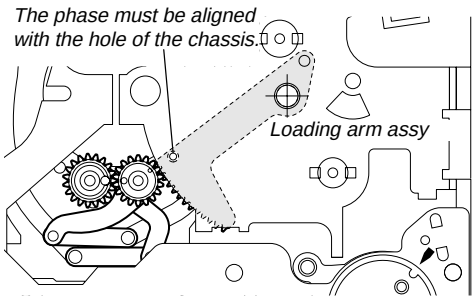
For the disassembling and assembling procedures of the GL gear, GL helical torsion spring, etc., refer to page 5-50.



Move the TG2/7 arms to the loading position with the regulated power supply or by hand while referring to page 5-35. Each coaster assembly must be in the unloading position.

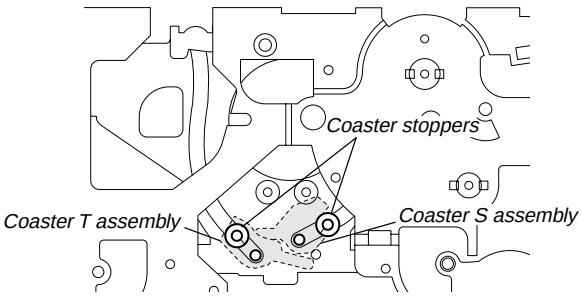


With consideration for future assembly, check from the rear of the chassis that the phase of the loading arm assy is aligned.

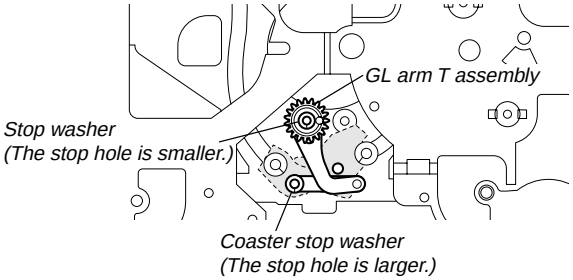


Assembly

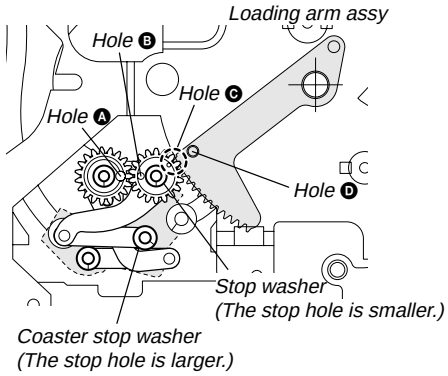
① Attach the coaster S/T assembly to the chassis with a new coaster stopper while being careful not to touch the tape guide. Do the work while holding the drum side of each coaster.



② Attach the GL arm T assembly. Fix the stop washers in the correct position, using new stop washers.



③ Attach the GL arm S assembly while checking the phase of each part. Fix the stop washers at the correct position, using new stop washers.



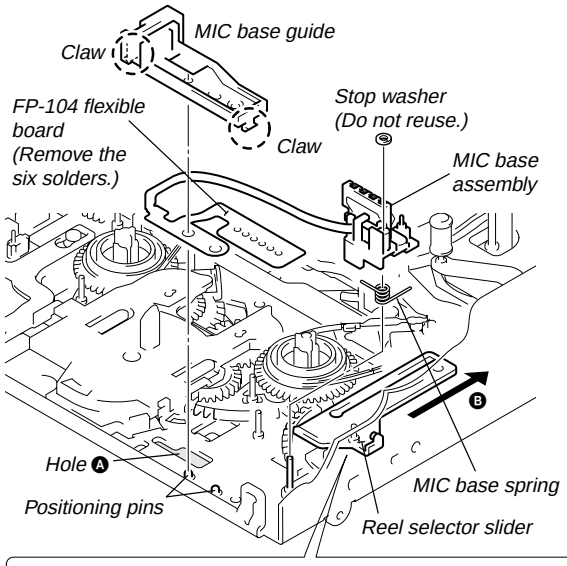
Check each phase adjustment while referring to the above figure.
Hole Ⓐ of the GL gear T and hole Ⓑ of the GL gear S must face each other. Hole Ⓓ of the loading arm assy must be aligned with the hole of the chassis, and the endmost gear tooth of the loading arm assy must face toward hole Ⓒ of the GL gear S.

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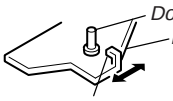
2-3-7. MIC BASE GUIDE, MIC BASE ASSEMBLY AND MIC BASE SPRING

Disassembly/Assembly

For the disassembling and assembling procedures of the components of the MIC base assembly, refer to page 5-50.



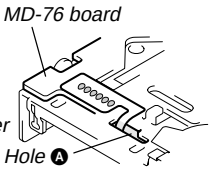
When selecting a cassette position, be careful not to touch the slider drive shaft because it can be easily bent or broken.



Select the desired cassette position by pressing the claw position.

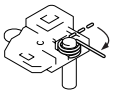
Remove the six solders on the FP-104 flexible board from the rear of the chassis. Pass the flexible board through hole A and pull it out of the front side of the chassis while being careful not to damage it. To attach the flexible board, perform the steps of disassembly in reverse order.

Six solders
Temperature of tip of soldering iron : 350 ± 20 °C
Hold time : one second or shorter



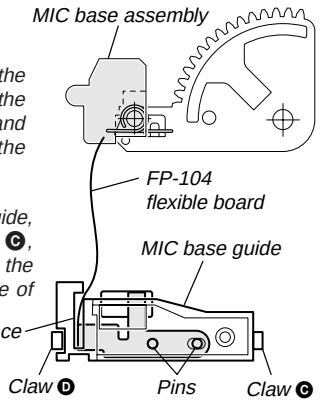
Move the reel selector slider in the direction of arrow B and attach the MIC base assembly at the position of "S cassette". For the assembly of the MIC base spring, refer to the figure.

Note: Do not hold the shaft when selecting the reels.



Insert the side of the shorter spring into the hole of the holder and hook the side of the longer spring.

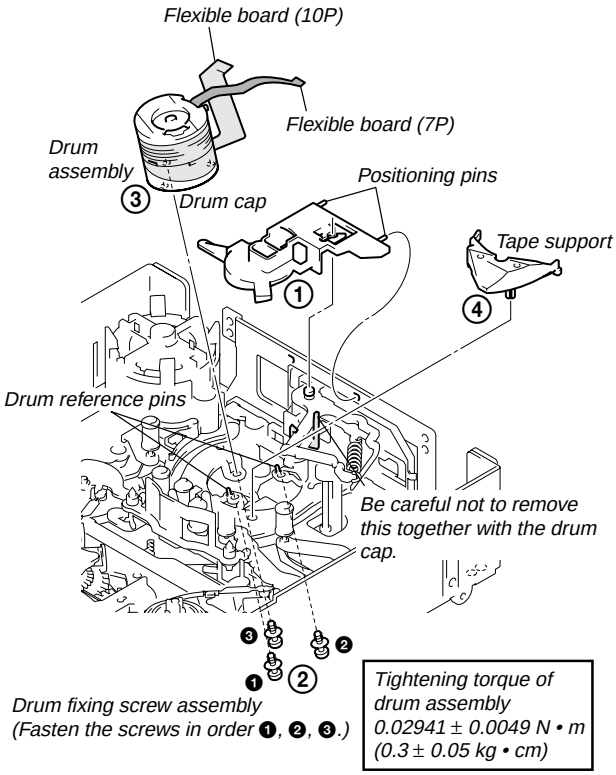
When attaching the MIC base guide, lock the positioning pins, claw C, and claw D in this order. Route the flexible board into the clearance of the MIC base guide.



2-3-8. DRUM CAP, DRUM ASSEMBLY AND TAPE SUPPORT

Disassembly: Remove them in order of ①➡②➡③

For the disassembly and assembly procedures of the components of the drum assembly, refer to page 5-51.



Drum fixing screw assembly (Fasten the screws in order 1, 2, 3.)

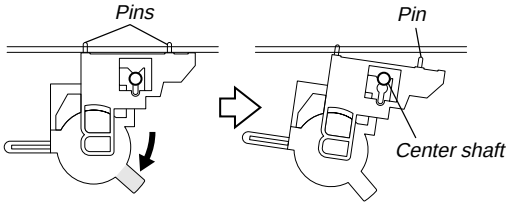
Tightening torque of drum assembly 0.02941 ± 0.0049 N • m (0.3 ± 0.05 kg • cm)

Assembly: Attach the parts while referring to the disassembly procedure and the figure below.

(After assembling, adjust the tape path while referring to page 5-52 and thereafter.)

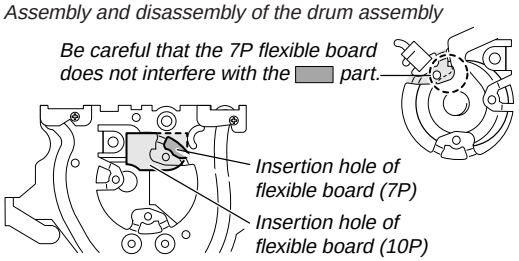
Assembly and disassembly of the drum assembly

When pulling the ▭ part in the direction of the arrow, the claw is removed from the center shaft, then the right pin and the drum cap are removed as shown in the figure on the right. To attach the drum assembly, perform the disassembly steps in reverse order.

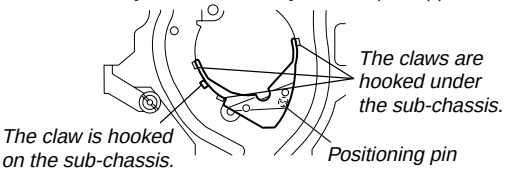


Assembly and disassembly of the drum assembly

Be careful that the 7P flexible board does not interfere with the ▭ part.



Assembly and disassembly of the tape support

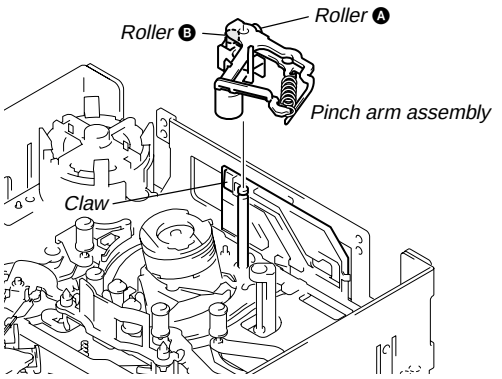


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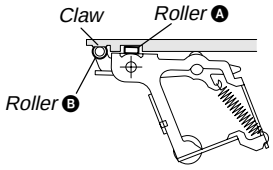
2-3-9. PINCH ARM ASSEMBLY

Disassembly/Assembly

For the disassembling and assembling procedures of the tape retainer and compression coil spring (tape retainer), refer to page 5-51.



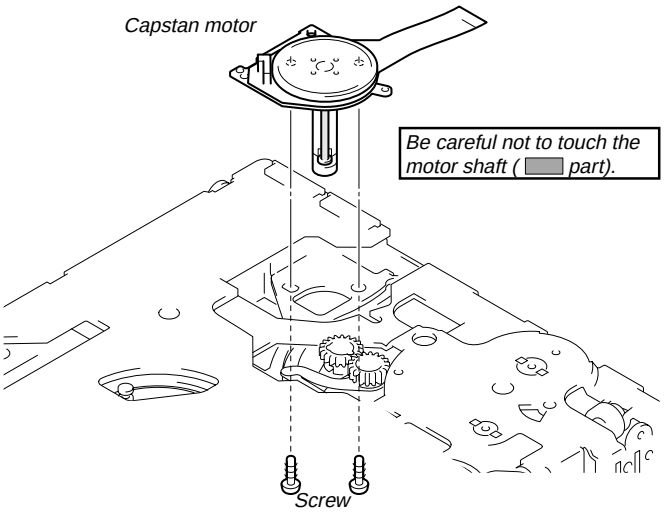
Push roller Ⓐ into the groove as shown in the figure. Insert roller Ⓑ into the claw. To remove the pinch arm assembly, pull out the pinch arm upward while pushing the claw.



2-3-10. CAPSTAN MOTOR

Disassembly/Assembly

(After assembling, adjust the tape path from page 5-52.)

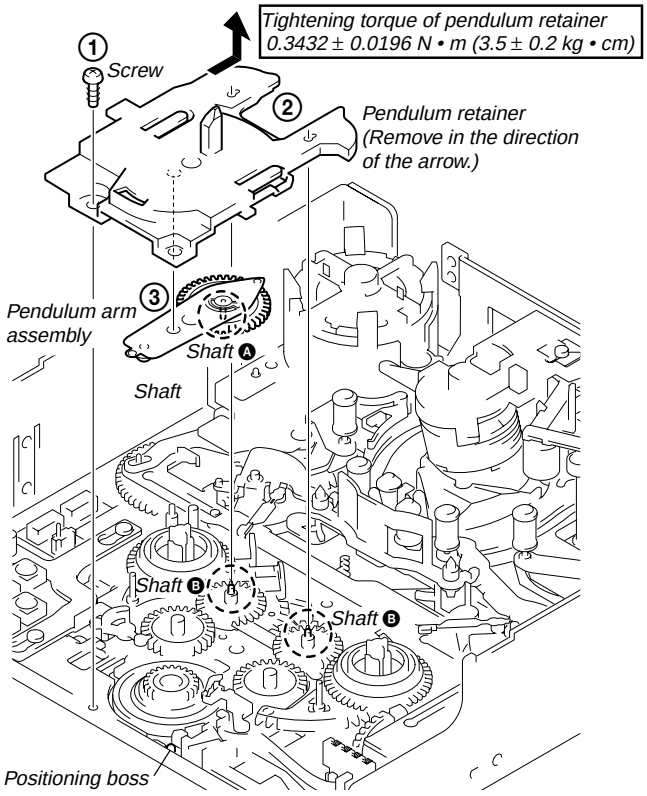


Tightening torque of capstan motor
0.1961 ± 0.0196 N • m (2.0 ± 0.2 kg • cm)

2-3-11. PENDULUM RETAINER AND PENDULUM ARM ASSEMBLY

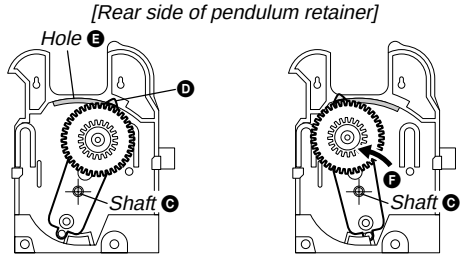
Disassembly: Remove them in order of ①➡②➡③

(To attach them, perform the disassembly steps in reverse order.)



Notes during assembly

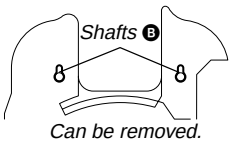
When assembling or disassembling the pendulum arm assembly, be careful of the following.



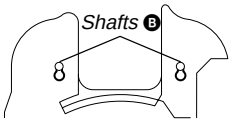
Insert tip Ⓓ of the pendulum arm into hole Ⓔ of the pendulum retainer and insert the pendulum into shaft Ⓒ.

Slide the pendulum arm in the direction of arrow Ⓕ and attach it to the chassis.

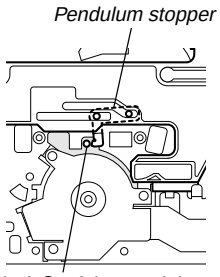
Attach the pendulum retainer to shaft Ⓑ. Be careful of the positions of the pendulum stopper at the rear of the chassis and shaft Ⓐ of the pendulum arm.



Can be removed.



Cannot be removed.

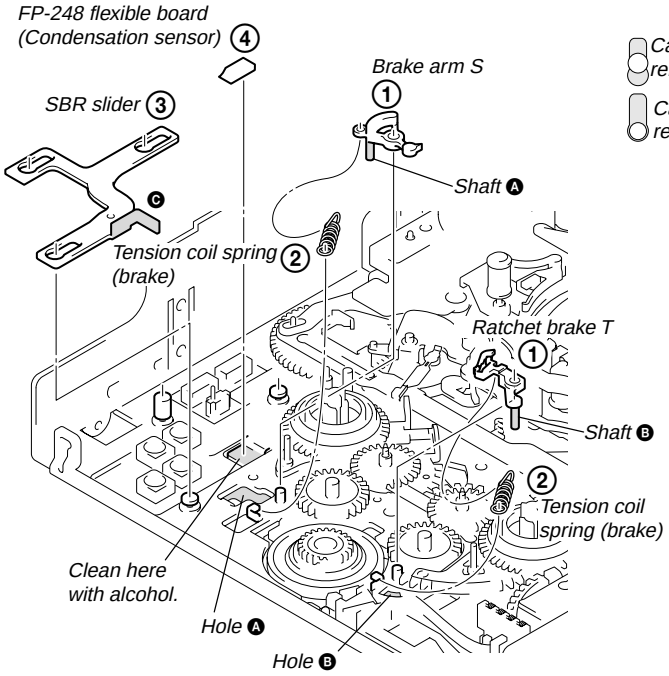


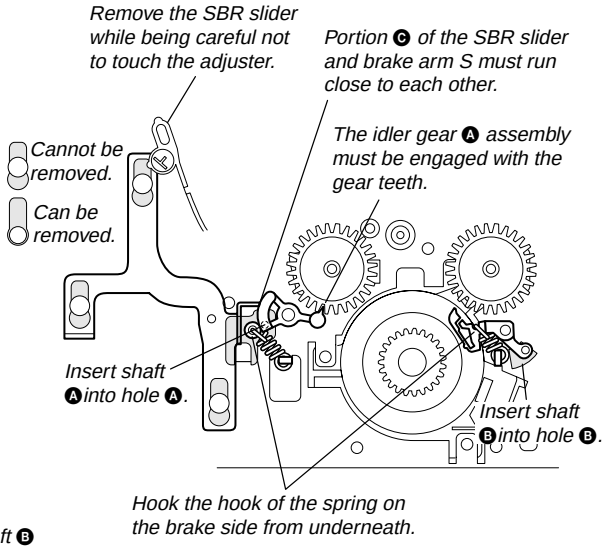
Shaft Ⓐ of the pendulum must be in this position.

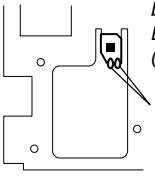
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2-3-12. BRAKE ARM S, RATCHET BRAKE T, TENSION COIL SPRING (BRAKE), SBR SLIDER AND FP-248 FLEXIBLE BOARD (CONDENSATION SENSOR)

Disassembly: Remove them in order of ①➡②➡③➡④
(To attach them, perform the disassembly steps in reverse order.)





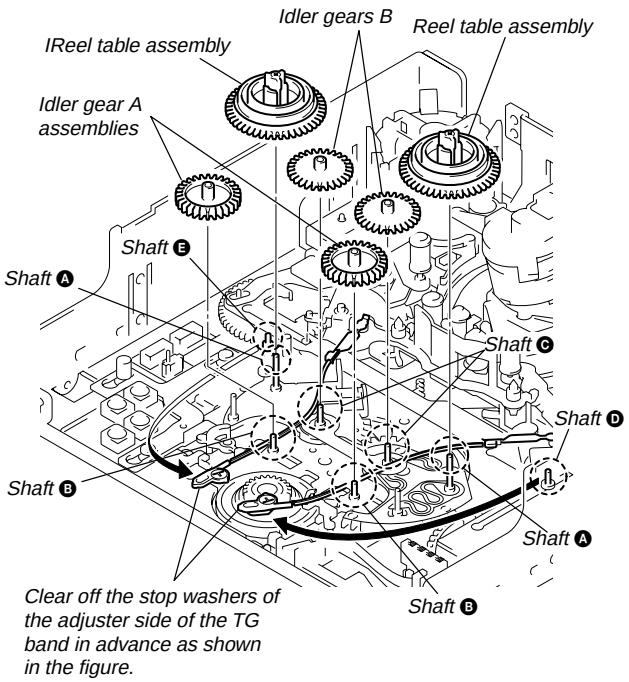


When attaching the FP-248 flexible board, scrape the contact surface with a swab to stick the flexible board to the chassis.
Do not touch the sensor block (black area).

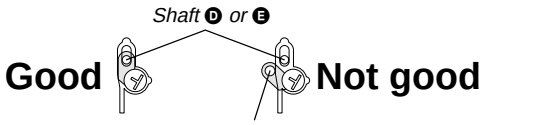
Two solders
Temperature of tip of soldering iron: 350 ± 20 °C
Hold time: one second or shorter

2-3-13. REEL TABLE ASSEMBLY, IDLER GEAR A ASSEMBLY AND IDLER GEAR B

Disassembly/Assembly
(Do not touch the TG band block.)
When the reel table assembly is replaced or attached, perform each adjustment from Adjustment Start -1 of the flowchart on page 5-52.

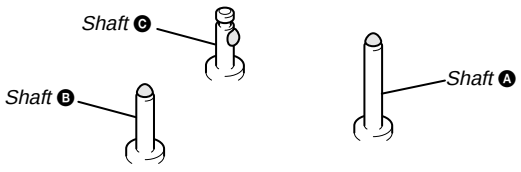


Checks before work
The TG band winds around the slit of the reel table assembly. Before removing the reel table assembly, clear off the TG band while referring to the left figure. When attaching the TG band, be sure to use new stop washers.

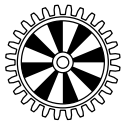


When attaching the TG band, the part also must be inserted into shaft Ⓓ or Ⓔ.

When attaching each gear, apply grease to each fixing shaft. Apply grease of half the size of one rice grain to the top side of shaft Ⓒ.
When attaching the idler gear A assembly, be careful not to apply grease to the reflection panel.



Apply grease to ▭ part.
(half size of one grain of rice)

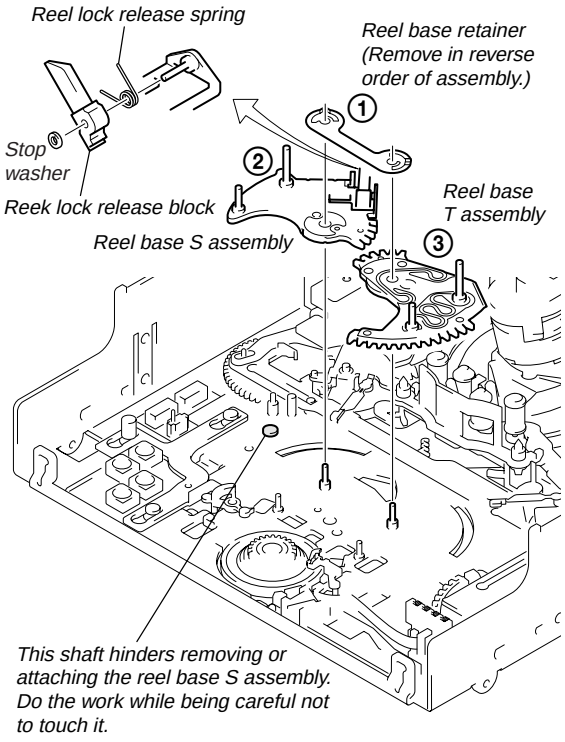


When attaching the idler gear A assembly, be careful not to apply grease to the reflection panel.

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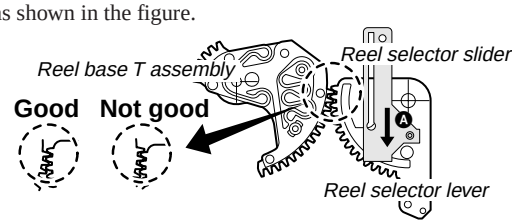
2-3-14. REEL BASE RETAINER, REEL BASE T ASSEMBLY AND REEL BASE S ASSEMBLY (REEL LOCK RELEASE BLOCK AND REEL LOCK RELEASE SPRING)

Disassembly: Remove them in order of ①➡②➡③
(Refer to Assembly, too.)

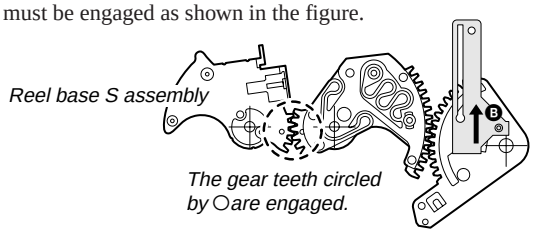


Assembly: Attach them in order of ①➡②➡③

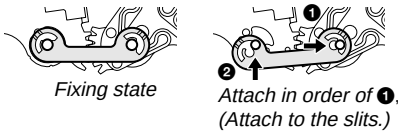
① Move the reel selector slider in the direction of arrow Ⓐ to check that the reel selector lever is "L cassette". At this position, attach the reel base T assembly. The gear teeth must be engaged as shown in the figure.



② Move the reel selector slider in the direction of arrow Ⓑ and switch the reel selector lever to "S cassette". At this position, attach the reel base S assembly. The gear teeth (circled by ○) must be engaged as shown in the figure.



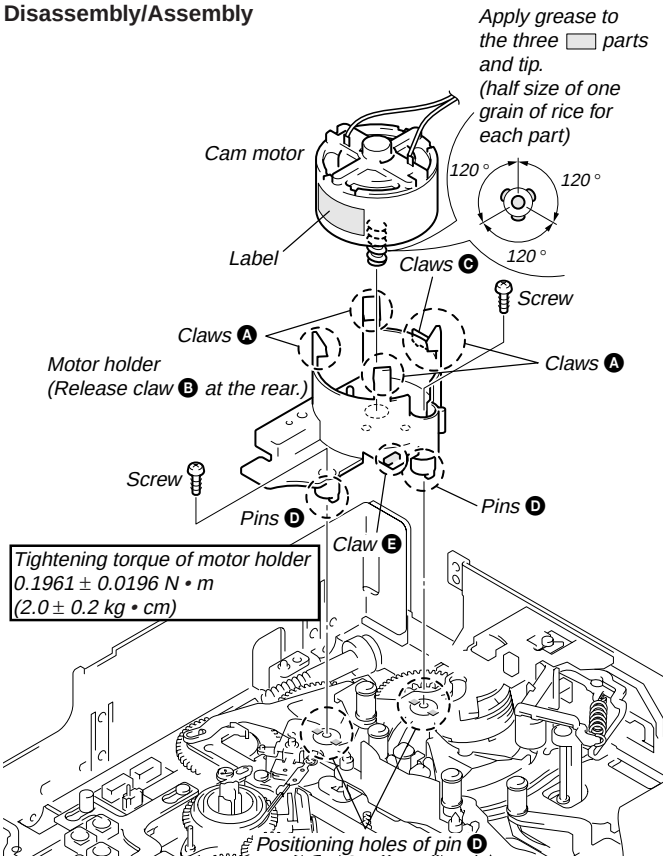
③ Attach the reel base retainer.



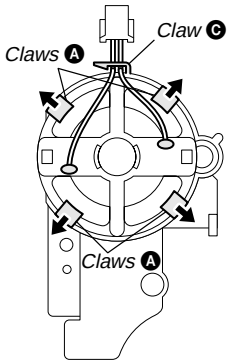
Note: Do not hold the shaft when selecting the reels.

2-3-15. CAM MOTOR, MOTOR HOLDER

Disassembly/Assembly

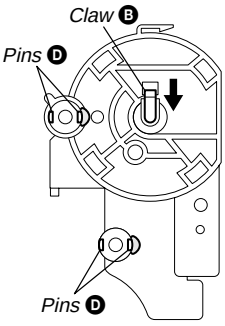


Checks before disassembly and assembly
The cam motor is fixed on the motor holder by the four claws. Releasing the four claws enables the cam motor to be removed without removing the motor holder from the chassis. When attaching the cam motor, be careful of the assembling direction (the label must face toward the front). If the phase of the gear, etc. moves when removing the motor holder, refer to page 5-40.



[Front side of motor holder]
While spreading claws Ⓐ in the direction of the arrow, pull out the cam motor upward. To attach it, push the cam motor into the motor holder and route the two wires of the cam motor into claw Ⓒ.

When attaching the TG2 control arm, claw Ⓔ must be inserted into the hole of the TG2 control arm.



[Rear side of motor holder]
The motor holder is fixed by the two screws and claw Ⓑ at the rear. To remove it, push claw Ⓑ in the direction of the arrow from the rear of the chassis. Note that positioning pins Ⓓ are easy to break when attaching the motor holder. Apply grease (half size of one grain of rice) to the two ▭ parts shown in the right figure.

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2-3-16. TG2/7 ARM BLOCK, TG2/7 BAND BLOCK AND TENSION COIL SPRING (TG2)/(TG7)

Disassembly: Remove them in order of ①➡②➡③➡④

For the disassembling and assembling procedures of the assembly components of the TG2/TG7 arm, refer to page 5-51.

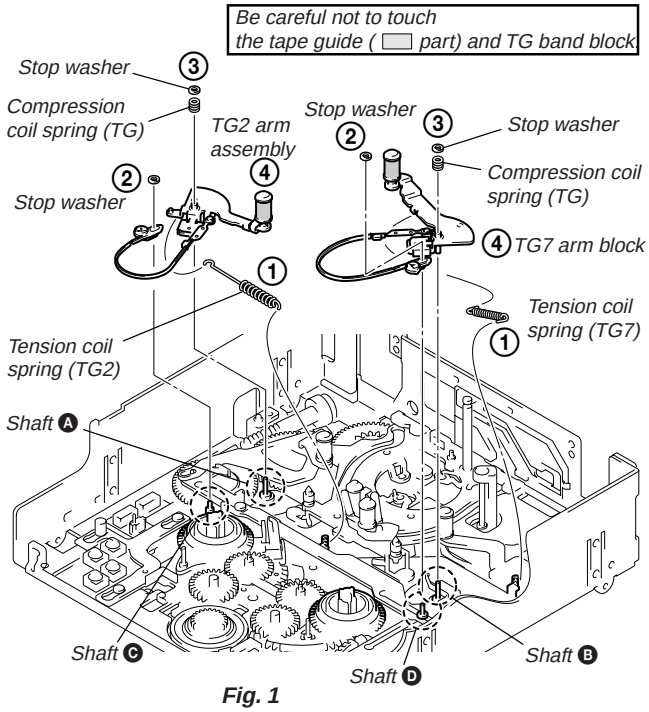


Fig. 1

Assembly: Attach them while referring to figure above or below and the descriptions.

When these parts are replaced or attached, perform each adjustment from Adjustment Start -3 of the flowchart on page 5-52.

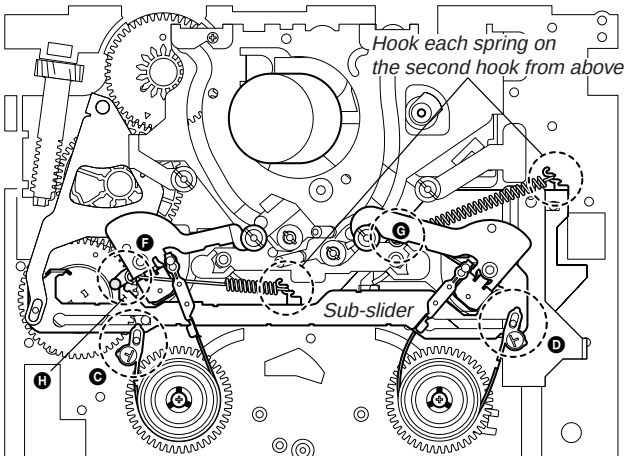


Fig. 3

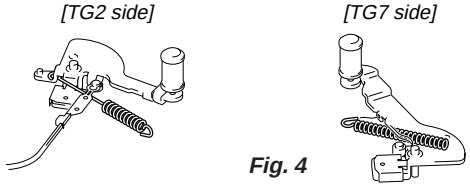


Fig. 4

Hook the spring from the inside and put it under the TG band.

Hook the spring from the outside and put it under the arm.

Notes during work

Be careful when handling the TG arm and the peripheral parts.

- Twisting and bending of the band block and tension coil spring
- Dirt and scratches of the tape guide
- Loss of the compression coil spring (TG)

Do not reuse removed stop washers.

Disassembly of the band TG2/TG7 assembly

When pulling portion Ⓔ of the TG2 or TG7 band in the direction of the arrow, a click sound is heard as the band is removed. To attach the bands, pull out the opposite side to portion Ⓔ to lock.

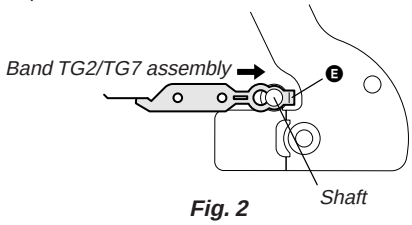
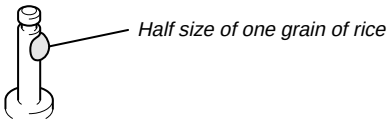


Fig. 2

① Apply grease to the top side of the fixing shaft (Ⓐ or Ⓑ) of the TG arm. (Fig. 1)



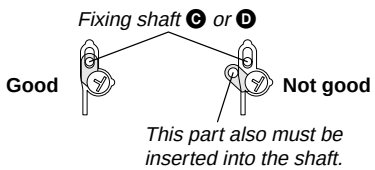
② Attach the TG band assembly to the TG arm assembly. (Fig. 2) Be sure that the felt sides of the TG band face toward the reel tables so that they surround the respective reel tables.

③ Attach the tension coil spring to the TG arm assembly. (Fig. 3, 4)

- Hook the spring of the tension coil spring (TG2) from the inside and put it under the TG band. (Fig. 3-Ⓕ, 4)
- Hook the spring of the tension coil spring (TG7) from the outside and put it under the TG7 band. (Fig. 3-Ⓖ, 4)

④ Attach the TG arm block to the shaft (Ⓐ or Ⓑ) and attach the tension coil spring to the second hook. When attaching the TG2 arm, the part must be at the left of portion Ⓗ of the slider. (Fig. 3)

⑤ Attach the adjuster of the TG band to shafts Ⓒ and Ⓓ.



⑥ Fix the TG band and TG arm with new stop washers. When attaching the TG arm, do not forget to attach the compression coil spring (TG). (Fig. 1)

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2-3-17. SUB-SLIDER ARM, SUB-SLIDER, ENCODER GEAR, MAIN CAM GEAR, COUPLING GEAR, SUB-CAM GEAR, PINCH SLIDER AND LOADING ARM ASSY

Disassembly: Remove them in order of ①➡②➡③➡④➡⑤➡⑥➡⑦➡⑧

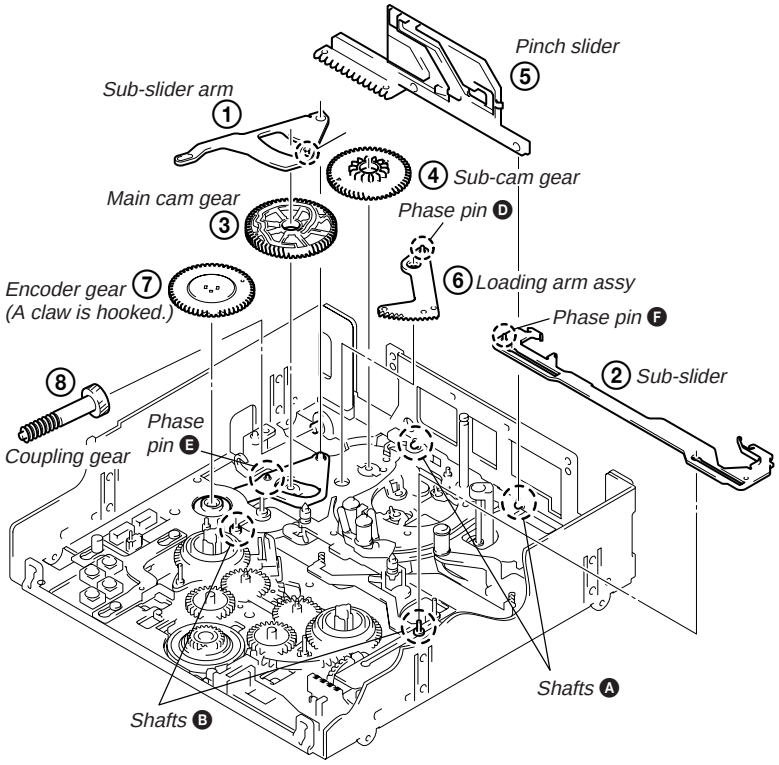


Fig. 1

Disassembly of the pinch slider

Move the pinch slider to the leftmost end, and slide it upward and remove it when two shafts Ⓐ are superimposed on the holes of the pinch slider.

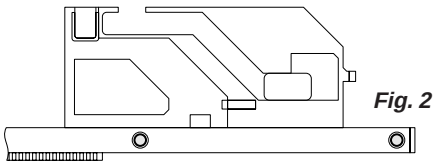


Fig. 2

Disassembly of the sub-slider

Move the sub-slider to the rightmost and remove it from two shafts Ⓑ.

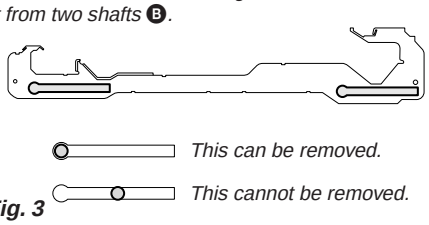


Fig. 3

Disassembly of the encoder gear

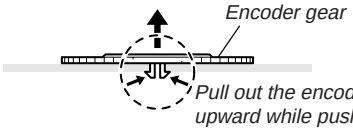


Fig. 4

Assembly: Attach them while referring to the figure above or below and the descriptions.

Check before work

When attaching the parts described in this section, various phase adjustments are required. Before work, refer to page 5-48 and check the reference phases.

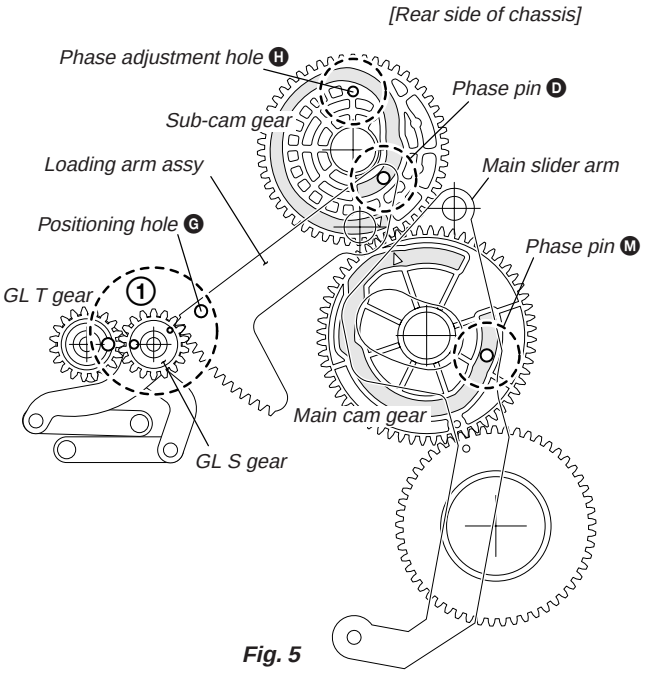


Fig. 5

① Attach the loading arm assy. (Refer to the figure above.)
The phases of the GLS gear and GLT gear must match and the positioning hole Ⓖ of the loading arm assy must be superimposed on the hole of the chassis. (Fig. 5)

② Attach the pinch slider. (Fig. 1, 2)

③ Apply grease to the groove at the rear of the sub-cam gear. (Fig. 6)
After applying, adjust the phase of the sub-cam gear to that of the pinch slider. (Fig. 7)
Phase pin Ⓓ of the loading arm assy must be inserted into the groove at the rear of the sub-cam gear. (Fig. 5, 7)

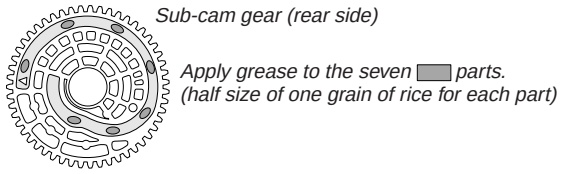


Fig. 6

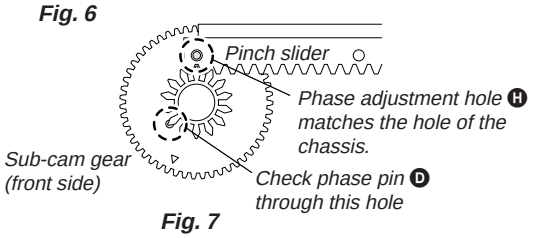


Fig. 7

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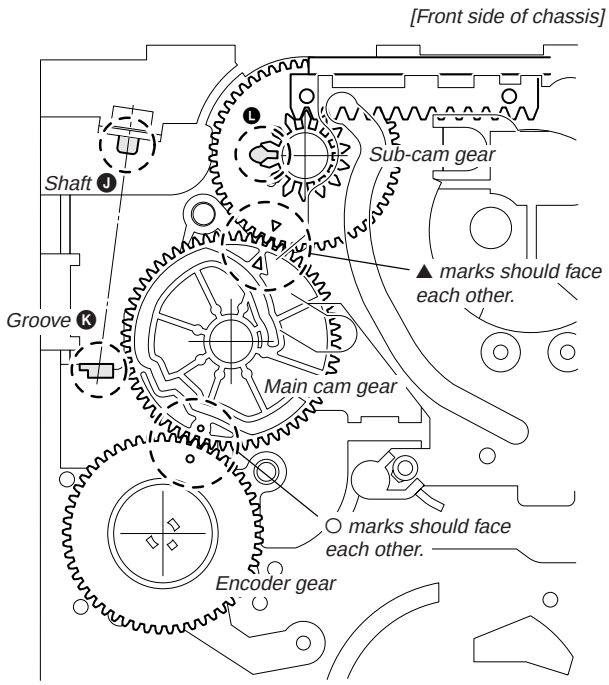


Fig. 8

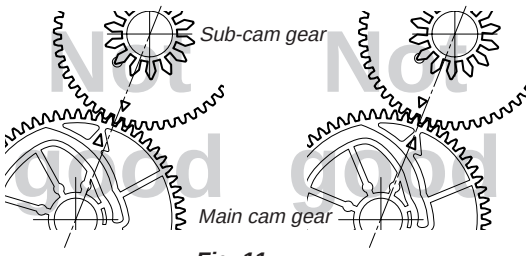


Fig. 11

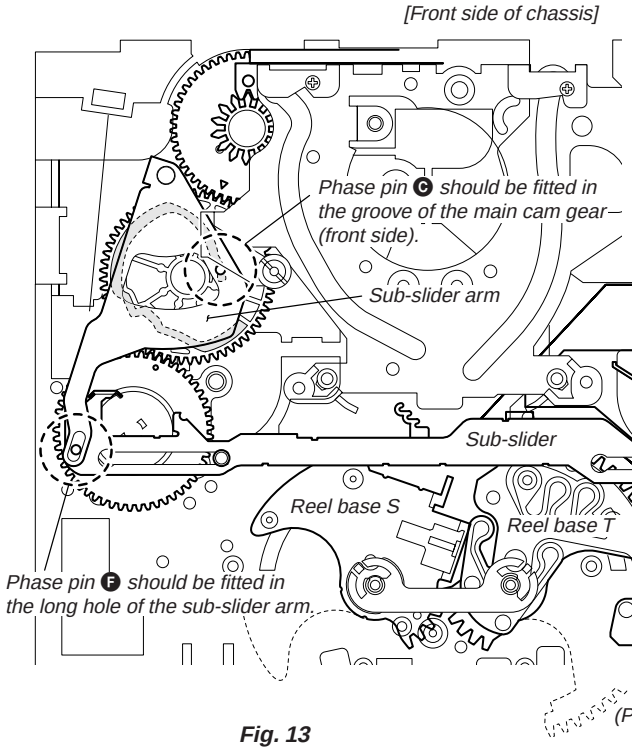


Fig. 13

④ Apply grease to the fixing block (shaft J and U-shaped groove K) of the coupling gear and portion L of the sub-cam gear (half size of one grain of rice for each part). (Fig. 8)

⑤ Attach the coupling gear. After attaching, apply grease while rotating the coupling gear by 120˚ each time. (Fig. 9, 10)

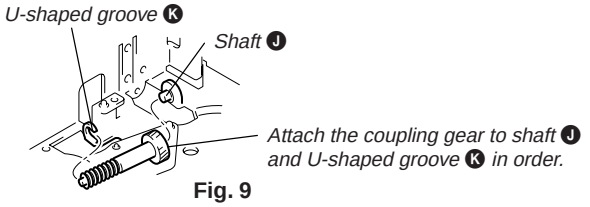


Fig. 9

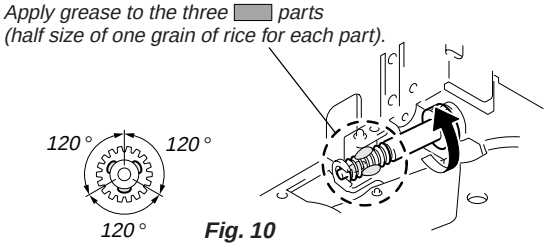


Fig. 10

⑥ Attach the main cam gear while being careful of the directions of the front and rear sides. Also, take care of the phase adjustment to the sub-cam gear. (Fig. 8, 11, 12)
Phase pin M of the main slider arm should be fitted in the groove of the main cam gear (rear side). (Fig. 5)

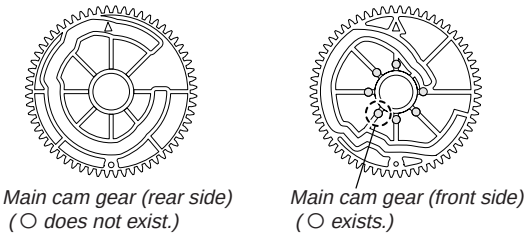


Fig. 12

⑦ Attach the encoder gear. (Fig. 3)
Adjust the phases (marked) to those of the main cam gear. (Fig. 4/Fig. 8)

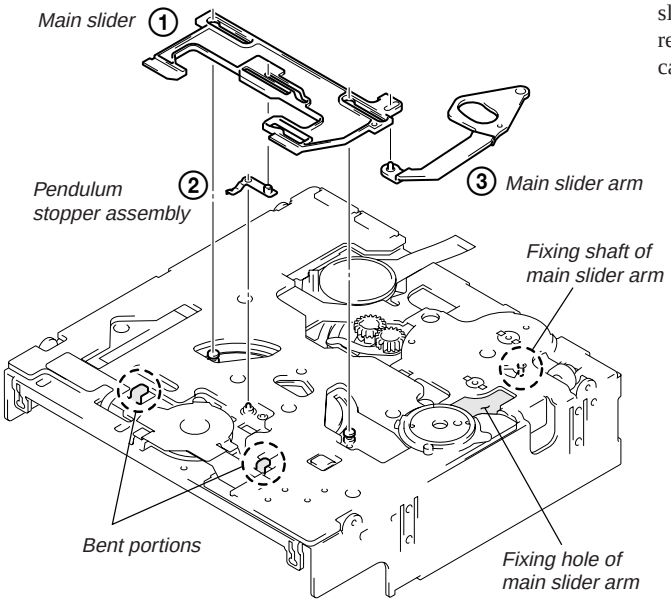
⑧ After moving the reel selector slider in the direction of arrow N to set the position of the reel base to "L cassette", attach the sub-slider in reverse order while referring to Fig. 3. (Fig. 13)

⑨ Attach the sub-slider arm. (Fig. 1/Fig. 13)

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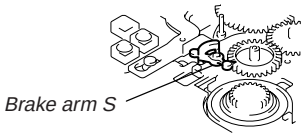
2-3-18. MAIN SLIDER, MAIN SLIDER ARM AND PENDULUM STOPPER ASSEMBLY

Disassembly: Remove them in order of ①➡②➡③



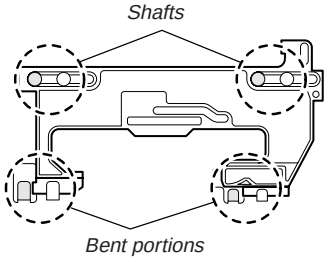
Disassembly of each part

The main slider controls several parts. Before removing the main slider, remove "Brake arm S" at the front of the chassis while referring to "Information" on page 5-34. Otherwise, the main slider cannot be removed.



Main slider

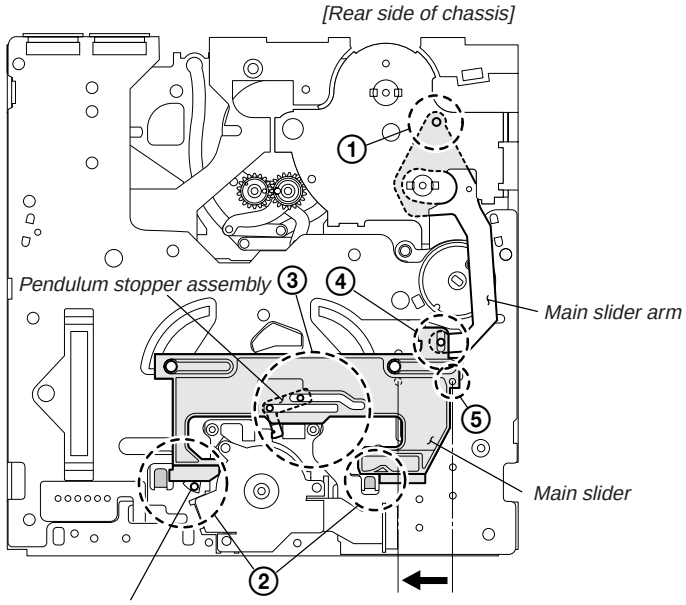
The main slider is fixed by the two shafts and the two bent portions at the rear of the chassis. The main slider can be removed when it is moved to the rightmost end (positions).



Assembly: Attach them while referring to the figure above or below and the descriptions.

Assembly of each part

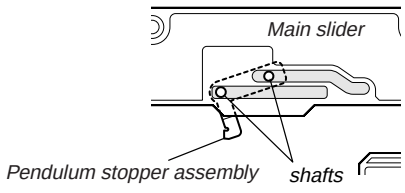
Attach each part while referring to the figure above or below. When attaching the parts, adjust the positions carefully while referring to the instructions in the figure below. Because these positioning will be used as a reference when assembling in future, make sure to adjust the positions and phases correctly.



① Insert the main slider arm into the fixing hole and attach it to the fixing shaft at the front of the chassis while referring to the figure above. (To facilitate assembly, stick adhesive tape so that the main slider arm does not drop.)

② Perform assembly so that the main slider can pass under the bent portion of the chassis. If "Ratchet brake T" remains, move down the "Ratchet brake T" as shown in the left figure and attach the main slider.

③ Carefully attach the pendulum stopper assembly so that the two shafts fit in the two long holes of the main slider.



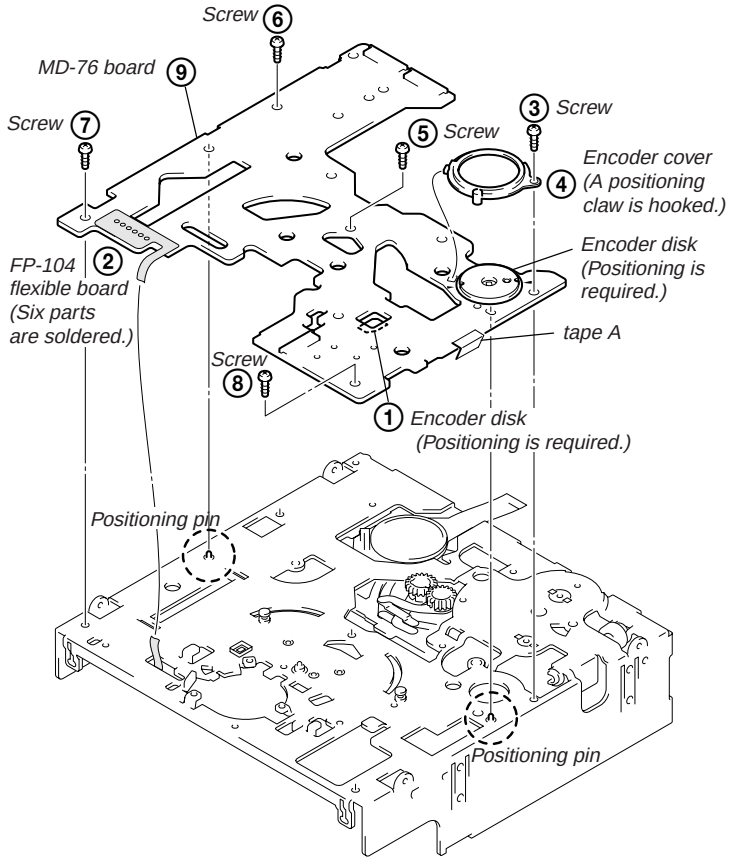
④ Attach the shaft of the main slider arm to the long hole of the main slider.

⑤ Move the main slider to the leftmost end so that the small positioning hole of the main slider is superimposed on the small positioning hole of the chassis, and fix the main slider. The position where the main slider is fixed will be used as a reference during assembling and phase adjustment in future.
(To avoid affecting the main unit, fix the reel motor and main slider with adhesive tape, etc.)

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2-3-19. MD-76 BOARD AND ENCODER RETAINER

Disassembly: Remove them in order of ①➡②➡③➡④➡⑤➡⑥➡⑦➡⑧➡⑨



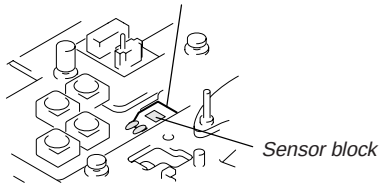
Disassembly of MD-76 board

Peel off the FP-248 flexible board at the front of the chassis (refer to page 5-43). Remove the six solders on the FP-104 flexible board from the rear of the chassis. Remove the screws in order of ③ to ⑧ shown in the figure. When removing the MD-76 board from the chassis, be careful not to let the sensors touch the chassis.

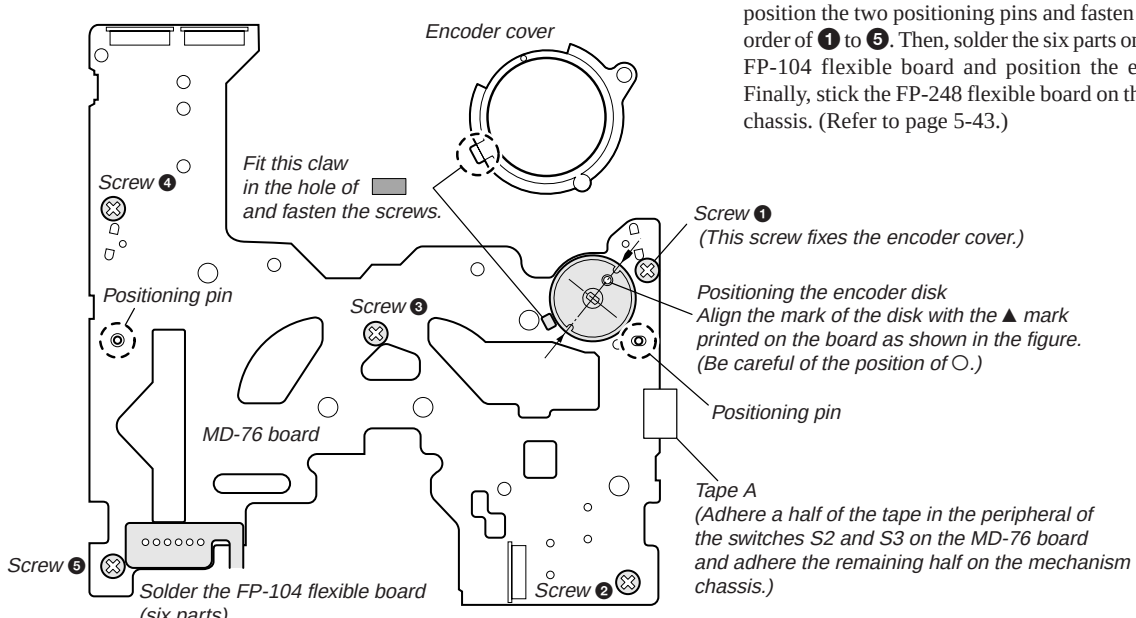
Note: When the tape A is removed, use the new tape A for replacement. (See the illustration below.)

FP-248 flexible board

Peel off the flexible board while being careful not to get the sensor block dirty or damage the sensor block.



Assembly: Attach them in order of ⑨➡⑧➡③➡④➡⑤➡⑥➡⑦➡①➡②
(Refer to the figure above or below.)



Assembly of MD-76 board

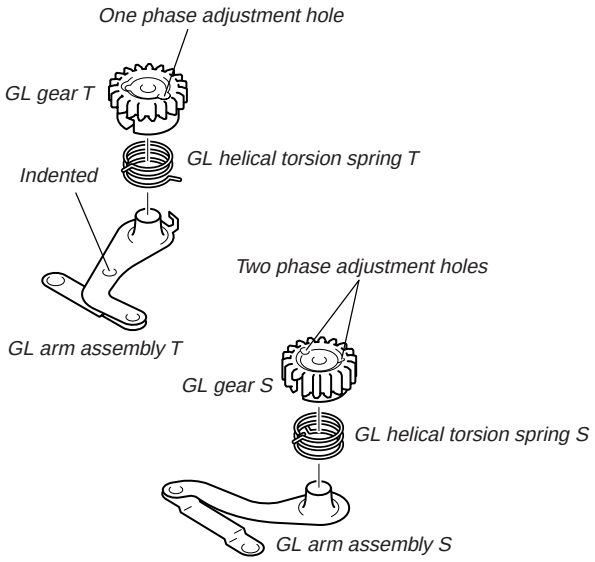
While being careful not to let the sensors touch the chassis, position the two positioning pins and fasten the screws in order of ❶ to ❺. Then, solder the six parts on the removed FP-104 flexible board and position the encoder disk. Finally, stick the FP-248 flexible board on the front of the chassis. (Refer to page 5-43.)

Tightening torque of MD-76 board
0.3432 ± 0.0196 N·m (3.5 ± 0.2 kg • cm)

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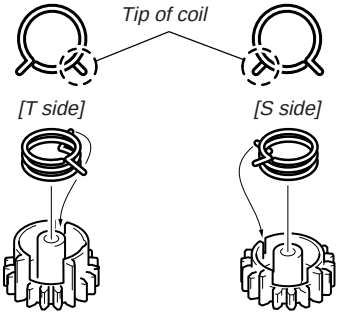
2-3-20. COMPONENTS OF GL ARM S/T ASSEMBLY (GL ARM ASSEMBLY, GL HELICAL TORSION SPRING, GL GEAR)

Disassembly and distinguishing the S side from the T side



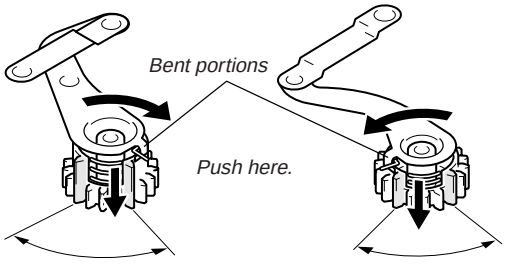
Assembly

① Attach each GL helical torsion spring to the GL gear. To distinguish the S side from the T side when the opening of the spring tip is facing toward the front, note that the coil tip of the S side is located on the left and that of the T side is located on the right.



Fit the tip of the spring into the small cut-out of the GL gear.

② Hook the tip of the spring on the bent portion of the GL arm assembly and push the bent portion of the GL arm into the large cut-out of the GL gear while rotating the GL gear in the direction of the arrow.

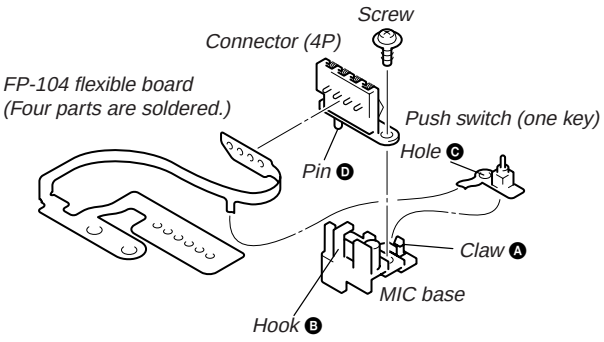


When the bent portion of the GL arm comes inside this range, push the bent portion into the gear.

2-3-21. COMPONENTS OF MIC BASE ASSEMBLY (FP-104 FLEXIBLE BOARD, MIC BASE)

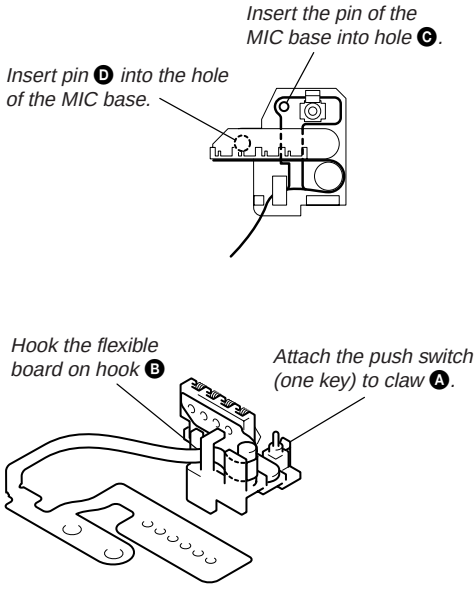
Disassembly

Remove the push switch from claw Ⓐ of the MIC base. Remove the screw and connector (4P). Then, remove the flexible board while being careful not to touch hook Ⓑ.



Tightening torque of connector (4P)
0.0392 ± 0.0098N • m (0.4 ± 0.1 kg • cm)

Assembly

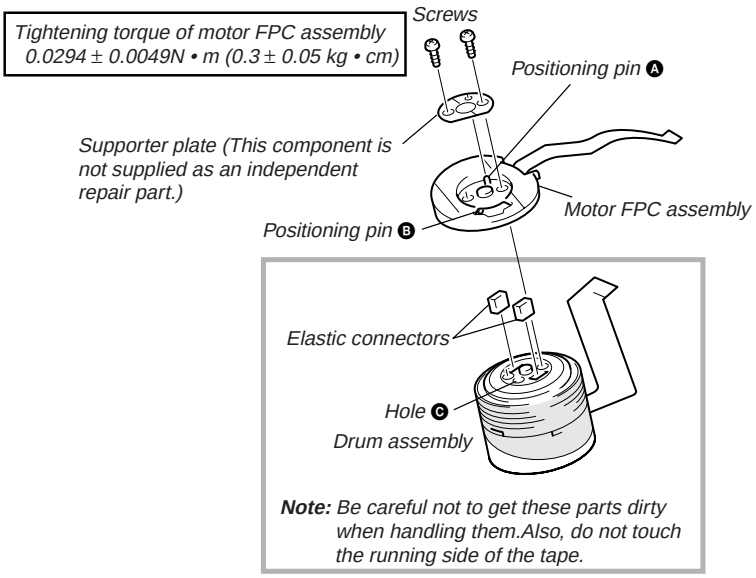


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2-3-22. COMPONENTS OF DRUM ASSEMBLY (MOTOR FPC ASSEMBLY, ELASTIC CONNECTOR)

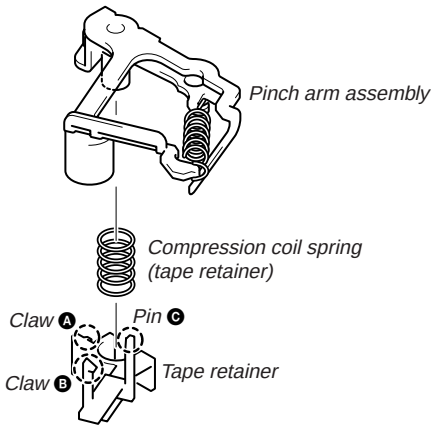
Disassembly/Assembly

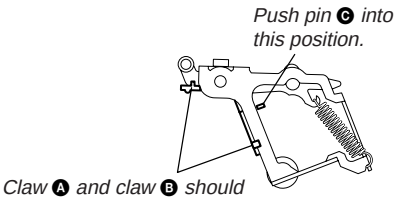
Connect the elastic connector to the drum assembly and attach the motor FPC assembly while aligning pin Ⓑ with hole Ⓒ of the drum assembly. Fix the supporter plate with the screws while being careful of pin Ⓐ of the motor FPC assembly.



2-3-23. COMPONENTS OF PINCH ARM ASSEMBLY (TAPE RETAINER, COMPRESSION COIL SPRING)

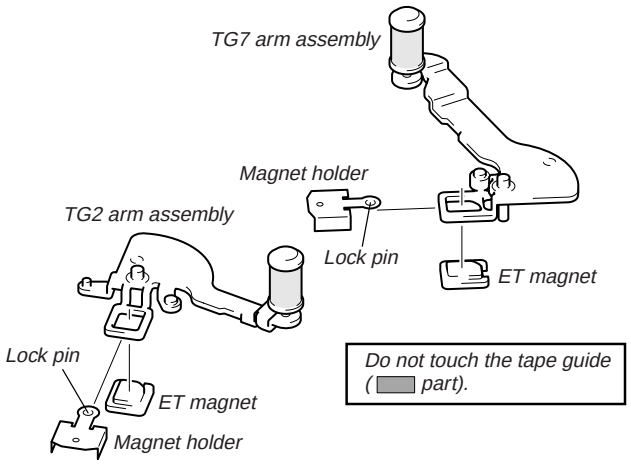
Disassembly/Assembly



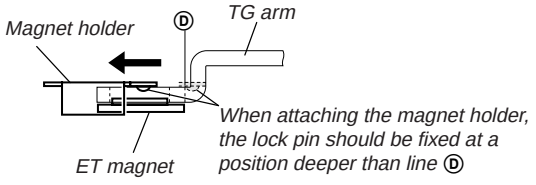


2-3-24. COMPONENTS OF TG2/7 ARM ASSEMBLY (ET MAGNET, MAGNET HOLDER)

Disassembly/Assembly



Remove the TG2 arm assembly and the TG7 arm assembly in the direction of the arrow while pushing the lock pin of the magnet holder from the rear of each TG arm. To attach them, insert the TG2 or TG7 arm assembly in the direction opposite to the arrow while holding the ET magnet with the magnet holder, then hook the lock pin.

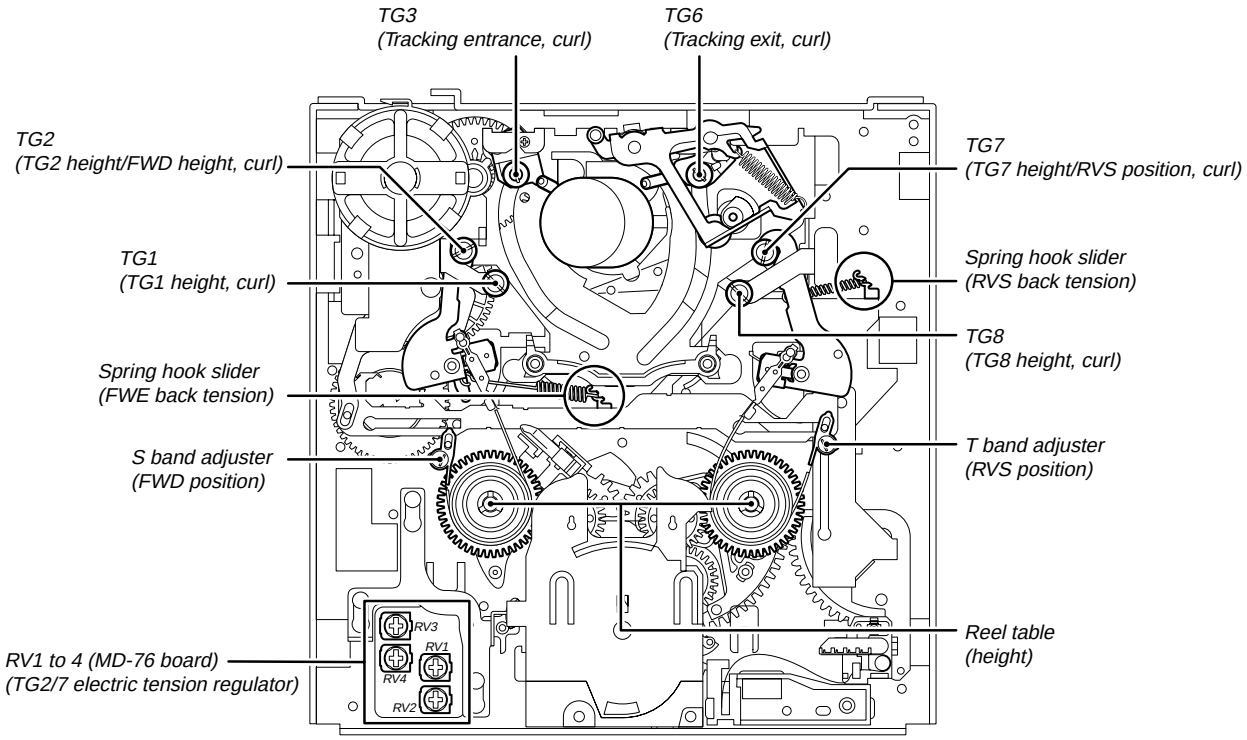


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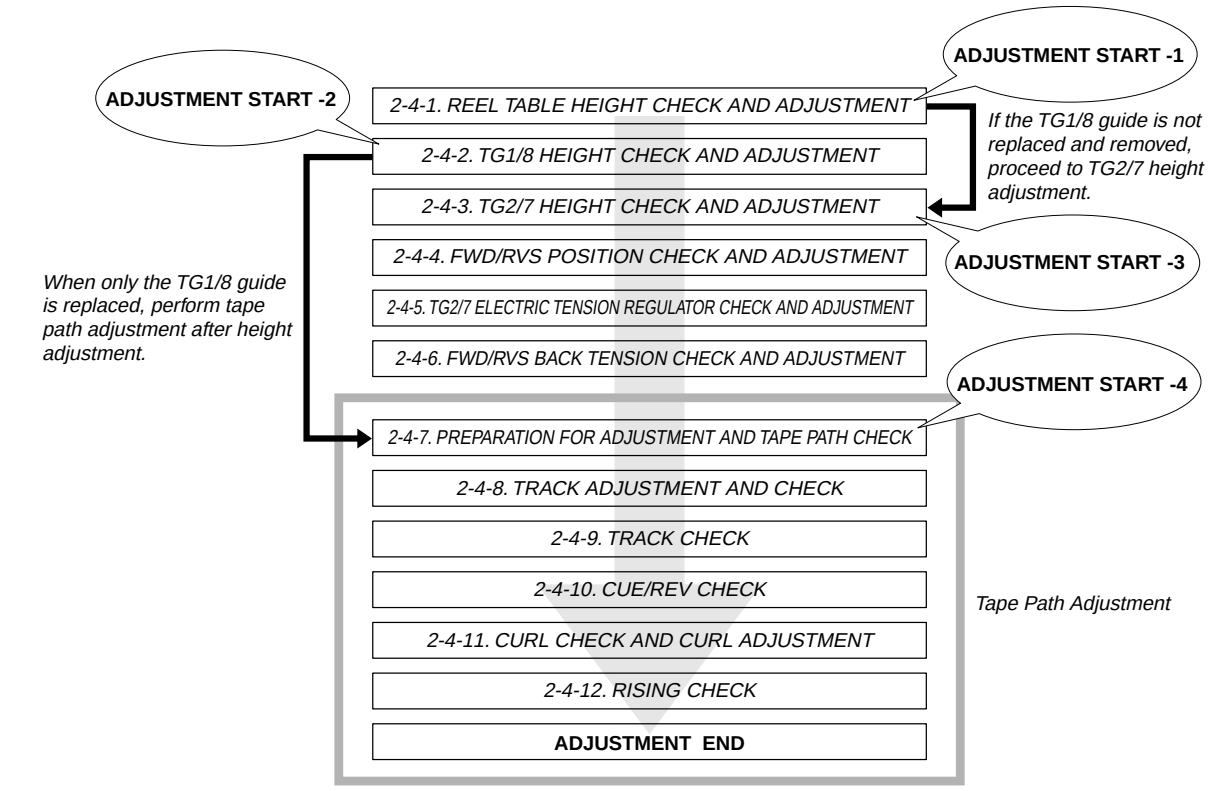
5-2-4. CHECK AND ADJUSTMENT

- When the parts of the tape path (tape guide, reel table, etc.) have been removed or parts have been replaced, adjust the following parts according to the flowchart below.

• ADJUSTMENT POSITION



• ADJUSTMENT ORDER (FLOWCHART)



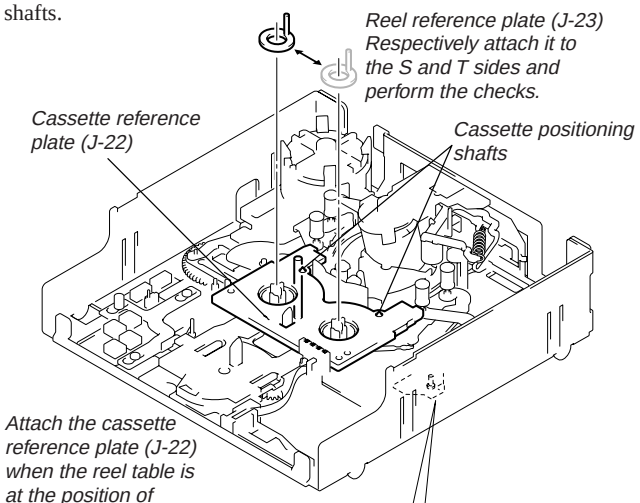
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2-4-1. REEL TABLE HEIGHT CHECK AND ADJUSTMENT

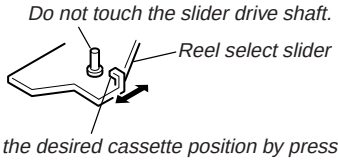
1. Preparation before check

Check that the cassette compartment has already been removed. (Refer to page 5-35.)

Fit the cassette reference plate (J-22) in the cassette positioning shafts.



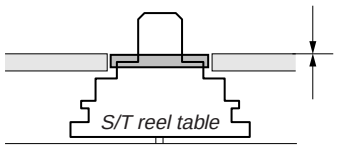
When selecting a cassette position, be careful not to touch the slider drive shaft because it can be easily bent or broken.

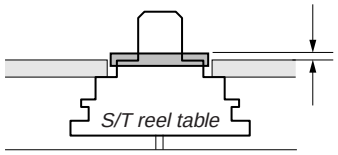


Select the desired cassette position by pressing the claw position.

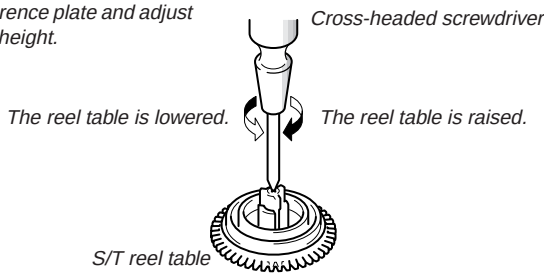
2. Check and adjustment

Put the reel reference plate (J-23) on each reel table. Rotate the screw block of the reel table so that the height of the cassette reference plate is the same as that of the reel reference plate.





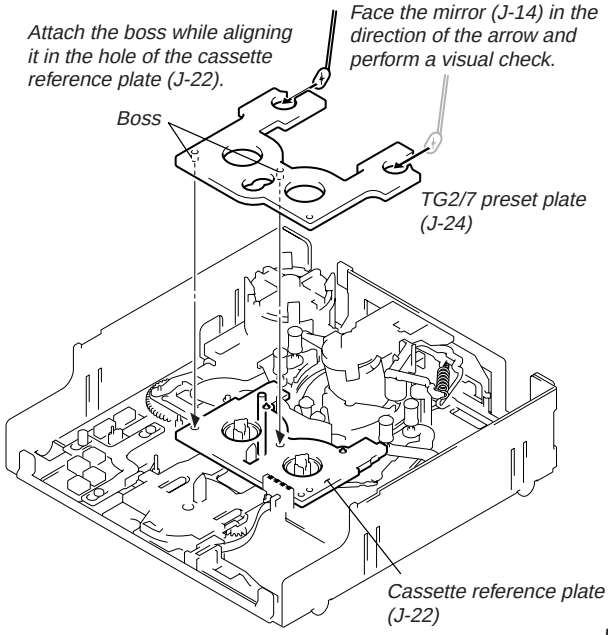
Put the reel and cassette reference plate and adjust the height.



2-4-2. TG1/8 HEIGHT CHECK AND ADJUSTMENT

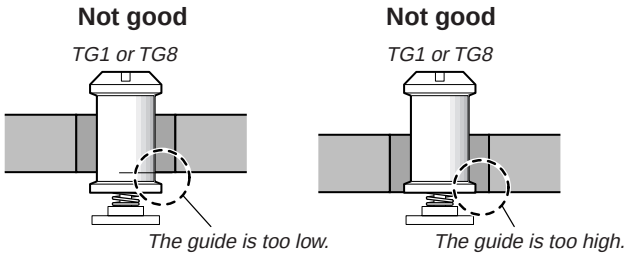
1. Preparation before check

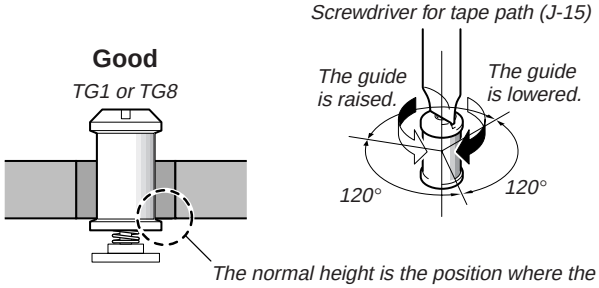
1) Check that the cassette compartment block has already been removed. (Refer to page 5-35.)
2) Set the mechanism deck to the loading end position (TG2 to 7 already moved to the loading end position and the pinch roller is in the unloading position). Alternatively, set the mechanism deck to the “LE position” using the mode selector II. (Refer to page 5-35.)
3) Place the TG2/7 preset plate (J-24).



2. Check and adjustment

Rotate the TG upper flange until the heights of the TG2/7 preset plate (J-24) and TG1 or TG8 roller block are the same. Alternatively, rotate the TG upper flange by 120˚ in the direction of lowering the guide from the reference height where the preset plate and roller have the same height.





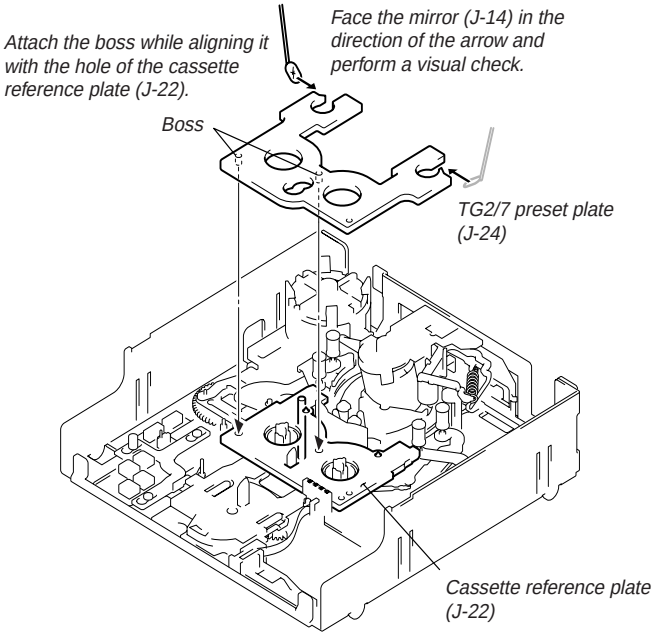
The normal height is the position where the TC upper flange is rotated by 120° in the direction of lowering the guide from the adjusted height while referring to the figure below.

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2-4-3. TG2/7 HEIGHT CHECK AND ADJUSTMENT

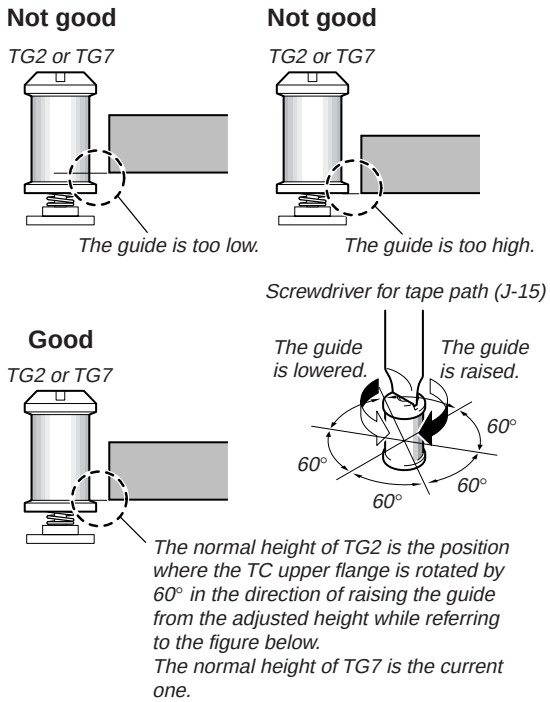
1. Preparation before check

1) Check that the cassette compartment block has already been removed. (Refer to page 5-35.)
2) Set the mechanism deck to the loading end position (TG2 to 7 already moved to the loading end position and the pinch roller is in the unloading position). Alternatively, set the mechanism deck to the "LE position" using the mode selector II. (Refer to page 5-35.)
3) Place the TG2/7 preset plate (J-24).



2. Check and adjustment

Rotate the TG upper flange until the height of the TG2/7 preset plate (J-24) and TG2 or TG7 roller block is the same. Alternatively, rotate the TG upper flange of only TG2 by 60˚ in the direction of raising the guide from the adjusted height while referring to the figure below.



The normal height of TG2 is the position where the TC upper flange is rotated by 60° in the direction of raising the guide from the adjusted height while referring to the figure below.
The normal height of TG7 is the current one.

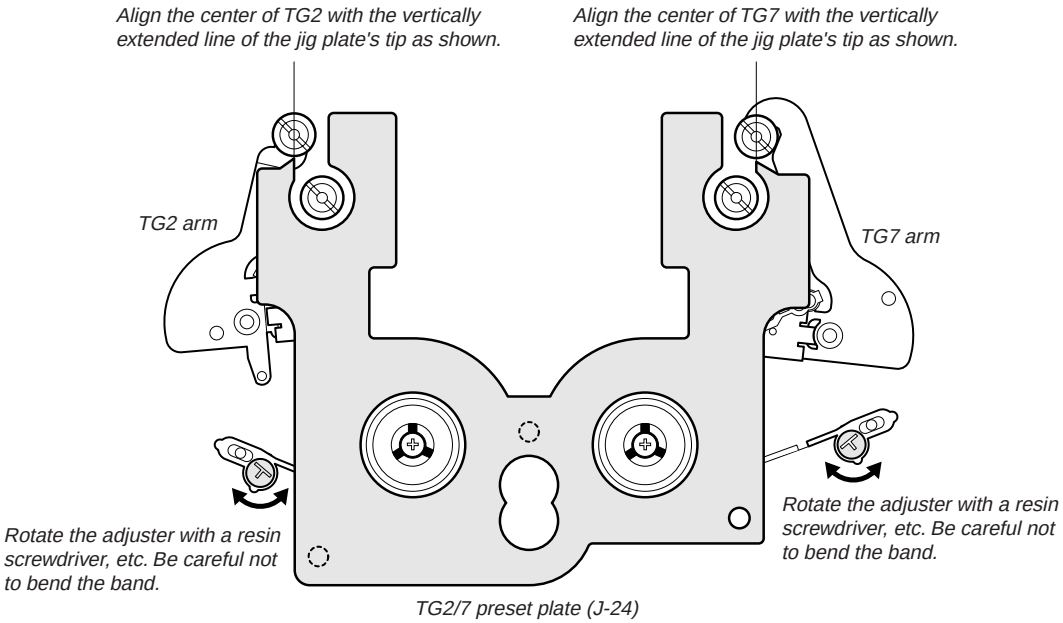
2-4-4. FWD/RVS POSITION CHECK AND ADJUSTMENT

1. Preparation before check

1) Check that the cassette compartment block has already been removed. (Refer to page 5-35.)
2) Set the mechanism deck to the loading end position (TG2 to 7 already moved to the loading end position and the pinch roller is in the unloading position). Alternatively, set the mechanism deck to the "LE position" using the mode selector II. (Refer to page 5-35.)
3) Place the TG2/7 preset plate (J-24).

2. Check and adjustment

Rotate each adjuster to adjust the TG2/7 position until ◿ or ◺ of the TG2/7 preset plate (J-24), TG2 and TG7 are in line.

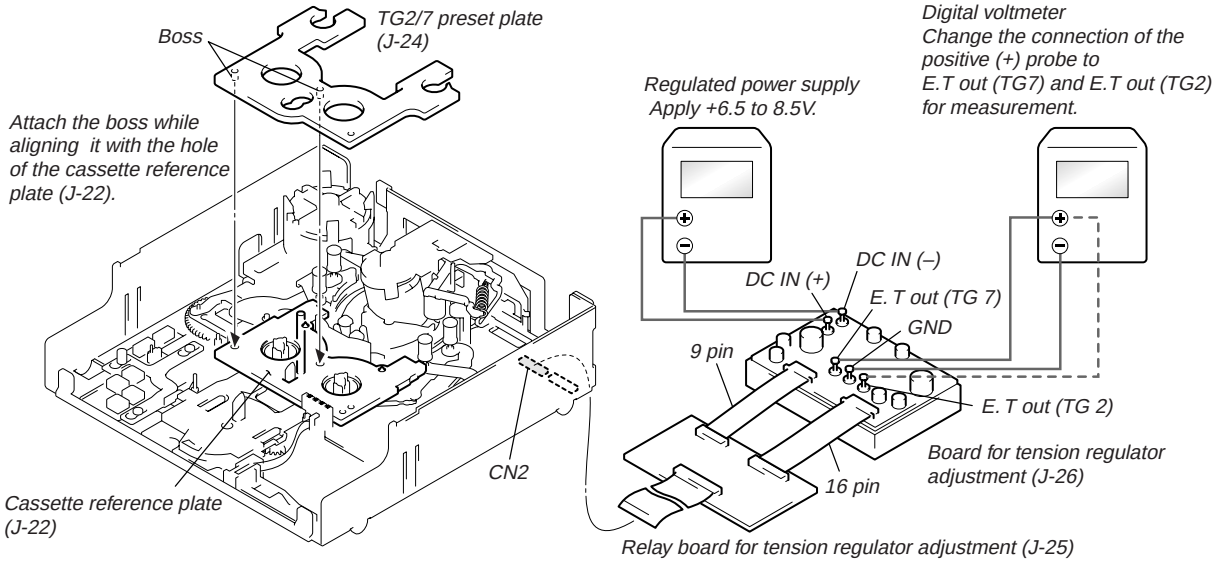


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2-4-5. ELECTRIC TENSION REGULATOR CHECK AND ADJUSTMENT OF TG2/7 ARM

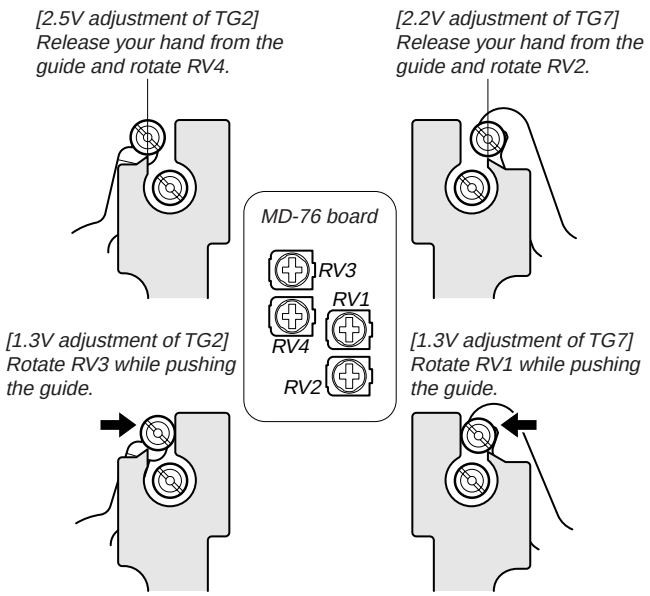
1. Preparation before check

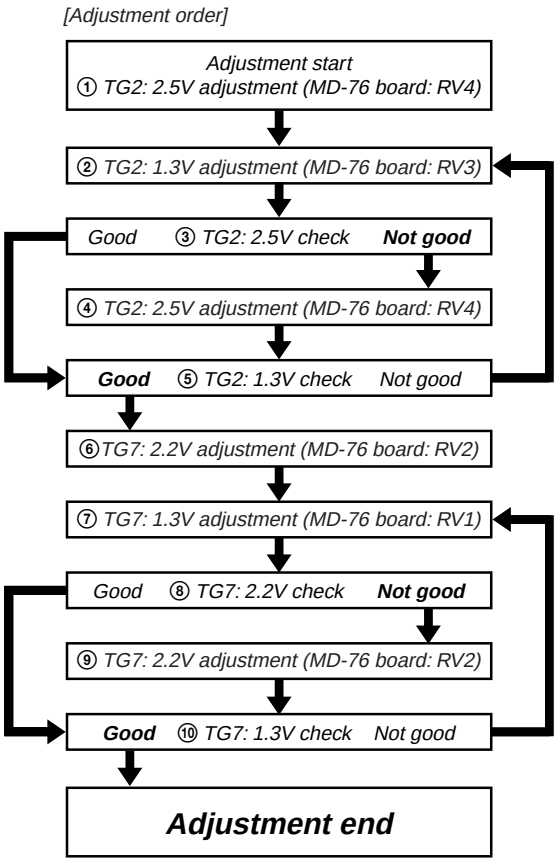
1) Check that the cassette compartment block has already been removed. (Refer to page 5-35.)
2) Set the mechanism deck to the loading end position (TG2 to 7 already moved to the loading end position and the pinch roller is in the unloading position). Alternatively, set the mechanism deck to the "LE position" using the mode selector II (J-19). (Refer to page 5-35.)
3) Attach the cassette reference plate (J-22) and TG2/7 preset plate (J-24). (Refer to page 5-54.)
4) Connect the relay board for tension regulator adjustment (J-25) and other equipment as shown in the figure below.



2. Check and adjustment

Connect the positive (+) probe of a digital voltmeter to E.T out (TG2: for measurement of TG2 data) or to E.T out (TG7: for measurement of TG7 data). First, press the guide to the TG2/7 preset plate (J-24), then release your hand from the guide and read the voltmeter value. Adjust RV4 (TG2 side) or RV2 (TG7 side) until the voltmeter measurement is 2.5 ± 0.1 V (TG2 side) or 2.2 ± 0.1 V (TG7 side) when releasing your hand. Then press the guide to the TG2/7 preset plate (J-24). Adjust RV3 (TG2 side) or RV1 (TG7 side) until the voltmeter measurement is 1.3 ± 0.1 V.



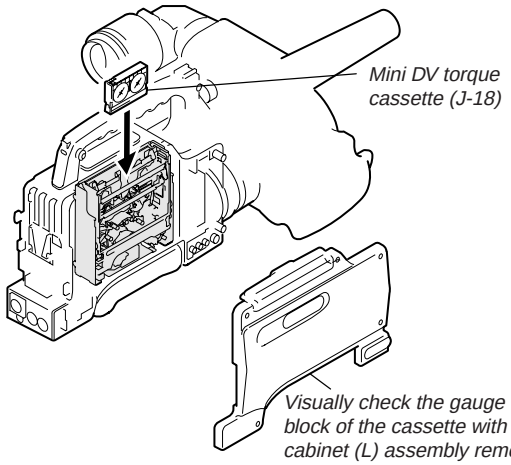


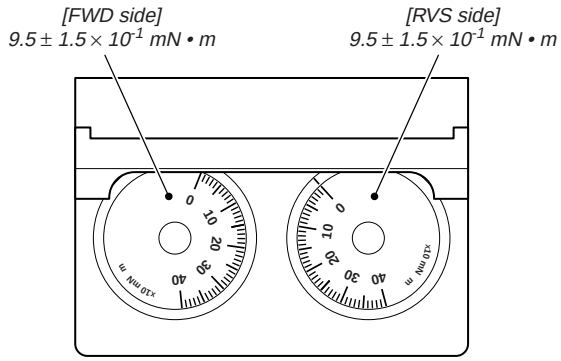
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2-4-6. FWD/RVS BACK TENSION CHECK AND ADJUSTMENT

1. Preparation before check

Mount the mechanism deck in the main unit, connect all the connectors, then insert the mini DV torque cassette (J-18) into the mechanism block.



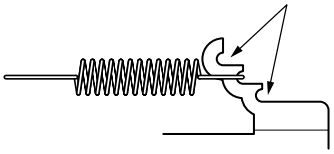


2. Check and adjustment

• FWD (TG2) side

The torque value should satisfy $9.5 \pm 1.5 \times 10^{-1}$ mN • m while the mini DV torque cassette runs in the FWD mode. If it does not satisfy this, take the following measure.

Re-attach the spring to the upper hook if the measurement value is beyond the specifications or re-attach the spring to the lower hook if the measurement value is below the specifications. Then, repeat the measurement.

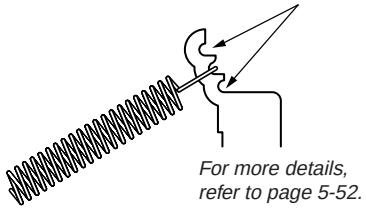


For more details, refer to page 5-52.

• RVS (TG7) side

The torque value should satisfy $9.5 \pm 1.5 \times 10^{-1}$ mN • m while the mini DV torque cassette runs in the RVS mode. If it does not satisfy this, take the following measure.

Re-attach the spring to the upper hook if the measurement value is beyond the specifications or re-attach the spring to the lower hook if the measurement value is below the specifications. Then, repeat the measurement.
Be careful that these spring blocks may hinder the FL motor.



For more details, refer to page 5-52.

2-4-7. PREPARATION FOR ADJUSTMENT AND TAPE PATH CHECK

Preparation before adjustment (connection and setting)

1. Mount the mechanism deck in the main unit.
   (Connect all the connectors.)

2. Clean the tape running side.
   (Refer to Section 2, "Periodic check".)

3. Connect the adjustment remote commander (J-5) to the LANC jack.

Adjustment remote commander (RM-95)



4. Turn the HOLD switch of the adjustment remote commander to the ON position.
5. Select page: 3, address: 33 and set data: 08.

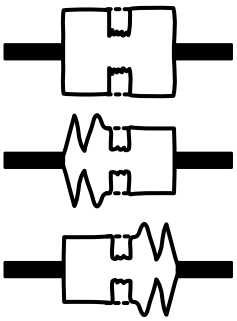
6. Select page: 3, address: 26 and set data: 31.

7. Connect an oscilloscope to VI-156 board CN007 via the CPC-13 jig (J-6082-388-A)(J-8).
   Channel 7: VI-156 board, CN007 Pin ② (Note)
   External trigger: VI-156 board, CN007 Pin ③

Note: Connect a 75 Ω resistor between pins ② of CN007 and ① (GND).
75 Ω resistor (Parts code: 1-247-804-11)

Tape path check (checking the RF waveform)

Play back the tracking tape (J-17) and check the states at the entrance and exit of the RF waveform. If it is not flat at either side, perform the adjustments from Adjustment Start-4 in the flowchart on page 5-52.



Normal entrance and exit sides

Faulty entrance side

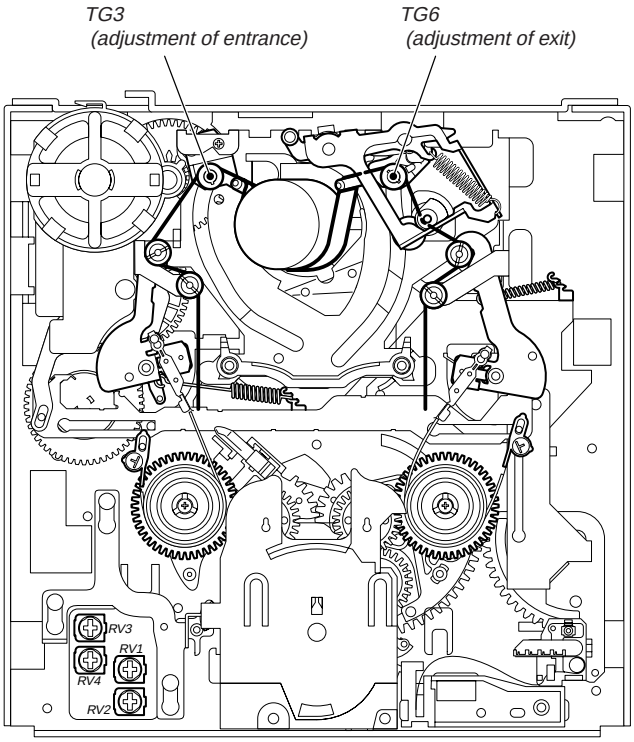
Faulty exit side

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2-4-8. TRACK ADJUSTMENT AND CHECK (Checking the RF Waveform)

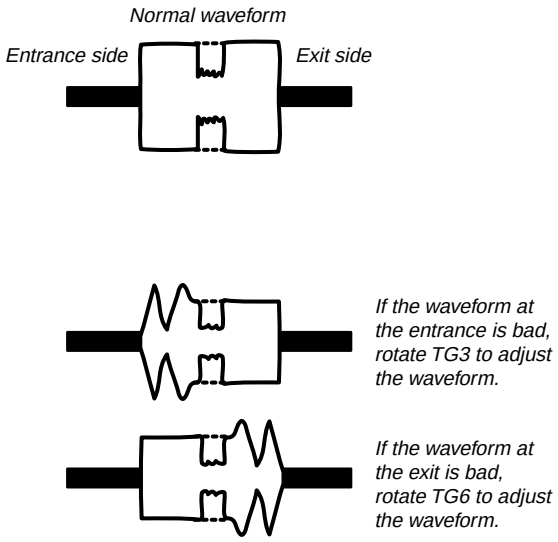
• Checking the RF waveform

Check that the RF waveforms at both the entrance and exit are flat while the tracking tape (J-17) runs in the PLAY mode.



• If not flat

If the waveform at the entrance is bad, rotate TG3. If the waveform at the exit is bad, rotate TG6 to flatten the waveform.

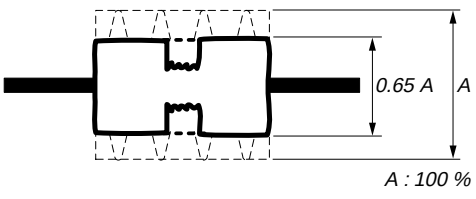


2-4-9. TRACK CHECK

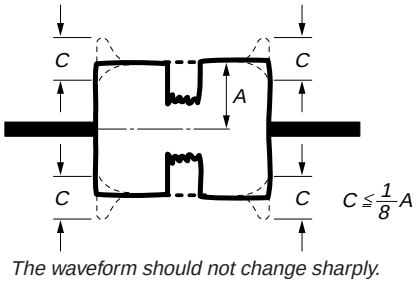
• Check

The difference between the maximum value and minimum value of the waveform amplitude during playback of the tracking tape (J-17) in the FWD mode should be 30% or less of the waveform amplitude during the CUE (or REV) mode (which is taken as 100% as shown). At the same time, there must not exist too much fluctuation of waveform amplitude.

Tracking waveform check -1

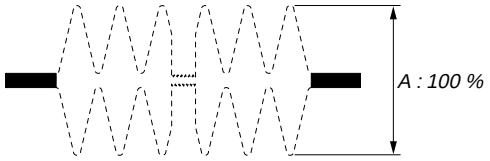


Tracking waveform check -2

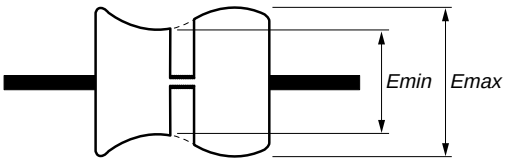


The waveform should not change sharply.

[Waveform in CUE or REV mode]



[Waveform in FWD mode]



Emin: Minimum value
Emax: Maximum value

(Emin - Emax) ≦ 30% or ($\frac{3}{10}$A)

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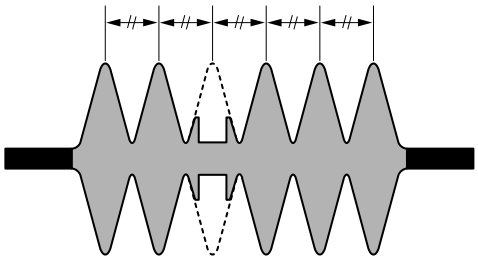
2-4-10. CUE/REV CHECK

• Check

Check that the intervals of the waveform peaks are consistent while the tracking tape (J-17) runs in the CUE mode or REV mode.

[Waveform in CUE or REV mode]

The intervals of the waveform peaks must be consistent.



• If not even

If the waveform peaks are not even, perform Section 2-4-8, “Tacking adjustment”.

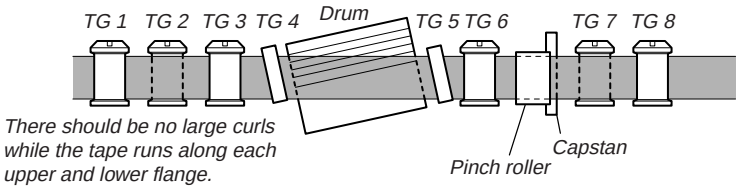
2-4-11. CURL CHECK AND ADJUSTMENT

• Check

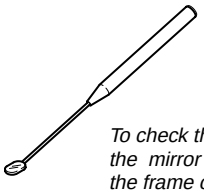
Check that the tape runs along each upper and lower flange while the tracking tape (J-17) runs in the CUE or REV mode. Also check that there are no large curls on each tape guide and pinch roller.

• If the curl is large

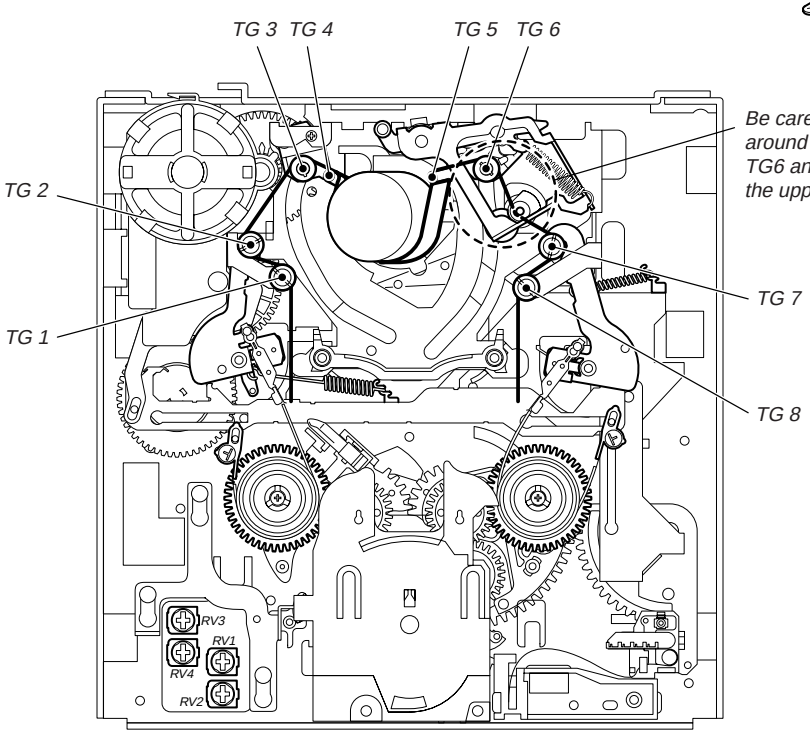
Perform the adjustment from Adjustment Start -3 (TG7 side) of the flowchart on page 5-52 again.



There should be no large curls while the tape runs along each upper and lower flange.



To check the tape path visually, use the mirror (J-14) to facilitate check as the frame of the cassette compartment hinders operations.



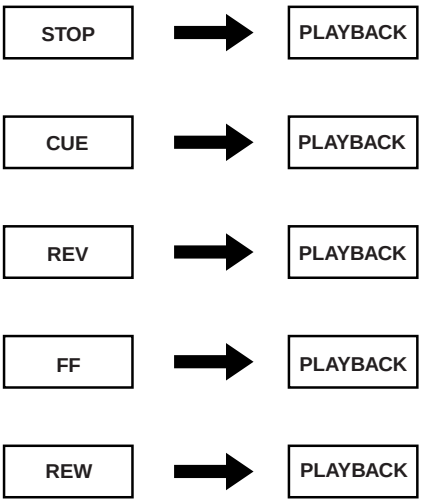
Be careful that there are often large curls around the capstan and pinch roller between TG6 and TG7. If there are large curls, rotate the upper flange of TG7 to remove the curls.

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2-4-12. RISING CHECK

• Check

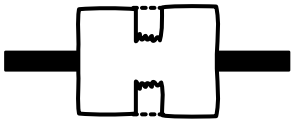
Check that when the tracking tape (J-17) is switched from the STOP, CUE, REV, FF, REW modes to the PLAYBACK mode, the waveform rises horizontally within 2 seconds. (Perform this 2 or 3 times.)



• Check after checking rising

- Check that the tape loads and unloads smoothly.
- Play a self-recorded or already recorded tape, and check that the sound and images are normal.

When switching the modes, the waveform should rise horizontally within 2 seconds.



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5-3. VIDEO SECTION ADJUSTMENTS

NTSC model : DSR-250
PAL model : DSR-250P

3-1. PREPARATIONS BEFORE ADJUSTMENTS

Use the following measuring instruments for video section adjustments.

3-1-1. Equipment Required

1) TV monitor
2) Oscilloscope (dual-phenomenon, band above 30 MHz with delay mode) (Unless specified otherwise, use a 10 : 1 probe.)
3) Frequency counter
4) Pattern generator with video output terminal.
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuator
10) Regulated power supply
11) Alignment tapes
    - Tracking standard (XH2-1A1)
      Parts code: 8-967-999-03
    - SW/OL standard (XH2-3)
      Parts code: 8-967-997-11
    - Audio operation check for NTSC (XH5-3)
      Parts code: 8-967-997-51
    - System operation check for NTSC (XH5-5)
      Parts code: 8-967-997-61
    - BIST check for NTSC (XH5-6)
      Parts code: 8-967-997-71
    - Audio operation check for PAL (XH5-3P)
      Parts code: 8-967-997-55
    - System operation check for PAL (XH5-5P)
      Parts code: 8-967-997-66
    - BIST check for PAL (XH5-6P)
      Parts code: 8-967-997-76
12) Adjustment remote commander (J-6082-053-B)
13) CPC-13 jig (J-6082-443-A)

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3-1-2. Precautions on Adjusting

1) The adjustments of this unit are performed in the VTR mode or camera mode.
   To set to the VTR mode, set the MODE switch to "VTR" or set the "Forced VTR Power ON mode" using the adjustmemt remote commander (Note 1).
   To set to the Camera mode, set the MODE switch to "CAMERA" or set the "Forced Camera Power ON mode" using the adjustmemt remote commander (Note 2).
   After completing adjustments, be sure to exit the "Forced VTR Power ON Mode" or "Forced Camera Power ON Mode". (Note 3)
2) By setting the "Forced VTR Power ON mode" or "Forced Camera Power ON mode", the video section can be operate even if the cabinet (R) assembly (SW-343 board, PD-126 board, PM-040 board, SB-036 board, AE-023 board, KP-011 board, MS-058 board) has been removed. But removing the cabinet (R) assembly (removing the VI-156 board CN015) means removing the lithium 3V power supply (SW-343 board, BT501), data such as date, time, user-set menus will be lost. After completing adjustments, reset these data. If the cabinet (R) assembly has been removed, the self-diagnosis data, data on history of use (total drum rotation time etc.) will be lost. Before removing, note down the self-diagnosis data and the data on the history use (data of page: 2, address: A2 to AA). (Refer to "SELF-DIAGNOSIS FUNCTION" for the self-diagnosis data, and to "5-4.Service Mode" for the data on the history use.) To remove the cabinet (R) assembly, disconnect the following connectors.
   VI-156 board CN014 (30P, 0.5mm)
   VI-156 board CN015 (30P, 0.5mm)
   VI-156 board CN006 (10P, 0.5mm)
3) To open the VI-156 board, disconnect the following connectors. The lens block and camera function switches need not be connected. (Except for "Battery End Adjustment".) To open the VI-156 board, disconnect the following connectors.
   VI-156 board CN025 (50P, 0.5mm) (CD-274 board)
   VI-156 board CN001 (39P, 0.3mm) (Lens, SE-116 board)
   VI-156 board CN002 (27P, 0.3mm) (Lens)
   VI-156 board CN004 (6P, 1.0mm) (FS-082 board)
   VI-156 board CN020 (6P, 0.5mm) (Iris ring)
   VI-156 board CN019 (3P, 1.0mm) (FC-074 board)
   VI-156 board CN018 (12P, 1.0mm) (CF-1044 block)

   The LL-010 board (LIGHT, LOW CUT, EDIT SEARCH switch) is need not be connected. To open the VI-156 board, disconnect the following connector.
   VI-156 board CN021 (4P, 1.0mm)

   The ME-019 board (Front microphone amplifier, viewfinder I/F) is need not be connected. (Except for "Battery End Adjustment".) To open the VI-156 board, disconnect the following connectors.
   VI-156 board CN016 (12P, 1.5mm)
   VI-156 board CN017 (7P, 1.5mm)

   The HP-129 board (Headphone jack) and TH-010 board (Remote commander receiver, Tally LED) are need not be connected. To open the VI-156 board, disconnect the following connectors.
   VI-156 board CN012 (12P, 1.0mm)

   The KY-049 board (VTR function switch) and EJ-034 board (Eject switch) are need not be connected. (Note) To open the VI-156 board, disconnect the following connectors.
   VI-156 board CN013 (8P, 0.5mm)

   Note: Use the adjustment remote commander to operate the VTR.
   To eject the cassette, connect Pin ⑦ of CN013 and GND (Pin ⑧) for a second with a jumper wire.

   The DV-031 board (DV connector) is need not be connected. To open the VI-156 board, disconnect the following connectors.
   VI-156 board CN010 (6P, 1.5mm)

   The XL-003 board (Rear audio input circuit) is need not be connected. (Except for "Battery End Adjustment" and "AUDIO SYSTEM ADJUSTMENT".) To open the VI-156 board, disconnect the following connectors.
   VI-156 board CN011 (8P, 1.5mm)

   The FS-082 board (Audio level VR, camera function switches) is need not be connected. (Except for "AUDIO SYSTEM ADJUSTMENT".) To open the VI-156 board, disconnect the following connectors.
   VI-156 board CN004 (6P, 1.0mm)

Note 1: Setting the "Forced VTR Power ON" mode (VTR mode)
1) Select page: 0, address: 01, and set data: 01.
2) Select page: D, address: 10, set data: 02, and press the PAUSE button of the adjustmemt remote commander.

The above procedure will enable the VTR power to be turned on with the cabinet (R) assembly removed.
After completing adjustments, be sure to exit the "Forced Power ON mode".

Note 2: Setting the "Forced Camera Power ON" mode (Camera mode)
1) Select page: 0, address: 01, and set data: 01.
2) Select page: D, address: 10, set data: 01, and press the PAUSE button of the adjustmemt remote commander.

The above procedure will enable the camera power to be turned on with the cabinet (R) assembly removed.
After completing adjustments, be sure to exit the "Forced Power ON mode".

Note 3: Setting the "Forced Memory Power ON" mode (Memory mode)
1) Select page: 0, address: 01, and set data: 01.
2) Select page: D, address: 10, set data: 05, and press the PAUSE button of the adjustmemt remote commander.

The above procedure will enable the memory power to be turned on with the cabinet (R) assembly removed.
After completing adjustments, be sure to exit the "Forced Power ON mode".

Note 4: Exiting the "Forced Power ON" mode
1) Select page: 0, address: 01, and set data: 01.
2) Select page: D, address: 10, set data: 00, and press the PAUSE button of the adjustmemt remote commander.
3) Select page: 0, address: 01, and set data: 00.

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3-1-3. HOW TO ENTER RECORD MODE WITHOUT CASSETTE

1) Connect the adjustment remote commander to the LANC jack.
2) Turn the HOLD switch of the adjustment remote commander to the ON position.
3) Close the cassette compartment without the cassette.
4) Select page: 3, address: 01, and set data: 0C, and press the PAUSE button of the adjustment remote commander.
(The mechanism enters the record mode automatically.)
Note: The function buttons becomes inoperable.
5) To quit the record mode, select page: 3, address: 01, set data: 00, and press the PAUSE button of the adjustment remote commander. (Whenever you want to quit the record mode, be sure to quit following this procedure.)

3-1-4. HOW TO ENTER PLAYBACK MODE WITHOUT CASSETTE

1) Connect the adjustment remote commander to the LANC jack.
2) Turn the HOLD switch of the adjustment remote commander to the ON position.
3) Close the cassette compartment without the cassette.
4) Select page: 3, address: 01, and set data: 0B, and press the PAUSE button of the adjustment remote commander.
(The mechanism enters the playback mode automatically.)
Note: The function buttons becomes inoperable.
5) To quit the playback mode, select page: 3, address: 01, set data: 00, and press the PAUSE button of the adjustment remote commander. (Whenever you want to quit the playback mode, be sure to quit following this procedure.)

3-1-5. Adjusting Connectors

Some of the adjusting points of the video section are concentrated at VI-156 board CN007. Connect the measuring instruments via the CPC-13 jig (J-6082-443-A). The following table lists the pin numbers and signal names of CN007.

Pin No.	Signal Name	Pin No.	Signal Name
1	GND	11	H START
2	RF MON	12	XHD/PSIG
3	SWP	13	PD VB
4	RF IN/LANC JACK IN	14	PD VR
5	TDO	15	EVF VCO
6	GND	16	GND
7	TCK	17	EVF BL –
8	TDI	18	EVF VG
9	PANEL COM	19	LANC SIG
10	TMS	20	EVF BL +

Table 5-3-1.

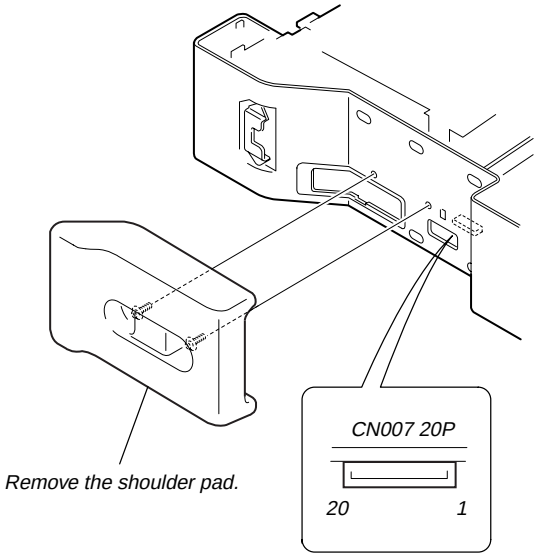


Fig. 5-3-1.

3-1-6. Connecting the Equipment

Connect the measuring instruments as shown in Fig. 5-3-2, and perform the adjustments.

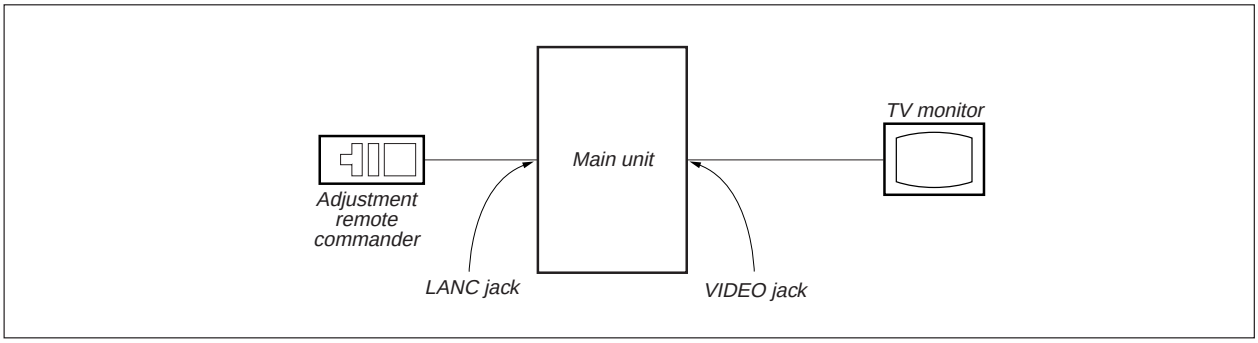


Fig. 5-3-2.

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3-1-7. Alignment Tapes

Use the alignment tapes shown in the following table.
Use tapes specified in the signal column of each adjustment.

Name	Use
Tracking standard (XH2-1A1)	Tape path adjustment
SW/OL standard (XH2-3)	Switching position adjustment
Audio operation check (XH5-3 (NTSC), XH5-3P (PAL))	Audio system adjustment
System operation check (XH5-5 (NTSC), XH5-5P (PAL))	Operation check
BIST check (XH5-6 (NTSC), XH5-6P (PAL))	BIST check

Fig. 5-3-3 shows the 75% color bar signals recorded on the alignment tape for Audio Operation Check.

Note: Measure with video terminal (Terminated at 75 Ω)

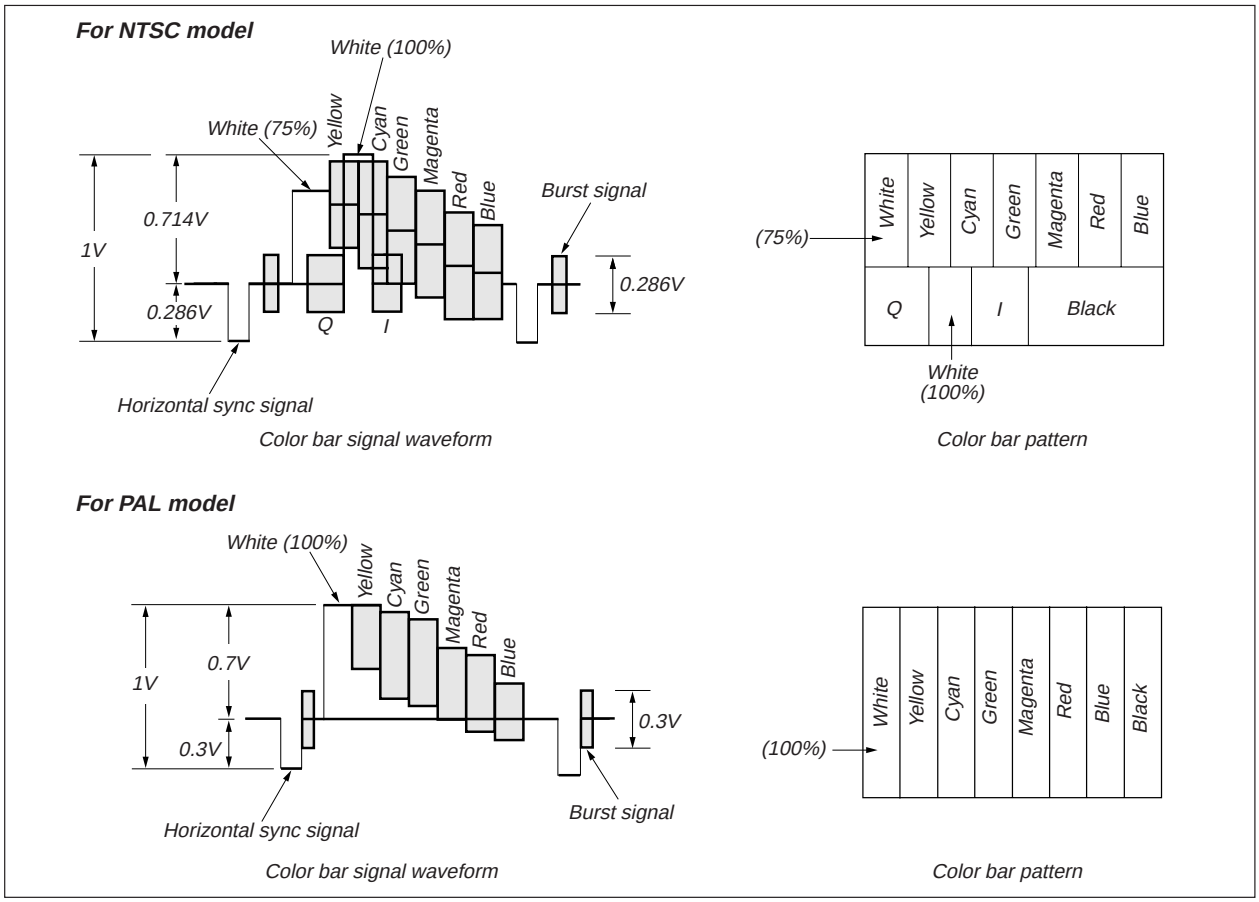


Fig. 5-3-3. Color bar signal of alignment tapes

3-1-8. Input/Output Level and Impedance

Video input/output
- Phono jack (Input/output), BNC connector (Output)
- Video signal: 1 Vp-p, 75 Ω unbalanced, sync negative

S video input/output
- 4-pin mini DIN
- Luminance signal: 1 Vp-p, 75 Ω unbalanced, sync negative
- Chrominance signal: 0.286 Vp-p, 75 Ω unbalanced (NTSC)
  : 0.300 Vp-p, 75 Ω unbalanced (PAL)

Audio input/output
- Phono jack
- Input level: 327mV
- Input impedance: More than 47kΩ
- Output level: 327 mV (at load impedance 47 kΩ)
- Output impedance: Below 2.2 kΩ

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3-2. SYSTEM CONTROL SYSTEM ADJUSTMENT

1. Initialization of A, B, C, D, E, F, 8 Page Data

If the B, C, D, E, F, 8 page data is erased due to some reason, perform "1-2. INITIALIZATION OF A, B, C, D, E, F, 8 PAGE DATA", of "5-1. CAMERA SECTION ADJUSTMENT"

2. Serial No. Input

2-1. Company ID Input

Write the company ID in the EEPROM (nonvolatile memory).

Page	C
Address	E8, E9, EA, EB, EC

Input method:

1) Select page: 0, address: 01, and set data: 01.
2) Input the following data to page: C, addresses: E8 to EC.
   Note: Press the PAUSE button of the adjustment remote commander each time to set the data.

Address	Data
E8	08
E9	00
EA	46
EB	01
EC	02

3) Select page: 0, address: 01, and set data: 00.

2-2. Serial No. Input

Write the serial No. and model code in the EEPROM (nonvolatile memory). Convert the serial No. on the name plate from decimal to hexadecimal, and write in the EEPROM.

Page	C
Address	ED, EE, EF

Input method:

1) Select page: 0, address: 01, and set data: 01.
2) Read the serial No. on the name plate, and take it as D_1.
   Example: If the serial No. is 77881.
   D_1=77881
3) Obtain D_2 and H_1 corresponding to D_1 from Table 5-3-2.
   Example: If D_1 is "77881".
   $D_2=D_1-65536=12345$
   H_1=FE

D_1 (Decimal)	D_2 (Decimal)	H_1 (Hexadecimal) (Service model code)
000001 to 065535	D_1	FE
065536 to 131071	$D_1-65536$	FE
131072 to 196607	$D_1-131072$	FE

Table 5-3-2.

4) Input H_1 to page: C, address: ED. (Model code input)
   Example: If H_1 is "FE".
   Select page: C, address: ED, set data: FE, and press the PAUSE button.
5) Obtain the maximum decimal not exceeding D_2 from Table 5-3-3, and take this as D_3.
   Example: If D_2 is "12345".
   D_3=12288
6) Obtain the hexadecimal corresponding to D_3 from Table 5-3-3, and take this as H_3.
   Example: If D_3 is "12288".
   H_3=3000
7) Obtain the difference D_4 between D_2 and D_3. (Decimal calculation, $0 \leqq D_4 \leqq 255$)
   $D_4=D_2-D_3$
   Example: If D_2 is "12345" and D_3 is "12288".
   $D_4=12345-12288=57$
8) Convert D_4 to hexadecimal, and take this as H_4.
   (Refer to "Hexadecimal-decimal conversion table" in "5-4. Service Mode".)
   Example: If D_4 is "57".
   H_4=39
9) Input the upper 2 digits of H_3 to page: C, address: EE.
   Example: If H_3 is "3000".
   Select page: C, address: EE, set data: 30, and press the PAUSE button.
10) Input H_4 to page: C, address: EF.
    Example: If H_4 is "39".
    Select page: C, address: EF, set data: 39, and press the PAUSE button.
11) Select page: 0, address: 01, and set data: 00.

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Decimal (D_3)	Hexa-decimal (H_3)	Decimal (D_3)	Hexa-decimal (H_3)	Decimal (D_3)	Hexa-decimal (H_3)	Decimal (D_3)	Hexa-decimal (H_3)	Decimal (D_3)	Hexa-decimal (H_3)	Decimal (D_3)	Hexa-decimal (H_3)	Decimal (D_3)	Hexa-decimal (H_3)	Decimal (D_3)	Hexa-decimal (H_3)
0	0000	8192	2000	16384	4000	24576	6000	32768	8000	40960	A000	49152	C000	57344	E000
256	0100	8448	2100	16640	4100	24832	6100	33024	8100	41216	A100	49408	C100	57600	E100
512	0200	8704	2200	16896	4200	25088	6200	33280	8200	41472	A200	49664	C200	57856	E200
768	0300	8960	2300	17152	4300	25344	6300	33536	8300	41728	A300	49920	C300	58112	E300
1024	0400	9216	2400	17408	4400	25600	6400	33792	8400	41984	A400	50176	C400	58368	E400
1280	0500	9472	2500	17664	4500	25856	6500	34048	8500	42240	A500	50432	C500	58624	E500
1536	0600	9728	2600	17920	4600	26112	6600	34304	8600	42496	A600	50688	C600	58880	E600
1792	0700	9984	2700	18176	4700	26368	6700	34560	8700	42752	A700	50944	C700	59136	E700
2048	0800	10240	2800	18432	4800	26624	6800	34816	8800	43008	A800	51200	C800	59392	E800
2304	0900	10496	2900	18688	4900	26880	6900	35072	8900	43264	A900	51456	C900	59648	E900
2560	0A00	10752	2A00	18944	4A00	27136	6A00	35328	8A00	43520	AA00	51712	CA00	59904	EA00
2816	0B00	11008	2B00	19200	4B00	27392	6B00	35584	8B00	43776	AB00	51968	CB00	60160	EB00
3072	0C00	11264	2C00	19456	4C00	27648	6C00	35840	8C00	44032	AC00	52224	CC00	60416	EC00
3328	0D00	11520	2D00	19712	4D00	27904	6D00	36096	8D00	44288	AD00	52480	CD00	60672	ED00
3584	0E00	11776	2E00	19968	4E00	28160	6E00	36352	8E00	44544	AE00	52736	CE00	60928	EE00
3840	0F00	12032	2F00	20224	4F00	28416	6F00	36608	8F00	44800	AF00	52992	CF00	61184	EF00
4096	1000	12288	3000	20480	5000	28672	7000	36864	9000	45056	B000	53248	D000	61440	F000
4352	1100	12544	3100	20736	5100	28928	7100	37120	9100	45312	B100	53504	D100	61696	F100
4608	1200	12800	3200	20992	5200	29184	7200	37376	9200	45568	B200	53760	D200	61952	F200
4864	1300	13056	3300	21248	5300	29440	7300	37632	9300	45824	B300	54016	D300	62208	F300
5120	1400	13312	3400	21504	5400	29696	7400	37888	9400	46080	B400	54272	D400	62464	F400
5376	1500	13568	3500	21760	5500	29952	7500	38144	9500	46336	B500	54528	D500	62720	F500
5632	1600	13824	3600	22016	5600	30208	7600	38400	9600	46592	B600	54784	D600	62976	F600
5888	1700	14080	3700	22272	5700	30464	7700	38656	9700	46848	B700	55040	D700	63232	F700
6144	1800	14336	3800	22528	5800	30720	7800	38912	9800	47104	B800	55296	D800	63488	F800
6400	1900	14592	3900	22784	5900	30976	7900	39168	9900	47360	B900	55552	D900	63744	F900
6656	1A00	14848	3A00	23040	5A00	31232	7A00	39424	9A00	47616	BA00	55808	DA00	64000	FA00
6912	1B00	15104	3B00	23296	5B00	31488	7B00	39680	9B00	47872	BB00	56064	DB00	64256	FB00
7168	1C00	15360	3C00	23552	5C00	31744	7C00	39936	9C00	48128	BC00	56320	DC00	64512	FC00
7424	1D00	15616	3D00	23808	5D00	32000	7D00	40192	9D00	48384	BD00	56576	DD00	64768	FD00
7680	1E00	15872	3E00	24064	5E00	32256	7E00	40448	9E00	48640	BE00	56832	DE00	65024	FE00
7936	1F00	16128	3F00	24320	5F00	32512	7F00	40704	9F00	48896	BF00	57088	DF00	65280	FF00

Table 5-3-3.

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3. Battery End Adjustment

Set the battery end voltage.
If the voltage is incorrect, the life of the battery will shorten.
The image at the battery end will also be rough.

Mode	Camera recording
Subject	Arbitrary
Measurement Point	Display data of page: 2, address: 5E
Measuring Instrument	Adjustmemt remote commander
Adjustment Page	D
Adjustment Address	F0 to F6, F8 to FE

Switch setting:

1) AUTO ..... OFF

Connection:

1) Connect the regulated power supply and the digital voltmeter to the battery terminal as shown in Fig. 5-3-4.

Preparations before adjustments:

1) Adjust the output voltage of the regulated power supply so that the digital voltmeter display is 11.0 ± 0.1Vdc.
2) Turn off the power supply.
3) Turn on the HOLD switch of the adjustmemt remote commander.
4) Turn on the power supply.
5) Load a cassette, and set to the camera recording mode.

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2				Adjust the output voltage of the regulated power supply so that the digital voltmeter display is 11.00 ± 0.01Vdc.
3	2	5E		Read the data, and this data is named Dref.
4	D	F0	Dref	Set the data, and press PAUSE button.
5	D	F8	Dref	Set the data, and press PAUSE button.
6				Convert Dref to decimal notation, and obtain Dref'. (Note1)
7				Calculate D_{F1}' to D_{F6}' and D_{F9}' to D_{FE}' using following equations. (decimal calculation) D_{F1}'=Dref'+4 D_{F2}'=Dref'+5 D_{F3}'=Dref'+12 D_{F4}'=Dref'+31 D_{F5}'=Dref'+46 D_{F6}'=Dref'+62 D_{F9}'=Dref'+4 D_{FA}'=Dref'+5 D_{FB}'=Dref'+8 D_{FC}'=Dref'+12 D_{FD}'=Dref'+16 D_{FE}'=Dref'+23
8				Convert D_{F1}', D_{F2}', D_{F3}', D_{F4}', D_{F5}', D_{F6}', D_{F9}', D_{FA}', D_{FB}', D_{FC}', D_{FD}' and D_{FE}' to decimal notation, and obtain D_{F1}, D_{F2}, D_{F3}, D_{F4}, D_{F5}, D_{F6}, D_{F9}, D_{FA}, D_{FB}, D_{FC}, D_{FD} and D_{FE}. (Note1)
9	D	F1	D_{F1}	Set the data, and press PAUSE button.
10	D	F2	D_{F2}	Set the data, and press PAUSE button.
11	D	F3	D_{F3}	Set the data, and press PAUSE button.
12	D	F4	D_{F4}	Set the data, and press PAUSE button.
13	D	F5	D_{F5}	Set the data, and press PAUSE button.
14	D	F6	D_{F6}	Set the data, and press PAUSE button.
15	D	F9	D_{F9}	Set the data, and press PAUSE button.
16	D	FA	D_{FA}	Set the data, and press PAUSE button.
17	D	FB	D_{FB}	Set the data, and press PAUSE button.
18	D	FC	D_{FC}	Set the data, and press PAUSE button.
19	D	FD	D_{FD}	Set the data, and press PAUSE button.
20	D	FE	D_{FE}	Set the data, and press PAUSE button.
21	0	01	00	Set the data.

Note1: Refer to Table 5-4-1. "Hexadecimal-decimal conversion table" of "5-4.Service mode".

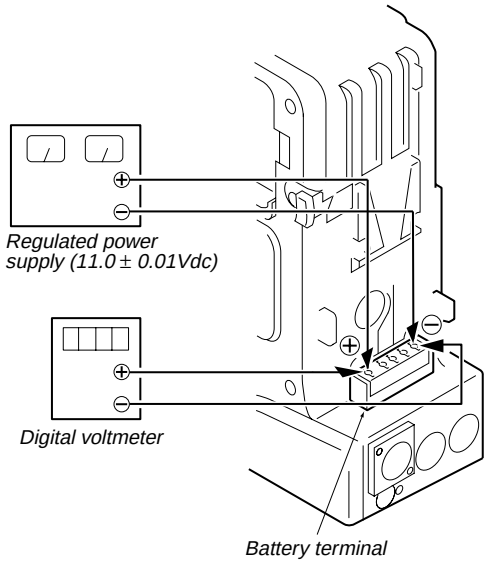


Fig. 5-3-4.

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3-3. SERVO AND RF SYSTEM ADJUSTMENT

Before perform the servo and RF system adjustments, check that the specified value of "27 MHz Origin Oscillation Adjustment" of "CAMERA SYSTEM ADJUSTMENT" is satisfied.

Adjusting Procedure:

1. Cap FG duty adjustment
2. PLL f_0 & LPF f_0 adjustment
3. Switching position adjustment
4. AGC center level
5. APC & AEQ adjustment
6. PLL f_0 & LPF f_0 final adjustment

1. Cap FG Duty Adjustment (VI-156 board)

Set the Cap FG signal duty cycle to 50% to establish an appropriate capstan servo. If deviated, the uneven rotation of capstan and noise can occur.

Measurement Point	Display data of page: 3, address: 03
Measuring Instrument	Adjustment remote commander
Adjustment Page	C
Adjustment Address	16
Specified Value	00

Adjusting method:

Order	Page	Address	Data	Procedure
1				Eject the cassette.
2	0	01	01	Set the data.
3	3	01	1B	Set the data, and press PAUSE button.
4	3	02		Check that the data changes in the following order. "1B" → "2B" → "00"
5	3	03		Check that the data is "00". (Note)
6	0	01	00	Set the data.
7				Press EJECT button.

Note: If the data is "01", adjustment has errors or the mechanism deck is defective.

2. PLL f_0 & LPF f_0 Adjustment (VI-156 board)

Mode	VTR stop
Measurement Point	Display data of page: 3, address: 03
Measuring Instrument	Adjustment remote commander
Adjustment Page	C
Adjustment Address	1F, 20, 22, 29
Specified Value	Bit2, bit3 and bit6 are "0"

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	3	01	30	Set the data, and press PAUSE button.
3	3	02		Check that the data changes to "00".
4	3	03		Check that the data is "00". (Note)
5	0	01	00	Set the data.

Note: If the data is other than "00", there are errors.
For the error contents, see the following table. (For the bit values, refer to "5-4. SERVICE MODE", "4-3. 3. Bit value discrimination".)

Bit value of page: 3, address: 03 data	Error contents
bit 6 = 1	LPF f_0 is defective
bit 3 = 1	PLL f_0 final adjustment is defective
bit 2 = 1	PLL f_0 final adjustment time-out

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3. Switching Position Adjustment (VI-156 board)

Mode	VTR playback
Signal	SW/OL reference tape (XH2-3)
Measurement Point	Display data of page: 3, address: 03
Measuring Instrument	Adjustment remote commander
Adjustment Page	C
Adjustment Address	10, 11, 12, 13
Specified Value	00

Adjusting method:

Order	Page	Address	Data	Procedure
1				Insert the SW/OL reference tape and enter the VTR STOP mode.
2	0	01	01	Set the data.
3	3	21		Check that the data is “02”. (Note1)
4	3	01	0D	Set the data, and press PAUSE button.
5	3	02		Check that the data changes to “00”.
6	3	03		Check that the data is “00”. (Note2)
7	0	01	00	Set the data.

Note1: If the data of page: 3, address: 21 is “72”, the tape top being played. After playing the tape for 1 to 2 seconds, stop it, perform step 4 and higher.

Note2: If bit 0 of the data is “1”, the even channel is defective. If bit 1 is “1”, the odd channel is defective. Contents of the defect is written into page: C, addresses: 10 and 12. See the following table. (For the bit values, refer to “5-4. SERVICE MODE”, “4-3. 3. Bit value discrimination”.)

When the even channel is defective

Data of page: C, address: 10	Contents of defect
EE	Writing into EEPROM (IC502) is defective
E8	Adjustment data is out of range
E7	No data is returned from IC301 (CAIN)

When the odd channel is defective

Data of page: C, address: 12	Contents of defect
EE	Writing into EEPROM (IC502) is defective
E8	Adjustment data is out of range
E7	No data is returned from IC301 (CAIN)

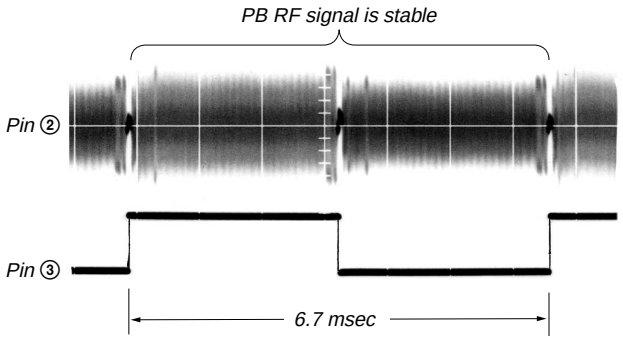


Fig. 5-3-5.

4. AGC Center Level and APC & AEQ Adjustment

4-1. Preparations before adjustments

Mode	Camera recording
Subject	Arbitrary

Adjusting method:

Order	Page	Address	Data	Procedure
1	2	30	40	Set the data.
2				Record the camera signal for three minutes.

4-2. AGC Center Level Adjustment (VI-156 board)

Mode	Playback
Signal	Recorded signal at “Preparations before adjustments”
Measurement Point	Pin ② of CN007 (RF MON) (Note 1) Ext. trigger: Pin ③ of CN007 (SWP)
Measuring Instrument	Oscilloscope
Adjustment Page	C
Adjustment Address	1E
Specified Value	The data of page: 3, address: 03 is “00”

Note 1: Connect a 75Ω resistor between Pin ② and Pin ① (GND) of CN007.
75Ω resistor (Parts code: 1-247-804-11)

Adjusting method:

Order	Page	Address	Data	Procedure
1				Playback the recorded signal at “Preparations before adjustments”
2	0	01	01	Set the data.
3	3	33	08	Set the data.
4				Confirm that the playback RF signal is stable. (Fig. 5-3-5.)
5	3	01	23	Set the data, and press PAUSE button.
6	3	02		Check that the data is “00”.
7	3	03		Check that the data is “00”. (Note2)
8				Perform “APC & AEQ Adjustment”.

Note2: If the data of page: 3, address: 03 is other than “00”, adjustment has errors. (Take an appropriate remedial measures according to the errors referring to the following table.)

Data	Contents of defect
20	Perform re-adjustment. (Note 3)
30	The machine is defective
40	Perform re-adjustment. (Note 3)
50	The machine is defective

Note 3: If this data is displayed twice successively, the machine is defective.

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4-3. APC & AEQ Adjustment (VI-156 Board)

Mode	Playback
Signal	Recorded signal at “Preparations before adjustments”
Measurement Point	Pin ② of CN007 (RF MON) (Note 1) Ext. trigger: Pin ③ of CN007 (SWP)
Measuring Instrument	Oscilloscope
Adjustment Page	C
Adjustment Address	18, 19, 1B, 1C, 21, 2C
Specified Value	The data of page: 3, address: 03 is “00”

Note 1: Connect a 75Ω resistor between Pin ② and Pin ① (GND) of CN007.
75Ω resistor (Parts code: 1-247-804-11)

Note 2: The “AGC Center Level Adjustment” must have already been completed before starting this adjustment.

Adjusting method:

Order	Page	Address	Data	Procedure
1				Playback the recorded signal at “Preparations before adjustments”
2	0	01	01	Set the data.
3	3	33	08	Set the data.
4				Confirm that the playback RF signal is stable. (Fig. 5-3-6.)
5	3	01	07	Set the data, and press PAUSE button.
6	3	02		Check that the data changes from “07” to “00” in about 30 seconds after pressing PAUSE button.
7	3	03		Check that the data is “00”. (Note3)
8				Perform “Processing after Completing Adjustments”.

Note3: If the data is other than “00”, adjustment has errors. Take an appropriate remedial measures according to the errors referring to the following table.

Data	Contents of defect
20	Perform re-adjustment. (Note 4)
30	The machine is defective
50	Perform re-adjustment. (Note 4)
60	The machine is defective
80	The machine is defective

Note 4: If this data is displayed twice successively, the machine is defective.

4-4. Processing after Completing Adjustments

Order	Page	Address	Data	Procedure
1	2	30	00	Set the data.
2	3	33	00	Set the data.
3	0	01	00	Set the data.

5. PLL f_0 & LPF f_0 Final Adjustment (VI-156 board)

Mode	VTR stop
Signal	Arbitrary
Measurement Point	Display data of page: 3, address: 03
Measuring Instrument	Adjustment remote commander
Adjustment Page	C
Adjustment Address	1F, 20, 22, 29
Specified Value	Bit2, bit3 and bit6 are “0”

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	3	01	30	Set the data, and press PAUSE button.
3	3	02		Check that the data changes to “00”.
4	3	03		Check that bit2, bit3 and bit6 of the data are “00”. (Note)
5	0	01	00	Set the data.

Note: If bit2, bit3 or bit 6 of the data is “1”, there are errors.
For the error contents, see the following table. (For the bit values, refer to “5-4. SERVICE MODE”, “4-3. 3. Bit value discrimination”.)

Bit value of page: 3, address: 03	Error contents
bit 6 = 1	LPF f_0 is defective
bit 3 = 1	PLL f_0 final adjustment is defective
bit 2 = 1	PLL f_0 final adjustment time-out

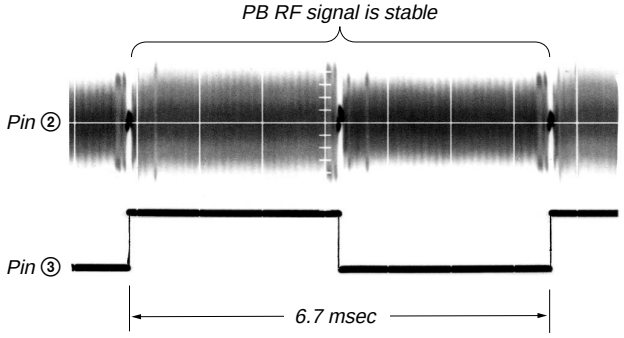


Fig. 5-3-6.

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3-4. VIDEO SYSTEM ADJUSTMENTS

Before perform the video system adjustments, check that the specified value of "27MHz Origin Oscillation Adjustment" of "CAMERA SYSTEM ADJUSTMENT" is satisfied.

3-4-1. Base Band Block Adjustments

1. Chroma BPF f_0 Adjustment (VI-156 board)

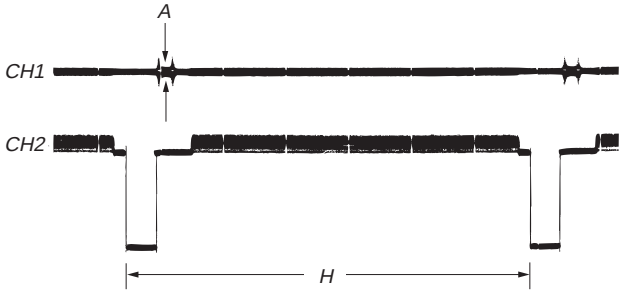
Set the center frequency of IC1301 chroma band-pass filter.

Mode	Camera
Subject	All black (Cover the lens with the lens cap)
Measurement Point	CH1: Chroma signal terminal of S VIDEO jack (75Ω terminated) CH2: Y signal terminal of S VIDEO jack (75Ω terminated)
Measuring Instrument	Oscilloscope
Adjustment Page	C
Adjustment Address	28
Specified Value	A = 100mVp-p or less B = 200mVp-p or more

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2				Check that the burst signal (B) is output to the chroma signal terminal of S VIDEO jack.
3	3	0C	04	Set the data, and press PAUSE button.
4	C	28		Change the data for minimum amplitude of the burst signal level (A). (The data should be "00" to "07".)
5	C	28		Press PAUSE button.
6	3	0C	00	Set the data, and press PAUSE button.
7				Check that the burst signal level (B) satisfies the specified value.
8	0	01	00	Set the data.

When the data of page: 3, address: 0C, is 04:



When the data of page: 3, address: 0C, is 00:

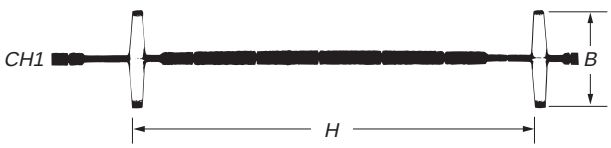


Fig. 5-3-7.

2. S VIDEO OUT Y Level Adjustment (VI-156 board)

Mode	Camera
Subject	Arbitrary
Measurement Point	Y signal terminal of S VIDEO jack (75Ω terminated)
Measuring Instrument	Oscilloscope
Adjustment Page	C
Adjustment Address	25
Specified Value	A = 1000 ± 14mV

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	2	35		Note down the data.
3	2	35	01	Set the data.
4	3	0C	02	Set the data, and press PAUSE button.
5	C	25		Change the data and set the Y signal level (A) to the specified value.
6	C	25		Press PAUSE button.
7	3	0C	00	Set the data, and press PAUSE button.
8	2	35		Set the data that is noted down at step 2.
9	0	01	00	Set the data.

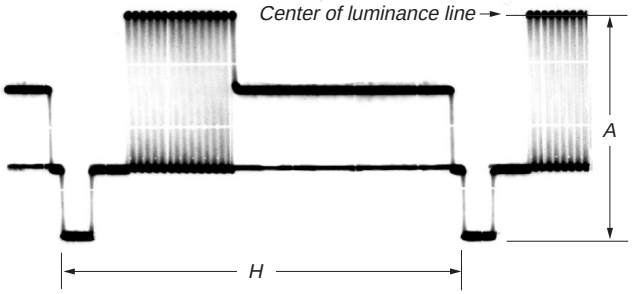


Fig. 5-3-8.

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3. S VIDEO OUT Chroma Level Adjustment (VI-156 board)

Mode	Camera
Subject	Arbitrary
Measurement Point	Chroma signal terminal of S VIDEO jack (75Ω terminated) External trigger: Y signal terminal of S VIDEO jack
Measuring Instrument	Oscilloscope
Adjustment Page	C
Adjustment Address	26, 27
Specified Value	Cr level: A = 714 ± 14mV(NTSC) A = 700 ± 14mV(PAL) Cb level: B = 714 ± 14mV(NTSC) B = 700 ± 14mV(PAL) Burst level: C = 286 ± 6mV(NTSC) C = 300 ± 6mV(PAL)

Adjusting method:

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	2	35		Note down the data.
3	2	35	01	Set the data.
4	3	0C	02	Set the data, and press PAUSE button.
5	C	26		Change the data and set the Cr signal level (A) to the specified value.
6	C	26		Press PAUSE button.
7	C	27		Change the data and set the Cb signal level (B) to the specified value.
8	C	27		Press PAUSE button.
9				Check that the burst signal level (C) is satisfied the specified value.
10	3	0C	00	Set the data, and press PAUSE button.
11	2	35		Set the data that is noted down at step 2.
12	0	01	00	Set the data.

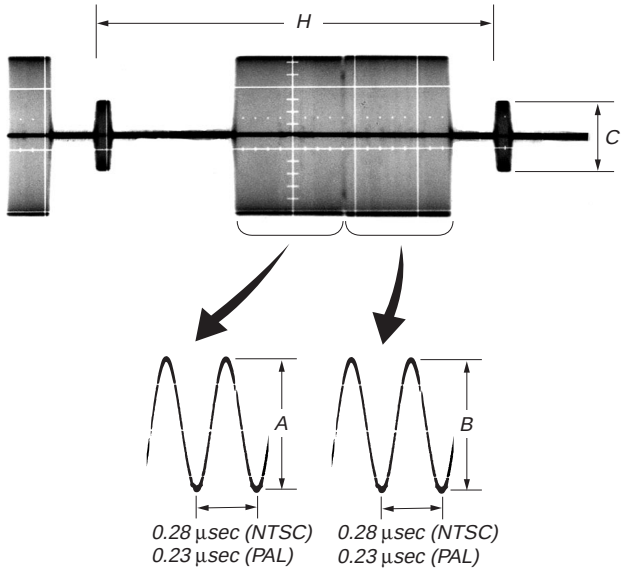


Fig. 5-3-9.

4. VIDEO OUT Y, Chroma Level Check (VI-156 board)

Mode	Camera
Subject	Arbitrary
Measurement Point	VIDEO jack (75Ω terminated)
Measuring Instrument	Oscilloscope
Specified Value	Sync level: A = 286 ± 18mV(NTSC) A = 300 ± 18mV(PAL) Burst level: B = 286 ± 18mV(NTSC) B = 300 ± 18mV(PAL)

Adjusting method:

Order	Page	Address	Data	Procedure
1	2	35		Note down the data.
2	2	35	01	Set the data.
3	3	0C	02	Set the data, and press PAUSE button.
4				Check that the sync signal level (A) satisfies the specified value.
5				Check that the burst signal level (B) satisfies the specified value.
6	3	0C	00	Set the data, and press PAUSE button.
7	2	35		Set the data that is noted down at step 1.
8	0	01	00	Set the data.

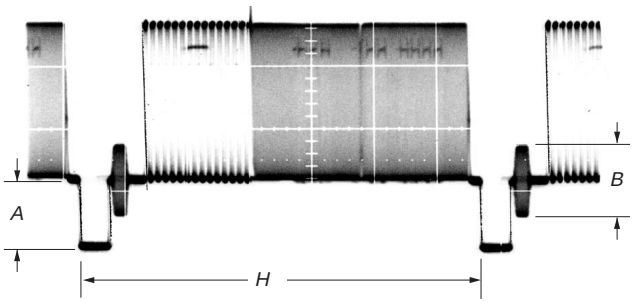


Fig. 5-3-10.

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3-4-2. BIST Check

Switch setting:
LCD panel ..... Open

1. Playback System Check

1-1. Preparations for Playback

Order	Page	Address	Data	Procedure
1				Set the MODE switch to VTR position.
2				Connect the adjustment remote commander and set the HOLD switch to ON (SERVICE) position.
3	0	01	01	Set the data.
4	C	42	00	Set the data, and press PAUSE button.
5				Playback the BIST check tape. (XH5-6 (NTSC), XH5-6P (PAL))

Note: Perform the following checks in the playback mode.

1-2. IC301 TRX (RF) PB BIST Check

Order	Page	Address	Data	Procedure
1	3	70	04	Set the data, and press PAUSE button.
2	3	70	00	Set the data, and press PAUSE button.
3	3	73		Check that the data is equal to either of the following values. And memorize the case number of the value. NTSC model: 63 (Case1), C5 (Case2), 75 (Case3), D3 (Case4), 59 (Case5), FF (Case6) PAL model: 86 (Case1), AA (Case2), 90 (Case3)
4	3	74		Check that the data is equal to the following value which case number is equal to that of address 73. NTSC model: 84 (Case1), 55 (Case2), 07 (Case3), D6 (Case4), 01 (Case5), D0 (Case6) PAL model: 35 (Case1), 33 (Case2), B6 (Case3)
5	3			If the data of address 73 and address 74 are correct, IC301 TRX (RF) playback system is normal.

1-3. IC301 AUD (ABUS) PB BIST Check

Order	Page	Address	Data	Procedure
1	3	11	04	Set the data, and press PAUSE button.
2	3	12	08	Set the data, and press PAUSE button.
3	3	12	00	Set the data, and press PAUSE button.
4	3	13	03	Set the data, and press PAUSE button.
5	3	14		Check that the data is the following value. NTSC model: 41 PAL model: 2D
6	3	15		Check that the data is the following value. NTSC model: 81 PAL model: 7C
7	3			If the data of address 14 and address 15 are correct, IC301 AUD (ABUS) playback system is normal.

1-4. IC301 VFD PB BIST Check
• EX Y BIST Check

Order	Page	Address	Data	Procedure
1	3	12	10	Set the data, and press PAUSE button.
2	3	12	00	Set the data, and press PAUSE button.
3	3	13	04	Set the data, and press PAUSE button.
4	3	14		Check that the data is the following value. NTSC model: FB PAL model: 54
5	3	15		Check that the data is the following value. NTSC model: F4 PAL model: ED
6	3			If the data of address 14 and address 15 are correct, IC301 EX Y playback system is normal.

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1-5. IC301 ENCODER BIST Check

• Preparations

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	8	21	0F	Set the data, and press PAUSE button.

• ENCODER Ya BIST Check

Order	Page	Address	Data	Procedure
1	3	10	8B	Set the data, and press PAUSE button.
2	3	12	10	Set the data, and press PAUSE button.
3	3	12	00	Set the data, and press PAUSE button.
4	3	13	04	Set the data, and press PAUSE button.
5	3	14		Check that the data is the following value. NTSC model: FD PAL model: 58
6	3	15		Check that the data is the following value. NTSC model: 3E PAL model: BE
7	3			If the data of address 14 and address 15 are correct, IC301 ENCORDER Ya playback system is normal.

• ENCODER Yb BIST Check

Order	Page	Address	Data	Procedure
1	3	10	8C	Set the data, and press PAUSE button.
2	3	12	10	Set the data, and press PAUSE button.
3	3	12	00	Set the data, and press PAUSE button.
4	3	13	04	Set the data, and press PAUSE button.
5	3	14		Check that the data is the following value. NTSC model: 94 PAL model: A1
6	3	15		Check that the data is the following value. NTSC model: D6 PAL model: ED
7	3			If the data of address 14 and address 15 are correct, IC301 ENCORDER Yb playback system is normal.

1-6. Processing after Completing Playback System Check

Order	Page	Address	Data	Procedure
1	0	01	01	Set the data.
2	C	42	0A	Set the data, and press PAUSE button.
3	8	21	03	Set the data, and press PAUSE button.
4	0	01	00	Set the data.
5				Turn off the power and turn on again.

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3-5. AUDIO SYSTEM ADJUSTMENTS

Switch setting:

AUDIO INPUT CH1 (SW-343 board) ..... REAR
AUDIO INPUT CH2 (SW-343 board) ..... REAR
AUDIO SELECT CH1 (SW-343 board) ..... AUTO
AUDIO SELECT CH2 (SW-343 board) ..... AUTO
AUDIO MONITOR (SW-343 board) ..... MIX
CH1 LINE/MIC SELECT (XL-003 board) ..... MIC
CH2 LINE/MIC SELECT (XL-003 board) ..... MIC
A REF REVEL (Menu setting) ..... –12dB (Note)

Note: Except for "Playback Level Check".

[Connection of Audio System Measuring Devices]

Connect the audio system measuring devices as shown in Fig. 5-3-11.

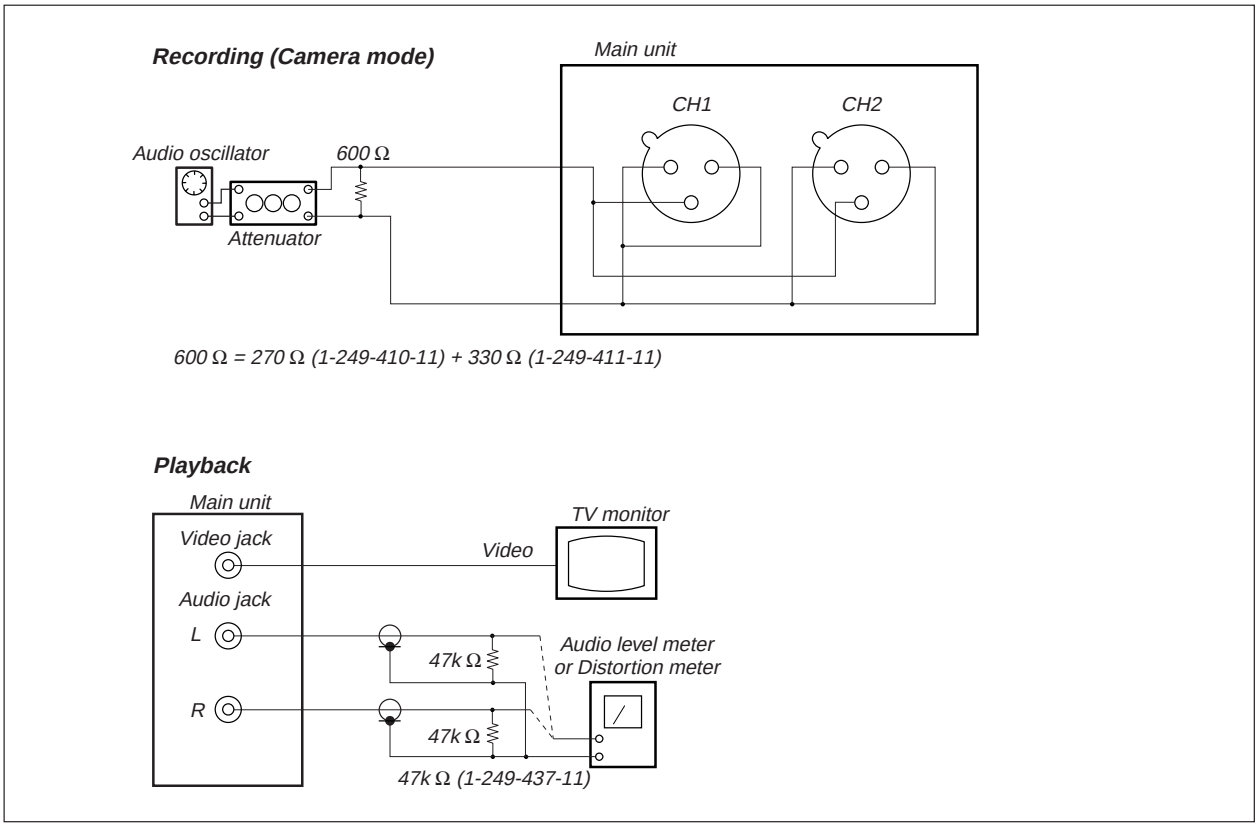


Fig. 5-3-11.

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1. Playback Level Check

Mode	VTR playback
Signal	Alignment tape: For audio operation check (XH5-3 (NTSC)) (XH5-3P (PAL))
Measurement Point	Audio CH1 or CH2 terminal of AUDIO jack
Measuring Instrument	Audio level meter and frequency counter
Specified Value	32 kHz mode: 1 kHz, +8.2 ± 2.0dBs 48 kHz mode: 1 kHz, +8.2 ± 2.0dBs 44.1 kHz mode: The 7.35kHz signal level during EMP OFF is +8.2 ± 2.0dBs. The 7.35kHz signal level during EMP ON is –6.2 ± 2.0 dB from the signal level during EMP OFF.

Menu setting:

A REF LEVEL ..... –20dB (NTSC)
..... –18dB (PAL)

Checking Method

1) Check that the playback signal level is the specified value.

2. Overall Level Characteristics Check

Mode	Camera recording and playback
Signal	400Hz, –60 dBs signal: XLR jack CH1 and CH2
Measurement Point	Audio CH1 or CH2 terminal of AUDIO jack
Measuring Instrument	Audio level meter
Specified Value	–10 ± 3.0dBs

Menu setting:

A REF LEVEL ..... –12dB

Checking Method

1) Input the 400Hz, –60dBs signal in the XLR jack.
2) Record in the camera mode.
3) Playback the recorded section.
4) Check that the 400Hz signal level is the specified value.

3. Overall Distortion Check

Mode	Camera recording and playback
Signal	400Hz, –60dBs signal: XLR jack CH1 and CH2
Measurement Point	Audio CH1 or CH2 terminal of AUDIO jack
Measuring Instrument	Audio distortion meter
Specified Value	Below 0.4% (200Hz to 6kHz BPF ON)

Menu setting:

A REF LEVEL ..... –12dB

Checking Method

1) Input the 400Hz, –60dBs signal in the XLR jack.
2) Record in the camera mode.
3) Playback the recorded section.
4) Check that the distortion is the specified value.

4. Overall Noise Level Check

Mode	Camera recording and playback
Signal	No signal: Insert a shorting plug in the XLR jack
Measurement Point	Audio CH1 or CH2 terminal of AUDIO jack
Measuring Instrument	Audio level meter
Specified Value	Below –45dBs (IHF-A filter ON, 20kHz LPF ON)

Menu setting:

A REF LEVEL ..... –12dB

Checking Method

1) Insert a shorting plug in the XLR jack.
2) Record in the camera mode.
3) Playback the recorded section.
4) Check that the noise level is the specified value.

5. Overall Separation Check

Mode	Camera recording and playback
Signal	400Hz, –60dBs signal: XLR jack <CH2> [CH1] (Insert a shorting plug in the XLR jack <CH1> [CH2])
Measurement Point	Audio <CH1> [CH2] terminal of AUDIO jack
Measuring Instrument	Audio level meter
Specified Value	Below –40dBs

< > : CH1 check
[ ] : CH2 channel check

Menu setting:

A REF LEVEL ..... –12dB

\Checking Method

1) Input the 400Hz, –60dBs signal in the <CH2> [CH1] terminal of the XLR jack only.
2) Record in the camera mode.
3) Playback the recorded section.
4) Check that the signal level of the audio <CH1> [CH2] terminal is the specified value.

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5-4. SERVICE MODE

4-1. ADJUSTMENT REMOTE COMMANDER

The adjustment remote commander is used for changing the calculation coefficient in signal processing, EVR data, etc. The adjustment remote commander performs bi-directional communication with the unit using the remote commander signal line (LANC). The resultant data of this bi-directional communication is written in the non-volatile memory.

1. Using the adjustment remote commander

1) Connect the adjustment remote commander to the LANC terminal.
2) Set the HOLD switch of the adjustment remote commander to "HOLD" (SERVICE position). If it has been properly connected, the LCD on the adjustment remote commander will display as shown in Fig. 5-4-1.



Fig. 5-4-1

3) Operate the adjustment 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 notation	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
LCD Display	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

   - 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 (B, C, D, F, 8 page) in the nonvolatile memory. (The new adjusting data will not be recorded in the nonvolatile memory if this step is not performed.)
4) After completing all adjustments, turn off the main power supply once.

2. Precautions upon using the adjustment remote commander

Mishandling of the adjustment 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.

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4-2. DATA PROCESS

The calculation of the DDS display and the adjustment remote commander display data (hexadecimal notation) are 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. Indicates the hexadecimal-decimal conversion table.

Hexadecimal-decimal Conversion Table

① \ Lower digit of hexadecimal / Upper digit of hexadecimal ②	0	1	2	3	4	5	6	7	8	9	A (A)	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	77	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 (A)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
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: The characters shown in the parenthesis ( ) shown the display on the adjustment remote commander.

(Example) If the DDS display or the adjustment remote commander shows BD (bd);
Because the upper digit of the adjustment number is B (b), and the lower digit is D (d), the meeting point "189" of ① and ② in the above table is the corresponding decimal number.

Table. 5-4-1.

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4-3. SERVICE MODE

1. Setting the Test Mode

Page D	Address 10

Data	Function
00	Normal
01	Forced camera power ON
02	Forced VTR power ON
03	Forced camera + VTR power ON
05	Forced memory power ON

- Before setting the data , select page: 0, address: 01, and set data: 01.
- For page D, the data set is recorded in the non-volatile memory by pressing the PAUSE button of the adjustment remote commander. In this case, take note that the test mode will not be exited even when the main power is turned off.
- After completing adjustments/repairs, be sure to return the data of this address to 00, and press the PAUSE button of the adjustment remote commander.
  Select page: 0, address: 01, and set data: 00.

2. Emergence Memory Address

Page C	Address F4 to FF

Address	Contents
F4	EMG code when first error occurs
F6	Upper: MSW code when shift starts when first error occurs Lower: MSW code when first error occurs
F7	Lower: MSW code to be moved when first error occurs
F8	EMG code when second error occurs
FA	Upper: MSW code when shift starts when second error occurs Lower: MSW code when second error occurs
FB	Lower: MSW code to be moved when second error occurs
FC	EMG code when last error occurs
FE	Upper: MSW code when shift starts when last error occurs Lower: MSW code when last error occurs
FF	Lower: MSW code to be moved when last error occurs

When no error occurs in this unit, data “00” is written in the above addresses (F4 to FF). when first error occurs in the unit, the data corresponding to the error is written in the first emergency address (F4 to F7). In the same way, when the second error occurs, the data corresponding to the error is written in the second emergency address (F8 to FB). Finally, when the last error occurs, the data corresponding to the error is written in the last emergency address (FC to FF).

Note: After completing adjustments, be sure to initialize the data of addresses F4 to FF to “00”.

Initializing method:

1) Select page: 0, address: 01, and set data: 01.
2) Select page: 3, address: 01, set data: 37, and press the PAUSE button.
3) Select page: 0, address: 01, and set data: 00.

2-1. EMG Code (Emergency Code)

Codes corresponding to the errors which occur are written in addresses F4, F8 and FC. The type of error indicated by the code are shown in the following table.

Code	Emergency Type
00	No error (Initial state)
10	Loading motor time-out during LOAD
11	Loading motor time-out during UNLOAD
19	MSW error
20	Reel slack
22	T reel error
23	S reel error
24	Reel table short
25	Reel motor error
30	Error during normal capstan rotation
40	FG error during drum start-up
42	FG error during normal drum rotation
50	False DEW detection
52	False wet DEW detection
70	Cassette compartment LOAD error
71	Cassette compartment UNLOAD error
72	Cassette compartment retry time-out during UNLOAD

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2-2. MSW Code

MSW when errors occur:

Information on MSW (mode SW) when errors occur

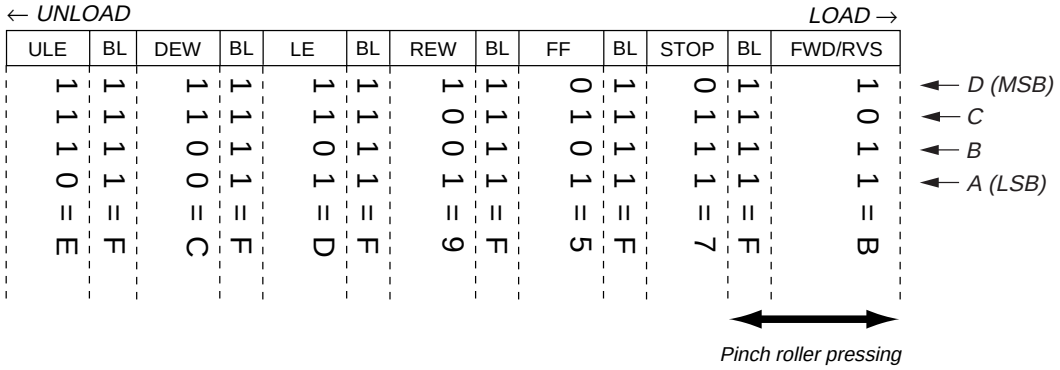
MSW when movement starts:

Information on MSW when movements starts when the mechanism position is moved (When the L motor is moved)

MSW of target of movement:

Information on target MSW of movement when the mechanism position is moved

Mechanical Position

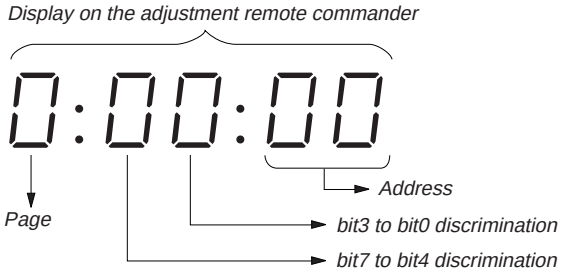


Position	Code	Contents
ULE	E	UNLOAD completion position. When the cassette is ejected, the mechanism will stop at this position. Cassette IN standby. The guide will start protruding out as the mechanism moves towards the LOAD position.
BL	F	BLANK code, at the boundary between codes. The mechanism will not stop at this code during operations. (Excluding LOAD/UNLOAD)
DEW	C	Code during loading
LE	D	Tape guide LOAD completion position.
REW	9	REW position. The pinch roller is released.
FF	5	FF position. The pinch roller is released.
STOP	7	Stop position. The pinch roller is released and tension regulator returns, and the brake is imposed on both reels.
FWD/RVS	B	PB, REC, CUE, REVIEW, PAUSE positions. The pinch roller is pressed, and the tension regulator is ON. The mechanism is operating at this position in modes in which normal images are shown.
NULL	0	Code not existing in the MD. When errors occur when the loading motor is not driving, this code is memorized.

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3. Bit value discrimination

Bit values must be discriminated using the display data of the adjustment remote commander for following items. Use the table below to discriminate if the bit value is "1" or "0".



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

Example: If "8E" is displayed on the adjustment remote commander, the bit values for bit7 to bit4 are shown in the Ⓐ column, and the bit values for bit3 to bit0 are shown in the Ⓑ column.

4. Switch check (1)

Page 2	Address 43

Bit	Function	When bit value=1	When bit value=0
0	VTR MODE SW (PM-040 board S081)	OFF	ON
1	CAMERA MODE SW (PM-040 board S081)	OFF	ON
2	START/STOP SW (FS-082 board S402, CF-1044 block S432)	OFF	ON
3	EJECT SW (EJ-034 board S291)	OFF	ON
4	CC DOWN SW (Mechanism chassis)	OFF (UP)	ON (DOWN)
5	PHOTO FREEZE SW (CF-1044 block S431)	OFF	ON
6	MEMORY MODE SW (PM-040 board S081)	OFF	ON
7			

Using method:

1) Select page: 2, address: 43.
2) By discriminating the bit value of display data, the state of the switch can be discriminated.

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5. Switch check (2)

Page 2	Address 5F to 67

Using method:

1) Select page: 2, address: 5F to 67.
2) By discriminating the display data, the pressed key can be discriminated.

Address	Data						
	00 (00 to 0A)	19 (0B to 24)	32 (25 to 44)	59 (45 to 6E)	85 (6F to 9F)	B8 (A0 to D4)	EE (D5 to FF)
5F (KEY AD8) (IC1104 ⑫)	CUSTOM PRESET (AE-023 board) (S044)	MENU (AE-023 board) (S044)	AE SHIFT (AE-023 board) (S045)			PRESET 3200 (AE-023 board) (S043)	PRESET 5800 (AE-023 board) (S043)
60 (KEY AD0) (IC1104 ⑬)	STOP (KY-049 board) (S261)	REW (KY-049 board) (S263)	PLAY (KY-049 board) (S265)	REC (KY-049 board) (S267,269)	EDIT + (LL-010 board) (S472)	EDIT – (LL-010 board) (S471)	No key input
61 (KEY AD1) (IC1104 ⑭)	PAUSE (KY-049 board) (S262)	FF (KY-049 board) (S264)	SLOW (KY-049 board) (S266)	AUDIO DUB (KY-049 board) (S268)	FRAME + (KY-049 board) (S270)	FRAME – (KY-049 board) (S271)	No key input
62 (KEY AD2) (IC1104 ⑮)	PHOTO (PHOTO REC) (CF-1044 block) (S431)				FOCUS INFINITY (FC-074 board) (S222)	FOCUS AUTO (FC-074 board) (S222, 221)	FOCUS MANUAL (FC-074 board) (S222)
63 (KEY AD3) (IC1104 ⑯)	MEMORY MIX (SW-343 board) (S507)	DATA CODE (SW-343 board) (S510)	END SEARCH (SW-343 board) (S513)	TITLE (SW-343 board) (S512)	DIGITAL EFFECT (SW-343 board) (S517)	AUTO MODE ON (SB-036 board) (S063)	AUTO MODE OFF (SB-036 board) (S063)
64 (KEY AD4) (IC1104 ⑰)	BACK LIGHT (SB-036 board) (S068)	SPOT LIGHT (SB-036 board) (S067)	AUDIO LEVEL DISPLAY (SB-036 board) (S065)	DISPLAY (SB-036 board) (S066)	ZEBRA 100% (SB-036 board) (S061)	ZEBRA OFF (SB-036 board) (S061)	ZEBRA 70% (SB-036 board) (S061)
65 (KEY AD5) (IC1104 ⑱)	EXCUTE (KP-011 board) (S121)			LCD BRIGHT + (SW-343 board) (S518)	LCD BRIGHT – (SW-343 board) (S519)	PANEL CLOSE (FP-241)	PANEL OPEN (FP-241)
66 (KEY AD6) (IC1104 ⑲)	MEMORY INDEX (SW-343 board) (S508)	MEMORY + (SW-343 board) (S509)	MEMORY – (SW-343 board) (S512)	MEMORY DELETE (SW-343 board) (S514)	MEMORY PLAY (SW-343 board) (S516)	PANEL REVERSE (FP-241)	PANEL NORMAL (FP-241)
67 (KEY AD7) (IC1104 ⑳)		WHITE BALANCE (FS-082 board) (S404)		INDEX (FS-082 board) (S403)	FADER (FS-082 board) (S405)	SHUTTER ON (FS-082 board) (S401)	SHUTTER OFF (FS-082 board) (S401)

6. Record of Use check

Note: When replacing the drum assembly, initialize the data of address: A2 to AA.

Page 2	Address A2 to AA

Address	Function		Remarks
A2	Drum rotation counted time (BCD code)	Minutes	
A3		Hour (L)	10th place digit and 1st place digit of counted time (decimal digit)
A4		Hour (H)	1000th place digit and 100th place digit of counted time (decimal digit)
A5	User initial power on date (BCD code)	Year	After setting the clock, set the date of power on next.
A6		Month	
A7		Day	
A8	Final condensation occurrence date (BCD code)	Year	
A9		Month	
AA		Day	

Using method:

1) The record of use data is displayed at page: 2, addresses: A2 to AA.
   Note: This data will be erased (reset) when the cabinet (R) assembly (SW-343 board) is removed.

Initializing method:

1) Using the adjustment remote commander, select the object address and set data: 00.

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7. Record of Self-diagnosis check

Page 2	Address B0 to C6

Address	Self-diagnosis code
B0	“Repaired by” code (Occurred 1st time) *1
B1	“Block function” code (Occurred 1st time)
B2	“Detailed” code (Occurred 1st time)
B4	“Repaired by” code (Occurred 2nd time) *1
B5	“Block function” code (Occurred 2nd time)
B6	“Detailed” code (Occurred 2nd time)
B8	“Repaired by” code (Occurred 3rd time) *1
B9	“Block function” code (Occurred 3rd time)
BA	“Detailed” code (Occurred 3rd time)
BC	“Repaired by” code (Occurred 4th time) *1
BD	“Block function” code (Occurred 4th time)
BE	“Detailed” code (Occurred 4th time)
C0	“Repaired by” code (Occurred 5th time) *1
C1	“Block function” code (Occurred 5th time)
C2	“Detailed” code (Occurred 5th time)
C4	“Repaired by” code (Occurred the last time) *1
C5	“Block function” code (Occurred the last time)
C6	“Detailed” code (Occurred the last time)

*1 : “01” → “C”, “03” → “E”

Using method:

1) The past self-diagnosis codes are displayed at page: 2, addresses: BC to C6. Refer to “SELF-DIAGNOSIS FUNCTION” for detail of the self-diagnosis code.
   Note: This data will be erased (reset) when the cabinet (R) assy (SW-343 board) is removed.

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8. HRS METER (Hours meter)

The data of "HRS METER" of the menu are memorized in addresses 00 to 13 of page A. (VI-156 board IC1105 (EEPROM)). When replacing the drum assy. capstan motor or mechanism deck, reset the data of the addresses corresponding to the replaced parts to "00".
Note: Same data is memorised in two addresses, so be sure to reset both addresses.

Page A	Address 00 to 13

Address	Name	Contents
00	OPERATION (L)	Power supply operation counted time (Lower digits)
01	OPERATION (H)	Power supply operation counted time (Upper digits)
02	DRUM RUN (L)	Drum rotation counted time (Lower digits)
03	DRUM RUN (H)	Drum rotation counted time (Upper digits)
04	TAPE RUN (L)	Capstan rotation counted time (Lower digits)
05	TAPE RUN (H)	Capstan rotation counted time (Upper digits)
06	THREADING (L)	Unloading counter (Lower digits)
07	THREADING (H)	Unloading counter (Upper digits)
08	CHECK SUM (L)	Check sum (Lower digits)
09	CHECK SUM (H)	Check sum (Upper digits)
0A	OPERATION (L)	Power supply operation counted time (Lower digits)
0B	OPERATION (H)	Power supply operation counted time (Upper digits)
0C	DRUM RUN (L)	Drum rotation counted time (Lower digits)
0D	DRUM RUN (H)	Drum rotation counted time (Upper digits)
0E	TAPE RUN (L)	Capstan rotation counted time (Lower digits)
0F	TAPE RUN (H)	Capstan rotation counted time (Upper digits)
10	THREADING (L)	Unloading counter (Lower digits)
11	THREADING (H)	Unloading counter (Upper digits)
12	CHECK SUM (L)	Check sum (Lower digits)
13	CHECK SUM (H)	Check sum (Upper digits)

Resetting method:
1) Select page: 0, address: 01, and set data: 01.
2) Select the addresses indicated by ● in the following table corresponding to the replaced parts, and input data: 00.
   Note: Press the PAUSE button of the adjustment remote commander each time to set the data.

Replaced parts	Address		
	02, 03, 0C, 0D (DRUM RUN)	04, 05, 0E, 0F (TAPE RUN)	06, 07, 10, 11 (THREADING)
Mechanism deck	●	●	●
Drum assy	●		
Capstan motor		●	

3) Select page: 0, address: 01, and set data: 00.

HRS METER data re-writing procedure
When a user forgets a password, replace IC1105 (EEPROM) on VI-156 board. At this time, replace IC1105 in the following order to copy the HRS METER data.

Processing before replacing IC1105:
1) Note down the data of page: A, address: 00 to 13.

Processing after replacing IC1105 :
1) Select page: 0, address: 01, set data: 01.
2) Select page: A, address: 00 to 13, and input the data noted down.
   Note: Press the PAUSE button of the adjustment remote commander each time to set the data.
3) Select page: 0, address: 01, set data: 00.

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SECTION 6
REPAIR PARTS LIST

6-1. EXPLODED VIEWS

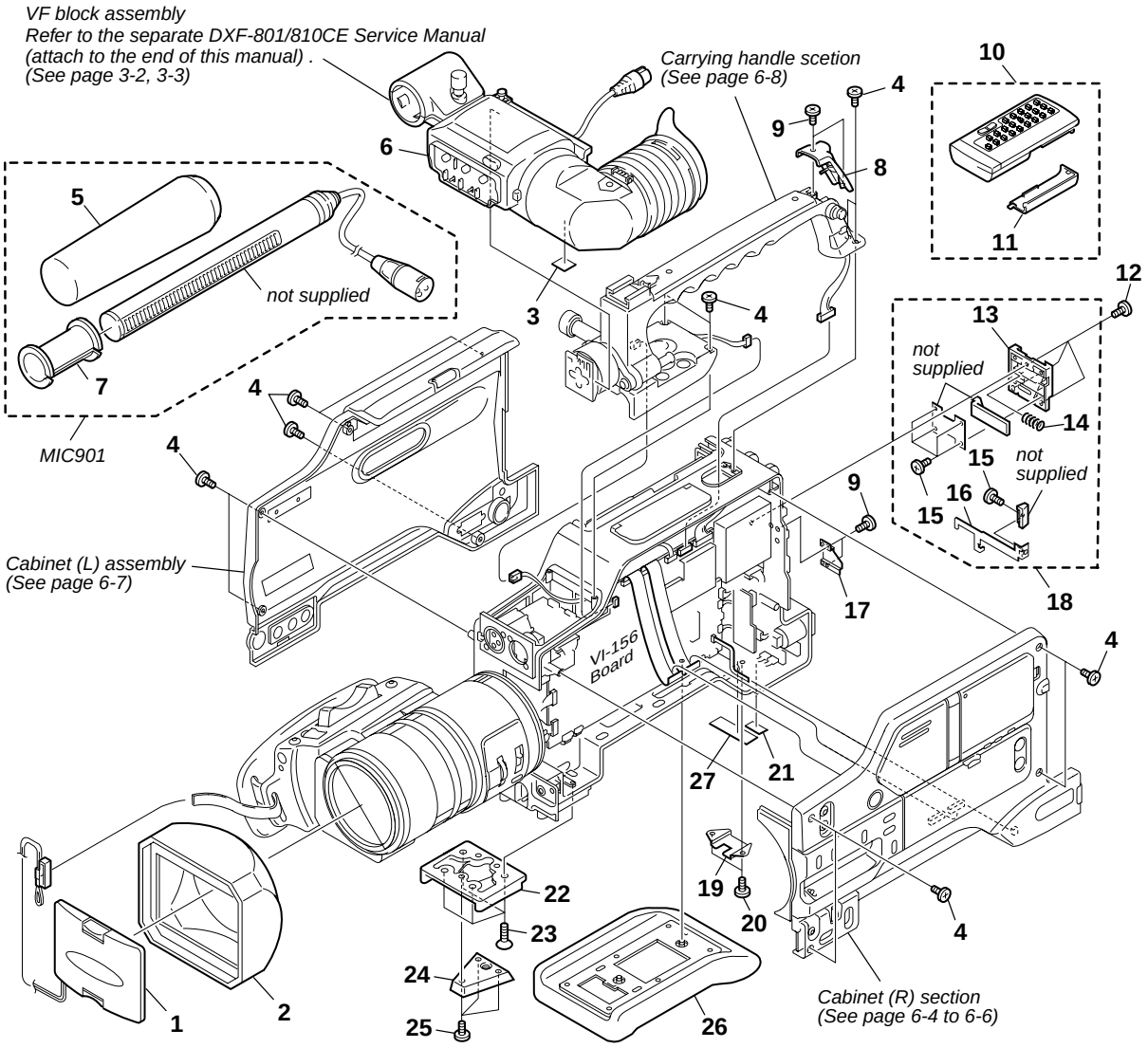
NOTE:

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

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

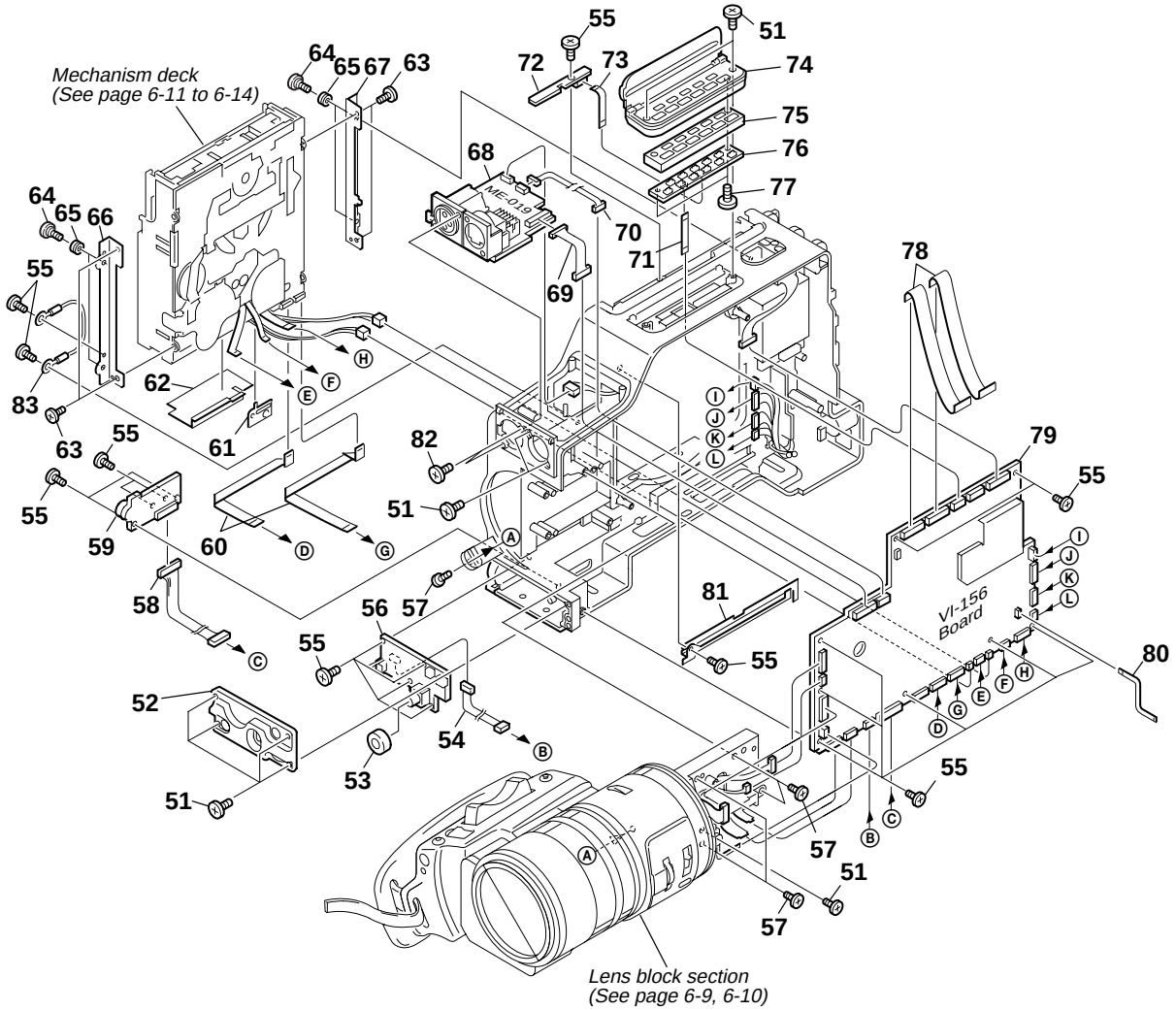
6-1-1. OVERALL SECTION-1



Ref. No.	Part No.	Description	Remarks
1	X-3950-568-2	CAP ASSY, HOOD	
2	X-3950-937-1	HOOD ASSY, LENS	
3	3-703-848-01	LABEL (N), SUB CAUTION (250)	
4	7-682-548-09	SCREW +B M3X8	
5	3-048-481-01	SCREEN, WINDOW	
6	A-8279-329-A	VF ASSY (250)	
6	A-8326-150-A	VF ASSY (250P)	
7	3-179-882-01	SPACER, MICROPHONE	
8	X-3950-953-1	COVER ASSY, HANDLE (REAR)	
9	3-968-729-91	SCREW(M2), LOCK ACE, P2	
10	1-475-950-21	REMOTE COMMANDER (RMT-811)	
11	3-053-056-01	LID, BATTERY CASE (FOR RMT-811)	
12	3-063-724-01	+B M3X6 (EG GRIP)	
* 13	3-679-690-02	MOUNT, V	
* 14	3-679-648-02	SPRING, COMPRESSION	
15	7-627-553-38	SCREW, PRECISION +P M2X3	
* 16	3-679-688-02	LEVER, RELEASE	
17	3-063-720-01	RETAINER, B LEVER	
18	A-7096-320-A	MOUNT ASSY, V	
* 19	3-971-072-01	STOPPER	
20	3-061-062-01	BOLT (M2.6), SPRING	
* 21	3-704-367-01	LABEL (250)	
* 22	3-612-631-01	SHOE (S), CAMERA	
23	3-063-723-01	+K M4X8 (EG GRIP)	
* 24	3-716-391-01	WEDGE, MOUNTING	
25	7-682-160-09	SCREW +P M4X6	
26	X-3950-907-1	PAD ASSY, SHOULDER	
27	3-703-845-01	LABEL (N) (U/C), MAIN CAUTION (250)	
MIC901	8-814-298-90	MICROPHONE (ECM-NV1)	

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6-1-2. OVERALL SECTION-2

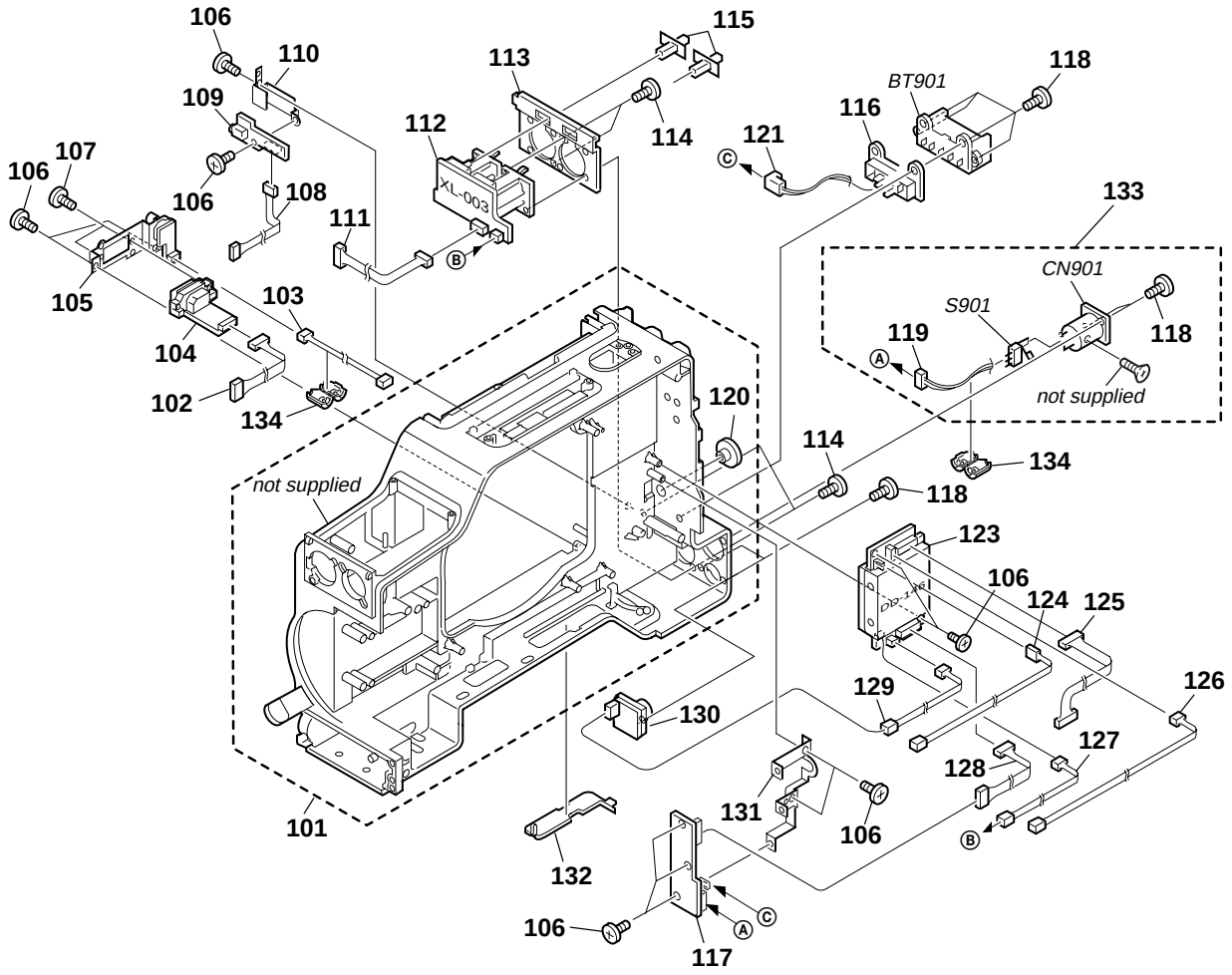


Ref. No.	Part No.	Description	Remarks
51	3-968-729-91	SCREW (M2), LOCK ACE, P2	
52	X-3950-929-1	CABINET ASSY, FRONT LOWER	
53	3-612-604-01	KNOB, VR (AUDIO)	
54	1-960-776-11	HARNESS (FV-120) 6P	
55	3-968-729-51	SCREW (M2), LOCK ACE, P2	
56	A-7074-556-A	FS-082 BOARD, COMPLETE	
57	7-682-548-09	SCREW +B M3X8	
58	1-960-777-11	HARNESS (VJ-107) 14P (250)	
58	1-960-777-21	HARNESS (VJ-107) 14P (250P)	
59	A-7074-555-A	JK-197 BOARD, COMPLETE	
60	1-757-151-11	FRV-008 FLEXIBLE FLAT CABLE 21P	
61	3-063-789-01	RETAINER (A), FLEXIBLE	
62	3-063-790-01	RETAINER (B), FLEXIBLE	
63	7-685-851-04	SCREW +BVTT M2X4 (S)	
64	3-974-010-01	SCREW (M3), STEP	
65	3-974-011-01	RUBBER, VIBRATION PROOF	
66	3-063-699-01	BRACKET (L), MD	

Ref. No.	Part No.	Description	Remarks
67	3-063-700-01	BRACKET (R), MD	
68	A-7074-553-A	ME-019 BOARD, COMPLETE	
69	1-960-783-11	HARNESS (VM-068) 12P	
70	1-960-784-11	HARNESS (MV-124) 7P	
71	1-757-148-11	FVK-001 FLEXIBLE FLAT CABLE 8P	
72	A-7074-554-A	EJ-034 BOARD, COMPLETE	
73	1-757-150-11	FKE-001 FLEXIBLE FLAT CABLE 6P	
74	X-3950-948-1	FRAME ASSY, VTR KEY	
75	3-063-711-01	KEY, VTR	
76	A-7074-545-A	KY-049 BOARD, COMPLETE	
77	3-948-339-61	TAPPING	
78	1-757-147-11	FVS-001 FLEXIBLE FLAT CABLE 30P	
79	A-7096-400-A	VI-156 BOARD, COMPLETE (SERVICE)	
80	1-679-395-11	FP-245 FLEXIBLE BOARD 10P	
* 81	3-063-550-01	PLATE, HARNESS GUIDE	
82	3-061-062-01	BOLT (M2.6), SPRING	
83	1-960-908-11	HARNESS (JJ-059)	

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6-1-3. OVERALL SECTION-3

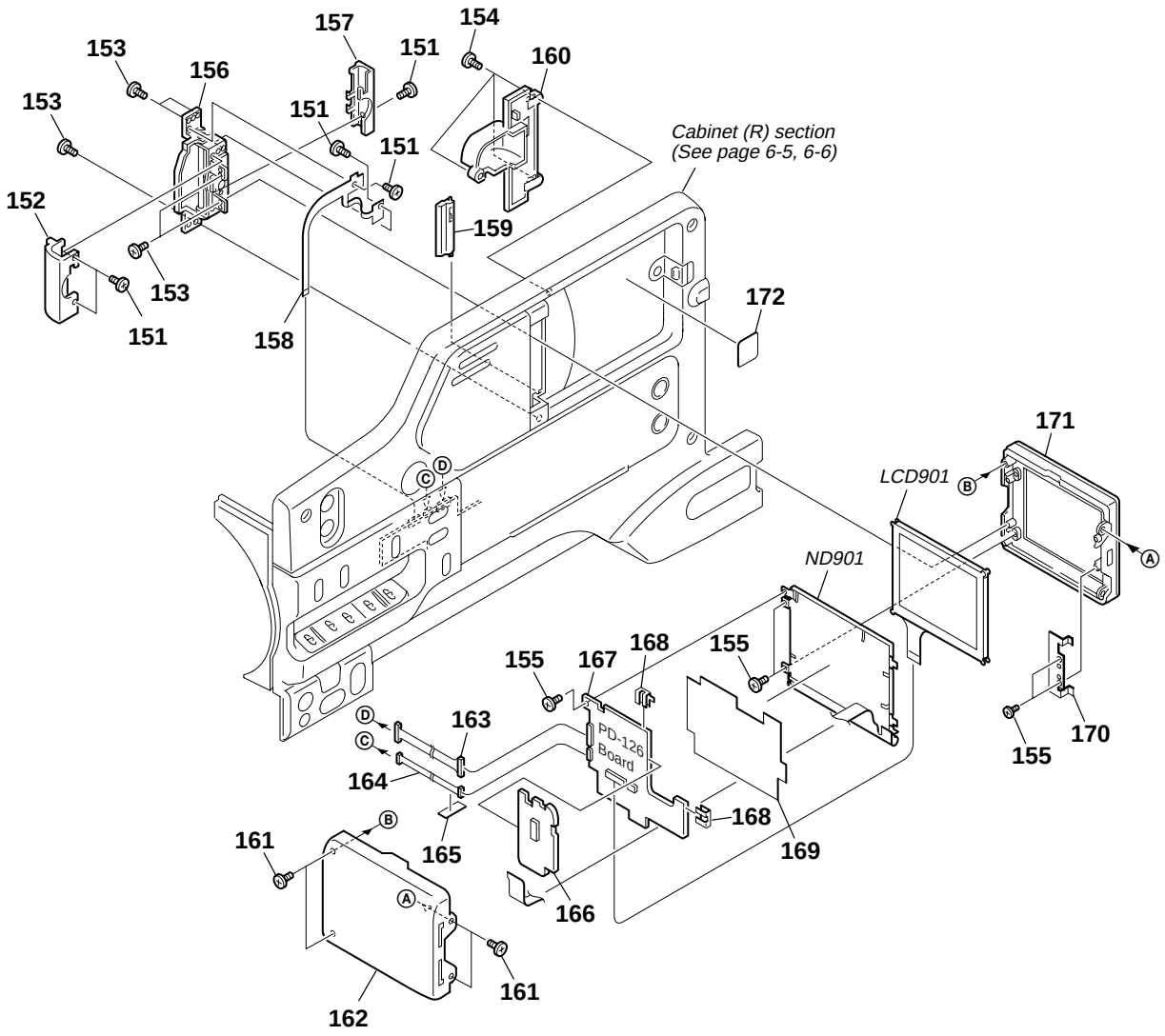


Ref. No.	Part No.	Description	Remarks
101	X-3950-947-A	FRAME ASSY, CENTER	
102	1-960-794-11	HARNESS (IL-053) 6P	
103	1-960-780-11	HARNESS (VV-114) 3P	
104	A-7074-550-A	DV-031 BOARD, COMPLETE	
105	A-7074-557-A	VO-012 BOARD, COMPLETE	
106	3-968-729-51	SCREW (M2), LOCK ACE, P2	
107	3-968-729-91	SCREW (M2), LOCK ACE, P2	
108	1-960-779-11	HARNESS (VR-128) 5P	
109	A-7074-549-A	RL-057 BOARD, COMPLETE	
* 110	3-063-708-01	BRACKET (LANC)	
111	1-960-781-11	HARNESS (VX-050) 8P	
112	A-7074-551-A	XL-003 BOARD, COMPLETE	
* 113	3-063-709-01	BRACKET (XLR)	
114	7-682-548-09	SCREW +B M3X8	
115	3-063-710-01	KNOB (AU), SLIDE	
116	3-063-361-01	SPACER, TERMINAL	
117	A-7074-548-A	IN-057 BOARD, COMPLETE	
118	3-061-062-01	BOLT (M2.6), SPRING	

Ref. No.	Part No.	Description	Remarks
119	1-960-796-11	HARNESS (ID-052) 6P	
120	3-717-821-01	CAP, BREAKER	
121	1-960-795-11	HARNESS (IB-053) 2P	
123	A-7074-546-A	DD-146 BOARD, COMPLETE	
124	1-960-790-11	HARNESS (DV-063) 2P	
125	1-960-778-11	HARNESS (VD-053) 12P	
126	1-960-789-11	HARNESS (DM-141) 4P	
127	1-960-786-11	HARNESS (DX-050) 3P	
128	1-960-787-11	HARNESS (DI-065) 9P	
129	1-960-788-11	HARNESS (DD-064) 2P	
130	A-7074-552-A	DC-095 BOARD, COMPLETE	
* 131	3-063-701-01	BRACKET (BREAKER)	
132	3-063-719-01	LID, BLIND	
133	1-960-957-11	HARNESS (DC-069)	
134	1-500-249-11	FERRITE BEAD (CASE)(250P)	
BT901	1-766-377-12	CONNECTOR, BATTERY	
CN901	1-564-603-31	CONNECTOR (WITH DC SW) 4P	
S901	1-553-442-21	SWITCH, MICRO	

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6-1-4. CABINET (R) SECTION-1



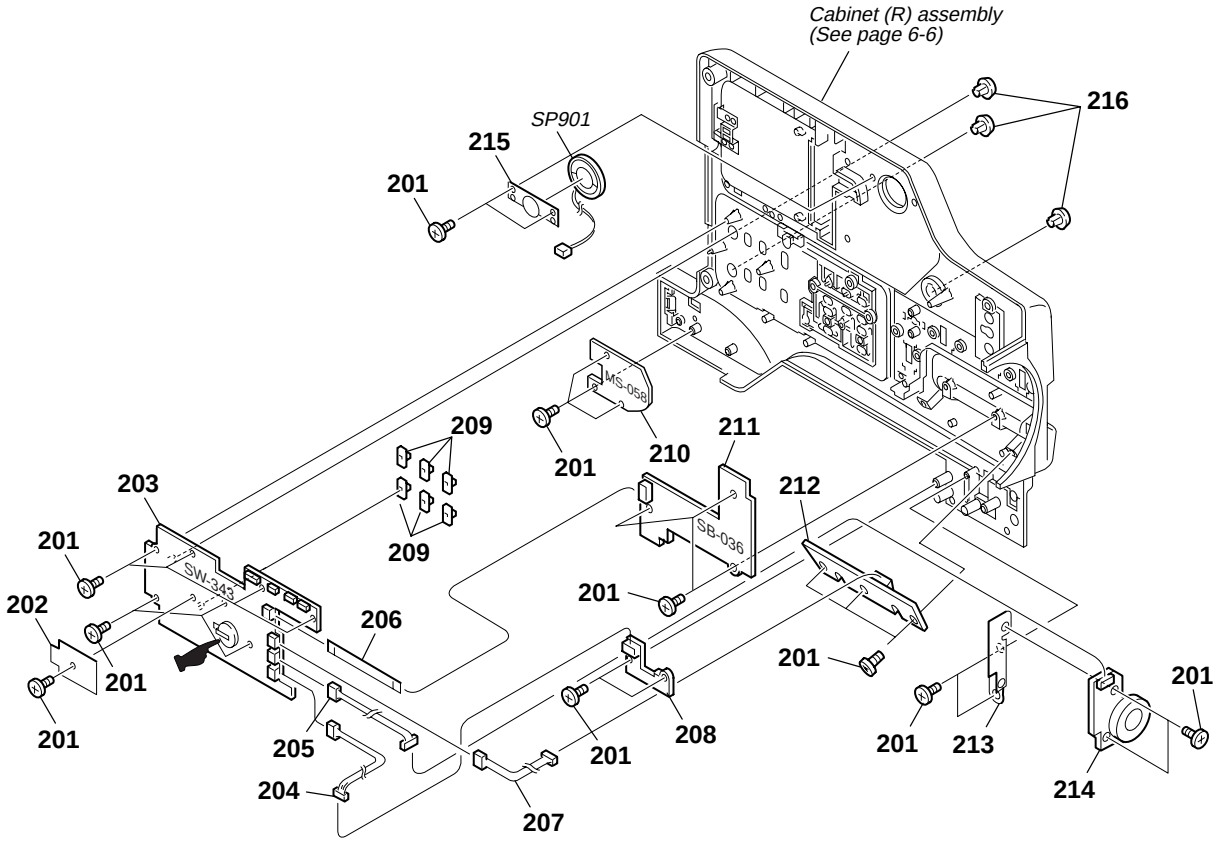
Ref. No.	Part No.	Description	Remarks
151	3-989-735-91	SCREW (M1.7), LOCK ACE, P2	
152	3-063-693-01	COVER (FRONT), HINGE	
153	3-968-729-71	SCREW (M2), LOCK ACE, P2	
154	3-968-729-51	SCREW (M2), LOCK ACE, P2	
155	3-989-735-11	SCREW (M1.7), LOCK ACE, P2	
156	X-3950-938-1	HINGE ASSY	
157	3-060-694-11	COVER (REAR), HINGE	
158	1-679-392-21	FP-241 FLEXIBLE BOARD 6P	
159	X-3949-119-1	PLATE ASSY, BLIND	
* 160	3-063-694-01	LID, HINGE	
161	3-968-729-91	SCREW (M2), LOCK ACE P2	
162	3-063-692-01	CABINET (C), P (250)	
162	3-063-692-11	CABINET (C), P (250P)	

Ref. No.	Part No.	Description	Remarks
163	1-960-798-11	HARNESS (PS-111) 14P	
164	1-960-797-11	HARNESS (PS-110) 8P	
165	3-060-795-01	TAPE, HARNESS FIXED	
⚠166	1-418-876-11	TRANSFORMER UNIT, INVERTER	
167	A-7096-158-A	PD-126 BOARD, COMPLETE	
* 168	3-051-232-01	CLIP, PCB	
169	3-060-704-01	SHEET (N), BL SHIELD	
* 170	3-063-695-01	RETAINER, BL	
171	X-3950-939-1	CABINET (M) ASSY, P	
172	3-703-848-01	LABEL (N), SUB CAUTION (250)	
LCD901	8-753-050-52	ACX300CK-J	
⚠ND901	1-517-931-11	TUBE, FLUORESCENT, COLD CATHODE (2.5)	

Note :	**Note :**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

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6-1-5. CABINET (R) SECTION-2



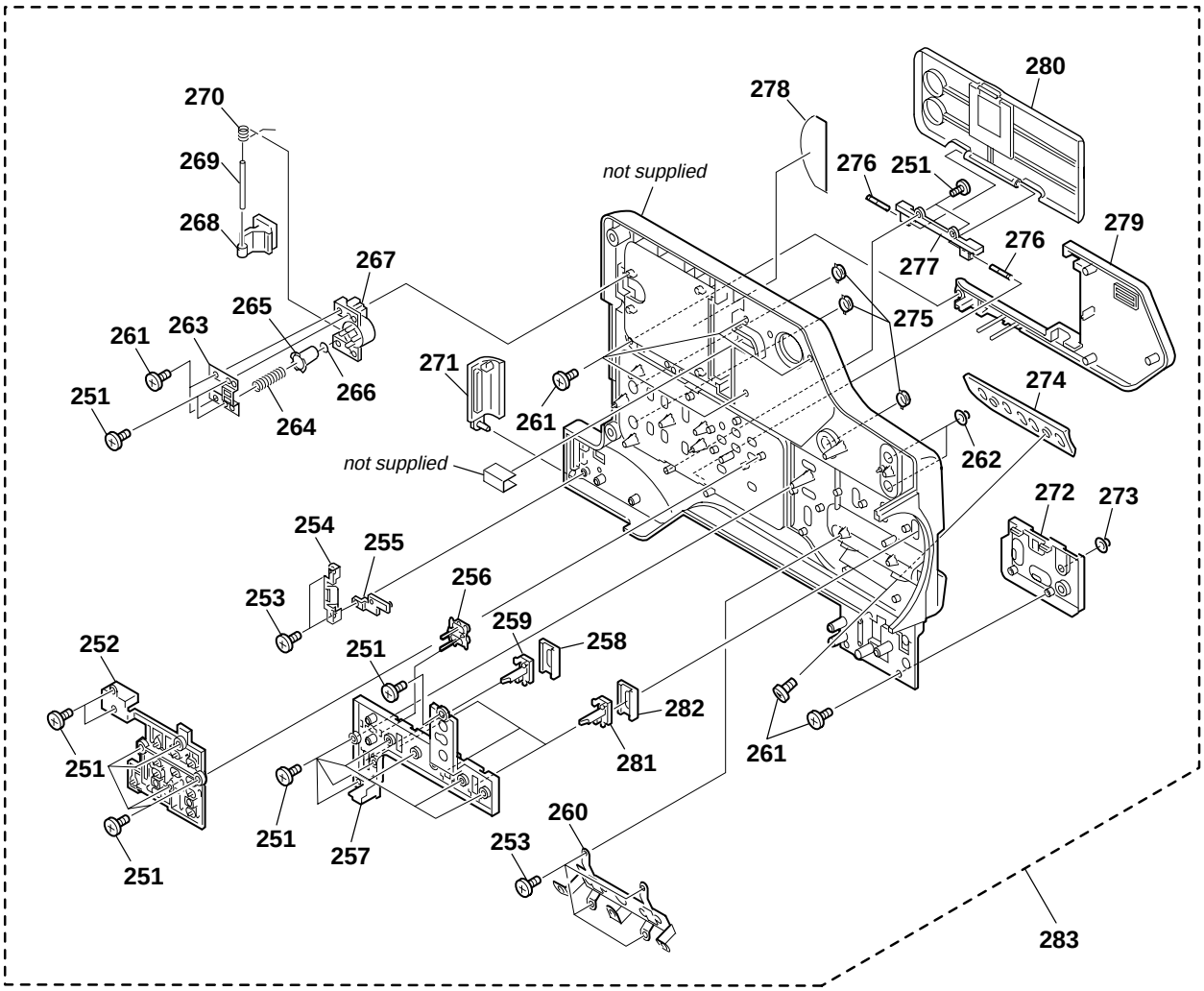
: BT501 (Lithium battary) SW-343 board on the mount position.(See page 4-88)

Ref. No.	Part No.	Description	Remarks
201	3-968-729-51	SCREW (M2), LOCK ACE, P2	
* 202	3-063-994-01	SHEET, SW PROTECTION	
203	A-7074-535-A	SW-343 BOARD, COMPLETE	
204	1-960-793-11	HARNESS (SP-167) 4P	
205	1-960-791-11	HARNESS (SK-101) 5P	
206	1-757-149-11	FSS-004 FLEXIBLE FLAT CABLE 7P	
207	1-960-792-11	HARNESS (SA-105) 6P	
208	A-7074-540-A	PM-040 BOARD, COMPLETE	
209	3-063-696-01	KNOB (A), SLIDE	

Ref. No.	Part No.	Description	Remarks
210	A-7074-539-A	MS-058 BOARD, COMPLETE	
211	A-7074-536-A	SB-036 BOARD, COMPLETE	
212	A-7074-537-A	AE-023 BOARD, COMPLETE	
* 213	3-063-698-01	FRAME, KP	
214	A-7074-538-A	KP-011 BOARD, COMPLETE	
* 215	X-3950-957-1	RETAINER ASSY, SP	
216	3-063-593-01	KNOB, VR	
SP901	1-529-590-11	SPEAKER (2.0CM)	

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6-1-6 CABINET (R) SECTION-3

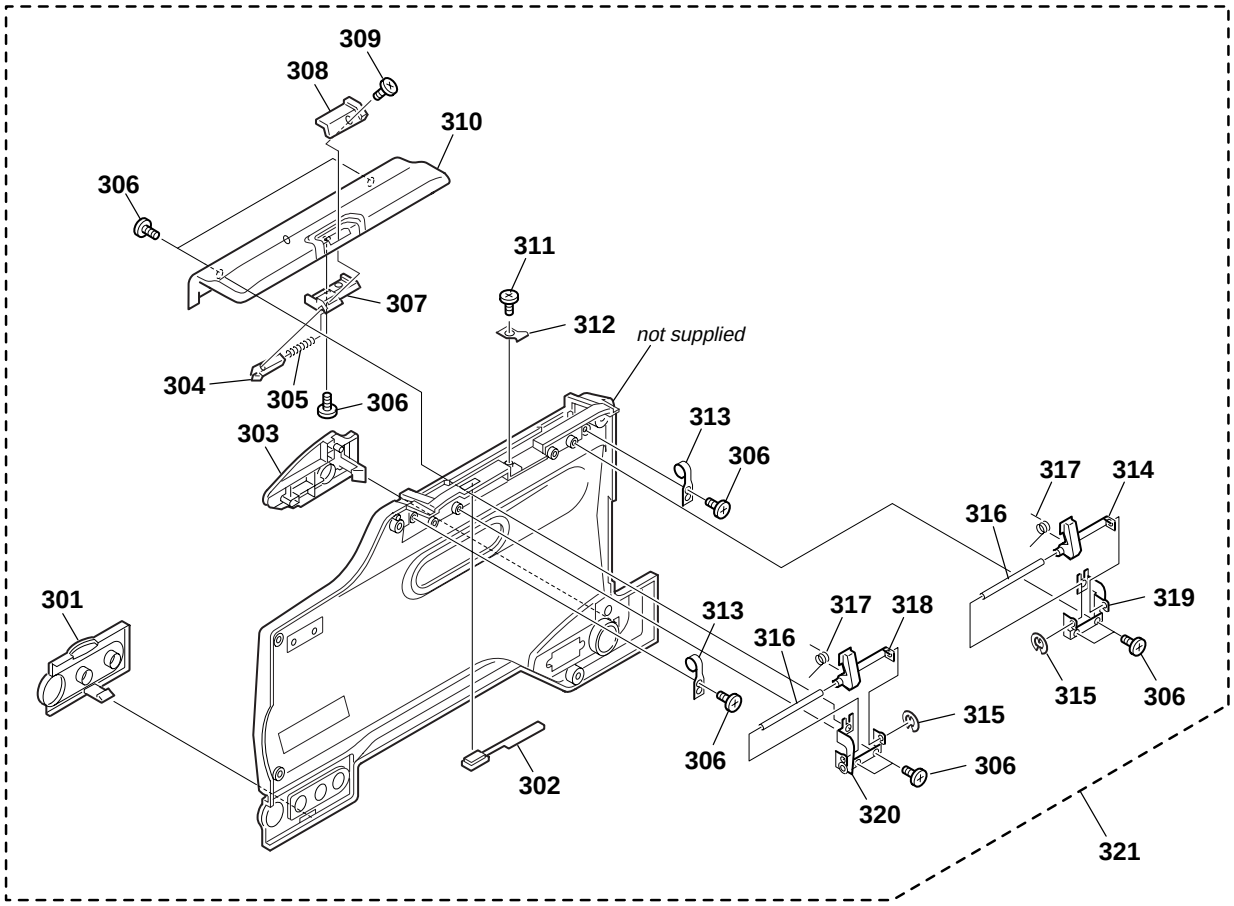


Ref. No.	Part No.	Description	Remarks
251	3-968-729-91	SCREW (M2), LOCK ACE, P2	
252	3-063-590-01	BUTTON, MS	
253	3-968-729-51	SCREW (M2), LOCK ACE, P2	
254	3-063-599-01	SPRING, MS	
* 255	3-063-600-01	LIGHT, MS TALLY GUIDE	
256	3-063-605-01	BUTTON, DA	
* 257	3-063-591-01	RETAINER (A), KNOB	
* 258	3-063-592-01	COVER (A), HOLE	
259	3-063-587-01	KNOB (B), SLIDE	
* 260	3-063-697-01	FRAME, AE	
261	3-948-339-61	TAPPING	
262	3-676-244-03	COVER, SWITCH	
* 263	3-063-580-01	BRACKET, PANEL LOCK	
264	3-060-633-01	SPRING, COMPRESSION	
265	3-060-632-21	UP, PANEL (POP)	
266	3-060-641-01	PAD, PANEL (POP) UP	
* 267	3-063-578-01	BASE, PANEL LOCK	

Ref. No.	Part No.	Description	Remarks
268	3-063-579-01	KNOB, PANEL LOCK	
269	3-055-248-01	SHAFT, PANEL LOCK	
* 270	3-063-721-01	SPRING, PANEL LOCK	
271	3-063-585-01	COVER, MS	
272	3-063-583-01	CABINET, POWER	
273	3-064-679-01	COVER (L STROKE), SW	
274	3-063-586-01	CABINET, AE	
* 275	3-063-606-01	GUIDE, VR	
276	3-063-597-01	SHAFT, SW	
277	3-063-805-01	RETAINER (B), SW SHAFT	
278	3-063-601-01	SHEET, PROTECTION	
279	X-3950-931-1	CABINET ASSY, SP	
280	X-3950-932-1	LID ASSY, SW	
281	3-063-589-01	KNOB (C), SLIDE	
* 282	3-063-602-01	COVER (B), HOLE	
283	X-3950-940-1	CABINET (R) ASSY	

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6-1-7. CABINET (L) ASSEMBLY

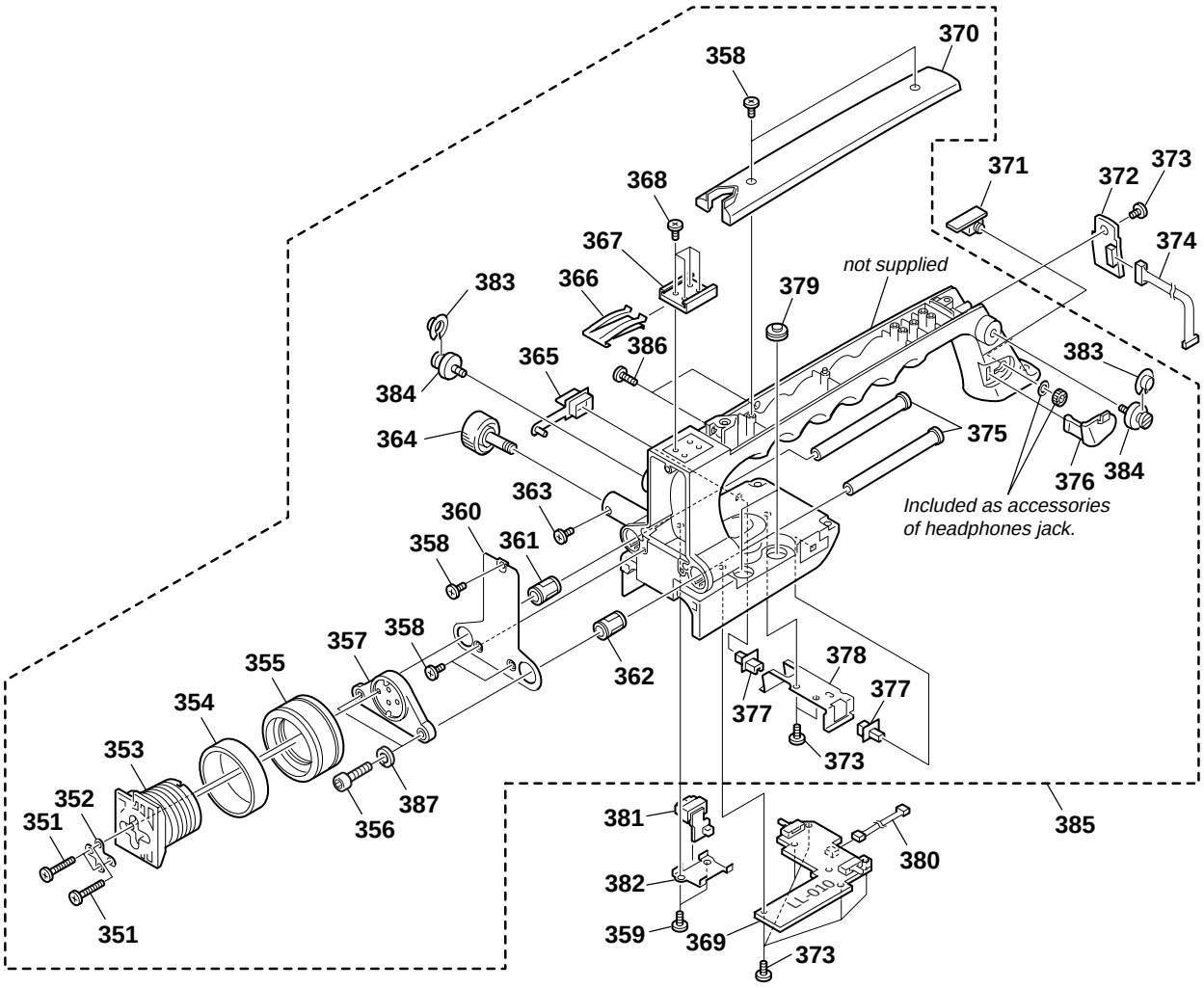


Ref. No.	Part No.	Description	Remarks
301	3-063-527-01	COVER (AV), JACK	
302	3-063-535-01	KEY, EJECT	
303	3-063-526-01	COVER (DV), JACK	
304	3-063-528-01	SLIDER, CC	
305	3-063-604-01	SPRING (SW), COMPRESSION COIL	
306	3-968-729-91	SCREW (M2), LOCK ACE, P2	
307	3-063-529-01	BASE, CC SLIDER	
308	3-063-533-01	KNOB, CC	
309	3-713-791-31	SCREW (M1.7X6), TAPPING, P2	
310	3-063-523-01	COVER, CASSETTE	
311	3-968-729-81	SCREW (M2), LOCK ACE, P2	

Ref. No.	Part No.	Description	Remarks
312	3-063-530-01	LOCK, CC	
313	3-063-531-01	SPRING, CC LEAF	
* 314	3-063-524-01	GUIDE (R), CASSETTE	
315	7-624-101-04	STOP RING 1.2 (E TYPE)	
316	3-063-534-01	SHAFT, CG	
* 317	3-063-532-01	SPRING, CC TORSION COIL	
* 318	3-063-536-01	GUIDE (L), CASSETTE	
319	X-3950-927-1	FRAME (R) ASSY, CC	
320	X-3950-928-1	FRAME (L) ASSY, CC	
321	X-3950-959-1	CABINET (L) ASSY (250)	
321	X-3951-182-1	CABINET (L) ASSY (250P)	

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6-1-8. CARRYING HANDLE SECTION

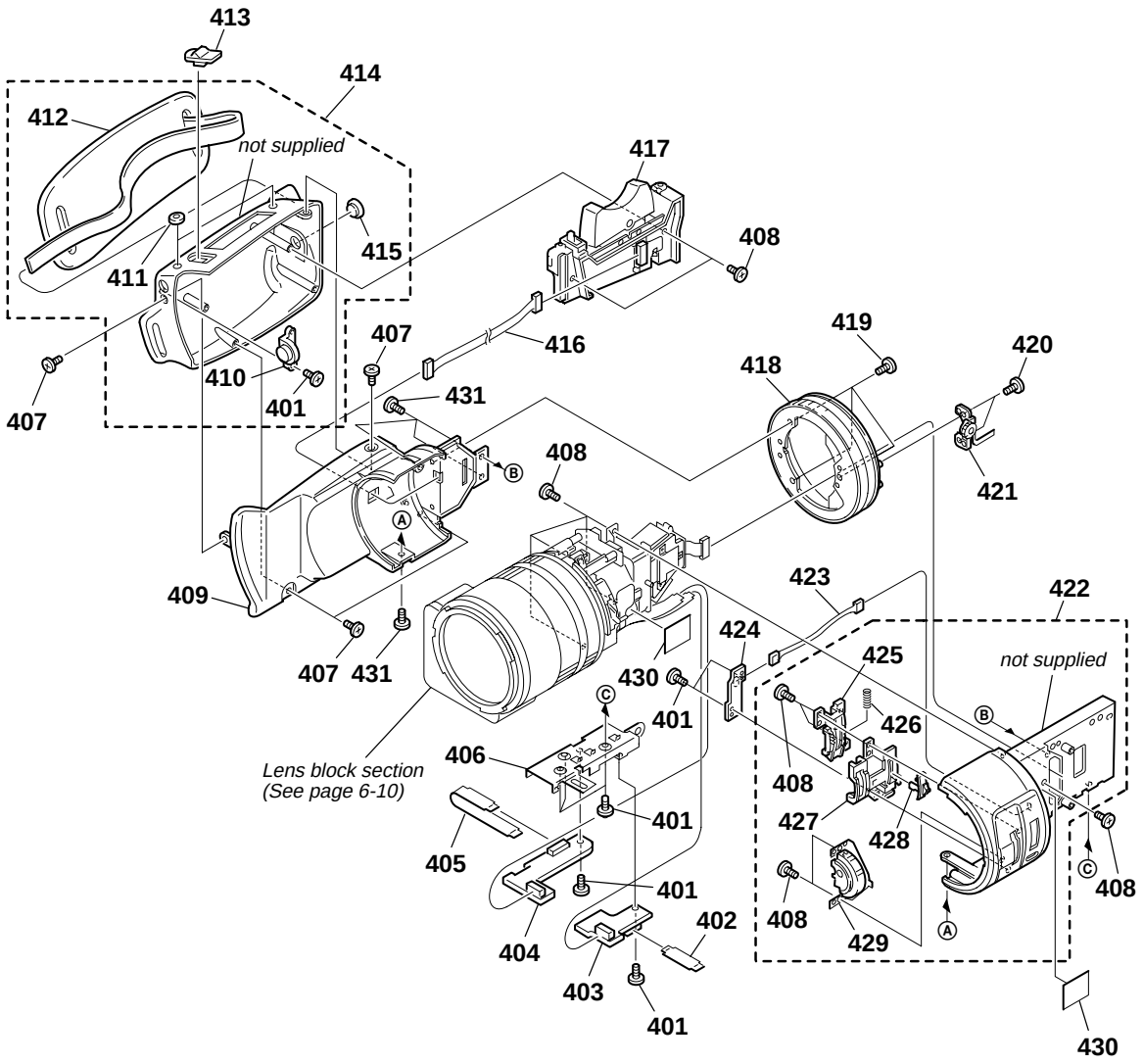


Ref. No.	Part No.	Description	Remarks
351	7-682-654-09	SCREW +PS M3X25	
* 352	3-687-070-01	WASHER, SHOE	
353	3-686-261-03	SHOE3, SLIDE, VF	
* 354	3-720-919-01	RUBBER, LOCK RING	
* 355	3-679-543-11	RING (D), LOCK	
356	7-683-421-04	BOLT, HEXAGON SOCKET M4X12	
357	3-063-659-01	BASE, VF SHOE	
358	3-061-062-01	BOLT (M2.6), SPRING	
359	7-682-548-09	SCREW +B M3X8	
* 360	3-063-661-01	COVER, HANDLE (FRONT)	
* 361	3-063-657-01	GUIDE (L), ARM	
* 362	3-063-655-01	GUIDE (R), ARM	
363	3-968-729-91	SCREW (M2), LOCK ACE, P2	
364	3-063-658-01	LOCK, ARM	
365	3-063-662-01	COVER, LIGHT	
366	3-688-754-11	SPRING	
367	3-688-755-11	SHOE, ACCESSORY	
368	3-968-729-11	SCREW (M2), LOCK ACE, P2	
369	A-7074-544-A	LL-010 BOARD, COMPLETE	

Ref. No.	Part No.	Description	Remarks
370	3-063-653-01	COVER, HANDLE (TOP)	
371	A-7074-542-A	HP-129 BOARD, COMPLETE	
372	A-7074-543-A	TH-010 BOARD, COMPLETE	
373	3-968-729-51	SCREW (M2), LOCK ACE, P2	
374	1-960-782-11	HARNESS (VH-050) 12P	
375	3-063-665-01	ARM, SLIDE	
376	3-063-663-01	COVER, PHONE	
377	3-063-617-01	KNOB, HANDLE SLIDE	
* 378	3-063-618-01	BRACKET, HANDLE SLIDE KNOB	
379	3-063-664-01	KEY, REV	
380	1-960-785-11	HARNESS (VL-054) 4P	
381	A-7074-541-A	VL-034 BOARD, COMPLETE	
* 382	3-063-715-01	RETAINER, LIGHT TERMINAL	
383	3-063-330-01	GUIDE, CARRYING BELT	
384	3-063-329-01	SHAFT, CARRYING BELT	
385	X-3950-951-1	HANDLE ASSY, CARRYING	
386	7-682-550-09	SCREW +B M3X12	
387	7-688-004-02	W4, SMALL	

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6-1-9. LENS BLOCK SECTION-1

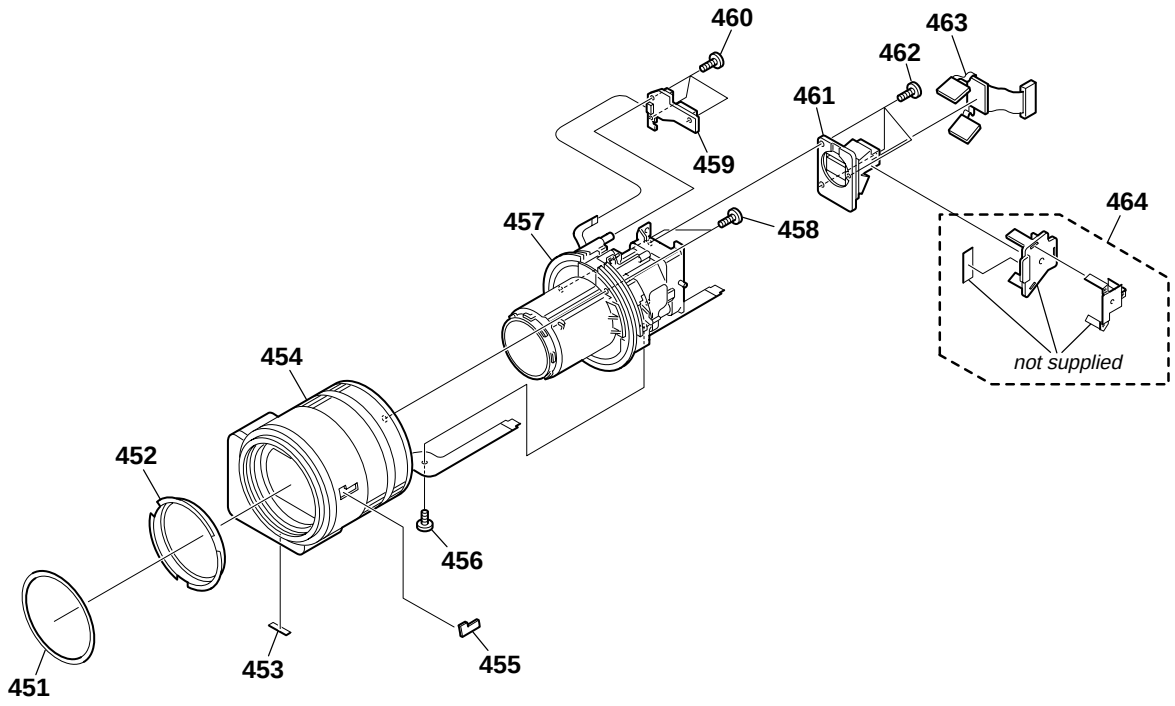


Ref. No.	Part No.	Description	Remarks
401	3-968-729-51	SCREW (M2), LOCK ACE, P2	
402	1-679-394-11	FP-243 FLEXIBLE BOARD 27P	
403	A-7074-534-A	ON-001 BOARD, COMPLETE	
404	A-7074-533-A	NO-001 BOARD, COMPLETE	
405	1-679-393-11	FP-242 FLEXIBLE BOARD 39P	
* 406	3-063-712-01	BRACKET (ON)	
407	7-682-548-09	SCREW +B M3X8	
408	3-968-729-91	SCREW (M2), LOCK ACE, P2	
409	3-063-716-01	BASE, GRIP	
410	3-063-610-01	WINDOW (G), RAY CATCHER	
411	3-063-664-01	KEY, REV	
412	3-063-612-01	BELT, GRIP	
413	X-3950-933-1	KNOB ASSY, SLIDE	
414	X-3950-946-1	GRIP ASSY	
415	3-063-611-01	KEY (A), GRIP	
416	1-960-775-11	HARNESS (VG-052) 12P	

Ref. No.	Part No.	Description	Remarks
417	1-476-007-11	SWITCH BLOCK, CONTROL (CF-1044)	
418	X-3950-936-1	RING ASSY, MI	
419	3-968-729-11	SCREW (M2), LOCK ACE, P2	
420	3-948-339-61	TAPPING	
421	1-476-008-11	SWITCH BLOCK, CONTROL (EG-1044)	
422	X-3950-930-1	CABINET (R) ASSY, LENS	
423	1-960-774-11	HARNESS (VF-071) 3P	
424	A-7074-530-A	FC-074 BOARD, COMPLETE	
425	3-063-562-01	HOLDER, MF KNOB	
426	3-063-604-01	SPRING, COMPRESSION (SW)	
427	3-063-561-01	ESCUTCHEON, MF	
428	3-063-560-01	KNOB, MF	
429	X-3950-934-1	KNOB ASSY, ND	
430	3-060-795-01	TAPE, HARNESS FIXED	
431	3-063-724-01	+B M3X6 (EG GRIP)	

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6-1-10. LENS BLOCK SECTION-2



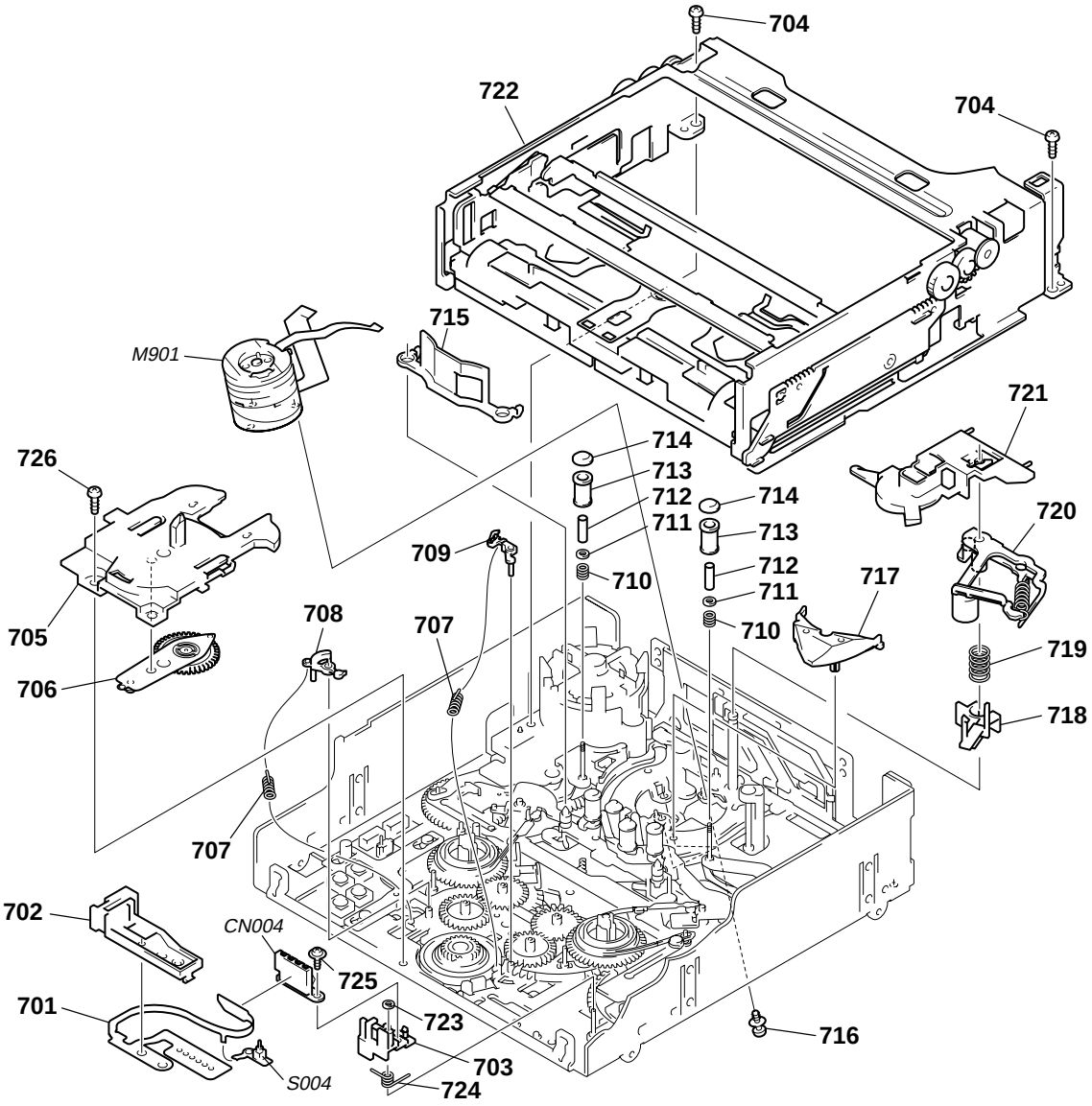
Be sure to read “Precautions upon replacing CCD imager” on page 4-9 when changing the CCD imager.

Ref. No.	Part No.	Description	Remarks
451	3-060-681-01	RING, NAME	
452	3-709-594-01	RING ASSY, GLASS ORNAMENTAL	
453	3-062-454-01	FOOT (A), RUBBER	
454	3-709-595-21	VAP ASSY (BC114C)	
455	3-963-933-01	EMBLEM, CCD	
456	3-713-791-91	SCREW (M1.7)	
457	3-709-596-01	LENS ASSY, ZOOM	
458	3-948-339-31	SCREW, TAPPING P2	
459	A-7074-532-A	SE-116 BOARD, COMPLETE	

Ref. No.	Part No.	Description	Remarks
460	3-948-339-61	TAPPING	
461	A-7031-100-A	PRISM ASSY (SERVICE) (INCLUDING 3CCD)	(250)
461	A-7031-101-A	PRISM ASSY (SERVICE) (INCLUDING 3CCD)	(250P)
462	3-713-791-61	SCREW (M1.7X7), TAPPING, P2	
463	A-7074-531-A	CD-274 BOARD, COMPLETE	
464	X-3950-586-1	COVER ASSY, PRISM	

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6-1-11. DRUM SECTION

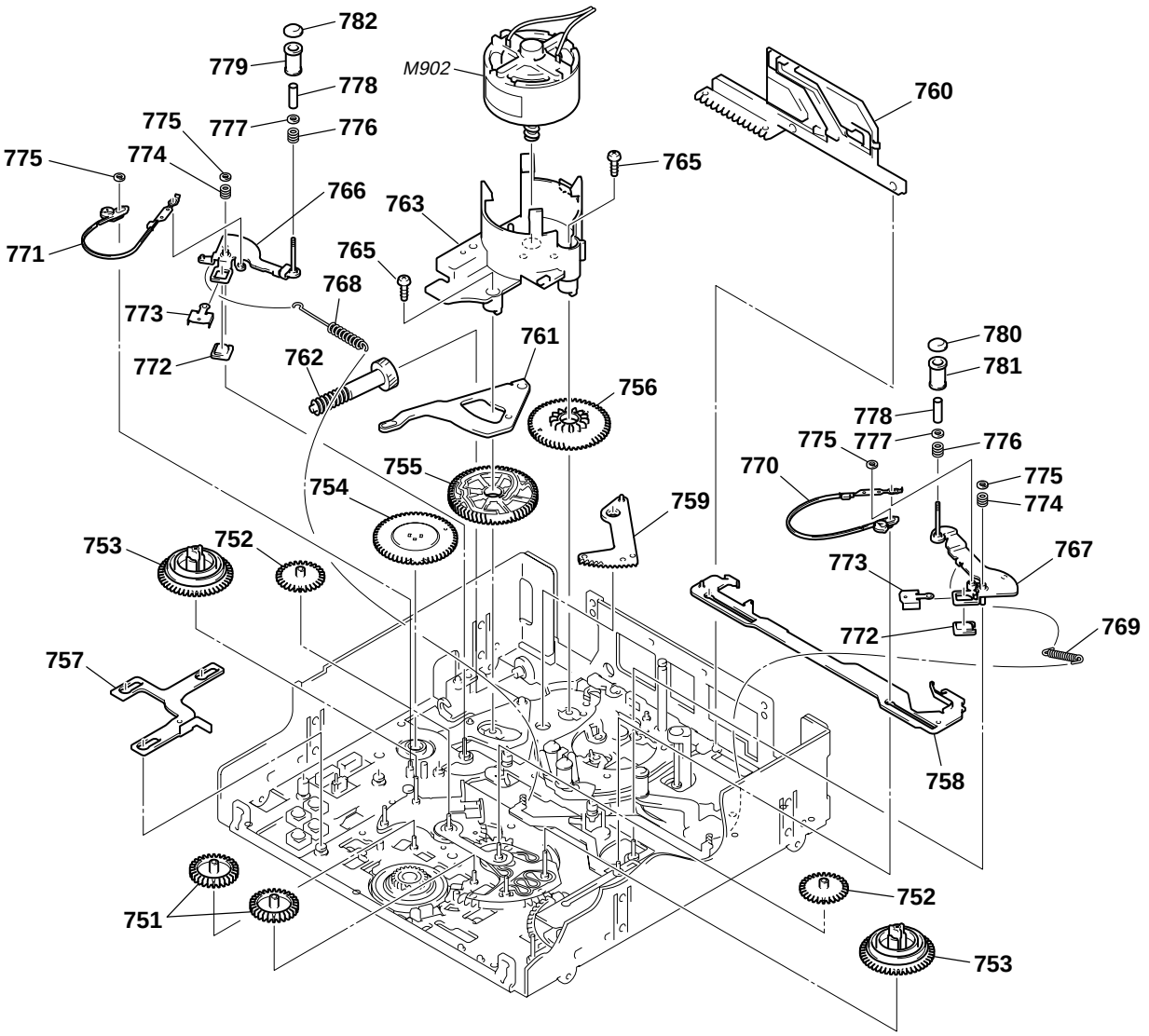


Ref. No.	Part No.	Description	Remarks
701	1-675-561-11	FP-104 FLEXIBLE BOARD	
* 702	3-057-351-01	GUIDE, MIC BASE	
703	3-057-350-02	BASE, MIC	
704	3-732-817-01	SCREW (M2X4.5), TAPPING	
705	3-057-319-01	RETAINER, PENDULUM	
706	X-3949-922-1	ARM ASSY, PENDULUM	
707	3-057-286-01	SPRING, EXTENSION (BRAKE)	
708	3-057-280-01	ARM (S), BRAKE	
709	3-057-279-01	BRAKE (T), RATCHET	
710	3-057-232-01	SPRING, COMPRESSION (TG)	
711	3-057-238-01	RING, TG	
712	3-057-237-01	SLEEVE, TG	
713	3-057-235-01	ROLLER, TG	
714	3-057-234-01	FLANGE, TG UPPER	
715	3-057-379-01	GUARD, GUIDE	

Ref. No.	Part No.	Description	Remarks
716	A-7094-608-B	SCREW ASSY, DRUM FITTING	
717	3-973-171-01	SUPPORT, TAPE	
718	3-057-227-01	RETAINER, TAPE	
719	3-973-818-01	SPRING, COMPRESSION (TAPE RETAINER)	
720	X-3949-915-1	ARM ASSY, PINCH	
721	3-057-228-01	CAP, DRUM	
722	A-7094-602-B	CASSETTE COMPARTMENT BLOCK ASSY	
723	3-726-829-01	WASHER, STOPPER	
724	3-057-353-01	SPRING, MIC BASE	
725	3-318-201-11	SCREW (B) (M1.4X3), TAPPING	
726	3-973-266-01	SCREW (M2X2.2 (MEK)), HEAD	
CN004	1-770-312-21	CONNECTOR 4P	
M901	A-4900-303-A	DRUM ASSY (SERVICE) (DEH-21A-R)	
S004	1-762-351-21	SWITCH, PUSH (1 KEY) (REC PROOF)	

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6-1-12. GEAR, ARM SECTION

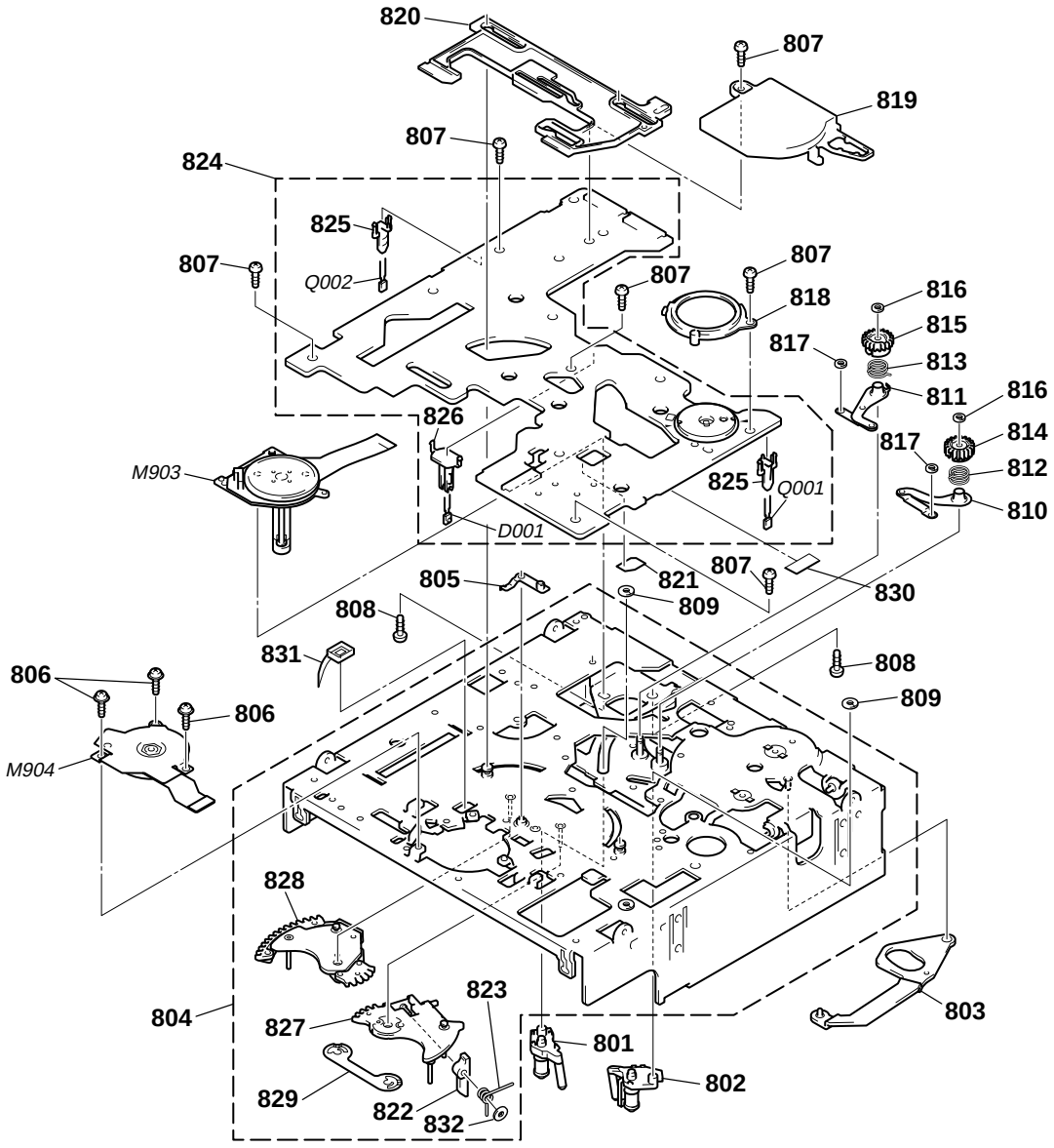


Ref. No.	Part No.	Description	Remarks
751	X-3949-923-1	GEAR (A) ASSY, IDLER	
752	3-057-311-01	GEAR (B), IDLER	
753	A-7094-599-A	REEL (LARGE) BLOCK ASSY	
754	3-057-267-01	GEAR, ENCODER	
755	3-057-294-01	GEAR, MAIN CAM	
756	3-973-140-01	GEAR, SUB CAM	
* 757	3-057-302-01	SLIDER, SBR	
* 758	3-057-314-01	SLIDER, SUB	
759	X-3950-816-1	ARM ASSY, LOADING	
760	3-057-221-01	SLIDER, PINCH	
* 761	3-057-252-01	ARM, SUB SLIDER	
762	3-973-159-01	GEAR, JOINT	
763	3-057-222-02	HOLDER, MOTOR	
765	3-973-266-01	SCREW (M2X2.2 (MEK)), HEAD	
766	X-3949-918-1	ARM ASSY, TG2	
767	X-3949-919-1	ARM ASSY, TG7	

Ref. No.	Part No.	Description	Remarks
768	3-057-295-01	SPRING, EXTENSION (TG2)	
769	3-057-296-02	SPRING, EXTENSION (TG7)	
770	X-3949-921-1	BAND (TG7) ASSY	
771	X-3949-920-1	BAND (TG2) ASSY	
772	3-057-281-01	MAGNET, ET	
773	3-057-336-01	HOLDER, MAGNET	
774	3-057-344-01	SPRING, COMPRESSION (TG ARM)	
775	3-726-829-01	WASHER, STOPPER	
776	3-057-232-01	SPRING, COMPRESSION (TG)	
777	3-057-238-01	RING, TG	
778	3-057-237-01	SLEEVE, TG	
779	3-057-235-01	ROLLER, TG	
780	3-057-234-01	FLANGE, TG UPPER	
781	3-057-337-01	ROLLER, TG7	
782	3-063-887-01	FLANGE (2), TG UPPER	
M902	X-3946-702-1	MOTOR ASSY, CAM	

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6-1-13. MOTOR, MD-76 BOARD SECTION

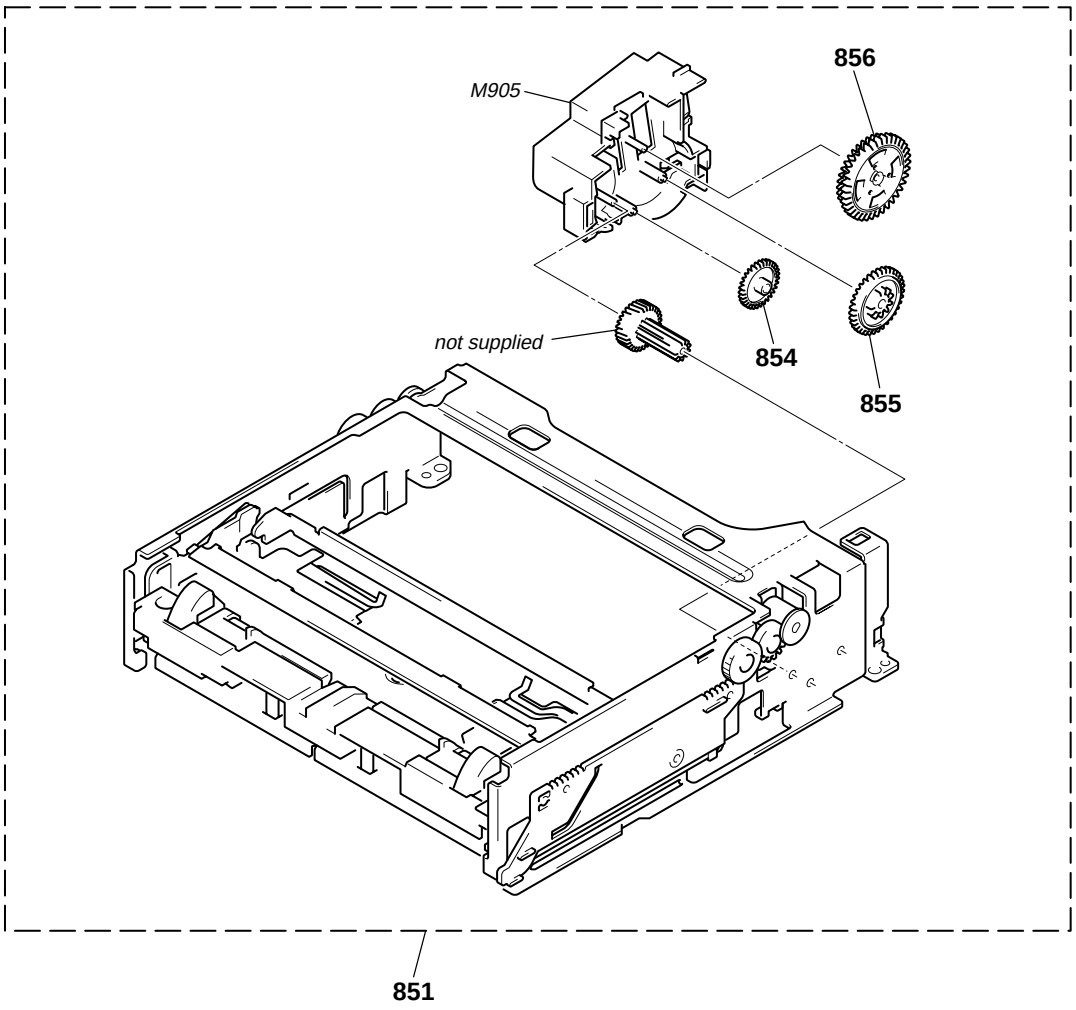


Ref. No.	Part No.	Description	Remarks
801	A-7025-007-A	COASTER (T) BLOCK ASSY	
802	A-7025-006-A	COASTER (S) ASSY	
* 803	3-057-283-01	ARM, MAIN SLIDER	
804	X-3949-916-9	CHASSIS ASSY, MECHANICAL	
805	X-3949-924-1	STOPPER ASSY, PENDULUM	
806	3-947-503-01	SCREW (M1.4)	
807	3-732-817-01	SCREW (M2X4.5), TAPPING	
808	3-973-266-01	SCREW (M2X2.2 (MEK)), HEAD	
809	3-973-142-01	STOPPER, COASTER PUNCHING	
810	X-3946-690-1	ARM(S) ASSY, GL	
811	X-3946-689-1	ARM (T) ASSY, GL	
812	3-973-146-02	SPRING (S), GL TORSION	
813	3-973-156-02	SPRING (T), GL TORSION	
814	3-973-264-01	GEAR (S), GL	
815	3-973-138-01	GEAR (T), GL	
816	3-727-176-01	WASHER, STOPPER	
817	3-973-143-01	WASHER, COASTER STOPPER	
818	3-057-339-01	COVER, ENCODER	
819	3-057-340-01	COVER, CAPSTAN	

Ref. No.	Part No.	Description	Remarks
820	3-057-282-01	SLIDER, MAIN	
821	1-657-785-11	FP-248 FLEXIBLE BOARD (DEW SENSOR)	
822	3-057-320-01	BLOCK, REEL LOCK RELEASE	
823	3-057-354-01	SPRING, REEL LOCK RELEASE	
824	A-7067-229-A	MD-76 BOARD, COMPLETE	
* 825	3-057-376-01	HOLDER, SENSOR	
* 826	3-057-555-01	HOLDER, LED	
827	X-3950-199-1	RAIL BASE, S ASSY (SERVICE)	
828	X-3950-200-1	RAIL BASE, T ASSY (SERVICE)	
829	3-057-265-01	RETAINER, REEL BASE	
830	3-941-343-21	TAPE (A)	
831	3-064-576-01	ECLIPSER	
832	3-726-829-01	WASHER, STOPPER	
D001	8-719-988-42	DIODE GL453S (TAPE LED)	
M903	8-835-648-01	MOTOR, DC (SCD17A/J-N) (CAPSTAN)	
M904	X-3949-928-1	MOTOR ASSY, REEL	
Q001	8-729-907-25	PHOTO TRANSISTOR PT4850F (TAPE END)	
Q002	8-729-907-25	PHOTO TRANSISTOR PT4850F (TAPE TOP)	

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6-1-14. CASSETTE COMPARTMENT BLOCK ASSEMBLY



Ref. No.	Part No.	Description	Remarks
851	A-7094-602-B	CASSETTE COMPARTMENT BLOCK ASSY	
854	3-057-254-01	GEAR (A)	
855	3-057-255-01	GEAR (B)	
856	A-7094-689-A	GEAR CD BLOCK ASSY (SERVICE)	
M905	X-3949-925-1	MOTOR ASSY, FL	

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6-2. 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, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
  uF: µF
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: µH
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA...: µA... , uPA... , µPA... ,
  uPB... , µPB... , uPC... , µPC... ,
  uPD..., µPD...

When indicating parts by reference number, please include the board name.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remarks
	A-7074-537-A	AE-023 BOARD, COMPLETE			
		**********			
		(Ref.No.;1000Series)			
		< CONNECTOR >			
CN041	1-778-508-21	PIN, CONNECTOR (PC BOARD) 6P			
		< DIODE >			
D041	8-719-064-61	DIODE 01BZA8.2(TE85L)			
D042	8-719-064-61	DIODE 01BZA8.2(TE85L)			
D043	8-719-064-61	DIODE 01BZA8.2(TE85L)			
		< RESISTOR >			
R041	1-216-837-11	METAL CHIP	22K	5%	1/16W
R042	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R043	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R044	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R045	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
		< SWITCH >			
S041	1-570-985-11	SWITCH, TOGGLE (GAIN)			
S042	1-570-985-11	SWITCH, TOGGLE (WHITE BAL)			
S043	1-570-984-11	SWITCH, TOGGLE (PRESET)			
S044	1-571-396-11	SWITCH, TOGGLE (CUSTOM)			
S045	1-572-660-11	SWITCH, TOGGLE (AE SHIFT)			
	A-7074-531-A	CD-274 BOARD, COMPLETE			
		**********			
		(Ref.No.;1000Series)			
		(IC100,101,102 are not included in this completed board)			
		< CAPACITOR >			
C100	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C101	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C102	1-119-751-11	TANTAL. CHIP	22uF	20%	16V
C103	1-119-751-11	TANTAL. CHIP	22uF	20%	16V
C104	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C105	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C108	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C109	1-107-686-11	TANTAL. CHIP	4.7uF	20%	16V
C110	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C111	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C112	1-107-686-11	TANTAL. CHIP	4.7uF	20%	16V
C113	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C114	1-107-686-11	TANTAL. CHIP	4.7uF	20%	16V
C115	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C117	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C118	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C119	1-119-751-11	TANTAL. CHIP	22uF	20%	16V
C120	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C130	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C131	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C132	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C133	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C134	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C135	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
		< CONNECTOR >			
CN100	1-778-078-21	CONNECTOR, BOARD TO BOARD 50P			
		< IC >			
IC103	8-759-561-46	IC AD8014ART-REEL7			
IC104	8-759-561-46	IC AD8014ART-REEL7			
IC105	8-759-561-46	IC AD8014ART-REEL7			
		< COIL >			
L100	1-412-963-11	INDUCTOR	100uH		
L101	1-412-963-11	INDUCTOR	100uH		
L104	1-412-963-11	INDUCTOR	100uH		
L105	1-412-963-11	INDUCTOR	100uH		
L106	1-412-963-11	INDUCTOR	100uH		
L107	1-412-963-11	INDUCTOR	100uH		
		< RESISTOR >			
R100	1-218-962-11	RES-CHIP	5.6K	5%	1/16W
R101	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R102	1-218-962-11	RES-CHIP	5.6K	5%	1/16W
R103	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R104	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R105	1-218-962-11	RES-CHIP	5.6K	5%	1/16W
R106	1-218-953-11	RES-CHIP	1K	5%	1/16W
R107	1-218-940-11	RES-CHIP	82	5%	1/16W
R108	1-218-953-11	RES-CHIP	1K	5%	1/16W
R109	1-218-940-11	RES-CHIP	82	5%	1/16W
R110	1-218-953-11	RES-CHIP	1K	5%	1/16W
R111	1-218-940-11	RES-CHIP	82	5%	1/16W
R112	1-220-210-11	RES-CHIP	200K	5%	1/16W
R113	1-220-210-11	RES-CHIP	200K	5%	1/16W
R114	1-220-210-11	RES-CHIP	200K	5%	1/16W

Be sure to read "Precautions upon replacing CCD imager" on page 4-9 when changing the CCD imager.

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DC-095 DD-146

Ref. No.	Part No.	Description				Remarks
	A-7074-552-A	DC-095 BOARD, COMPLETE				
		**********				
						(Ref.No.;1000Series)
		< CONNECTOR >				
CN281	1-506-467-11	PIN, CONNECTOR 2P				
CN282	1-563-929-11	CONNECTOR, ROUND TYPE (RF) 4P				
						(DC OUT 12V)
	A-7074-546-A	DD-146 BOARD, COMPLETE				
		**********				
						(Ref.No.;1000Series)
		< CAPACITOR >				
C302	1-104-478-11	TANTAL. CHIP	10uF	20%	35V	
C304	1-107-690-11	TANTAL. CHIP	6.8uF	20%	35V	
C305	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V	
C306	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C307	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C308	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V	
C309	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V	
C310	1-162-920-11	CERAMIC CHIP	27PF	5%	50V	
C311	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V	
C312	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V	
C313	1-125-988-21	ELECT CHIP	330uF	20%	25V	
C314	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V	
C315	1-163-038-11	CERAMIC CHIP	0.1uF		25V	
C316	1-163-038-11	CERAMIC CHIP	0.1uF		25V	
C317	1-163-038-11	CERAMIC CHIP	0.1uF		25V	
C318	1-163-038-11	CERAMIC CHIP	0.1uF		25V	
C319	1-128-347-11	ELECT CHIP	82uF	20%	16V	
C320	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C321	1-162-927-11	CERAMIC CHIP	100PF	5%	50V	
C323	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C324	1-104-919-11	TANTAL. CHIP	10uF	20%	25V	
C325	1-107-690-11	TANTAL. CHIP	6.8uF	20%	35V	
C326	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C327	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V	
C328	1-163-237-11	CERAMIC CHIP	27PF	5%	50V	
C331	1-110-618-11	ELECT	12uF	20%	63V	
C332	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V	
C333	1-125-988-21	ELECT CHIP	330uF	20%	25V	
C334	1-163-038-11	CERAMIC CHIP	0.1uF		25V	
C335	1-163-038-11	CERAMIC CHIP	0.1uF		25V	
C336	1-163-038-11	CERAMIC CHIP	0.1uF		25V	
C337	1-163-038-11	CERAMIC CHIP	0.1uF		25V	
C338	1-165-319-11	CERAMIC CHIP	0.1uF		50V	
C339	1-165-319-11	CERAMIC CHIP	0.1uF		50V	
C340	1-110-618-11	ELECT	12uF	20%	63V	
C341	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C342	1-125-988-21	ELECT CHIP	330uF	20%	25V	
C343	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C344	1-104-920-11	TANTAL. CHIP	4.7uF	20%	35V	
C345	1-104-920-11	TANTAL. CHIP	4.7uF	20%	35V	
C346	1-117-193-11	CERAMIC	1.5uF		50V	
C347	1-163-038-11	CERAMIC CHIP	0.1uF		25V	
C348	1-104-920-11	TANTAL. CHIP	4.7uF	20%	35V	
C349	1-104-920-11	TANTAL. CHIP	4.7uF	20%	35V	
C350	1-104-920-11	TANTAL. CHIP	4.7uF	20%	35V	
C351	1-104-920-11	TANTAL. CHIP	4.7uF	20%	35V	
C352	1-110-398-11	TANTAL. CHIP	15uF	20%	35V	
C353	1-110-398-11	TANTAL. CHIP	15uF	20%	35V	
		< CONNECTOR >				
* CN301	1-560-356-00	CONNECTOR POST HEADER,ILG (2P)				
CN302	1-506-469-11	PIN, CONNECTOR 4P				
CN303	1-506-474-11	PIN, CONNECTOR 9P				
CN304	1-506-467-11	PIN, CONNECTOR 2P				
* CN305	1-766-383-11	PIN, CONNECTOR (1.5MM)(SMD)12P				
CN306	1-691-550-11	PIN, CONNECTOR (1.5MM)(SMD) 3P				
		< DIODE >				
D301	8-719-066-98	DIODE RB051L-40TE25				
D302	8-719-987-21	DIODE SB02-09CP-TB				
D304	8-719-941-86	DIODE DAN202UT106				
D305	8-719-066-33	DIODE RB081L-20TE25				
		< FUSE >				
⚠F301	1-576-286-21	FUSE, MICRO (1.4A/24V)				
⚠F302	1-576-286-21	FUSE, MICRO (1.4A/24V)				
⚠F303	1-576-286-21	FUSE, MICRO (1.4A/24V)				
⚠F304	1-576-286-21	FUSE, MICRO (1.4A/24V)				
⚠F305	1-576-286-21	FUSE, MICRO (1.4A/24V)				
⚠F307	1-576-410-21	FUSE, CHIP (2A/63V)				
		< IC >				
IC301	8-759-521-35	IC TL5001CDR				
IC302	8-759-521-35	IC TL5001CDR				
IC303	8-759-521-35	IC TL5001CDR				
IC304	8-759-701-36	IC NJM3403AM				
		< COIL >				
L301	1-412-058-11	INDUCTOR CHIP	10uH			
L302	1-419-824-11	INDUCTOR	6.8uH			
L304	1-416-906-11	INDUCTOR	33uH			
L306	1-414-405-11	INDUCTOR	150uH			
L308	1-419-822-21	INDUCTOR	7uH			
L309	1-419-823-21	INDUCTOR	33uH			
L310	1-416-865-21	INDUCTOR	33uH			
		< IC LINK >				
⚠PS302	1-576-123-21	LINK, IC (0.8A)				
⚠PS303	1-576-123-21	LINK, IC (0.8A)				
⚠PS304	1-576-123-21	LINK, IC (0.8A)				
		< TRANSISTOR >				
Q303	8-729-117-32	TRANSISTOR	2SC4177-T1L5L6			
Q304	8-729-140-63	TRANSISTOR	2SA1611T1-M5M6			
Q305	8-729-033-65	TRANSISTOR	2SJ204-T1B			
Q306	8-729-117-32	TRANSISTOR	2SC4177-T1L5L6			
Q307	8-729-117-32	TRANSISTOR	2SC4177-T1L5L6			
Q308	8-729-043-74	TRANSISTOR	SI4435DY-T1-REVA			
Q309	8-729-117-32	TRANSISTOR	2SC4177-T1L5L6			
Q310	8-729-041-23	TRANSISTOR	NDS356AP			
Q311	8-729-117-32	TRANSISTOR	2SC4177-T1L5L6			
Q312	8-729-140-63	TRANSISTOR	2SA1611T1-M5M6			

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note :
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

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Ref. No.	Part No.	Description			Remarks
Q313	8-729-029-14	TRANSISTOR	DTC144EUA-T106		
Q314	8-729-028-91	TRANSISTOR	DTA144EUA-T106		
Q315	8-729-042-92	TRANSISTOR	2SK1470-TD		
Q316	8-729-117-32	TRANSISTOR	2SC4177-T1L5L6		
Q317	8-729-140-63	TRANSISTOR	2SA1611T1-M5M6		
Q318	8-729-117-32	TRANSISTOR	2SC4177-T1L5L6		
Q319	8-729-043-74	TRANSISTOR	SI4435DY-T1-REVA		
Q320	8-729-117-32	TRANSISTOR	2SC4177-T1L5L6		
Q321	8-729-045-16	TRANSISTOR	SI4410DY-T1-REVA		
Q322	8-729-117-32	TRANSISTOR	2SC4177-T1L5L6		
Q323	8-729-117-32	TRANSISTOR	2SC4177-T1L5L6		
		< RESISTOR >			
R302	1-216-029-00	METAL CHIP	150	5%	1/10W
R303	1-218-868-11	METAL CHIP	7.5K	0.5%	1/16W
R304	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R305	1-218-897-11	METAL CHIP	120K	0.5%	1/16W
R306	1-216-073-00	METAL CHIP	10K	5%	1/10W
R307	1-216-845-11	METAL CHIP	100K	5%	1/16W
R308	1-218-847-11	METAL CHIP	1K	0.5%	1/16W
R309	1-216-846-11	METAL CHIP	120K	5%	1/16W
R310	1-216-849-11	METAL CHIP	220K	5%	1/16W
R311	1-216-073-00	METAL CHIP	10K	5%	1/10W
R312	1-216-073-00	METAL CHIP	10K	5%	1/10W
R313	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R314	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R315	1-216-013-00	METAL CHIP	33	5%	1/10W
R317	1-216-853-11	METAL CHIP	470K	5%	1/16W
R318	1-216-105-91	RES-CHIP	220K	5%	1/10W
R319	1-216-097-11	RES-CHIP	100K	5%	1/10W
R320	1-216-833-11	METAL CHIP	10K	5%	1/16W
R321	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R322	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R323	1-216-845-11	METAL CHIP	100K	5%	1/16W
R324	1-216-841-11	METAL CHIP	47K	5%	1/16W
R325	1-216-809-11	METAL CHIP	100	5%	1/16W
R326	1-216-864-11	METAL CHIP	0	5%	1/16W
R327	1-216-097-11	RES-CHIP	100K	5%	1/10W
R328	1-216-029-00	METAL CHIP	150	5%	1/10W
R330	1-208-807-11	METAL CHIP	11K	0.5%	1/10W
R331	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R332	1-216-073-00	METAL CHIP	10K	5%	1/10W
R333	1-216-845-11	METAL CHIP	100K	5%	1/16W
R334	1-218-847-11	METAL CHIP	1K	0.5%	1/16W
R335	1-216-073-00	METAL CHIP	10K	5%	1/10W
R336	1-216-073-00	METAL CHIP	10K	5%	1/10W
R337	1-216-013-00	METAL CHIP	33	5%	1/10W
R338	1-216-025-11	RES-CHIP	100	5%	1/10W
R339	1-216-105-91	RES-CHIP	220K	5%	1/10W
R340	1-216-097-11	RES-CHIP	100K	5%	1/10W
R341	1-218-879-11	METAL CHIP	22K	0.5%	1/16W
R342	1-218-877-11	METAL CHIP	18K	0.5%	1/16W
R343	1-218-865-11	METAL CHIP	5.6K	0.5%	1/16W
R344	1-218-847-11	METAL CHIP	1K	0.5%	1/16W
R345	1-216-077-91	RES-CHIP	15K	5%	1/10W
R346	1-216-049-11	RES-CHIP	1K	5%	1/10W
R347	1-216-073-00	METAL CHIP	10K	5%	1/10W
R348	1-216-838-11	METAL CHIP	27K	5%	1/16W
R349	1-216-105-91	RES-CHIP	220K	5%	1/10W
R350	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R351	1-219-989-11	RES-CHIP	0.02	1%	1W
R352	1-216-097-11	RES-CHIP	100K	5%	1/10W
R353	1-216-838-11	METAL CHIP	27K	5%	1/16W
R354	1-216-838-11	METAL CHIP	27K	5%	1/16W
R404	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
	A-7074-550-A	DV-031 BOARD, COMPLETE			
		**********			
		(Ref.No.;1000Series)			
		< CONNECTOR >			
* CN161	1-580-789-21	PIN, CONNECTOR (SMD) 6P			
CN162	1-793-304-12	SQUARE-BUILT CONNECTOR(1394)			
		(DV IN/OUT)			
		< SHORT JUMPER >			
JS161	1-216-296-91	SHORT	0		
JS162	1-216-296-91	SHORT	0		
	A-7074-554-A	EJ-034 BOARD, COMPLETE			
		**********			
		(Ref.No.;1000Series)			
		< CONNECTOR >			
CN291	1-766-336-21	CONNECTOR, FFC/FPC 6P			
		< SWITCH >			
S291	1-771-138-61	SWITCH, KEY BOARD (EJECT)			
	A-7074-530-A	FC-074 BOARD, COMPLETE			
		**********			
		(Ref.No.;1000Series)			
		< CONNECTOR >			
* CN221	1-793-137-21	PIN, CONNECTOR 3P			
		< DIODE >			
D221	8-719-073-03	DIODE MA8082-(K8).S0			
D222	8-719-062-16	DIODE 01ZA8.2(TPL3)			
		< RESISTOR >			
R223	1-216-837-11	METAL CHIP	22K	5%	1/16W
		< SWITCH >			
S221	1-572-078-11	SWITCH, TACTILE (PUSH AUTO)			
S222	1-771-487-21	SWITCH, SLIDE (INFINITY/MANU/AUTO)			
	A-7074-556-A	FS-082 BOARD, COMPLETE			
		**********			
		(Ref.No.;2000Series)			
		< CONNECTOR >			
CN401	1-778-508-21	PIN, CONNECTOR (PC BOARD) 6P			

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FS-082 **HP-129** **IN-057** **JK-197**

Ref. No.	Part No.	Description			Remarks
		< DIODE >			
D401	8-719-064-61	DIODE 01BZA8.2(TE85L)			
D402	8-719-064-61	DIODE 01BZA8.2(TE85L)			
		< RESISTOR >			
R401	1-216-837-11	METAL CHIP	22K	5%	1/16W
R402	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R403	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R404	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R405	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R408	1-216-864-11	METAL CHIP	0	5%	1/16W
		< VARIABLE RESISTOR >			
RV401	1-225-610-11	RES, VAR, CARBON 5K/5K (AUDIO LEVEL)			
		< SWITCH >			
S401	1-571-414-11	SWITCH, TOGGLE (SHUTTER ON/OFF)			
S402	1-771-435-11	SWITCH, TACTILE (START/STOP)			
S403	1-771-435-11	SWITCH, TACTILE (INDEX MARK)			
S404	1-571-417-11	SWITCH, TOGGLE (WHITE BAL ON/OFF)			
* S405	1-571-914-21	SWITCH, TACTILE (FADER)			
	A-7074-542-A	HP-129 BOARD, COMPLETE			
		**********			
		(Ref.No.;1000Series)			
		< CAPACITOR >			
C901	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C902	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
		< CONNECTOR >			
CN901	1-778-508-21	PIN, CONNECTOR (PC BOARD) 6P			
		< DIODE >			
D901	8-719-062-16	DIODE 01ZA8.2(TPL3)			
D902	8-719-062-16	DIODE 01ZA8.2(TPL3)			
D903	8-719-062-16	DIODE 01ZA8.2(TPL3)			
D904	8-719-062-16	DIODE 01ZA8.2(TPL3)			
		< JACK >			
J901	1-507-980-41	JACK (PHONES)			
		< SHORT JUMPER >			
JS901	1-216-864-11	METAL CHIP	0	5%	1/16W
JS902	1-216-864-11	METAL CHIP	0	5%	1/16W
JS903	1-216-864-11	METAL CHIP	0	5%	1/16W
JS904	1-216-864-11	METAL CHIP	0	5%	1/16W
JS905	1-216-864-11	METAL CHIP	0	5%	1/16W
	A-7074-548-A	IN-057 BOARD, COMPLETE			
		**********			
		(Ref.No.;1000Series)			
		< CAPACITOR >			
C241	1-128-406-11	ELECT CHIP	33uF	20%	50V
C242	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C243	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V

Ref. No.	Part No.	Description			Remarks
		< CIRCUIT BREAKER >			
CB241	1-532-524-11	BREAKER, CIRCUIT			
		< CONNECTOR >			
CN241	1-506-485-11	PIN, CONNECTOR 6P			
* CN242	1-566-693-11	PIN, CONNECTOR 2P			
CN243	1-506-474-11	PIN, CONNECTOR 9P			
		< DIODE >			
D241	8-719-030-03	DIODE EA60QC06-TE16F2			
		< TRANSISTOR >			
Q241	8-729-043-74	TRANSISTOR	SI4435DY-T1-REVA		
Q242	8-729-043-74	TRANSISTOR	SI4435DY-T1-REVA		
Q243	8-729-043-74	TRANSISTOR	SI4435DY-T1-REVA		
		< RESISTOR >			
R243	1-216-097-11	RES-CHIP	100K	5%	1/10W
R244	1-216-097-11	RES-CHIP	100K	5%	1/10W
	A-7074-555-A	JK-197 BOARD, COMPLETE			
		**********			
		(Ref.No.;1000Series)			
		< CONNECTOR >			
CN181	1-785-283-21	PIN, CONNECTOR (PC BOARD) 14P			
		< DIODE >			
D181	8-719-062-16	DIODE 01ZA8.2(TPL3)			
D182	8-719-073-03	DIODE MA8082-(K8).S0			
D183	8-719-062-16	DIODE 01ZA8.2(TPL3)			
D184	8-719-062-16	DIODE 01ZA8.2(TPL3)			
D185	8-719-062-16	DIODE 01ZA8.2(TPL3)			
D186	8-719-073-03	DIODE MA8082-(K8).S0			
D187	8-719-062-16	DIODE 01ZA8.2(TPL3)			
D188	8-719-073-03	DIODE MA8082-(K8).S0			
D189	8-719-073-03	DIODE MA8082-(K8).S0			
		< FERRITE BEAD >			
FB181	1-500-444-11	FERRITE	0UH		
FB182	1-500-444-11	FERRITE	0UH		
		< JACK >			
J181	1-694-713-11	TERMINAL BOARD (VIDEO/LCH/RCH)			
J182	1-566-850-31	CONNECTOR, (S) TERMINAL 4P (S VIDEO)			
		< COIL >			
L181	1-412-963-11	INDUCTOR	100uH		
L182	1-412-963-11	INDUCTOR	100uH		
		< RESISTOR >			
R181	1-216-864-11	METAL CHIP	0	5%	1/16W
R182	1-216-864-11	METAL CHIP	0	5%	1/16W
R184	1-216-864-11	METAL CHIP	0	5%	1/16W
R185	1-216-864-11	METAL CHIP	0	5%	1/16W
R186	1-216-864-11	METAL CHIP	0	5%	1/16W

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Ref. No.	Part No.	Description			Remarks
R187	1-216-864-11	METAL CHIP	0	5%	1/16W
R188	1-216-864-11	METAL CHIP	0	5%	1/16W
R189	1-216-864-11	METAL CHIP	0	5%	1/16W
R190	1-216-864-11	METAL CHIP	0	5%	1/16W
	A-7074-538-A	KP-011 BOARD, COMPLETE			
		**********			
					(Ref.No.;1000Series)
		< CONNECTOR >			
CN121	1-793-302-21	PIN, CONNECTOR (PC BOARD) 5P			
		< DIODE >			
D121	8-719-421-59	DIODE MA3075WA-(TX)			
D122	8-719-421-59	DIODE MA3075WA-(TX)			
		< SWITCH >			
S121	1-771-025-21	SWITCH, ROTARY (ENCODER)			
					(SEL/PUSH EXEC)
	A-7074-545-A	KY-049 BOARD, COMPLETE			
		**********			
					(Ref.No.;1000Series)
		< CONNECTOR >			
CN261	1-779-328-21	CONNECTOR, FFC/FPC 8P			
CN262	1-779-327-11	CONNECTOR, FFC/FPC 6P			
		< DIODE >			
D261	8-719-062-16	DIODE 01ZA8.2(TPL3)			
		< RESISTOR >			
R262	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R263	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R264	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R265	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R266	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R267	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R268	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R269	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R270	1-216-837-11	METAL CHIP	22K	5%	1/16W
		< SWITCH >			
S261	1-572-438-11	SWITCH, TACTIL (STOP)			
S262	1-572-438-11	SWITCH, TACTIL (PAUSE)			
S263	1-572-438-11	SWITCH, TACTIL (REW)			
S264	1-572-438-11	SWITCH, TACTIL (FF)			
S265	1-572-438-11	SWITCH, TACTIL (PLAY)			
S266	1-572-438-11	SWITCH, TACTIL (SLOW)			
S267	1-572-438-11	SWITCH, TACTIL (REC)			
S268	1-572-438-11	SWITCH, TACTIL (AUDIO DUB)			
S269	1-572-438-11	SWITCH, TACTIL (REC)			
S270	1-572-438-11	SWITCH, TACTIL (FRAME+)			
S271	1-572-438-11	SWITCH, TACTIL (FRAME-)			

Ref. No.	Part No.	Description			Remarks
	A-7074-544-A	LL-010 BOARD, COMPLETE			
		**********			
					(Ref.No.;1000Series)
		< CONNECTOR >			
CN471	1-778-507-21	PIN, CONNECTOR (PC BOARD) 4P			
		< DIODE >			
D471	8-719-064-61	DIODE 01BZA8.2(TE85L)			
D472	8-719-064-61	DIODE 01BZA8.2(TE85L)			
		< RESISTOR >			
R471	1-216-837-11	METAL CHIP	22K	5%	1/16W
		< SWITCH >			
S471	1-762-333-21	SWITCH, TACTILE (EDIT-/REC REV)			
S472	1-762-333-21	SWITCH, TACTILE (EDIT+)			
S473	1-571-767-11	SWITCH, SLIDE (LIGHT)			
S474	1-571-767-11	SWITCH, SLIDE (LOW CUT ON/OFF)			
	A-7067-229-A	MD-76 BOARD, COMPLETE			
		**********			
					(Ref.No.;3000Series)
	3-057-376-01	HOLDER, SENSOR			
*	3-057-555-01	HOLDER, LED			
	3-973-185-01	ENCODER			
		< CAPACITOR >			
C001	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C002	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
		< CONNECTOR >			
CN001	1-691-359-21	CONNECTOR, FFC/FPC (ZIF) 21P			
CN002	1-691-359-21	CONNECTOR, FFC/FPC (ZIF) 21P			
CN003	1-691-356-21	CONNECTOR, FFC/FPC (ZIF) 18P			
		< DIODE >			
D001	8-719-988-42	DIODE GL453S			
		< IC >			
IC001	8-759-510-71	IC BA10358F-E2			
IC002	8-719-052-03	ELEMENT, HOLE THS124TE85L			
IC003	8-719-052-03	ELEMENT, HOLE THS124TE85L			
IC004	8-719-801-60	PHOTO TRASISTOR TLP907-OLB			
IC005	8-719-801-60	PHOTO TRASISTOR TLP907-OLB			
		< JUMPER RESISTOR >			
JR001	1-216-296-91	SHORT	0		
JR003	1-216-296-91	SHORT	0		
JR004	1-216-296-91	SHORT	0		
JR005	1-216-296-91	SHORT	0		
JR006	1-216-864-11	METAL CHIP	0	5%	1/16W
		< TRANSISTOR >			
Q001	8-729-907-25	PHOTO TRAN	ISTOR PT4850F		
Q002	8-729-907-25	PHOTO TRAN	ISTOR PT4850F		

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Ref. No.	Part No.	Description			Remarks
		< RESISTOR >			
R001	1-216-816-11	METAL CHIP	390	5%	1/16W
R003	1-216-810-11	METAL CHIP	120	5%	1/16W
R004	1-216-837-11	METAL CHIP	22K	5%	1/16W
R005	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R006	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R007	1-216-809-11	METAL CHIP	100	5%	1/16W
R008	1-216-837-11	METAL CHIP	22K	5%	1/16W
R009	1-216-837-11	METAL CHIP	22K	5%	1/16W
R010	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R011	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R012	1-216-174-00	RES-CHIP	100	5%	1/8W
R013	1-216-837-11	METAL CHIP	22K	5%	1/16W
R014	1-216-180-00	RES-CHIP	180	5%	1/8W
R015	1-216-816-11	METAL CHIP	390	5%	1/16W
R028	1-216-809-11	METAL CHIP	100	5%	1/16W
R029	1-216-809-11	METAL CHIP	100	5%	1/16W
R030	1-216-864-11	METAL CHIP	0	5%	1/16W
R031	1-216-864-11	METAL CHIP	0	5%	1/16W
R032	1-216-864-11	METAL CHIP	0	5%	1/16W
R033	1-216-864-11	METAL CHIP	0	5%	1/16W
		< VARIABLE RESISTOR >			
RV001	1-241-770-11	RES, ADJ, CARBON 1M			
RV002	1-238-019-11	RES, ADJ, CARBON 47K			
RV003	1-241-770-11	RES, ADJ, CARBON 1M			
RV004	1-238-019-11	RES, ADJ, CARBON 47K			
		< SWITCH >			
S001	1-762-551-21	SWITCH, PUSH (L/S CAS)			
S002	1-771-604-11	SWITCH, DETECTION (C IN)			
S003	1-771-604-11	SWITCH, DETECTION (CC DOWN)			
	A-7074-553-A	ME-019 BOARD, COMPLETE			
		**********			
		(Ref.No.;1000Series)			
		< CAPACITOR >			
C701	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C702	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C703	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C704	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C705	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C706	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C707	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C708	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C709	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C710	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C711	1-128-996-11	ELECT CHIP	4.7uF	20%	50V
C712	1-128-996-11	ELECT CHIP	4.7uF	20%	50V
C713	1-128-996-11	ELECT CHIP	4.7uF	20%	50V
C714	1-128-996-11	ELECT CHIP	4.7uF	20%	50V
C715	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C716	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C717	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C718	1-125-926-91	TANTAL. CHIP	4.7uF	20%	6.3V
C719	1-125-926-91	TANTAL. CHIP	4.7uF	20%	6.3V
C720	1-125-926-91	TANTAL. CHIP	4.7uF	20%	6.3V

Ref. No.	Part No.	Description			Remarks
C721	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C722	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C723	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C724	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C725	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C726	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C727	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C734	1-125-838-11	CERAMIC CHIP	2.2uF	10%	6.3V
C735	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C736	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C737	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C738	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C739	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C740	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C741	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C742	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C743	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C744	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C745	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C746	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C749	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
		< CONNECTOR >			
CN701	1-764-394-11	CONNECTOR (XLR TYPE) 3P (FRONT MIC)			
* CN702	1-565-249-11	SOCKET, CONNECTOR			
CN703	1-506-483-21	PIN, CONNECTOR 4P			
* CN704	1-764-007-11	PIN, CONNECTOR (SMD) 12P			
* CN705	1-580-756-21	PIN, CONNECTOR (SMD) 7P			
		< DIODE >			
D701	8-719-073-01	DIODE MA111-(K8).S0			
D702	8-719-073-01	DIODE MA111-(K8).S0			
D703	8-719-073-01	DIODE MA111-(K8).S0			
D704	8-719-073-01	DIODE MA111-(K8).S0			
		< FERRITE BEAD >			
FB701	1-543-775-11	FERRITE	0UH		
FB702	1-543-775-11	FERRITE	0UH		
FB703	1-543-775-11	FERRITE	0UH		
FB704	1-543-775-11	FERRITE	0UH		
FB705	1-543-775-11	FERRITE	0UH		
FB706	1-543-775-11	FERRITE	0UH		
		< IC >			
IC701	8-759-648-48	IC TC7W34FU(TE12R)			
IC702	8-759-111-56	IC uPC4572G2-E2			
IC703	8-759-111-56	IC uPC4572G2-E2			
IC705	8-759-603-27	IC M5201FP-600D			
IC706	8-759-075-66	IC TA75S01F(TE85R)			
IC707	8-759-111-56	IC uPC4572G2-E2			
		< COIL >			
L701	1-414-398-11	INDUCTOR	10uH		
L702	1-414-398-11	INDUCTOR	10uH		
L703	1-414-398-11	INDUCTOR	10uH		
L704	1-414-854-11	INDUCTOR	1MH		

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Ref. No.	Part No.	Description			Remarks
		< TRANSISTOR >			
Q704	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO		
Q705	8-729-037-71	TRANSISTOR	UN9210J-(TX).SO		
Q706	8-729-037-74	TRANSISTOR	UN9213J-(K8).SO		
		< RESISTOR >			
R241	1-216-864-11	METAL CHIP	0	5%	1/16W
R701	1-216-845-11	METAL CHIP	100K	5%	1/16W
R702	1-216-845-11	METAL CHIP	100K	5%	1/16W
R703	1-216-845-11	METAL CHIP	100K	5%	1/16W
R704	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R705	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R706	1-216-809-11	METAL CHIP	100	5%	1/16W
R707	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R708	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R709	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R710	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R711	1-216-037-00	METAL CHIP	330	5%	1/10W
R712	1-216-037-00	METAL CHIP	330	5%	1/10W
R713	1-216-295-11	SHORT	0		
R714	1-216-035-00	METAL CHIP	270	5%	1/10W
R715	1-216-035-00	METAL CHIP	270	5%	1/10W
R716	1-216-864-11	METAL CHIP	0	5%	1/16W
R718	1-220-222-11	RES-CHIP	4.7K	5%	1/2W
R719	1-216-845-11	METAL CHIP	100K	5%	1/16W
R720	1-216-845-11	METAL CHIP	100K	5%	1/16W
R721	1-216-845-11	METAL CHIP	100K	5%	1/16W
R722	1-216-845-11	METAL CHIP	100K	5%	1/16W
R723	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R724	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R725	1-218-897-11	METAL CHIP	120K	0.5%	1/16W
R728	1-218-829-11	METAL CHIP	180	0.5%	1/16W
R729	1-216-971-11	METAL CHIP	12	5%	1/16W
R730	1-218-887-11	METAL CHIP	47K	0.5%	1/16W
R731	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R732	1-218-885-11	METAL CHIP	39K	0.5%	1/16W
R733	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R734	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R735	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R736	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R748	1-216-864-11	METAL CHIP	0	5%	1/16W
R749	1-216-833-11	METAL CHIP	10K	5%	1/16W
R750	1-216-833-11	METAL CHIP	10K	5%	1/16W
R751	1-216-821-11	METAL CHIP	1K	5%	1/16W
R753	1-216-833-11	METAL CHIP	10K	5%	1/16W
R754	1-216-833-11	METAL CHIP	10K	5%	1/16W
R755	1-216-845-11	METAL CHIP	100K	5%	1/16W
R756	1-216-841-11	METAL CHIP	47K	5%	1/16W
R757	1-216-841-11	METAL CHIP	47K	5%	1/16W
R758	1-216-839-11	METAL CHIP	33K	5%	1/16W
R759	1-216-833-11	METAL CHIP	10K	5%	1/16W
R760	1-216-839-11	METAL CHIP	33K	5%	1/16W
R761	1-216-833-11	METAL CHIP	10K	5%	1/16W
R762	1-216-841-11	METAL CHIP	47K	5%	1/16W
R763	1-216-840-11	METAL CHIP	39K	5%	1/16W
R764	1-218-887-11	METAL CHIP	47K	0.5%	1/16W

Ref. No.	Part No.	Description			Remarks
R765	1-218-887-11	METAL CHIP	47K	0.5%	1/16W
R766	1-218-887-11	METAL CHIP	47K	0.5%	1/16W
R767	1-218-887-11	METAL CHIP	47K	0.5%	1/16W
R768	1-218-911-11	METAL CHIP	470K	0.5%	1/16W
R770	1-216-864-11	METAL CHIP	0	5%	1/16W
R778	1-211-990-11	METAL CHIP	75	0.5%	1/16W
R779	1-218-845-11	METAL CHIP	820	0.5%	1/16W
	A-7074-539-A	MS-058 BOARD, COMPLETE			
		**********			
					(Ref.No.;2000Series)
		< CONNECTOR >			
CN011	1-779-329-11	CONNECTOR, FFC/FPC 10P			
CN012	1-793-641-11	CONNECTOR, MEMORY STICK			
		< DIODE >			
D011	8-719-061-82	DIODE TLSU1002(TPX1,SONY)			
		< RESISTOR >			
R012	1-216-818-11	METAL CHIP	560	5%	1/16W
	A-7074-533-A	NO-001 BOARD, COMPLETE			
		**********			
					(Ref.No.;1000Series)
		< CONNECTOR >			
CN421	1-784-423-21	CONNECTOR, FFC/FPC (ZIF) 39P			
CN422	1-784-423-21	CONNECTOR, FFC/FPC (ZIF) 39P			
	A-7074-534-A	ON-001 BOARD, COMPLETE			
		**********			
					(Ref.No.;10000Series)
		< CONNECTOR >			
CN2001	1-784-421-11	CONNECTOR, FFC/FPC (ZIF) 27P			
CN2002	1-784-421-11	CONNECTOR, FFC/FPC (ZIF) 27P			
	A-7096-158-A	PD-126 BOARD, COMPLETE			
		**********			
					(Ref.No.;10000Series)
		< CAPACITOR >			
C2101	1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V
C2102	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2103	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2104	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C2105	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2107	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C2108	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2109	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2110	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2111	1-164-739-11	CERAMIC CHIP	560PF	5%	50V
C2112	1-125-838-11	CERAMIC CHIP	2.2uF	10%	6.3V
C2113	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C2114	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2115	1-107-687-11	TANTAL. CHIP	3.3uF	20%	20V
C2116	1-164-937-11	CERAMIC CHIP	0.001uF	10%	16V

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Ref. No.	Part No.	Description			Remarks
C2117	1-164-874-11	CERAMIC CHIP	100PF	5%	16V
C2118	1-125-838-11	CERAMIC CHIP	2.2uF	10%	6.3V
C2119	1-125-838-11	CERAMIC CHIP	2.2uF	10%	6.3V
C2120	1-125-838-11	CERAMIC CHIP	2.2uF	10%	6.3V
C2123	1-107-687-11	TANTAL. CHIP	3.3uF	20%	20V
C2124	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2125	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C2126	1-115-566-11	CERAMIC CHIP	4.7uF	10%	10V
C2127	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2128	1-107-725-11	CERAMIC CHIP	0.1uF	10%	16V
C2129	1-216-295-11	SHORT	0		(Note)
C2130	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2133	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C2181	1-119-751-11	TANTAL. CHIP	22uF	20%	16V
C2182	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2183	1-119-751-11	TANTAL. CHIP	22uF	20%	16V
C2184	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C2185	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C2186	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
		< CONNECTOR >			
CN2100	1-794-378-21	PIN, CONNECTOR 14P			
CN2101	1-794-377-21	PIN, CONNECTOR 8P			
* CN2103	1-778-155-11	CONNECTOR, FFC/FPC (ZIF) 7P			
* CN2104	1-778-172-11	CONNECTOR, FFC/FPC (ZIF) 24P			
CN2105	1-764-704-21	CONNECTOR, FFC/FPC (LIF) 5P			
		< DIODE >			
D2101	8-719-073-01	DIODE MA111-TX			
D2102	8-713-102-80	DIODE 1T369-01-T8A			
D2104	8-719-050-42	DIODE RD3.3UM-T1B			
D2181	8-719-059-47	DIODE PG1111R-TR			
		< IC >			
IC2101	8-759-660-93	IC RB5P004AM1			
IC2103	8-752-403-84	IC CXD3505R-T4			
		< COIL >			
L2101	1-414-755-11	INDUCTOR	22uH		
L2102	1-414-754-11	INDUCTOR	10uH		
L2103	1-414-754-11	INDUCTOR	10uH		
L2104	1-410-998-31	INDUCTOR	2.7uH		
L2181	1-412-056-11	INDUCTOR	4.7uH		
L2182	1-414-757-11	INDUCTOR	100uH		
		< TRANSISTOR >			
Q2101	8-729-427-74	TRANSISTOR	XP4601-TXE		
Q2102	8-729-037-74	TRANSISTOR	UN9213J-(TX).SO		
Q2103	8-729-427-74	TRANSISTOR	XP4601-TXE		
Q2104	8-729-041-23	TRANSISTOR	NDS356AP		
Q2109	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO		
Q2111	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO		
Q2112	8-729-048-77	TRANSISTOR	XP4313-(TX).SO		
Q2181	8-729-042-72	TRANSISTOR	UN9214J-(K8).SO		
Q2182	8-729-037-53	TRANSISTOR	2SA1832F-Y/GR(TPL3)		
Q2183	8-729-042-59	TRANSISTOR	UN9112J-(K8).SO		

Ref. No.	Part No.	Description			Remarks
		< RESISTOR >			
R2111	1-218-985-11	RES-CHIP	470K	5%	1/16W
R2112	1-218-985-11	RES-CHIP	470K	5%	1/16W
R2113	1-218-990-11	SHORT	0		
R2114	1-218-967-11	RES-CHIP	15K	5%	1/16W
R2115	1-218-958-11	RES-CHIP	2.7K	5%	1/16W
R2116	1-218-973-11	RES-CHIP	47K	5%	1/16W
R2117	1-218-975-11	RES-CHIP	68K	5%	1/16W
R2118	1-218-969-11	RES-CHIP	22K	5%	1/16W
R2119	1-218-975-11	RES-CHIP	68K	5%	1/16W
R2122	1-218-989-11	RES-CHIP	1M	5%	1/16W
R2123	1-218-990-11	SHORT	0		
R2124	1-218-977-11	RES-CHIP	100K	5%	1/16W
R2129	1-218-990-11	SHORT	0		
R2134	1-218-929-11	RES-CHIP	10	5%	1/16W
R2136	1-218-929-11	RES-CHIP	10	5%	1/16W
R2137	1-218-929-11	RES-CHIP	10	5%	1/16W
R2138	1-218-941-11	RES-CHIP	100	5%	1/16W
R2143	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2144	1-218-985-11	RES-CHIP	470K	5%	1/16W
R2146	1-218-990-11	SHORT	0		
R2147	1-218-990-11	SHORT	0		
R2148	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2153	1-218-990-11	SHORT	0		
R2157	1-218-989-11	RES-CHIP	1M	5%	1/16W
R2158	1-218-975-11	RES-CHIP	68K	5%	1/16W
R2159	1-218-979-11	RES-CHIP	150K	5%	1/16W
R2160	1-218-988-11	RES-CHIP	820K	5%	1/16W
R2162	1-218-990-11	SHORT	0		
R2163	1-218-990-11	SHORT	0		
R2165	1-218-990-11	SHORT	0		
R2166	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2168	1-218-990-11	SHORT	0		
R2169	1-218-990-11	SHORT	0		
R2170	1-218-977-11	RES-CHIP	100K	5%	1/16W
R2172	1-218-990-11	SHORT	0		
R2173	1-218-990-11	SHORT	0		
R2174	1-218-990-11	SHORT	0		
R2175	1-218-990-11	SHORT	0		
R2176	1-218-990-11	SHORT	0		
R2177	1-218-977-11	RES-CHIP	100K	5%	1/16W
R2178	1-218-977-11	RES-CHIP	100K	5%	1/16W
R2179	1-218-977-11	RES-CHIP	100K	5%	1/16W
R2180	1-218-977-11	RES-CHIP	100K	5%	1/16W
R2181	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R2182	1-218-953-11	RES-CHIP	1K	5%	1/16W
R2183	1-218-941-11	RES-CHIP	100	5%	1/16W
R2184	1-218-990-11	SHORT	0		

A-7074-540-A	PM-040 BOARD, COMPLETE	
	**********	
		(Ref.No.;1000Series)
	< CONNECTOR >	
CN081	1-778-507-21	PIN, CONNECTOR (PC BOARD) 4P

Note : Resistor is mounted to the location where C2129 is printed.

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Ref. No.	Part No.	Description			Remarks
		< DIODE >			
D081	8-719-064-61	DIODE 01BZA8.2(TE85L)			
D082	8-719-064-61	DIODE 01BZA8.2(TE85L)			
		< SWITCH >			
S081	1-570-985-11	SWITCH, TOGGLE (MODE)			
S082	1-570-984-11	SWITCH, TOGGLE (POWER)			
	A-7074-549-A	RL-057 BOARD, COMPLETE			
		**********			
		(Ref.No.;1000Series)			
		< CONNECTOR >			
CN141	1-569-775-11	PIN, CONNECTOR (SMD) 5P			
		< DIODE >			
D141	8-719-072-91	DIODE MAZJ200D0LS0			
D142	8-719-062-16	DIODE 01ZA8.2(TPL3)			
D143	8-719-422-70	DIODE MA8075-TX			
		< JACK >			
J141	1-793-995-11	JACK, SUPER SMALL TYPE (LANC)			
		< RESISTOR >			
R141	1-216-864-11	METAL CHIP	0	5%	1/16W
R142	1-216-864-11	METAL CHIP	0	5%	1/16W
R143	1-216-864-11	METAL CHIP	0	5%	1/16W
R144	1-216-817-11	METAL CHIP	470	5%	1/16W
R145	1-216-864-11	METAL CHIP	0	5%	1/16W
R146	1-216-864-11	METAL CHIP	0	5%	1/16W
	A-7074-536-A	SB-036 BOARD, COMPLETE			
		**********			
		(Ref.No.;1000Series)			
		< CONNECTOR >			
CN061	1-691-371-21	CONNECTOR, FFC/FPC 7P			
		< DIODE >			
D061	8-719-064-61	DIODE 01BZA8.2(TE85L)			
D062	8-719-064-61	DIODE 01BZA8.2(TE85L)			
		< RESISTOR >			
R061	1-216-837-11	METAL CHIP	22K	5%	1/16W
R062	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R063	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R064	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R065	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
		< SWITCH >			
S061	1-572-342-11	SWITCH, SLIDE (ZEBRA)			
S062	1-572-272-11	SWITCH, SLIDE (ATW ON/OFF)			
S063	1-572-272-11	SWITCH, SLIDE (AUTO ON/OFF)			
S064	1-572-272-11	SWITCH, SLIDE (AGC ON/OFF)			
S065	1-572-078-11	SWITCH, TACTILE (AUDIO LEVEL)			
S066	1-572-078-11	SWITCH, TACTILE (DISPLAY)			
S067	1-572-078-11	SWITCH, TACTILE (SPOT LIGHT)			
S068	1-572-078-11	SWITCH, TACTILE (BACK LIGHT)			
	A-7074-532-A	SE-116 BOARD, COMPLETE			
		**********			
		(Ref.No.;1000Series)			
		< CAPACITOR >			
C600	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C601	1-127-895-91	TANTAL. CHIP	22uF	20%	4V
		< CONNECTOR >			
CN600	1-766-336-21	CONNECTOR, FFC/FPC 6P			
		< FERRITE BEAD >			
FB601	1-414-385-21	FERRITE	0UH		
FB602	1-414-385-21	FERRITE	0UH		
FB603	1-414-385-21	FERRITE	0UH		
FB604	1-414-385-21	FERRITE	0UH		
FB605	1-414-385-21	FERRITE	0UH		
FB606	1-414-385-21	FERRITE	0UH		
		< COIL >			
L600	1-414-754-11	INDUCTOR	10uH		
		< SENSOR >			
SE600	1-803-042-31	SENSOR, ANGULAR VELOCITY (YAW)			
SE601	1-803-042-41	SENSOR, ANGULAR VELOCITY (PITCH)			
	A-7074-535-A	SW-343 BOARD, COMPLETE			
		**********			
		(Ref.No.;2000Series)			
		< BATTERY >			
BT501	1-528-724-21	BATTERY, V/L RICHARGEABL			
		< CAPACITOR >			
C501	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
		< CONNECTOR >			
CN502	1-750-345-11	CONNECTOR, FFC/EPC (ZIF) 30P			
CN503	1-778-506-21	PIN, CONNECTOR (PC BOARD) 2P			
CN504	1-778-508-21	PIN, CONNECTOR (PC BOARD) 6P			
CN505	1-794-377-21	PIN, CONNECTOR 8P			
CN506	1-750-345-11	CONNECTOR, FFC/EPC (ZIF) 30P			
CN507	1-794-378-21	PIN, CONNECTOR 14P			
CN508	1-691-371-21	CONNECTOR, FFC/FPC 7P			
CN509	1-793-302-21	PIN, CONNECTOR (PC BOARD) 5P			
CN511	1-778-507-21	PIN, CONNECTOR (PC BOARD) 4P			
CN512	1-573-346-21	CONNECTOR, FFC/FPC 6P			

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SW-343 **TH-010** **VI-156**

Ref. No.	Part No.	Description			Remarks
		< DIODE >			
D101	8-719-064-61	DIODE 01BZA8.2(TE85L)			
D501	8-719-064-61	DIODE 01BZA8.2(TE85L)			
D502	8-719-064-61	DIODE 01BZA8.2(TE85L)			
D503	8-719-064-61	DIODE 01BZA8.2(TE85L)			
D504	8-719-064-61	DIODE 01BZA8.2(TE85L)			
D505	8-719-064-61	DIODE 01BZA8.2(TE85L)			
D506	8-719-064-61	DIODE 01BZA8.2(TE85L)			
D507	8-719-073-03	DIODE MA8082-(K8).SO			
D508	8-719-064-61	DIODE 01BZA8.2(TE85L)			
		< IC >			
IC501	8-759-664-85	IC TC3W02FU(TE12R)			
		< TRANSISTOR >			
Q001	8-729-427-74	TRANSISTOR	XP4601-TXE		
		< RESISTOR >			
R101	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R102	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R103	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R104	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R105	1-216-837-11	METAL CHIP	22K	5%	1/16W
R501	1-216-853-11	METAL CHIP	470K	5%	1/16W
R502	1-216-853-11	METAL CHIP	470K	5%	1/16W
R503	1-216-853-11	METAL CHIP	470K	5%	1/16W
R505	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R506	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R507	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R508	1-216-823-11	METAL CHIP	1.5K	5%	1/16W
R509	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R510	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R511	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R512	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R513	1-216-837-11	METAL CHIP	22K	5%	1/16W
R514	1-216-837-11	METAL CHIP	22K	5%	1/16W
R517	1-216-821-11	METAL CHIP	1K	5%	1/16W
R518	1-216-841-11	METAL CHIP	47K	5%	1/16W
R519	1-218-871-11	METAL CHIP	10K	0.5%	1/16W
R520	1-218-869-11	METAL CHIP	8.2K	0.5%	1/16W
R521	1-164-937-11	CERAMIC CHIP	0.001uF	10%	16V (Note)
		< VARIABLE RESISTOR >			
RV501	1-223-649-11	RES, VAR, CARBON 20K (CH-1 AUDIO LEVEL)			
RV502	1-223-649-11	RES, VAR, CARBON 20K (CH-2 AUDIO LEVEL)			
RV503	1-223-649-11	RES, VAR, CARBON 20K (MONITOR)			
		< SWITCH >			
S501	1-570-860-11	SWITCH, SLIDE (CH-1 AUDIO SELECT)			
S502	1-570-860-11	SWITCH, SLIDE (CH-2 AUDIO SELECT)			
S503	1-570-860-11	SWITCH, SLIDE (CH-1 AUDIO INPUT)			
S504	1-570-860-11	SWITCH, SLIDE (CH-2 AUDIO INPUT)			
S505	1-570-852-11	SWITCH, SLIDE (AUDIO MONITOR)			
S506	1-570-860-11	SWITCH, SLIDE (DISPLAY SELECT)			
S507	1-572-078-11	SWITCH, TACTILE (MEMORY MIX)			
S508	1-572-078-11	SWITCH, TACTILE (MEMORY INDEX)			
S509	1-572-078-11	SWITCH, TACTILE (MEMORY+)			
S510	1-572-078-11	SWITCH, TACTILE (DATA CODE)			
S511	1-572-078-11	SWITCH, TACTILE (RESET)			
S512	1-572-078-11	SWITCH, TACTILE (MEMORY-)			
S513	1-572-078-11	SWITCH, TACTILE (END SEARCH)			
S514	1-572-078-11	SWITCH, TACTILE (MEMORY DELETE)			
S515	1-572-078-11	SWITCH, TACTILE (TITLE)			
S516	1-572-078-11	SWITCH, TACTILE (MEMORY PLAY)			
S517	1-572-078-11	SWITCH, TACTILE (DIGITAL EFFECT)			
S518	1-572-078-11	SWITCH, TACTILE (LCD BRIGHT+)			
S519	1-572-078-11	SWITCH, TACTILE (LCD BRIGHT-)			
S520	1-572-272-11	SWITCH, SLIDE (LCD ON/OFF)			

	A-7074-543-A	TH-010 BOARD, COMPLETE			
		**********			
					(Ref.No.;1000Series)
		< CAPACITOR >			
C451	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
		< CONNECTOR >			
CN451	1-793-302-21	PIN, CONNECTOR (PC BOARD) 5P			
		< DIODE >			
D451	8-719-071-31	DIODE SLI-342URC3F			
D452	8-719-071-31	DIODE SLI-342URC3F			
D453	8-719-064-61	DIODE 01BZA8.2(TE85L)			
D454	8-719-064-61	DIODE 01BZA8.2(TE85L)			
		< IC >			
IC451	8-749-013-13	IC RS-70-TU			
		< TRANSISTOR >			
Q451	8-729-037-71	TRANSISTOR	UN9210J-(TX).SO		
		< RESISTOR >			
R451	1-216-820-11	METAL CHIP	820	5%	1/16W
R452	1-216-820-11	METAL CHIP	820	5%	1/16W
R453	1-216-805-11	METAL CHIP	47	5%	1/16W
R454	1-216-864-11	METAL CHIP	0	5%	1/16W
		< SWITCH >			
S451	1-570-608-11	SWITCH, TOGGLE (TALLY ON/OFF)			

	A-7096-400-A	VI-156 BOARD, COMPLETE (SERVICE)			
		**********			
					(Ref.No.;10000Series)
		< CAPACITOR >			
C051	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C052	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C053	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C054	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C102	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C103	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C104	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C105	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C106	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C107	1-127-895-95	TANTAL. CHIP	22uF	10%	4V

Note : Capacitor is mounted to the location where R521 is printed.

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Ref. No.	Part No.	Description			Remarks
C108	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C109	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C110	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C111	1-164-935-11	CERAMIC CHIP	470PF	10%	16V
C112	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C113	1-164-866-11	CERAMIC CHIP	47PF	5%	16V
C114	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C115	1-164-935-11	CERAMIC CHIP	470PF	10%	16V
C116	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C117	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C118	1-164-866-11	CERAMIC CHIP	47PF	5%	16V
C119	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C120	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C121	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C122	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C123	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C124	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C125	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C127	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C128	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C140	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C141	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C142	1-164-941-11	CERAMIC CHIP	0.0047uF	10%	16V
C143	1-115-156-11	CERAMIC CHIP	1uF		10V
C145	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C146	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C147	1-164-935-11	CERAMIC CHIP	470PF	10%	16V
C148	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C149	1-164-937-11	CERAMIC CHIP	0.001uF	10%	16V
C150	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C151	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C152	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C153	1-164-939-11	CERAMIC CHIP	0.0022uF	10%	16V
C154	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C155	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C156	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C157	1-127-895-91	TANTAL. CHIP	22uF	20%	4V
C158	1-127-895-91	TANTAL. CHIP	22uF	20%	4V
C159	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C160	1-164-866-11	CERAMIC CHIP	47PF	5%	16V
C161	1-164-866-11	CERAMIC CHIP	47PF	5%	16V
C162	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
C163	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
C166	1-127-895-91	TANTAL. CHIP	22uF	20%	4V
C170	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C171	1-164-935-11	CERAMIC CHIP	470PF	10%	16V
C172	1-164-935-11	CERAMIC CHIP	470PF	10%	16V
C173	1-164-935-11	CERAMIC CHIP	470PF	10%	16V
C174	1-164-935-11	CERAMIC CHIP	470PF	10%	16V
C301	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C302	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C303	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C304	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C305	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C306	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C307	1-164-850-11	CERAMIC CHIP	10PF	0.50PF	16V
C308	1-164-850-11	CERAMIC CHIP	10PF	0.50PF	16V
C309	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C310	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C311	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C312	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C313	1-164-937-11	CERAMIC CHIP	0.001uF	10%	16V
C314	1-164-937-11	CERAMIC CHIP	0.001uF	10%	16V
C315	1-164-937-11	CERAMIC CHIP	0.001uF	10%	16V
C316	1-164-937-11	CERAMIC CHIP	0.001uF	10%	16V
C317	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C318	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C319	1-164-937-11	CERAMIC CHIP	0.001uF	10%	16V
C320	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C321	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C322	1-117-863-11	CERAMIC CHIP	0.47uF	10%	6.3V
C323	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C324	1-119-923-81	CERAMIC CHIP	0.047uF	10%	10V
C325	1-164-937-11	CERAMIC CHIP	0.001uF	10%	16V
C326	1-125-838-11	CERAMIC CHIP	2.2uF	10%	6.3V
C327	1-127-895-91	TANTAL. CHIP	22uF	20%	4V
C328	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C329	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C331	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C332	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C333	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C334	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C335	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C337	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C338	1-164-882-11	CERAMIC CHIP	220PF	5%	16V
C342	1-117-863-11	CERAMIC CHIP	0.47uF	10%	6.3V
C343	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C345	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C346	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C348	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C352	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C353	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C354	1-117-863-11	CERAMIC CHIP	0.47uF	10%	6.3V
C501	1-164-937-11	CERAMIC CHIP	0.001uF	10%	16V
C502	1-164-850-11	CERAMIC CHIP	10PF	0.50PF	16V
C503	1-164-850-11	CERAMIC CHIP	10PF	0.50PF	16V
C504	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C505	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C506	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C507	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C508	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C509	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C510	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C511	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C512	1-164-937-11	CERAMIC CHIP	0.001uF	10%	16V
C513	1-164-937-11	CERAMIC CHIP	0.001uF	10%	16V
C514	1-164-937-11	CERAMIC CHIP	0.001uF	10%	16V
C515	1-164-937-11	CERAMIC CHIP	0.001uF	10%	16V
C516	1-164-937-11	CERAMIC CHIP	0.001uF	10%	16V
C701	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C702	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C703	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C704	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C705	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C706	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C707	1-113-682-11	TANTAL. CHIP	33uF	20%	10V
C708	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C709	1-107-689-21	TANTAL. CHIP	1uF	20%	35V
C710	1-107-689-21	TANTAL. CHIP	1uF	20%	35V
C711	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V

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Ref. No.	Part No.	Description			Remarks
C712	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C713	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C714	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C715	1-113-981-11	TANTAL. CHIP	22uF	20%	20V
C716	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C717	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C718	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C720	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C721	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C722	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C723	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C724	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C725	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C726	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C727	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C728	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C729	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C732	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C733	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C734	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C735	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C736	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C737	1-119-749-11	TANTAL. CHIP	33uF	20%	4V
C740	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C743	1-164-937-11	CERAMIC CHIP	0.001uF	10%	16V
C744	1-164-937-11	CERAMIC CHIP	0.001uF	10%	16V
C745	1-164-844-11	CERAMIC CHIP	4PF	5%	16V
C746	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C747	1-164-850-11	CERAMIC CHIP	10PF	0.50PF	16V
C748	1-164-850-11	CERAMIC CHIP	10PF	0.50PF	16V
C749	1-164-850-11	CERAMIC CHIP	10PF	0.50PF	16V
C750	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C751	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C752	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C753	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C754	1-128-964-91	TANTAL. CHIP	100uF	20%	6.3V
C755	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C757	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C758	1-127-895-91	TANTAL. CHIP	22uF	20%	4V
C759	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C760	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C761	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C762	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C763	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C771	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C772	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C801	1-127-895-95	TANTAL. CHIP	22uF	10%	4V
C802	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C803	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C805	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C806	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C807	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C808	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C809	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C810	1-127-895-95	TANTAL. CHIP	22uF	10%	4V
C811	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C901	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C902	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C903	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C904	1-104-851-11	TANTAL. CHIP	10uF	20%	10V

Ref. No.	Part No.	Description			Remarks
C908	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C910	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C911	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C912	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C913	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C914	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C915	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C916	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C917	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C918	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C919	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C920	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C921	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C922	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C926	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C928	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C929	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C930	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C931	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C932	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C933	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C934	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C935	1-164-858-11	CERAMIC CHIP	22PF	5%	16V
C936	1-164-866-11	CERAMIC CHIP	47PF	5%	16V
C1002	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C1003	1-117-863-11	CERAMIC CHIP	0.47uF	10%	6.3V
C1005	1-117-863-11	CERAMIC CHIP	0.47uF	10%	6.3V
C1006	1-117-863-11	CERAMIC CHIP	0.47uF	10%	6.3V
C1007	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C1008	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C1009	1-109-935-11	TANTAL. CHIP	4.7uF	20%	6.3V
C1010	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C1011	1-117-863-11	CERAMIC CHIP	0.47uF	10%	6.3V
C1013	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C1014	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C1015	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1017	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C1018	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1019	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1020	1-117-863-11	CERAMIC CHIP	0.47uF	10%	6.3V
C1021	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C1022	1-117-863-11	CERAMIC CHIP	0.47uF	10%	6.3V
C1023	1-117-863-11	CERAMIC CHIP	0.47uF	10%	6.3V
C1024	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C1025	1-164-860-11	CERAMIC CHIP	27PF	5%	16V
C1026	1-117-863-11	CERAMIC CHIP	0.47uF	10%	6.3V
C1027	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1028	1-113-994-11	TANTAL. CHIP	6.8uF	20%	16V
C1029	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1034	1-117-720-11	CERAMIC CHIP	4.7uF		10V
C1035	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1037	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C1038	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1039	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C1040	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C1041	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1042	1-117-863-11	CERAMIC CHIP	0.47uF	10%	6.3V
C1044	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C1045	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C1047	1-164-942-11	CERAMIC CHIP	0.0068uF	10%	16V

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Ref. No.	Part No.	Description			Remarks
C1048	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1049	1-117-863-11	CERAMIC CHIP	0.47uF	10%	6.3V
C1050	1-117-863-11	CERAMIC CHIP	0.47uF	10%	6.3V
C1051	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C1052	1-164-489-11	CERAMIC CHIP	0.22uF	10%	16V
C1053	1-109-935-11	TANTAL. CHIP	4.7uF	20%	4V
C1054	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C1055	1-117-863-11	CERAMIC CHIP	0.47uF	10%	6.3V
C1056	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C1058	1-117-863-11	CERAMIC CHIP	0.47uF	10%	6.3V
C1060	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C1061	1-117-863-11	CERAMIC CHIP	0.47uF	10%	6.3V
C1062	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C1065	1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V
C1066	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1067	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1068	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1069	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1070	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1071	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1072	1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V
C1073	1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V
C1074	1-119-750-11	TANTAL. CHIP	22uF	20%	6.3V
C1075	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C1076	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C1077	1-164-942-11	CERAMIC CHIP	0.0068uF	10%	16V
C1078	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1080	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1082	1-117-863-11	CERAMIC CHIP	0.47uF	10%	6.3V
C1083	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1084	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1085	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C1086	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1087	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1088	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C1089	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1090	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1091	1-109-935-11	TANTAL. CHIP	4.7uF	20%	6.3V
C1092	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1093	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1094	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1095	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1096	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1097	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1098	1-110-569-11	TANTAL. CHIP	47uF	20%	6.3V
C1099	1-110-569-11	TANTAL. CHIP	47uF	20%	6.3V
C1100	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C1101	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1102	1-115-156-11	CERAMIC CHIP	1uF		10V
C1103	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C1104	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1105	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1106	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C1107	1-119-749-11	TANTAL. CHIP	33uF	20%	4V
C1108	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1109	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1110	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1111	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1112	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1113	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V

Ref. No.	Part No.	Description			Remarks
C1114	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1115	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1116	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1117	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1119	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1120	1-107-819-11	CERAMIC CHIP	0.022uF	10%	16V
C1121	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1122	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1128	1-164-858-11	CERAMIC CHIP	22PF	5%	16V
C1129	1-164-858-11	CERAMIC CHIP	22PF	5%	16V
C1130	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1131	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1132	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1133	1-110-569-11	TANTAL. CHIP	47uF		6.3V
C1134	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1301	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1302	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1303	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1304	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
C1305	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1306	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1307	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1308	1-125-838-11	CERAMIC CHIP	2.2uF	10%	6.3V
C1309	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C1310	1-125-838-11	CERAMIC CHIP	2.2uF	10%	6.3V
C1311	1-125-838-11	CERAMIC CHIP	2.2uF	10%	6.3V
C1312	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1313	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C1314	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1315	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1316	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1318	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1319	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C1320	1-164-937-11	CERAMIC CHIP	0.001uF	10%	16V
C1321	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1322	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1328	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1329	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1330	1-127-569-91	TANTAL. CHIP	100uF	20%	4V
C1332	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C1337	1-125-838-11	CERAMIC CHIP	2.2uF	10%	6.3V
C1338	1-125-838-11	CERAMIC CHIP	2.2uF	10%	6.3V
C1340	1-127-569-91	TANTAL. CHIP	100uF	20%	4V
C1341	1-127-569-91	TANTAL. CHIP	100uF	20%	4V
C1342	1-127-569-91	TANTAL. CHIP	100uF	20%	4V
C1343	1-164-858-11	CERAMIC CHIP	22PF	5%	16V
C1401	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1402	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1403	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1404	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1405	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1406	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1407	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1408	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C1409	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C1410	1-164-315-11	CERAMIC CHIP	470PF	2.00%	50V
C1411	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1412	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C1413	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1414	1-164-360-11	CERAMIC CHIP	0.1uF		16V

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Ref. No.	Part No.	Description			Remarks
C1415	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1416	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C1417	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1418	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C1419	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C1420	1-164-850-11	CERAMIC CHIP	10PF	0.50PF	16V
C1421	1-164-850-11	CERAMIC CHIP	10PF	0.50PF	16V
C1422	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1423	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C1424	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1425	1-164-943-11	CERAMIC CHIP	0.01uF	10%	16V
C1426	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1427	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1428	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C1601	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C1602	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C1603	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1604	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1605	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C1606	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C1607	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1608	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1609	1-125-838-11	CERAMIC CHIP	2.2uF	10%	6.3V
C1610	1-113-642-11	TANTAL. CHIP	47uF	20%	10V
C1611	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1612	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1615	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1616	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1619	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1620	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1621	1-113-994-11	TANTAL. CHIP	6.8uF	20%	16V
C1622	1-113-994-11	TANTAL. CHIP	6.8uF	20%	16V
C1623	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1624	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C1625	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C1626	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C2200	1-127-895-91	TANTAL. CHIP	22uF	20%	4V
C2201	1-127-895-91	TANTAL. CHIP	22uF	20%	4V
C2202	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C2203	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C2204	1-107-819-11	CERAMIC CHIP	0.022uF	10%	16V
C2205	1-107-819-11	CERAMIC CHIP	0.022uF	10%	16V
C2206	1-107-819-11	CERAMIC CHIP	0.022uF	10%	16V
C2207	1-107-819-11	CERAMIC CHIP	0.022uF	10%	16V
C2208	1-110-569-11	TANTAL. CHIP	47uF	20%	4V
C2209	1-110-569-11	TANTAL. CHIP	47uF	20%	4V
C2210	1-110-569-11	TANTAL. CHIP	47uF	20%	4V
C2211	1-110-569-11	TANTAL. CHIP	47uF	20%	4V
C2214	1-127-895-91	TANTAL. CHIP	22uF	20%	4V
C2215	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2501	1-127-569-91	TANTAL. CHIP	100uF	20%	4V
C2502	1-127-569-91	TANTAL. CHIP	100uF	20%	4V
C2503	1-110-569-11	TANTAL. CHIP	47uF	20%	6.3V
C2504	1-107-686-11	TANTAL. CHIP	4.7uF	20%	16V
C2505	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C2506	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C2507	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C2508	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C2509	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C2512	1-127-569-91	TANTAL. CHIP	100uF	20%	4V
C2513	1-127-569-91	TANTAL. CHIP	100uF	20%	4V
C2770	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2771	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C2772	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C2773	1-164-942-11	CERAMIC CHIP	0.0068uF	10%	16V
C2774	1-164-942-11	CERAMIC CHIP	0.0068uF	10%	16V
C2775	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C2776	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C2777	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C2778	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2779	1-135-210-11	TANTALUM CHIP	4.7uF	20%	10V
C2780	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C2785	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
C2786	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
C2787	1-119-923-81	CERAMIC CHIP	0.047uF	10%	10V
C2788	1-119-923-81	CERAMIC CHIP	0.047uF	10%	10V
C2789	1-164-940-11	CERAMIC CHIP	0.0033uF	10%	16V
C2790	1-107-819-11	CERAMIC CHIP	0.022uF	10%	16V
C2791	1-107-819-11	CERAMIC CHIP	0.022uF	10%	16V
C2792	1-164-940-11	CERAMIC CHIP	0.0033uF	10%	16V
C2793	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C2794	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C2796	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C2797	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C2798	1-125-838-11	CERAMIC CHIP	2.2uF	10%	6.3V
C2799	1-125-838-11	CERAMIC CHIP	2.2uF	10%	6.3V
C2800	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C2821	1-127-895-91	TANTAL. CHIP	22uF	20%	4V
C3301	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3302	1-119-923-81	CERAMIC CHIP	0.047uF	10%	10V
C3303	1-119-923-81	CERAMIC CHIP	0.047uF	10%	10V
C3306	1-107-725-11	CERAMIC CHIP	0.1uF	10%	16V
C3307	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3308	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C3309	1-164-874-11	CERAMIC CHIP	100PF	5%	16V
C3310	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C3311	1-164-935-11	CERAMIC CHIP	470PF	10%	16V
C3312	1-119-923-81	CERAMIC CHIP	0.047uF	10%	10V
C3313	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C3314	1-119-751-11	TANTAL. CHIP	22uF	20%	16V
C3315	1-164-937-11	CERAMIC CHIP	0.001uF	10%	16V
C3316	1-119-751-11	TANTAL. CHIP	22uF	20%	16V
C3317	1-164-939-11	CERAMIC CHIP	0.0022uF	10%	16V
C3318	1-164-935-11	CERAMIC CHIP	470PF	10%	16V
C3319	1-164-937-11	CERAMIC CHIP	0.001uF	10%	16V
C3320	1-164-933-11	CERAMIC CHIP	220PF	10%	16V
C3321	1-164-874-11	CERAMIC CHIP	100PF	5%	16V
C3322	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C3323	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C3324	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C3325	1-164-940-11	CERAMIC CHIP	0.0033uF	10%	16V
C3326	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C3327	1-164-939-11	CERAMIC CHIP	0.0022uF	10%	16V
C3328	1-164-940-11	CERAMIC CHIP	0.0033uF	10%	16V
C3330	1-164-940-11	CERAMIC CHIP	0.0033uF	10%	16V
C3332	1-164-940-11	CERAMIC CHIP	0.0033uF	10%	16V
C3333	1-115-566-11	CERAMIC CHIP	4.7uF	10%	10V
C3335	1-115-566-11	CERAMIC CHIP	4.7uF	10%	10V
C3336	1-115-566-11	CERAMIC CHIP	4.7uF	10%	10V
C3337	1-115-566-11	CERAMIC CHIP	4.7uF	10%	10V

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Ref. No.	Part No.	Description			Remarks
C3338	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3339	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C3342	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C3343	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C3344	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C3345	1-127-760-11	CERAMIC CHIP	4.7uF	10%	6.3V
C3346	1-127-820-11	CERAMIC	4.7uF		16V
C3347	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C3349	1-127-820-11	CERAMIC	4.7uF		16V
C3350	1-113-985-11	TANTAL. CHIP	10uF	20%	20V
C3351	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C3352	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C3353	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C3354	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C3355	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C3356	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C3357	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C3358	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C3359	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C3360	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C3361	1-110-569-11	TANTAL. CHIP	47uF	20%	6.3V
C3363	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C3364	1-135-214-21	TANTAL. CHIP	4.7uF	20%	20V
C3365	1-113-987-11	TANTAL. CHIP	4.7uF	20%	25V
C3366	1-113-985-11	TANTAL. CHIP	10uF	20%	20V
C3367	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C3368	1-135-259-11	TANTAL. CHIP	10uF	20%	6.3V
C3370	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C3371	1-113-985-11	TANTAL. CHIP	10uF	20%	20V
C3373	1-104-851-11	TANTAL. CHIP	10uF	20%	10V
C3375	1-113-985-11	TANTAL. CHIP	10uF	20%	20V
C3376	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C3377	1-135-212-21	TANTAL. CHIP	2.2uF	20%	35V
C3378	1-113-985-11	TANTAL. CHIP	10uF	20%	20V
C3450	1-115-566-11	CERAMIC CHIP	4.7uF	10%	10V
C4100	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C4101	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C4102	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C4103	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C4104	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C4105	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C4106	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C4107	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4108	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C4109	1-164-739-11	CERAMIC CHIP	560PF	5%	50V
C4111	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C4112	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C4113	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4114	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C4115	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C4116	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C4117	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C4118	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C4119	1-119-869-91	CERAMIC CHIP	0PF		0V
C4129	1-119-869-91	CERAMIC CHIP	0PF		0V
C4130	1-119-869-91	CERAMIC CHIP	0PF		0V
C4131	1-119-869-91	CERAMIC CHIP	0PF		0V
C4132	1-119-869-91	CERAMIC CHIP	0PF		0V
C4134	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C4135	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C4136	1-113-985-11	TANTAL. CHIP	10uF	20%	20V
C4137	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C4200	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4201	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4202	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4203	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4204	1-113-987-11	TANTAL. CHIP	4.7uF	20%	25V
C4205	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4206	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4207	1-107-686-11	TANTAL. CHIP	4.7uF	20%	16V
C4208	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C4300	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C4301	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4302	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C4303	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4320	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C4321	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C4322	1-164-505-11	CERAMIC CHIP	2.2uF		16V
C4323	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C4324	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4325	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C4326	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4327	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C4329	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C4330	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C4331	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C4400	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4401	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4402	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4403	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4404	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4405	1-107-686-11	TANTAL. CHIP	4.7uF	20%	16V
C4406	1-107-686-11	TANTAL. CHIP	4.7uF	20%	16V
C4407	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4501	1-135-177-21	TANTALUM CHIP	1uF	20%	20V
C4502	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C4503	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4504	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C4505	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4506	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4507	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4508	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C4509	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C4510	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C4511	1-107-686-11	TANTAL. CHIP	4.7uF	20%	16V
C4512	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4515	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4518	1-164-739-11	CERAMIC CHIP	560PF	5%	50V
C4519	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4520	1-107-686-11	TANTAL. CHIP	4.7uF	20%	16V
C4521	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4522	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4523	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4524	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C4525	1-107-686-11	TANTAL. CHIP	4.7uF	20%	16V

< CONNECTOR >

CN001	1-784-423-21	CONNECTOR, FFC/FPC (ZIF) 39P
CN002	1-784-421-11	CONNECTOR, FFC/FPC (ZIF) 27P
CN003	1-766-346-21	CONNECTOR, FFC/FPC 16P
CN004	1-778-508-21	PIN, CONNECTOR (PC BOARD) 6P
CN005	1-785-283-21	PIN, CONNECTOR (PC BOARD) 14P

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Ref. No.	Part No.	Description	Remarks
CN006	1-779-329-11	CONNECTOR, FFC/FPC 10P	
CN007	1-766-350-21	CONNECTOR, FFC/FPC 20P	
* CN008	1-580-056-21	PIN, CONNECTOR (SMD) 3P	
CN009	1-569-775-11	PIN, CONNECTOR (SMD) 5P	
* CN010	1-580-789-21	PIN, CONNECTOR (SMD) 6P	
* CN011	1-691-591-11	PIN, CONNECTOR (1.5MM) (SMD)8P	
CN012	1-778-509-21	PIN, CONNECTOR (PC BOARD) 11P	
CN013	1-691-346-11	CONNECTOR, FFC/FPC 8P	
* CN016	1-764-007-11	PIN, CONNECTOR (SMD) 12P	
* CN017	1-580-756-21	PIN, CONNECTOR (SMD) 7P	
CN018	1-770-629-21	PIN, CONNECTOR 12P	
* CN019	1-793-137-21	PIN, CONNECTOR 3P	
CN020	1-779-327-11	CONNECTOR, FFC/FPC 6P	
CN021	1-778-507-21	PIN, CONNECTOR (PC BOARD) 4P	
* CN022	1-764-007-11	PIN, CONNECTOR (SMD) 12P	
CN025	1-778-083-21	CONNECTOR, BOARD TO BOARD 50P	
CN101	1-750-337-21	CONNECTOR, FFC/FPC (ZIF) 10P	
CN200	1-691-385-21	CONNECTOR, FFC/FPC 21P	
CN201	1-691-385-21	CONNECTOR, FFC/FPC 21P	
CN400	1-750-341-11	CONNECTOR, FFC/EPC (ZIF) 18P	
CN500	1-573-351-11	CONNECTOR, FFC/FPC (ZIF) 11P	
* CN501	1-580-055-21	PIN, CONNECTOR (SMD) 2P	
* CN4300	1-580-055-21	PIN, CONNECTOR (SMD) 2P	
		< DIODE >	
D001	8-719-036-80	DIODE RD3.9SB-T1	
D140	8-719-056-23	DIODE MA2S111-(K8).SO	
D301	8-719-027-95	DIODE HSM88WK-TL	
D302	8-719-055-86	DIODE KV1470TL1-3	
D303	8-719-027-95	DIODE HSM88WK-TL	
D304	8-719-055-86	DIODE KV1470TL1-3	
D701	8-713-103-84	DIODE 1T379-01-T8A	
D702	8-719-046-91	DIODE MA2S111-TX	
D1104	8-719-421-27	DIODE MA728-(K8).S0	
D1106	8-719-073-01	DIODE MA111-(K8).S0	
D1112	8-719-067-56	DIODE MA112-TX	
D1113	8-719-067-56	DIODE MA112-TX	
D1114	8-719-067-56	DIODE MA112-TX	
D1115	8-719-067-56	DIODE MA112-TX	
D1116	8-719-067-56	DIODE MA112-TX	
D1117	8-719-067-56	DIODE MA112-TX	
D1401	8-719-056-23	DIODE MA2S111-(K8).SO	
D2501	8-719-073-01	DIODE MA111-(K8).S0	
D2502	8-719-073-01	DIODE MA111-(K8).S0	
D2503	8-719-073-01	DIODE MA111-(K8).S0	
D2504	8-719-073-01	DIODE MA111-(K8).S0	
D2770	8-719-064-61	DIODE 01BZA8.2(TE85L)	
D3305	8-719-058-24	DIODE RB501V-40TE-17	
D3306	8-719-058-24	DIODE RB501V-40TE-17	
D3307	8-719-058-24	DIODE RB501V-40TE-17	
D3308	8-719-056-48	DIODE 1SS388(TPL3)	
D3309	8-719-056-48	DIODE 1SS388(TPL3)	
D3310	8-719-056-48	DIODE 1SS388(TPL3)	
D3311	8-719-056-48	DIODE 1SS388(TPL3)	
D3312	8-719-056-48	DIODE 1SS388(TPL3)	
D4101	8-719-066-98	DIODE RB051L-40TE25	
D4102	8-719-066-98	DIODE RB051L-40TE25	
D4103	8-719-066-98	DIODE RB051L-40TE25	
D4104	8-719-066-98	DIODE RB051L-40TE25	

Ref. No.	Part No.	Description	Remarks
		< FERRITE BEAD >	
FB101	1-414-760-21	FERRITE 0UH	
FB140	1-414-445-11	FERRITE 0UH	
FB301	1-414-760-21	FERRITE 0UH	
FB302	1-414-760-21	FERRITE 0UH	
FB303	1-414-760-21	FERRITE 0UH	
FB304	1-414-760-21	FERRITE 0UH	
FB305	1-414-760-21	FERRITE 0UH	
FB306	1-414-760-21	FERRITE 0UH	
FB307	1-414-760-21	FERRITE 0UH	
FB501	1-414-760-21	FERRITE 0UH	
FB701	1-414-445-11	FERRITE 0UH	
FB702	1-414-445-11	FERRITE 0UH	
FB703	1-414-445-11	FERRITE 0UH	
FB704	1-500-284-21	INDUCTOR CHIP 0UH	
FB705	1-414-445-11	FERRITE 0UH	
FB706	1-414-445-11	FERRITE 0UH	
FB707	1-414-445-11	FERRITE 0UH	
FB708	1-469-537-21	FILTER, EMI	
FB709	1-469-537-21	FILTER, EMI	
FB710	1-469-537-21	FILTER, EMI	
FB711	1-469-537-21	FILTER, EMI	
FB712	1-469-537-21	FILTER, EMI	
FB713	1-469-537-21	FILTER, EMI	
FB771	1-414-445-11	FERRITE 0UH	
FB772	1-414-445-11	FERRITE 0UH	
FB901	1-414-760-21	FERRITE 0UH	
FB1002	1-500-329-21	INDUCTOR CHIP 0UH	
FB1101	1-500-329-21	INDUCTOR CHIP 0UH	
FB1301	1-414-760-21	FERRITE 0UH	
FB1401	1-543-955-22	FERRITE 0UH	
FB1402	1-543-955-22	FERRITE 0UH	
FB1403	1-543-960-22	FERRITE 0UH	
FB1404	1-543-955-22	FERRITE 0UH	
FB1405	1-543-955-22	FERRITE 0UH	
FB1406	1-543-955-22	FERRITE 0UH	
FB1407	1-543-955-22	FERRITE 0UH	
FB1410	1-469-180-22	FERRITE 0UH	
FB1411	1-469-180-22	FERRITE 0UH	
FB1412	1-469-180-22	FERRITE 0UH	
FB1413	1-469-180-22	FERRITE 0UH	
		< IC >	
IC051	8-759-524-20	IC TC74VHC165FT(EL)	
IC052	8-759-524-20	IC TC74VHC165FT(EL)	
IC053	8-759-242-70	IC TC7WU04F(TE12R)	
IC054	8-759-062-66	IC TC7S66F(TE85R)	
IC101	8-752-086-52	IC CXA2071R-T4	
IC102	8-752-086-53	IC CXA2072R-T4	
IC140	8-759-637-96	IC uPD16877MA-6A5-E2	
IC141	8-759-444-87	IC NJM324V(TE2)	
IC142	8-759-075-66	IC TA75S01F(TE85R)	
IC143	8-759-327-33	IC BU9241FS-E2	
IC144	8-759-327-33	IC BU9241FS-E2	
IC301	8-759-650-74	IC CAIN	
IC302	8-759-677-31	IC MB90099PFV-G-103-BND-ER	
IC361	8-759-566-52	IC SN104266PN-TEB	
IC501	8-759-693-44	IC MB91192PFF-G-120-BND	

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Ref. No.	Part No.	Description	Remarks
IC502	8-759-593-47	IC AK6417AM-E2	
IC503	8-759-443-08	IC TC7W241FU-TE12R	
IC504	8-759-443-08	IC TC7W241FU-TE12R	
IC701	8-752-397-67	IC CXD3400N-T4	
IC702	8-752-397-67	IC CXD3400N-T4	
IC704	8-752-083-11	IC CXA2107R-T4	
IC705	8-752-408-78	IC CXD2484AR-T4	
IC706	8-759-598-08	IC AK5483-L	
IC707	8-759-075-66	IC TA75S01F(TE85R)	
IC771	8-752-397-00	IC CXD3116AR-T6	
IC801	8-759-445-94	IC BR9080RFV-E2	
IC802	8-752-918-26	IC CXP972048-021R-T6	
IC803	8-759-426-25	IC MB88346LPFV-G-BND-ER	
IC903	8-759-653-60	IC MB87L1241PFV-G-BND-ER	
IC1001	8-759-689-59	IC LA74207FN-TBM	
IC1002	8-759-647-71	IC AK4550VT-E2	
IC1003	8-759-680-44	IC TLC2272CDR	
IC1004	8-759-689-59	IC LA74207FN-TBM	
IC1005	8-759-430-57	IC M62367GP-75ED	
IC1006	8-759-633-55	IC M5222FP-E1	
IC1007	8-759-633-55	IC M5222FP-E1	
IC1008	8-759-111-56	IC uPC4572G2-E2	
IC1085	8-759-238-55	IC TC74HC4052AF (EL)	
IC1086	8-759-299-00	IC BA7785FS-E2	
IC1101	8-759-580-27	IC S-81236SGUP-DQ7-T1	
IC1102	8-759-424-79	IC S-8423YFS-T2	
IC1103	8-759-642-45	IC TL1596CPWR	
IC1104	8-752-919-79	IC CXP921064A-027R-T6	
IC1105	8-759-566-20	IC AK6440BH-E2	
IC1301	8-759-599-37	IC AN2225FHQ-EB	
IC1401	8-759-692-19	IC HD6437044P15XSZ	
IC1402	8-759-234-20	IC TC7S08F(TE85R)	
IC1403	8-759-693-38	IC K4F151612C-TL60T	
IC1404	8-759-495-15	IC uPD4721GS-GJG-E2	
IC1405	8-759-327-60	IC TC7W125FU-TE12R	
IC1406	8-759-566-20	IC AK6440BH-E2	
IC1407	8-752-395-94	IC CXD3133AR	
IC1409	8-759-547-24	IC RL5V834/E2H	
IC1410	8-759-584-32	IC MB86189PFV-G-BND-ER	
IC1411	8-759-058-60	IC TC7SU04FU(TE85R)	
IC1412	8-759-644-18	IC ML2201-100MBZ060	
IC1413	8-759-693-38	IC K4F151612C-TL60T	
IC1601	8-759-075-66	IC TA75S01F(TE85R)	
IC1602	8-759-075-66	IC TA75S01F(TE85R)	
IC1603	8-759-603-27	IC M5201FP-600D	
IC1604	8-759-603-27	IC M5201FP-600D	
IC1607	8-759-603-27	IC M5201FP-600D	
IC1608	8-759-603-27	IC M5201FP-600D	
IC1611	8-759-603-27	IC M5201FP-600D	
IC1612	8-759-603-27	IC M5201FP-600D	
IC2200	8-759-489-19	IC uPC6756GR-8JG-E2	
IC2501	8-759-564-49	IC TC7W53FU(TE12R)	
IC2502	8-759-564-49	IC TC7W53FU(TE12R)	
IC2770	8-759-359-49	IC NJM3414AV(TE2)	
IC2771	8-759-359-49	IC NJM3414AV(TE2)	
IC2772	8-759-823-51	IC LB1830M-TLM	
IC2773	8-759-444-87	IC NJM324V(TE2)	
IC2774	8-759-058-45	IC NJM3403AV(TE2)	
IC2775	8-759-478-92	IC TC7SET04FU(TE85R)	
IC2776	8-759-478-92	IC TC7SET04FU(TE85R)	

Ref. No.	Part No.	Description			Remarks
IC3300	8-759-491-09	IC MB4488PFV-G-BND-ER			
IC3301	8-759-364-52	IC TA75S01F(TE85R)			
IC4100	8-759-060-94	IC MB3785APFV-G-BND-ER			
IC4200	8-759-339-61	IC LB1897D			
IC4202	8-759-338-95	IC NJM2903V(TE2)			
IC4300	8-759-327-61	IC LB8112V-TLM			
IC4400	8-759-431-41	IC LB1991V-TLM			
IC4500	8-759-431-30	IC CXA8062R-EB			
IC4501	8-759-434-46	IC TA8486F(EL)			
		< JUMPER RESISTOR >			
JR4501	1-216-864-11	METAL CHIP	0	5%	1/16W
JR4503	1-216-864-11	METAL CHIP	0	5%	1/16W
JR4505	1-216-864-11	METAL CHIP	0	5%	1/16W
		< SHORT JUMPER >			
JS002	1-216-864-11	METAL CHIP	0	5%	1/16W
		< COIL >			
L101	1-414-771-91	INDUCTOR CHIP	10uH		
L102	1-414-771-91	INDUCTOR CHIP	10uH		
L103	1-414-771-91	INDUCTOR CHIP	10uH		
L140	1-414-754-11	INDUCTOR	10uH		
L141	1-414-754-11	INDUCTOR	10uH		
L142	1-414-754-11	INDUCTOR	10uH		
L143	1-414-754-11	INDUCTOR	10uH		
L303	1-412-936-11	INDUCTOR	0.56uH		
L304	1-414-246-11	INDUCTOR	1.8uH		
L305	1-414-754-11	INDUCTOR	10uH		
L306	1-414-771-91	INDUCTOR CHIP	10uH		
L307	1-414-771-91	INDUCTOR CHIP	10uH		
L701	1-414-755-11	INDUCTOR	22uH		
L702	1-414-754-11	INDUCTOR	10uH		
L703	1-414-755-11	INDUCTOR	22uH		
L801	1-414-754-11	INDUCTOR	10uH		
L802	1-412-951-11	INDUCTOR	10uH		
L901	1-414-771-91	INDUCTOR CHIP	10uH		
L902	1-414-771-91	INDUCTOR CHIP	10uH		
L1001	1-414-754-11	INDUCTOR	10uH		
L1002	1-469-058-11	INDUCTOR CHIP	22uH		
L1003	1-414-754-11	INDUCTOR	10uH		
L1004	1-414-754-11	INDUCTOR	10uH		
L1073	1-414-754-11	INDUCTOR	10uH		
L1085	1-414-754-11	INDUCTOR	10uH		
L1086	1-414-754-11	INDUCTOR	10uH		
L1301	1-469-058-11	INDUCTOR CHIP	22uH		
L1302	1-414-771-91	INDUCTOR CHIP	10uH		
L1303	1-412-937-11	INDUCTOR	0.68uH		
L1304	1-414-771-91	INDUCTOR CHIP	10uH		
L2200	1-414-754-11	INDUCTOR	10uH		
L2501	1-414-771-91	INDUCTOR CHIP	10uH		
L2770	1-412-951-11	INDUCTOR	10uH		
L2771	1-412-963-11	INDUCTOR	100uH		
L2773	1-414-771-91	INDUCTOR CHIP	10uH		
L2774	1-414-754-11	INDUCTOR	10uH		
L3302	1-416-669-11	INDUCTOR	22uH		
L3303	1-416-669-11	INDUCTOR	22uH		
L3304	1-416-669-11	INDUCTOR	22uH		
L3305	1-416-669-11	INDUCTOR	22uH		

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Ref. No.	Part No.	Description		Remarks
L3306	1-412-056-11	INDUCTOR	4.7uH	
L3307	1-414-770-91	INDUCTOR CHIP	4.7uH	
L3308	1-412-056-11	INDUCTOR	4.7uH	
L3309	1-414-400-11	INDUCTOR	22uH	
L3310	1-414-770-91	INDUCTOR CHIP	4.7uH	
L3311	1-414-771-91	INDUCTOR CHIP	10uH	
L3312	1-412-056-11	INDUCTOR	4.7uH	
L3313	1-414-770-91	INDUCTOR CHIP	4.7uH	
L3314	1-414-770-91	INDUCTOR CHIP	4.7uH	
L3315	1-414-394-11	INDUCTOR	2.2uH	
L3316	1-414-770-91	INDUCTOR CHIP	4.7uH	
L3318	1-469-058-11	INDUCTOR CHIP	22uH	
L3319	1-414-770-91	INDUCTOR CHIP	4.7uH	
L3451	1-414-770-91	INDUCTOR CHIP	4.7uH	
L4100	1-406-823-11	INDUCTOR	10uH	
L4101	1-406-823-11	INDUCTOR	10uH	
L4102	1-424-522-21	INDUCTOR	10uH	
L4103	1-406-823-11	INDUCTOR	10uH	
L4104	1-409-535-41	INDUCTOR	100uH	
L4105	1-409-535-41	INDUCTOR	100uH	
L4106	1-424-523-21	INDUCTOR	22uH	
L4107	1-406-825-11	INDUCTOR	33uH	
L4200	1-414-398-11	INDUCTOR	10uH	
L4400	1-414-754-11	INDUCTOR	10uH	
L4500	1-414-754-11	INDUCTOR	10uH	
		< TRANSISTOR >		
Q004	8-729-037-72	TRANSISTOR	UN9211J-(K8).SO	
Q102	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q140	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q141	8-729-037-74	TRANSISTOR	UN9213J-(K8).SO	
Q142	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	
Q143	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	
Q301	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q302	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q303	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q304	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q305	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q306	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q307	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q308	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q701	8-729-042-68	TRANSISTOR	UN911FJ-(K8).SO	
Q702	8-729-037-74	TRANSISTOR	UN9213J-(K8).SO	
Q801	8-729-037-72	TRANSISTOR	UN9211J-(K8).SO	
Q902	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q903	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	
Q904	8-729-049-91	TRANSISTOR	2SA2018H-T2L	
Q905	8-729-037-74	TRANSISTOR	UN9213J-(K8).SO	
Q906	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q1001	8-729-037-71	TRANSISTOR	UN9210J-(K8).SO	
Q1002	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	
Q1003	8-729-037-71	TRANSISTOR	UN9210J-(K8).SO	
Q1004	8-729-037-63	TRANSISTOR	UN9115J-(K8).SO	
Q1005	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	
Q1007	8-729-117-32	TRANSISTOR	2SC4177-T1L5L6	
Q1008	8-729-037-63	TRANSISTOR	UN9115J-(K8).SO	
Q1010	8-729-037-74	TRANSISTOR	UN9213J-(K8).SO	

Ref. No.	Part No.	Description		Remarks
Q1011	8-729-024-39	TRANSISTOR	2SD1511-R/S(TX)	
Q1014	8-729-037-63	TRANSISTOR	UN9115J-(K8).SO	
Q1015	8-729-037-74	TRANSISTOR	UN9213J-(K8).SO	
Q1016	8-729-117-32	TRANSISTOR	2SC4177-T1L5L6	
Q1024	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q1025	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q1031	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	
Q1032	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	
Q1033	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	
Q1034	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	
Q1101	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	
Q1103	8-729-037-74	TRANSISTOR	UN9213J-(K8).SO	
Q1106	8-729-042-58	TRANSISTOR	UN9111J-(K8).SO	
Q1107	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q1108	8-729-037-61	TRANSISTOR	UN9113J-(K8).SO	
Q1109	8-729-049-91	TRANSISTOR	2SA2018H-T2L	
Q1112	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q1113	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	
Q1301	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	
Q1302	8-729-037-61	TRANSISTOR	UN9113J-(K8).SO	
Q1303	8-729-049-25	TRANSISTOR	2SC5376F-B(TPL3)	
Q1304	8-729-049-25	TRANSISTOR	2SC5376F-B(TPL3)	
Q1305	8-729-049-25	TRANSISTOR	2SC5376F-B(TPL3)	
Q1306	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q1401	8-729-037-74	TRANSISTOR	UN9213J-(K8).SO	
Q1402	8-729-037-74	TRANSISTOR	UN9213J-(K8).SO	
Q1403	8-729-037-61	TRANSISTOR	UN9113J-(K8).SO	
Q1404	8-729-037-74	TRANSISTOR	UN9213J-(K8).SO	
Q1405	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q1601	8-729-037-74	TRANSISTOR	UN9213J-(K8).SO	
Q1602	8-729-037-74	TRANSISTOR	UN9213J-(K8).SO	
Q2200	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q2201	8-729-037-74	TRANSISTOR	UN9213J-(K8).SO	
Q2501	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q2502	8-729-037-72	TRANSISTOR	UN9211J-(K8).SO	
Q2770	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q2771	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q2772	8-729-037-74	TRANSISTOR	UN9213J-(K8).SO	
Q2773	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q2774	8-729-037-74	TRANSISTOR	UN9213J-(K8).SO	
Q2775	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q2776	8-729-013-31	TRANSISTOR	2SA1588-OY-TE85L	
Q2777	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q2778	8-729-037-74	TRANSISTOR	UN9213J-(K8).SO	
Q3305	8-729-050-24	TRANSISTOR	MCH6202-TL	
Q3306	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q3307	8-729-037-74	TRANSISTOR	UN9213J-(K8).SO	
Q3308	8-729-043-60	TRANSISTOR	CPH6102-TL	
Q3309	8-729-046-98	TRANSISTOR	CPH6702-TL	
Q3312	8-729-046-98	TRANSISTOR	CPH6702-TL	
Q3313	8-729-046-98	TRANSISTOR	CPH6702-TL	
Q3314	8-729-046-98	TRANSISTOR	CPH6702-TL	
Q3315	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	
Q3316	8-729-017-61	TRANSISTOR	2SB1581-T1	
Q3317	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q3318	8-729-044-58	TRANSISTOR	SI2304DS-T1	
Q3321	8-729-044-58	TRANSISTOR	SI2304DS-T1	
Q3322	8-729-044-58	TRANSISTOR	SI2304DS-T1	
Q3323	8-729-044-58	TRANSISTOR	SI2304DS-T1	
Q3324	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	

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Ref. No.	Part No.	Description		Remarks
Q3325	8-729-037-74	TRANSISTOR	UN9213J-(K8).SO	
Q3326	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	
Q3327	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	
Q3328	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q3331	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q3332	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q3333	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q3334	8-729-049-25	TRANSISTOR	2SC5376F-B(TPL3)	
Q3335	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	
Q3336	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	
Q3337	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	
Q3338	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q3340	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	
Q3341	8-729-049-91	TRANSISTOR	2SA2018H-T2L	
Q3344	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	
Q3345	8-729-034-59	TRANSISTOR	2SA1745-6.7-TL	
Q3348	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	
Q3349	8-729-042-26	TRANSISTOR	2SB1462J-QR(K8).SO	
Q3351	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	
Q3352	8-729-037-74	TRANSISTOR	UN9213J-(K8).SO	
Q3353	8-729-024-39	TRANSISTOR	2SD1511-R/S(TX)	
Q4100	8-729-048-75	TRANSISTOR	CPH3109-TL	
Q4101	8-729-048-75	TRANSISTOR	CPH3109-TL	
Q4102	8-729-048-75	TRANSISTOR	CPH3109-TL	
Q4103	8-729-048-75	TRANSISTOR	CPH3109-TL	
Q4104	8-729-216-22	TRANSISTOR	2SB709A-QRS-TX	
Q4105	8-729-037-72	TRANSISTOR	UN9211J-(TX).SO	
Q4200	8-729-216-22	TRANSISTOR	2SB709A-QRS-TX	
Q4201	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	
Q4301	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	
Q4302	8-729-037-52	TRANSISTOR	2SD2216J-QR(K8).SO	
Q4501	8-729-216-22	TRANSISTOR	2SB709A-QRS-TX	

< RESISTOR >

R001	1-218-954-11	RES-CHIP	1.2K	5%	1/16W
R002	1-218-955-11	RES-CHIP	1.5K	5%	1/16W
R003	1-218-959-11	RES-CHIP	3.3K	5%	1/16W
R004	1-218-963-11	RES-CHIP	6.8K	5%	1/16W
R007	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R008	1-218-990-11	SHORT	0		
R010	1-218-990-11	SHORT	0		
R051	1-216-845-11	METAL CHIP	100K	5%	1/16W
R052	1-216-845-11	METAL CHIP	100K	5%	1/16W
R053	1-216-845-11	METAL CHIP	100K	5%	1/16W
R054	1-216-845-11	METAL CHIP	100K	5%	1/16W
R055	1-216-845-11	METAL CHIP	100K	5%	1/16W
R056	1-216-845-11	METAL CHIP	100K	5%	1/16W
R057	1-216-845-11	METAL CHIP	100K	5%	1/16W
R058	1-216-845-11	METAL CHIP	100K	5%	1/16W
R059	1-216-845-11	METAL CHIP	100K	5%	1/16W
R060	1-216-845-11	METAL CHIP	100K	5%	1/16W
R061	1-216-845-11	METAL CHIP	100K	5%	1/16W
R062	1-216-845-11	METAL CHIP	100K	5%	1/16W
R063	1-216-845-11	METAL CHIP	100K	5%	1/16W
R064	1-216-845-11	METAL CHIP	100K	5%	1/16W
R065	1-216-845-11	METAL CHIP	100K	5%	1/16W
R066	1-216-809-11	METAL CHIP	100	5%	1/16W
R067	1-216-845-11	METAL CHIP	100K	5%	1/16W
R068	1-216-845-11	METAL CHIP	100K	5%	1/16W
R103	1-218-965-11	RES-CHIP	10K	5%	1/16W
R104	1-218-963-11	RES-CHIP	6.8K	5%	1/16W
R105	1-218-990-11	SHORT	0		
R106	1-218-989-11	RES-CHIP	1M	5%	1/16W
R107	1-218-979-11	RES-CHIP	150K	5%	1/16W
R108	1-218-966-11	RES-CHIP	12K	5%	1/16W
R109	1-218-965-11	RES-CHIP	10K	5%	1/16W
R110	1-218-949-11	RES-CHIP	470	5%	1/16W
R112	1-218-966-11	RES-CHIP	12K	5%	1/16W
R113	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R114	1-218-965-11	RES-CHIP	10K	5%	1/16W
R115	1-218-969-11	RES-CHIP	22K	5%	1/16W
R116	1-208-910-11	METAL CHIP	9.1K	0.5%	1/16W
R117	1-208-909-11	METAL CHIP	8.2K	0.5%	1/16W
R118	1-218-969-11	RES-CHIP	22K	5%	1/16W
R120	1-218-945-11	METAL CHIP	220	0.5%	1/16W
R122	1-218-945-11	METAL CHIP	220	0.5%	1/16W
R123	1-218-945-11	METAL CHIP	220	0.5%	1/16W
R124	1-218-945-11	METAL CHIP	220	0.5%	1/16W
R125	1-216-864-11	METAL CHIP	0	5%	1/16W
R126	1-216-864-11	METAL CHIP	0	5%	1/16W
R127	1-218-939-11	RES-CHIP	68	5%	1/16W
R128	1-218-990-11	SHORT	0		
R129	1-218-990-11	SHORT	0		
R140	1-218-953-11	RES-CHIP	1K	5%	1/16W
R141	1-218-973-11	RES-CHIP	47K	5%	1/16W
R142	1-218-975-11	RES-CHIP	68K	5%	1/16W
R143	1-218-975-11	RES-CHIP	68K	5%	1/16W
R144	1-218-975-11	RES-CHIP	68K	5%	1/16W
R145	1-218-975-11	RES-CHIP	68K	5%	1/16W
R146	1-218-975-11	RES-CHIP	68K	5%	1/16W
R147	1-216-295-11	SHORT	0		
R148	1-218-973-11	RES-CHIP	47K	5%	1/16W
R150	1-218-953-11	RES-CHIP	1K	5%	1/16W
R151	1-218-989-11	RES-CHIP	1M	5%	1/16W
R152	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R153	1-218-965-11	RES-CHIP	10K	5%	1/16W
R154	1-218-981-11	RES-CHIP	220K	5%	1/16W
R155	1-218-985-11	RES-CHIP	470K	5%	1/16W
R156	1-218-985-11	RES-CHIP	470K	5%	1/16W
R157	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R158	1-218-967-11	RES-CHIP	15K	5%	1/16W
R159	1-218-969-11	RES-CHIP	22K	5%	1/16W
R160	1-218-985-11	RES-CHIP	470K	5%	1/16W
R161	1-218-953-11	RES-CHIP	1K	5%	1/16W
R162	1-218-953-11	RES-CHIP	1K	5%	1/16W
R163	1-218-947-11	RES-CHIP	330	5%	1/16W
R164	1-218-969-11	RES-CHIP	22K	5%	1/16W
R165	1-218-953-11	RES-CHIP	1K	5%	1/16W
R166	1-218-965-11	RES-CHIP	10K	5%	1/16W
R167	1-218-973-11	RES-CHIP	47K	5%	1/16W
R168	1-208-927-11	METAL CHIP	47K	0.5%	1/16W
R169	1-208-713-11	METAL CHIP	18K	0.5%	1/16W
R170	1-208-675-11	METAL CHIP	470	0.5%	1/16W
R171	1-218-973-11	RES-CHIP	47K	5%	1/16W
R172	1-218-973-11	RES-CHIP	47K	5%	1/16W
R173	1-218-953-11	RES-CHIP	1K	5%	1/16W
R174	1-218-953-11	RES-CHIP	1K	5%	1/16W
R177	1-218-974-11	RES-CHIP	56K	5%	1/16W
R178	1-218-950-11	RES-CHIP	560	5%	1/16W

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Ref. No.	Part No.	Description			Remarks
R179	1-218-973-11	RES-CHIP	47K	5%	1/16W
R180	1-218-973-11	RES-CHIP	47K	5%	1/16W
R181	1-218-953-11	RES-CHIP	1K	5%	1/16W
R182	1-218-953-11	RES-CHIP	1K	5%	1/16W
R185	1-218-974-11	RES-CHIP	56K	5%	1/16W
R186	1-218-950-11	RES-CHIP	560	5%	1/16W
R187	1-216-295-11	SHORT	0		
R224	1-216-841-11	METAL CHIP	47K	5%	1/16W
R305	1-218-990-11	SHORT	0		
R306	1-218-990-11	SHORT	0		
R310	1-218-965-11	RES-CHIP	10K	5%	1/16W
R311	1-218-965-11	RES-CHIP	10K	5%	1/16W
R312	1-218-946-11	RES-CHIP	270	5%	1/16W
R313	1-218-990-11	SHORT	0		
R314	1-218-990-11	SHORT	0		
R315	1-218-959-11	RES-CHIP	3.3K	5%	1/16W
R316	1-218-959-11	RES-CHIP	3.3K	5%	1/16W
R317	1-218-959-11	RES-CHIP	3.3K	5%	1/16W
R318	1-218-965-11	RES-CHIP	10K	5%	1/16W
R319	1-218-965-11	RES-CHIP	10K	5%	1/16W
R320	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R321	1-218-965-11	RES-CHIP	10K	5%	1/16W
R322	1-218-941-11	RES-CHIP	100	5%	1/16W
R323	1-218-947-11	RES-CHIP	330	5%	1/16W
R324	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R325	1-218-937-11	RES-CHIP	47	5%	1/16W
R326	1-218-990-11	SHORT	0		
R327	1-218-953-11	RES-CHIP	1K	5%	1/16W
R328	1-218-953-11	RES-CHIP	1K	5%	1/16W
R329	1-218-945-11	RES-CHIP	220	5%	1/16W
R331	1-218-952-11	RES-CHIP	820	5%	1/16W
R332	1-218-953-11	RES-CHIP	1K	5%	1/16W
R334	1-218-953-11	RES-CHIP	1K	5%	1/16W
R335	1-218-945-11	RES-CHIP	220	5%	1/16W
R336	1-218-952-11	RES-CHIP	820	5%	1/16W
R338	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R340	1-218-953-11	RES-CHIP	1K	5%	1/16W
R341	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R343	1-218-952-11	RES-CHIP	820	5%	1/16W
R351	1-218-954-11	RES-CHIP	1.2K	5%	1/16W
R356	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R358	1-218-943-11	RES-CHIP	150	5%	1/16W
R360	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R361	1-208-709-11	METAL CHIP	12K	0.5%	1/16W
R364	1-208-709-11	METAL CHIP	12K	0.5%	1/16W
R367	1-218-938-11	METAL CHIP	56	0.5%	1/16W
R368	1-218-938-11	METAL CHIP	56	0.5%	1/16W
R369	1-208-707-11	METAL CHIP	10K	0.5%	1/16W
R370	1-218-938-11	METAL CHIP	56	0.5%	1/16W
R371	1-208-707-11	METAL CHIP	10K	0.5%	1/16W
R372	1-218-938-11	METAL CHIP	56	0.5%	1/16W
R377	1-218-941-11	RES-CHIP	100	5%	1/16W
R378	1-218-941-11	RES-CHIP	100	5%	1/16W
R379	1-218-941-11	RES-CHIP	100	5%	1/16W
R380	1-218-941-11	RES-CHIP	100	5%	1/16W
R381	1-218-941-11	RES-CHIP	100	5%	1/16W
R382	1-218-990-11	SHORT	0		
R383	1-218-990-11	SHORT	0		
R501	1-218-977-11	RES-CHIP	100K	5%	1/16W
R502	1-218-977-11	RES-CHIP	100K	5%	1/16W
R503	1-218-977-11	RES-CHIP	100K	5%	1/16W
R504	1-218-977-11	RES-CHIP	100K	5%	1/16W
R505	1-218-985-11	RES-CHIP	470K	5%	1/16W
R507	1-218-953-11	RES-CHIP	1K	5%	1/16W
R508	1-218-985-11	RES-CHIP	470K	5%	1/16W
R509	1-218-985-11	RES-CHIP	470K	5%	1/16W
R510	1-218-985-11	RES-CHIP	470K	5%	1/16W
R511	1-218-985-11	RES-CHIP	470K	5%	1/16W
R512	1-218-985-11	RES-CHIP	470K	5%	1/16W
R513	1-218-953-11	RES-CHIP	1K	5%	1/16W
R514	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R515	1-218-990-11	SHORT	0		
R516	1-218-977-11	RES-CHIP	100K	5%	1/16W
R517	1-208-927-11	METAL CHIP	47K	0.5%	1/16W
R518	1-208-943-11	METAL CHIP	220K	0.5%	1/16W
R520	1-218-943-11	RES-CHIP	150	5%	1/16W
R521	1-218-945-11	RES-CHIP	220	5%	1/16W
R522	1-218-943-11	RES-CHIP	150	5%	1/16W
R523	1-218-945-11	RES-CHIP	220	5%	1/16W
R524	1-218-990-11	SHORT	0		
R525	1-218-990-11	SHORT	0		
R527	1-218-977-11	RES-CHIP	100K	5%	1/16W
R528	1-218-977-11	RES-CHIP	100K	5%	1/16W
R531	1-218-965-11	RES-CHIP	10K	5%	1/16W
R532	1-218-977-11	RES-CHIP	100K	5%	1/16W
R533	1-218-985-11	RES-CHIP	470K	5%	1/16W
R534	1-218-985-11	RES-CHIP	470K	5%	1/16W
R535	1-216-821-11	METAL CHIP	1K	5%	1/16W
R536	1-216-821-11	METAL CHIP	1K	5%	1/16W
R537	1-218-953-11	RES-CHIP	1K	5%	1/16W
R538	1-218-953-11	RES-CHIP	1K	5%	1/16W
R539	1-218-953-11	RES-CHIP	1K	5%	1/16W
R540	1-218-953-11	RES-CHIP	1K	5%	1/16W
R542	1-218-953-11	RES-CHIP	1K	5%	1/16W
R701	1-218-977-11	RES-CHIP	100K	5%	1/16W
R703	1-220-193-81	RES-CHIP	7.5K	5%	1/16W
R708	1-218-990-11	SHORT	0		
R710	1-218-990-11	SHORT	0		
R711	1-208-683-11	METAL CHIP	1K	0.5%	1/16W
R712	1-208-712-11	METAL CHIP	16K	0.5%	1/16W
R713	1-208-713-11	METAL CHIP	18K	0.5%	1/16W
R714	1-218-934-11	RES-CHIP	27	5%	1/16W
R715	1-218-934-11	RES-CHIP	27	5%	1/16W
R716	1-208-713-11	METAL CHIP	18K	0.5%	1/16W
R717	1-208-713-11	METAL CHIP	18K	0.5%	1/16W
R718	1-208-713-11	METAL CHIP	18K	0.5%	1/16W
R719	1-208-713-11	METAL CHIP	18K	0.5%	1/16W
R720	1-208-713-11	METAL CHIP	18K	0.5%	1/16W
R721	1-218-934-11	RES-CHIP	27	5%	1/16W
R722	1-218-934-11	RES-CHIP	27	5%	1/16W
R723	1-218-934-11	RES-CHIP	27	5%	1/16W
R724	1-218-934-11	RES-CHIP	27	5%	1/16W
R725	1-218-935-11	RES-CHIP	33	5%	1/16W
R726	1-218-935-11	RES-CHIP	33	5%	1/16W
R727	1-218-935-11	RES-CHIP	33	5%	1/16W
R730	1-218-990-11	SHORT	0		
R732	1-218-985-11	RES-CHIP	470K	5%	1/16W
R733	1-218-937-11	RES-CHIP	47	5%	1/16W
R735	1-218-962-11	RES-CHIP	5.6K	5%	1/16W
R736	1-218-965-11	RES-CHIP	10K	5%	1/16W

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Ref. No.	Part No.	Description			Remarks
R751	1-218-959-11	RES-CHIP	3.3K	5%	1/16W
R773	1-218-990-11	SHORT	0		
R801	1-218-977-11	RES-CHIP	100K	5%	1/16W
R802	1-218-977-11	RES-CHIP	100K	5%	1/16W
R803	1-218-977-11	RES-CHIP	100K	5%	1/16W
R812	1-218-977-11	RES-CHIP	100K	5%	1/16W
R813	1-218-977-11	RES-CHIP	100K	5%	1/16W
R814	1-218-977-11	RES-CHIP	100K	5%	1/16W
R815	1-218-953-11	RES-CHIP	1K	5%	1/16W
R818	1-218-953-11	RES-CHIP	1K	5%	1/16W
R819	1-218-989-11	RES-CHIP	1M	5%	1/16W
R820	1-218-973-11	RES-CHIP	47K	5%	1/16W
R826	1-218-953-11	RES-CHIP	1K	5%	1/16W
R827	1-218-977-11	RES-CHIP	100K	5%	1/16W
R828	1-218-953-11	RES-CHIP	1K	5%	1/16W
R829	1-218-953-11	RES-CHIP	1K	5%	1/16W
R830	1-218-989-11	RES-CHIP	1M	5%	1/16W
R831	1-218-953-11	RES-CHIP	1K	5%	1/16W
R833	1-218-977-11	RES-CHIP	100K	5%	1/16W
R835	1-218-989-11	RES-CHIP	1M	5%	1/16W
R836	1-218-985-11	RES-CHIP	470K	5%	1/16W
R837	1-218-985-11	RES-CHIP	470K	5%	1/16W
R839	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R840	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R841	1-218-985-11	RES-CHIP	470K	5%	1/16W
R842	1-218-985-11	RES-CHIP	470K	5%	1/16W
R850	1-218-977-11	RES-CHIP	100K	5%	1/16W
R851	1-218-977-11	RES-CHIP	100K	5%	1/16W
R852	1-218-977-11	RES-CHIP	100K	5%	1/16W
R853	1-218-953-11	RES-CHIP	1K	5%	1/16W
R907	1-218-965-11	RES-CHIP	10K	5%	1/16W
R908	1-218-965-11	RES-CHIP	10K	5%	1/16W
R909	1-218-973-11	RES-CHIP	47K	5%	1/16W
R911	1-218-951-11	RES-CHIP	680	5%	1/16W
R912	1-218-965-11	RES-CHIP	10K	5%	1/16W
R916	1-218-949-11	RES-CHIP	470	5%	1/16W
R924	1-218-990-11	SHORT	0		
R930	1-218-990-11	SHORT	0		
R936	1-218-990-11	SHORT	0		
R949	1-218-990-11	SHORT	0		
R953	1-218-990-11	SHORT	0		
R954	1-218-941-11	RES-CHIP	100	5%	1/16W
R955	1-218-977-11	RES-CHIP	100K	5%	1/16W
R956	1-218-960-11	RES-CHIP	3.9K	5%	1/16W
R957	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R958	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1001	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R1002	1-218-945-11	METAL CHIP	220	0.5%	1/16W
R1003	1-218-990-11	SHORT	0		
R1004	1-218-990-11	SHORT	0		
R1005	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R1006	1-208-927-11	METAL CHIP	47K	0.5%	1/16W
R1007	1-218-941-11	RES-CHIP	100	5%	1/16W
R1008	1-218-941-11	RES-CHIP	100	5%	1/16W
R1009	1-216-295-11	SHORT	0		
R1010	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1011	1-208-928-11	METAL CHIP	51K	0.5%	1/16W
R1015	1-218-960-11	RES-CHIP	3.9K	5%	1/16W
R1016	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1018	1-218-864-11	METAL CHIP	5.1K	0.5%	1/16W

Ref. No.	Part No.	Description			Remarks
R1020	1-218-971-11	RES-CHIP	33K	5%	1/16W
R1021	1-218-971-11	RES-CHIP	33K	5%	1/16W
R1022	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1023	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1024	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1025	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1026	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R1027	1-218-966-11	RES-CHIP	12K	5%	1/16W
R1028	1-218-945-11	METAL CHIP	220	0.5%	1/16W
R1031	1-218-949-11	RES-CHIP	470	5%	1/16W
R1032	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1033	1-208-927-11	METAL CHIP	47K	0.5%	1/16W
R1034	1-208-928-11	METAL CHIP	51K	0.5%	1/16W
R1035	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1036	1-218-864-11	METAL CHIP	5.1K	0.5%	1/16W
R1037	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1041	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1049	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1050	1-218-971-11	RES-CHIP	33K	5%	1/16W
R1051	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1053	1-218-949-11	RES-CHIP	470	5%	1/16W
R1054	1-216-864-11	METAL CHIP	0	5%	1/16W
R1056	1-216-814-11	METAL CHIP	270	5%	1/16W
R1057	1-216-864-11	METAL CHIP	0	5%	1/16W
R1059	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R1060	1-218-980-11	RES-CHIP	180K	5%	1/16W
R1061	1-218-981-11	RES-CHIP	220K	5%	1/16W
R1062	1-218-969-11	RES-CHIP	22K	5%	1/16W
R1063	1-218-969-11	RES-CHIP	22K	5%	1/16W
R1064	1-218-981-11	RES-CHIP	220K	5%	1/16W
R1066	1-218-962-11	RES-CHIP	5.6K	5%	1/16W
R1067	1-218-962-11	RES-CHIP	5.6K	5%	1/16W
R1068	1-218-980-11	RES-CHIP	180K	5%	1/16W
R1069	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R1070	1-218-966-11	RES-CHIP	12K	5%	1/16W
R1071	1-218-966-11	RES-CHIP	12K	5%	1/16W
R1072	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1073	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1074	1-218-960-11	RES-CHIP	3.9K	5%	1/16W
R1075	1-218-960-11	RES-CHIP	3.9K	5%	1/16W
R1079	1-218-969-11	RES-CHIP	22K	5%	1/16W
R1084	1-216-845-11	METAL CHIP	100K	5%	1/16W
R1085	1-216-821-11	METAL CHIP	1K	5%	1/16W
R1086	1-216-821-11	METAL CHIP	1K	5%	1/16W
R1087	1-216-845-11	METAL CHIP	100K	5%	1/16W
R1088	1-216-800-11	RES-CHIP	18	5%	1/16W
R1089	1-216-800-11	RES-CHIP	18	5%	1/16W
R1090	1-216-821-11	METAL CHIP	1K	5%	1/16W
R1091	1-216-821-11	METAL CHIP	1K	5%	1/16W
R1092	1-216-807-11	METAL CHIP	68	5%	1/16W
R1093	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1094	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1095	1-216-845-11	METAL CHIP	100K	5%	1/16W
R1096	1-216-845-11	METAL CHIP	100K	5%	1/16W
R1097	1-218-952-11	RES-CHIP	820	5%	1/16W
R1098	1-218-952-11	RES-CHIP	820	5%	1/16W
R1099	1-216-864-11	METAL CHIP	0	5%	1/16W
R1100	1-216-864-11	METAL CHIP	0	5%	1/16W
R1101	1-216-845-11	METAL CHIP	100K	5%	1/16W
R1102	1-216-845-11	METAL CHIP	100K	5%	1/16W

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Ref. No.	Part No.	Description			Remarks
R1103	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1104	1-216-845-11	METAL CHIP	100K	5%	1/16W
R1105	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1108	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1109	1-218-936-11	RES-CHIP	39	5%	1/16W
R1110	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1112	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1113	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1116	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1117	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1118	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1119	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1120	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1121	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1122	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1123	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1124	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1126	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1128	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1129	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1130	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1131	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1132	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1133	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1134	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1137	1-218-958-11	RES-CHIP	2.7K	5%	1/16W
R1138	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1139	1-218-989-11	RES-CHIP	1M	5%	1/16W
R1140	1-208-943-11	METAL CHIP	220K	0.5%	1/16W
R1142	1-218-989-11	METAL CHIP	1M	0.5%	1/16W
R1144	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1145	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1146	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1147	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1148	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1149	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1150	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1151	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1152	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1153	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1154	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1155	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1156	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1157	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1158	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1159	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1160	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1161	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1162	1-218-972-11	RES-CHIP	39K	5%	1/16W
R1163	1-218-964-11	RES-CHIP	9.1K	5%	1/16W
R1164	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1165	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1166	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1167	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1176	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1177	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1178	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1179	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1180	1-218-989-11	RES-CHIP	1M	5%	1/16W
R1188	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1189	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1191	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1193	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1194	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1195	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1196	1-218-962-11	RES-CHIP	5.6K	5%	1/16W
R1197	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R1198	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1199	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1200	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1201	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1202	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1203	1-219-570-11	RES-CHIP	10M	5%	1/16W
R1206	1-218-955-11	RES-CHIP	1.5K	5%	1/16W
R1207	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1208	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1209	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1210	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1211	1-218-949-11	RES-CHIP	470	5%	1/16W
R1212	1-216-791-11	METAL CHIP	3.3	5%	1/16W
R1213	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1214	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1215	1-218-959-11	RES-CHIP	3.3K	5%	1/16W
R1216	1-218-959-11	RES-CHIP	3.3K	5%	1/16W
R1217	1-218-959-11	RES-CHIP	3.3K	5%	1/16W
R1218	1-218-990-11	SHORT	0		
R1220	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1222	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1223	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1224	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1229	1-218-989-11	RES-CHIP	1M	5%	1/16W
R1231	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1232	1-218-949-11	RES-CHIP	470	5%	1/16W
R1233	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1234	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1237	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1238	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1301	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1302	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1304	1-218-941-11	RES-CHIP	100	5%	1/16W
R1305	1-218-981-11	RES-CHIP	220K	5%	1/16W
R1306	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1307	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1308	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1312	1-218-935-11	RES-CHIP	33	5%	1/16W
R1313	1-218-935-11	RES-CHIP	33	5%	1/16W
R1314	1-218-935-11	RES-CHIP	33	5%	1/16W
R1315	1-218-935-11	RES-CHIP	33	5%	1/16W
R1316	1-218-935-11	RES-CHIP	33	5%	1/16W
R1317	1-218-935-11	RES-CHIP	33	5%	1/16W
R1318	1-208-715-11	METAL CHIP	22K	0.5%	1/16W
R1319	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1320	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1321	1-218-971-11	RES-CHIP	33K	5%	1/16W
R1322	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1323	1-218-972-11	RES-CHIP	39K	5%	1/16W
R1324	1-218-945-11	RES-CHIP	220	5%	1/16W
R1325	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1326	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1327	1-218-953-11	RES-CHIP	1K	5%	1/16W

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Ref. No.	Part No.	Description			Remarks
R1328	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1329	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1330	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R1335	1-218-974-11	METAL CHIP	56K	0.5%	1/16W
R1336	1-208-935-11	METAL CHIP	100K	0.5%	1/16W
R1401	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1402	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1403	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1404	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1405	1-218-958-11	RES-CHIP	2.7K	5%	1/16W
R1406	1-218-946-11	RES-CHIP	270	5%	1/16W
R1407	1-218-949-11	RES-CHIP	470	5%	1/16W
R1408	1-218-985-11	RES-CHIP	470K	5%	1/16W
R1409	1-218-944-11	RES-CHIP	180	5%	1/16W
R1410	1-218-932-11	RES-CHIP	18	5%	1/16W
R1411	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1412	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1413	1-218-990-11	SHORT	0		
R1414	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1415	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1416	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1417	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1418	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1419	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1420	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1421	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1422	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1423	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1424	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1425	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1426	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1427	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1428	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1429	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1430	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1431	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1432	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1433	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1434	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1435	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1436	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1437	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1438	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1439	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1440	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1441	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1442	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1443	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1444	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1445	1-218-989-11	METAL CHIP	1M	0.5%	1/16W
R1446	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1447	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1448	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1449	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1450	1-218-977-11	RES-CHIP	100K	5%	1/16W
R1451	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1452	1-218-943-11	RES-CHIP	150	5%	1/16W
R1453	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1454	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1455	1-218-938-11	RES-CHIP	56	5%	1/16W
R1456	1-218-990-11	SHORT	0		
R1457	1-218-943-11	RES-CHIP	150	5%	1/16W
R1601	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1602	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1603	1-208-915-11	RES-CHIP	15K	0.5%	1/16W
R1604	1-208-915-11	RES-CHIP	15K	0.5%	1/16W
R1605	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1606	1-218-975-11	RES-CHIP	68K	5%	1/16W
R1607	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1608	1-218-975-11	RES-CHIP	68K	5%	1/16W
R1609	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1610	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1611	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1612	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1613	1-208-721-11	METAL CHIP	39K	0.5%	1/16W
R1614	1-208-721-11	METAL CHIP	39K	0.5%	1/16W
R1615	1-208-719-11	METAL CHIP	33K	0.5%	1/16W
R1616	1-208-719-11	METAL CHIP	33K	0.5%	1/16W
R1617	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1618	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1619	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1620	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1621	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1622	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1623	1-216-800-11	RES-CHIP	18	5%	1/16W
R1624	1-216-800-11	RES-CHIP	18	5%	1/16W
R1625	1-218-952-11	RES-CHIP	820	5%	1/16W
R1626	1-218-952-11	RES-CHIP	820	5%	1/16W
R1629	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1630	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1631	1-208-721-11	METAL CHIP	39K	0.5%	1/16W
R1632	1-208-721-11	METAL CHIP	39K	0.5%	1/16W
R1633	1-208-719-11	METAL CHIP	33K	0.5%	1/16W
R1634	1-208-719-11	METAL CHIP	33K	0.5%	1/16W
R1635	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1636	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1639	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1640	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1642	1-216-821-11	METAL CHIP	1K	5%	1/16W
R1647	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1648	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1649	1-208-721-11	METAL CHIP	39K	0.5%	1/16W
R1650	1-208-721-11	METAL CHIP	39K	0.5%	1/16W
R1651	1-208-719-11	METAL CHIP	33K	0.5%	1/16W
R1652	1-208-719-11	METAL CHIP	33K	0.5%	1/16W
R1653	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1654	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1657	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1658	1-218-973-11	RES-CHIP	47K	5%	1/16W
R1660	1-208-925-11	RES-CHIP	39K	0.5%	1/16W
R1661	1-208-910-11	RES-CHIP	9.1K	0.5%	1/16W
R1662	1-208-925-11	RES-CHIP	39K	0.5%	1/16W
R1663	1-208-910-11	RES-CHIP	9.1K	0.5%	1/16W
R1664	1-208-689-11	METAL CHIP	1.8K	0.5%	1/16W
R1665	1-208-689-11	METAL CHIP	1.8K	0.5%	1/16W
R1666	1-208-689-11	METAL CHIP	1.8K	0.5%	1/16W
R1667	1-208-689-11	METAL CHIP	1.8K	0.5%	1/16W
R1668	1-208-689-11	METAL CHIP	1.8K	0.5%	1/16W
R1669	1-208-689-11	METAL CHIP	1.8K	0.5%	1/16W
R2200	1-218-969-11	RES-CHIP	22K	5%	1/16W

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Ref. No.	Part No.	Description			Remarks
R2201	1-218-969-11	RES-CHIP	22K	5%	1/16W
R2202	1-218-969-11	RES-CHIP	22K	5%	1/16W
R2203	1-218-969-11	RES-CHIP	22K	5%	1/16W
R2204	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2205	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2206	1-218-989-11	RES-CHIP	1M	5%	1/16W
R2209	1-218-989-11	RES-CHIP	1M	5%	1/16W
R2210	1-218-953-11	RES-CHIP	1K	5%	1/16W
R2211	1-218-973-11	RES-CHIP	47K	5%	1/16W
R2501	1-216-807-11	METAL CHIP	68	5%	1/16W
R2502	1-216-821-11	METAL CHIP	1K	5%	1/16W
R2503	1-216-821-11	METAL CHIP	1K	5%	1/16W
R2504	1-216-821-11	METAL CHIP	1K	5%	1/16W
R2506	1-216-839-11	METAL CHIP	33K	5%	1/16W
R2507	1-216-835-11	METAL CHIP	15K	5%	1/16W
R2508	1-218-977-11	RES-CHIP	100K	5%	1/16W
R2509	1-218-977-11	RES-CHIP	100K	5%	1/16W
R2510	1-218-977-11	RES-CHIP	100K	5%	1/16W
R2511	1-218-977-11	RES-CHIP	100K	5%	1/16W
R2512	1-218-953-11	RES-CHIP	1K	5%	1/16W
R2513	1-218-953-11	RES-CHIP	1K	5%	1/16W
R2514	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2515	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2516	1-218-977-11	RES-CHIP	100K	5%	1/16W
R2517	1-218-977-11	RES-CHIP	100K	5%	1/16W
R2518	1-218-977-11	RES-CHIP	100K	5%	1/16W
R2519	1-218-977-11	RES-CHIP	100K	5%	1/16W
R2520	1-218-977-11	RES-CHIP	100K	5%	1/16W
R2522	1-218-977-11	RES-CHIP	100K	5%	1/16W
R2523	1-218-977-11	RES-CHIP	100K	5%	1/16W
R2524	1-216-864-11	METAL CHIP	0	5%	1/16W
R2770	1-208-885-11	METAL CHIP	820	0.5%	1/16W
R2771	1-208-703-11	METAL CHIP	6.8K	0.5%	1/16W
R2772	1-208-885-11	METAL CHIP	820	0.5%	1/16W
R2773	1-208-703-11	METAL CHIP	6.8K	0.5%	1/16W
R2774	1-208-707-11	METAL CHIP	10K	0.5%	1/16W
R2775	1-208-707-11	METAL CHIP	10K	0.5%	1/16W
R2776	1-208-707-11	METAL CHIP	10K	0.5%	1/16W
R2777	1-208-935-11	METAL CHIP	100K	0.5%	1/16W
R2778	1-208-707-11	METAL CHIP	10K	0.5%	1/16W
R2779	1-208-707-11	METAL CHIP	10K	0.5%	1/16W
R2780	1-208-935-11	METAL CHIP	100K	0.5%	1/16W
R2781	1-208-711-11	METAL CHIP	15K	0.5%	1/16W
R2782	1-208-707-11	METAL CHIP	10K	0.5%	1/16W
R2783	1-208-711-11	METAL CHIP	15K	0.5%	1/16W
R2784	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R2785	1-216-134-00	METAL CHIP	2.2	5%	1/8W
R2786	1-218-973-11	RES-CHIP	47K	5%	1/16W
R2787	1-218-973-11	RES-CHIP	47K	5%	1/16W
R2788	1-208-927-11	METAL CHIP	47K	0.5%	1/16W
R2789	1-208-927-11	METAL CHIP	47K	0.5%	1/16W
R2791	1-208-935-11	METAL CHIP	100K	0.5%	1/16W
R2792	1-208-935-11	METAL CHIP	100K	0.5%	1/16W
R2793	1-208-943-11	METAL CHIP	220K	0.5%	1/16W
R2795	1-208-943-11	METAL CHIP	220K	0.5%	1/16W
R2796	1-208-707-11	METAL CHIP	10K	0.5%	1/16W
R2797	1-208-707-11	METAL CHIP	10K	0.5%	1/16W
R2798	1-208-935-11	METAL CHIP	100K	0.5%	1/16W
R2799	1-208-935-11	METAL CHIP	100K	0.5%	1/16W
R2800	1-218-969-11	RES-CHIP	22K	5%	1/16W

Ref. No.	Part No.	Description			Remarks
R2801	1-218-969-11	RES-CHIP	22K	5%	1/16W
R2802	1-218-969-11	RES-CHIP	22K	5%	1/16W
R2803	1-218-969-11	RES-CHIP	22K	5%	1/16W
R2804	1-218-969-11	RES-CHIP	22K	5%	1/16W
R2805	1-218-969-11	RES-CHIP	22K	5%	1/16W
R2806	1-218-975-11	RES-CHIP	68K	5%	1/16W
R2807	1-218-977-11	RES-CHIP	100K	5%	1/16W
R2808	1-218-975-11	RES-CHIP	68K	5%	1/16W
R2809	1-218-977-11	RES-CHIP	100K	5%	1/16W
R2810	1-218-953-11	RES-CHIP	1K	5%	1/16W
R2811	1-218-973-11	RES-CHIP	47K	5%	1/16W
R2812	1-218-953-11	RES-CHIP	1K	5%	1/16W
R2813	1-218-977-11	RES-CHIP	100K	5%	1/16W
R2814	1-218-973-11	RES-CHIP	47K	5%	1/16W
R2815	1-218-965-11	RES-CHIP	10K	5%	1/16W
R2816	1-218-953-11	RES-CHIP	1K	5%	1/16W
R2817	1-218-953-11	RES-CHIP	1K	5%	1/16W
R2818	1-218-953-11	RES-CHIP	1K	5%	1/16W
R2819	1-218-973-11	RES-CHIP	47K	5%	1/16W
R2820	1-218-973-11	RES-CHIP	47K	5%	1/16W
R3316	1-218-969-11	RES-CHIP	22K	5%	1/16W
R3317	1-208-715-11	METAL CHIP	22K	0.5%	1/16W
R3318	1-208-927-11	METAL CHIP	47K	0.5%	1/16W
R3319	1-218-969-11	RES-CHIP	22K	5%	1/16W
R3320	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3321	1-208-719-11	METAL CHIP	33K	0.5%	1/16W
R3322	1-218-971-11	RES-CHIP	33K	5%	1/16W
R3323	1-218-973-11	RES-CHIP	47K	5%	1/16W
R3324	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3325	1-208-927-11	METAL CHIP	47K	0.5%	1/16W
R3326	1-218-969-11	RES-CHIP	22K	5%	1/16W
R3327	1-208-927-11	METAL CHIP	47K	0.5%	1/16W
R3328	1-208-931-11	METAL CHIP	68K	0.5%	1/16W
R3329	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3330	1-218-971-11	RES-CHIP	33K	5%	1/16W
R3331	1-208-715-11	METAL CHIP	22K	0.5%	1/16W
R3332	1-208-701-11	METAL CHIP	5.6K	0.5%	1/16W
R3333	1-218-974-11	METAL CHIP	56K	0.5%	1/16W
R3334	1-218-974-11	METAL CHIP	56K	0.5%	1/16W
R3335	1-208-715-11	METAL CHIP	22K	0.5%	1/16W
R3336	1-208-720-11	METAL CHIP	36K	0.5%	1/16W
R3337	1-218-945-11	RES-CHIP	220	5%	1/16W
R3338	1-208-912-11	METAL CHIP	11K	0.5%	1/16W
R3339	1-208-709-11	METAL CHIP	12K	0.5%	1/16W
R3340	1-208-697-11	METAL CHIP	3.9K	0.5%	1/16W
R3341	1-218-982-11	METAL CHIP	270K	0.5%	1/16W
R3342	1-218-941-11	RES-CHIP	100	5%	1/16W
R3344	1-218-937-11	RES-CHIP	47	5%	1/16W
R3345	1-218-941-11	RES-CHIP	100	5%	1/16W
R3346	1-218-953-11	RES-CHIP	1K	5%	1/16W
R3347	1-218-953-11	RES-CHIP	1K	5%	1/16W
R3349	1-218-941-11	RES-CHIP	100	5%	1/16W
R3350	1-218-973-11	RES-CHIP	47K	5%	1/16W
R3351	1-218-965-11	RES-CHIP	10K	5%	1/16W
R3352	1-208-921-11	METAL CHIP	27K	0.5%	1/16W
R3353	1-208-907-11	METAL CHIP	6.8K	0.5%	1/16W
R3354	1-208-721-11	METAL CHIP	39K	0.5%	1/16W
R3355	1-218-973-11	RES-CHIP	47K	5%	1/16W
R3356	1-218-969-11	RES-CHIP	22K	5%	1/16W
R3358	1-218-977-11	RES-CHIP	100K	5%	1/16W

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Ref. No.	Part No.	Description			Remarks
R3359	1-218-973-11	RES-CHIP	47K	5%	1/16W
R3360	1-218-973-11	RES-CHIP	47K	5%	1/16W
R3361	1-218-969-11	RES-CHIP	22K	5%	1/16W
R3362	1-218-973-11	RES-CHIP	47K	5%	1/16W
R3365	1-218-973-11	RES-CHIP	47K	5%	1/16W
R3366	1-218-978-11	METAL CHIP	120K	0.5%	1/16W
R3367	1-208-939-11	METAL CHIP	150K	0.5%	1/16W
R3368	1-218-878-11	METAL CHIP	20K	0.5%	1/16W
R3369	1-218-978-11	METAL CHIP	120K	0.5%	1/16W
R3370	1-218-974-11	METAL CHIP	56K	0.5%	1/16W
R3371	1-208-713-11	METAL CHIP	18K	0.5%	1/16W
R3372	1-218-978-11	METAL CHIP	120K	0.5%	1/16W
R3373	1-208-909-11	METAL CHIP	8.2K	0.5%	1/16W
R3374	1-208-943-11	METAL CHIP	220K	0.5%	1/16W
R3376	1-218-973-11	RES-CHIP	47K	5%	1/16W
R3378	1-218-973-11	RES-CHIP	47K	5%	1/16W
R3381	1-218-973-11	RES-CHIP	47K	5%	1/16W
R3382	1-218-878-11	METAL CHIP	20K	0.5%	1/16W
R3383	1-208-935-11	METAL CHIP	100K	0.5%	1/16W
R3384	1-218-977-11	RES-CHIP	100K	5%	1/16W
R3385	1-218-969-11	RES-CHIP	22K	5%	1/16W
R3386	1-218-949-11	RES-CHIP	470	5%	1/16W
R3388	1-218-978-11	METAL CHIP	120K	0.5%	1/16W
R3389	1-208-933-11	METAL CHIP	82K	0.5%	1/16W
R3390	1-208-699-11	METAL CHIP	4.7K	0.5%	1/16W
R3391	1-217-671-11	METAL CHIP	1	5%	1/10W
R3392	1-217-671-11	METAL CHIP	1	5%	1/10W
R3396	1-218-990-11	SHORT	0		
R3400	1-218-953-11	RES-CHIP	1K	5%	1/16W
R3401	1-218-953-11	RES-CHIP	1K	5%	1/16W
R3402	1-216-821-11	METAL CHIP	1K	5%	1/16W
R3405	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R3406	1-218-990-11	SHORT	0		
R3408	1-216-864-11	METAL CHIP	0	5%	1/16W
R3409	1-216-864-11	METAL CHIP	0	5%	1/16W
R3410	1-216-864-11	METAL CHIP	0	5%	1/16W
R3411	1-216-864-11	METAL CHIP	0	5%	1/16W
R3412	1-216-864-11	METAL CHIP	0	5%	1/16W
R3414	1-216-864-11	METAL CHIP	0	5%	1/16W
R3456	1-218-990-11	SHORT	0		
R4100	1-216-049-11	RES-CHIP	1K	5%	1/10W
R4101	1-216-041-00	METAL CHIP	470	5%	1/10W
R4102	1-216-025-11	RES-CHIP	100	5%	1/10W
R4103	1-216-841-11	METAL CHIP	47K	5%	1/16W
R4104	1-218-890-11	METAL CHIP	62K	0.5%	1/16W
R4105	1-218-883-11	METAL CHIP	33K	0.5%	1/16W
R4106	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R4107	1-218-865-11	METAL CHIP	5.6K	0.5%	1/16W
R4108	1-216-864-11	METAL CHIP	0	5%	1/16W
R4109	1-216-864-11	METAL CHIP	0	5%	1/16W
R4110	1-216-864-11	METAL CHIP	0	5%	1/16W
R4111	1-216-833-11	METAL CHIP	10K	5%	1/16W
R4112	1-216-049-11	RES-CHIP	1K	5%	1/10W
R4114	1-216-837-11	METAL CHIP	22K	5%	1/16W
R4115	1-216-839-11	METAL CHIP	33K	5%	1/16W
R4116	1-218-878-11	METAL CHIP	20K	0.5%	1/16W
R4117	1-216-834-11	METAL CHIP	12K	5%	1/16W
R4118	1-216-864-11	METAL CHIP	0	5%	1/16W
R4120	1-216-864-11	METAL CHIP	0	5%	1/16W
R4122	1-216-864-11	METAL CHIP	0	5%	1/16W
R4123	1-216-838-11	METAL CHIP	27K	5%	1/16W
R4124	1-216-864-11	METAL CHIP	0	5%	1/16W
R4126	1-216-833-11	METAL CHIP	10K	5%	1/16W
R4127	1-216-842-11	METAL CHIP	56K	5%	1/16W
R4128	1-216-864-11	METAL CHIP	0	5%	1/16W
R4131	1-218-865-11	METAL CHIP	5.6K	0.5%	1/16W
R4136	1-216-864-11	METAL CHIP	0	5%	1/16W
R4200	1-216-821-11	METAL CHIP	1K	5%	1/16W
R4201	1-216-833-11	METAL CHIP	10K	5%	1/16W
R4202	1-218-878-11	METAL CHIP	20K	0.5%	1/16W
R4203	1-218-873-11	METAL CHIP	12K	0.5%	1/16W
R4204	1-216-857-11	METAL CHIP	1M	5%	1/16W
R4205	1-217-671-11	METAL CHIP	1	5%	1/10W
R4206	1-217-671-11	METAL CHIP	1	5%	1/10W
R4207	1-217-671-11	METAL CHIP	1	5%	1/10W
R4208	1-217-671-11	METAL CHIP	1	5%	1/10W
R4209	1-216-841-11	METAL CHIP	47K	5%	1/16W
R4211	1-216-864-11	METAL CHIP	0	5%	1/16W
R4212	1-216-821-11	METAL CHIP	1K	5%	1/16W
R4223	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R4300	1-216-835-11	METAL CHIP	15K	5%	1/16W
R4301	1-216-835-11	METAL CHIP	15K	5%	1/16W
R4302	1-216-818-11	METAL CHIP	560	5%	1/16W
R4303	1-216-818-11	METAL CHIP	560	5%	1/16W
R4304	1-216-864-11	METAL CHIP	0	5%	1/16W
R4307	1-216-864-11	METAL CHIP	0	5%	1/16W
R4308	1-216-864-11	METAL CHIP	0	5%	1/16W
R4309	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R4310	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R4311	1-218-859-11	METAL CHIP	3.3K	0.5%	1/16W
R4312	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R4313	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R4314	1-216-826-11	METAL CHIP	2.7K	5%	1/16W
R4315	1-216-841-11	METAL CHIP	47K	5%	1/16W
R4316	1-216-841-11	METAL CHIP	47K	5%	1/16W
R4323	1-216-864-11	METAL CHIP	0	5%	1/16W
R4324	1-216-833-11	METAL CHIP	10K	5%	1/16W
R4325	1-216-845-11	METAL CHIP	100K	5%	1/16W
R4326	1-216-833-11	METAL CHIP	10K	5%	1/16W
R4327	1-216-833-11	METAL CHIP	10K	5%	1/16W
R4328	1-216-833-11	METAL CHIP	10K	5%	1/16W
R4329	1-216-864-11	METAL CHIP	0	5%	1/16W
R4330	1-216-845-11	METAL CHIP	100K	5%	1/16W
R4332	1-216-845-11	METAL CHIP	100K	5%	1/16W
R4333	1-216-833-11	METAL CHIP	10K	5%	1/16W
R4334	1-216-833-11	METAL CHIP	10K	5%	1/16W
R4335	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R4336	1-216-845-11	METAL CHIP	100K	5%	1/16W
R4337	1-217-671-11	METAL CHIP	1	5%	1/10W
R4339	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R4340	1-218-859-11	METAL CHIP	3.3K	0.5%	1/16W
R4342	1-217-671-11	METAL CHIP	1	5%	1/10W
R4400	1-216-833-11	METAL CHIP	10K	5%	1/16W
R4402	1-216-295-11	SHORT	0		
R4403	1-216-836-11	METAL CHIP	18K	5%	1/16W
R4405	1-216-845-11	METAL CHIP	100K	5%	1/16W
R4501	1-218-839-11	METAL CHIP	470	0.5%	1/16W
R4503	1-216-833-11	METAL CHIP	10K	5%	1/16W
R4504	1-216-833-11	METAL CHIP	10K	5%	1/16W
R4505	1-216-833-11	METAL CHIP	10K	5%	1/16W

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Ref. No.	Part No.	Description			Remarks
R4506	1-216-864-11	METAL CHIP	0	5%	1/16W
R4507	1-216-821-11	METAL CHIP	1K	5%	1/16W
R4508	1-218-899-11	METAL CHIP	150K	0.5%	1/16W
R4509	1-218-871-11	METAL CHIP	10K	0.5%	1/16W
R4511	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R4512	1-216-809-11	METAL CHIP	100	5%	1/16W
R4513	1-216-809-11	METAL CHIP	100	5%	1/16W
R4514	1-216-809-11	METAL CHIP	100	5%	1/16W
R4515	1-217-671-11	METAL CHIP	1	5%	1/10W
R4516	1-217-671-11	METAL CHIP	1	5%	1/10W
R4518	1-218-879-11	METAL CHIP	22K	0.5%	1/16W
R4519	1-218-879-11	METAL CHIP	22K	0.5%	1/16W
R4520	1-218-897-11	METAL CHIP	120K	0.5%	1/16W
R4522	1-218-897-11	METAL CHIP	120K	0.5%	1/16W
R4526	1-218-629-91	METAL CHIP	180	5%	1W
R4527	1-218-629-91	METAL CHIP	180	5%	1W
R4528	1-218-629-91	METAL CHIP	180	5%	1W
R4529	1-218-629-91	METAL CHIP	180	5%	1W
R4532	1-217-671-11	METAL CHIP	1	5%	1/10W
R4533	1-217-671-11	METAL CHIP	1	5%	1/10W
R4534	1-217-671-11	METAL CHIP	1	5%	1/10W
R4535	1-217-671-11	METAL CHIP	1	5%	1/10W
R4536	1-216-864-11	METAL CHIP	0	5%	1/16W
R4537	1-216-864-11	METAL CHIP	0	5%	1/16W
		< TRANSFORMER >			
T3300	1-435-456-21	TRANSFORMER, DC-DC CONVERTER			
T3301	1-435-518-21	TRANSFORMER, DC-DC CONVERTER			
		< VIBRATOR >			
X001	1-781-641-21	VIBRATOR, CRYSTAL (13.5MHz)			
X301	1-767-399-11	VIBRATOR, CRYSTAL (24.576MHz)			
X501	1-760-655-41	VIBRATOR, CRYSTAL (20MHz)			
X701	1-767-586-21	VIBRATOR, CRYSTAL (27MHz)			
X801	1-767-980-21	VIBRATOR, CERAMIC (20MHz)			
X1101	1-767-980-21	VIBRATOR, CERAMIC (20MHz)			
X1102	1-760-458-21	VIBRATOR, CRYSTAL (32.768KHz)			
X1401	1-781-770-21	VIBRATOR, LITHIUM NIOBATE (7.375MHz)			
X1402	1-760-655-41	VIBRATOR, CRYSTAL (20MHz)			
	A-7074-541-A	VL-034 BOARD, COMPLETE			
		**********			
		(Ref.No.;1000Series)			
		< CAPACITOR >			
C841	1-127-715-11	CERAMIC CHIP	0.22uF		
C842	1-127-715-11	CERAMIC CHIP	0.22uF		
		< CONNECTOR >			
* CN481	1-560-364-00	CONNECTOR POST HEADER,ILG (2P)			

Ref. No.	Part No.	Description			Remarks
	A-7074-557-A	VO-012 BOARD, COMPLETE			
		**********			
		(Ref.No.;1000Series)			
		< CONNECTOR >			
* CN201	1-778-787-13	CONNECTOR, COAXIAL (BNC TYPE)			
		(AUDIO OUT)			
CN202	1-691-550-11	PIN, CONNECTOR (1.5MM)(SMD) 3P			
		< DIODE >			
D201	8-719-062-16	DIODE 01ZA8.2(TPL3)			
		< RESISTOR >			
R201	1-216-864-11	METAL CHIP	0	5%	1/16W
	A-7074-551-A	XL-003 BOARD, COMPLETE			
		**********			
		(Ref.No.;1000Series)			
		< CAPACITOR >			
C801	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C802	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C803	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C804	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C805	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C806	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C807	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C808	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C809	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C810	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C811	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C812	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C813	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C814	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C815	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C816	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C817	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C818	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C819	1-128-996-11	ELECT CHIP	4.7uF	20%	50V
C820	1-128-996-11	ELECT CHIP	4.7uF	20%	50V
C821	1-128-996-11	ELECT CHIP	4.7uF	20%	50V
C822	1-128-996-11	ELECT CHIP	4.7uF	20%	50V
C823	1-128-996-11	ELECT CHIP	4.7uF	20%	50V
C824	1-128-996-11	ELECT CHIP	4.7uF	20%	50V
C825	1-128-996-11	ELECT CHIP	4.7uF	20%	50V
C826	1-128-996-11	ELECT CHIP	4.7uF	20%	50V
C827	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C828	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C829	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C830	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C831	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C832	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C833	1-125-926-91	TANTAL. CHIP	4.7uF	20%	6.3V
C834	1-125-926-91	TANTAL. CHIP	4.7uF	20%	6.3V
C835	1-125-926-91	TANTAL. CHIP	4.7uF	20%	6.3V

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Ref. No.	Part No.	Description			Remarks
C836	1-125-926-91	TANTAL. CHIP	4.7uF	20%	6.3V
C837	1-125-926-91	TANTAL. CHIP	4.7uF	20%	6.3V
C838	1-125-926-91	TANTAL. CHIP	4.7uF	20%	6.3V
C839	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C840	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C841	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C842	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C843	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C844	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C845	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C846	1-117-919-11	TANTAL. CHIP	10uF	20%	6.3V
C847	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C848	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C849	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C850	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C851	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C852	1-164-156-11	CERAMIC CHIP	0.1uF		25V
		< CONNECTOR >			
CN801	1-750-788-11	CONNECTOR (XLR TYPE) 3P (CH1 AUDIO IN)			
CN802	1-750-788-11	CONNECTOR (XLR TYPE) 3P (CH2 AUDIO IN)			
CN803	1-691-550-11	PIN, CONNECTOR (1.5MM)(SMD) 3P			
* CN804	1-691-591-11	PIN, CONNECTOR (1.5MM) (SMD)8P			
		< DIODE >			
D801	8-719-073-01	DIODE MA111-(K8).S0			
D802	8-719-073-01	DIODE MA111-(K8).S0			
D803	8-719-073-01	DIODE MA111-(K8).S0			
D804	8-719-073-01	DIODE MA111-(K8).S0			
D805	8-719-073-01	DIODE MA111-(K8).S0			
D806	8-719-073-01	DIODE MA111-(K8).S0			
D807	8-719-073-01	DIODE MA111-(K8).S0			
D808	8-719-073-01	DIODE MA111-(K8).S0			
		< IC >			
IC801	8-759-111-56	IC uPC4572G2-E2			
IC802	8-759-111-56	IC uPC4572G2-E2			
IC803	8-759-111-56	IC uPC4572G2-E2			
IC804	8-759-111-56	IC uPC4572G2-E2			
		< COIL >			
L801	1-414-398-11	INDUCTOR	10uH		
L802	1-414-398-11	INDUCTOR	10uH		
L803	1-414-398-11	INDUCTOR	10uH		
L804	1-414-398-11	INDUCTOR	10uH		
L805	1-414-398-11	INDUCTOR	10uH		
L806	1-414-398-11	INDUCTOR	10uH		
L807	1-414-854-11	INDUCTOR	1MH		
L808	1-414-854-11	INDUCTOR	1MH		
		< RESISTOR >			
R801	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R802	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R803	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R804	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R805	1-216-057-00	METAL CHIP	2.2K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
R806	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R807	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R808	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R809	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R810	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R811	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R812	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R813	1-216-033-00	METAL CHIP	220	5%	1/10W
R814	1-216-037-00	METAL CHIP	330	5%	1/10W
R815	1-216-295-11	SHORT	0		
R816	1-216-033-00	METAL CHIP	220	5%	1/10W
R817	1-216-037-00	METAL CHIP	330	5%	1/10W
R818	1-216-295-11	SHORT	0		
R819	1-216-035-00	METAL CHIP	270	5%	1/10W
R820	1-216-035-00	METAL CHIP	270	5%	1/10W
R821	1-216-035-00	METAL CHIP	270	5%	1/10W
R822	1-216-035-00	METAL CHIP	270	5%	1/10W
R823	1-220-222-11	RES-CHIP	4.7K	5%	1/2W
R824	1-220-222-11	RES-CHIP	4.7K	5%	1/2W
R825	1-216-845-11	METAL CHIP	100K	5%	1/16W
R826	1-216-845-11	METAL CHIP	100K	5%	1/16W
R827	1-216-845-11	METAL CHIP	100K	5%	1/16W
R828	1-216-845-11	METAL CHIP	100K	5%	1/16W
R829	1-216-845-11	METAL CHIP	100K	5%	1/16W
R830	1-216-845-11	METAL CHIP	100K	5%	1/16W
R831	1-216-845-11	METAL CHIP	100K	5%	1/16W
R832	1-216-845-11	METAL CHIP	100K	5%	1/16W
R833	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R834	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R835	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R836	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R837	1-218-897-11	METAL CHIP	120K	0.5%	1/16W
R838	1-218-897-11	METAL CHIP	120K	0.5%	1/16W
R839	1-216-825-11	METAL CHIP	120	5%	1/16W
R840	1-216-825-11	METAL CHIP	120	5%	1/16W
R841	1-216-825-11	METAL CHIP	120	5%	1/16W
R842	1-216-825-11	METAL CHIP	120	5%	1/16W
R843	1-218-887-11	METAL CHIP	47K	0.5%	1/16W
R844	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R845	1-218-885-11	METAL CHIP	39K	0.5%	1/16W
R846	1-218-887-11	METAL CHIP	47K	0.5%	1/16W
R847	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R848	1-218-885-11	METAL CHIP	39K	0.5%	1/16W
R849	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R850	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R851	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R852	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R853	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R854	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R855	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
R856	1-218-863-11	METAL CHIP	4.7K	0.5%	1/16W
		< SWITCH >			
S801	1-762-825-11	SWITCH, SLIDE (LINE/MIC)			
S802	1-762-825-11	SWITCH, SLIDE (LINE/MIC)			

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Ref. No.	Part No.	Description	Remarks
		ACCESSORIES	
		**********	
	1-475-950-21	REMOTE COMMANDER (RMT-811)	
	1-575-334-11	CORD, CONNECTION (AV CABLE)	
	1-792-826-11	CORD, CONNECTION (USB CABLE)	
	3-053-056-01	LID, BATTERY CASE (FOR RMT-811)	
	3-060-458-11	MANUAL, INSTRUCTION (PICTURE GEAR 4.1 LITE) (ENGLISH/RUSSIAN)	
	3-060-458-21	MANUAL, INSTRUCTION (PICTURE GEAR 4.1 LITE) (FRENCH/GERMAN)	
	3-060-476-01	PICTURE GEAR 4.1 LITE (SYSTEM DISK)	
	3-061-255-01	SYSTEM DISK (MSAC-US1)	
	3-062-061-12	MANUAL, INSTRUCTION (AUTO LOGO INSERT FOR CORYRIGHT PROTECTION) (ENGLISH/FRENCH/GERMAN/ITALIAN)	
	3-064-678-11	MANUAL, INSTRUCTION (ENGLISH)(250)	
	3-064-678-21	MANUAL, INSTRUCTION (FRENCH)(250)	
	3-064-678-31	MANUAL, INSTRUCTION (ENGLISH)(250P)	
	3-064-678-41	MANUAL, INSTRUCTION (FRENCH)(250P)	
	3-064-678-51	MANUAL, INSTRUCTION (GERMAN)(250P)	
	3-064-678-61	MANUAL, INSTRUCTION (ITALIAN)(250P)	
	8-814-298-90	MICROPHONE ECM-NV1	
	A-7033-740-A	MEMORY STICK MSA-4A	
	A-7096-180-A	MSAC-US1 MEMORY STICK READER/WRITER	

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SONY

ELECTRONIC VIEWFINDER

DXF-801
DXF-801CE

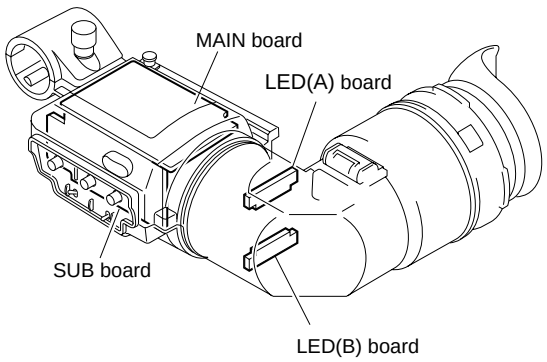
SERVICE MANUAL

Attached Manual

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Section 1
Service Information

1-1. Board Layout



1-2. Replacement of Main Parts

1-2-1. Notes on Replacement of MAIN Board

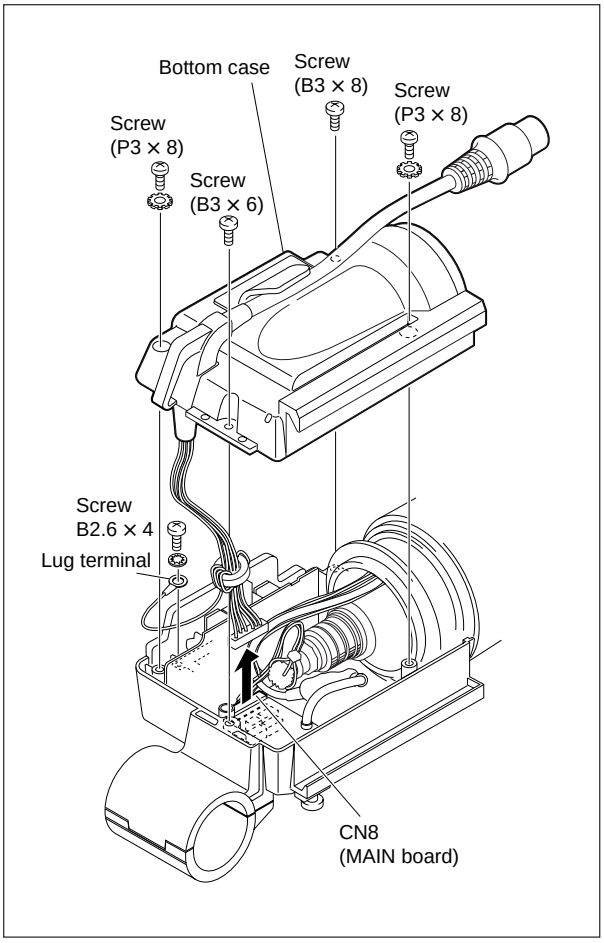
To replace the MAIN board, perform adjustment referring to Section 2.“Alignment”.

1-2-2. Replacement of CRT/DY Assembly

Note

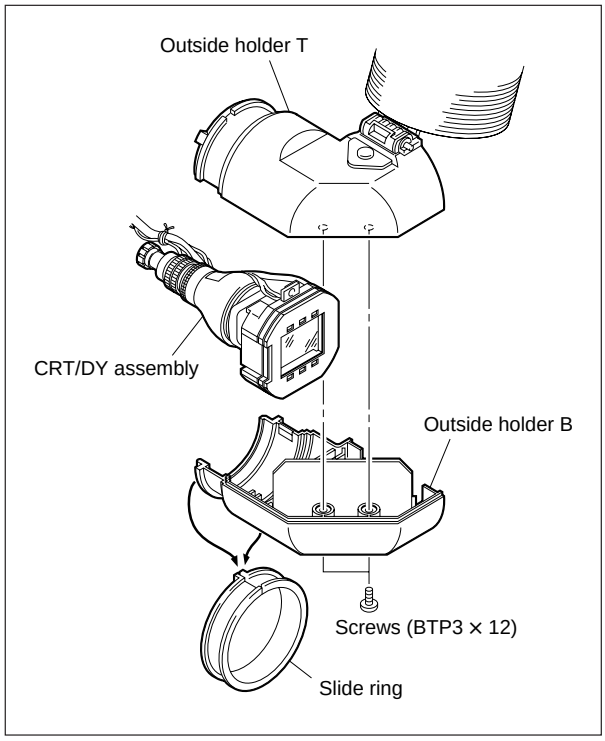
If a deflection yoke is replaced, you should replace assembly of CRT and deflection yoke (CRT/DY assembly).

1. Remove four screws and remove the bottom case.
2. Remove the screw (B2.6 × 4). Disconnect connector CN8 from the MAIN board.

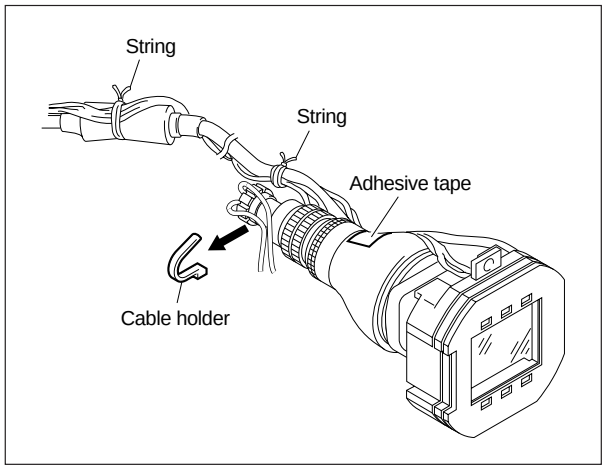


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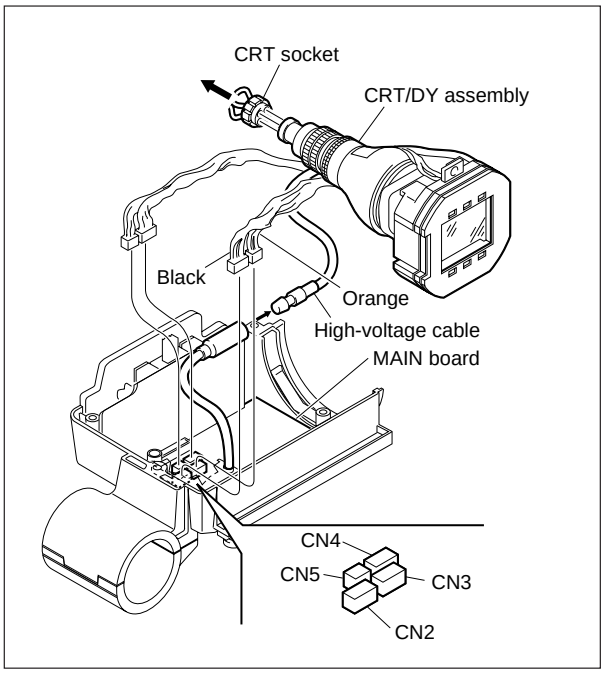
3. Remove the slide ring. Remove two screws and remove the CRT/DY assembly from outside holders B and T.



4. Untie two strings and remove an adhesive tape and a cable holder.



5. Disconnect four connectors CN2, 3, 4 and 5 on the MAIN board and high-voltage cable. Disconnect the CRT socket from the CRT/DY assembly.



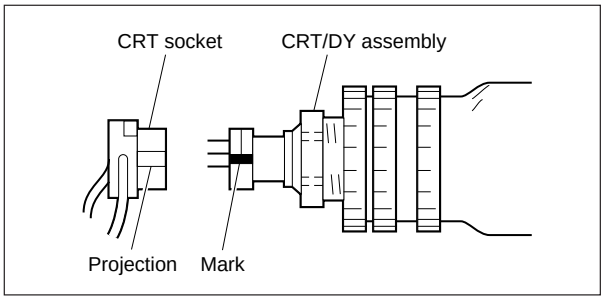
Note

In disconnecting, carefully pull the CRT socket backward, as the pins of CRT/DY assembly is liable to bend.

6. When installing a new CRT/DY assembly, reverse the above procedures.

Note

In reconnecting the CRT socket, be sure to match a projection of the CRT socket with a mark of the CRT/DY assembly.



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1-3. Replacement of VF Loupe

Optional VF loupe

There are two kind of VF loupes as optional accessory. Use a VF loupe to match your visibility range.

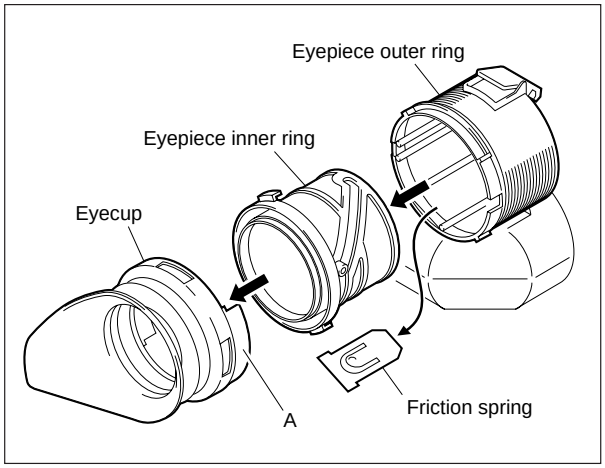
VF loupe for aged eyes;

−2D to +1D (Sony part No. 3-725-276-01)
−0.5 to +3D (Sony part No. 3-176-501-01)
(For reference) Standard ; −3D to 0D

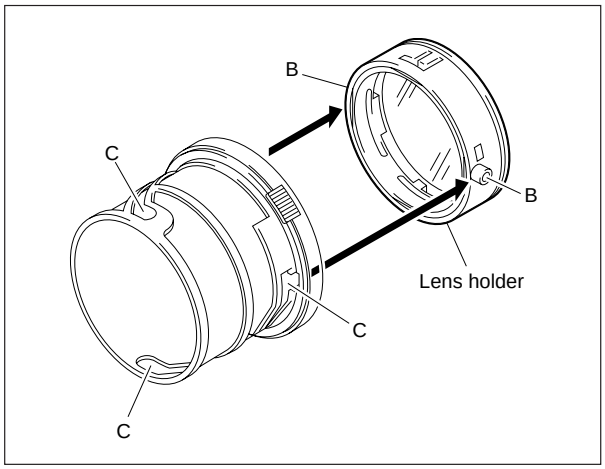
1. Insert a slotted screwdriver to the clearance between portion A and eyepiece outer ring as shown in figure. Remove eyecup by lifting its portion A and remove eyepiece inner ring.

   Note

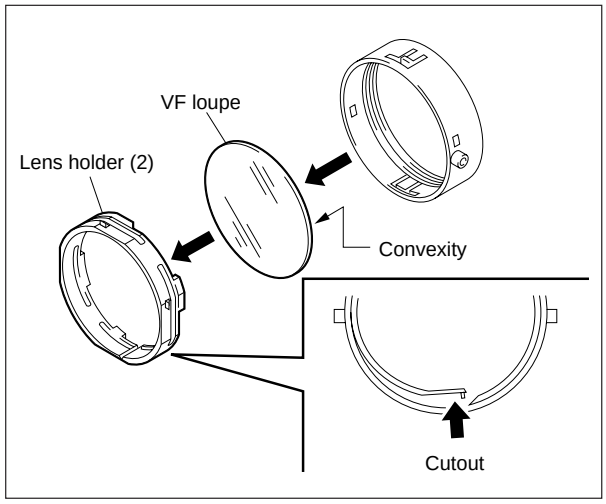
   When removing eyepiece inner ring, the friction spring is liable to remove.



2. Hold the portion B as shown in figure. Remove the lens holder along the groove C.



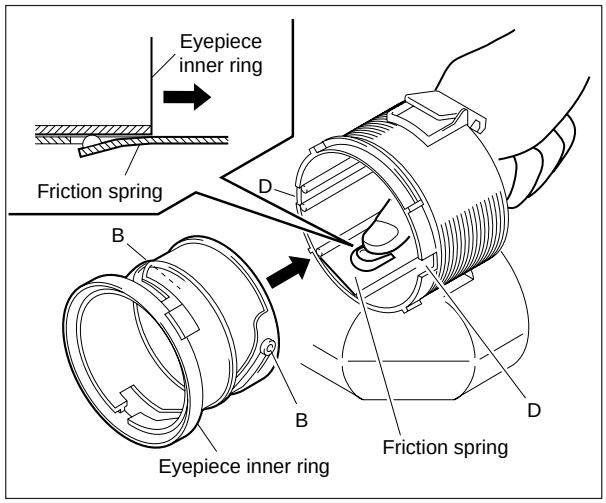
3. Remove one side of cutout portion as shown in figure. Pull out the lens holder (2) and remove the VF loupe.



4. When installing the VF loupe, reverse the above procedures.

   Notes

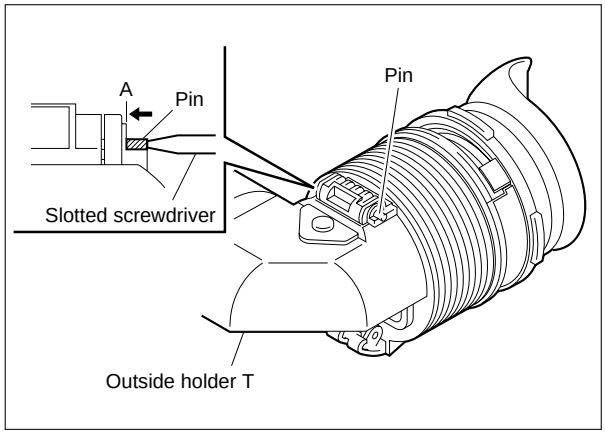
   - When installing the VF loupe, ensure the direction of VF loupe. (Refer to step 3.)
   - When installing eyepiece inner ring, ensure the inserting position of friction spring and hold it by finger. Match boss of portion D with B and insert the inner ring to the outer ring.



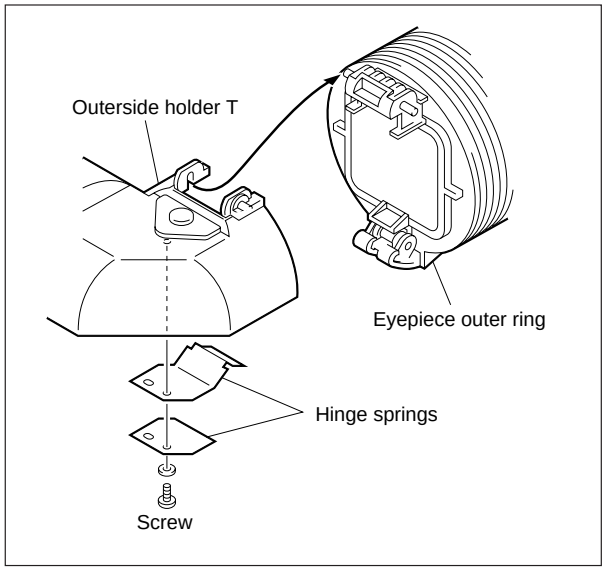
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1-4. Replacement of Outside Holder T and Eyepiece Outer Ring

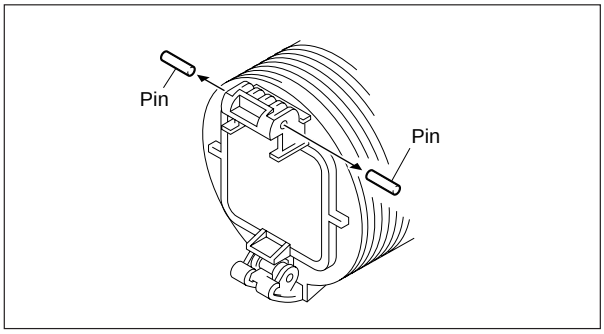
1. Remove the outside holder T referring to Section 1-2-2. “Replacement of CRT/DY assembly”.
2. Push two pins to portion A by slotted screwdriver as shown in figure.



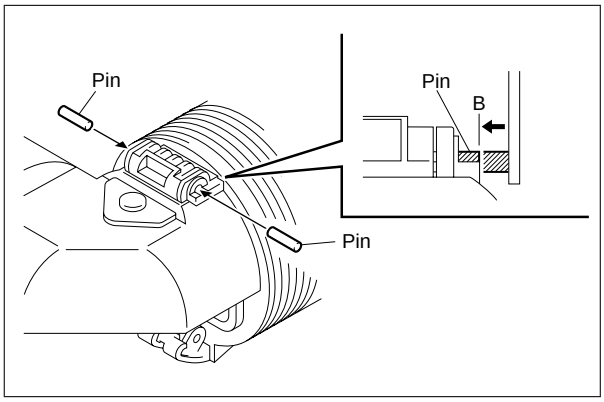
3. Remove a screw, washer and two hinge springs. Then, remove the outside holder T and eypiece outer ring as shown in figure arrow.



4. Pull out two pins.



5. Replace outside holder T or eyepiece outer ring to new one. Insert two pins to portion B by slotted screwdriver as shown in figure.



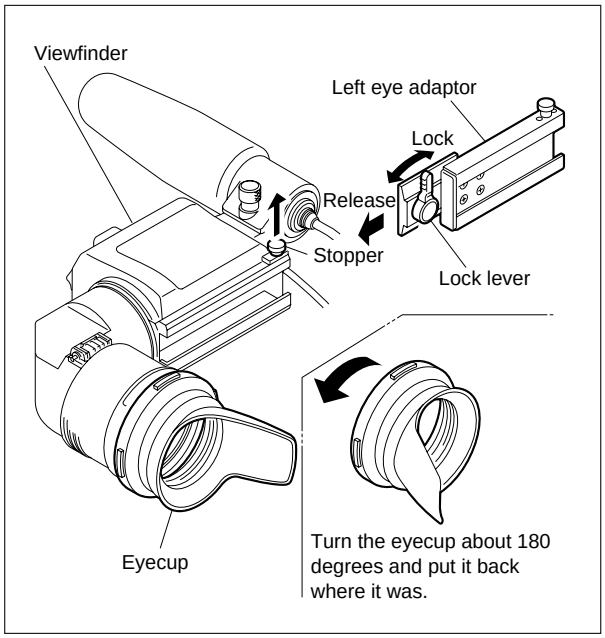
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1-5. Changing the Viewfinder Correspond to Left Eye

Part Required (sold separately)
Left eye adaptor (Sony Part No.: A-8267-181-A)

Attaching Procedures

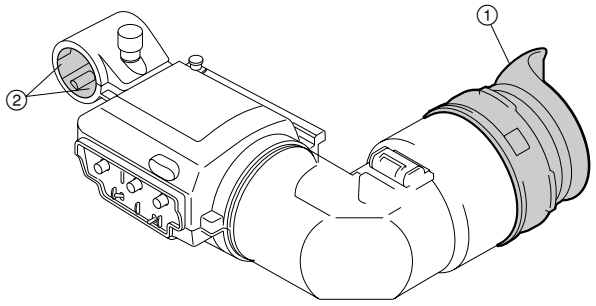
1. Remove the eyecup. Turn the eyecup about 180 degrees as shown in figure and put it back where it was.
2. While pushing up the stopper of the viewfinder, attach the left eye adaptor. At this time, pull the lock lever to release locking.
3. Fix the left eye adaptor by pushing the lock lever vertically direction.



1-6. Recommended Replacement Parts

Parts listed below are recommended replacement parts. They are subject to cracks with the lapse of time. Check sometimes by visual, and replace as necessary.

No.	Description	Sony P/N
①	EYE CUP	3-723-079-0X
②	MIC CUSHION	3-608-303-0X *1



*1 : It is recommended that the MIC cushions are replaced in pairs. In this case, please order two pieces.

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Sectioin 2
Alignment

2-1. Preparation

2-1-1. Equipment Required

Tools

- Pattern box PTB-500
  Sony part number : J-6029-140-B
- Resolution chart
  Sony part number : J-6026-100-A
- White window chart

Measuring equipment

- Oscilloscope
- Waveform monitor
- Digital voltmeter
- Frequency counter
- Pattern generator

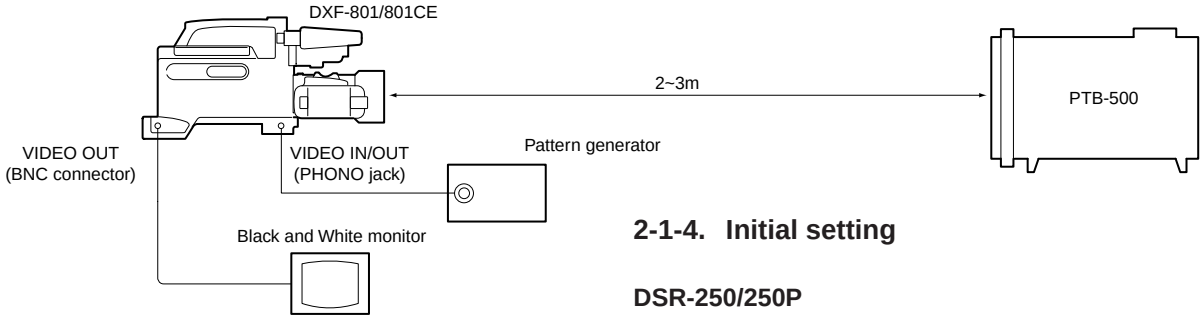
Related equipment

- Digital camcorder DSR-250/250P
- B/W monitor PVM-91/91CE or equivalent

2-1-2. Notes on Adjustment

Because DSR-250/250P can select the aspect ratio 16:9 or 4:3, some adjustment items need changing the setting of the aspect ratio. (Refer to Section 2-2-6, Picture Frame Adjustment.) Changing of the aspect ratio is done in the 16:9 WIDE setting of the CAMERA SET menu.
When the aspect ratio is not specified, perform adjustment in the 4:3 mode (16:9 WIDE → OFF).

2-1-3. Connecting Diagram



2-1-4. Initial setting

DSR-250/250P

- MODE switch → CAMERA
- AUTO MODE switch → OFF
- ATW switch → OFF
- WHITE BAL switch → PRESET
- 5600K/3200K → 3200K
- AGC switch → OFF
- GAIN switch → L
- IRIS switch → AUTO
- DIGITAL EFECT switch → OFF
- ZEBRA switch → OFF
- PROG. SCAN (MANUAL SET menu) → OFF
- SET UP (MANUAL SET menu) → 0%
- 16:9 WIDE (CAMERA SET menu) → OFF

Viewfinder

- CONTRAST control → A full turn clockwise
- BRIGHT control → Mechanical center

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2-2. Viewfinder System Adjustment

2-2-1. +9.5 V Adjustment

Note

- Perform the adjustment only when measured voltage is more than ±1 % with respect to the specified voltage.
- When this adjustment is carried out, all of following adjustments must be confirmed.

Equipment : Digital voltmeter
Test point : TP1/MAIN board
Adjusting point : ⊘RV1 (VO-ADJ)/MAIN board
Specification : +9.5 ±0.05 V dc

2-2-2. Heater Voltage Pre-Adjustment

Note

When this adjustment is carrie out, “2-2-4. Horizontal Hold Adjustment”, “2-2-5. Focus Adjustment”, “2-2-6. Picture Frame Adjustment” and “2-2-7. Operational Amplifier Output Adjustment” must be confirmed.

Equipment : Digital voltmeter (AC mode)
Test point : TP5 ↔ TP6/MAIN board
Specification : 0.65 ±0.03 Vrms

Adjustment Procedure

If not met the specification, adjust ⊘RV4 (VH-ADJ)/ MAIN board.

2-2-3. Vertical Hold Adjustment

Note

- Perform adjustment with removing R76 resistor on the SUB board. After adjustment, re-mount R76 resistor.
- Perform adjustment with connecting Pin 2 of RV20 (CONTRAST) on SUB board and GND with a jumper wire. After adjustment, disconnect the jumper wire.

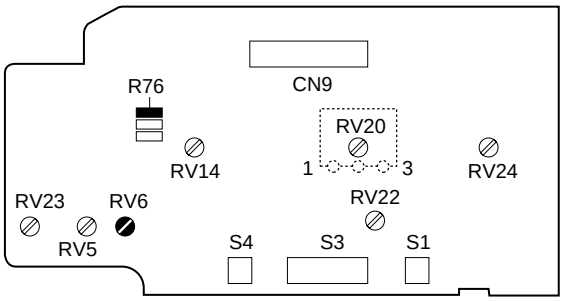
Equipment : Frequency counter

Preparation

⊘RV7 (V-SIZE)/MAIN board → Mechanical center (If ⊘RV7 (V-SIZE)/MAIN board is marked, not turn ⊘RV7 (V SIZE)/MAIN board.)

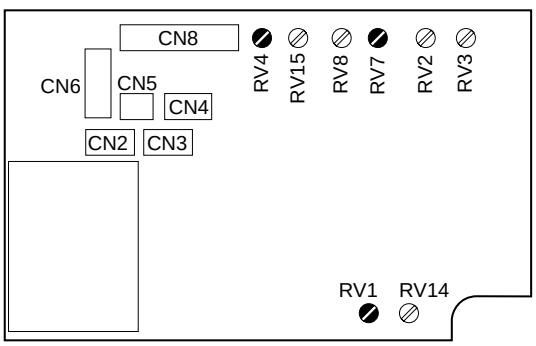
Test point : TP 10/MAIN board
Adjusting point : ⊘RV6 (V-HOLD)/SUB board
Specification : NTSC : 48 ±0.5 Hz
PAL : 38 ±0.5 Hz

SUB BOARD



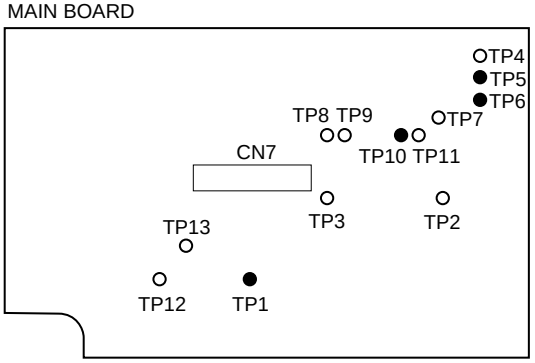
– COMPONENT SIDE –

MAIN BOARD



– COMPONENT SIDE –

MAIN BOARD



– SOLDERING SIDE –

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2-2-4. Horizontal Hold Adjustment

Note

When this adjustment is carried out, “2-2-2. Heater Voltage Pre-Adjustment” must be confirmed.

Object : White Window chart
Equipment : Waveform monitor, Oscilloscope
Trigger : CH2/Oscilloscope

Preparation

[DSR-250/250P]

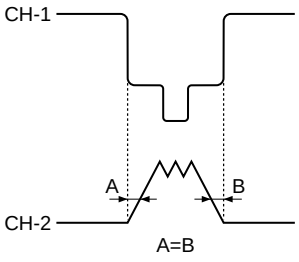
1. Shoot the White Window chart and adjust the lens zoom so that the picture on the monitor screen becomes all white.

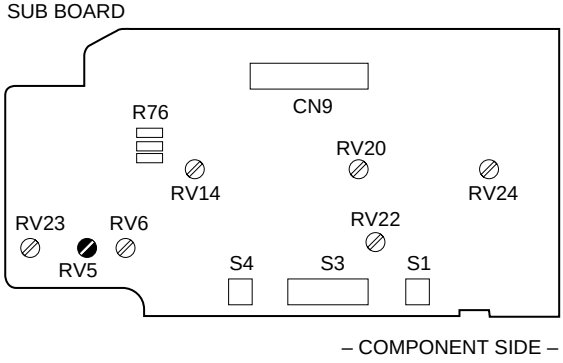
Monitor Screen

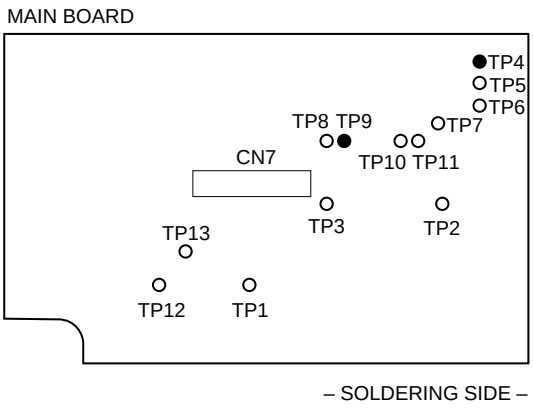


2. IRIS switch → MAN
   Adjust the iris control for the white level at VIDEO OUT connector on the camera is 100 ±2 IRE (PAL : 700 ±14 mV).

Test point : CH1 TP4 (G1)/MAIN board
CH2 TP9 (+H DEF)/MAIN board
Adjusting point : ◓RV5 (H-HOLD)/SUB board
Adjustment :







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2-2-5. Focus Adjustment

Note

- "2-2-6. Picture Frame Adjustment" and this adjustment affect each other. Repeat these adjustments until both specifications are met.
- When these adjustments are carried out, "2-2-2. Heater Voltage Pre-Adjustment" must be confirmed again.

Object : Resolution chart
Equipment : Waveform monitor

Preparation

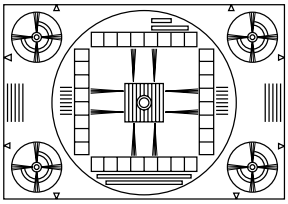
[DSR-250/250P]
- IRIS switch → MAN

[Viewfinder]
- BRIGHT control → Mechanical center
- CONTRAST control → Fully clockwise ↺
- PEAKING control → Fully counterclockwise ↺

Adjustment Procedure

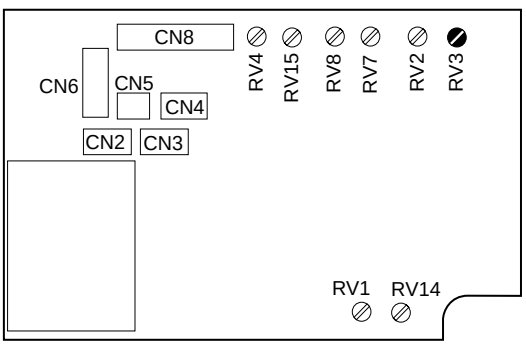
1. Adjust the lens zoom so that the resolution chart frame coincides the underscanned picture frame on the monitor screen.
2. Set the resolution on the monitor screen to the best state with the lens focus.

Monitor Screen



3. Adjust the iris control for the white level at VIDEO OUT connector on the camera is 100 ±2 IRE (PAL : 700 ±14 mV).
4. Adjust ◓RV3 (FOCUS)/MAIN board so that the picture on the viewfinder screen is best focused.

MAIN BOARD



– COMPOMENT SIDE –

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2-2-6. Picture Frame Adjustment

Note

- "2-2-5. Focus Adjustment", "2-2-7. Operational Amplifier Output Adjustment" and this adjustment affect each other. Repeat these adjustments until both specifications are met.
- When these adjustments are carried out, "2-2-2. Heater Voltage Pre-Adjustment" must be confirmed again.

Object : Resolution chart
Equipment : Waveform monitor

Preparation

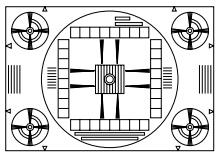
[DSR-250/250P]
- IRIS switch → MAN

[Viewfinder]
- Remove the eye cap from the viewfinder.
- BRIGHT control → Mechanical center
- CONTRAST control → Mechanical center
- PEAKING control → Fully counterclockwise ↺

Adjustment Procedure

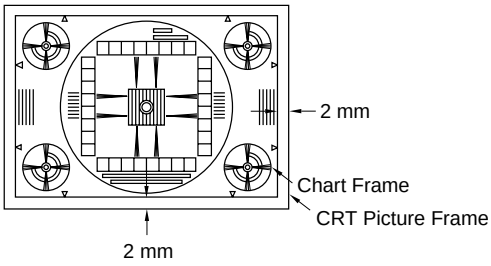
1. Adjust the lens zoom so that the resolution chart frame touches the underscanned picture frame on the monitor screen.
2. Set the resolution on the monitor screen to the best state with the lens focus.
3. Adjust the iris control for the white level at VIDEO OUT connector on the camera is 100 ±2 IRE (PAL : 700 ±14 mV).

Monitor Screen

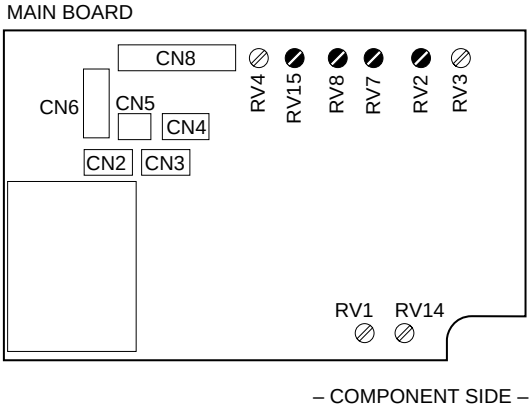


4. Adjust ⊘RV2 (H-SIZE)/MAIN board so that the H size of resolution chart is underscanned by approximately 2 mm from the CRT picture frame.
5. Adjust ⊘RV7 (V-SIZE)/MAIN board so that the V size of resolution chart is underscanned by approximately 2 mm from the CRT picture frame.

Viewfinder Screen



6. Adjust ⊘RV8 (V-LIN)/MAIN board so that the distortion of each circle at the four corners of resolution chart is minimized.
7. Repeat procedure 4 to 6 until the specification are met.
8. Select ON mode from 16:9 WIDE on the CAMERA SET menu.
9. Adjust ⊘RV15 (V-SIZE : WIDE)/MAIN board so that the circle in the center of resolution chart becomes a circle.
10. Select OFF mode from 16:9 WIDE on the CAMERA SET menu.
11. Confirm that the procedure 5 and procedure 6. If not met, readjust the procedure 4 through procedure 10.



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2-2-7. Operational Amplifier Output Adjustment

Note

When this adjustment is carried out, “2-2-5. Focus Adjustment” and “2-2-2. Heater Voltage Pre-Adjustment” must be confirmed again.

Equipment : Digital voltmeter

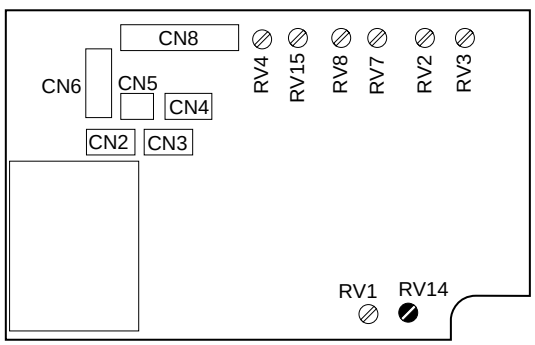
Preparation

[DSR-250/250P]
- IRIS switch → MAN
- Lens iris → Close “C”

[Viewfinder]
- BRIGHT control → Fully counterclockwise ↺
- CONTRAST control → Fully counterclockwise ↺
- PEAKING control → Fully counterclockwise ↺

Test point : TP12/MAIN board
Adjusting point : ⊘RV14 (OP-ADJ)/MAIN board
Specification : 6.0 ±0.5 Vdc

MAIN BOARD



– COMPONENT SIDE –

2-2-8. Bright Calibration Adjustment

Preparation

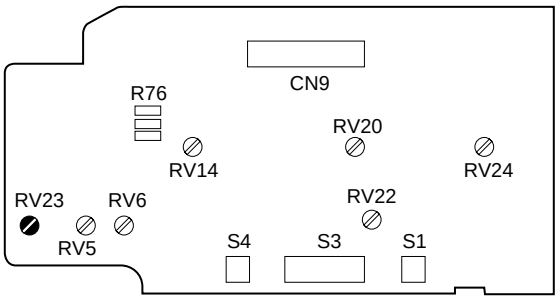
[DSR-250/250P]
- MODE switch → VTR
  After adjustment, reset to “CAMERA” position.
- Connect a pattern generator to VIDEO IN/OUT jack and input a white 100% color bar signal.

[Viewfinder]
- BRIGHT control → Fully counterclockwise ↺
- CONTRAST control → Fully counterclockwise ↺

Adjustment Procedure

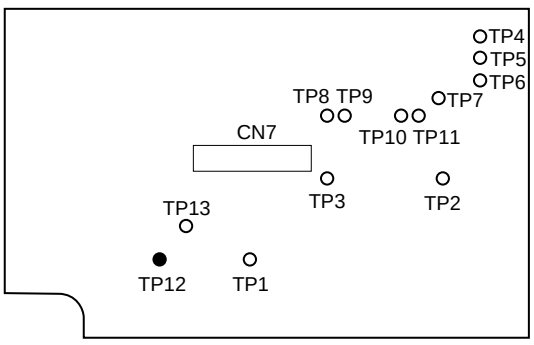
Adjust the picture by turning ⊘RV23 (SUB-BRIGHT)/ SUB board clockwise ↻ from fully counterclockwise ↺ position so that the picture of the white (100%) part just appears on the monitor screen.

SUB BOARD



– COMPONENT SIDE –

MAIN BOARD

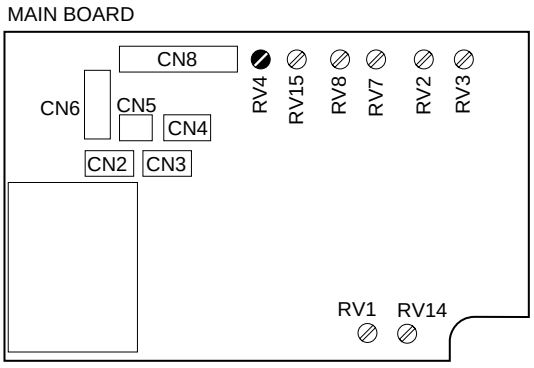


– SOLDERING SIDE –

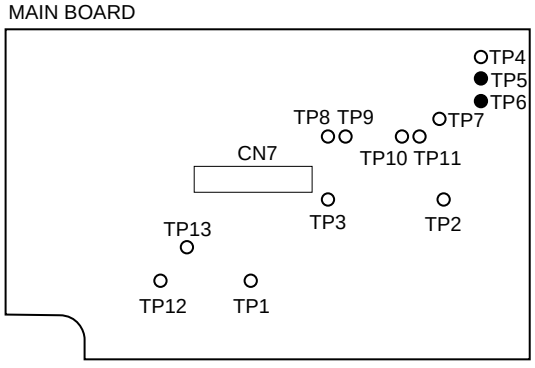
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2-2-9. Heater Voltage Adjustment

Equipment : Digital voltmeter (AC mode)
Test point : TP5 ↔ TP6/MAIN board
Adjusting point : ⊘RV4 (VH-ADJ)/MAIN board
Specification : 0.65 ±0.03 Vrms



– COMPONENT SIDE –



– SOLDERING SIDE –

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Section 3
Spare Parts

3-1. Notes on Repair Parts

1. Safety Related Components Warning

WARNING

Components marked ⚠ are critical to safe operation. Therefore, specified parts should be used in the case of replacement.

2. Standardization of Parts

Some repair parts supplied by Sony differ from those used for the unit. These are because of parts commonality and improvement.
Parts list has the present standardized repair parts.

3. Stock of Parts

Parts marked with “o” at SP (Supply Code) column of the spare parts list may not be stocked. Therefore, the delivery date will be delayed.

4. Harness

Harnesses with no part number are not registered as spare parts.
In need of repair, get components shown in the list and repair using them.

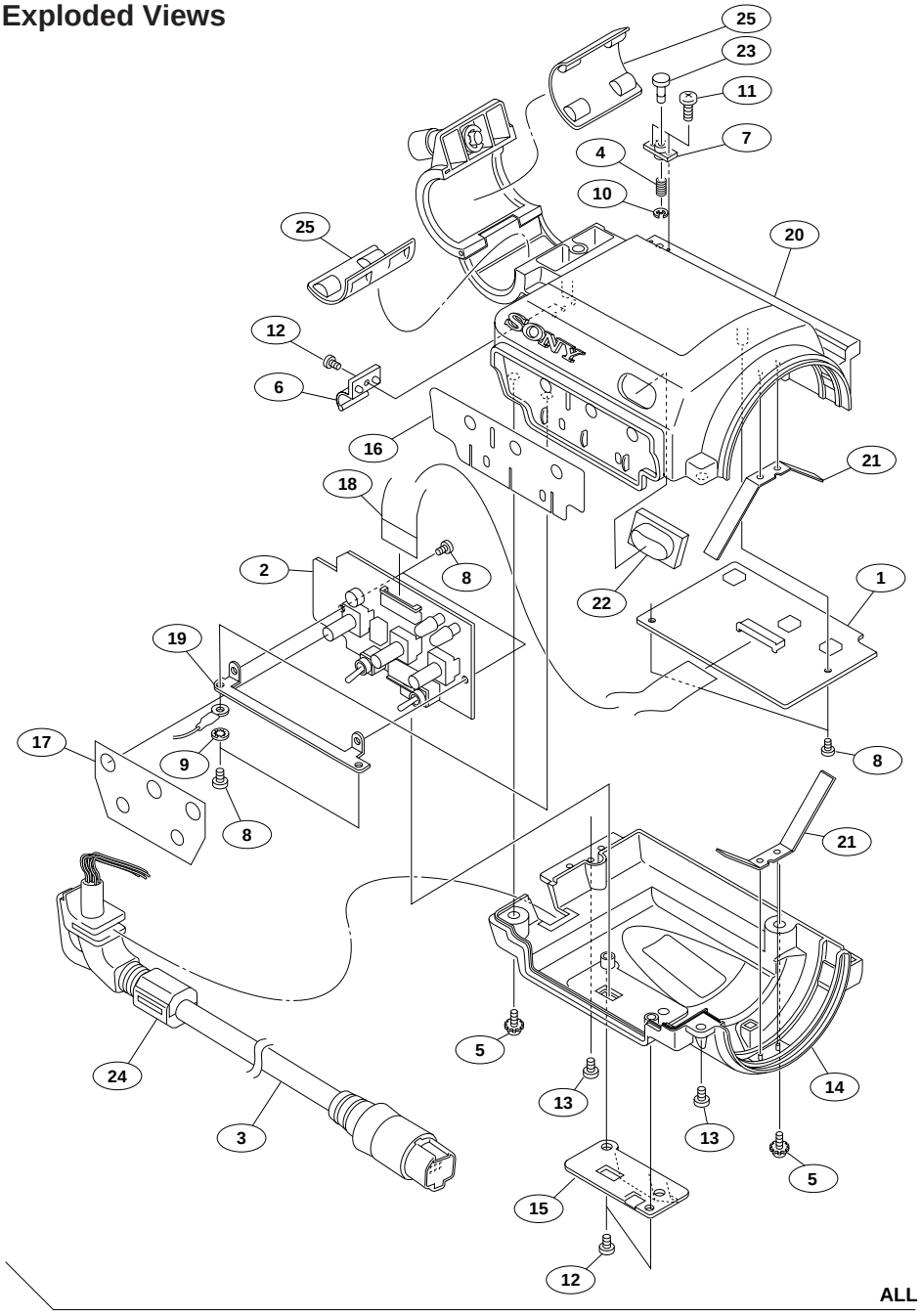
5. Destination Representation

The part indicated “For J/UC/CE” in the spare parts list is used in the unit written below.

For J: The part is used in a unit for Japan.
For UC: The part is used in a unit for the U.S.A. and Canada.
For CE: The part is used in a unit for regions except the above countries.

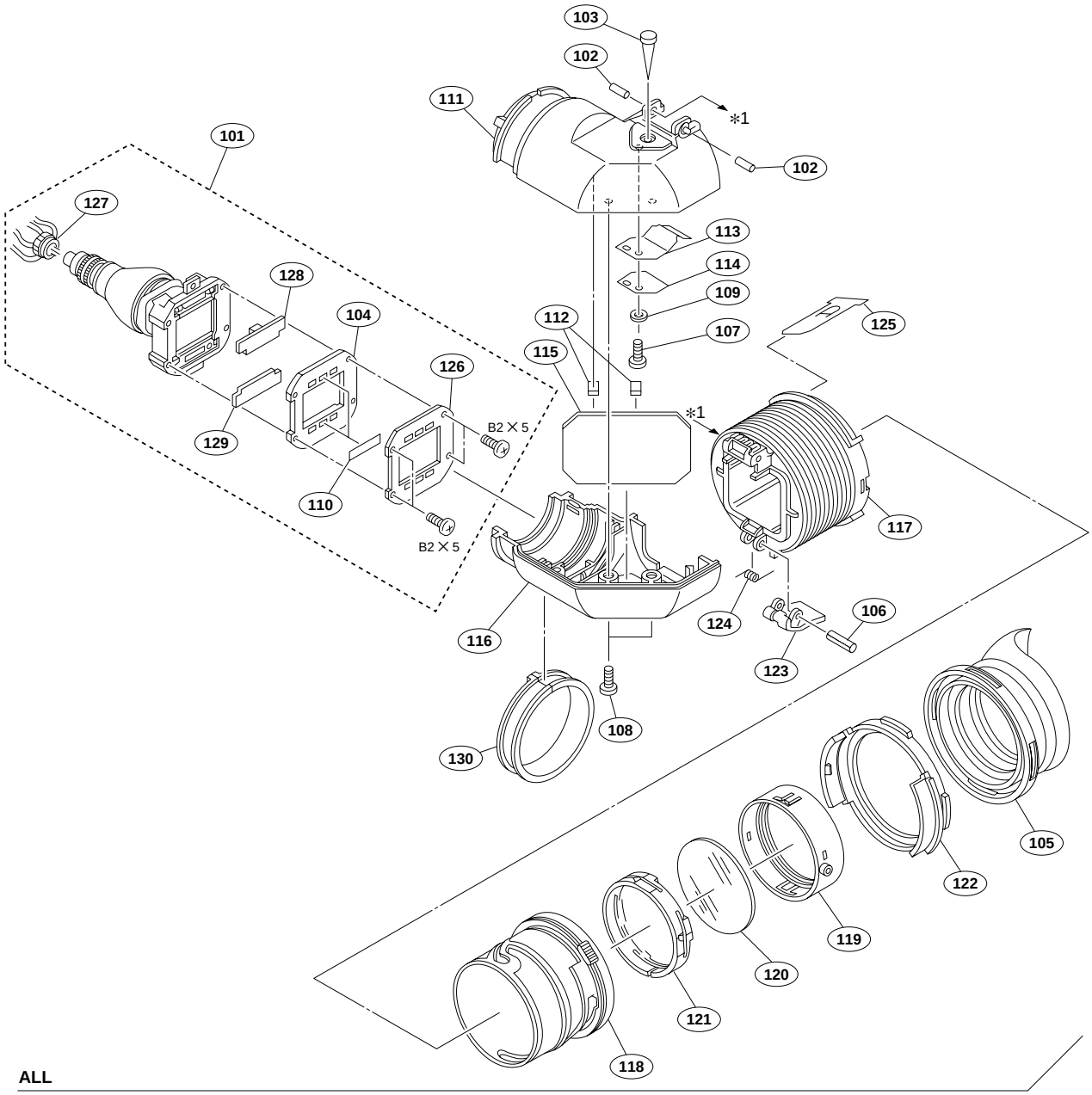
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3-2. Exploded Views



No.	Part No.	SP	Description
ALL	A-8279-329-A	s	DXF-801 [VF ASSY (UCJ)]
ALL	A-8326-150-A	s	DXF-801CE [VF ASSY (CE)]
1	⚠ 1-761-318-11	o	MOUNTED CIRCUIT BOARD, MAIN
2	⚠ 1-761-319-11	o	MOUNTED CIRCUIT BOARD, SUB (J, UC)
	⚠ 1-761-319-21	o	MOUNTED CIRCUIT BOARD, SUB (CE)
3	1-792-554-12	s	CABLE, VF
4	2-277-466-01	s	SPRING, COMPRESSION
5	3-178-214-11	s	SCREW B3X8
6	3-678-684-01	s	HOLDER, CABLE
7	3-710-008-02	s	HOUSING STOPPER
8	7-621-773-86	s	SCREW B2.6X4
9	7-623-307-07	s	LW 2.6, TYPE A
10	7-624-102-04	s	STOPRING 1.5, TYPE-E
11	7-627-554-18	s	SCREW P2X3.5
12	7-627-556-38	s	SCREW P2.6X4
13	7-682-547-09	s	SCREW B3X6
14	9-885-000-94	o	CASE, BOTTOM
15	9-885-000-95	o	CLAMP, CABLE
16	9-885-000-96	o	LABEL, VF
17	9-885-000-97	o	PLATE, PARTING
18	9-885-000-98	o	FREXIBLE FLAT CABLE
19	9-885-000-99	o	STAY, BOARD
20	9-885-001-60	o	TOP CASE/MIC HOLDER ASSY
21	9-933-326-01	o	SPRING, PLATE
22	9-933-327-01	o	COVER, TALLY
23	9-933-328-01	s	KNOB, STOPPER
24	1-469-821-11	o	CORE, FERRITE (CE)
25	3-608-303-01	s	RUBBER

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ALL

No.	Part No.	SP	Description
ALL	A-8279-329-A	s	DXF-801 [VF ASSY (UCJ)]
ALL	A-8326-150-A	s	DXF-801CE [VF ASSY (CE)]
101	⚠ 1-251-463-11	s	CRT/DY+CONNECTOR ASSY
102	2-249-361-01	o	PIN, PARALLEL
103	2-362-365-00	s	FOOT, RUBBER
104	3-176-022-03	o	SPACER (B), MASK
105	3-723-079-03	s	EYECAP
106	7-626-314-31	s	SPRING PIN 2X16
107	7-627-556-38	s	SCREW P2.6X4
108	7-685-548-19	s	SCREW BTP3X12
109	7-688-002-12	s	WASHER M2.6
110	9-933-305-01	o	PLATE, SPREAD
111	9-933-335-02	s	HOLDER T, OUTSIDE
112	9-933-336-01	s	MOLT (2)
113	9-933-337-01	o	SPRING (1), HINGE
114	9-933-338-01	o	SPRING (2), HINGE
115	9-933-339-01	o	MIRROR
116	9-933-340-02	s	HOLDER B, OUTSIDE
117	9-933-341-02	o	OUTER RING, EYEPIECE
118	9-933-342-01	o	INNER RING, EYEPIECE
119	9-933-343-01	o	HOLDER, LENS
120	9-933-344-01	s	LOUPE, VF (-3D to 0D)
	3-176-501-01	s	LOUPE (aged eyes), VF (-0.5D to +3D)
	3-725-276-01	s	LOUPE (aged eyes), VF (-2D to +1D)
121	9-933-345-01	o	HOLDER (2), LENS
122	9-933-346-03	s	HOLDER, EYECAP
123	9-933-347-02	s	STOPPER
124	9-933-348-01	s	SPRING, HELICAL TORSION
125	9-936-099-01	o	SPRING, FRICTION
126	9-939-449-01	s	ORNAMENTAL PLATE, MASK
127	9-939-450-01	o	SOCKET, CRT
128	9-939-451-01	o	MOUNTED CIRCUIT BOARD, LED (A)
129	9-939-453-02	o	MOUNTED CIRCUIT BOARD, LED (B)
130	9-994-820-01	o	RING, SLIDE

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3-3. Electrical Parts List

LED(A) BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	9-933-451-01	s	PRINTED CIRCUIT BOARD, LED(A)
1pc	9-933-312-01	s	HARNESS (4-CORE)
CN10	9-933-310-01	s	PIN, CONNECTOR 4P
LED3	8-719-026-39	s	LED CL-150UR-CD RED
LED4	8-719-026-16	s	LED CL-150D-CD ORG
LED5	8-719-026-39	s	LED CL-150UR-CD RED

LED(B) BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	9-939-453-01	s	PRINTED CIRCUIT BOARD, LED(B)
1pc	9-939-452-01	s	HARNESS (4-CORE)
CN11	9-933-310-01	s	PIN, CONNECTOR 4P
LED6	8-719-026-16	s	LED CL-150D-CD ORG
LED7	8-719-026-39	s	LED CL-150UR-CD RED
LED8	8-719-026-39	s	LED CL-150UR-CD RED

MAIN BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	1-761-318-11	o	MOUNTED CIRCUIT BOARD, MAIN
1pc	9-936-098-01	s	CASE, SHIELD
C1	9-904-851-01	s	TANTALUM, CHIP 10uF 20% 16V
C2	9-904-845-01	s	TANTALUM, CHIP 22uF 20% 10V
C4	9-933-314-01	s	ELECT 100uF 20% 20V
C5	9-904-851-01	s	TANTALUM, CHIP 10uF 20% 16V
C6	9-885-001-13	s	CERAMIC, CHIP 1uF 10V
C7	9-904-851-01	s	TANTALUM, CHIP 10uF 20% 16V
C8	9-885-001-14	s	CERAMIC, CHIP 390pF 5% 50V
C9	9-933-315-01	s	ELECT 100uF 20% 16V
C10	1-104-912-11	s	TANTALUM, CHIP 3.3uF 20% 16V
C11	9-885-001-15	s	CERAMIC, CHIP 0.1uF 16V
C12	1-104-823-11	s	TANTALUM, CHIP 47uF 20% 16V
C13	9-885-001-17	s	CERAMIC, CHIP 580pF 50V
C14	1-163-021-91	s	CERAMIC, CHIP 0.01uF 10% 50V
C15	9-885-001-18	s	CERAMIC, CHIP 47pF 50V
C16	9-885-001-19	s	CERAMIC, CHIP 0.1uF 16V
C17	9-885-001-19	s	CERAMIC, CHIP 0.1uF 16V
C18	9-885-001-19	s	CERAMIC, CHIP 0.1uF 16V
C19	9-885-001-15	s	CERAMIC, CHIP 0.1uF 16V
C20	1-136-291-11	s	FILM 6800pF 5% 100V
C21	9-885-001-19	s	CERAMIC, CHIP 0.1uF 16V
C22	9-904-854-01	s	CERAMIC 470PF 10% 2KV
C23	9-904-853-01	s	CERAMIC, CHIP 0.1uF 20% 100V
C24	1-111-134-11	s	ELECT 27uF 20% 63V
C25	1-163-135-00	s	CERAMIC, CHIP 560pF 5% 50V
C26	1-104-823-11	s	TANTALUM, CHIP 47uF 20% 16V
C48	9-980-617-01	s	ELECT 100uF 16V
C49	9-885-001-20	s	CERAMIC, CHIP 220pF 50V
C50	1-104-912-11	s	TANTALUM, CHIP 3.3uF 20% 16V
C51	9-885-001-21	s	CERAMIC, CHIP 0.015uF 50V
C52	9-885-001-15	s	CERAMIC, CHIP 0.1uF 16V
C53	9-904-851-01	s	TANTALUM, CHIP 10uF 20% 16V
C55	9-980-618-01	s	ELECT 220uF 20% 6.3V
C56	9-885-001-22	s	CERAMIC, CHIP 100pF 50V
C57	9-885-001-23	s	CERAMIC, CHIP 1000pF 50V
C58	9-885-001-22	s	CERAMIC, CHIP 100pF 50V
C60	9-885-001-24	s	CERAMIC, CHIP 0.01uF 50V
C61	9-885-001-22	s	CERAMIC, CHIP 100pF 50V
C62	1-163-243-11	s	CERAMIC, CHIP 47pF 5% 50V
C63	9-885-001-18	s	CERAMIC, CHIP 47pF 50V
C64	9-885-001-18	s	CERAMIC, CHIP 47pF 50V
C65	1-163-243-11	s	CERAMIC, CHIP 47pF 5% 50V
C66	1-163-251-11	s	CERAMIC, CHIP 100pF 5% 50V
C67	1-163-251-11	s	CERAMIC, CHIP 100pF 5% 50V
C68	1-163-243-11	s	CERAMIC, CHIP 47pF 5% 50V
C69	1-163-243-11	s	CERAMIC, CHIP 47pF 5% 50V
C70	1-163-243-11	s	CERAMIC, CHIP 47pF 5% 50V
C71	1-163-243-11	s	CERAMIC, CHIP 47pF 5% 50V
CN2	9-933-322-01	s	PIN, CONNECTOR 4P
CN3	9-933-322-01	s	PIN, CONNECTOR 4P
CN4	9-994-792-01	s	PIN, CONNECTOR 3P
CN5	9-994-793-01	s	PIN, CONNECTOR 2P
CN6	1-564-707-11	s	PIN, CONNECTOR 5P
CN7	1-569-531-11	s	HOUSING, CONNECTOR 20P
CN8	1-580-538-11	s	PIN, CONNECTOR (PC BOARD) 18P

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(MAIN BOARD)

Ref. No. or Q'ty		Part No.	SP	Description
CP1	⚠	9-904-864-01	s	RESISTOR, FUSE 2.2
D2		8-719-941-86	s	DIODE DAN202U
D3		8-719-989-76	s	DIODE SC802-04
D4		8-719-941-09	s	DIODE DAP202U
D6		8-719-941-09	s	DIODE DAP202U
D7		8-719-941-09	s	DIODE DAP202U
D8		8-719-941-09	s	DIODE DAP202U
D9		8-719-820-41	s	DIODE 1SS302
D10		8-719-976-56	s	DIODE RLS245
D11		8-719-976-56	s	DIODE RLS245
D12		8-719-919-16	s	DIODE ESJA57-03
D13		8-719-976-56	s	DIODE RLS245
D14		8-719-820-41	s	DIODE 1SS302
D20		8-719-976-56	s	DIODE RLS245
FB1		1-239-077-11	s	FILTER, EMI
FBT	⚠	1-439-419-12	s	TRANSFORMER, FLYBACK
HLC		1-459-823-13	s	COIL, HORIZONTAL LINEARITY
IC2		8-759-268-33	s	IC SN74HC595ADBR
IC6	⚠	8-759-360-66	s	IC TL1453CPWR
IC7		8-759-209-54	s	IC TC4S01F
IC8		8-759-075-66	s	IC TA75S01F
IC9		8-759-209-57	s	IC TC4S69F
IC10		8-759-981-44	s	IC BA15218F-K
L1		9-933-321-01	s	INDUCTOR, CHIP 100uH
Q1		8-729-905-38	s	TRANSISTOR 2SC4081T106R
Q2		8-729-905-38	s	TRANSISTOR 2SC4081T106R
Q3		8-729-907-26	s	TRANSISTOR IMX1
Q4		8-729-907-46	s	TRANSISTOR IMZ1
Q5		8-729-024-66	s	TRANSISTOR 2SB1201-S
Q6		8-729-927-90	s	TRANSISTOR 2SA1579-RS
Q7		8-729-106-60	s	TRANSISTOR 2SB1115A-YQ
Q8		8-729-013-08	s	TRANSISTOR 2SK1113
Q9		8-729-013-08	s	TRANSISTOR 2SK1113
Q12		8-729-905-38	s	TRANSISTOR 2SC4081T106R
Q13		8-729-907-46	s	TRANSISTOR IMZ1
Q14		8-729-422-12	s	TRANSISTOR 2SK664
R1		1-216-049-11	s	METAL, CHIP 1K 5% 1/10W
R2		1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R3		1-216-049-11	s	METAL, CHIP 1K 5% 1/10W
R4	⚠	1-216-081-00	s	METAL, CHIP 22K 5% 1/10W
R5		1-216-085-00	s	METAL, CHIP 33K 5% 1/10W
R6		1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R9	⚠	1-218-887-11	s	METAL, CHIP 47K 0.5% 1/16W
R10		1-218-847-11	s	METAL, CHIP 1K 0.5% 1/16W
R11		1-218-847-11	s	METAL, CHIP 1K 0.5% 1/16W
R12	⚠	1-218-871-11	s	METAL, CHIP 10K 0.5% 1/16W
R13	⚠	1-218-887-11	s	METAL, CHIP 47K 0.5% 1/16W
R14	⚠	1-218-887-11	s	METAL, CHIP 47K 0.5% 1/16W
R15	⚠	1-218-855-11	s	METAL, CHIP 2.2K 0.5% 1/16W
R16	⚠	1-218-855-11	s	METAL, CHIP 2.2K 0.5% 1/16W
R17		1-218-863-11	s	METAL, CHIP 4.7K 0.5% 1/16W
R18	⚠	1-218-855-11	s	METAL, CHIP 2.2K 0.5% 1/16W
R19	⚠	1-218-855-11	s	METAL, CHIP 2.2K 0.5% 1/16W
R20	⚠	1-218-851-11	s	METAL, CHIP 1.5K 0.5% 1/16W
R21		9-885-001-25	s	METAL, CHIP 750

(MAIN BOARD)

Ref. No. or Q'ty		Part No.	SP	Description
R22	⚠	1-218-856-11	s	METAL, CHIP 2.4K 0.5% 1/16W
R23		1-216-051-00	s	METAL, CHIP 1.2K 5% 1/10W
R24		1-218-823-11	s	METAL, CHIP 100 0.5% 1/16W
R25	⚠	1-218-855-11	s	METAL, CHIP 2.2K 0.5% 1/16W
R26	⚠	1-216-053-00	s	METAL, CHIP 1.5K 5% 1/10W
R28		1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R29		1-218-871-11	s	METAL, CHIP 10K 0.5% 1/16W
R30	⚠	1-218-851-11	s	METAL, CHIP 1.5K 0.5% 1/16W
R31	⚠	1-216-053-00	s	METAL, CHIP 1.5K 5% 1/10W
R32		1-216-049-11	s	METAL, CHIP 1K 5% 1/10W
R33		1-216-097-00	s	METAL, CHIP 100K 5% 1/10W
R34		1-218-895-11	s	METAL, CHIP 100K 0.5% 1/16W
R35		1-218-895-11	s	METAL, CHIP 100K 0.5% 1/16W
R36		1-218-871-11	s	METAL, CHIP 10K 0.5% 1/16W
R37		1-216-044-00	s	METAL, CHIP 620 5% 1/10W
R38		1-216-041-11	s	METAL, CHIP 470 5% 1/10W
R39		1-216-049-11	s	METAL, CHIP 1K 5% 1/10W
R40	⚠	1-218-874-11	s	METAL, CHIP 13K 0.5% 1/16W
R41	⚠	1-218-851-11	s	METAL, CHIP 1.5K 0.5% 1/16W
R42		1-216-061-00	s	METAL, CHIP 3.3K 5% 1/10W
R43		1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R45		9-885-001-26	s	METAL, CHIP 0
R46		1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R47		1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R48		1-218-887-11	s	METAL, CHIP 47K 0.5% 1/16W
R50		9-885-001-27	s	METAL, CHIP 2.2 1/4W
R51	⚠	1-216-081-00	s	METAL, CHIP 22K 5% 1/10W
R52	⚠	1-218-877-11	s	METAL, CHIP 18K 0.5% 1/16W
R53		1-218-859-11	s	METAL, CHIP 3.3K 0.5% 1/16W
R54	⚠	1-218-879-11	s	METAL, CHIP 22K 0.5% 1/16W
R55	⚠	1-218-879-11	s	METAL, CHIP 22K 0.5% 1/16W
R56		1-216-060-00	s	METAL, CHIP 3K 5% 1/10W
R57		1-216-097-00	s	METAL, CHIP 100K 5% 1/10W
R58		1-216-049-11	s	METAL, CHIP 1K 5% 1/10W
R59	⚠	1-216-077-00	s	METAL, CHIP 15K 5% 1/10W
R60	⚠	1-218-875-11	s	METAL, CHIP 15K 0.5% 1/16W
R61		1-216-121-00	s	METAL, CHIP 1M 5% 1/10W
R62		1-216-121-00	s	METAL, CHIP 1M 5% 1/10W
R64		1-216-049-11	s	METAL, CHIP 1K 5% 1/10W
R65		1-216-009-00	s	METAL, CHIP 22 5% 1/10W
R66		1-211-977-11	s	METAL, CHIP 22 0.5% 1/16W
R67		9-904-861-01	s	CARBON, CHIP 3.3M 1% 1/8W
R68		9-904-861-01	s	CARBON, CHIP 3.3M 1% 1/8W
R69		9-904-861-01	s	CARBON, CHIP 3.3M 1% 1/8W
R70		9-904-862-01	s	CARBON, CHIP 91K 1% 1/8W
R71		1-216-025-00	s	METAL, CHIP 100 5% 1/10W
R72		1-216-033-00	s	METAL, CHIP 220 5% 1/10W
R73		1-216-061-00	s	METAL, CHIP 3.3K 5% 1/10W
R97		1-216-308-00	s	METAL, CHIP 4.7 5% 1/10W
R98		1-218-847-11	s	METAL, CHIP 1K 0.5% 1/16W
R99		1-218-859-11	s	METAL, CHIP 3.3K 0.5% 1/16W
R100		1-216-065-00	s	METAL, CHIP 4.7K 5% 1/10W
R101		1-216-308-00	s	METAL, CHIP 4.7 5% 1/10W
R102		1-218-883-11	s	METAL, CHIP 33K 0.5% 1/16W
R103	⚠	1-218-890-11	s	METAL, CHIP 62K 0.5% 1/16W
R104		1-218-895-11	s	METAL, CHIP 100K 0.5% 1/16W
R105		1-216-043-00	s	METAL, CHIP 560 5% 1/10W
R106		1-216-025-00	s	METAL, CHIP 100 5% 1/10W
R107		9-885-001-28	s	METAL, CHIP 13
R108		1-218-831-11	s	METAL, CHIP 220 0.5% 1/16W

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(MAIN BOARD)

Ref. No. or Q'ty		Part No.	SP	Description
RV1	⚠	9-885-001-29	s	RES, VAR METAL 1K
RV2	⚠	9-885-001-30	s	RES, VAR METAL 5K
RV3	⚠	9-885-001-31	s	RES, VAR METAL 10K
RV4		9-885-001-32	s	RES, VAR METAL 200
RV7		9-885-001-33	s	RES, VAR METAL 500
RV8		9-885-001-33	s	RES, VAR METAL 500
RV14	⚠	9-885-001-30	s	RES, VAR METAL 5K
RV15		9-885-001-33	s	RES, VAR METAL 500

SUB BOARD

Ref. No. or Q'ty		Part No.	SP	Description
1pc		1-761-319-11	o	MOUNTED CIRCUIT BOARD, SUB (for DXF-801)
1pc		1-761-319-21	o	MOUNTED CIRCUIT BOARD, SUB (for DXF-801CE)
2pcs		9-885-001-00	s	SPACER, LM-4
C31		9-904-851-01	s	TANTALUM, CHIP 10uF 20% 16V
C32		9-904-851-01	s	TANTALUM, CHIP 10uF 20% 16V
C33		1-104-912-11	s	TANTALUM, CHIP 3.3uF 20% 16V
C34		1-163-125-00	s	CERAMIC, CHIP 220pF 5% 50V
C35		1-164-004-11	s	CERAMIC, CHIP 0.1uF 10% 25V
C36		1-164-004-11	s	CERAMIC, CHIP 0.1uF 10% 25V
C37		9-904-851-01	s	TANTALUM, CHIP 10uF 20% 16V
C38		9-904-851-01	s	TANTALUM, CHIP 10uF 20% 16V
C39		1-135-177-21	s	TANTALUM, CHIP 1uF 20% 16V
C40		1-130-481-00	s	FILM 6800pF 5% 50V
C41		1-136-287-11	s	FILM 4700pF 5% 100V
C42		1-130-487-00	s	FILM 0.022uF 5% 50V
C43		1-135-177-21	s	TANTALUM, CHIP 1uF 20% 16V
C44		9-904-851-01	s	TANTALUM, CHIP 10uF 20% 16V
C45		1-135-177-21	s	TANTALUM, CHIP 1uF 20% 16V
C46		1-130-479-00	s	FILM 4700pF 5% 50V
C47		9-980-617-01	s	ELECT 100uF 20% 16V
C75		9-904-851-01	s	TANTALUM, CHIP 10uF 20% 16V
C76		9-904-851-01	s	TANTALUM, CHIP 10uF 20% 16V
C77		1-401-913-11	s	TANTALUM, CHIP 10uF 20% 16V
C78		1-104-911-11	s	TANTALUM, CHIP 33uF 20% 10V
C80		9-885-001-06	s	CERAMIC, CHIP 4.7uF 10V
C81		1-104-911-11	s	TANTALUM, CHIP 33uF 20% 10V
C82		9-885-001-07	s	TANTALUM, CHIP 4.7uF 20V
C85		9-885-001-08	s	TANTALUM, CHIP 10uF 20V
C86		1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 100V
C87		1-104-911-11	s	TANTALUM, CHIP 33uF 20% 10V
C88		9-885-001-09	s	CERAMIC, CHIP 1uF 10V
C89		1-164-232-11	s	CERAMIC, CHIP 0.01uF 10% 100V
C90		1-163-251-11	s	CERAMIC, CHIP 100pF 5% 50V
C91		1-163-255-91	s	CERAMIC, CHIP 150pF 5% 50V
CN9		1-569-531-11	s	HOUSING, CONNECTOR 20P
D25		8-719-820-41	s	DIODE 1SS302
D26		8-719-941-86	s	DIODE DAN202U
D27		9-904-843-01	s	DIODE HZK9CL
DL1		1-411-383-11	s	DELAY LINE 80ns
IC11	⚠	8-759-300-28	s	IC HA11423MP
IC12		8-759-337-40	s	IC NJM2904V(TE2)
LED1		8-719-950-44	s	LED GL5LR40 RED
LED2		8-719-950-44	s	LED GL5LR40 RED
LED9		9-885-001-05	s	LED NSPW315BS
Q10		8-729-905-35	s	TRANSISTOR 2SC4081-R
Q11		8-729-117-72	s	TRANSISTOR 2SC4178-F13
Q15		8-729-905-35	s	TRANSISTOR 2SC4081-R
Q16		8-729-905-35	s	TRANSISTOR 2SC4081-R
Q17		8-729-905-35	s	TRANSISTOR 2SC4081-R
Q18		8-729-905-23	s	TRANSISTOR 2SA1576-R
Q19		8-729-403-29	s	TRANSISTOR XN6435
Q20		8-729-024-56	s	TRANSISTOR 2SA1808-P
Q21		8-729-118-62	s	TRANSISTOR 2SK852-T1X3
Q22		8-729-117-72	s	TRANSISTOR 2SC4178-F13

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(SUB BOARD)

Ref. No. or Q'ty		Part No.	SP	Description
Q23		9-904-849-01	s	TRANSISTOR 2SC4102
Q24		9-904-849-01	s	TRANSISTOR 2SC4102
Q25		9-904-849-01	s	TRANSISTOR 2SC4102
Q26		8-729-927-90	s	TRANSISTOR 2SA1579-RS
Q27		8-729-905-35	s	TRANSISTOR 2SC4081-R
Q28		8-729-403-32	s	TRANSISTOR XN6534
R75		1-218-871-11	s	METAL, CHIP 10K 0.5% 1/16W
R76		1-218-823-11	s	METAL, CHIP 100 0.5% 1/16W
R77	⚠	1-218-887-11	s	METAL, CHIP 47K 0.5% 1/16W
R78	⚠	1-218-887-11	s	METAL, CHIP 47K 0.5% 1/16W
R79		1-218-865-11	s	METAL, CHIP 5.6K 0.5% 1/16W
R80		1-216-025-00	s	METAL, CHIP 100 5% 1/10W
R81		1-216-071-00	s	METAL, CHIP 8.2K 5% 1/10W
R82		1-218-825-11	s	METAL, CHIP 120 0.5% 1/16W
R83		1-218-891-11	s	METAL, CHIP 68K 0.5% 1/16W
R84		1-216-027-00	s	METAL, CHIP 120 5% 1/10W
R85		1-216-067-00	s	METAL, CHIP 5.6K 5% 1/10W
R86		1-216-093-00	s	METAL, CHIP 68K 5% 1/10W
R87		1-216-075-00	s	METAL, CHIP 12K 5% 1/10W
R88		1-218-869-11	s	METAL, CHIP 8.2K 0.5% 1/16W
R89	⚠	1-216-089-00	s	METAL, CHIP 47K 5% 1/10W
R90	⚠	1-216-057-00	s	METAL, CHIP 2.2K 5% 1/10W
R91		1-218-903-11	s	METAL, CHIP 220K 0.5% 1/16W
R92	⚠	1-218-887-11	s	METAL, CHIP 47K 0.5% 1/16W
R93		9-939-459-01	s	METAL, CHIP 12
R94		1-218-865-11	s	METAL, CHIP 5.6K 0.5% 1/16W
R95		1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R96		1-216-311-00	s	METAL, CHIP 6.8 5% 1/10W
R120		1-218-871-11	s	METAL, CHIP 10K 0.5% 1/16W
R121		1-218-878-11	s	METAL, CHIP 20K 0.5% 1/16W
R122		9-885-001-10	s	METAL, CHIP 6.2K
R123		1-216-043-00	s	METAL, CHIP 560 5% 1/10W
R124		1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R125		1-216-049-11	s	METAL, CHIP 1K 5% 1/10W
R126		1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R127		1-216-081-00	s	METAL, CHIP 22K 5% 1/10W
R128		1-216-025-00	s	METAL, CHIP 100 5% 1/10W
R129		1-216-071-00	s	METAL, CHIP 8.2K 5% 1/10W
R130		9-885-001-11	s	METAL, CHIP 43
R131		1-216-042-00	s	METAL, CHIP 510 5% 1/10W
R132		1-218-863-11	s	METAL, CHIP 4.7K 0.5% 1/16W
R133		1-218-877-11	s	METAL, CHIP 18K 5% 1/10W
R134		1-218-839-11	s	METAL, CHIP 470 5% 1/10W
R135		1-218-831-11	s	METAL, CHIP 220 0.5% 1/16W
R136		1-216-045-00	s	METAL, CHIP 680 0.5% 1/16W
R137		1-218-831-11	s	METAL, CHIP 220 0.5% 1/16W
R138		1-216-025-00	s	METAL, CHIP 100 5% 1/10W
R139		1-216-061-00	s	METAL, CHIP 3.3K 0.5% 1/16W
R140		1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R141		1-216-033-00	s	METAL, CHIP 220 5% 1/10W
R142		1-216-311-00	s	METAL, CHIP 6.8 5% 1/10W
R143		1-216-025-00	s	METAL, CHIP 100 5% 1/10W
R144		1-218-871-11	s	METAL, CHIP 10K 0.5% 1/16W
R145		1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R146		1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R147		1-216-047-00	s	METAL, CHIP 820 5% 1/10W
R148		1-216-037-00	s	METAL, CHIP 330 5% 1/10W
R149		1-218-838-11	s	METAL, CHIP 430 0.5% 1/16W
R151		1-218-863-11	s	METAL, CHIP 4.7K 0.5% 1/16W

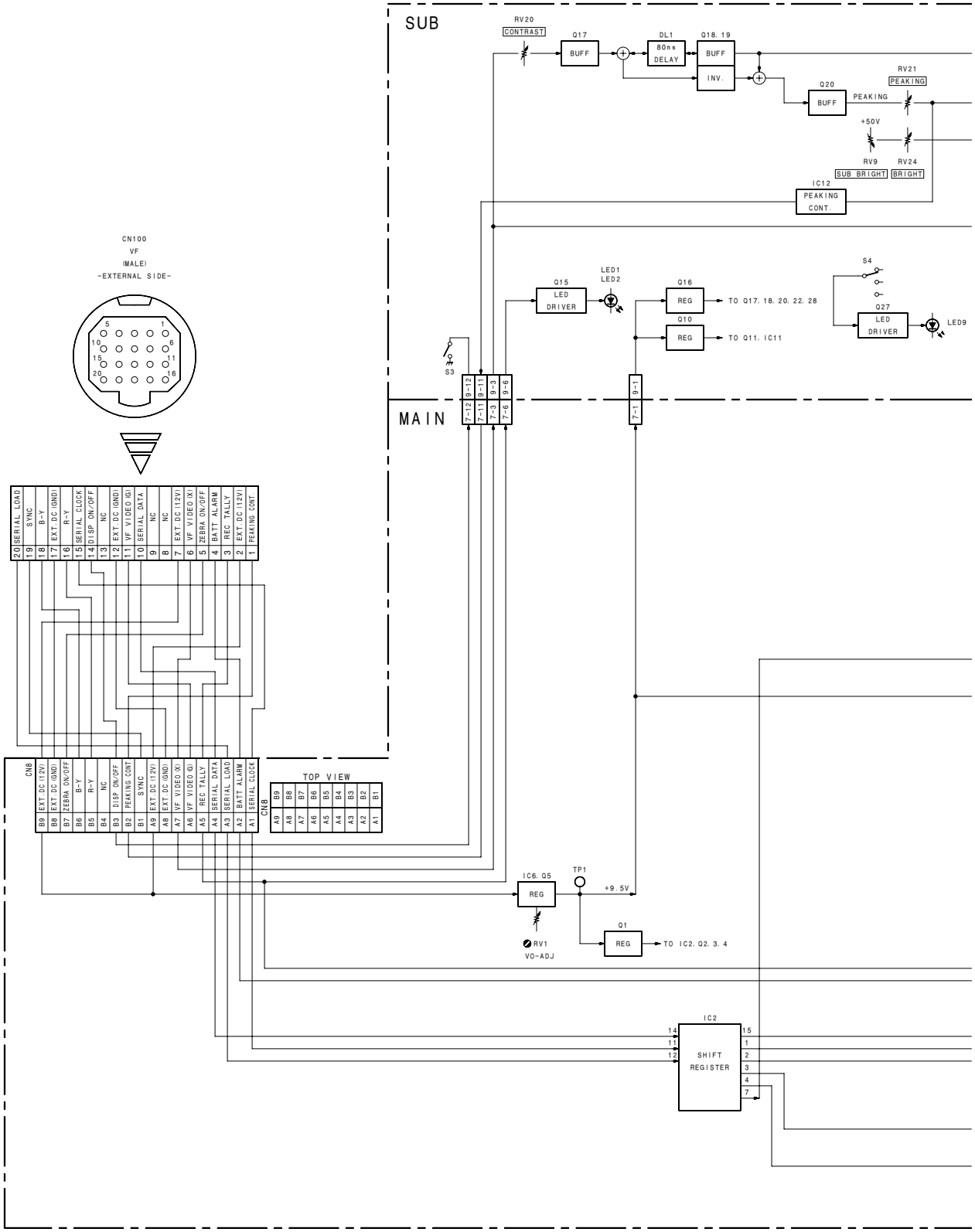
(SUB BOARD)

Ref. No. or Q'ty		Part No.	SP	Description
R152		1-216-067-00	s	METAL, CHIP 5.6K 5% 1/10W
R153		9-885-001-10	s	METAL, CHIP 6.2K
R154		1-216-055-00	s	METAL, CHIP 1.8K 5% 1/10W
R155		1-216-025-00	s	METAL, CHIP 100 5% 1/10W
R156		1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R157		1-216-081-00	s	METAL, CHIP 22K 5% 1/10W
R158		1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R159		1-216-057-00	s	METAL, CHIP 2.2K 5% 1/10W
R160		1-216-091-00	s	METAL, CHIP 56K 5% 1/10W
R161		1-216-085-00	s	METAL, CHIP 33K 5% 1/10W
R162		1-216-689-11	s	METAL, CHIP 39K 5% 1/10W
R163		9-885-001-12	s	METAL, CHIP 3.3M
R167		1-216-087-11	s	METAL, CHIP 39K 5% 1/10W
R168		1-218-880-11	s	METAL, CHIP 24K 0.5% 1/16W
R169		1-218-871-11	s	METAL, CHIP 10K 0.5% 1/16W
R170		1-218-878-11	s	METAL, CHIP 20K 0.5% 1/16W
R171		1-216-041-11	s	METAL, CHIP 470 5% 1/10W
R172		1-216-049-11	s	METAL, CHIP 1K 5% 1/10W
R173		1-218-847-11	s	METAL, CHIP 1K 0.5% 1/16W
R174		1-216-033-00	s	METAL, CHIP 220 5% 1/10W
R176		1-216-036-00	s	METAL, CHIP 300 5% 1/10W
RV5	⚠	9-885-001-01	s	RES, VAR METAL 5K
RV6	⚠	9-885-001-01	s	RES, VAR METAL 5K
RV20		9-933-301-01	s	RES, VAR CARBON 2K
RV21		9-939-682-01	s	RES, VAR CARBON 5K
RV22		9-885-001-02	s	RES, VAR METAL 200
RV23		9-885-001-03	s	RES, VAR METAL 50K
RV24		9-933-302-01	s	RES, VAR CARBON 10K
S1		1-570-985-11	s	SWITCH, TOGGLE
S3		1-570-984-11	s	SWITCH, TOGGLE
S4		9-885-001-04	s	SWITCH, SLIDE

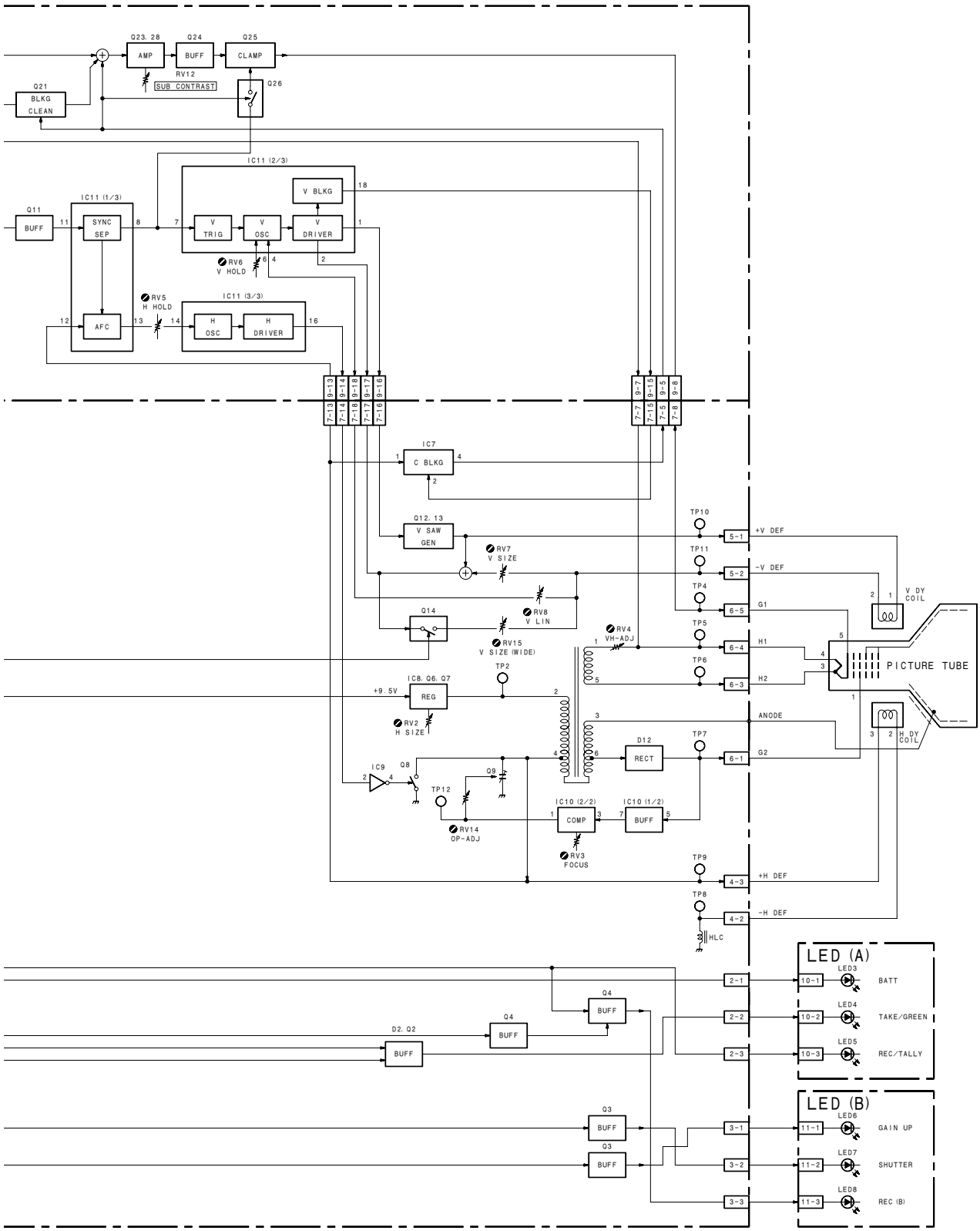
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Section 5
Diagrams

5-1. Block Diagram



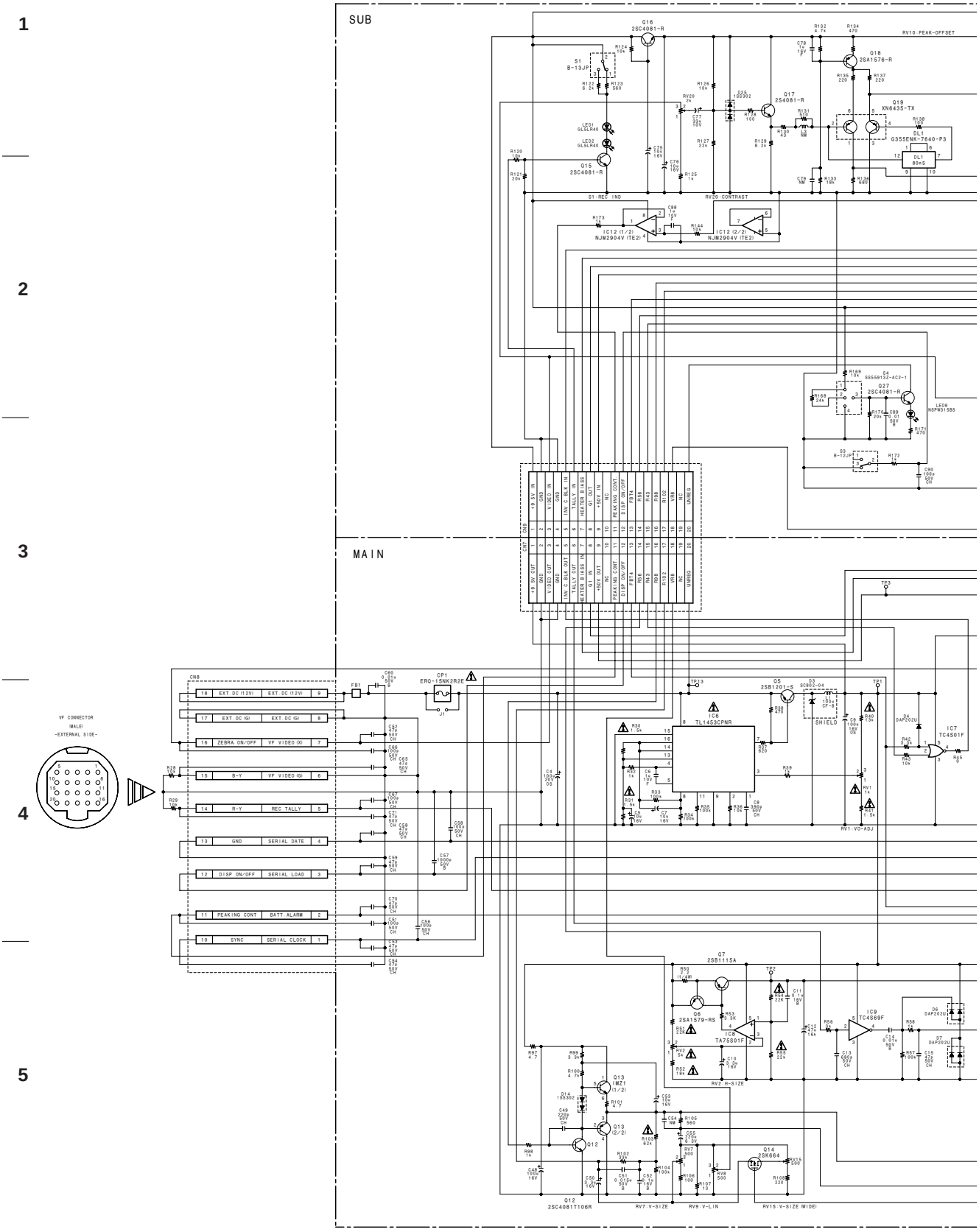
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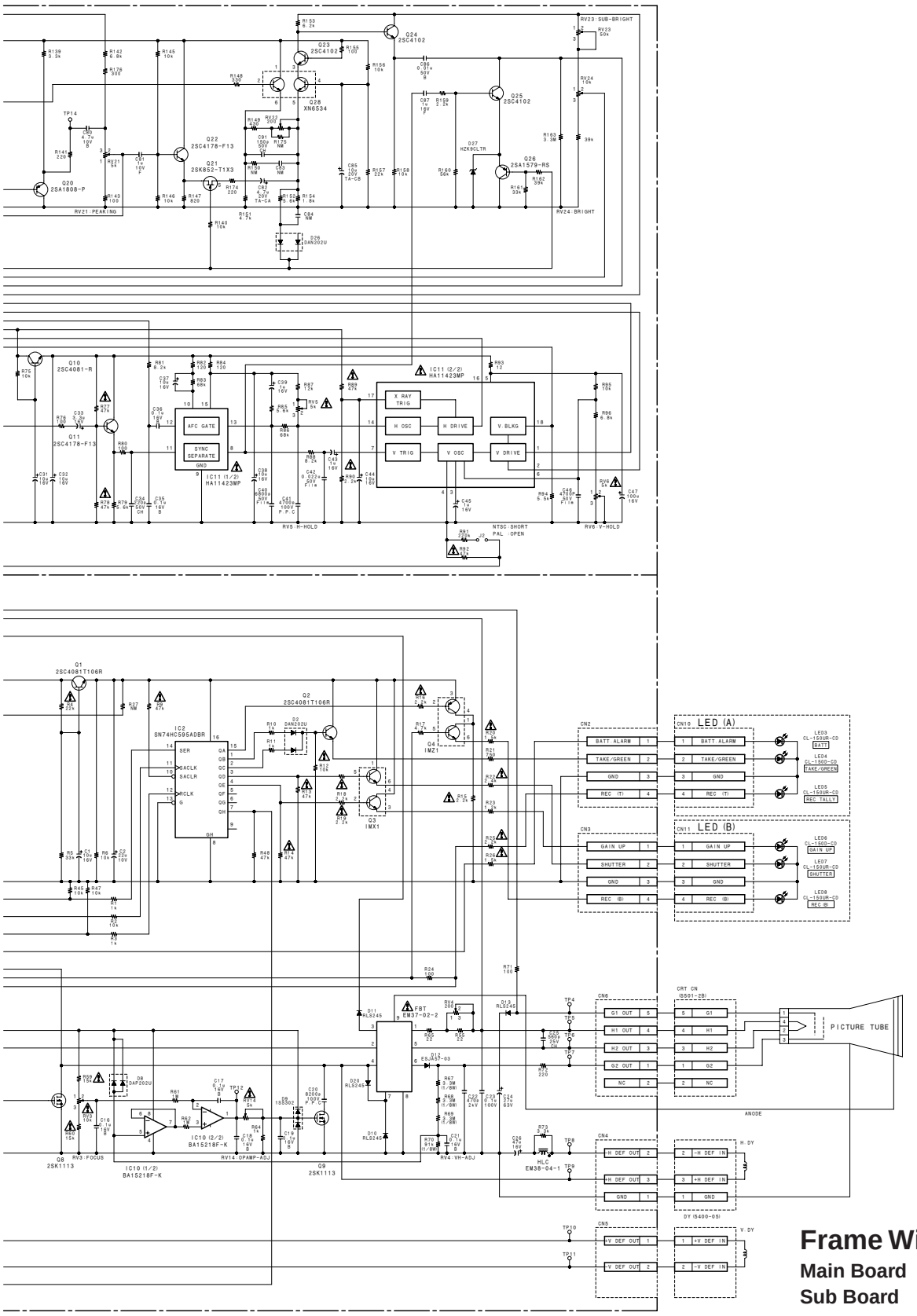
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5-2. Schematic Diagram



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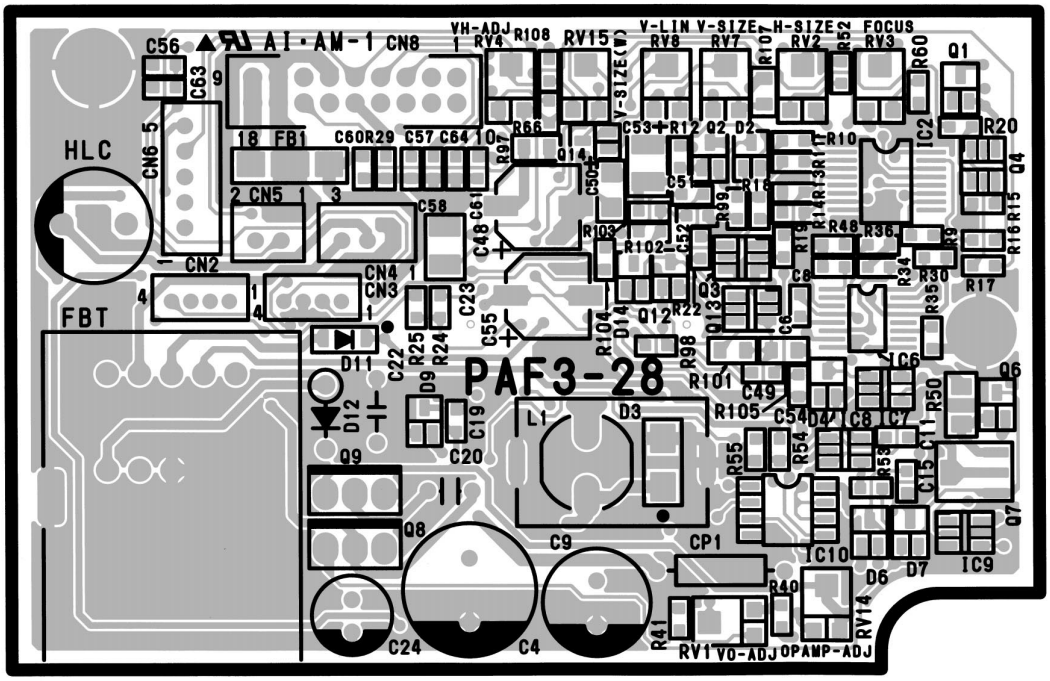
Frame Wiring

Main Board

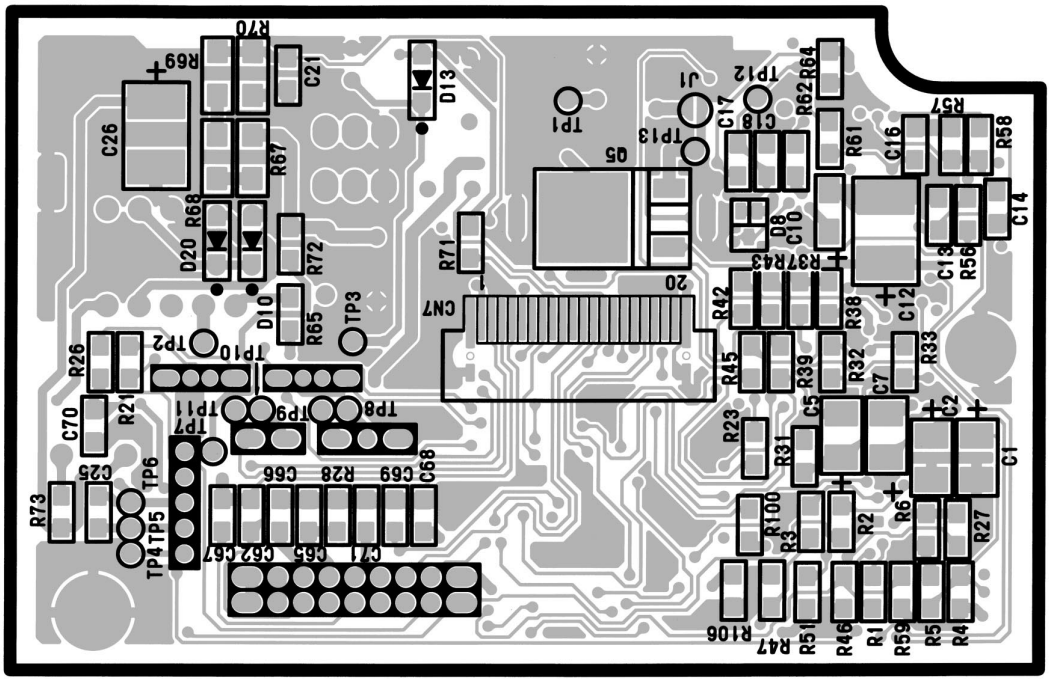
Sub Board

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Section 6
Board Layouts

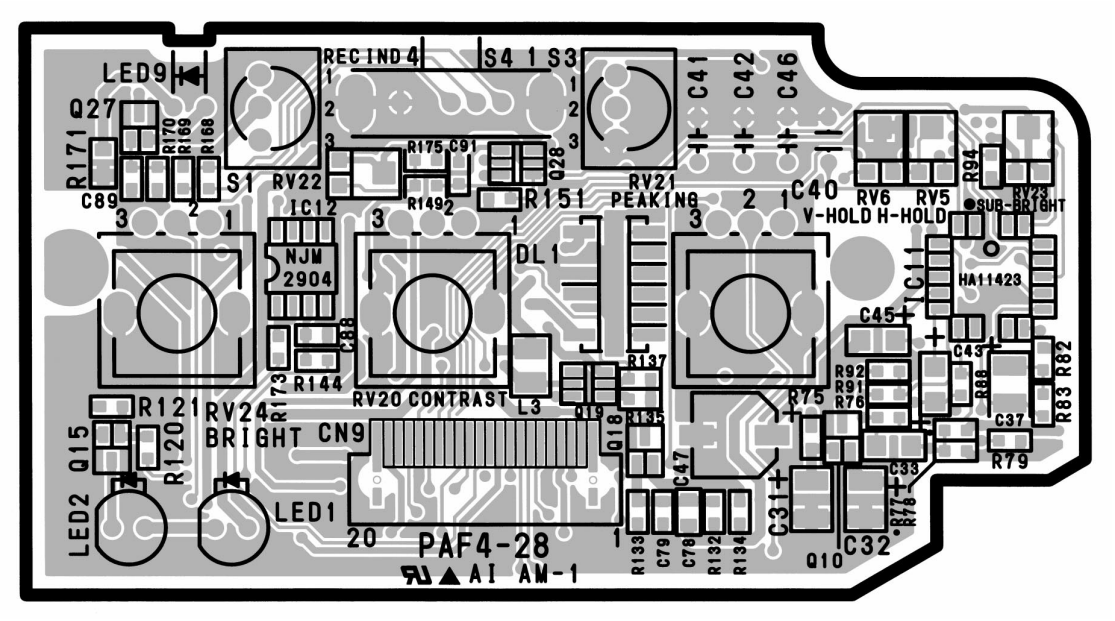


MAIN -COMPONENT SIDE-

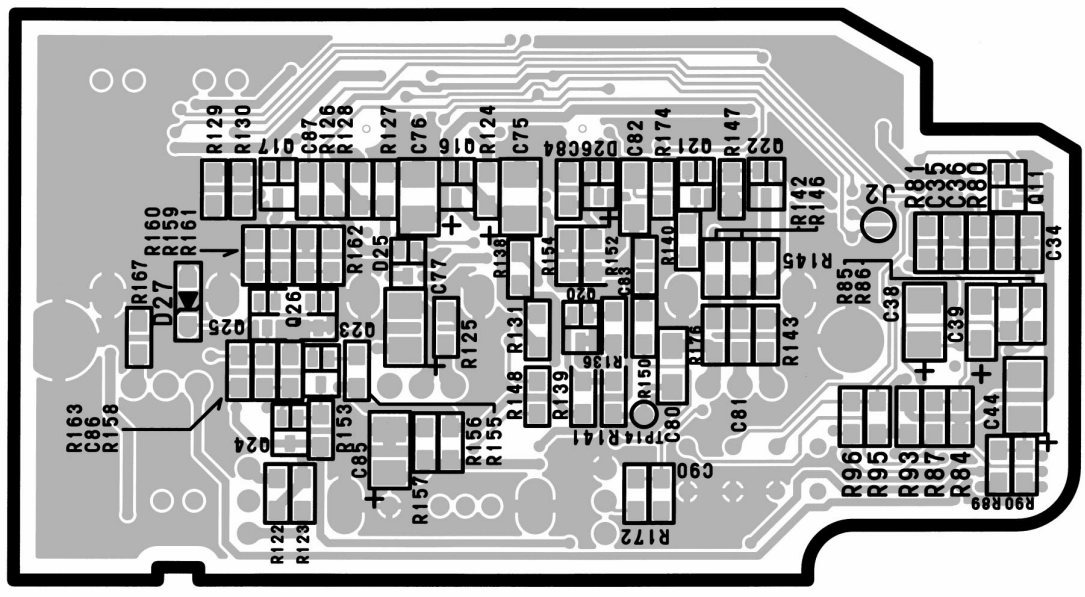


MAIN -SOLDERING SIDE-

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SUB -COMPONENT SIDE-

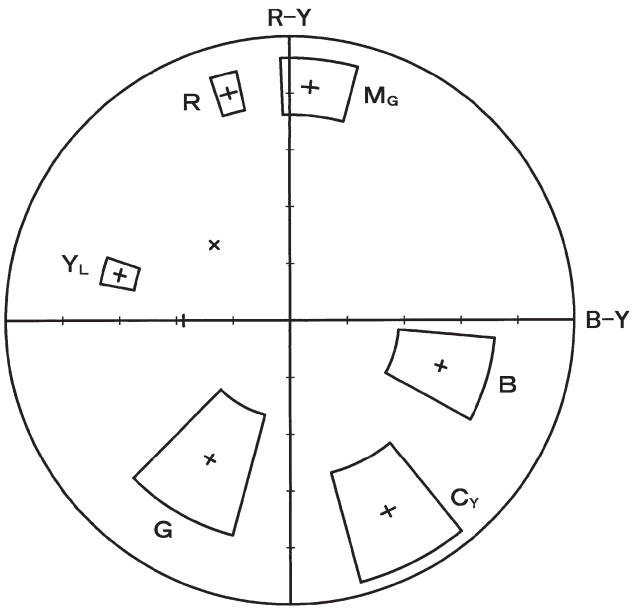


SUB -SOLDERING SIDE-

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〈FOR CAMERA COLOR REPRODUCTION ADJUSTMENT〉

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



DSR-250/250P

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9-929-845-12

Sony EMCS Co.

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DSR-250/250P

RMT-811

SONY

US Model
Canadian Model
DSR-250
AEP Model
DSR-250P

SERVICE MANUAL

2000. 11

SUPPLEMENT-1

File this supplement-1 with the Service Manual.
(PV00-019)

Subject:
Change of Self-diagnosis code table.
Change of Adjustments.
Addition of Supplied parts.

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(Refer to page 10)

SELF-DIAGNOSIS FUNCTION

4. SELF-DIAGNOSIS CODE TABLE

☞ : Added portion. ▨ : Changed portion. ☛ : Deleted portion.

Self-diagnosis Code					Symptom/State	Correction
Repaired by:	Block Function		Detailed Code			
C	3	1	2	0	T reel side tape slacking when unloading.	Load the tape again, and perform operations from the beginning.
~~C~~	~~3~~	~~1~~	~~2~~	~~1~~	~~Winding S reel fault when counting the rest of tape.~~	~~Load the tape again, and perform operations from the beginning.~~
C	3	1	2	2	T reel fault. (FG fault.)	Load the tape again, and perform operations from the beginning.
C	3	1	2	3	S reel fault. (FG fault.)	Load the tape again, and perform operations from the beginning.
~~C~~	~~3~~	~~1~~	~~2~~	~~4~~	~~T reel fault.~~	~~Load the tape again, and perform operations from the beginning.~~
C	3	1	2	5	Reel motor fault. (FG fault.)	Load the tape again, and perform operations from the beginning.
C	3	1	3	0	FG fault when starting capstan.	Load the tape again, and perform operations from the beginning.
C	3	1	4	0	FG fault when starting drum.	Load the tape again, and perform operations from the beginning.
C	3	1	4	2	FG fault during normal drum operations.	Load the tape again, and perform operations from the beginning.
C	3	1	7	0	Cassette compartment motor fault (LOAD direction)	Load the tape again, and perform operations from the beginning.
C	3	1	7	1	Cassette compartment motor fault (UNLOAD direction)	Load the tape again, and perform operations from the beginning.
C	3	1	7	2	Cassette unloading retry fault	Load the tape again, and perform operations from the beginning.
C	3	2	1	0	LOAD direction loading motor time-out.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	1	1	UNLOAD direction loading motor time-out.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	2	0	T reel side tape slacking when unloading.	Remove the battery or power cable, connect, and perform operations from the beginning.
~~C~~	~~3~~	~~2~~	~~2~~	~~1~~	~~Winding S reel fault when counting the rest of tape.~~	~~Remove the battery or power cable, connect, and perform operations from the beginning.~~
C	3	2	2	2	T reel fault. (FG fault.)	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	2	3	S reel fault. (FG fault.)	Remove the battery or power cable, connect, and perform operations from the beginning.
~~C~~	~~3~~	~~2~~	~~2~~	~~4~~	~~T reel fault.~~	~~Remove the battery or power cable, connect, and perform operations from the beginning.~~
C	3	2	2	5	Reel motor fault. (FG fault.)	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	3	0	FG fault when starting capstan.	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	4	0	FG fault when starting drum	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	4	2	FG fault during normal drum operations	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	7	0	Cassette compartment motor fault (LOAD direction)	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	7	1	Cassette compartment motor fault (UNLOAD direction)	Remove the battery or power cable, connect, and perform operations from the beginning.
C	3	2	7	2	Cassette unloading retry fault	Remove the battery or power cable, connect, and perform operations from the beginning.
E	6	1	0	0	Difficult to adjust focus (Cannot initialize focus.)	Inspect the lens block focus reset sensor (Pin ㉕ of CN001 on VI-156 board) when focusing is performed when the focusing is rotated in the focus manual mode, and the focus motor drive circuit (IC140 of VI-156 board) when the focusing is not performed.

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SECTION 5. ADJUSTMENTS

: Added portion. : Changed portion.

<table>
<tr><th>Page</th><th>Before Change</th><th>After Change</th></tr>
<tr><td>5-14</td><td>

1-2-3. INITIALIZATION OF E, F PAGE DATA

3. F Page Table

Address	Initial value		Remark
	NTSC	PAL	
70	89	89	HALL adj.
71 to FF	Fixed data-1		

Table. 5-1-7.

</td><td>

Address	Initial value		Remark
	NTSC	PAL	
70	89	89	HALL adj.
71 to AA	Fixed data-1		
AB	Fixed data-2		
AC to FF	Fixed data-1		

Table. 5-1-7.

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1-3. CAMERA SYSTEM ADJUSTMENTS

19. White Balance Check

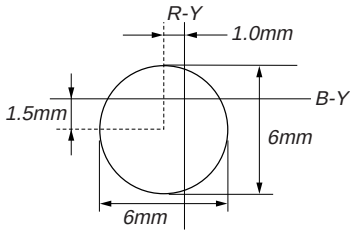


Fig. 5-1-13. (B)

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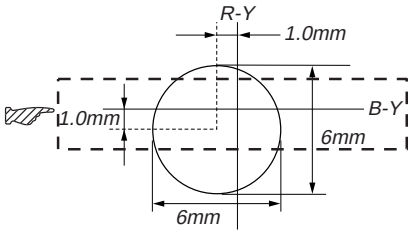


Fig. 5-1-13. (B)

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<tr><td>5-64</td><td>

3-2. SYSTEM CONTROL SYSTEM ADJUSTMENT

2-2. Serial No. Input

Input method:

1) Select page: 0, address: 01, and set data: 01.
2) Read the serial No. on the name plate, and take it as D_1.
   Example: If the serial No. is 77881.
   D_1=77881
3) Obtain D_2 and H_1 corresponding to D_1 from Table 5-3-2.
   Example: If D_1 is “77881”.
   $D_2=D_1-65536=12345$
   H_1=FE

</td><td>

Input method:

1) Select page: 0, address: 01, and set data: 01.
2) Read the serial No. on the name plate, and take it as D_1.
   Example: If the serial No. is 77881.
   D_1=77881

Note: Use six digits of the low rank when a serial No. is more than seven digits.

3) Obtain D_2 and H_1 corresponding to D_1 from Table 5-3-2.
   Example: If D_1 is “77881”.
   $D_2=D_1-65536=12345$
   H_1=FE

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</table>

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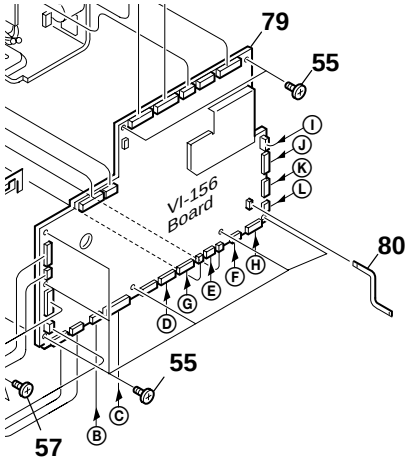
SECTION 6. REPAIR PARTS LIST

6-1. EXPLODED VIEWS

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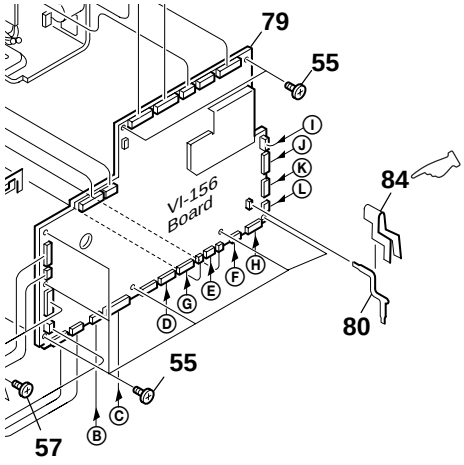
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<tr><th>Page</th><th>Before Change</th><th>After Change</th></tr>
<tr><td>6-2</td><td>

6-1-2. OVERALL SECTION-2



Ref. No.	Part No.	Description	Remarks
82	3-061-062-01	BOLT (M2.6), SPRING	
83	1-960-908-11	HARNESS (JJ-059)	

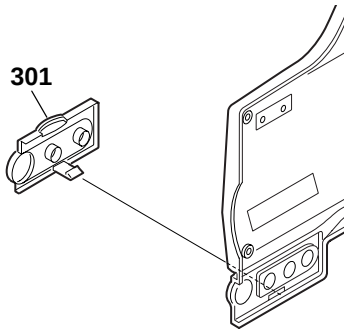
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Ref. No.	Part No.	Description	Remarks
82	3-061-062-01	BOLT (M2.6), SPRING	
83	1-960-908-11	HARNESS (JJ-059)	
* 84	3-066-154-01	SHEET, MS	

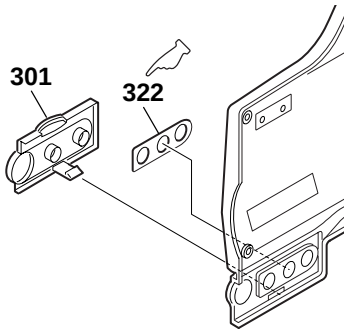
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6-1-7. CABINET (L) ASSEMBLY



Ref. No.	Part No.	Description	Remarks
321	X-3950-959-1	CABINET (L) ASSY (250)	
321	X-3951-182-1	CABINET (L) ASSY (250P)	

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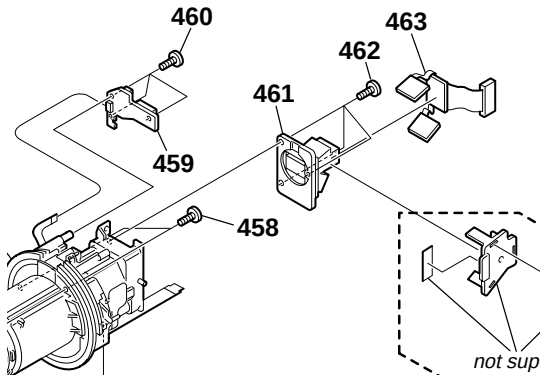
Ref. No.	Part No.	Description	Remarks
321	X-3950-959-1	CABINET (L) ASSY (250)	
321	X-3951-182-1	CABINET (L) ASSY (250P)	
* 322	3-066-290-01	PANEL, JACK	

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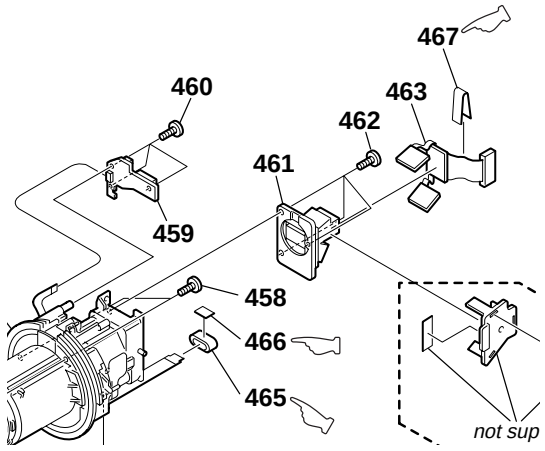
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: Added portion.

Page	Before Change	After Change
6-10	**6-1-10. LENS BLOCK SECTION-2**	



Ref. No.	Part No.	Description	Remarks
464	X-3950-586-1	COVER ASSY, PRISM	



Ref. No.	Part No.	Description	Remarks
464	X-3950-586-1	COVER ASSY, PRISM	
465	1-543-936-11	CORE (FPC)	
* 466	3-066-155-01	CUSHION	
* 467	3-066-153-01	SHEET, VI	

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9-929-845-81

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DSR-250/250P

RMT-811

SONY

SERVICE MANUAL

Ver 1.3 2003. 01

US Model
Canadian Model
DSR-250

AEP Model
Chinese Model
DSR-250P

SUPPLEMENT-2

File this supplement-2 with the Service Manual.
(PV02-009)

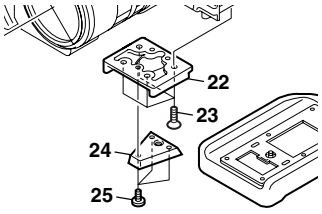
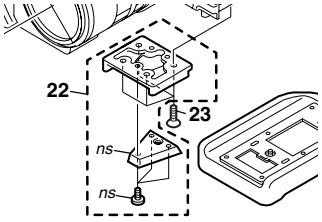
Subject: • Addtion of Chinese Model
• Addtion of Supplied parts

• Refer to Supplement-1 (9-929-845-81) together with the original Service manual (9-929-845-11) for parts details.

SECTION 6. REPAIR PARTS LIST

6-1. EXPLODED VIEWS

: Changed portion. : Deleted portion. : Added portion.

Page	Before change	After change
Original 6-1	**6-1-1. OVERALL SECTION-1** 	

Before change

Ref. No.	Part No.	Description	Remarks
* 22	3-716-391-01	WEDGE, MOUNTING	
23	3-063-723-01	+K M4X8 (EG GRIP)	
* 24	3-612-631-01	SHOE (S), CAMERA	
25	7-682-160-09	SCREW +P M4X6	

After change

Ref. No.	Part No.	Description	Remarks
* 22	A-8279-486-B	SHOE(C)ASSY,V	
23	3-063-723-01	+K M4X8 (EG GRIP)	
—	—	—	
—	—	—	

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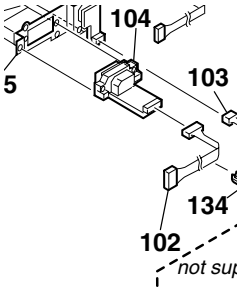
SECTION 6. REPAIR PARTS LIST

6-1. EXPLODED VIEWS

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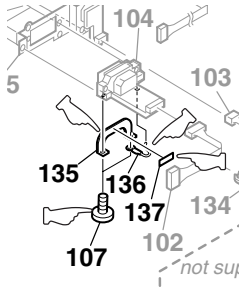
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6-3</td><td>

6-1-3. OVERALL SECTION-3



Ref. No.	Part No.	Description	Remarks
134	1-500-249-11	FERRITE BEAD (CASE)(250P)	

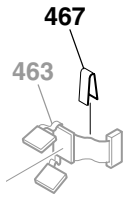
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Ref. No.	Part No.	Description	Remarks
134	1-500-249-11	FERRITE BEAD (CASE)(250P)	
* 135	3-064-914-01	REINFORCEMENT, DV TERMINAL	
136	1-960-907-11	HARNESS (JJ-058)	
* 137	3-065-149-01	SHEET, DV TERMINAL PROTECTION	

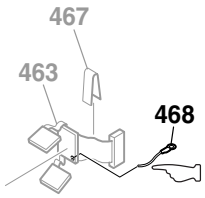
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6-10
Supple-
ment-
1
5</td><td>

6-1-10. LENS BLOCK SECTION-2



Ref. No.	Part No.	Description	Remarks
464	X-3950-586-1	COVER ASSY, PRISM	
465	1-543-936-11	CORE (FPC)	
* 466	3-066-155-01	CUSHION	
* 467	3-066-153-01	SHEET, VI	

</td><td>



Ref. No.	Part No.	Description	Remarks
464	X-3950-586-1	COVER ASSY, PRISM	
465	1-543-936-11	CORE (FPC)	
* 466	3-066-155-01	CUSHION	
* 467	3-066-153-01	SHEET, VI	
468	1-960-906-11	HARNESS (JJ-057)	

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6-2. ELECTRICAL PARTS LIST

: Changed portion. : Deleted portion. : Added portion.

Page	Before change	After change
Original 6-42	Ref. No. Part No. Description Remarks ACCESSORIES ********** 1-475-950-21 REMOTE COMMANDER (RMT-811) 1-575-334-11 CORD, CONNECTION (AV CABLE) 1-792-826-11 CORD, CONNECTION (USB CABLE) 3-053-056-01 LID, BATTERY CASE (FOR RMT-811) 3-060-458-11 MANUAL, INSTRUCTION (PICTURE GEAR 4.1 LITE) (ENGLISH/RUSSIAN) 3-060-458-21 MANUAL, INSTRUCTION (PICTURE GEAR 4.1 LITE) (FRENCH/GERMAN) 3-060-476-01 PICTURE GEAR 4.1 LITE (SYSTEM DISK) 3-061-255-01 SYSTEM DISK (MSAC-US1) 3-062-061-12 MANUAL, INSTRUCTION (AUTO LOGO INSERT FOR CORYRIGHT PROTECTION) (ENGLISH/FRENCH/GERMAN/ITALIAN) 3-064-678-11 MANUAL, INSTRUCTION (ENGLISH)(250) 3-064-678-21 MANUAL, INSTRUCTION (FRENCH)(250) 3-064-678-31 MANUAL, INSTRUCTION (ENGLISH)(250P) 3-064-678-41 MANUAL, INSTRUCTION (FRENCH)(250P) 3-064-678-51 MANUAL, INSTRUCTION (GERMAN)(250P) 3-064-678-61 MANUAL, INSTRUCTION (ITALIAN)(250P) 8-814-298-90 MICROPHONE ECM-NV1 A-7033-740-A MEMORY STICK MSA-4A A-7096-180-A MSAC-US1 MEMORY STICK READER WRITER	Ref. No. Part No. Description Remarks ACCESSORIES ********** 1-475-950-21 REMOTE COMMANDER (RMT-811) — — 1-792-554-13 CORD, CONNECTION 1-824-234-11 CORD WITH CONNECTOR 3-053-056-01 LID, BATTERY CASE (FOR RMT-811) 3-060-458-11 MANUAL, INSTRUCTION (PICTURE GEAR 4.1 LITE) (ENGLISH/RUSSIAN) 3-060-458-21 MANUAL, INSTRUCTION (PICTURE GEAR 4.1 LITE) (FRENCH/GERMAN) 3-060-458-71 MANUAL, INSTRUCTION (PICTURE GEAR 4.1 LITE) (CHINESE) (250P:CH) 3-060-476-01 PICTURE GEAR 4.1 LITE (SYSTEM DISK) — 3-062-061-12 MANUAL, INSTRUCTION (AUTO LOGO INSERT FOR CORYRIGHT PROTECTION) (ENGLISH/FRENCH/GERMAN/ITALIAN) 3-064-678-11 MANUAL, INSTRUCTION (ENGLISH)(250) 3-064-678-24 MANUAL, INSTRUCTION (FRENCH)(250) 3-064-678-34 MANUAL, INSTRUCTION (ENGLISH)(250P) 3-064-678-44 MANUAL, INSTRUCTION (FRENCH)(250P) 3-064-678-54 MANUAL, INSTRUCTION (GERMAN)(250P) 3-064-678-64 MANUAL, INSTRUCTION (ITALIAN)(250P) 3-077-012-02 CD-ROM (SPVD-008 I (51100)) (250) 3-077-023-02 CD-ROM (SPVD-008 (51100)) (250P) 3-078-362-11 MANUAL, INSTRUCTION (ENGLISH/FRENCH) (MSAC-US2)(250P:AEP) 3-078-362-21 MANUAL, INSTRUCTION (GERMANSPANISH DUTCH/DUTCH/SWEDISH/ITALIAN/PORTUGUESE/RUSSIAN/ ARABIC/TRADITIONAL CHINESE/KOREAN/DANISH/FINNISH) 3-082-347-01 MANUAL, INSTRUCTION (CHINESE) (250P:CH) 8-814-298-90 MICROPHONE ECM-NV1 A-7096-180-A MSAC-US1 MEMORY STICK READER WRITER — A-7013-113-A OVERALL ASSY (MSAC-US2) X-3952-84401 STAND ASSY X-3950-568-1 CAP ASSY, HOOD

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Revision History

Ver.	Date	History	Contents	S.M. Rev. issued
1.0	2000.08	Official Release	—	—
1.1	2000.11	Supplement-1	• Change of Self-diagnosis code table. • Change of Adjustments. • Addition of Supplied parts.	No
1.2	2001.11	Correction-1 (PV01-036)	Correction of part No. for service part. S.M. correction: Page 6-1, 6-16	Yes
1.3	2003.01	Supplement-2	• Addtion of Chinese Model. • Addtion of Supplied parts.	No

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