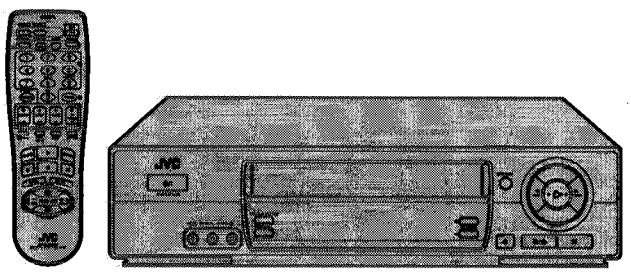
JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER

HR-J260EE/J265EA/J268EE



SHOWVIEW®

Hi-Fi VHS PAL NTSC

Regarding service information other than these sections, refer to the HR-J261MS service manual (No. 82734). Also, be sure to note important safety precautions provided in the service manual.

SPECIFICATIONS *(The specifications shown pertain specifically to the model HR-J711EE/J460EE/J268EE/J260EE)*

GENERAL

Power requirement	
Rating	: AC 110 – 240 V~, 50/60 Hz
Operating	: AC 90 – 260 V~, 50/60 Hz
Power consumption	: 20 W [HR-J711EE]
	: 18 W [HR-J460/J268/J260EE]
Temperature	
Operating	: 5°C to 40°C
Storage	: –20°C to 60°C
Operating position	: Horizontal only
Dimensions (WxHxD)	: 400 x 94 x 275 mm
Weight	: 3.2 kg
Format	: VHS standard
Maximum recording time	
(SP)	: 240 min. with E-240 video cassette (PAL/MESECAM)
	: 160 min. with T-160 video cassette (NTSC)
(LP) [HR-J711/J460EE only]	: 480 min. with E-240 video cassette (PAL/MESECAM)
(EP) [HR-J711/J460EE only]	: 480 min. with T-160 video cassette (NTSC)

VIDEO/AUDIO

Signal system	: PAL-type colour signal and CCIR monochrome signal, 625 lines 50 fields
	: NTSC colour and EIA monochrome signals, 525 lines/60 fields
Recording system	: DA-4 (Double Azimuth) head helical scan system [HR-J711/J460EE]
	: Rotary two-head helical scan system [HR-J268/J260EE]
Signal-to-noise ratio	: 45 dB
Horizontal resolution	: 250 lines (PAL/MESECAM)
	: 220 lines (NTSC)
Frequency range	: 70 Hz to 10,000 Hz (Normal audio) 20 Hz to 20,000 Hz (Hi-Fi audio) [HR-J711EE only]
Input/Output	: RCA connectors (IN x 2, OUT x 1) [HR-J711EE] (IN x 1, OUT x 1) [HR-J460/J268/J260EE]

TUNER/TIMER

TV channel storage capacity	: 99 positions (+AUX position)
Tuning system	: Frequency synthesized tuner
Channel coverage	: VHF (Low) 42 – 175 MHz (High)175 – 470 MHz UHF 470 – 870 MHz
Aerial output	: UHF channels (Adjustable E28 – E60)
Memory backup time	: Approx. 6 months Estimated figure based on supplied fresh battery; actual performance may differ.

ACCESSORIES

Provided accessories	: RF cable, Infrared remote control unit, "R6/UM-3" battery x 2, Lithium battery CR2025

Specifications shown are for SP mode unless otherwise specified.
Design and specifications subject to change without notice.

This service manual is made from all recycled paper.

No. 82773
October 1999

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The following table indicate main different points between models HR-J261MS, HR-J260EE, HR-J265EA and HR-J268EE.

MODEL / ITEM	HR-J261MS	HR-J260EE	HR-J265EA	HR-J268EE
POWER PLUG	CEE Plug(CLASS II)	←	SAA Plug(CLASS II)	CEE Plug(CLASS II)
RECORDING & PLAYBACK SPEED	SP/LP/EP	SP	SP/LP/EP	SP
SHUTTLE SEARCH(LATCH)-PAL	SP:x9, LP:x9	SP:x9	SP:x9, LP:x9	SP:x9
SHUTTLE SEARCH(LATCH)-NTSC	SP:x7, EP:x21	SP:x7	SP:x7, EP:x21	SP:x7
HQ SYSTEM	WC, DE, YNR	WC, DE	WC, DE, YNR	WC, DE
AUTO CH PRESET[INITIAL]	[B/G]	[D/K]	[B/G]	[D/K]
VCR Plus+	NOT USED	←	USED	←
AUTO SP → EP(LP) TIMER	USED	NOT USED	USED	NOT USED
SKIP	NOT USED	USED	←	←
RCU(TYPE)	V10-10k(V11A1)	V11-10k(V11A2)	←	←
TV MBR	NOT USED	USED	←	←
CABLE & DBS BOX MBR	NOT USED	USED	NOT USED	USED

Note : Mark ← is same as left.

The following table indicate different parts number between models HR-J261MS, HR-J260EE, HR-J265EA and HR-J268EE.

PACKING AND ACCESSORY ASSEMBLY <M1>

⚠ REF. NO	ITEM \ MODEL	HR-J261MS	HR-J260EE	HR-J265EA	HR-J268EE
301	PACKING CASE	LP30535-039A	LP30535-052A	LP30535-037A	LP30535-050A
306	REMOTE CONTROLLER	LP20034-016B	LP20337-008A	←	←
306A	COVER(BATTERY)	LP40033-002A	LP40254-002B	←	←
⚠ 310	INST.BOOK(EN)	LPT0285-001A	—	LPT0280-001B	—
⚠ 310	INST.BOOK(RU)	LPT0285-002A	LPT0287-001A	—	LPT0287-001A
316	WARRANTY CARD	—	BT-54012-1	BT-56001-2	BT-54012-1
319	SERVICE NET CARD	—	—	BT-56002-2	—

CABINET AND CHASSIS ASSEMBLY <M2>

⚠ REF. NO	ITEM \ MODEL	HR-J261MS	HR-J260EE	HR-J265EA	HR-J268EE
⚠ 501	FRONT PANEL ASSY	LP10212-032A	LP10212-044B	LP10212-035A	LP10212-043B
501A	CASSETTE DOOR	PQ21884-149	PQ21884-155	PQ21884-152	PQ21884-154
501C	DISPLAY WINDOW	LP20326-066A	LP20326-077A	LP20326-069A	LP20326-076A
505	DRUM SUB ASSY	LP20617-005A	LP20617-009A	LP20617-005A	LP20617-009A
505A	UPPER DRUM ASSY	LP20084-003A	LP20084-005A	LP20084-003A	LP20084-005A
⚠ 517	POWER CORD	QMP4A10-170	QMP2990-220	←	QMP4A10-170
522	SHEET(POWER PLUG)	—	PM30129	←	—

MAIN BOARD ASSEMBLY <03>

⚠ REF. NO	ITEM \ MODEL	HR-J261MS	HR-J260EE	HR-J265EA	HR-J268EE
PW1	MAIN BOARD ASSY	LPA10045-33B1	LPA10045-40B1	LPA10045-36B1	LPA10045-39B1
IC3003	IC	M24C04-BN6	←	M24C08-BN6	←
Q154	TRANSISTOR	2SB1218A/QR/-X	—	2SB1218A/QR/-X	—
R63	MG RESISTOR	—	NRSA02J-102X	—	—
R154	MG RESISTOR	NRSA02J-0R0X	—	NRSA02J-0R0X	—
R157	MG RESISTOR	NRSA02J-221X	—	NRSA02J-221X	—
R158	MG RESISTOR	NRSA02J-102X	—	NRSA02J-102X	—
R193	RESISTOR	QRE141J-0R0	—	QRE141J-0R0	—
R7009	RESISTOR	QRE141J-393Y	—	—	—
R7011	MG RESISTOR	—	—	NRSA02J-103X	NRSA02J-153X
R7012	MG RESISTOR	—	NRSA02J-393X	—	NRSA02J-393X
C74	MG RESISTOR	NRSA02J-0R0X	—	NRSA02J-0R0X	—
C153	CAPACITOR	NDC21HJ-390X	—	NDC21HJ-390X	—
C5003	CAPACITOR	—	—	QCZ9071-101	—
C7013	CAPACITOR	—	NCB21HK-103X	←	←
L151	P COIL	QQL29BJ-680Z	—	QQL29BJ-680Z	—

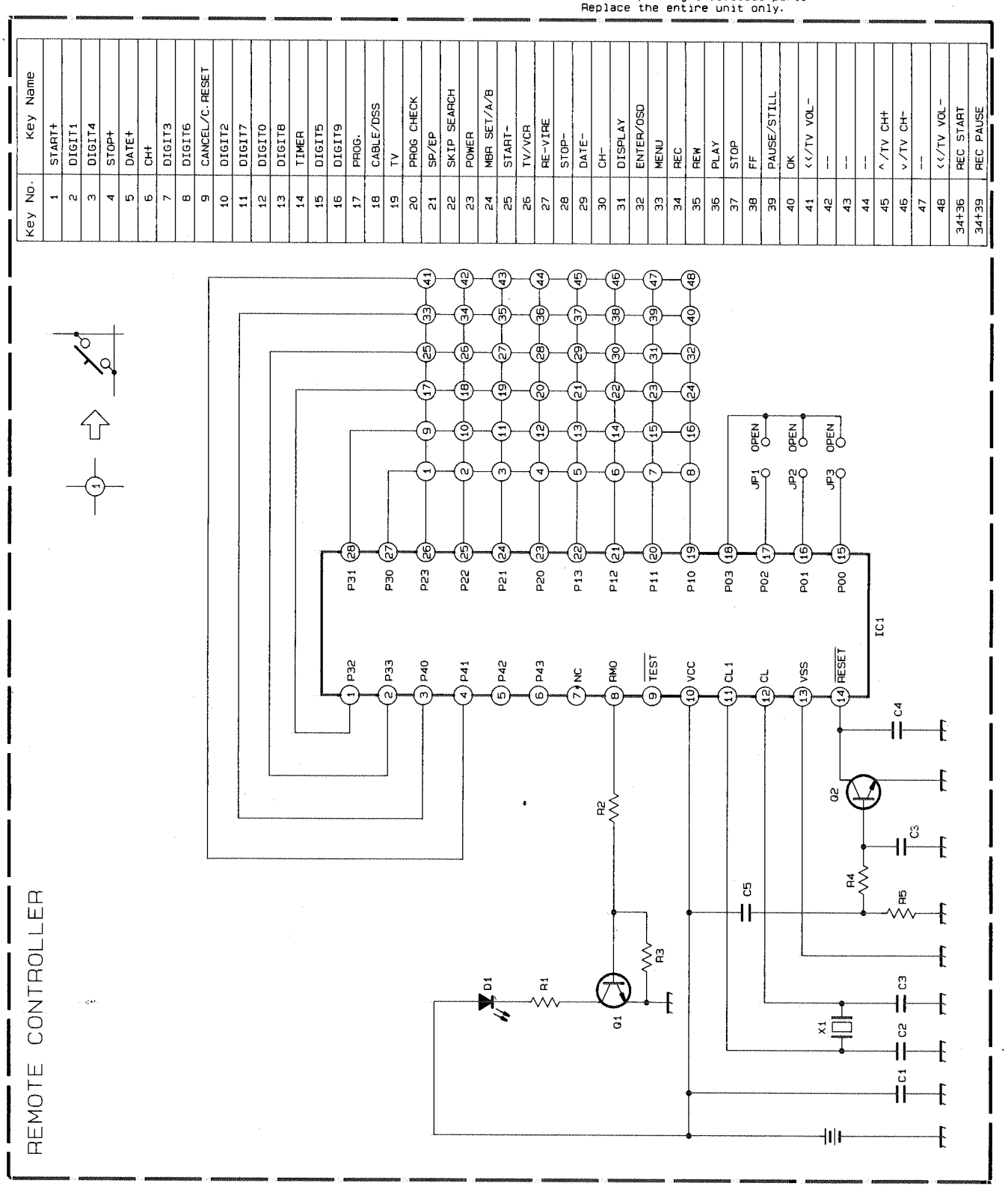
Notes : Mark — is not used.
Mark ← is same as left.

SECTION 4
CHARTS AND DIAGRAMS

4.1 REMOTE CONTROL SCHEMATIC DIAGRAM

NOTES:
1.All parts shown in this schematic are critical for safety.
2.This schematic is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.

Key No.	Key Name
1	START+
2	DIGIT1
3	DIGIT4
4	STOP+
5	DATE+
6	CH+
7	DIGIT3
8	DIGIT6
9	CANCEL/C.RESET
10	DIGIT2
11	DIGIT7
12	DIGIT0
13	DIGIT8
14	TIMER
15	DIGIT5
16	DIGIT9
17	PROG.
18	CABLE/DSS
19	TV
20	PROG CHECK
21	SP/EP
22	SKIP SEARCH
23	POWER
24	MBR SET/A/B
25	START-
26	TV/VCR
27	RE-VIRE
28	STOP-
29	DATE-
30	CH-
31	DISPLAY
32	ENTER/OSD
33	MENU
34	REC
35	REW
36	PLAY
37	STOP
38	FF
39	PAUSE/STILL
40	OK
41	<</TV VOL-
42	--
43	--
44	--
45	^/TV CH+
46	v/TV CH-
47	--
48	>>/TV VOL-
34+36	REC START
34+39	REC PAUSE



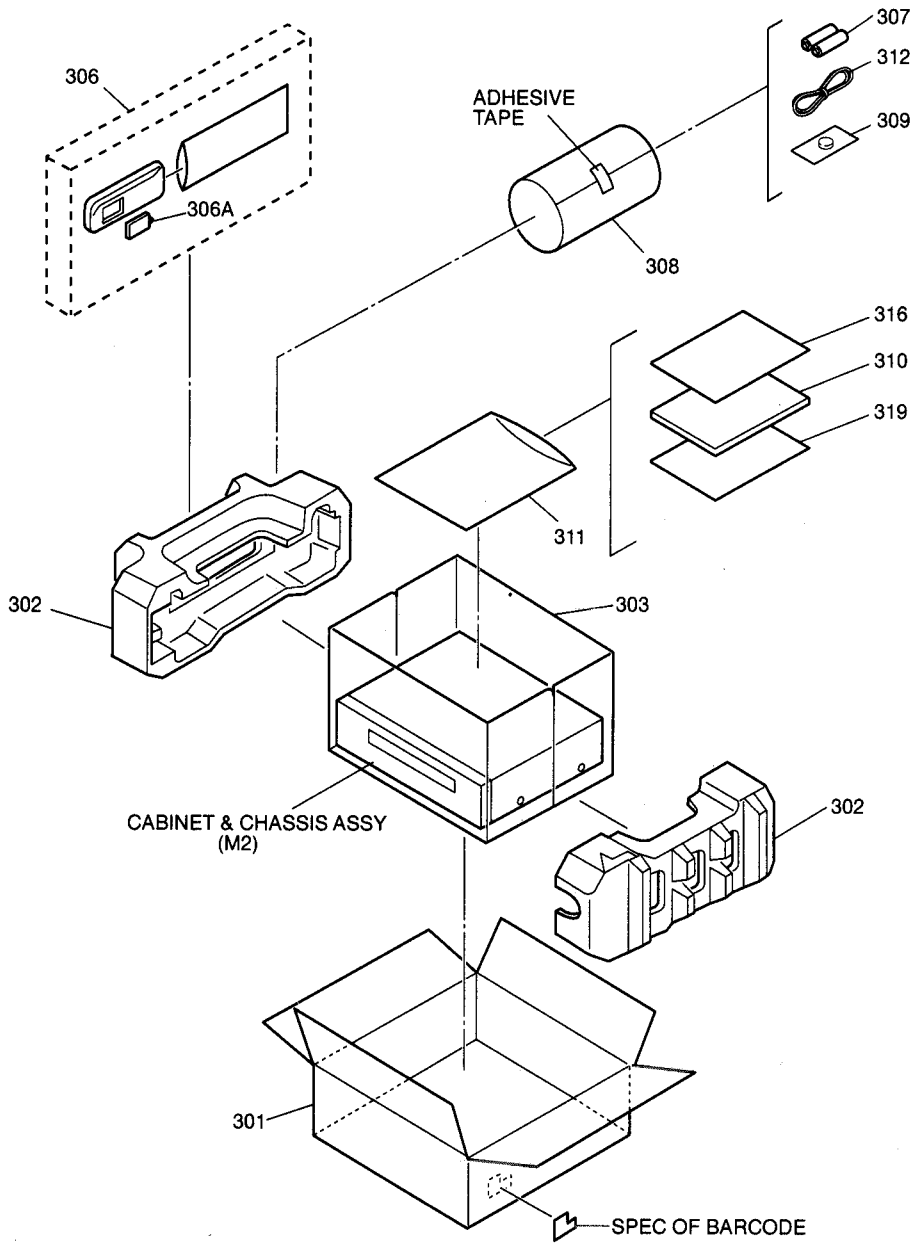
SECTION 5
PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

5.1 PACKING AND ACCESSORY ASSEMBLY <M1>

The instruction manual to be provided with this product will differ according to the destination.



#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION

****

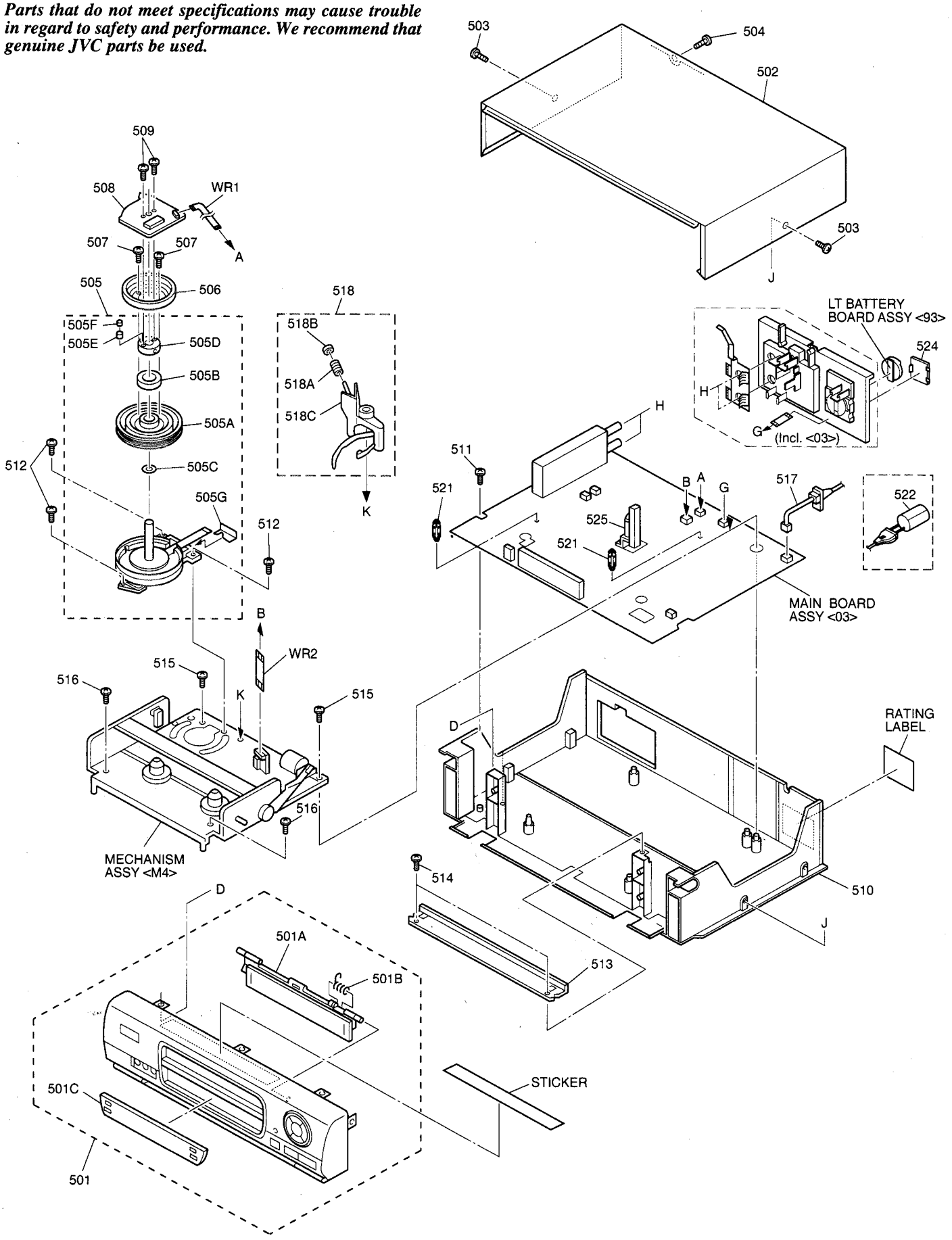
PACKING AND ACCESSORY ASSEMBLY <M1>

	301	LP30535-052A	PACKING CASE,J260EE
		LP30535-037A	PACKING CASE,J265EA
		LP30535-050A	PACKING CASE,J268EE
	302	LP30536-001B	CUSHION ASSY
	303	PQM30021-93	POLY BAG
	306	LP20337-008A	REMOTE CONTROLLER
	306A	LP40254-002B	COVER(BATTERY)
	307	—	BATTERY,X2("R6" TYPE)
	308	QPC02202215P	POLY BAG
⚠	309	PECA0903	LI BATTERY
⚠	310	LPT0280-001B	INST.BOOK(EN),J265EA
⚠		LPT0287-001A	INST.BOOK(RU),J260EE/J268EE
	311	QPC02503515P	POLY BAG
	312	PU59168-7	RF CABLE
	316	BT-54012-1	WARRANTY CARD,J260EE/J268EE
		BT-56001-2	WARRANTY CARD,J265EA
	319	BT-56002-2	SERVICE NET CARD,J265EA

5.2 CABINET AND CHASSIS ASSEMBLY <M2>

BEWARE OF BOGUS PARTS

Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.

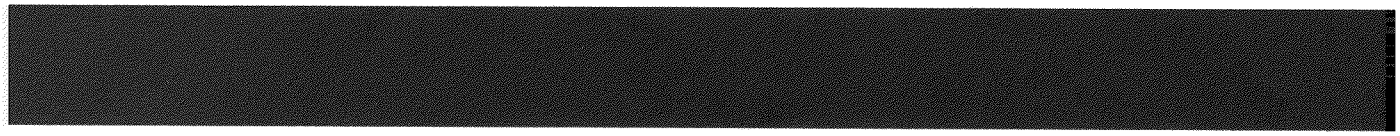


# ⚠	REF No.	PART No.	PART NAME, DESCRIPTION

****

CABINET AND CHASSIS ASSEMBLY <M2>

⚠	501	LP10212-044B	FRONT PANEL ASSY,J260EE
⚠		LP10212-035A	FRONT PANEL ASSY,J265EA
⚠		LP10212-043B	FRONT PANEL ASSY,J268EE
	501A	PQ21884-155	CASSETTE DOOR,J260EE
		PQ21884-152	CASSETTE DOOR,J265EA
		PQ21884-154	CASSETTE DOOR,J268EE
	501B	PQ46448	TORSION SPRING
	501C	LP20326-077A	DISPLAY WINDOW,J260EE
		LP20326-069A	DISPLAY WINDOW,J265EA
		LP20326-076A	DISPLAY WINDOW,J268EE
⚠	502	LP10013-021C	TOP COVER
	503	QYTDSF3010M	SCREW,X2 TOP COVER(SIDE)
	504	QYTDSF3010M	SCREW,TOP COVER(REAR)
	505	LP20617-009A	DRUM SUB ASSY,J260EE/J268EE
		LP20617-005A	DRUM SUB ASSY,J265EA
	505A	LP20084-003A	UPPER DRUM ASSY,J265EA
		LP20084-005A	UPPER DRUM ASSY,J260EE/J268EE
	505B	PDM4439	CAP
	505C	PDM4444-19-2	WASHER
	505D	LP40572-001A	COLLAR ASSY
	505E	LP40323-001A	CONTACT
	505F	LP30004-014A	COMPRESSION SPRING
	505G	LP40174-001B	FPC PLATE
	506	PDZ0179-1-4	ROTOR ASSY
	507	QYSPSP3006Z	SCREW,X2
	508	PDZ0180-1-2	STATOR ASSY
	509	QYSPSPH2606Z	SCREW,X2
⚠	510	LP10108-009B	BOTTOM CHASSIS
	511	QYTDSF3010Z	SCREW,MAIN
	512	QYSDST2610Z	SCREW,X3 DRUM
	513	LP30312-001B	BRACKET(CHASSIS)
	514	QYTDSF3010Z	SCREW,X2
	515	QYTDSF4012Z	SCREW,X2 MECHA
	516	QYTDSF3010Z	SCREW,X2 MECHA
⚠	517	QMP4A10-170	POWER CORD,J268EE
		QMP2990-220	POWER CORD,J260EE/J265EA
	518	LP40369-001D	CLEANER ASSY
	518A	PQ46418-1-2	CLEANER ROLLER
	518B	PQ46419-1-2	CLEANER
	518C	LP30407-001D	CLEANER ARM
	521	LP40226-001A	PC SUPPORT,X2
	522	PM30129	SHEET(POWER PLUG),J260EE/J265EA
	524	LP30336-001A	CAP,LT BATTERY
	525	LP40253-001B	STOPPER
	WR1	QUQ212-0518CG	FFC WIRE,DRUM CN3001
	WR2	WJT0005-002A	E-CARD WIRE,A/C HEAD CN2001



JVC
VICTOR COMPANY OF JAPAN, LIMITED
VIDEO DIVISION

S40894

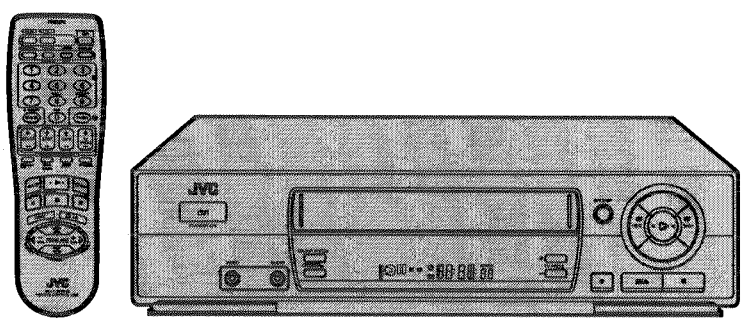
Printed in Japan

JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER

HR-J261MS/J461MS



VHS
PAL NTSC

SPECIFICATIONS *(The specifications shown pertain specifically to the model HR-J461MS)*

GENERAL

Power requirement	
Rating	: AC 110 – 240 V∿, 50/60 Hz
Operating	: AC 90 – 260 V∿, 50/60 Hz
Power consumption	: 18 W
Temperature	
Operating	: 5°C to 40°C
Storage	: –20°C to 60°C
Operating position	: Horizontal only
Dimensions (WxHxD)	: 400 x 94 x 275 mm
Weight	: 3.2 kg
Format	: VHS standard
Maximum recording time	
(SP)	: 240 min. with E-240 video cassette (PAL/MESECAM)
	: 160 min. with T-160 video cassette (NTSC)
(LP)	: 480 min. with E-240 video cassette (PAL/MESECAM)
(EP)	: 480 min. with T-160 video cassette (NTSC)

VIDEO/AUDIO

Signal system	: PAL-type colour signal and CCIR monochrome signal, 625 lines 50 fields
	: NTSC colour and EIA monochrome signals, 525 lines/60 fields
Recording system	: DA-4 (Double Azimuth) head helical scan system
Signal-to-noise ratio	: 45 dB
Horizontal resolution	: 250 lines (PAL/MESECAM)
	: 220 lines (NTSC)
Frequency range	: 70 Hz to 10,000 Hz
Input/Output	: RCA connectors (IN x 2, OUT x 1)

TUNER/TIMER

TV channel storage capacity	: 99 positions (+AUX position)
Tuning system	: Frequency synthesized tuner
Channel coverage	: VHF (Low) 42 – 175 MHz (High)175 – 470 MHz UHF 470 – 870 MHz
Aerial output	: UHF channels (Adjustable E28 – E60)
Memory backup time	: Approx. 6 months Estimated figure based on supplied fresh battery; actual performance may differ.

ACCESSORIES

Provided accessories	: RF cable, Infrared remote control unit, "R6/UM-3" battery x 2, Lithium battery CR2025

Specifications shown are for SP mode unless otherwise specified.
Design and specifications subject to change without notice.

No. 82734
July 1999

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The following table lists the differing points between Models (HR-J261MS and HR-J461MS) in this series.

	HR-J261MS	HR-J461MS
VIDEO HEAD	2 HEAD	4 HEAD
SKIP	NOT USED	USED
REAR VIDEO/AUDIO IN	NOT USED	USED

Important Safety Precautions

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

●Precautions during Servicing

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

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

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

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

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

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

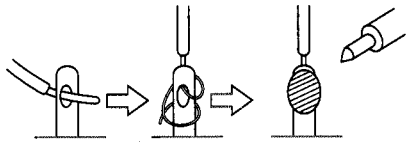


Fig.1

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

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

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

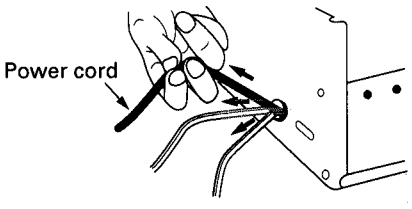


Fig.2

10. Also check areas surrounding repaired locations.

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

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

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

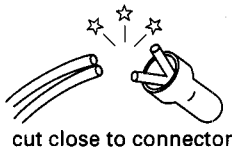


Fig.3

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

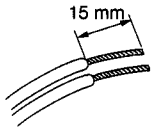


Fig.4

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

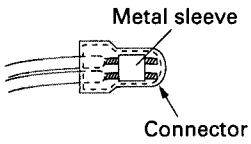


Fig.5

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

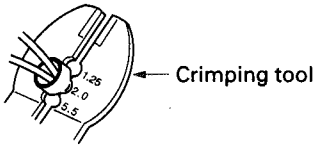


Fig.6

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

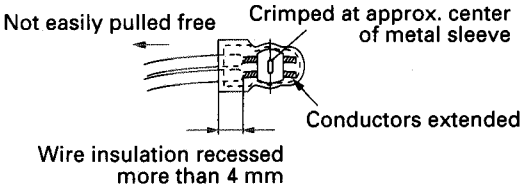


Fig.7

● Safety Check after Servicing

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

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

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

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

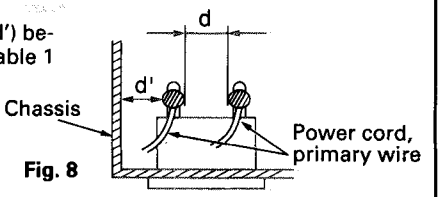


Fig. 8

4. **Leakage current test**
   Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).
   Measuring Method : (Power ON)
   Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

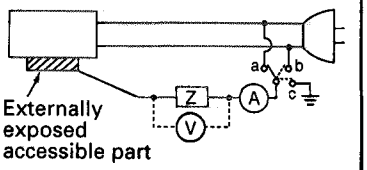


Fig. 9

5. **Grounding (Class I model only)**
   Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).
   Measuring Method:
   Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

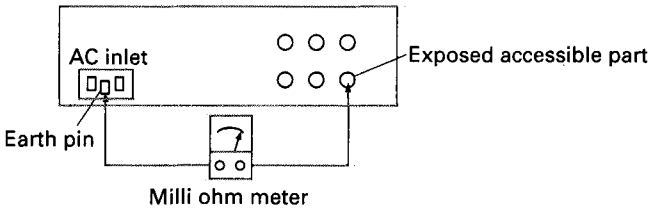


Fig. 10

Grounding Specifications

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

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

Table 1 Specifications for each region

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

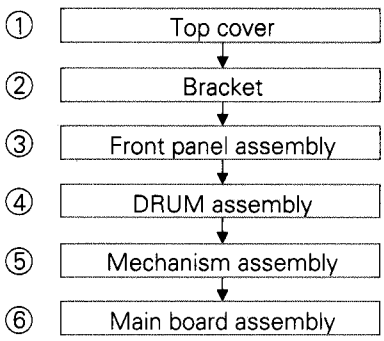
Table 2 Leakage current specifications for each region

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

SECTION 1
DISASSEMBLY

1.1 DISASSEMBLY FLOW CHART

This flowchart lists the disassembling steps for the cabinet parts and P.C. boards in order to gain access to item(s) to be serviced. When reassembling, perform the step(s) in reverse order. Bend, route and dress the flat cables as they were originally laid.



1.2 HOW TO READ THE DISASSEMBLY AND ASSEMBLY

STEP /LOC NO.	PART NAME	FIG. NO.	POINT	NOTE
①	TOP COVER	D1	3(S1)	
②	BRACKET	D2	2(S2)	
③	FRONT PANEL ASSEMBLY	D3	7(L1)	<NOTE 1> <NOTE 2>
④	DRUM ASSEMBLY	D4	3(S3), (L2), CN1(WR1), CN1(WR2), CLEANER ASSEMBLY	<NOTE 3>
⑤	MECHANISM ASSEMBLY	D5	2(S4),2(S5),2(L3), CN1(WR3)	<NOTE 3> <NOTE 4>
⑥	MAIN BOARD ASSEMBLY	D6	(S6), 6(L4)	

(1) (2) (3) (4) (5)

(1) Order of steps in Procedure
When reassembling, perform the step(s) in the reverse order. These numbers are also used as the identification (location) NO. of parts Figures.
(2) Part name to be removed or installed.
(3) Fig.No. showing procedure or part location
(4) Identification of part to be removed,unhooked,unlocked, released,unpluged,unclamped or unsoldered. P = Spring, W = Washer, S = Screw, L = Locking tab, CNxx(WRxx) = Remove the wire (WRxx) from the connector (CNxx).

NOTE: *The bracketed ( ) WR of the connector symbol are assigned nos. in priority order and do not correspond to those on the spare parts list.*

(5) Adjustment information for installation

1.3 DISASSEMBLY/ASSEMBLY METHOD

STEP /LOC NO.	PART NAME	FIG. NO.	POINT	NOTE
①	TOP COVER	D1	3(S1)	
②	BRACKET	D2	2(S2)	
③	FRONT PANEL ASSEMBLY	D3	7(L1)	<NOTE 1> <NOTE 2>
④	DRUM ASSEMBLY	D4	3(S3), (L2), CN1(WR1), CN1(WR2), CLEANER ASSEMBLY	<NOTE 3>
⑤	MECHANISM ASSEMBLY	D5	2(S4),2(S5),2(L3), CN1(WR3)	<NOTE 3> <NOTE 4>
⑥	MAIN BOARD ASSEMBLY	D6	(S6), 6(L4)	

<NOTE1>
When reattaching the Front panel assembly, make sure that the door opener ⓐ of the Cassette holder assembly is lowered in position prior to the reinstallation.

<NOTE2>
When reattaching the Front panel assembly, pay careful attention to the switch lever not to make it touch the switch knob ⓑ of the Main board assembly from the side.
(If the switch knob of the Main board assembly is damaged, cassette loading is impossible.)

<NOTE3>
When inserting the flat wire into the connector, be careful not to make a mistake in the positioning of its electrodes.

<NOTE4>
- When it is required to remove the screws (S4) retaining the Mechanism assembly, please refer to the "Procedures for Lowering the Cassette holder assembly". (See on pages 1-3.)
- When removing the Mechanism assembly only, unhook the two spacers connecting it with the Main board assembly with pliers from the back side of the Main board assembly first, and then remove the Mechanism assembly.
- When reattaching the Mechanism assembly to the Main board assembly, take care not to damage the sensors on the Main board. (D3001: LED, Q3002: Start sensor, Q3003: End sensor)

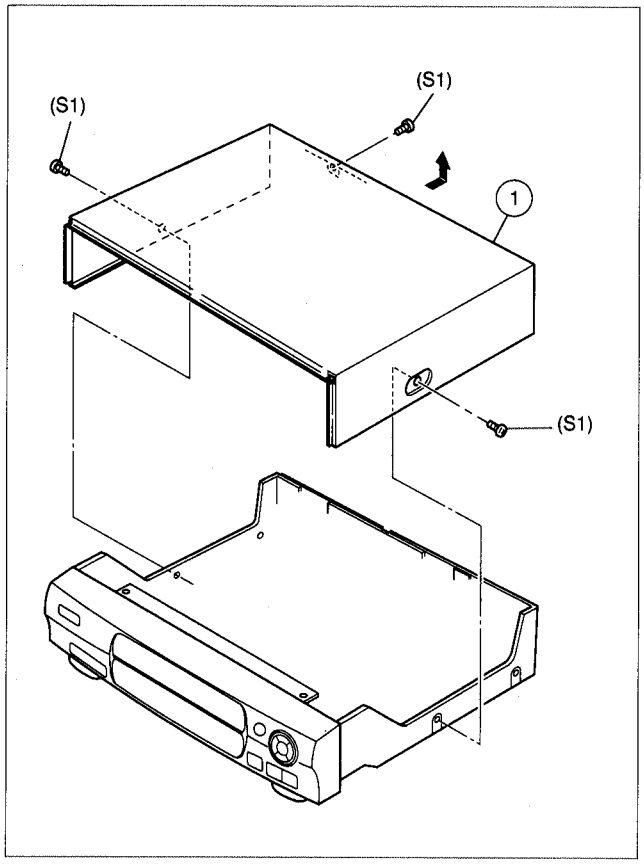


Fig. D1

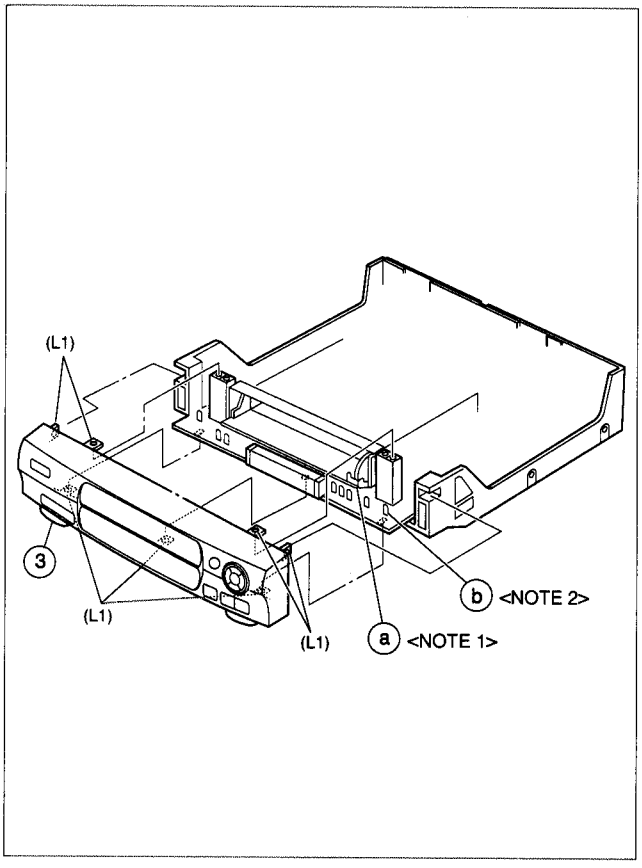


Fig. D3

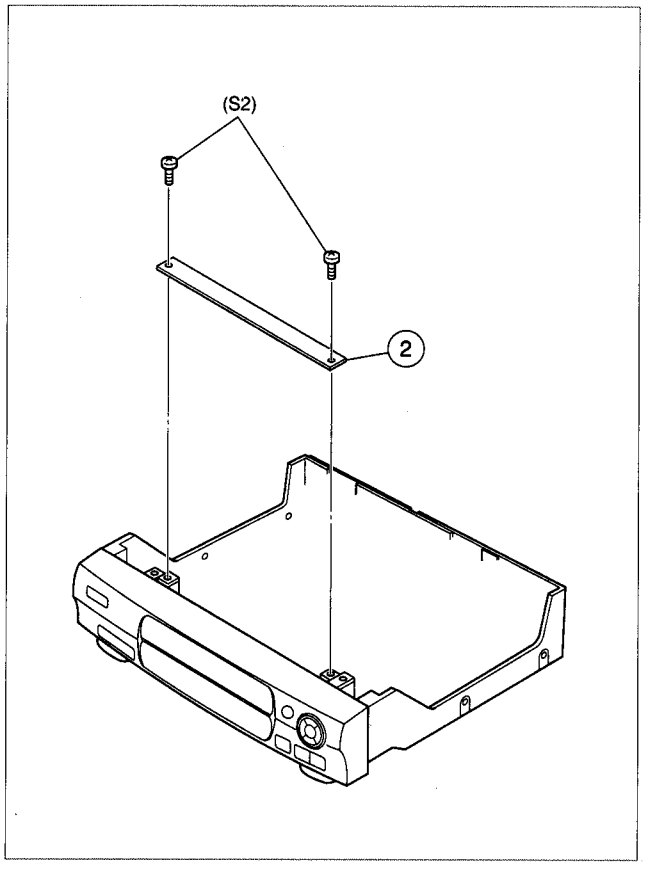


Fig. D2

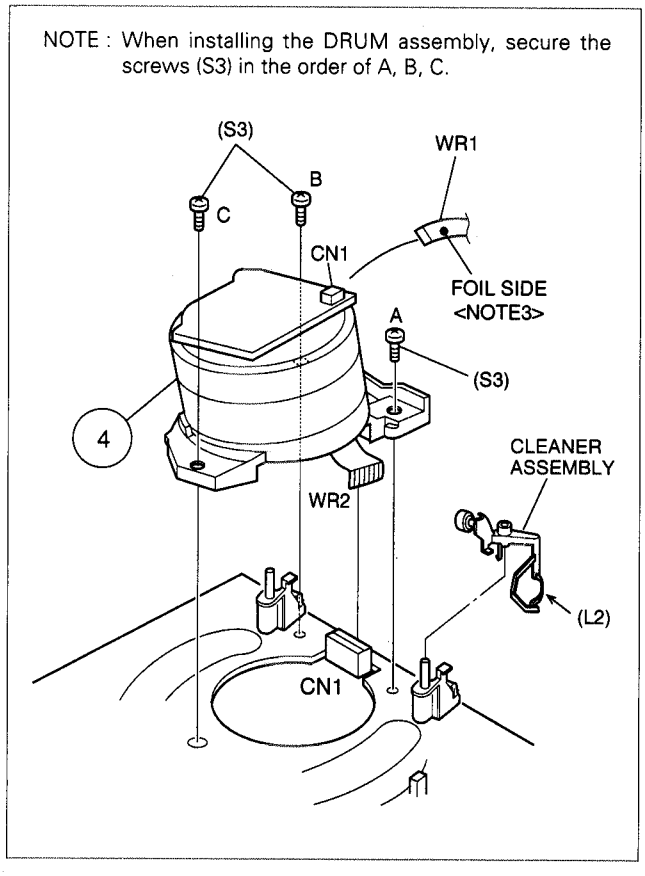


Fig. D4

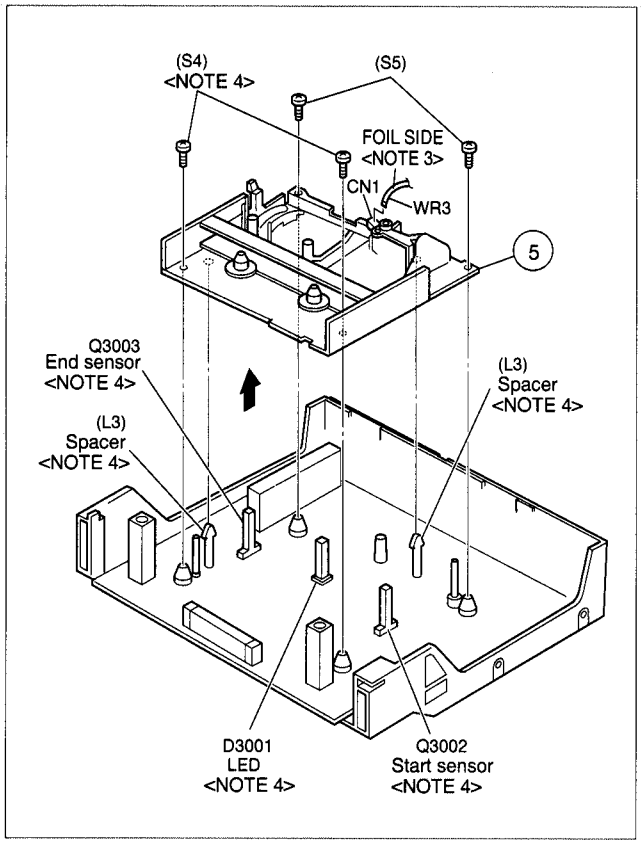


Fig. D5

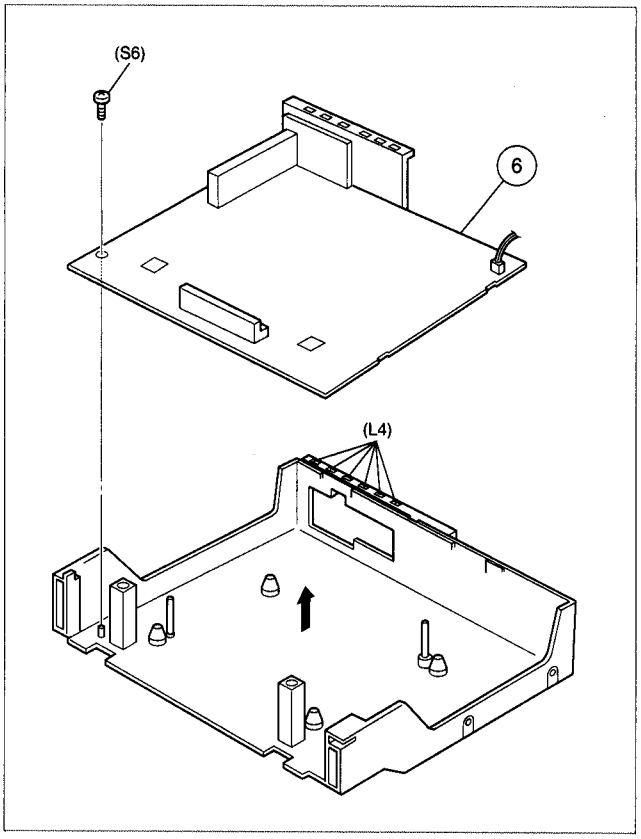


Fig. D6

Procedures for Lowering the Cassette holder assembly

As the mechanism of this unit is integrated with the Housing assembly, the holder must be lowered and the two screws unscrewed when removing the Mechanism assembly.

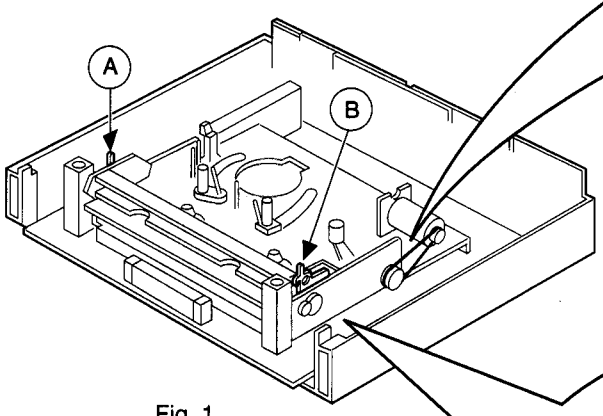


Fig. 1

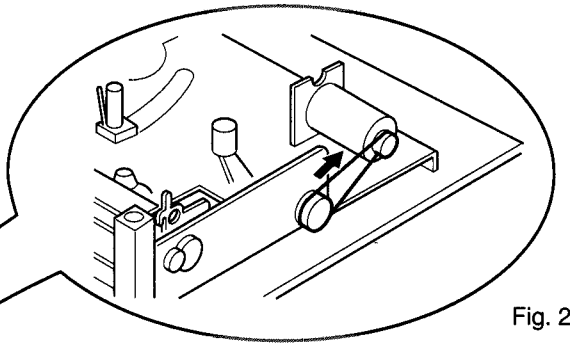


Fig. 2

Turn the loading motor pulley in the direction as indicated by Fig.2. As both Ⓐ and Ⓑ levers are lodged twice, push the levers in the direction as indicated by Fig.3 to release them. When pushing the levers, do it in the order of Ⓐ,Ⓑ,Ⓑ,Ⓐ. When the holder has been lowered, turn the pulley until the cassette holder is securely in place without allowing any up/down movement.

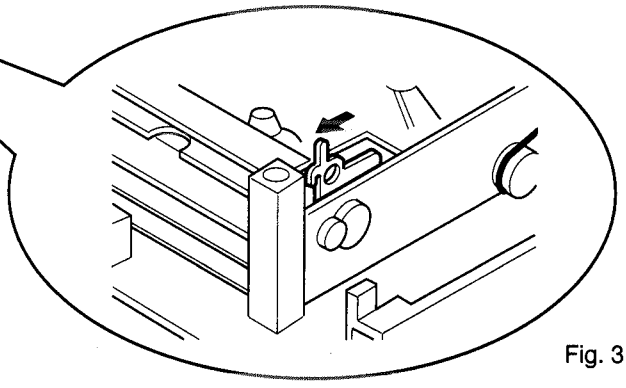


Fig. 3

1.4 SERVICE POSITION

In order to facilitate diagnosis and the repair of the Mechanism assembly, this unit is constructed so as to allow the Mechanism and Main board assemblies to be removed together from the Chassis assembly.

1.4.1 How to take out the Mechanism and Main board assemblies

(1) Remove the Top cover, Bracket and Front panel assembly. (See 1.3 DISASSEMBLY/ASSEMBLY METHOD. Take care not to pull the drum wire (Fig.D4) from CN1.)
(2) Lower the cassette holder, and make the preparations required in order to remove the screws from the Mechanism assembly. (Refer to the "Procedures for Lowering the Cassette holder assembly" on pages 1-3 of 1.3 DISASSEMBLY/ASSEMBLY METHOD.)
(3) Take out 2 screws Ⓐ, 2 screws Ⓑ and 1 screw Ⓒ as shown in Fig. 1-4-1.

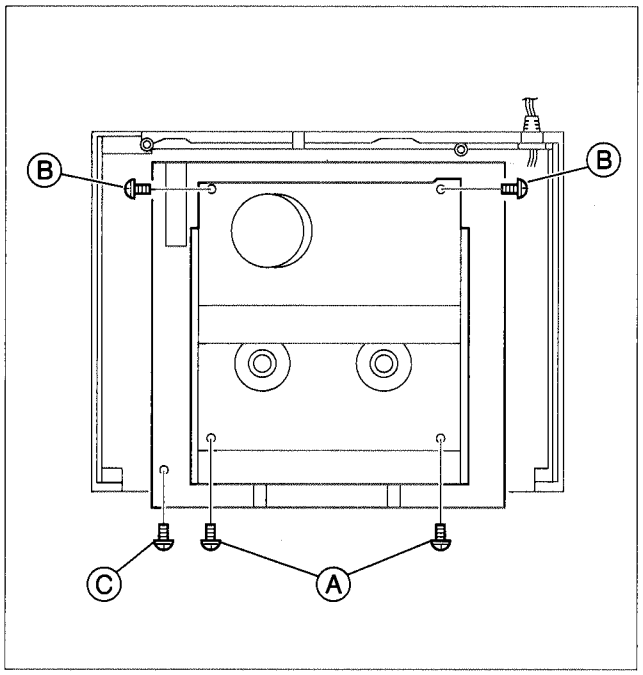


Fig. 1-4-1

(4) Remove the Main board and Mechanism assemblies together while holding the edge of the Main board assembly. At this stage be careful of the power cord and prongs of the jacks on the back side. (See Fig. 1-4-2.)

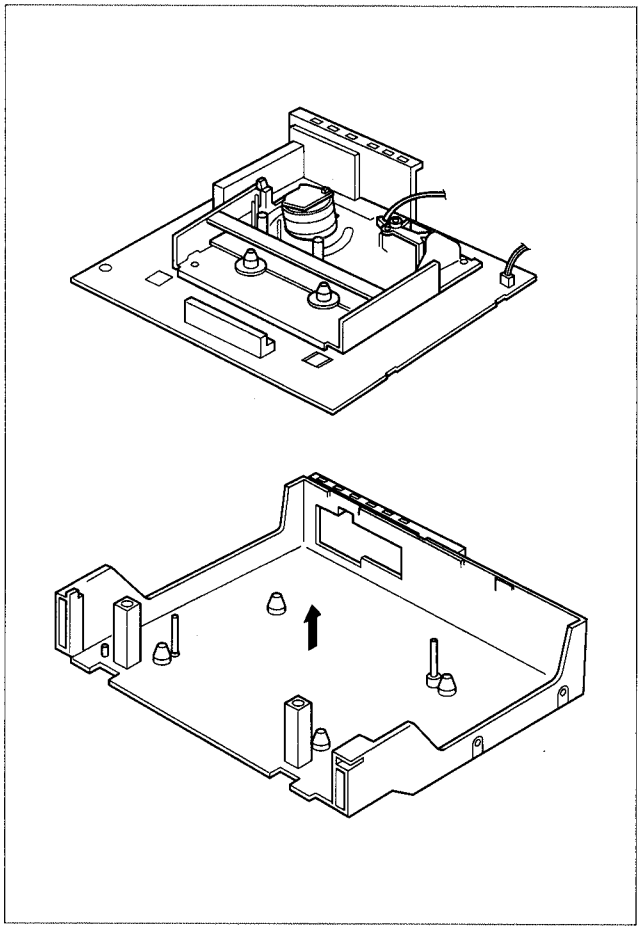


Fig. 1-4-2

(5) Connect the power cord to the wall socket, and lift the cassette holder.
(Before turning on the power make sure that there is nothing which may produce a short circuit, such as faulty soldering.)
(6) When performing a diagnosis or repair of the Main board assembly with a cassette tape in place, turn on the power, insert a cassette tape, and turn over the Main board and Mechanism assemblies together.

NOTES: • *When carrying out diagnosis and repair of the Main board assembly in the service position, be sure to ground both the Main board and the Mechanism assemblies.*

If they are improperly grounded, there may be noise on the playback picture or the FDP counter display may move even when the mechanism is kept in an inoperative status.

• *When performing diagnostics of the tape playback or recording condition in the "SERVICE POSITION", enter the desired mode before turning the set upside down, and do not change the mode during diagnostics while the set is placed upside down. If you want to switch the mode, turn the set to the normal position.*

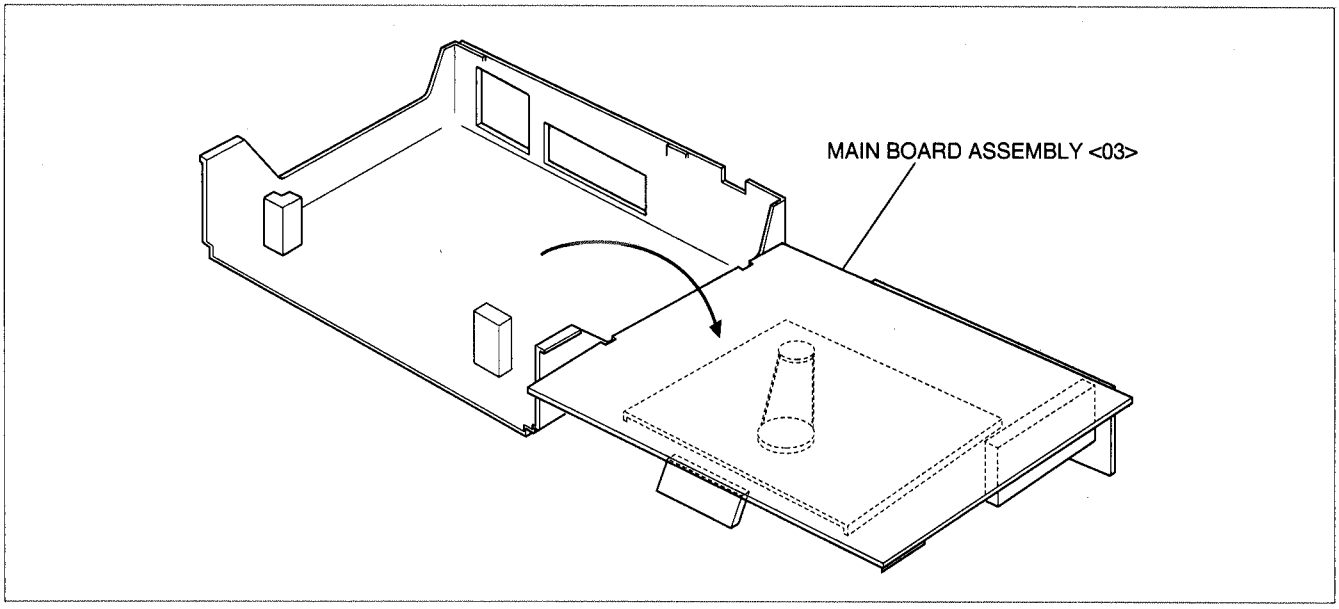


Fig. 1-4-3

1.5 MECHANISM SERVICE MODE

This model has a unique function to enter the mechanism into every operation mode without loading of any cassette tape. This function is called the "MECHANISM SERVICE MODE".

1.5.1 How to set the "MECHANISM SERVICE MODE"

(1) Disconnect VCR from AC.
(2) Connect TPGND and TP7001(TEST) on the Main board assembly with a jump wire.
(3) Connect VCR to AC.
(4) Press the POWER button.
(5) With lock levers ⒶⒷ on the left and right of the Cassette holder assembly pulled toward the front, slide the holder in the same direction as the cassette insertion direction. (For the positions of lock levers ⒶⒷ, refer to the "Procedures for Lowering the Cassette holder assembly" on pages 1-3 of 1.3 DISASSEMBLY/ASSEMBLY METHOD.)
(6) The cassette holder lowers and, when the loading has completed, the mechanism enters the desired mode.

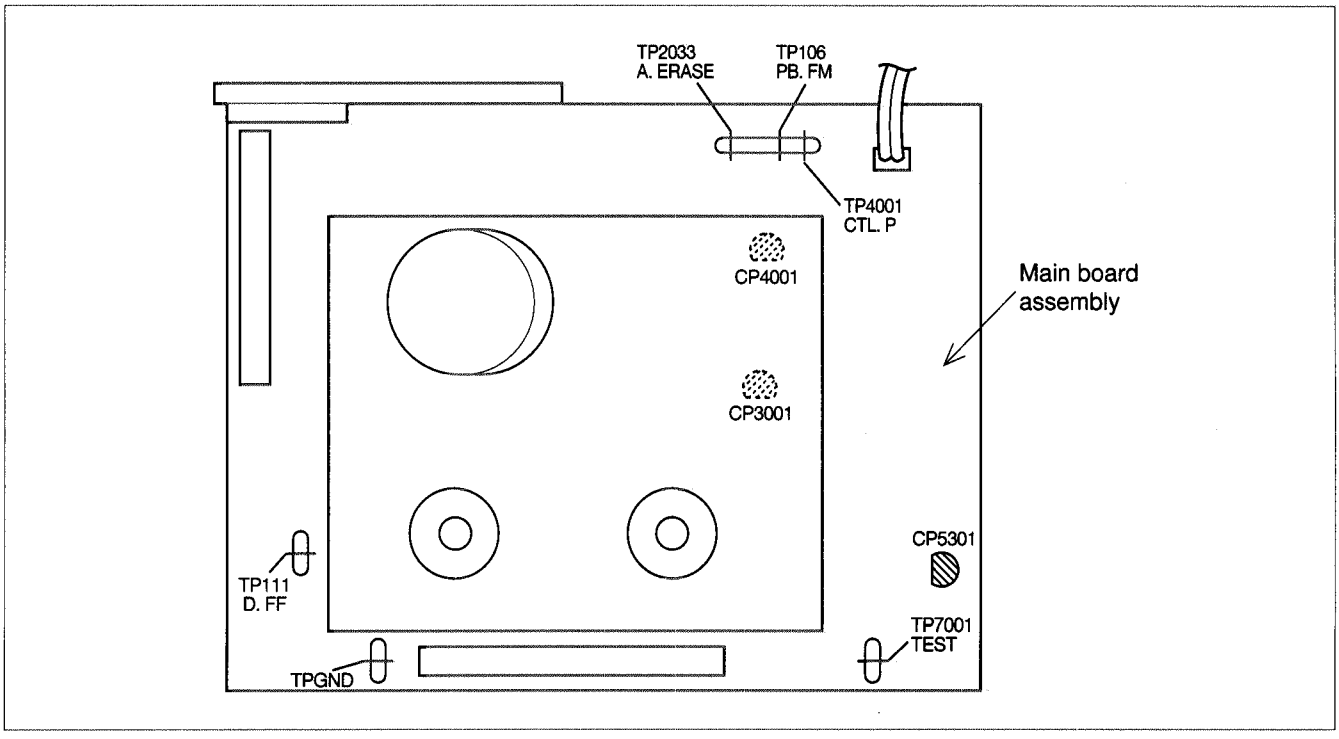


Fig. 1-5-1

1.6 EMERGENCY DISPLAY FUNCTION

This product has the function to store the last two previous emergency faults which can be displayed in the FDP when servicing.

1.6.1 How to display record of an emergency faults

Note: *Put the unit into A mode by using the VCR remote controller. (When it is in B mode, the preset remote control codes are not accepted.)*

(1) Press the "N" button of the presetting unit and the two previous emergency faults are shown in the FDP.
(2) Press the "N" button of the presetting unit again to return to the normal mode.

[Example] E : 01 : 03

- Emergency fault before last
- Emergency fault of the last time

[Example] E : — — : — — ← No record of emergency

1.6.2 Detail of emergency faults

EMG DATA	Symptom	Detect mode	Resulting mode
E : 01	Loading motor rotates for more than 8 Sec without shift to next mode.	Loading	POWER OFF
E : 02	Loading motor rotates for more than 8 Sec without shift to next mode.	Unloading	POWER OFF
E : 03	TU REEL FG input is absent. (for more than 4 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E : 04	DRUM FF input is absent. (for more than 3 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E : 06	CAPSTAN FG input is absent. (for more than 4 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E : 07	No SWD5V/12V	POWER ON	POWER OFF

Table 1-6-1 EMERGENCY FAULTS

1.6.3 How to clear emergency record

Press the COUNTER RESET button on the remote controller in the emergency record display mode, and the record of the emergency fault(s) is cleared.

1.7 SYSCON CIRCUIT

1.7.1 Syscon CPU pin function (IC3001) 1/2

PIN NO.	LABEL	IN/OUT	FUNCTION
1	CTL(+)	IN/OUT	CTL(+) SIGNAL
2	SVSS	-	GND
3	CTL(-)	IN/OUT	CTL(-) SIGNAL
4	CTLBIAS	-	CTL BIAS VOLTAGE
5	CTLFB	-	NC
6	CTLAMPOUT	OUT	CTL PULSE OUTPUT
7	CTLSMTIN	IN	CTL PULSE INPUT
8	CFG	IN	CAPSTAN FG PULSE INPUT
9	SVCC	-	SYSTEM POWER
10	AVCC	-	SYSTEM POWER FOR ANALOG CIRCUIT
11	MESECAM DET	OUT	MESECAM MODE:H
12	SECAM DET	-	NC
13	VIDEO ENV	IN	AUTO TRACKING DETECT/INPUT THE AVERAGE OF PLAYBACK VIDEO SIGNAL
14	START SENSOR	IN	START SENSOR
15	END SENSOR	IN	END SENSOR
16	IND(L)	-	NC
17	IND(R)	-	NC
18	SCR ID	-	NC
19	NC	-	NC
20	AFC	IN	TUNING CLOCK
21	RF AGC	-	NC
22	A.ENV/ND(L)	-	NC
23	AVSS	-	GND FOR ANALOG CIRCUIT
24	CTL GAIN	OUT	CONTROL AMP OUT FREQUENCY RESPONSE SWITCHING
25	LSA	IN	MECHANISM MODE DETECT(A)
26	LSB	IN	MECHANISM MODE DETECT(B)
27	LSC	IN	MECHANISM MODE DETECT(C)
28	CAP REV(L)	OUT	CAPSTAN MOTOR REVERSE CONTROL (FWD:H/REV:L)
29	RC	IN	REMOTE CONTROL DATA INPUT
30	R.PAUSE	-	NC
31	PROJECT 50 IN	-	NC
32	LMC3	OUT	LOADING MOTOR DRIVE(3)
33	PROJECT 50 OUT	-	NC
34	NC	-	NC
35	LMC1	OUT	LOADING MOTOR DRIVE(1)
36	LMC2	OUT	LOADING MOTOR DRIVE(2)
37	P.SAVE(L)	-	NC
38	P.CTL(H)	OUT	CONTROL SIGNAL FOR SWITCHING POWER SUPPLY
39	SIDE BAND GAIN	OUT	VOLTAGE CONTROL SIGNAL FOR VIDEO FREQUENCY RESPONSE
40	POWER DET	IN	DETECTION SIGNAL FOR POWER DOWN OF AC POWER SUPPLY
41	REC SAFETY	IN	REC SAFETY SWITCH DETECT (SW ON:L)
42	PROTECT	IN	DETECTION SIGNAL FOR SW POWER SUPPLY
43	VSS	-	GND
44	STB/TEST	OUT	STROBE SIGNAL (FOR FDP DRIVER)
45	VCC	-	SYSTEM POWER
46	JSA	-	NC
47	JSB	-	NC
48	STL(L)	-	NC
49	I2C DATA	IN/OUT	SERIAL DATA TRANSFER OUTPUT FOR THE ON-SCREEN IC
50	I2C CLK	OUT	SERIAL DATA TRANSFER CLOCK FOR THE ON-SCREEN IC
51	S.DATA TOSYS	IN	SERIAL DATA TRANSFER OUTPUT FROM THE ON-SCREEN IC TO THE FDP DRIVER
52	S.DATA FRSYS	OUT	SERIAL DATA TRANSFER OUTPUT FROM THE FDP DRIVER TO THE ON-SCREEN IC
53	S.CLK	OUT	SERIAL DATA TRANSMISSION CLOCK FROM THE FDP DRIVER TO THE ON-SCREEN IC
54	SP FG	IN	DETECTION SIGNAL FOR SUPPLY REEL ROTATION/TAPE REMAIN
55	TU FG	IN	DETECTION SIGNAL FOR TAKE-UP REEL ROTATION/TAPE REMAIN
56	LOCK(L)	IN	TUNING PLL LOCK DETECT:L

Table 1-7-1 SYSCON CPU pin function(1/2)

1.7.2 Syscon CPU pin function (IC3001) 2/2

PIN NO.	LABEL	IN/OUT	FUNCTION
57	TU CE	OUT	CHIP ENABLE OF THE TUNER UNIT
58	SW2	OUT	TUNER SYSTEM "L" MODE:L
59	NC	-	NC
60	TU CLK	OUT	CLOCK FOR DATA TRANSFER TO THE TUNER UNIT
61	TU DATA	OUT	TUNING DATA
62	FWE	-	NC
63	NMI(L)	-	NC
64	X2	-	TIMER CLOCK (32.768KHz)
65	X1	-	TIMER CLOCK (32.768KHz)
66	RES(L)	-	RESET TERMINAL (RESETON:L)
67	OSC1(IN)	-	MAIN SYSTEM CLOCK(10MHz)
68	VSS	-	GND
69	OSC2(OUT)	-	MAIN SYSTEM CLOCK(10MHz)
70	VCC	-	SYSTEM POWER
71	MODE	-	NC
72	TU A MUTE(H)	OUT	TUNER AUDIO MUTE CONTROL (MUTE:H)
73	TU V MUTE(H)	OUT	TUNER VIDEO MUTE CONTROL (MUTE:H)
74	SW1	OUT	TUNER "L" SYSTEM MODE:H
75	I2C CLK2	OUT	SERIAL DATA TRANSFER CLOCK FOR MEMORY IC
76	I2C DATA2	IN/OUT	SERIAL DATA TRANSFER OUTPUT FOR MEMORY IC
77	NC	-	NC
78	NC	-	NC
79	NC	-	NC
80	A.MUTE(H)	OUT	AUDIO MUTE CONTROL (MUTE:H)
81	FMA_ADJ	-	NC
82	VCC	-	SYSTEM POWER
83	CCIR(H)	-	NC
84	VSS	-	GND
85	SP SHORT(H)	-	NC
86	LP SHORT(H)	-	NC
87	N.REC ST(H)	OUT	NORMAL AUDIO SOUND RECORDING START
88	H.REC ST(H)	-	NC
89	B/W(H)	-	NC
90	NC	-	NC
91	OSD CS	OUT	CHIP SELECT FOR THE ON-SCREEN IC
92	SYNC DET(H)	IN	DETECTION OF VIDEO SYNC SIGNAL (DETECTED:H)
93	P.MUTE(L)	OUT	PICTURE MUTE CONTROL (MUTE:L)
94	SECAM(H)	-	NC
95	IP ON(H)	-	NC
96	NC	-	NC
97	N.REC(H)	OUT	NORMAL AUDIO REC MODE CONTROL (REC:H)
98	C.SYNC	IN	COMPOSITE SYNC
99	A.FF	-	NC
100	V.FF	OUT	ROTATION DETECTION SIGNAL FOR DRUM MOTOR/TIMING CONTROL SIGNAL FOR REC
101	CAPPWM	OUT	CAPSTAN MOTOR CONTROL
102	DRUMPWM	OUT	DRUM MOTOR CONTROL
103	NC	-	NC
104	S PB(H)/SP SEARCH(H)	-	NC
105	EE(L)	OUT	EE/PB CONTROL (EE MODE:L)
106	NC	-	NC
107	DPG	IN	DRUM PICKUP PULSE INPUT (SWITCHING PULSE)
108	DFG	IN	DRUM FG PULSE INPUT
109	VCC	-	SYSTEM POWER
110	V.PULSE	OUT	V.PULSE ADDITION TIMING CONTROL
111	VSS	-	GND
112	CTLREF	-	CTL REFERENCE VOLTAGE

Table 1-7-2 SYSCON CPU pin function(2/2)

SECTION 2
MECHANISM ADJUSTMENT

2.1 BEFORE STARTING REPAIR AND ADJUSTMENT

2.1.1 Precautions

(1) Unplug the power cable of the main unit before using your soldering iron.
(2) Take care not to cause any damage to the conductor wires when plugging and unplugging the connectors.
(3) Do not randomly handle the parts without identifying where the trouble is.
(4) Exercise enough care not to damage the lugs, etc. during the repair work.
(5) When installing the front panel assembly, be sure to hook the lug on the back side of the cassette door to the door opener of the cassette holder. If this operation is neglected it will not be possible to remove the cassette when ejecting because the housing door cannot be opened.

2.1.2 Checking for Proper Mechanical Operations

Enter the mechanism service mode when you want to operate the mechanism when no cassette is loaded. (See 1.5 MECHANISM SERVICE MODE.)

2.1.3 Manually Removing the Cassette Tape

1. In case of electrical failures

If you cannot remove the cassette tape which is loaded because of any electrical failure, manually remove it by taking the following steps.

(1) Unplug the power cable and remove the top cover, bracket and front panel assembly. (See 1.3 DISASSEMBLY/ASSEMBLY METHOD.)
(2) Unload the cassette by manually turning the loading motor of the mechanism assembly toward the front. In doing so, hold the tape by the hand to keep the slack away from any grease. (See Fig.2-1-1.)
(3) Bring the pole base assembly (supply or take-up side) to a pause when it reaches the position where it is hidden behind the cassette tape.
(4) Move the top guide toward the drum while holding down the lug Ⓐ of the bracket retaining the top guide. Likewise hold part Ⓑ down and remove the top guide. Section Ⓒ of the top guide is then brought under the cassette lid. Then remove the top guide by pressing the whole cassette tape down. (See Fig.2-1-2.)
(5) Remove the cassette tape by holding both the slackened tape and the cassette lid.
(6) Take up the slack of the tape into the cassette. This completes removal of the cassette tape.

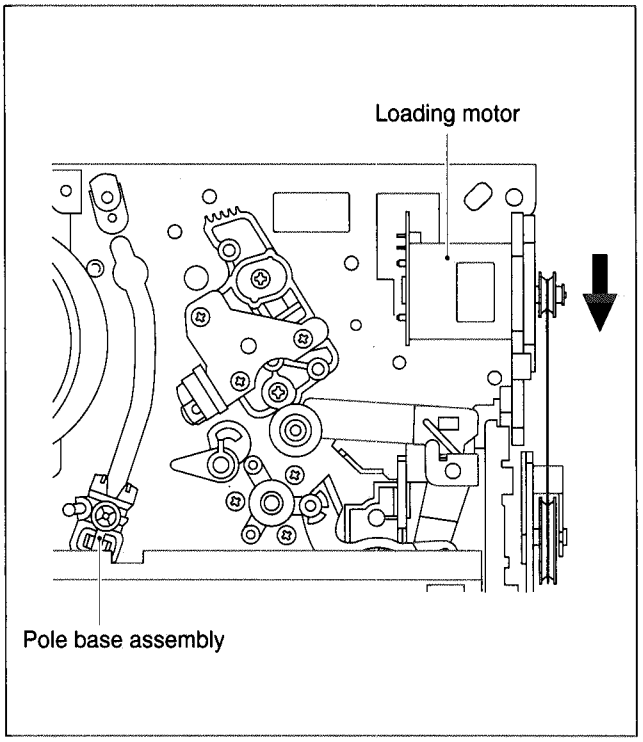


Fig. 2-1-1

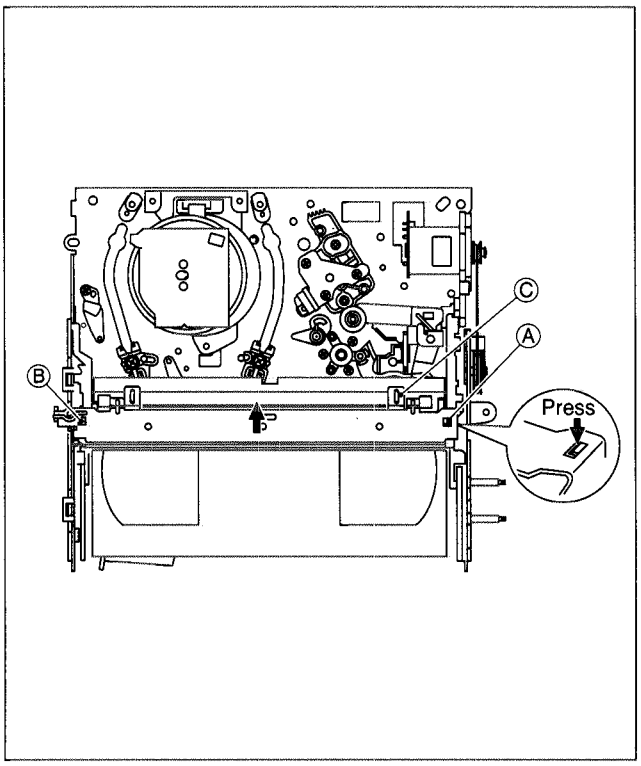


Fig. 2-1-2

2. In case of mechanical failure

If you cannot remove the cassette tape which is loaded because of any mechanical failure, manually remove it by taking the following steps.

(1) Unplug the power cable and remove the top cover, front panel assembly and others so that the mechanism assembly is visible. (See 1.3 DISASSEMBLY/ASSEMBLY METHOD.)

(2) While keeping the tension arm assembly of the mechanism assembly free from tension, pull the tape on the pole base assembly (supply or take-up side) out of the guide roller. (See Fig.2-1-3.)

(3) Take the spring of the pinch roller arm assembly off the hook of the press lever assembly, and detach it from the tape. (See Fig.2-1-4.)

(4) In the same way as in the electrical failure instructions in 2.1.3 (4), remove the top guide.

(5) Raise the cassette tape cover. By keeping it in that position, draw out the cassette tape case from the cassette holder and take out the tape.

(6) By hanging the pinch roller arm assembly spring back on the hook, take up the slack of the tape into the cassette.

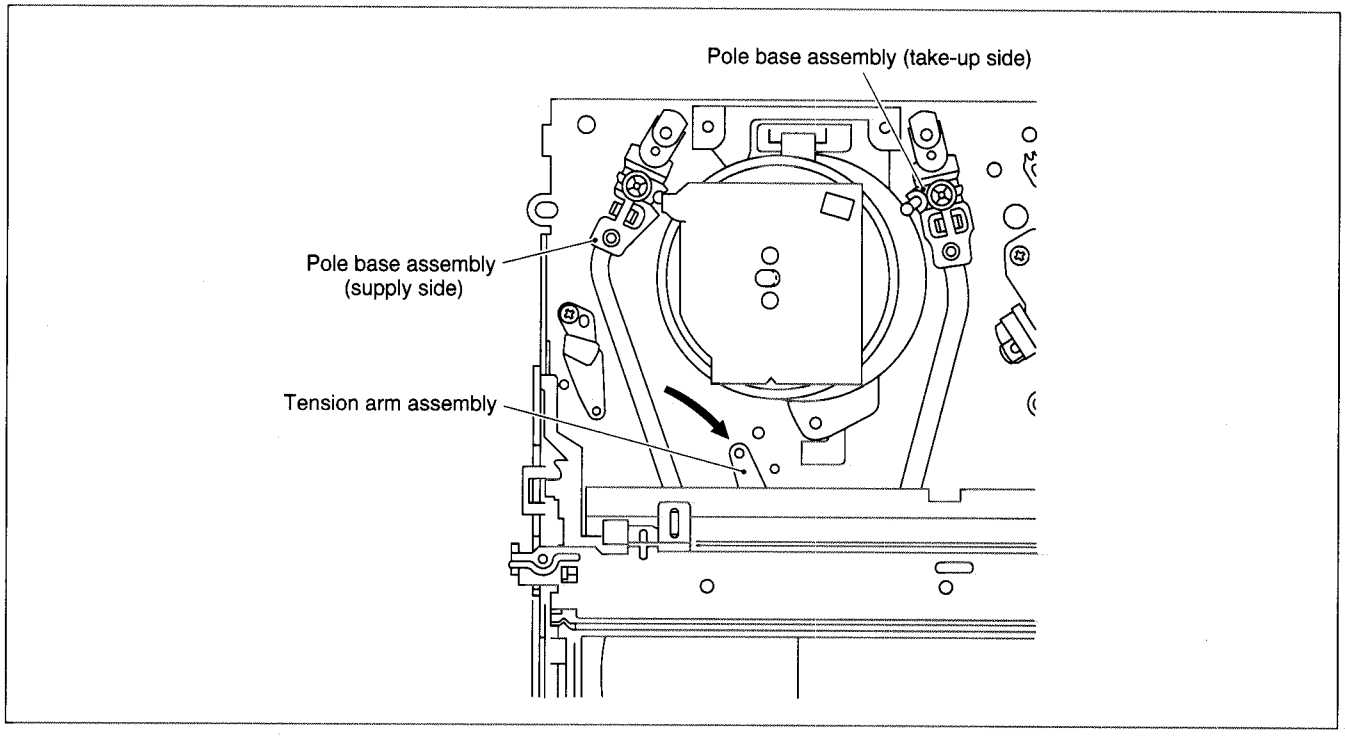


Fig. 2-1-3

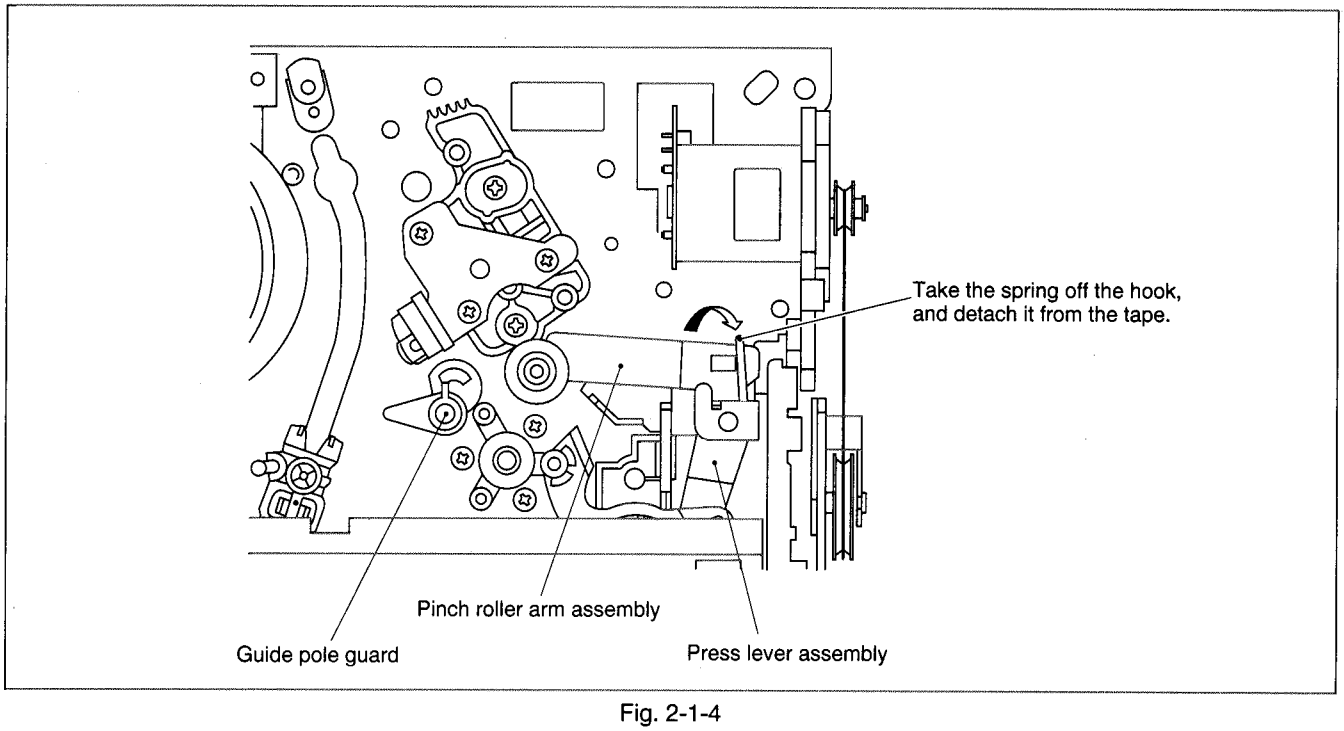


Fig. 2-1-4

2.1.4 Jigs and Tools Required for Adjustment

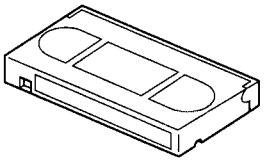
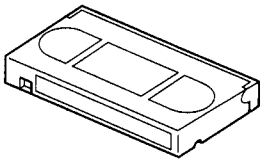
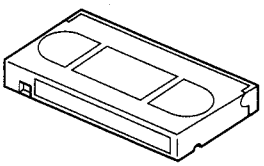
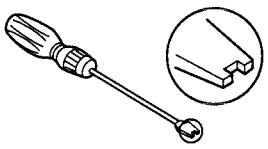
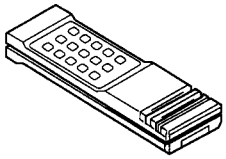
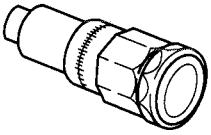
Alignment tape (SP) MHPE	Alignment tape (LP) MHPE-L	Back tension cassette gauge PUJ48076-2	A/C head position bit PTU94010
			
Roller driver PTU94002	Presetting unit PTU94008	Torque gauge PUJ48075-2	
			

Table 2-1-1 Jigs and tools required for adjustment

2.1.5 Maintenance and Inspection

1. Location of major mechanical parts

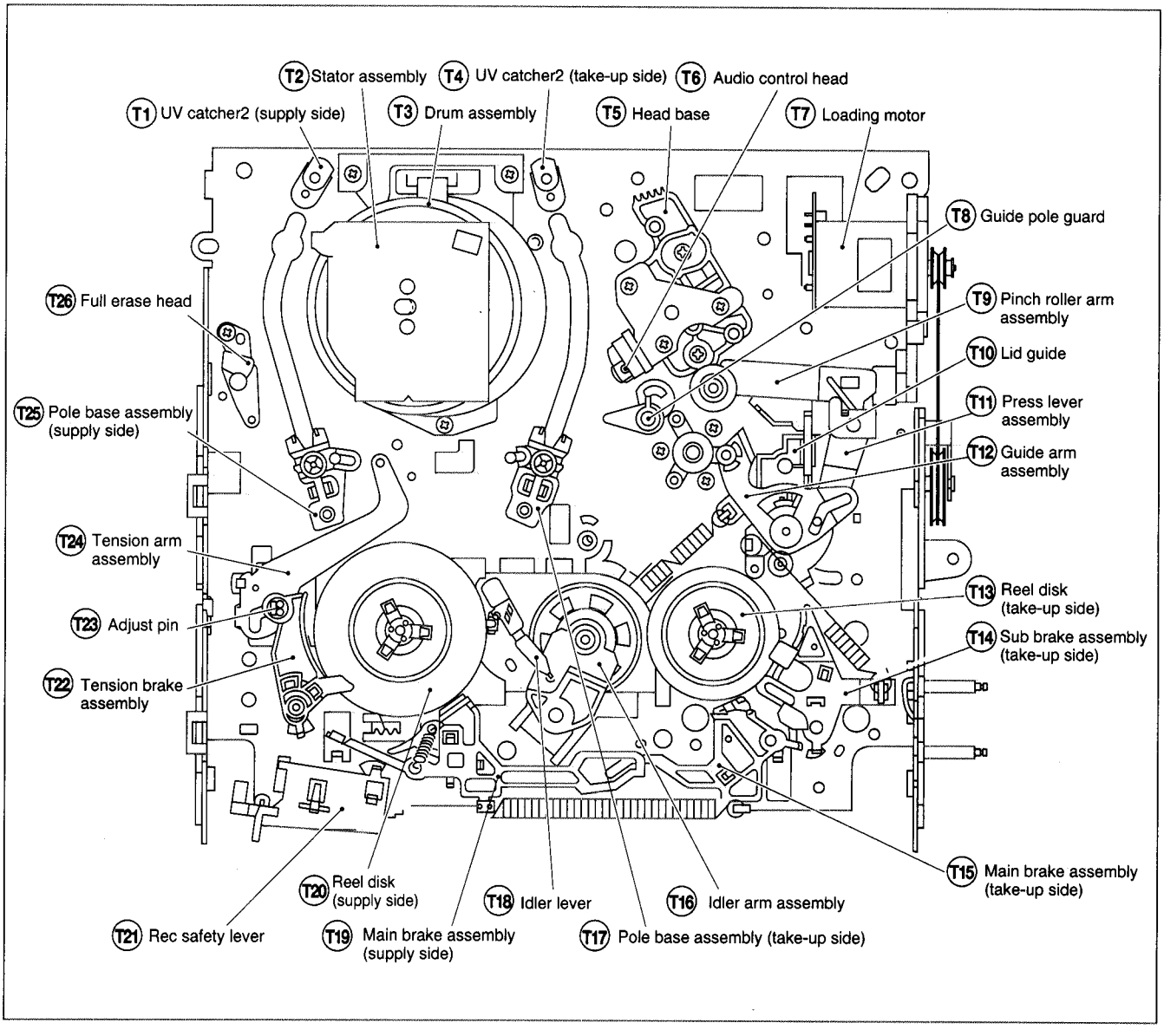


Fig. 2-1-5 Mechanism assembly top side

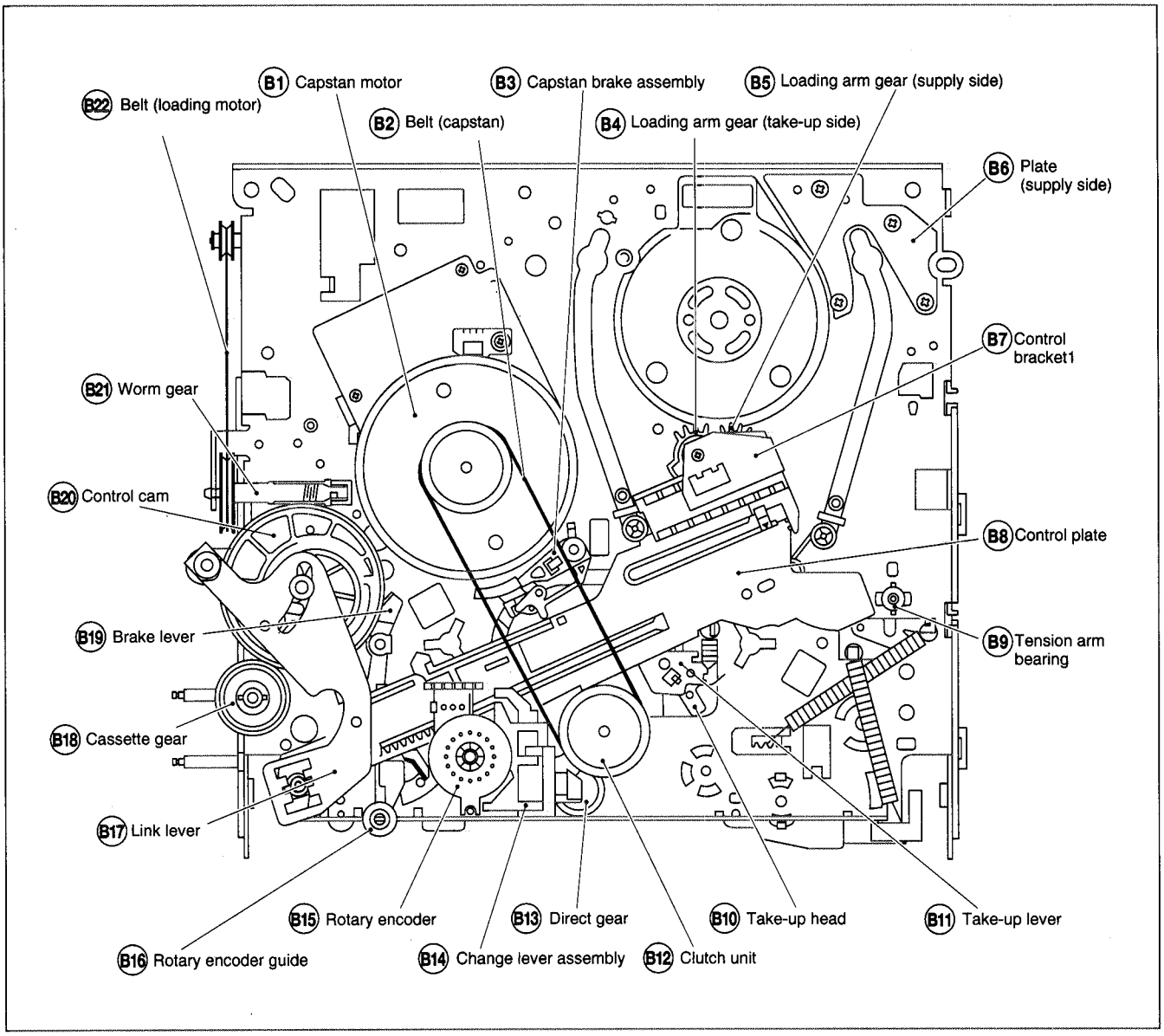


Fig. 2-1-6 Mechanism assembly bottom side

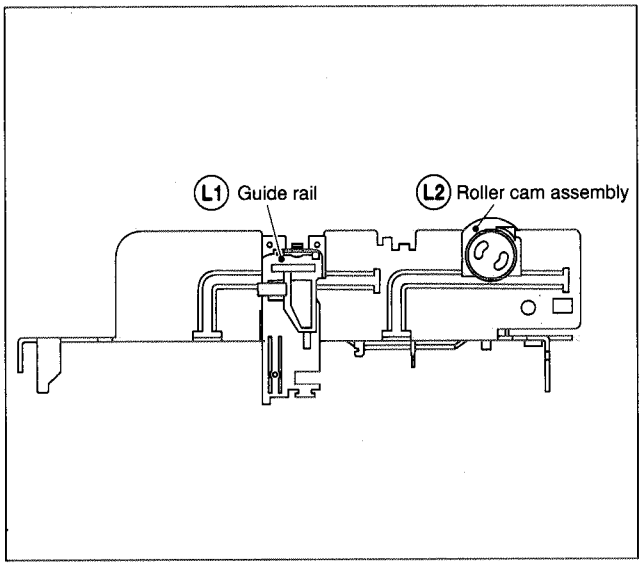


Fig. 2-1-7 Mechanism assembly left side

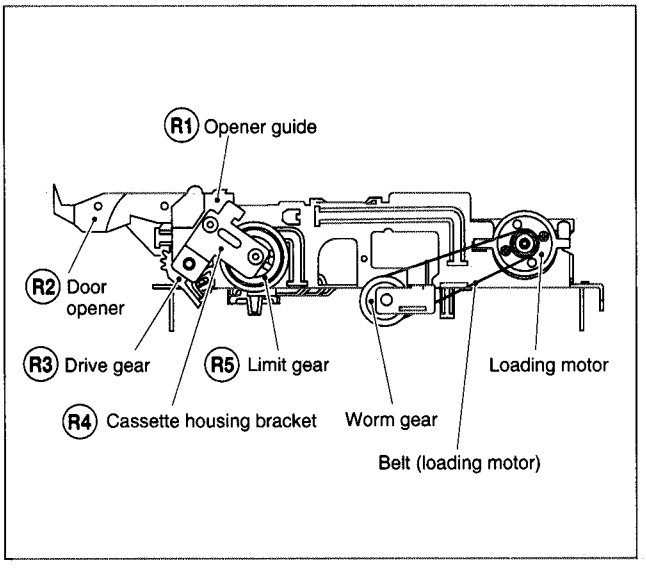


Fig. 2-1-8 Mechanism assembly right side

Note: *This table shows the order in which parts are removed for replacement. To replace parts, remove them in the order of 1 to 18 as shown in the table. To install them, reverse the removal sequence.*
The circled numbers (symbols and numbers) preceding the individual part names represent the numbers in the "Location of major mechanical parts" table. Also, the "T", "B", and "T/B" on the right of each part name shows that the particular part is removed from the front, from the back, and from both sides of the mechanism, respectively.

Symbols and numbers	Removal parts / (Reference items) Replacement parts	Front (T)/Back (B) of mechanism	Nomber of removal steps	L1 Guide rail	L2 Roller cam assembly	R4 Cassette housing bracket	R1 Opener guide	– Relay gear	– Cassette holder assembly	R3 Drive gear	– Drive arm	T9 Pinch roller arm assembly	T12 Guide arm assembly	T11 Press lever assembly	T1,T4 UV catcher2	B15 Rotary encoder	B12 Clutch unit	B14 Change lever assembly	B13 Direct gear	B17 Link lever	B21 Worm gear	B7 Control bracket1	B8 Control plate	B5 Loading arm gear (supply side)	B4 Loading arm gear (take-up side)	B11 Take-up lever	T14 Sub brake assembly (take-up side)	T15 Main brake assembly (take-up side)	T13 Reel disk (take-up side)	T22 Tension brake assembly	T24 Tension arm assembly	T18 Idler lever	B19 Brake lever
L1	2.2.3 Guide rail	T	1																														
L2	2.2.3 Roller cam assembly	T	1																														
R4	2.2.3 Cassette housing bracket	T	1																														
R1	2.2.3 Opener guide	T	2			1																											
R2	2.2.3 Door opener	T	3			1	2																										
–	2.2.3 Relay gear	T	3			1	2																										
R5	2.2.3 Limit gear	T	3			1	2																										
–	2.2.3 Cassette holder assembly	T	6	1	2	3	4	5																									
R3	2.2.3 Drive gear	T	4			1	2	3																									
–	2.2.3 Drive arm	T	8	1	2	3	4	5	6	7																							
T9	2.2.4 Pinch roller arm assembly	T	1																														
T12	2.2.5 Guide arm assembly	T	1																														
T11	2.2.5 Press lever assembly	T	3									1	2																				
T6	2.2.6 Audio control head	T	1																														
T7	2.2.7 Loading motor	T	1																														
B1	2.2.8 Capstan motor	T/B	1																														
T1,T4	2.2.9 UV catcher2	T	1																														
T17	2.2.9 Pole base assembly (take-up side)	T/B	2												1																		
T25	2.2.9 Pole base assembly (supply side)	T/B	2												1																		
B15	2.2.10 Rotary encoder	B	1																														
B12	2.2.11 Clutch unit	B	1																														
B14	2.2.12 Change lever assembly	B	3													1	2																
B13	2.2.12 Direct gear	B	4													1	2	3															
–	2.2.12 Clutch gear1	B	5													1	2	3	4														
B17	2.2.13 Link lever	B	1																	1													
B18	2.2.14 Cassette gear	B	2																	1													
B20	2.2.14 Control cam	B	2																	1													
B21	2.2.14 Worm gear	B	1																														
T10	- Lid guide	T/B	5									1	2	3							4												
B7	2.2.15 Control bracket1	B	1																														
B8	2.2.15 Control plate	B	6													1	2	3		4		5											
B5	2.2.16 Loading arm gear (supply side)	B	7													1	2	3		4		5	6										
B4	2.2.16 Loading arm gear (take-up side)	B	8													1	2	3		4		5	6	7									
–	2.2.16 Loading arm gear shaft	B	9													1	2	3		4		5	6	7	8								
B11	2.2.17 Take-up lever	T/B	7													1	2	3		4		5	6										
B10	2.2.17 Take-up head	T/B	8													1	2	3		4		5	6			7							
–	2.2.17 Control plate guide	T/B	8													1	2	3		4		5	6			7							
B3	2.2.18 Capstan brake assembly	T/B	7													1	2	3		4		5	6										
T14	2.2.19 Sub brake assembly(take-up side)	T/B	15	1	2	3	4	5	6	7	8					9	10	11		12		13	14										
T15	2.2.20 Main brake assembly(take-up side)	T/B	16	1	2	3	4	5	6	7	8					9	10	11		12		13	14				15						
T19	2.2.20 Main brake assembly(supply side)	T/B	9	1	2	3	4	5	6	7	8																						
T13	2.2.20 Reel disk (take-up side)	T/B	16	1	2	3	4	5	6	7	8					9	10	11		12		13	14				15						
T22	2.2.21 Tension brake assembly	T/B	9	1	2	3	4	5	6	7	8																						
T20	2.2.21 Reel disk (supply side)	T/B	10	1	2	3	4	5	6	7	8																			9			
T24	2.2.21 Tension arm assembly	T/B	10	1	2	3	4	5	6	7	8																			9			
B9	2.2.21 Tension arm bearing	T/B	10	1	2	3	4	5	6	7	8																			9			
T18	2.2.22 Idler lever	T/B	17	1	2	3	4	5	6	7	8					9	10	11		12		13	14							15	16		
T16	2.2.22 Idler arm assembly	T/B	18	1	2	3	4	5	6	7	8					9	10	11		12		13	14							15	16	17	
B19	- Brake lever	T/B	18	1	2	3	4	5	6	7	8					9	10	11		12		13	14				15	16	17				
B16	- Rotary encoder guide	T/B	19	1	2	3	4	5	6	7	8					9	10	11		12		13	14				15	16	17				18

2. Cleaning

Regular cleaning of the transport system parts is desirable but practically impossible. So make it a rule to carry out cleaning of the tape transport system whenever the machine is serviced.

When the video head, tape guide and/or brush get soiled, the playback picture may appear inferior or at worst disappear, resulting in possible tape damage.

(1) When cleaning the upper drum (especially the video head), soak a piece of closely woven cloth or Kimu-wipe with alcohol and while holding the cloth onto the upper drum by the fingers, turn the upper drum counterclockwise.

Note: ***Absolutely avoid sweeping the upper drum vertically as this will cause damage to the video head.***

(2) To clean the parts of the tape transport system other than the upper drum, use a piece of closely woven cloth or a cotton swab soaked with alcohol.

(3) After cleaning, make sure that the cleaned parts are completely dry before using the video tape.

3. Lubrication

With no need for periodical lubrication, you have only to lubricate new parts after replacement. If any oil or grease on contact parts is soiled, wipe it off and newly lubricate the parts.

(1) See the mechanism assembly and disassembly diagrams (M4) for the lubricating or greasing spots. See Table 2-1-2 for the types of oil or grease to be used.

Type	Name	Serial No.	Symbols on the disassembly diagrams
Grease	Maltemp SH-P	KYODO-SH-P	AA
Oil	Cosmohydro HV56	COSMO-HV56	BB

Table 2-1-2 Grease and oil used for the unit

4. Suggested servicing schedule for main components

The following table indicates the suggested period for such service measures as cleaning,lubrication and replacement. In practice, the indicated periods will vary widely according to environmental and usage conditions.However, the indicated components should be inspected when a set is brought for service and the maintenance work performed if necessary. Also note that rubber parts may deform in time,even if the set is not used.

System	Parts Name	Operation Hours	
		~1000H	~2000H
Tape transport	Upper drum assembly	★○	○
	A/C head	★○	★○
	Lower drum assembly	★	★○
	Pinch roller arm assembly	★	★
	Full erase head	★	★
	Tension arm assembly	★	★
	Capstan motor (Shaft)	★	★
	Guide arm assembly	★	★
Drive	Capstan motor		○
	Capstan brake assembly		○
	Main brake assembly		○
	Belt (Capstan)	○	○
	Belt (Loading motor)		○
	Loading motor		○
	Clutch unit		○
	Worm gear		○
	Control plate		○
Other	Brush	★○	★○
	Tension brake assembly	○	○
	Rotary encoder		○

★: Cleaning

○: Inspection or Replacement if necessary

Table 2-1-3

2.2 REPLACEMENT OF MAJOR PARTS

2.2.1 Before Starting Disassembling (Phase matching between mechanical parts)

The mechanism of this unit is closely linked with the rotary encoder and system controller circuits.

Since the system controller detects the status of mechanical operation in response to phases of the rotary encoder (internal switch positions), the mechanism may not operate properly unless such parts as the rotary encoder, control plate, loading arm gear, control cam, cassette gear, limit gear, relay gear and drive gear are installed in their correct positions.

Especially, this model is not provided with any cassette housing assembly, so that cassette loading and unloading must be accomplished by operation of the cassette holder assembly. The latter is in turn driven by such parts as the drive gear, relay gear and limit gear. Exercise enough care, therefore, to have the phases of all this gear matching one another.

(For information on phase matching of the mechanism, see the instructions on how to install individual parts.)

This unit is provided with a mechanism assembly mode. It is therefore necessary to enter this mode for assembling and disassembling procedures.
This mode is usually not in use, manually set it when it is required.

2.2.2 How to Set the Mechanism Assembling Mode

Remove the mechanism assembly and place it bottom side up. (See SECTION 1 DISASSEMBLY.) Turn the worm gear toward the front so that the guide hole of the control cam is brought into alignment with the hole at the mechanism assembling chassis. This position renders the mechanism assembling mode operational. Make sure that the control plate is located in alignment with the mark E. (See Fig.2-2-1.)

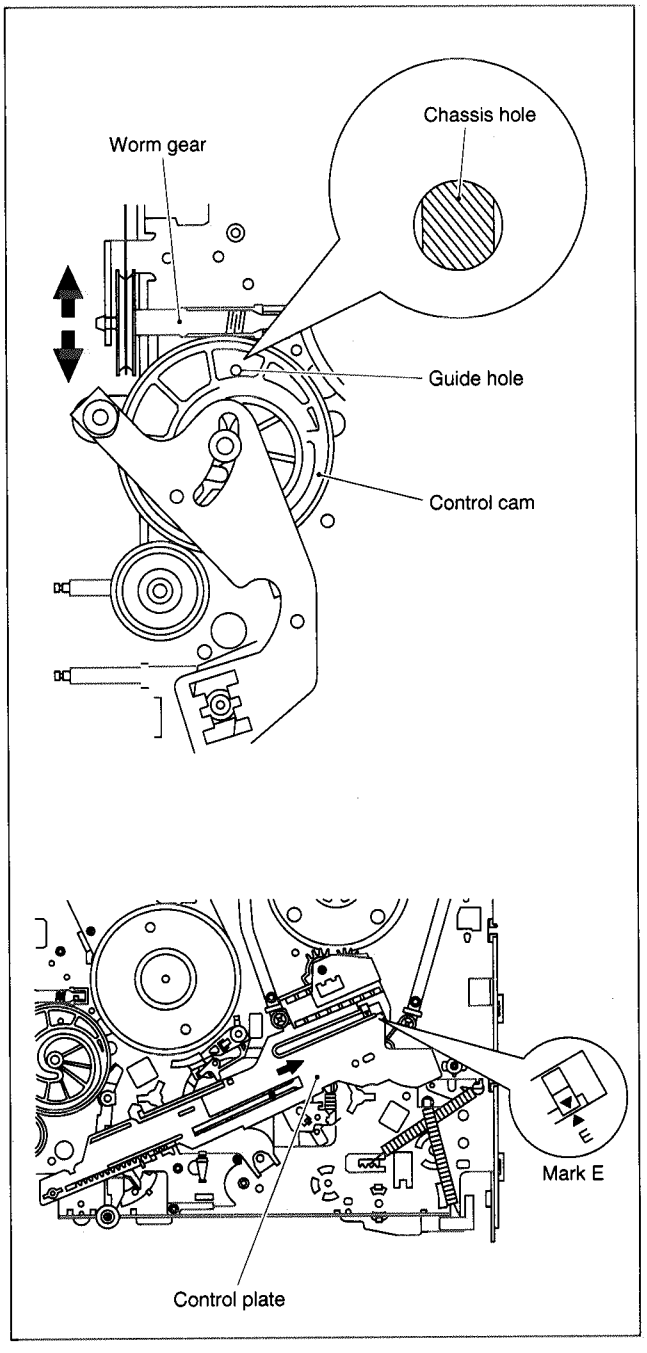


Fig. 2-2-1

2.2.3 Cassette Holder Assembly

1. How to remove

(1) Remove the guide rail and roller cam assembly. (See Fig.2-2-2.)
(3 lugs on the guide rail and one lug on the roller cam assembly)

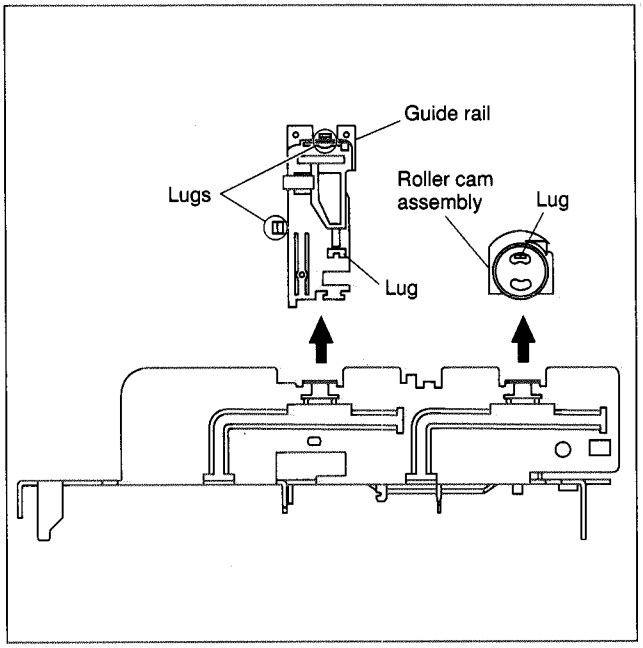


Fig. 2-2-2

(2) Remove the two slit washers and remove the cassette housing bracket. (See Fig.2-2-3.)
(3) Remove the opener guide, spring(A), door opener, relay gear and limit gear. (See Fig.2-2-3.)

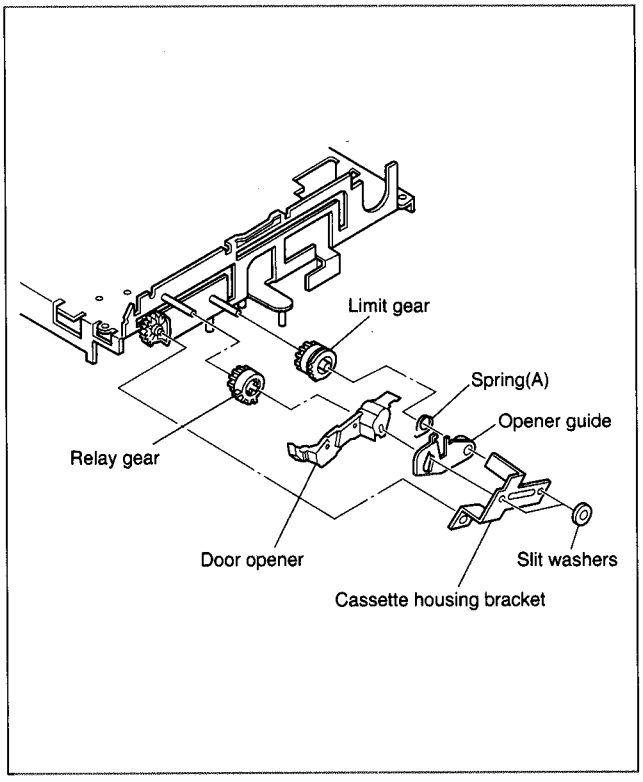


Fig. 2-2-3

(4) While swinging the lock levers (R) and (L) of the cassette holder assembly toward the front, slide the cassette holder assembly until its legs come to where the guide rail and the roller cam assembly have been removed (so that the drive arm is upright). (See Fig.2-2-4.)

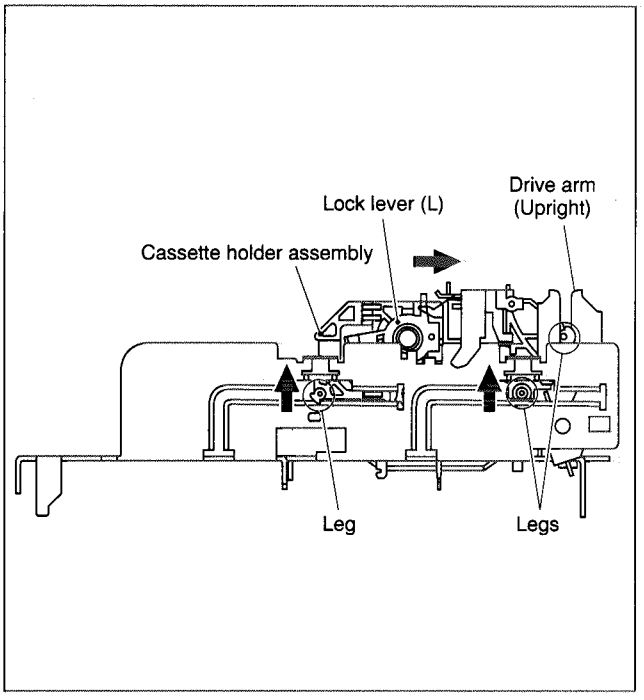


Fig. 2-2-4

(5) While holding the left side of the cassette holder, lift the cassette holder assembly so that the three legs on the left side are all released. Then pull the legs Ⓐ and Ⓑ on the right side out of the rail and also pull up the leg Ⓒ. (See Fig.2-2-5 and Fig.2-2-6.)

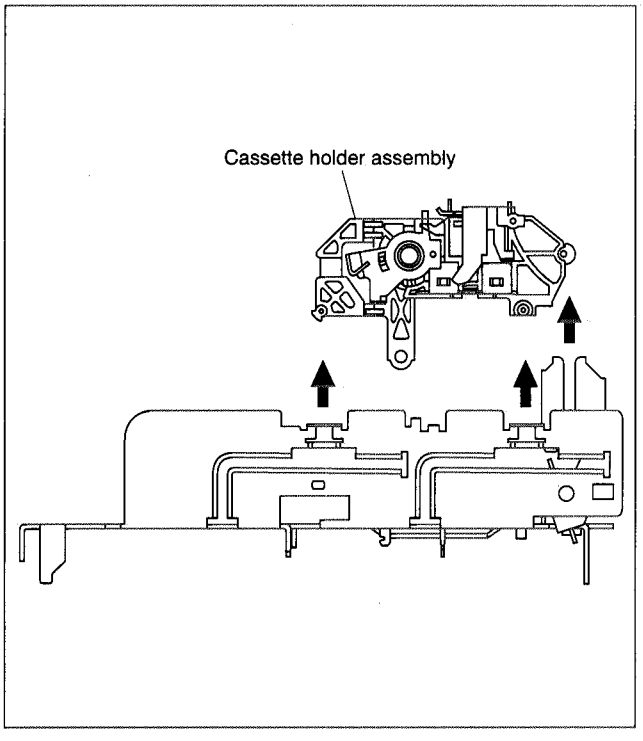


Fig. 2-2-5

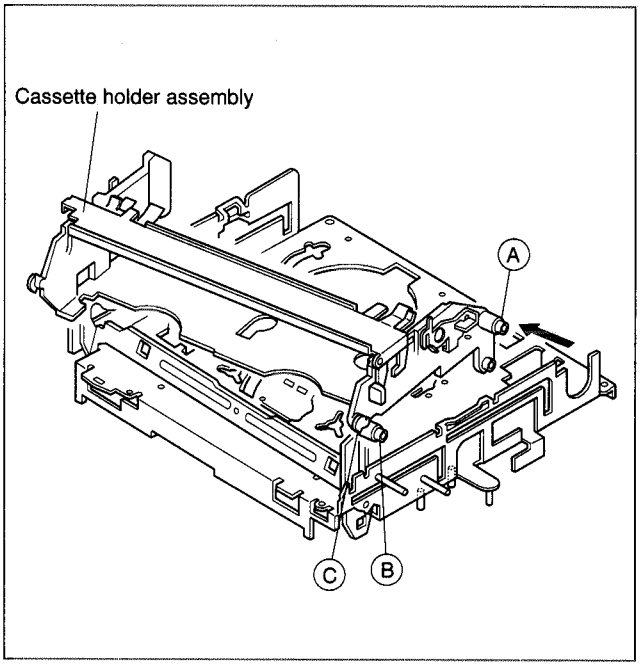


Fig. 2-2-6

(6) Draw out the drive gear, and remove the drive arm.

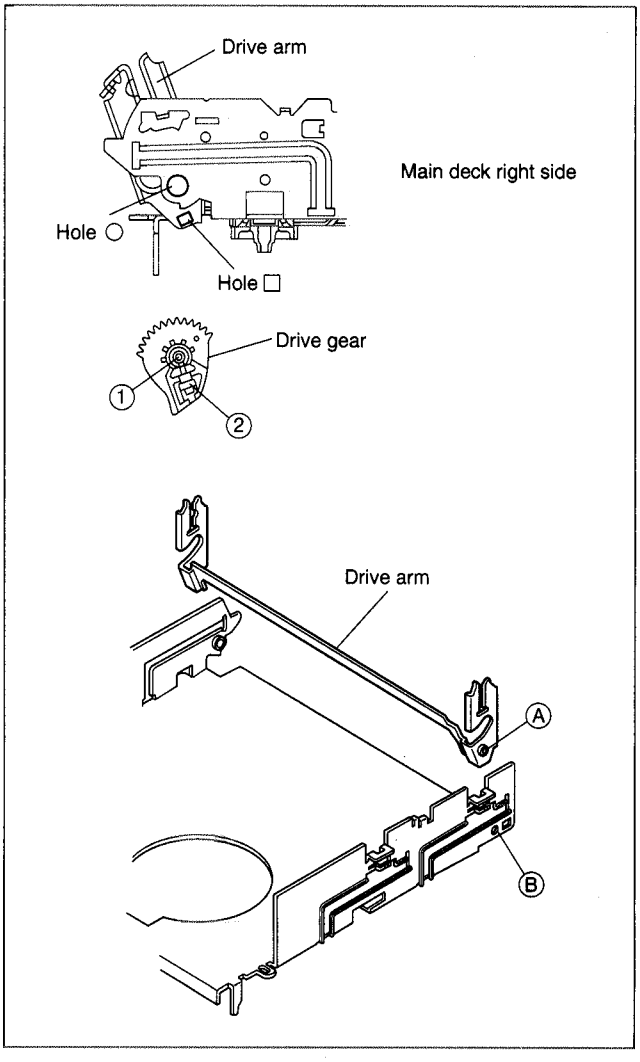


Fig. 2-2-7

2. How to install (Phase matching)

(1) Insert the section Ⓐ of the drive arm into the section Ⓑ of the main deck.

(2) Insert the section ① of the drive gear into the round hole, and the section ② into the square hole on the drive arm. (See Fig.2-2-7.)

(3) Hold the drive arm upright and fit the leg Ⓒ on the right side of the cassette holder assembly into the groove. (See Fig.2-2-8.)

(4) While swinging the lock lever (R) of the cassette holder assembly toward the front, put the legs Ⓐ and Ⓑ into the rail. (See Fig.2-2-8.)

(5) Drop the three legs on the left side of the cassette holder assembly into the groove at one time. (See Fig.2-2-9.)

(6) Slide the whole cassette holder assembly toward the front to bring it to the eject end position.

(7) Install the limit gear so that the notch on the outer circumference of the limit gear is brought into alignment with the guide hole on the main deck. (See Fig.2-2-10.)

(8) Install so that the notch on the periphery of the relay gear is aligned with the notch of the main deck and that hole A of the relay gear is aligned with the hole A of the limit gear and that hole B of the relay gear is aligned with the hole B of the drive gear. (See Fig.2-2-10.)

(9) Install the door opener, opener guide, spring(A) and cassette housing bracket and fasten the two slit washers.

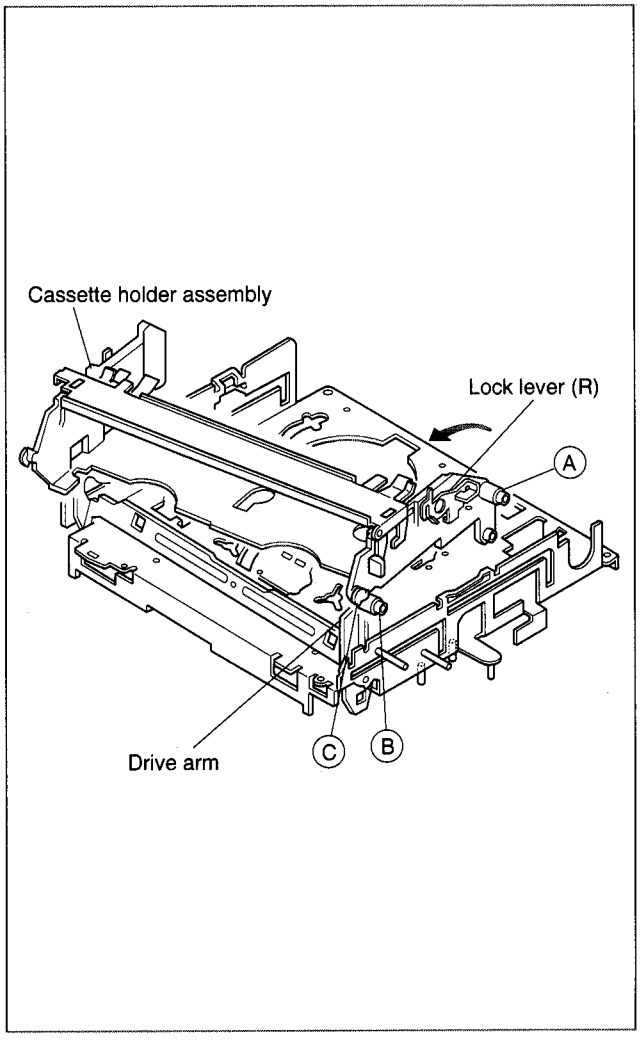


Fig. 2-2-8

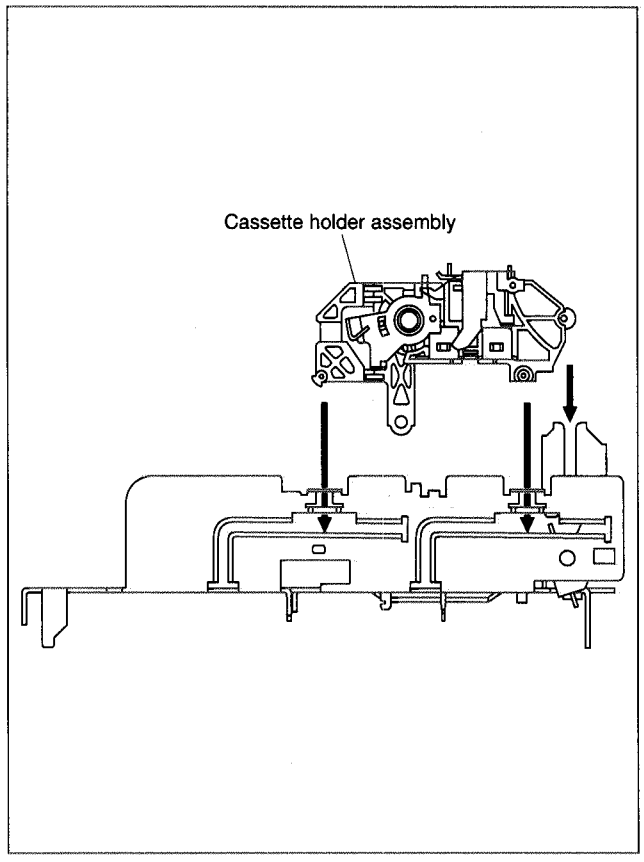


Fig. 2-2-9

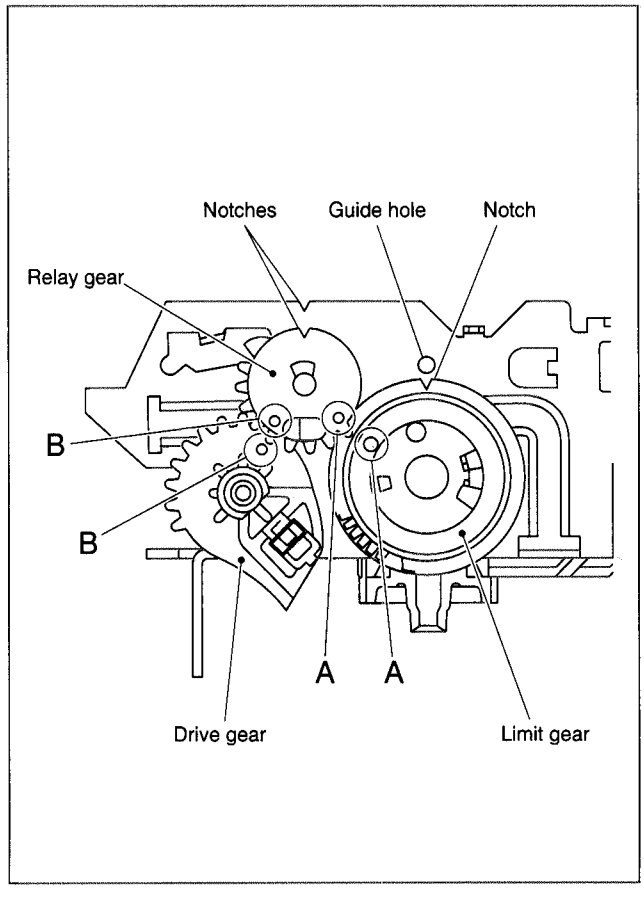


Fig. 2-2-10

2.2.4 Pinch Roller Arm Assembly

1. How to remove

(1) Remove the spring from the hook of the press lever assembly.
(2) Remove the slit washer and remove the pinch roller seat 2. (See Fig.2-2-11.)
(3) Remove the pinch roller arm assembly by pulling it up.

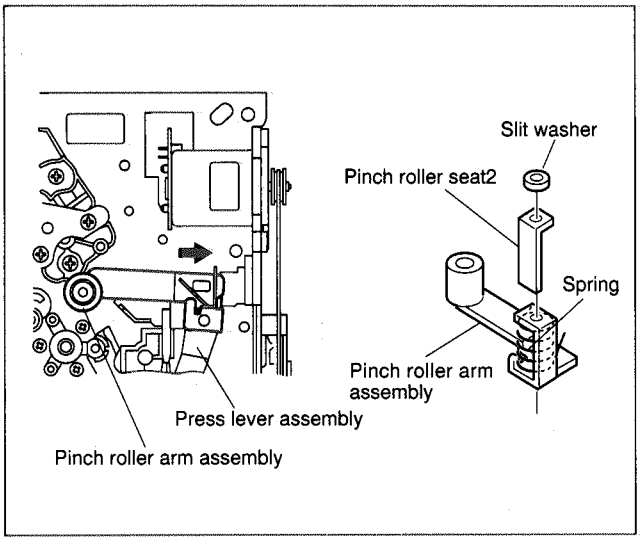


Fig. 2-2-11

2.2.5 Guide Arm Assembly and Press Lever Assembly

1. How to remove

(1) Remove the spring and expand the lug of the lid guide in the arrow-indicated direction. Then remove the guide arm assembly by pulling it up.
(2) Remove the press lever assembly by pulling it up. (See Fig.2-2-12.)

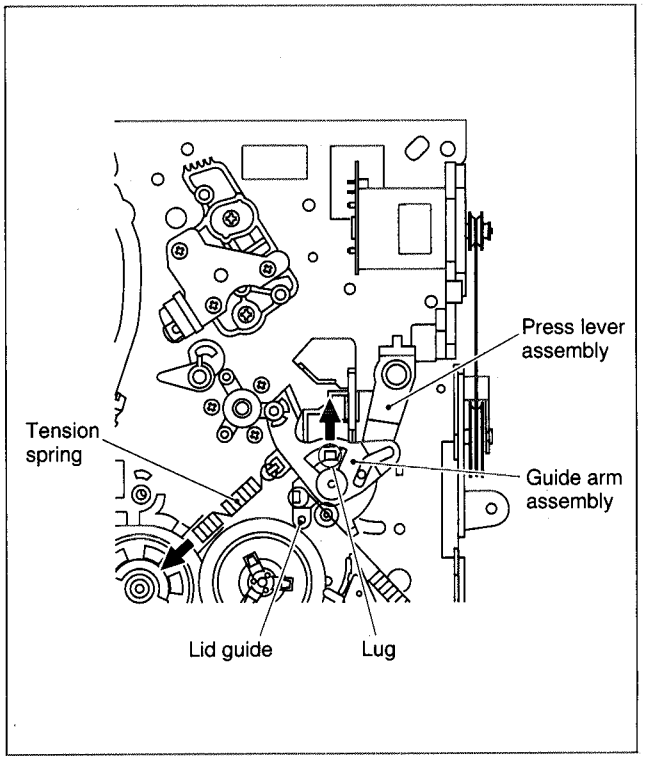


Fig. 2-2-12

2.2.6 Audio Control Head

1. How to remove

(1) Remove the two screws (A) and remove the audio control head together with the head base.

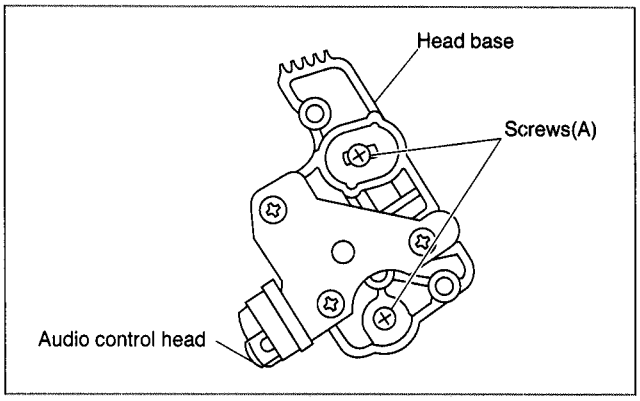


Fig. 2-2-13

(2) When replacing only the audio control head, remove the three screws (B) while controlling the compression spring.

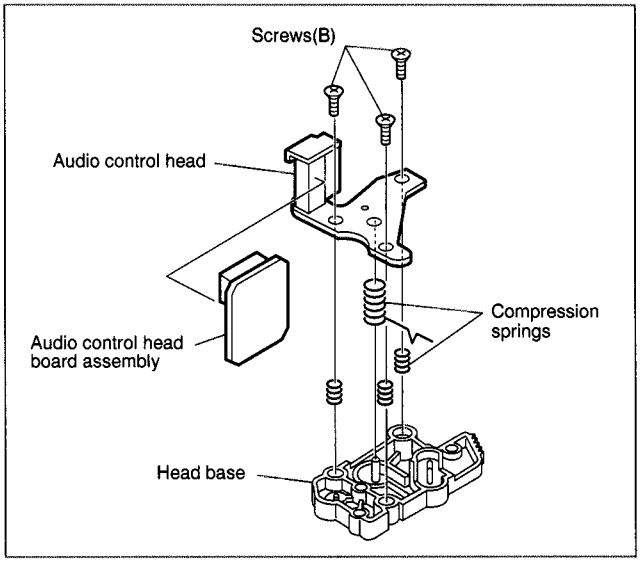


Fig. 2-2-14

2. How to install

(1) To make the post-installation adjustment easier, set the temporary level as indicated in Fig.2-2-15. Also make sure that the screw center is brought into alignment with the center position of the slot.

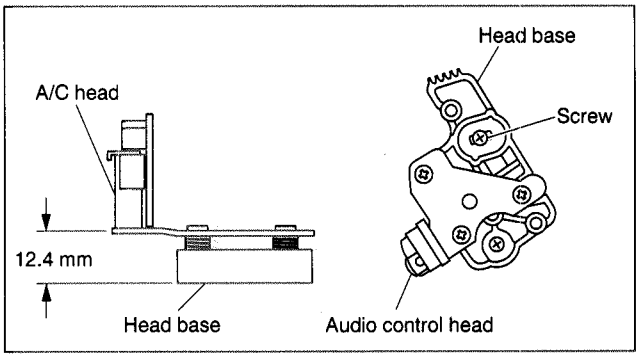


Fig. 2-2-15

2.2.7 Loading Motor

1. How to remove

(1) Remove the belt wound around the worm gear.
(2) Open the two lugs of the motor guide and remove the loading motor, loading motor board assembly and motor guide altogether by pulling them up.
(3) When replacing the loading motor board assembly, take care with the orientation of the loading motor. (Install so that the loading motor label faces upward.)
(4) When the motor pulley has been replaced, choose the fitting dimension as indicated in Fig.2-2-16.

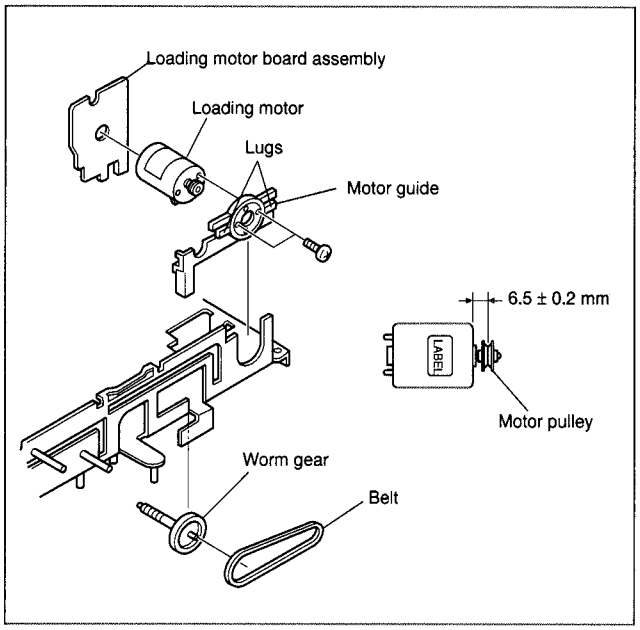


Fig. 2-2-16

2.2.8 Capstan Motor

1. How to remove

(1) Remove the belt (capstan) on the mechanism assembly back side.
(2) Remove the three screws (A) and remove the capstan motor.

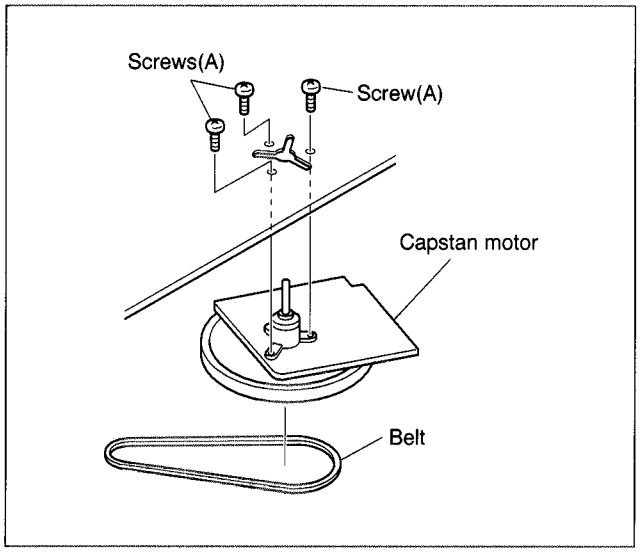


Fig. 2-2-17

2. How to install (Centering the mounting position)

When the capstan motor has once been removed and then reinstalled out of the initial correct position in the rotational direction, the capstan motor current may be unstable during operation in high or low temperatures. This may result in greater Wow & Flutter and occasionally in power breakdown because of current over - load. Install the capstan motor while following the procedure given below.
(The capstan motor is centrally located when the unit is shipped from the factory.)

(1) Provisionally tighten the three screws (A) securing the capstan motor.
(2) Install the mechanism assembly to which the capstan motor is provisionally fastened on the bottom chassis which incorporates the Main board assembly. (No need to tighten the screws for mounting the mechanism.)
Make sure that all the connectors for the mechanism assembly and the Main board assembly are correctly installed as indicated in Fig. 2-2-18.

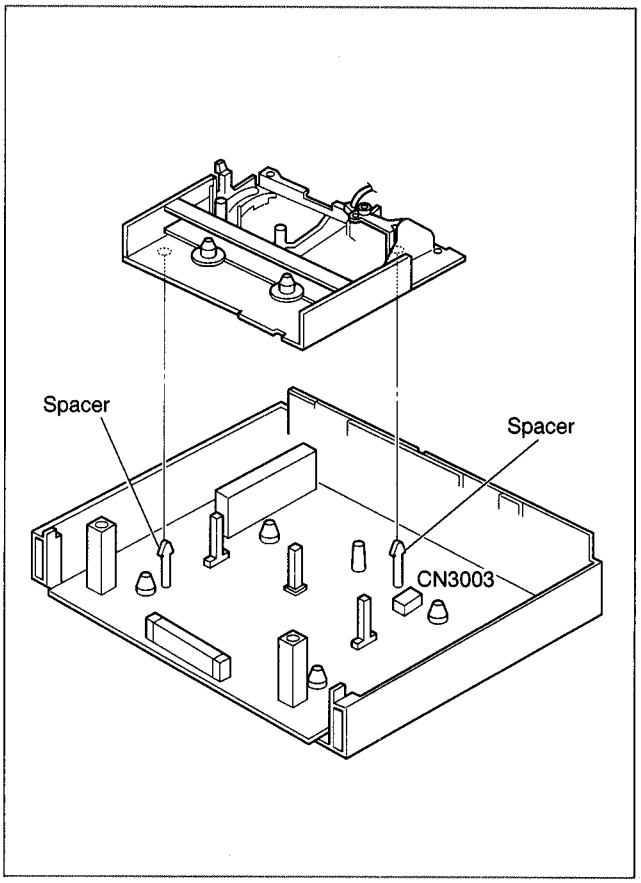


Fig. 2-2-18

(3) Making sure that the connector CN3003 of the capstan motor is correctly mounted, and securely tighten the three screws (A).

Note: *When the capstan motor has been replaced with a new one, perform recording in the EP mode for at least 2 minutes at normal temperatures immediately before starting the FF/REW or SEARCH operations (Aging).*

2.2.9 Pole Base Assembly (supply or take-up side)

1. How to remove

(1) Remove the UV catcher 2 on the removal side by loosening the screw (A).

(2) Remove the pole base assembly on the supply side from the mechanism assembly by loosening the screw (B) on the mechanism assembly back side and sliding the pole base assembly toward the UV catcher 2.

(3) As for the pole base assembly on the take-up side, turn the pulley of the loading motor to lower the cassette holder because the screw (B) is hidden under the control plate. (See the "Procedures for Lowering the Cassette holder assembly" of 1.3 DISASSEMBLY/ASSEMBLY METHOD.) Further turn the motor pulley to move the cassette holder until the screw (B) is no longer under the control plate (in the half-loading position). Then remove it as done for the supply side by removing the screw (B).

NOTE: *After reinstalling the Pole base assembly and the UV catcher2, be sure to perform compatibility adjustment.*

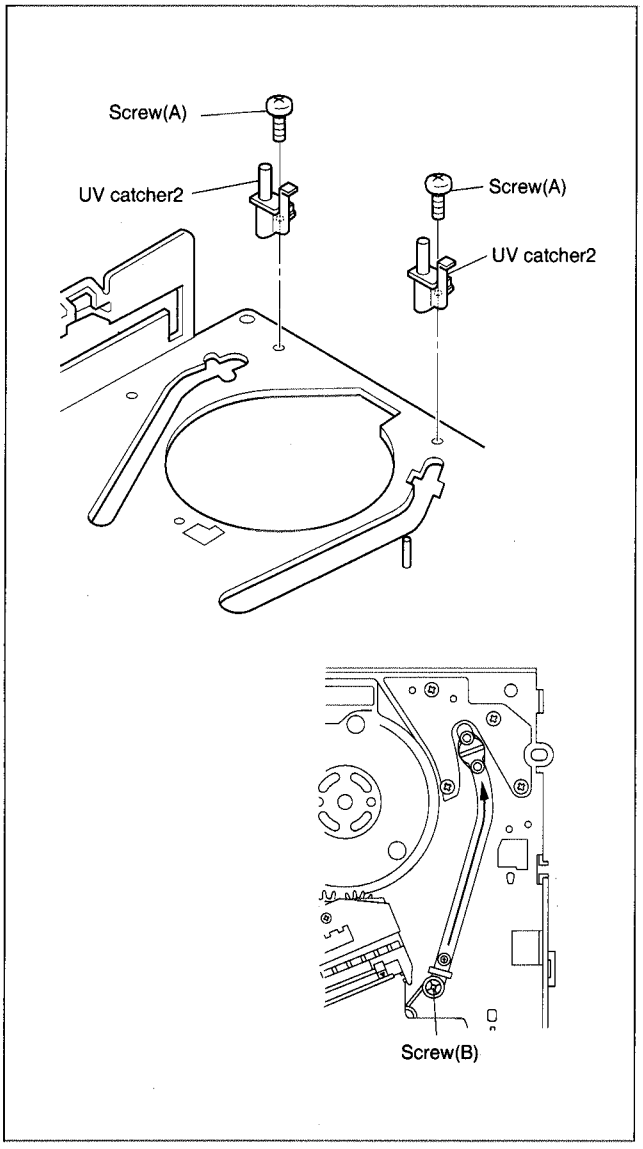


Fig. 2-2-19

2.2.10 Rotary Encoder

1. How to remove

(1) Remove the screw (A) and remove the rotary encoder by pulling it up. (See Fig. 2-2-20.)

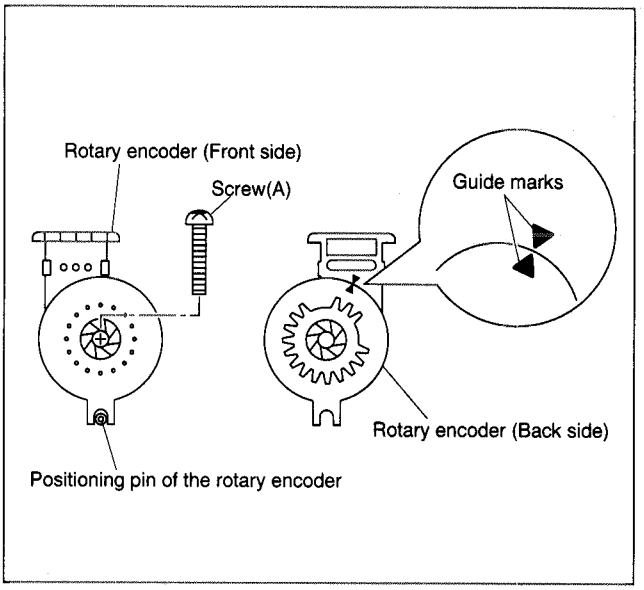


Fig. 2-2-20

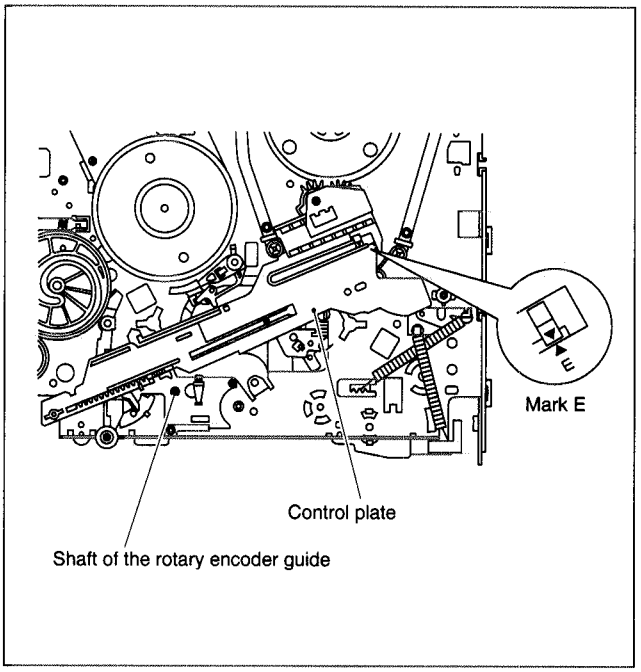


Fig. 2-2-21

2. How to install (Phase matching)

(1) Make sure that the mark E of the control plate is in alignment with the mark ▼ of the loading arm gear shaft and bring the guide marks on the rotary encoder into alignment as indicated in Fig.2-2-20. (See Fig. 2-2-20 and Fig. 2-2-21.)

(2) Turn over the rotary encoder with its guide marks kept in alignment and install it by fitting on the shaft of the rotary encoder guide and the positioning pin.

(3) Tighten the screw (A) to complete the installation.

2.2.11 Clutch Unit

(1) Remove the belt wound around the capstan motor and the clutch unit.
(2) Remove the slit washer and remove the clutch unit.

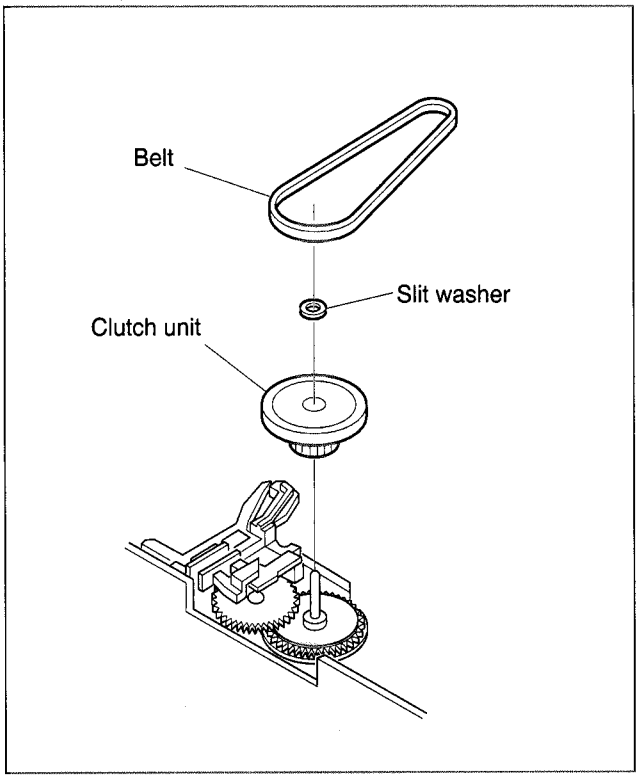


Fig. 2-2-22

2.2.12 Change Lever Assembly, Direct Gear and Clutch Gear1

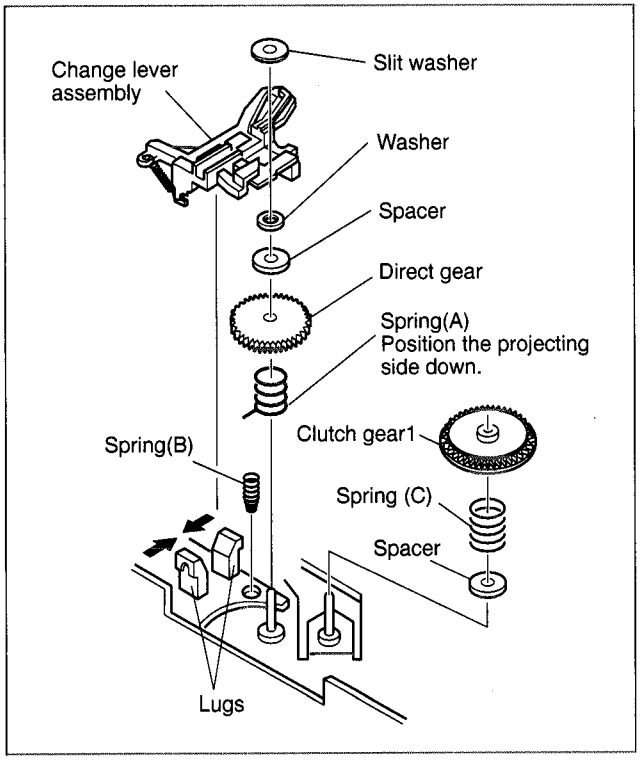


Fig. 2-2-23

1. How to remove

(1) Release the two lugs of the rotary encoder guide in the arrow-indicated direction and remove the change lever assembly.
(2) Remove the slit washer retaining the direct gear and remove the latter.
Take care so as not to lose the washer and spring. (See Fig.2-2-23.)

2. How to install

(1) Install the clutch gear1, spring (A), spring (C), direct gear, spacer and others to the individual shafts of the main deck, and finally the slit washer. (See Fig.2-2-23.)
(2) Let the spring (B) drops into the rotary encoder guide hole and install the change lever assembly.(Take care not to mistake a direction of the spring.) The point is to slightly lift the clutch gear1 and catch it from the both sides with the assembly. (See Fig.2-2-24.)

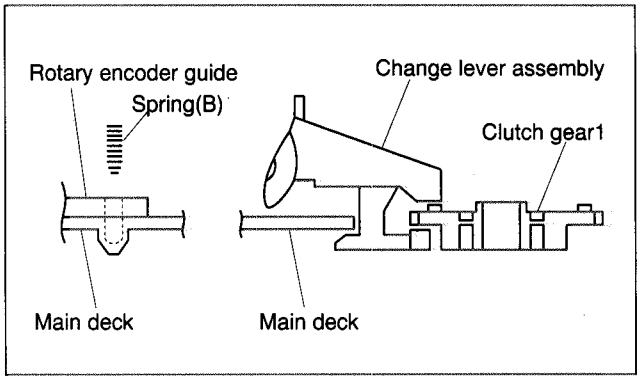


Fig. 2-2-24

2.2.13 Link Lever

1. How to remove

(1) Remove the two slit washers.
(2) Remove the link lever by lifting it from the shaft retained by the slit washers. Then swing the link lever counterclockwise and remove it from the locking section of the control plate.

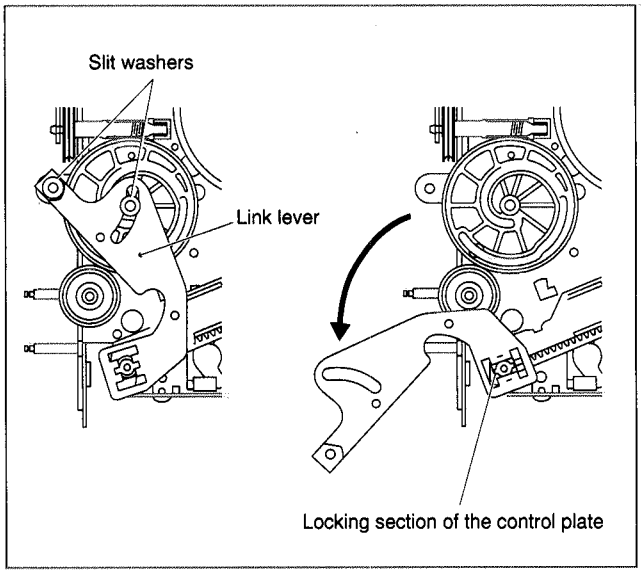


Fig. 2-2-25

2. How to install (Phase matching)

(1) Slide the control plate so that its mark E is aligned with the mark ▼ on the loading arm gear shaft. (See Fig.2-2-26.)
(2) Rotate the worm gear until the guide hole of the control cam is aligned exactly with the guide hole of the main deck. (See Fig.2-2-27.)
(3) Insert the link lever into the locking section of the control plate. (See Fig.2-2-25.)
(4) Rotate the link lever clockwise so that it is installed on the shafts in the center and on the left of the control cam.
(5) Fasten the slit washers at these two points.

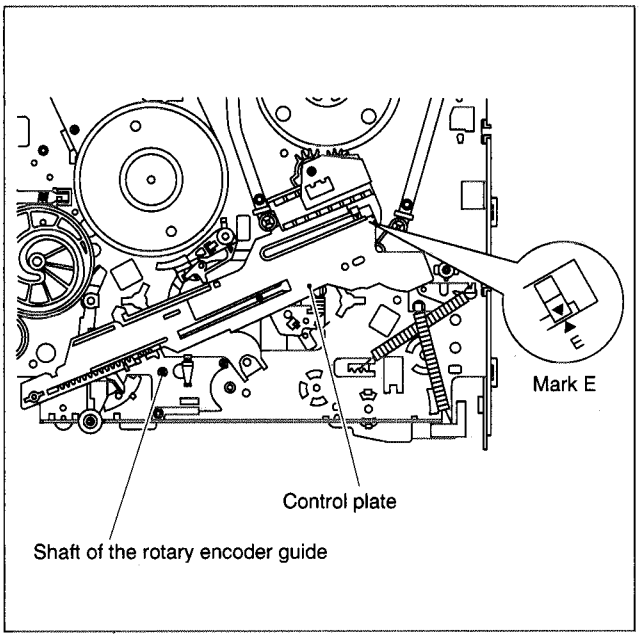


Fig. 2-2-26

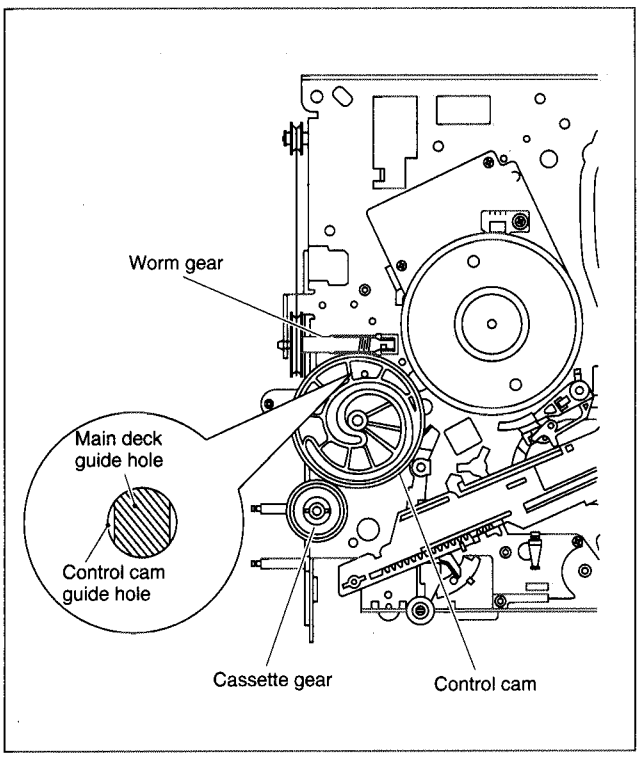


Fig. 2-2-27

2.2.14 Cassette Gear, Control Cam and Worm Gear

1. How to remove

(1) Remove the control cam by lifting it.
(2) Open the two lugs of the cassette gear outward and pull the latter off.
(3) Remove the belt wound around the worm gear and the loading motor.
(4) Open the lug of the lid guide outward and remove the worm gear.

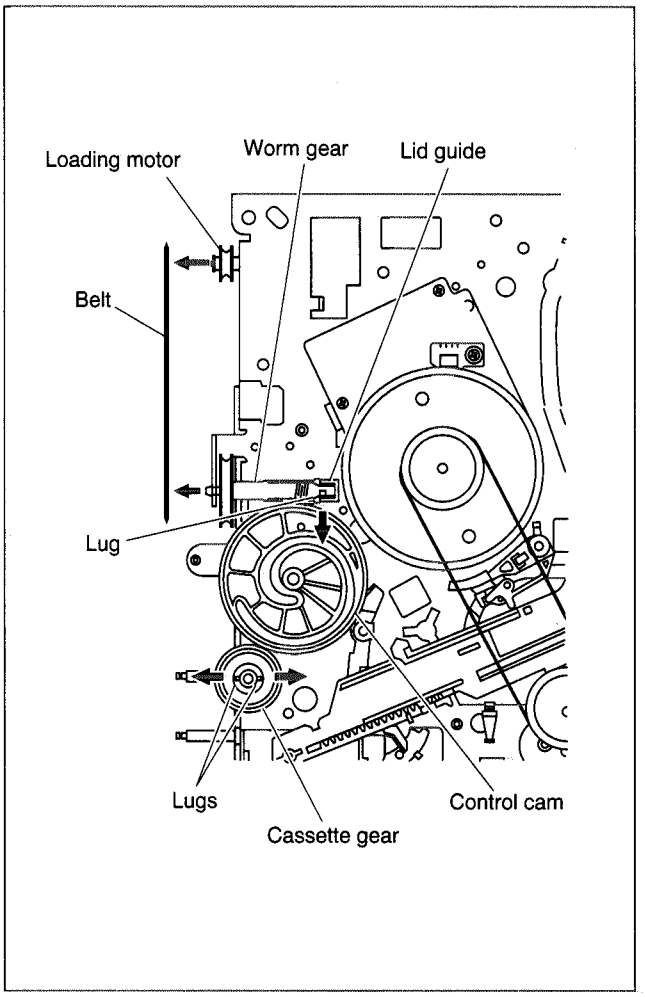


Fig. 2-2-28

2.2.15 Control Plate

1. How to remove

(1) Remove the screw (A) retaining the control bracket 1 and remove the latter.
(2) Slide the control plate as indicated by the arrow and remove the control plate. (See Fig.2-2-29.)

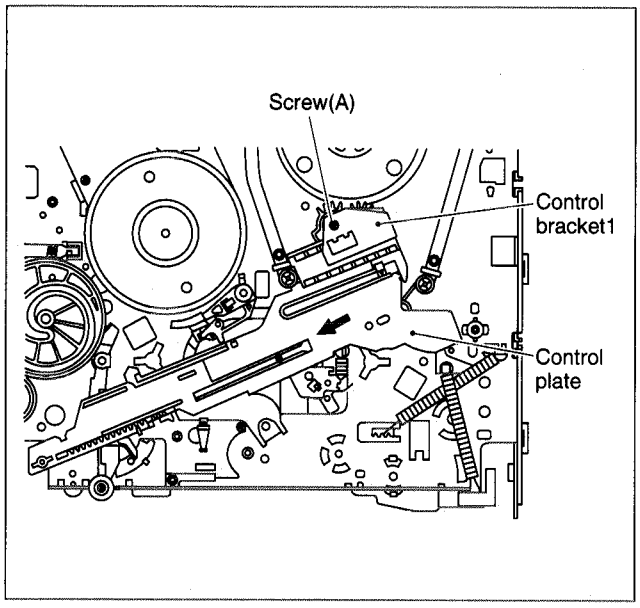


Fig. 2-2-29

2. How to install (Phase matching)

(1) Adjust the position of the idler arm assembly pin as indicated in Fig.2-2-30 (to the left of centre of the R section).

(2) Bring the guide hole of the take-up lever into alignment with the hole at the control plate guide and fix the position by inserting a 1.5 mm hexagonal wrench.

(3) Install the control plate so that the section A of the loading arm gear shaft fits into the hole (A) of the control plate, the section B of the control plate guide into the hole (B), and the control plate comes under the section C of the rotary encoder guide and the section D of the loading arm gear shaft while press-fit the pole base assmebly (supply side) as indicated by the arrow. It is important that the tension arm assembly shaft is positioned closer toward you than the control plate. (See Fig.2-2-31.)

(4) Make sure that the mark E of the control plate is in alignment with the mark ▼ of the loading arm gear shaft. (See Fig.2-2-31.)

(5) Pull off the hexagonal wrench for positioning.

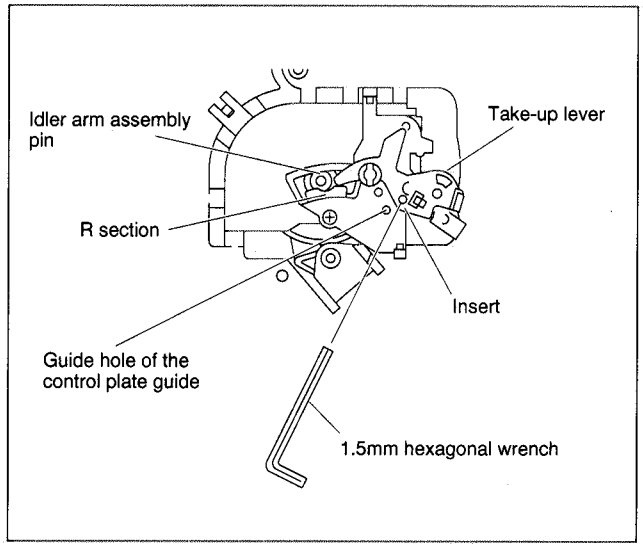


Fig. 2-2-30

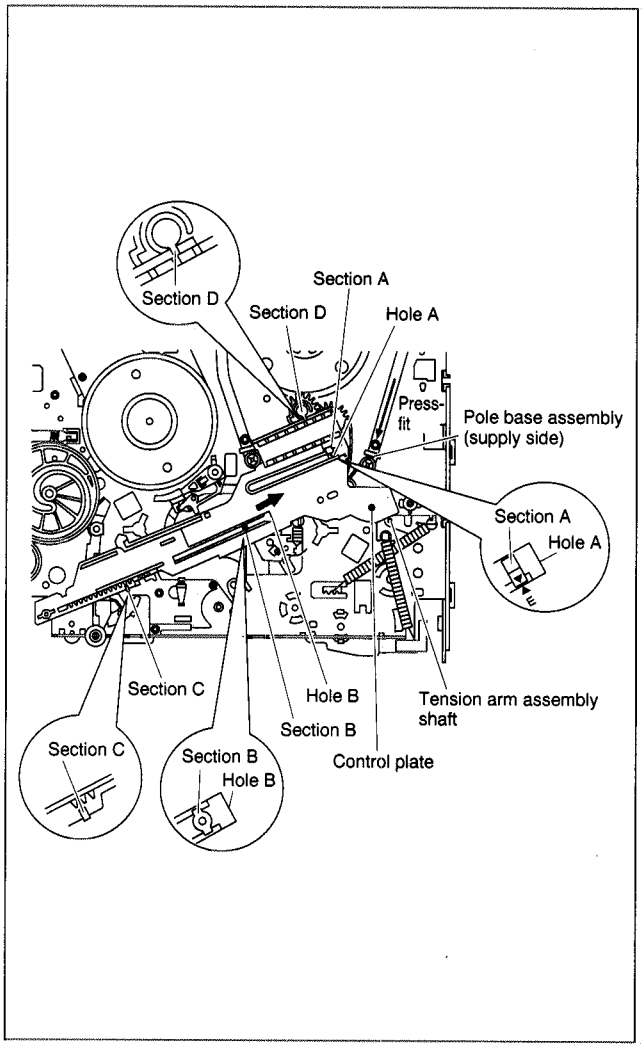


Fig. 2-2-31

2.2.16 Loading Arm Gear (supply or take-up side) and Loading Arm Gear Shaft

1. How to remove

(1) Remove the loading arm gear (supply side) by loosening the screw (A). (See Fig. 2-2-32.)

(2) Remove the screw (B) and remove the torsion arm from the pole base assembly (take-up side). (See Fig.2-2-32.)

(3) Turn the loading arm gear (take-up side) clockwise so that the notch of the loading arm gear (take-up side) is in alignment with the projection of the loading arm gear shaft and lift it.
Likewise, turn the loading arm counterclockwise so that the notch is in alignment with the projection and remove the loading arm gear (take-up side). (See Fig.2-2-32 and Fig. 2-2-33.)

(4) When removing the loading arm gear shaft, be sure of first removing the screw retaining the drum assembly (on the back side of the loading arm gear shaft). Then remove the screw (C) and remove the loading arm gear shaft by sliding it.

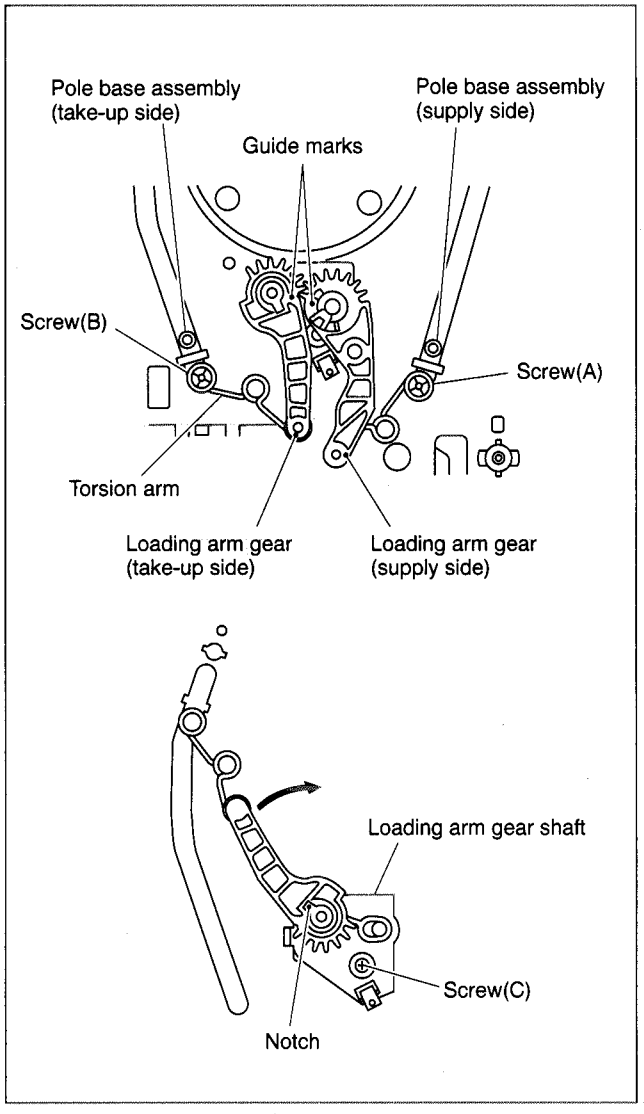


Fig. 2-2-32

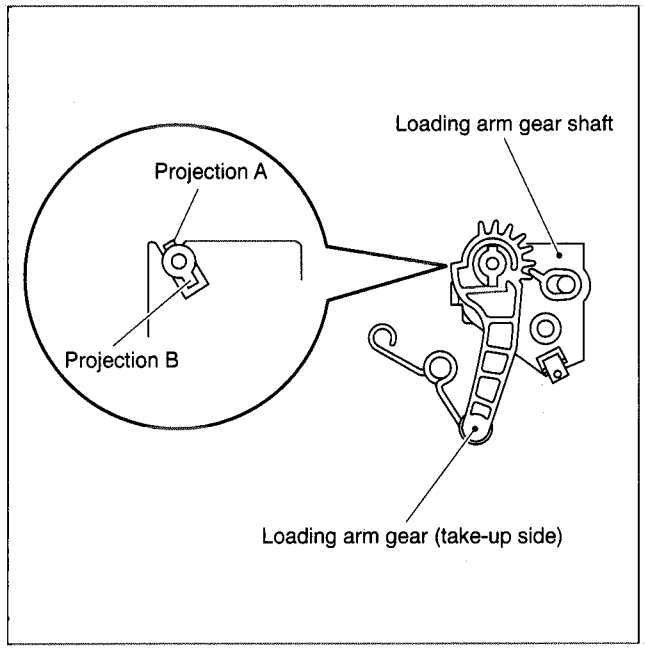


Fig. 2-2-33

2. How to install

(1) Align the notch of the loading arm gear (take-up side) to the projection B of the loading arm gear shaft and slip it over. Then rotate it clockwise for alignment with the projection A and slip it down to the bottom. (See Fig.2-2-33.)

(2) Then turn the loading arm gear (take-up side) counterclockwise. Hang the torsion arm on the pole base assembly (take-up side) and tighten the screw (B).

(3) Install the loading arm gear (supply side) so that the guide mark of the loading arm gear (take-up side) is in alignment with the guide mark of the loading arm gear (supply side). Then hang the torsion arm on the pole base assembly (supply side) and tighten the screw (A). (See Fig.2-2-32.)

2.2.17 Take-up Lever, Take-up Head and Control Plate Guide

(1) Remove the spring of the take-up lever from the main deck.

(2) Remove the lug (A) of the take-up lever from the main deck and pull out the take-up lever and the take-up head together.

(3) Remove the screw (A).

(4) Align the idler arm assembly pin in the center of the R section of the control plate guide, remove the control plate guide lugs (B) and (C) from the main deck, and remove the control plate guide.

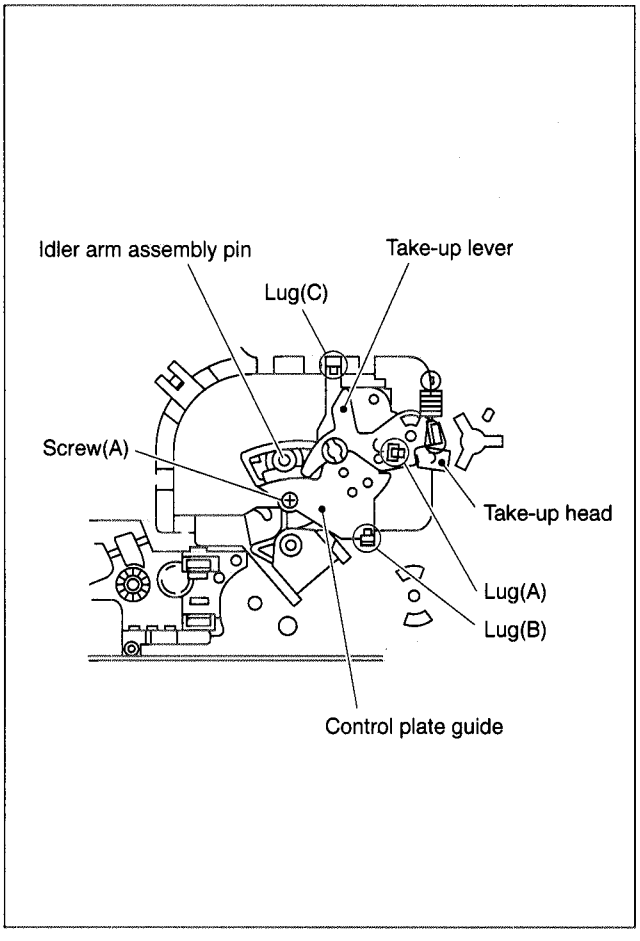


Fig. 2-2-34

2.2.18 Capstan Brake Assembly

1. How to remove

(1) Move the lug (A) of the capstan brake assembly in the arrow-indicated direction so that it comes into alignment with the notch of the main deck. (See Fig. 2-2-35.)
(2) Remove the lug (B) of the capstan brake assembly from the main deck and remove the capstan brake assembly.

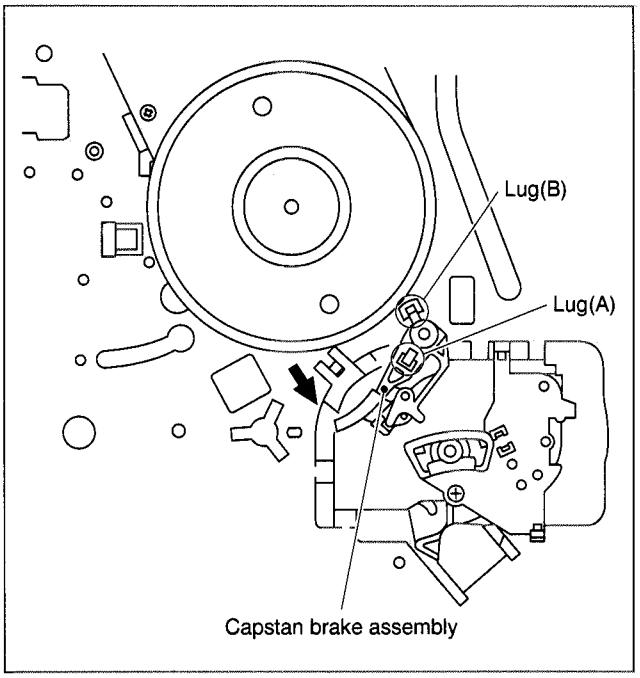


Fig. 2-2-35

2.2.19 Sub Brake Assembly (take-up side)

1. How to remove

(1) Remove the spring attached to the lid guide and sub brake assembly (take-up side).
(2) Bring the lug (A) of the sub brake assembly (take-up side) into alignment with the notch of the main deck.
(3) Remove the lugs (B) and (C) of the sub brake assembly (take-up side) from the main deck and remove the sub brake assembly (take-up side).

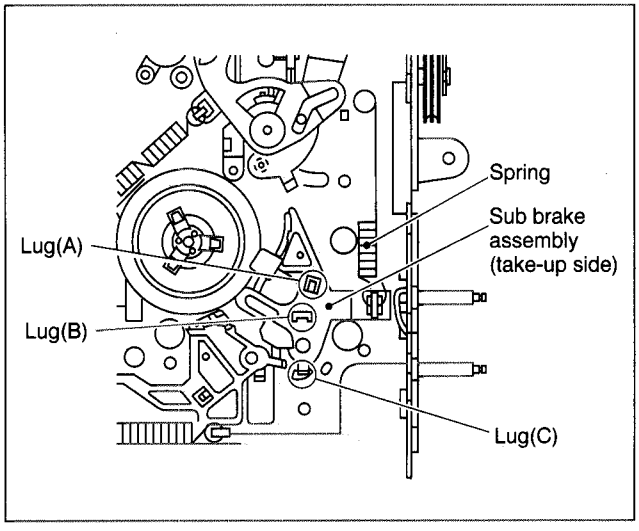


Fig. 2-2-36

2.2.20 Main Brake Assembly (take-up side), Reel Disk (take-up side) and Main Brake Assembly (supply side)

1. How to remove

(1) Move the main brake assembly (take-up side) in the arrow-indicated direction and remove the reel disk (take-up side).
(2) Remove the spring attached to the main brake assembly.
(3) Remove the lug (A) of the main brake assembly (take-up side) and pull out the lug (B) after bringing it into alignment with the main deck notch.
(4) Remove the lugs (C), (D) and (E) of the main brake assembly (supply side) from the main deck and pull them off. (See Fig.2-2-37.)

Note: *If the main brake assembly is difficult to remove, press it and hold the adjustment pin from the back side of the main deck when attempting to remove it.*
After the adjustment pin has been removed or the main brake assembly or the reel disk on the supply or take-up side have been replaced, it is required to adjust the main brake assembly torque. See page 2-23 for the detailed adjustment procedures.

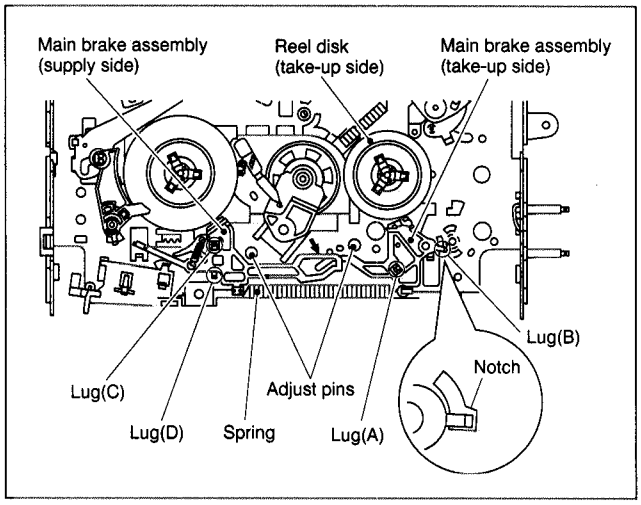


Fig. 2-2-37

(5) When installing the main brake assembly (take-up side), slide the brake lever in the direction as indicated by the arrow to prevent it from hitting the projection of the main brake assembly (take-up side). (See Fig.2-2-38.)

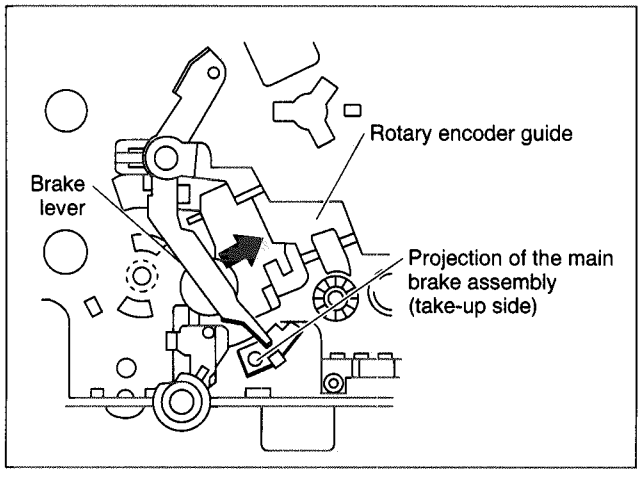


Fig. 2-2-38

2.2.21 Tension Brake Assembly, Reel Disk (supply side) and Tension Arm Assembly

1. How to remove

(1) Remove the three lugs of the tension brake assembly from the main deck and pull them off.
(2) Remove the reel disk (supply side) by loosening in the arrow-indicated direction the main brake assembly (supply side).
(3) Remove the tension spring on the back of the main deck. Then release the lug of the tension arm bearing in the arrow-indicated direction and draw out the tension arm assembly. (See Fig. 2-2-39.)

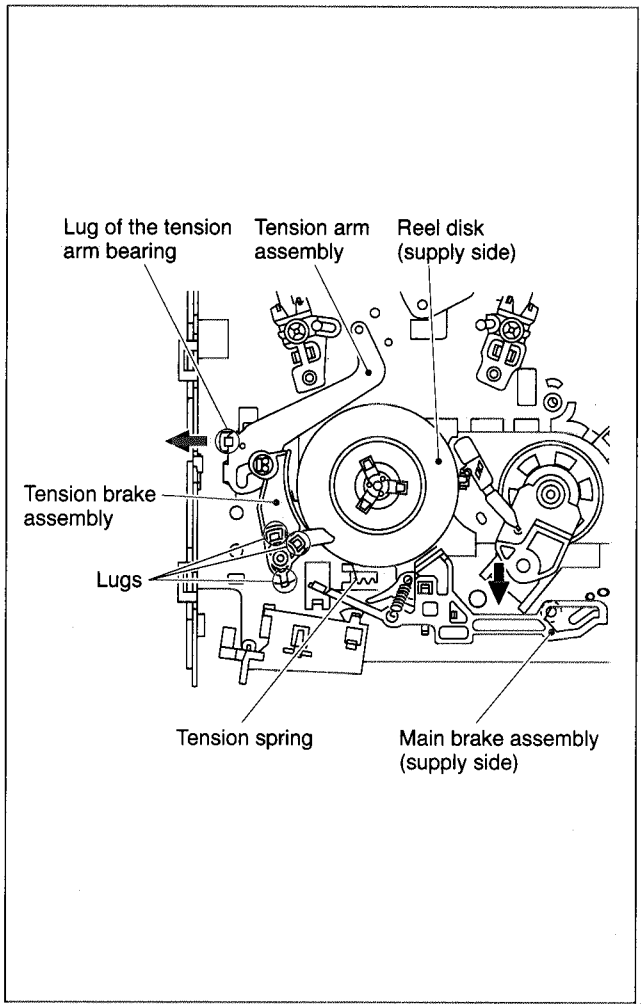


Fig. 2-2-39

2.2.22 Idler Lever, Idler Arm Assembly

1. How to remove

(1) Remove the lug of the idler lever from the main deck and remove the hook fitted in the idler arm assembly hole by lifting it.
(2) Remove the slit washer and pull out the idler arm assembly.

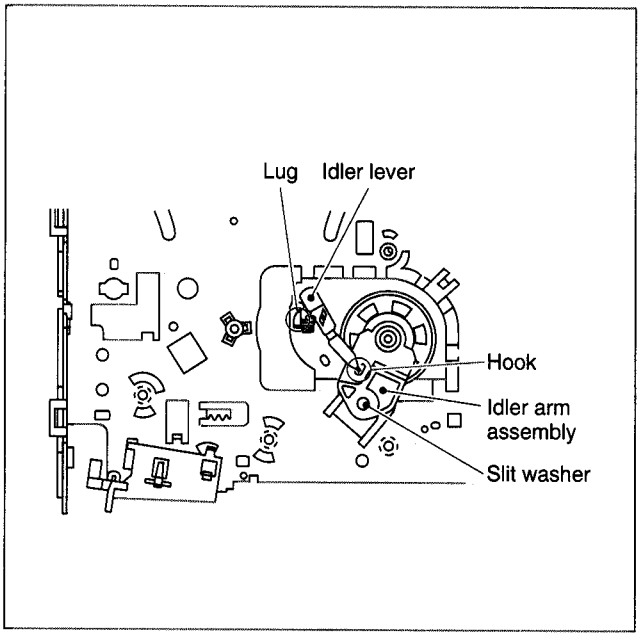


Fig. 2-2-40

2.2.23 Stator Assembly

(1) Remove the flat cable.
(2) Remove the two screws (A).
(3) Remove the stator assembly by lifting in the arrow-indicated direction. (Take care that the brush spring does not jump out.)
(4) After installation, be sure to perform the PB switching point adjustment according to the electrical adjustment procedure.

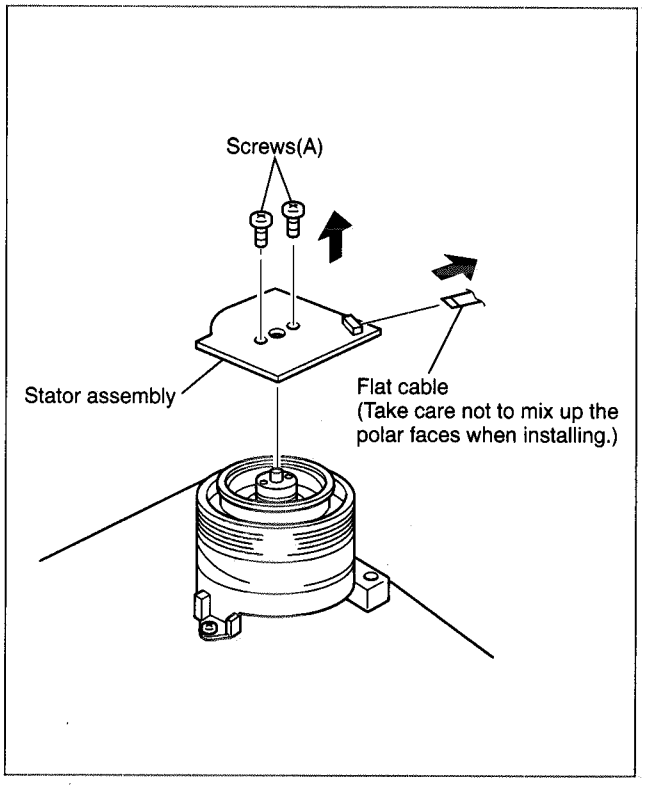


Fig. 2-2-41

2.2.24 Rotor Assembly

(1) Remove the stator assembly.
(2) Remove the two screws (B) and remove the rotor assembly.

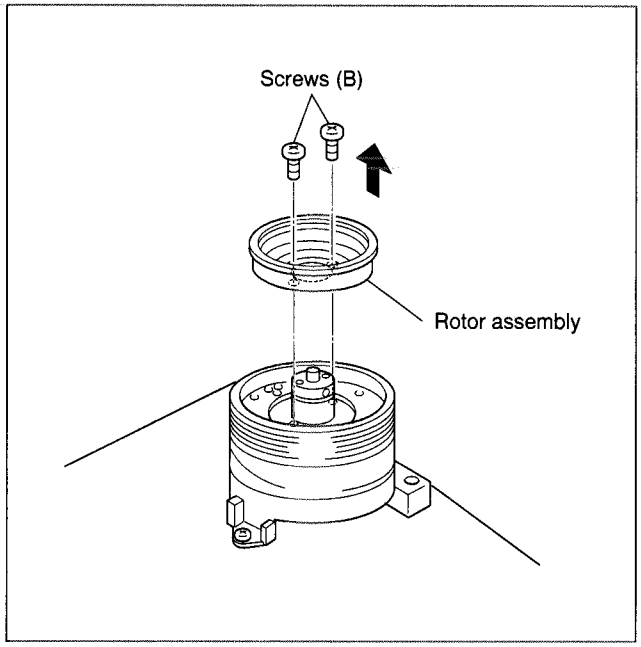


Fig. 2-2-42

Note: *When installing the rotor assembly, note that a normal picture cannot be obtained without ensuring the phase matching as mentioned below.*

(3) Match the phases of the upper drum assembly and the rotor assembly as indicated in Fig.2-2-43.
(4) Place the upper drum assembly hole (a) over the rotor assembly holes (b) (with three holes to be aligned) and tighten the two screws (B). (See Fig.2-2-43.)

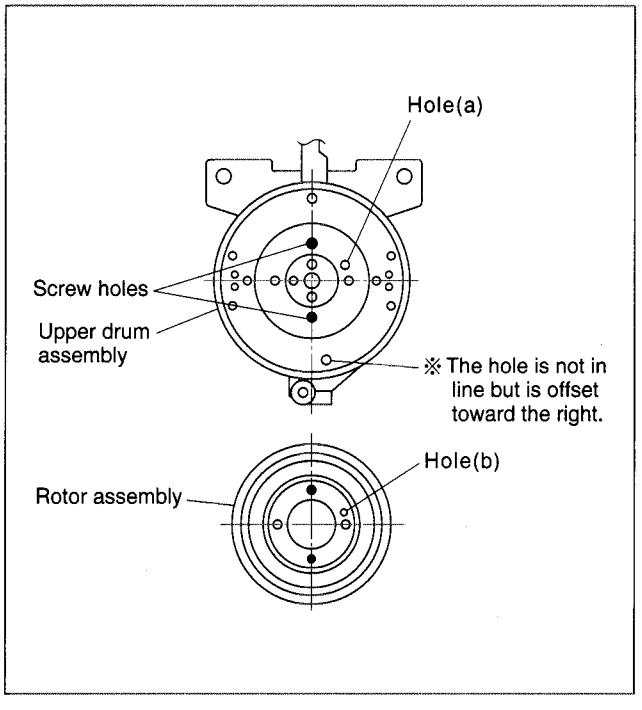


Fig. 2-2-43

2.2.25 Upper Drum Assembly

1. How to remove

(1) Remove the stator assembly and rotor assembly.
(2) Loosen the screw of the collar assembly using a 1.5 mm hexagonal wrench and remove the collar assembly. Also remove the brush, spring and cap at one time.
(3) Remove the upper drum assembly and remove the washer using tweezers.

Note: *When replacement is required, control the up-down movement of the brush. Never apply grease.*

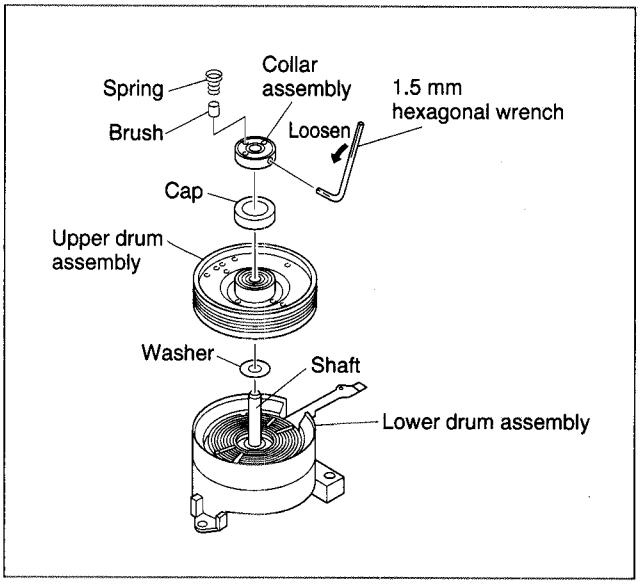


Fig. 2-2-44

2. How to install

(1) Clean the coil parts of the lower drum assembly and the newly installed upper drum assembly with an air brush in advance. (See Fig.2-2-45.)
(2) Install a new washer and upper drum assembly on the drum shaft. (See Fig.2-2-44.)

Note: *When replacing the upper drum assembly, replace it the together with the washer.*

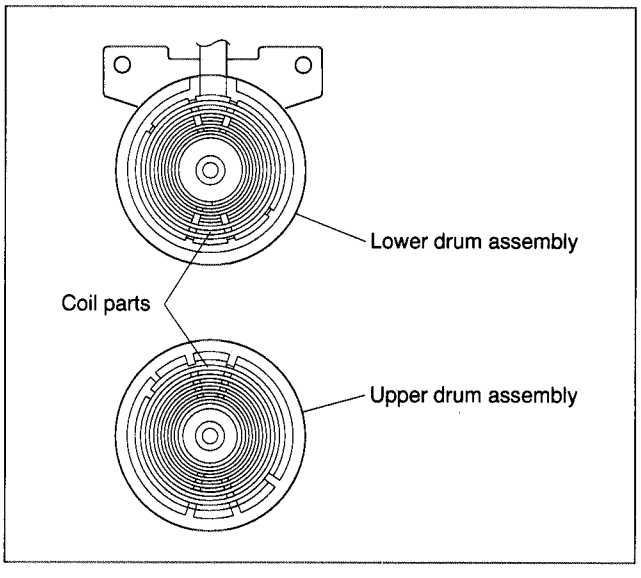


Fig. 2-2-45

(3) Install the cap to the upper drum assembly.
(4) Position the collar assembly as indicated in Fig.2-2-46 while controlling its up- down movement.

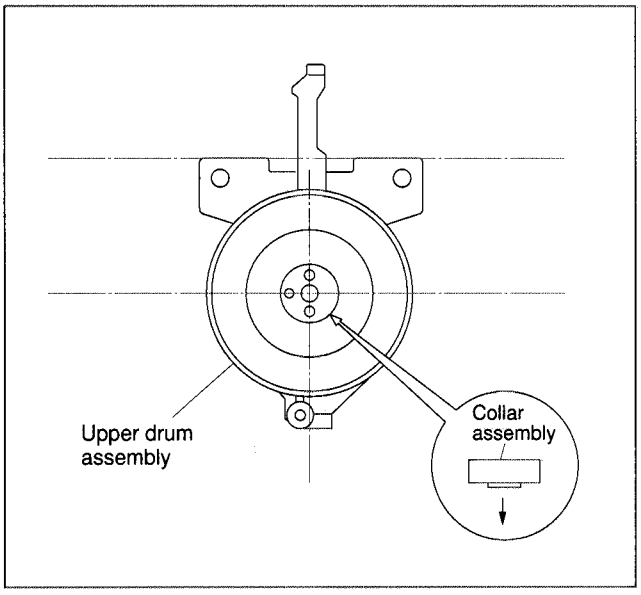


Fig. 2-2-46

(5) Secure the collar assembly in position with a hexagonal wrench while pressing its top with the fingers.

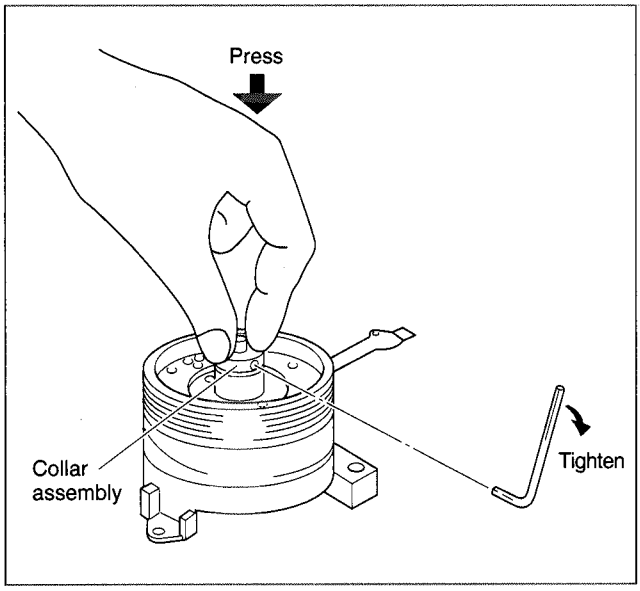


Fig. 2-2-47

(6) After installation, gently turn the upper drum assembly with your hand to make sure that it turns normally. Then install the brush and the spring.
(7) Install the rotor assembly and stator assembly according to Fig 2-2-41 and 2-2-42.
(8) When installation is complete, clean the upper drum assembly and lower drum assembly and carry out the following adjustments.
- PB switching point adjustment
- Slow tracking adjustment
- Compatibility adjustment (Be sure to check for compatibility for the LP mode.)

2.3 COMPATIBILITY ADJUSTMENT

Notes: • *Although compatibility adjustment is very important, it is not necessary to perform this as part of the normal servicing work. It will be required when you have replaced the audio control head, drum assembly or any part of the tape transport system.*
• *To avoid any damage to the alignment tape while performing the compatibility adjustment, get a separate cassette tape (for recording and play back) ready to be used for checking the initial tape running behavior.*

2.3.1 Checking/Adjustment of FM Waveform Linearity

(1) Connect the oscilloscope to TP106(PB.FM) of the main board assembly and to TP111(D.FF) of the main board assembly for external sync connection.
(2) Playing the alignment tape MHPE, observe the FM waveform.
(3) Press the channel buttons (+, –) simultaneously during playback to enter the manual tracking mode. (This also brings tracking to the centre.)
(4) Make sure that there is no significant level drop of the FM waveform caused by the tracking operation, with its generally parallel and linear variation ensured. Perform the following adjustments when required. (See Fig.2-3-1.)
(5) Reduce the FM waveform while pressing the channel buttons (+, –) during playback. If a drop in level is found on the left side, turn the guide roller of the pole base assembly (supply side) with the roller driver (PTU94002) to make the FM waveform linear.
If a drop in level is on the right side, likewise turn the guide roller of the pole base assembly (take-up side) with the guide roller to make it linear. (See Fig.2-3-3.)
(6) Then play MHPE-L and make sure that the FM waveform varies in parallel and linearly with the tracking operation. When required, perform fine-adjustment of the guide roller of the pole base assembly (supply or take-up side).
(7) Unload the cassette tape once, play the alignment tape MHPE-L again and confirm the FM waveform.

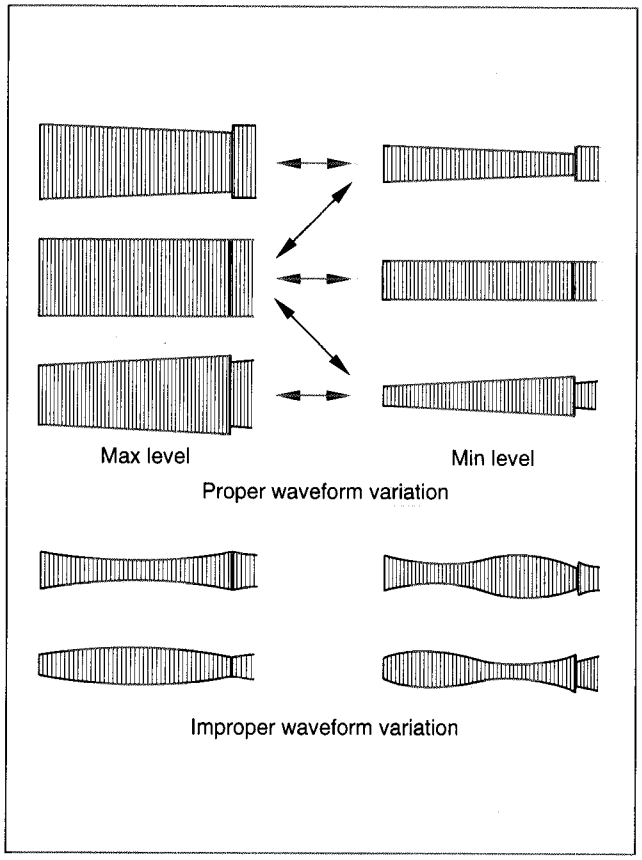


Fig. 2-3-1

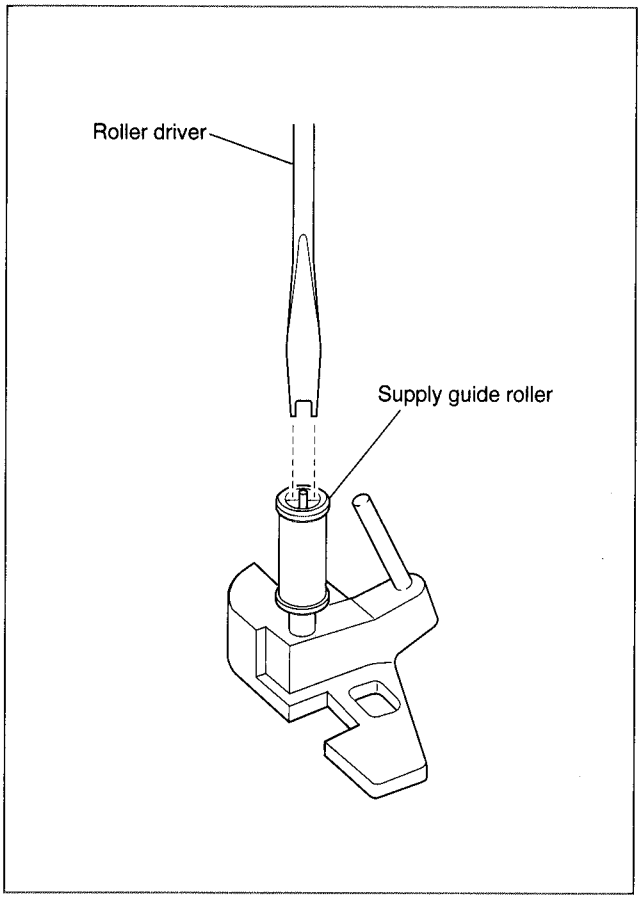


Fig. 2-3-2

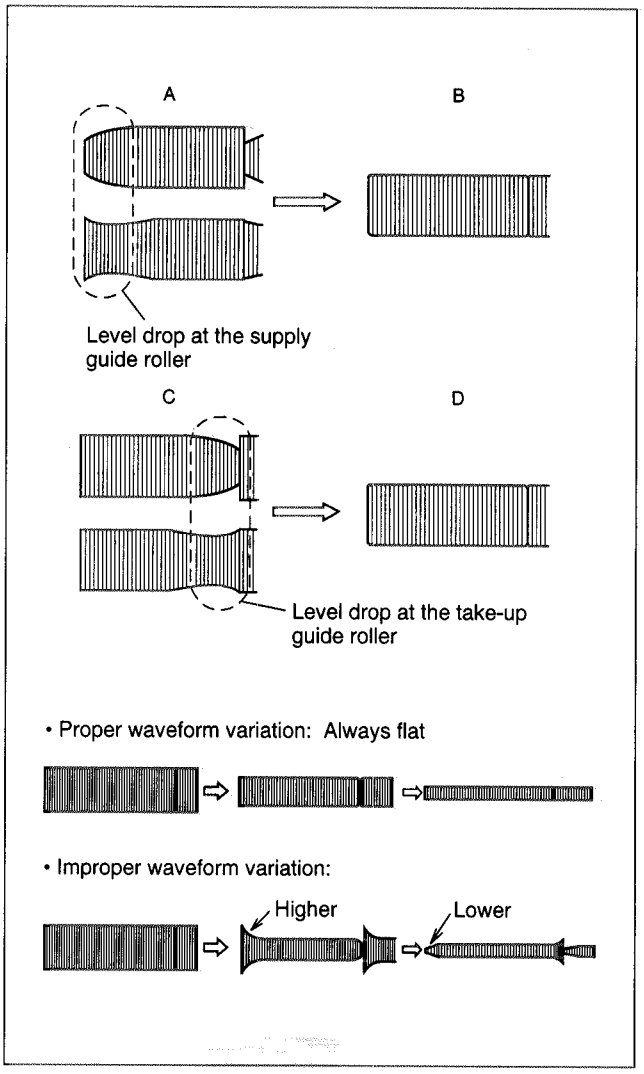


Fig. 2-3-3

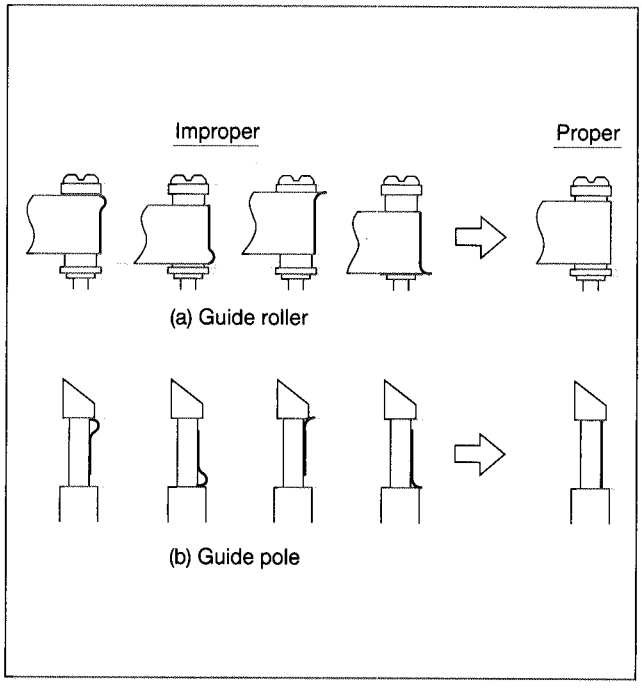


Fig. 2-3-4

2.3.2 Checking/Adjustment of the Height and Tilt of the Audio Control Head

Note: *Set a temporary level of the height of the A/C head in advance to make the adjustment easier after the A/C head has been replaced. (See Fig.2-2-15.)*

(1) Connect CH-1 of the oscilloscope to AUDIO OUT and CH-2 to TP4001 (CTL.P) of the main board assembly and observe the waveforms on both channels in the ALT mode.
(2) Play the alignment tape MHPE and adjust it by turning the screws (1), (2) and (3) little by little until the waveform of both the audio output signal and the control pulse reach maximum. The screw (1) and screw (3) are for adjustment of tilt and screw (2) for azimuth.

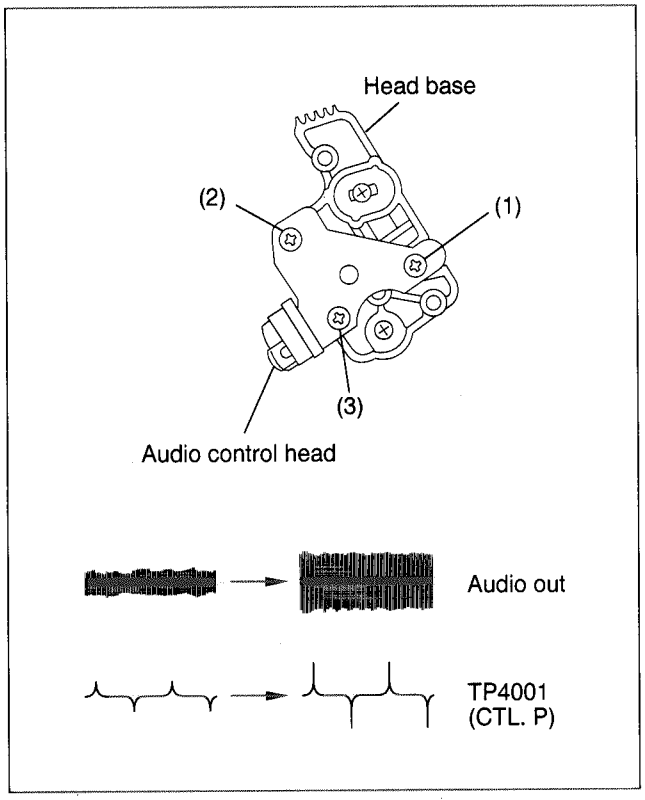


Fig. 2-3-5

2.3.3 Checking/Adjustment of the Audio Control Head Phase (X-Value)

(1) Connect the oscilloscope to TP106(PB.FM) of the main board assembly and to TP111(D.FF) of the main board assembly for external sync connection.
(2) Play the alignment tape MHPE and observe the FM waveforms.
(3) Press the channel buttons (+, –) simultaneously during playback to enter the manual tracking mode. (This also brings tracking to the centre.)
(4) Loosen screws (4) and (5) so that the A/C head position bit (PTU94010) is set as indicated in Fig.2-3-6.
(5) Turn the A/C head position bit fully toward the capstan. Then turn it back gradually toward the drum and stop on the second peak point position of the FM waveform output level. Then tighten the screw (4) temporarily.
(6) Then play the alignment tape MHPE-L.
(7) Press the channel buttons (+, –) simultaneously during playback to enter the manual tracking mode. (This also brings the tracking to the centre.)
(8) Perform the tracking operation and make sure that the FM waveform is at its maximum.
(9) If it is not at maximum, loosen the temporarily tightened the screw (4) and turn the A/C head position bit to bring the audio control head to a position, around where the waveform reaches its maximum for the first time. Then tighten the screws (4) and (5).

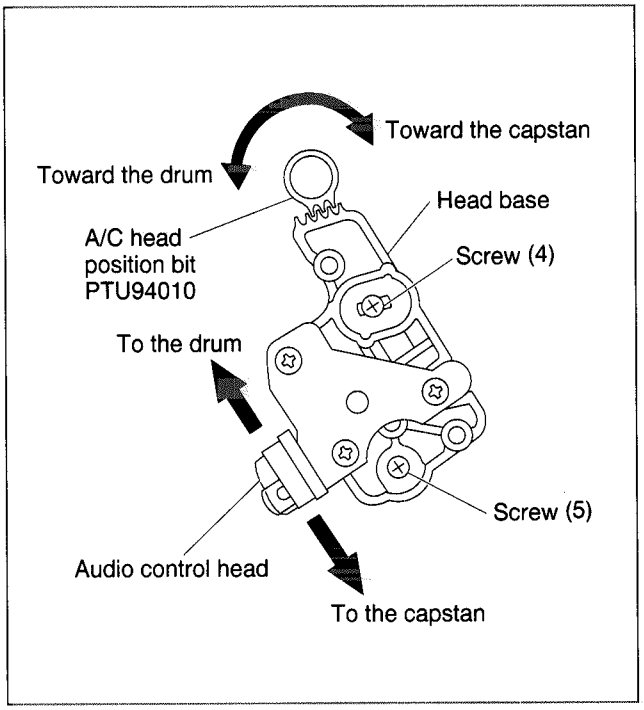


Fig. 2-3-6

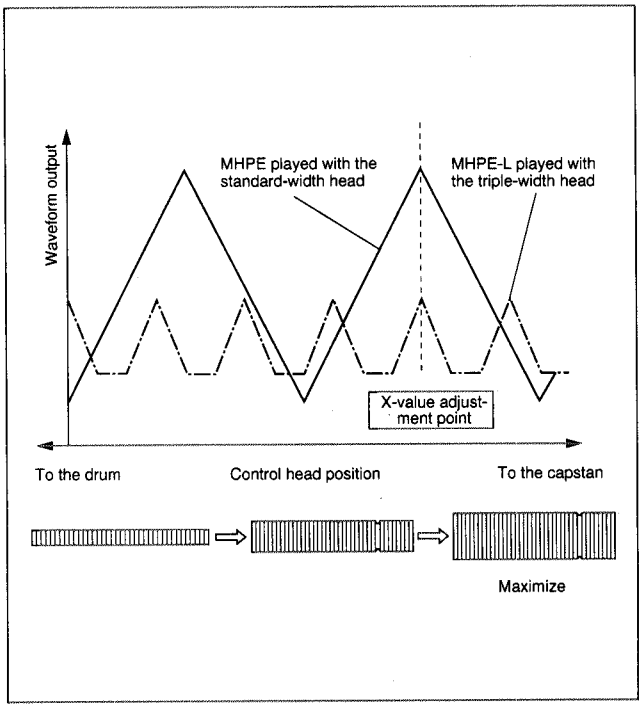


Fig. 2-3-7

2.3.4 Checking/Adjustment of the Standard Tracking Preset [HR-J461MS]

Note: *Set the remote control code of the video recorder to A mode.*
(The unit set in B mode does not accept the remote control code of the presetting unit.)

(1) Connect the oscilloscope to TP106(PB.FM) of the main board assembly and to TP111(D.FF) of the main board assembly for external sync connection.
(2) Playing the alignment tape MHPE-L and observing the FM waveform, make sure that the auto tracking operation is complete.
(3) Press the button "D" of the presetting unit twice.
(4) Make sure that the MHPE-L is not ejected.
(5) If ejected, again perform the phase (X-value) adjustment of the audio control head.

2.3.5 Checking/Adjustment of the Tension Pole

(1) Check the back tension cassette gauge (PUJ48076-2) to make sure that the indicator points to 25 - 51 gf•cm.
(2) If the indicated value is outside this range, carry out the following adjustment steps.
  1) Select the mechanism servicing mode. (See 1.5 MECHANISM SERVICE MODE.)
  2) While in the Play mode, turn the adjustment pin with a straight-slot screwdriver while taking care not to touch the 2.5 mm dia. pole. (See Fig.2-3-8.)

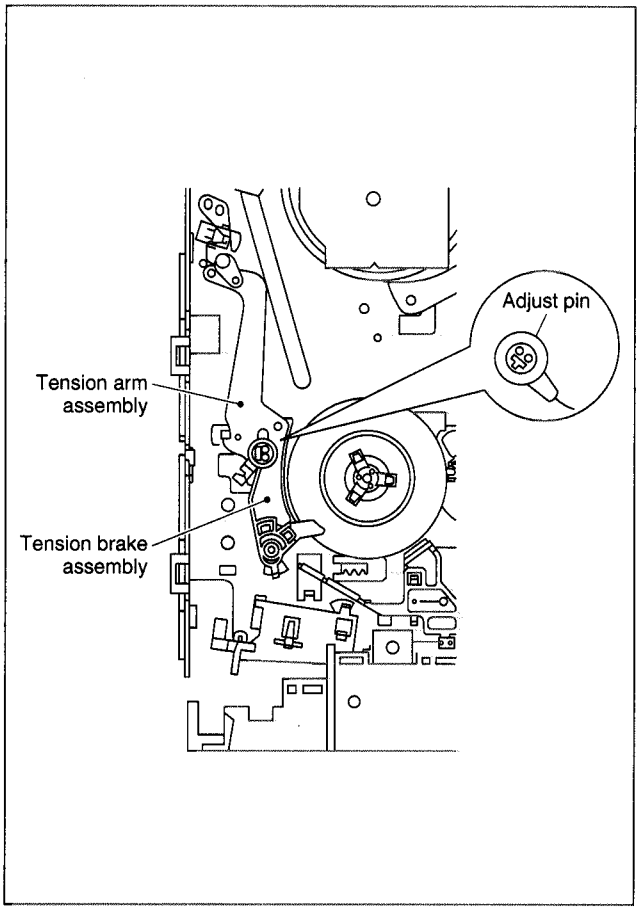


Fig. 2-3-8

2.3.6 Adjustment of the Tension Stud

(1) Adjust so that the left side of the tension stud is on the extension of the notch line of the main deck. (See Fig. 2-3-9.)

Note: *Adjustment is not usually necessary for the tension stud. Perform this adjustment only when it is out of position.*

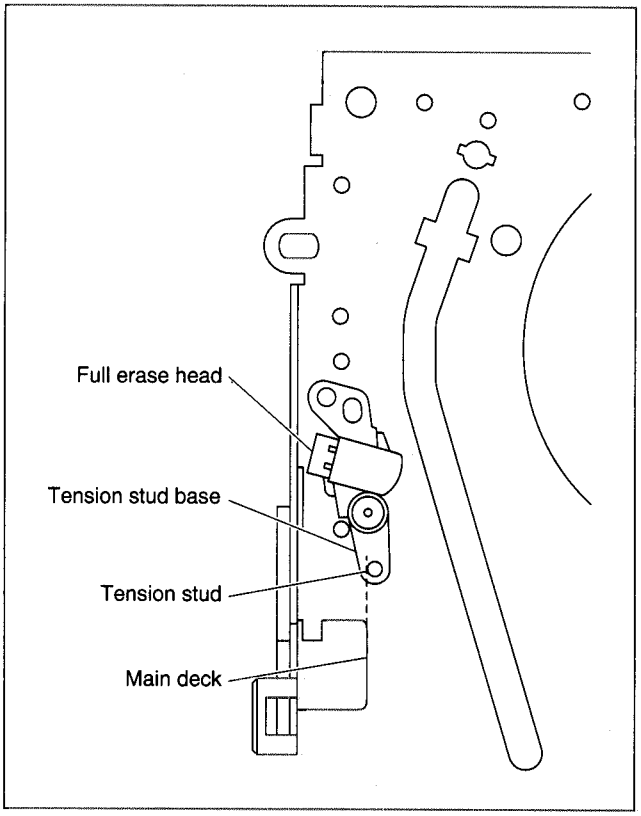


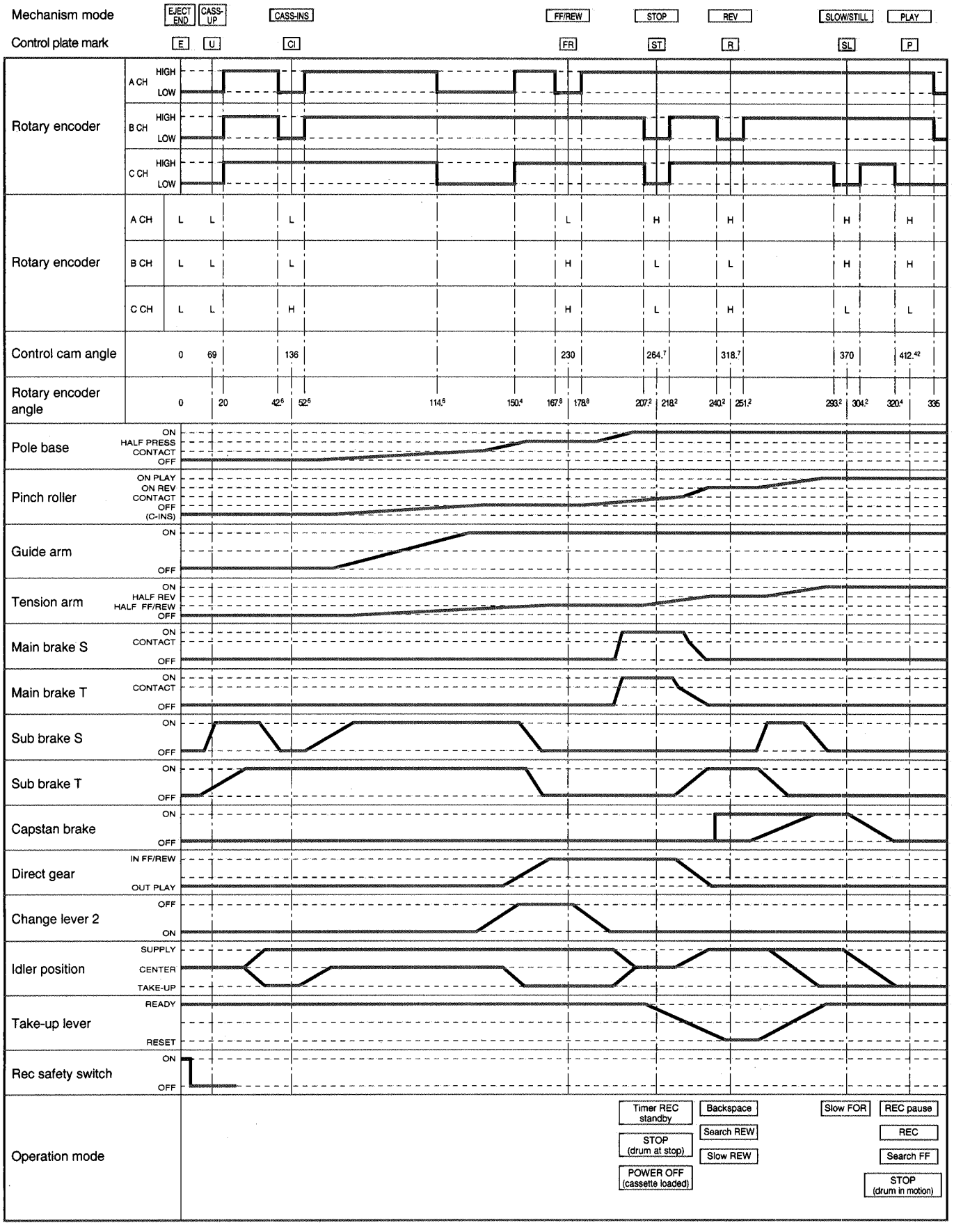
Fig. 2-3-9

2.3.7 Main Brake Torque Adjustment

Note: Adjustment of the main brake torque is required after the adjustment pin has been removed or the main brake assembly or the reel disk on the supply or take-up side have been replaced, removed or attached.

(1) Rotate the pulley of the loading motor by hand to align the mark ▼ on the loading arm gear shaft with the ST marking on the control plate (i.e. set to the STOP mode position).
(2) Insert a torque gauge (PUJ48075-2) into the reel disk on the side to be played, hold the torque gauge lightly, rotate it clockwise when measuring the supply side torque or counterclockwise when measuring the take-up side torque, and read the value indicated at the moment the reel disk starts to slip.
(3) Make sure that the main brake torque values on the supply and take-up sides are both between $23.^{5}$ — $78.^{4}$ x 10^{-3} N•m (240 — 800 gf•cm). If the value is outside the specified range, adjust to the specified value by rotating the adjustment pin.
If an adjustment by using the adjustment pin is not possible, replace the main brake assembly.

Mechanism Timing Chart



SECTION 3
ELECTRICAL ADJUSTMENT

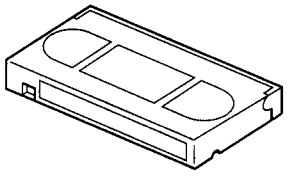
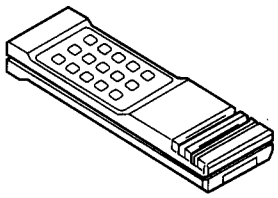
3.1 PRECAUTION

Electrical adjustment are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustments only after all repairs and replacements have been completed. Also do not attempt these adjustments unless the proper equipments is available.

3.1.1 Required test equipment

① Colour television or monitor
② Oscilloscope: wide-band,dual-trace,triggered delayed sweep
③ Frequency counter
④ Signal generator: RF/IF sweep/marker
⑤ Signal generator: PAL/NTSC colour bar, stairstep
⑥ Recording tape
⑦ Digit-key remote controller(provided)

3.1.2 Required adjustment tools

Alignment tape (SP,stairstep) MHPE	Presetting unit PTU94008
	

Note:

The system control circuit of this model has an automatic recognition about the ON-OFF control of the ***DOCTOR SYSTEM.***

3.1.3 Colour bar signal,colour bar pattern

● PAL colour bar signal

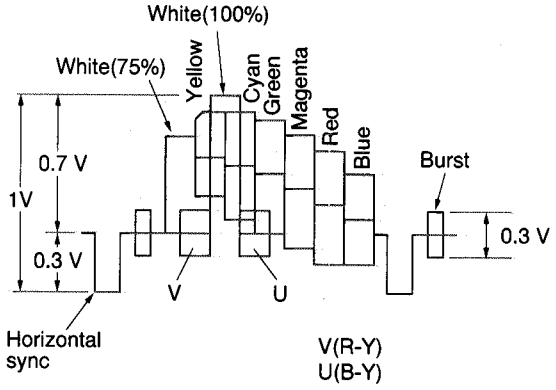


Fig. 3-1-1 PAL colour bar signal waveform

● PAL colour bar pattern

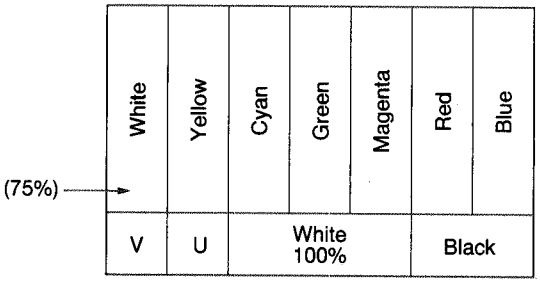


Fig. 3-1-2 PAL colour bar pattern

● NTSC colour bar signal

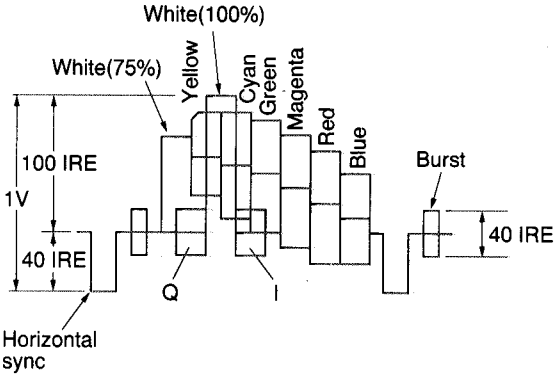


Fig. 3-1-3 NTSC colour bar sinal

● NTSC colour bar pattern

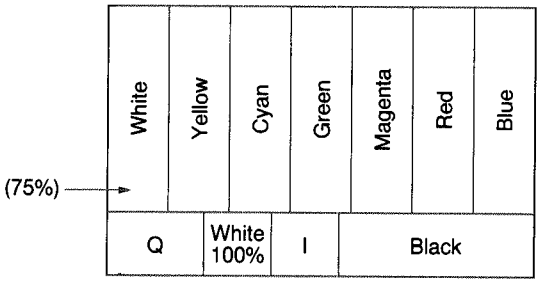


Fig. 3-1-4 NTSC colour bar pattern

3.2 SERVO CIRCUIT

Notes: • ***Unless otherwise specified,all measurement point and adjustment parts are located on the MAIN BOARD.***
• ***Set the VCR to the mode A by the remote controller.***

3.2.1 PB switching point

Signal	• Alignment tape [MHPE],Stairstep
Mode	• PB • Automatic tracking OFF
Equipment	• Oscilloscope
Measurement point	• VIDEO OUT TERMINAL
Trigger slope (-)	• TP111(D. FF)
Adjustment tool	• Presetting unit [PTU94008]
Specification	• 6.5 ± 0.5H

Note : • ***Use only the "O" button, depressing other buttons during adjustment may cause adjustment errors.***

(1) Connect an oscilloscope to VIDEO OUT TERMINAL and external trigger from TP111 (negative slope).
(2) Playback the stairstep signal of the alignment tape.
(3) Press the "O" button of the presetting unit.
The adjustment is performed automatically. Once the adjustment is performed, the VCR will go into the STOP mode.
(4) Playback the alignment tape again, confirm the switching point. (See Fig.3-2-2.)

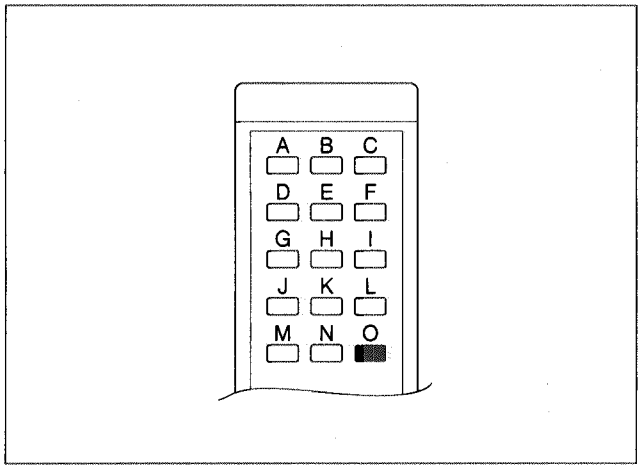


Fig. 3-2-1 Presetting unit

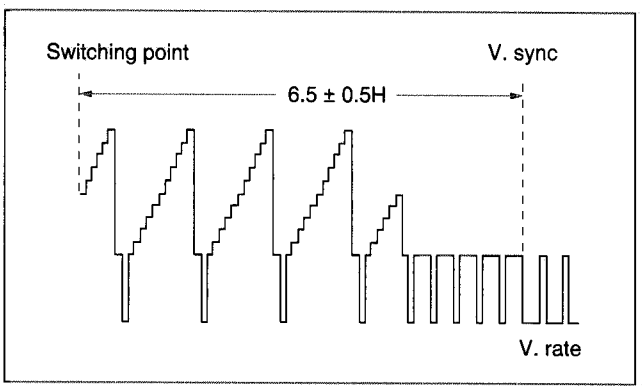


Fig. 3-2-2 PB switching point

3.2.2 Slow tracking preset

Signal	• Colour bar (PAL, NTSC)
Mode	• SP/LP: REC → PB(SLOW) [HR-J461MS] • SP: REC → PB(SLOW) [HR-J261MS] • Automatic tracking OFF
Equipment	• TV-Monitor
Adjustment tool	• Presetting unit [PTU94008]
Specification	• Minimum noise

Note : • ***Use only the "B" and "C" buttons, depressing other buttons during adjustment may cause adjustment errors.***

(1) Record a PAL colour bar signal in the SP mode.
(2) Playback the recorded signal on the FWD slow mode.
(3) Set the tracking control to the centre position by simultaneously pressing the CH "▲" and "▼" buttons.
(4) Observe the display on the TV monitor and adjust for optimum noise condition (best tracking) by depressing the "B " or "C " buttons of the presetting unit.
(5) Depress the STOP button.
(6) Confirm that the bar noise is not visible on the TV monitor in the slow mode.
(7) Repeat steps (2) to (6) in the REV slow mode.
(8) Repeat steps (1) to (7) in the LP mode.
(9) Repeat steps (1) to (8) in the NTSC mode.

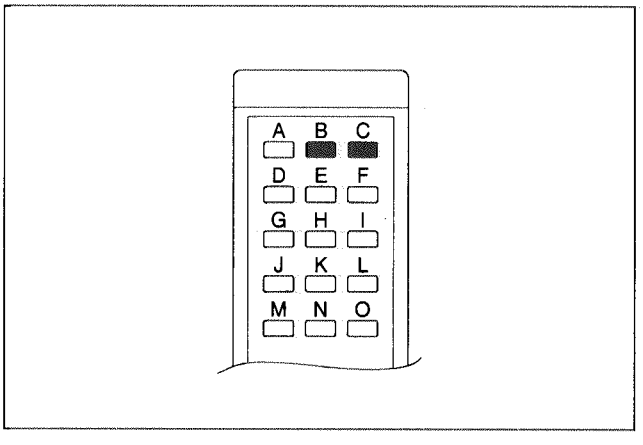


Fig. 3-2-3 Presetting unit

3.3 VIDEO CIRCUIT

Note : • ***Set the VCR to the mode A by the remote controller.***

3.3.1 Auto picture

Signal	• Monoscope
Mode	• B.E.S.T : OFF • REC then PB • SP/LP
Adjustment tool	• Presetting unit[PTU94008]
Specification	• STOP mode

Note : • ***Use only the "L" button, depressing other buttons during adjustment may cause adjustment errors.***

(1) Record a monoscope signal in the SP mode.
(2) Playback the recorded signal.
(3) Press the "L" button of the presetting unit during playback.
(4) Confirm that the VCR will go into the STOP mode.
(5) Repeat steps (2) to (4) in the LP mode.

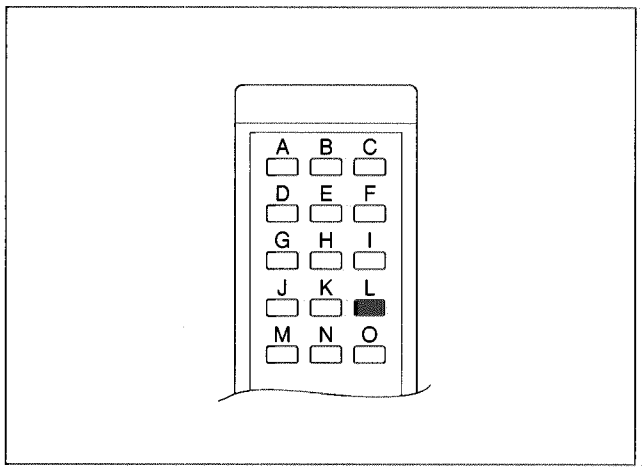


Fig.3-3-1 Presetting unit

3.4 ON SCREEN CIRCUIT

Note : • ***Set the VCR to the mode A by the remote controller.***

3.4.1 Character position

Signal	• No signal
Mode	• EE
Equipment	• TV-monitor
Adjustment tool	• Presetting unit [PTU94008] • Digit-key remote controller
Specification	• Character centre

Note : • ***Use only the "H" button, depressing other buttons during adjustment may cause adjustment errors.***

(1) Press the MENU button and display the on screen character.
(2) Observe the TV-monitor and centre position of character by pressing the "H" button of the presetting unit.

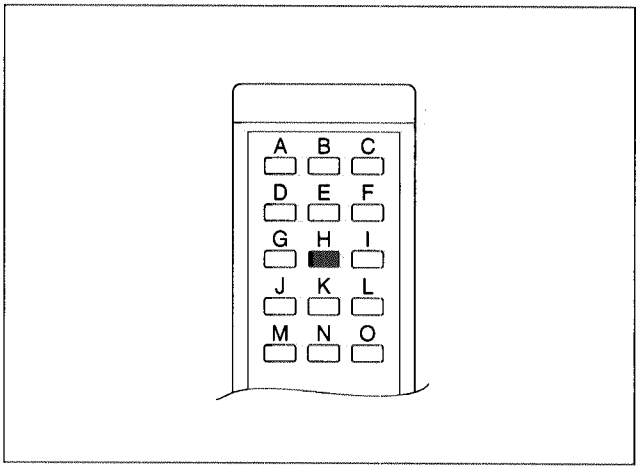


Fig.3-4-1 Presetting unit

3.5 SYSCON CIRCUIT

Notes: • ***Unless otherwise specified,all measurement point and adjustment parts are located on the MAIN BOARD.***
• ***When perform this adjustment,remove the MECHANISM assembly.***

3.5.1 Timer clock

Signal	• No signal
Mode	• EE
Equipment	• Frequency counter
Measurement point	• IC3001-PIN61
Adjustment part	• C3025 (TIMER CLOCK)
Specification	• 1024.008 ± 0.001 Hz [976.5549 ± 0.0010 µsec.]

(1) Connect the frequency counter to IC3001-PIN61.
(2) Connect the short wire between IC3001-PIN24 and Vcc(5V).
(3) Short the leads of capacitor C3026 once in order to reset IC3001.
(4) Disconnect the short wire between IC3001-PIN24 and Vcc then connect it again.
(5) Adjust C3025 trimmer capacitor so that the output from IC3001-PIN61 falls within 1024.008 ± 0.001 Hz (976.5549 ± 0.0010 µsec.) range.

SECTION 4
CHARTS AND DIAGRAMS

NOTES OF SCHEMATIC DIAGRAM

Safety precautions
The Components identified by the symbol ⚠ are critical for safety. For continued safety, replace safety critical components only with manufacturer's recommended parts.

1. Units of components on the schematic diagram

Unless otherwise specified.

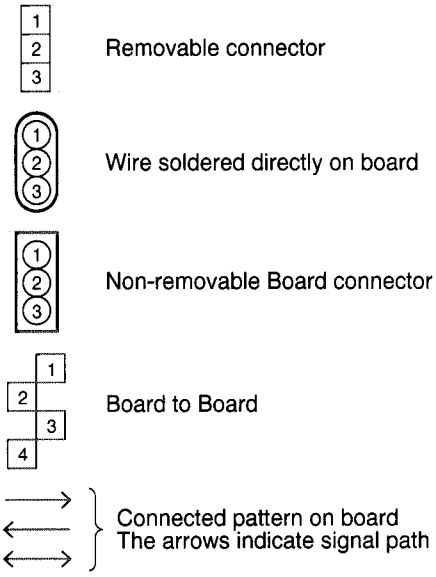
1) All resistance values are in ohm, 1/6 W, 1/8 W (refer to parts list).
   Chip resistors are 1/16 W.
   K: KΩ (1000Ω), M: MΩ (1000KΩ)
2) All capacitance values are in μF, (P: PF).
3) All inductance values are in μH, (m: mH).
4) All diodes are 1SS133, MA165 or 1N4148M (refer to parts list).

2. Indications of control voltage

AUX : Active at high

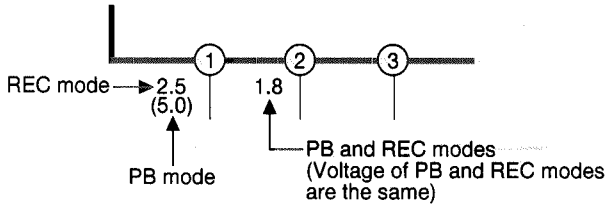
$\overline{\text{AUX}}$ or AUX(L) : Active at low

3. Interpreting Connector indications



4. Voltage measurement

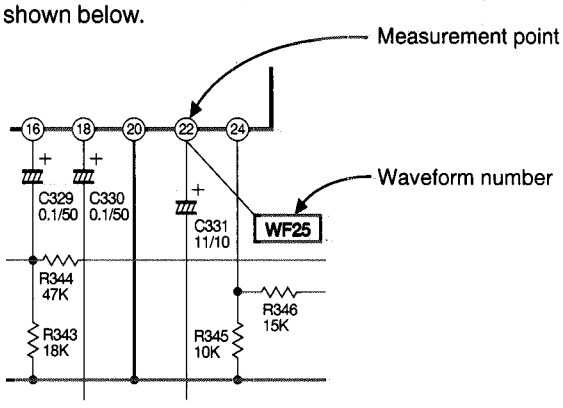
1) Video circuits
   REC : Colour bar signal in SP mode, normal VHS mode
   PB : Alignment tape, colour bar SP mode, normal VHS mode
   — : Unmeasurable or unnecessary to measure
2) Audio circuits
   REC : 1KHz, –8 dBs sine wave signal in SP mode, Normal VHS mode
   PB : REC then playback it
3) Movie Camera circuits
   Measured using a correctly illuminated gray scale or colour bar test charts in the E-E mode
4) Indication on schematic diagram
   Voltage Indications for REC and PB mode on the schematic diagram are as shown below.



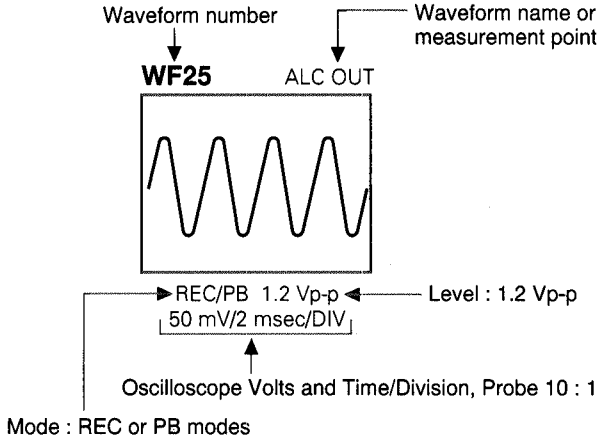
Note: If the voltages are not indicated on the schematic diagram, refer to the voltage charts.

5. Waveform measurement

1) Video circuits
   REC : Colour bar signal in SP mode, normal VHS mode
   PB : Alignment tape, colour bar SP mode, normal VHS mode
2) Audio circuits
   REC : 1KHz, –8 dBs sine wave signal in SP mode, normal VHS mode
   PB : REC then playback it
3) Movie Camera circuits
   Measured using a correctly illuminated gray scale or colour bar test chatrs in the E-E mode
4) Indication on schematic diagram
   Waveform indications on the schematic diagram are as shown below.



5) Waveform indications



6. Signal path Symbols

The arrows indicate the signal path as follows.

Playback signal path

Playback and recording signal path

Recording signal path
(including E-E signal path)

Capstan servo path

Drum servo path

(Example)

R-Y Playback R-Y signal path

Y Recording Y signal path

7. Indication of the parts for adjustments

The parts for the adjustments are surrounded with the circle as shown below.

8. Indication of the parts not mounted on the circuit board

"OPEN" is indicated by the parts not mounted on the circuit board.

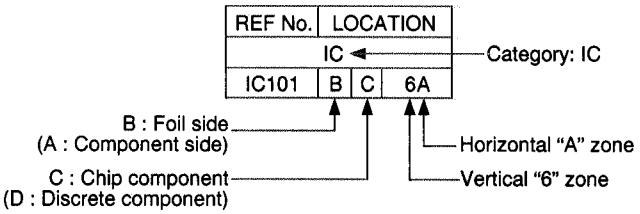
CIRCUIT BOARD NOTES

1. Foil and Component sides

1) Foil side (B side) :
Parts on the foil side seen from foil face (pattern face) are indicated.
2) Component side (A side) :
Parts on the component side seen from component face (parts face) indicated.

2. Parts location guides

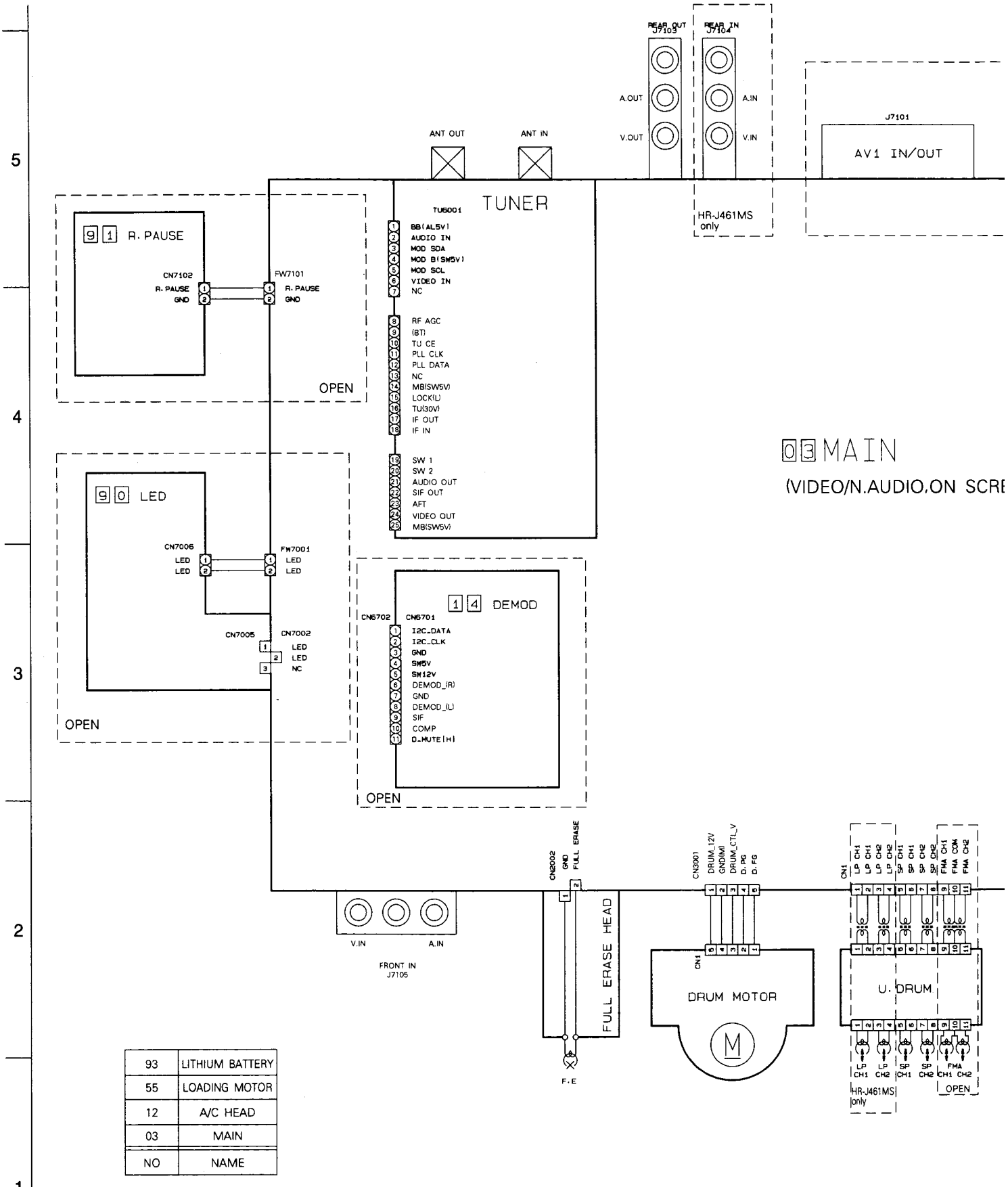
Parts location are indicated by guide scale on the circuit board.



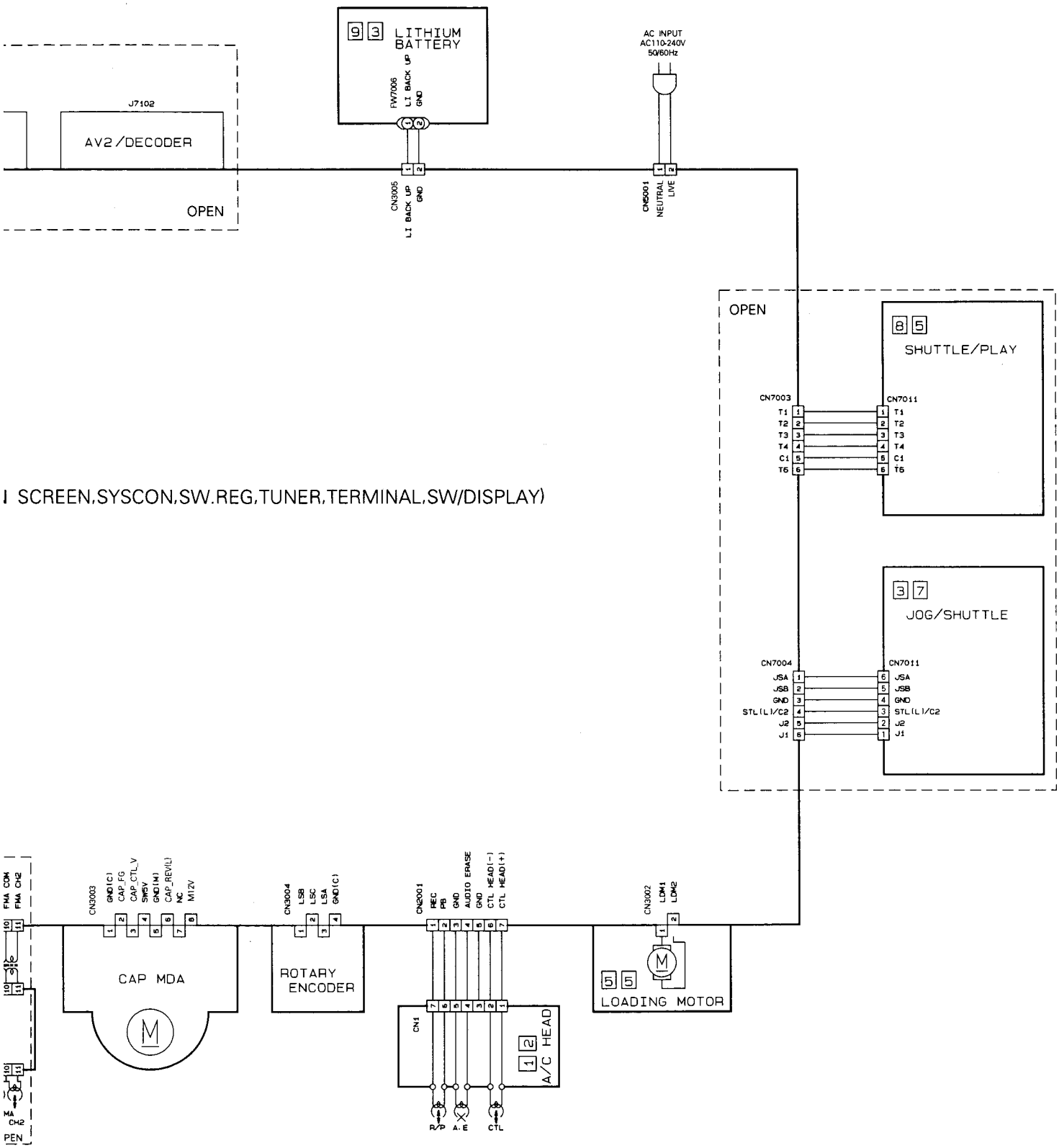
Note:

For general information in service manual, please refer to the Service Manual of GENERAL INFORMATION Edition 4 No. 82054D (January 1994).

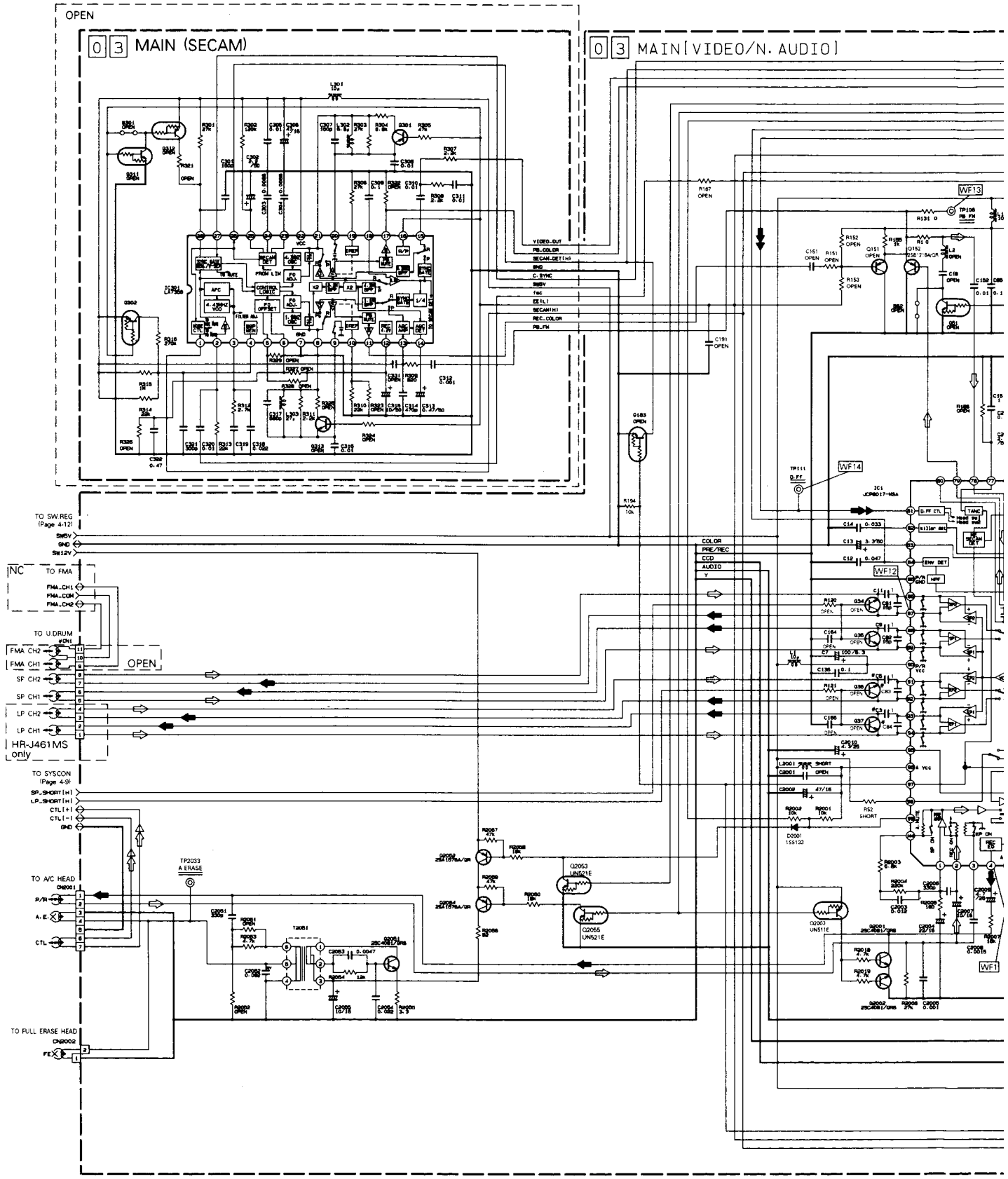
4.1 BOARD INTERCONNECTIONS



NO	NAME
93	LITHIUM BATTERY
55	LOADING MOTOR
12	A/C HEAD
03	MAIN


9 3 LITHIUM BATTERY
FW7006
LI BACK UP
GND
AC INPUT
AC110-240V
50/60Hz
J7102
AV2/DECODER
OPEN
CN3005
LI BACK UP
GND
CN5001
NEUTRAL
LIVE
OPEN
8 5
SHUTTLE/PLAY
CN7003
T1
T2
T3
T4
C1
T6
CN7011
I SCREEN,SYSCON,SW.REG,TUNER,TERMINAL,SW/DISPLAY)
3 7
JOG/SHUTTLE
CN7004
JSA
JSB
GND
STL(L)/C2
J2
J1
CN7011
FMA COM
FMA CH2
CN3003
GND(C)
CAP_FG
CAP_CTL_V
SW5V
GND(M)
CAP_REV(L)
NC
M12V
CAP MDA
CN3004
LSB
LSC
LSA
GND(C)
ROTARY ENCODER
CN2001
REC
PB
GND
AUDIO ERASE
GND
CTL HEAD(-)
CTL HEAD(+)
CN1
1 2
A/C HEAD
R/P
A.E
CTL
CN3002
LDM1
LDM2
5 5
LOADING MOTOR
MA
CH2
PEN

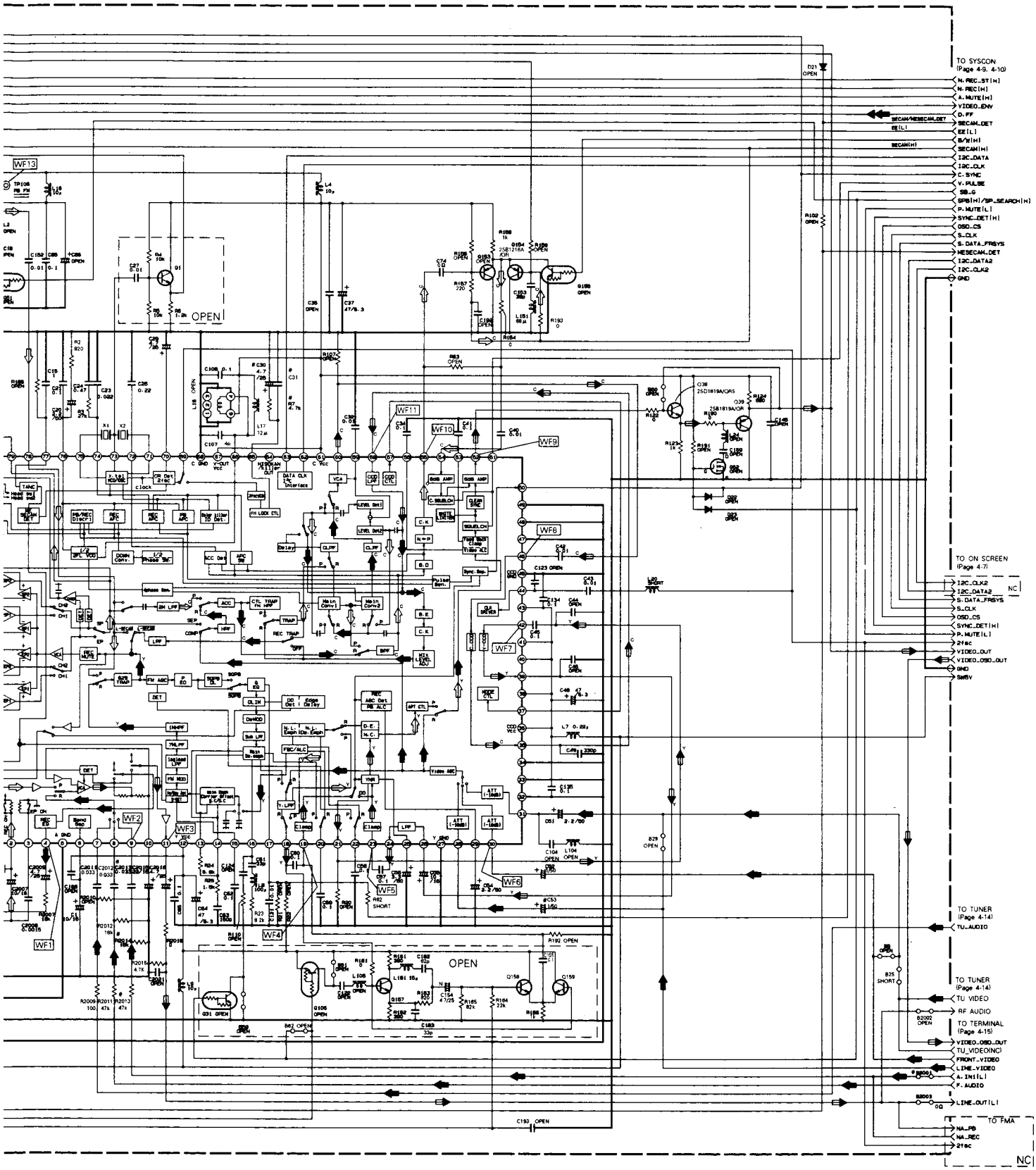
4.2 VIDEO/N.AUDIO SCHEMATIC DIAGRAM



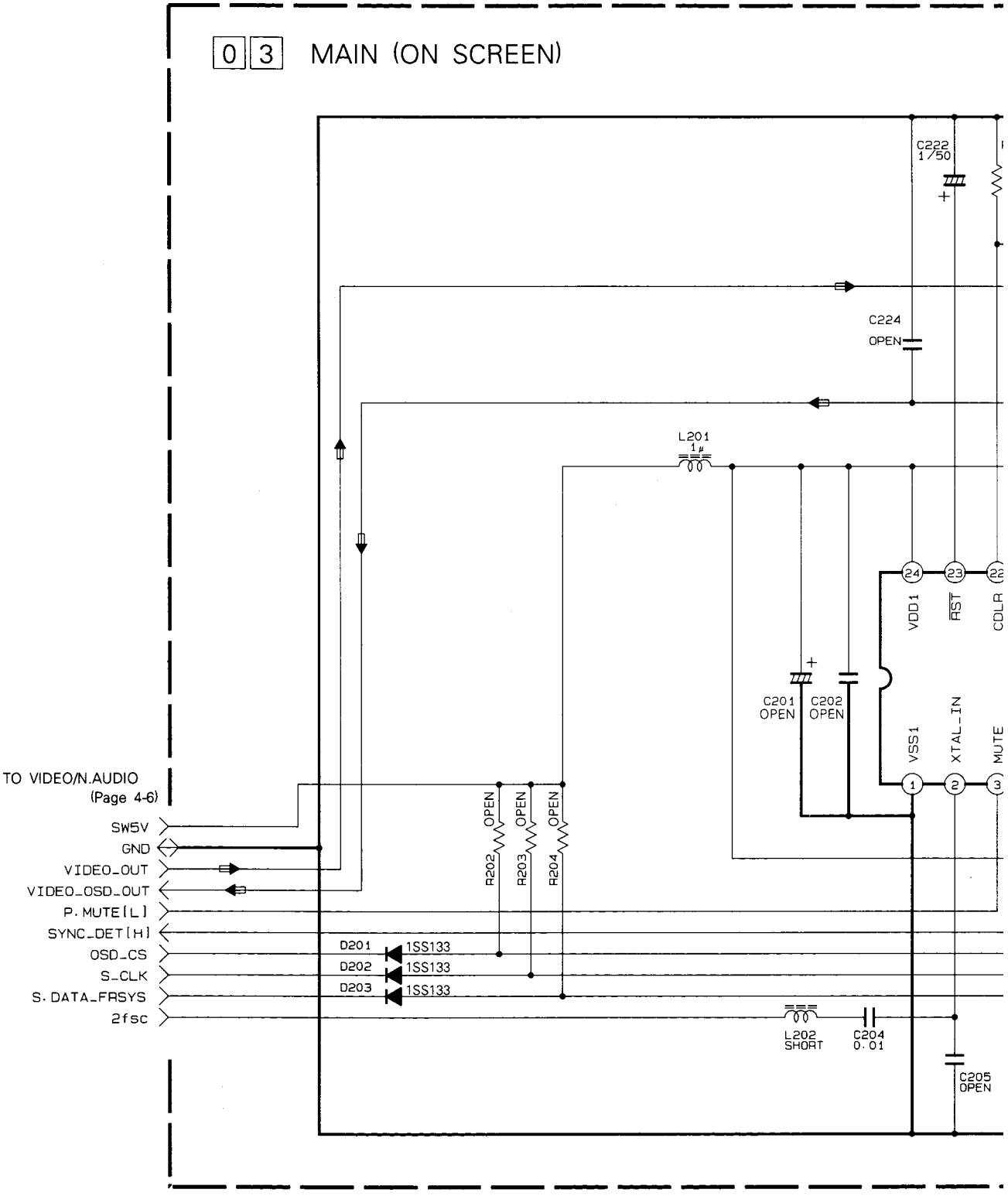
NOTES : 1. For VIDEO/N.AUDIO waveforms, please refer to page 4-19.

2. Comparison chart of models & marks(#).

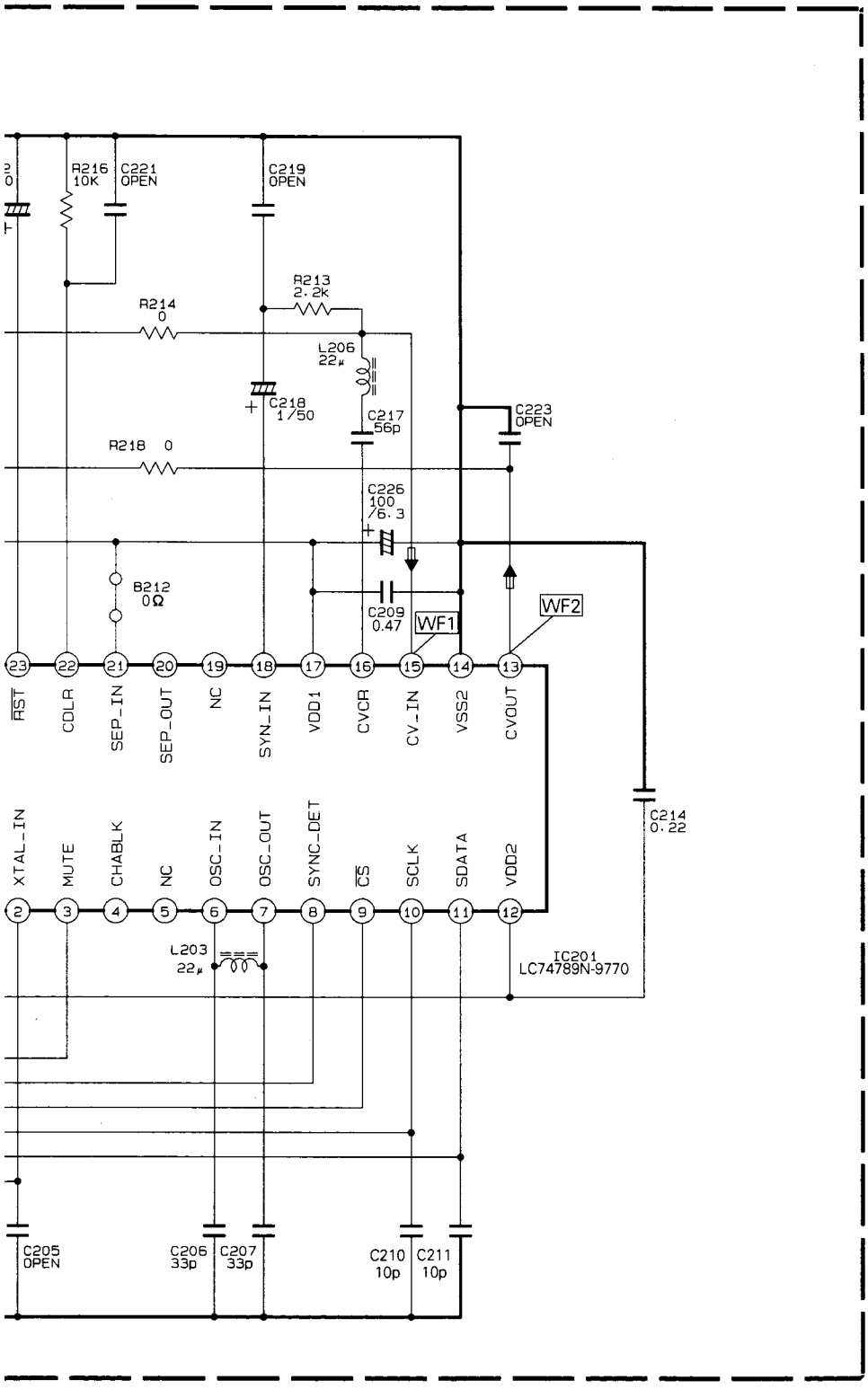
	REF.NO.	CN1	R7	C3.C5.C30	C31	C53	C83.C84	B2001	R2013.R2014	C2013
MODEL	HR-J261MS	PIN5-8 (1-4:NOT USED)	NOT USED	NOT USED	0Ω	NOT USED	0Ω	OPEN	NOT USED	NOT USED
	HR-J461MS	PIN1-8	USED	USED	0.022μF	USED	15pF	SHORT	USED	USED


TO SYSCON
(Page 4-9, 4-10)
N. REC_ST(H)
N. REC(H)
A. MUTE(H)
VIDEO_ENV
D. FF
SECAM_DET
EE(L)
B/W(H)
SECAM(H)
I2C_DATA
I2C_CLK
C. SYNC
V. PULSE
SB_G
SPS(H)/SP_SEARCH(H)
P. MUTE(L)
SYNC_DET(H)
OSD_CS
S_CLK
S. DATA_FRSYS
MESECAM_DET
I2C_DATA2
I2C_CLK2
GND
TO ON SCREEN
(Page 4-7)
I2C_CLK2
I2C_DATA2
S. DATA_FRSYS
S_CLK
OSD_CS
SYNC_DET(H)
P. MUTE(L)
21sc
VIDEO_OUT
VIDEO_OSD_OUT
GND
5V(S)
TO TUNER
(Page 4-14)
TU_AUDIO
TO TUNER
(Page 4-14)
TU_VIDEO
RF AUDIO
TO TERMINAL
(Page 4-15)
VIDEO_OSD_OUT
TU_VIDEO(NC)
FRONT_VIDEO
LINE_VIDEO
A. IN1(L)
F. AUDIO
LINE_OUT(L)
TO FMA
NA_PB
NA_REC
21sc
NC
OPEN
SHORT
WF1
WF2
WF3
WF4
WF5
WF6
WF7
WF9
WF10
WF11
WF13

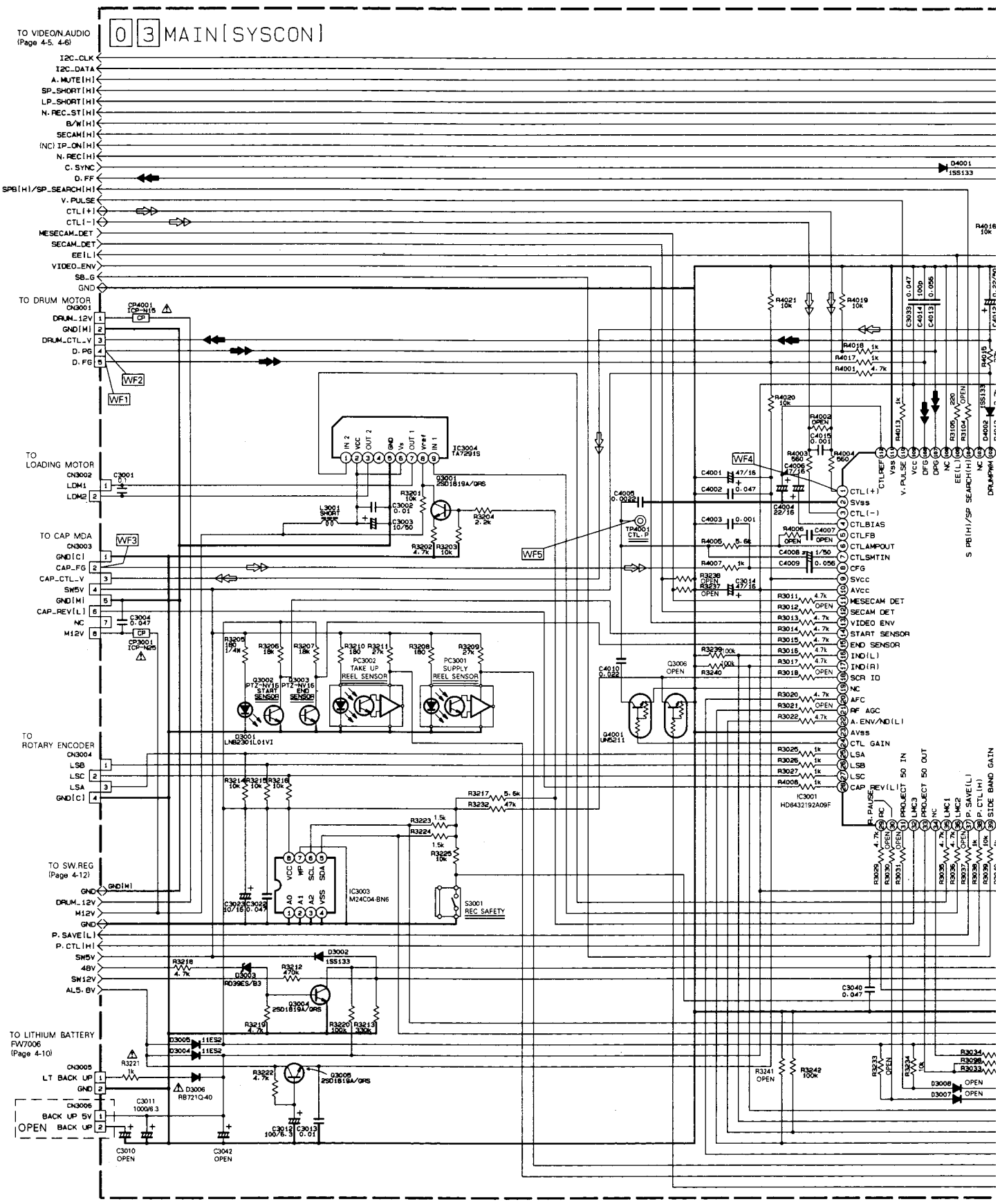
4.3 ON SCREEN SCHEMATIC DIAGRAM



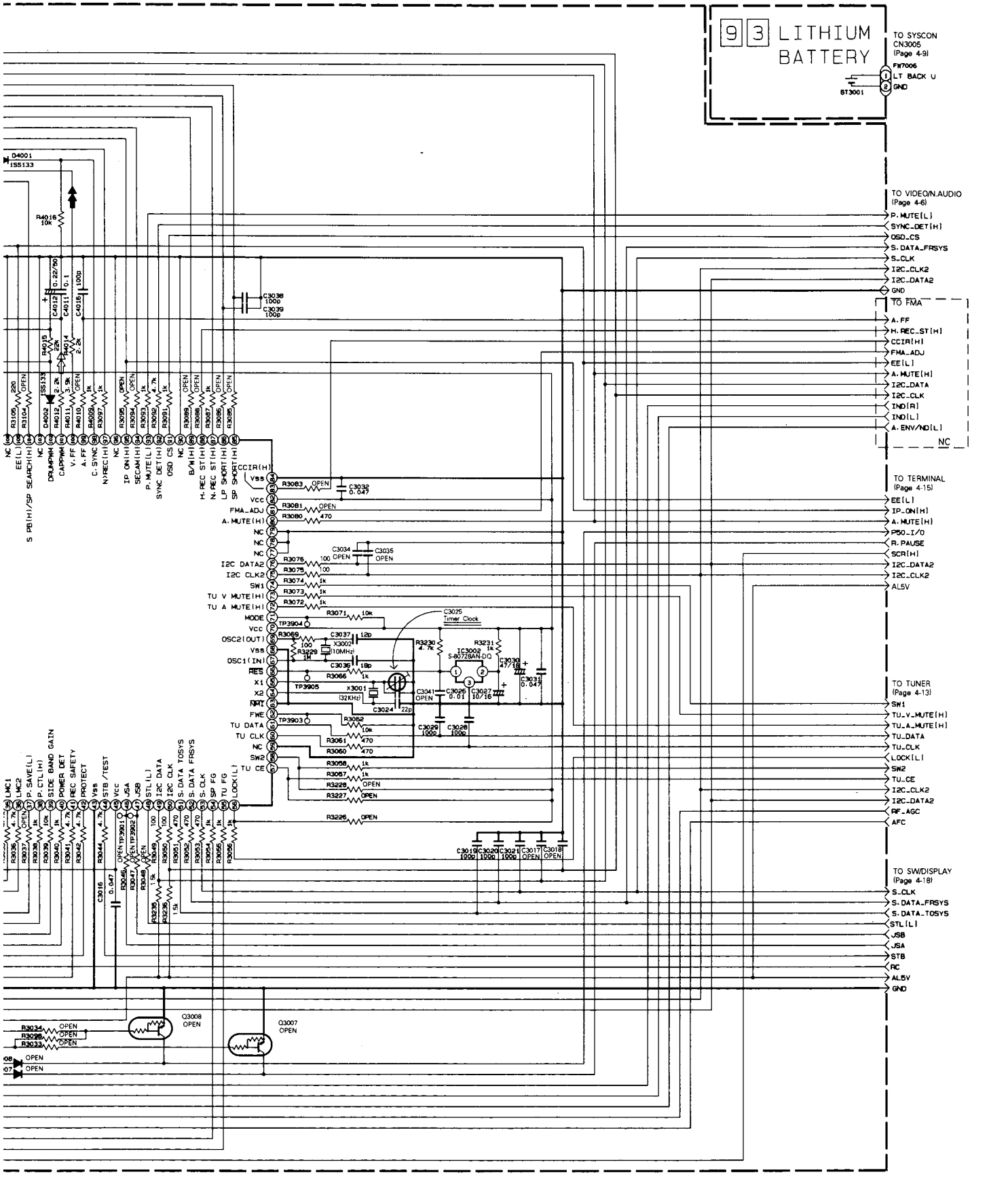
NOTE: For ON SCREEN waveforms, please refer to page 4-19.


R216 10K
C221 OPEN
C219 OPEN
R213 2.2k
R214 0
L206 22μ
C218 1/50
C217 56p
C223 OPEN
R218 0
C226 100 /6.3
B212 0Ω
C209 0.47
WF1
WF2
C214 0.22
RST
CDLR
SEP_IN
SEP_OUT
NC
SYN_IN
VDD1
CVCR
CV_IN
VSS2
CVOUT
XTAL_IN
MUTE
CHABLK
NC
OSC_IN
OSC_OUT
SYNC_DET
CS
SCLK
SDATA
VDD2
L203 22μ
IC201 LC74789N-9770
C205 OPEN
C206 33p
C207 33p
C210 10p
C211 10p

4.4 SYSTEM CONTROL AND LITHIUM BATTERY SCHEMATIC DIAGRAMS

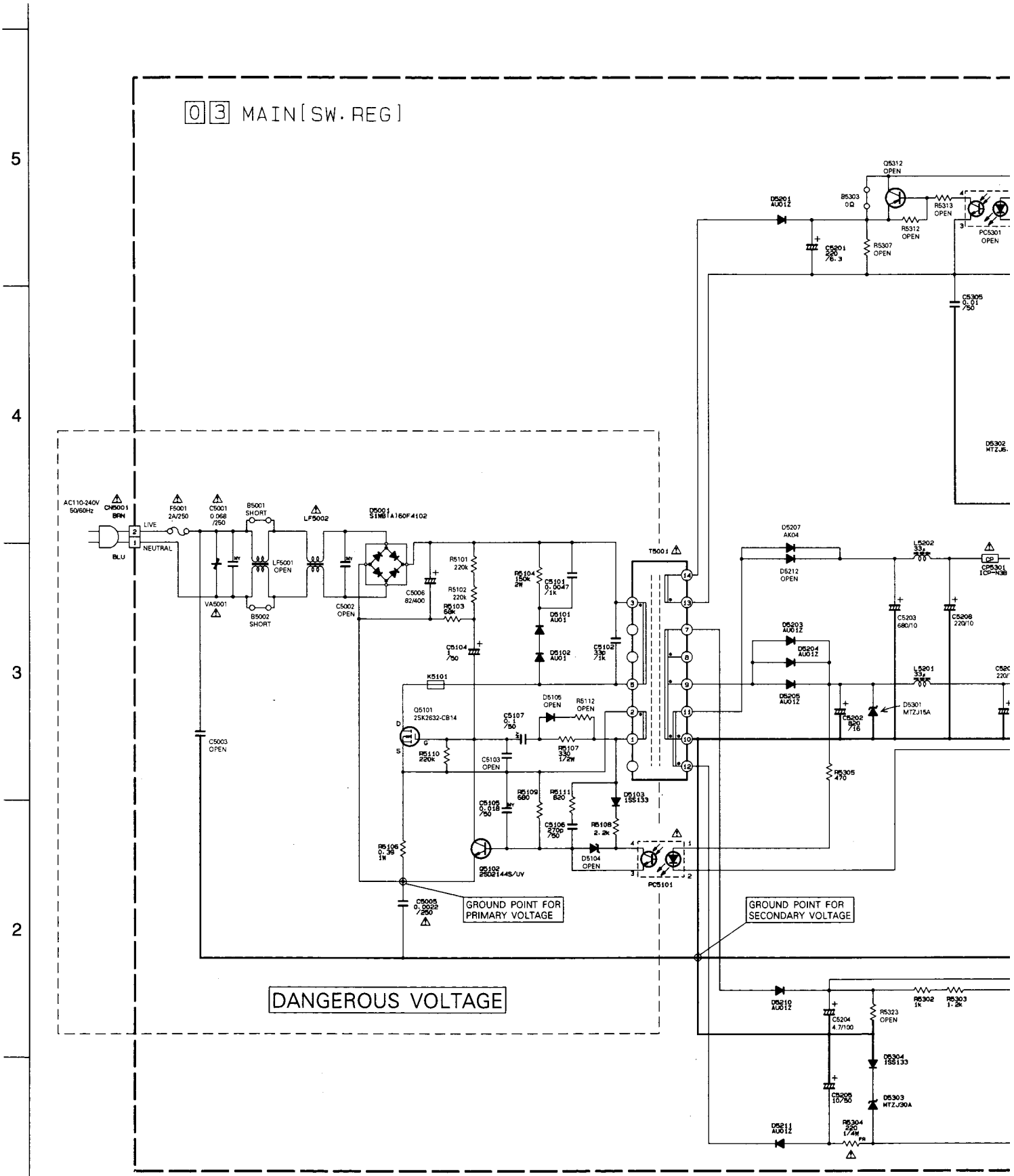


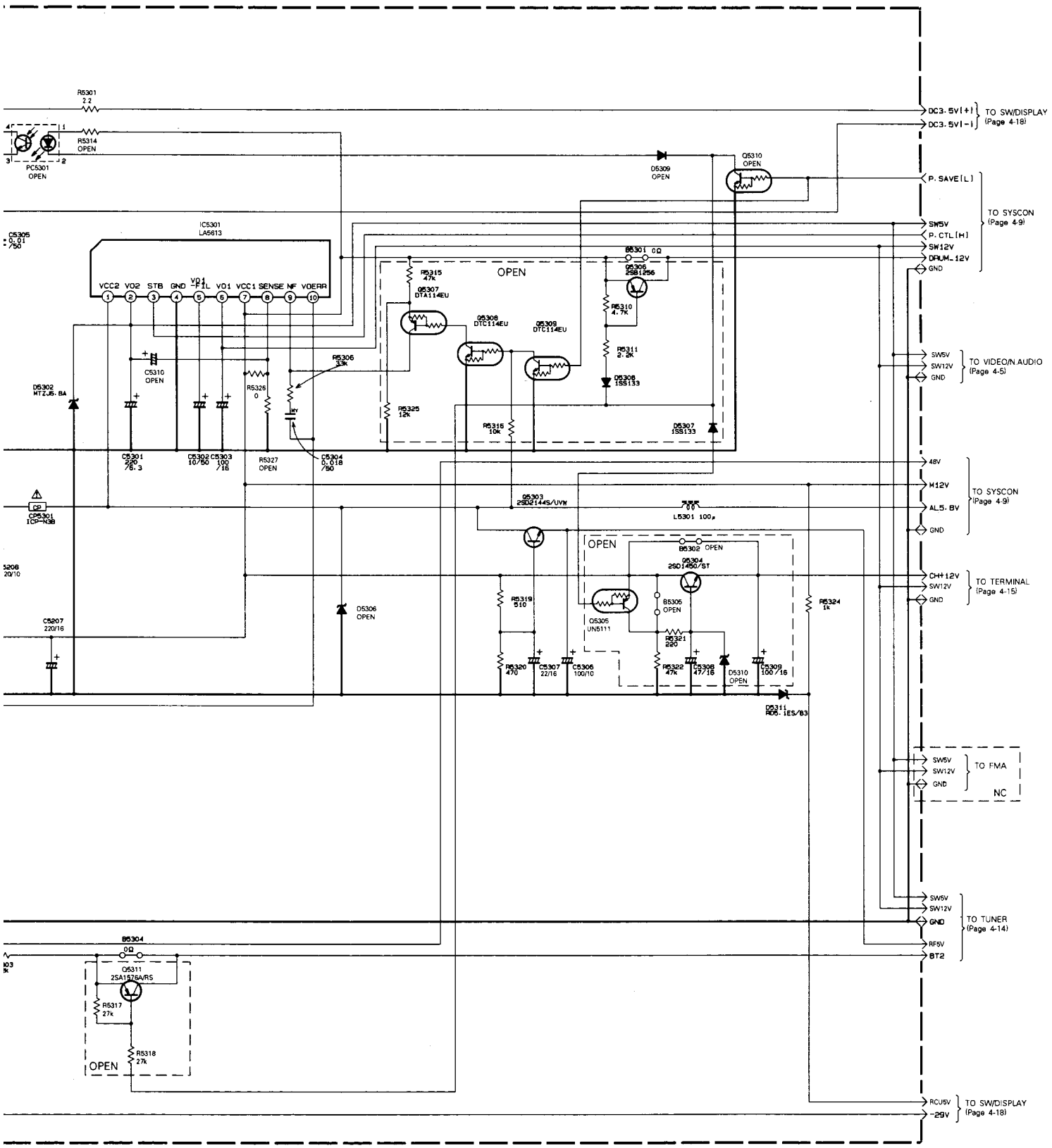
NOTES : 1. For SYSCON waveforms, please refer to page 4-19.
2. The SYSTEM CONTROL circuit of this model has an automatic recognition about the ON-OFF control of the



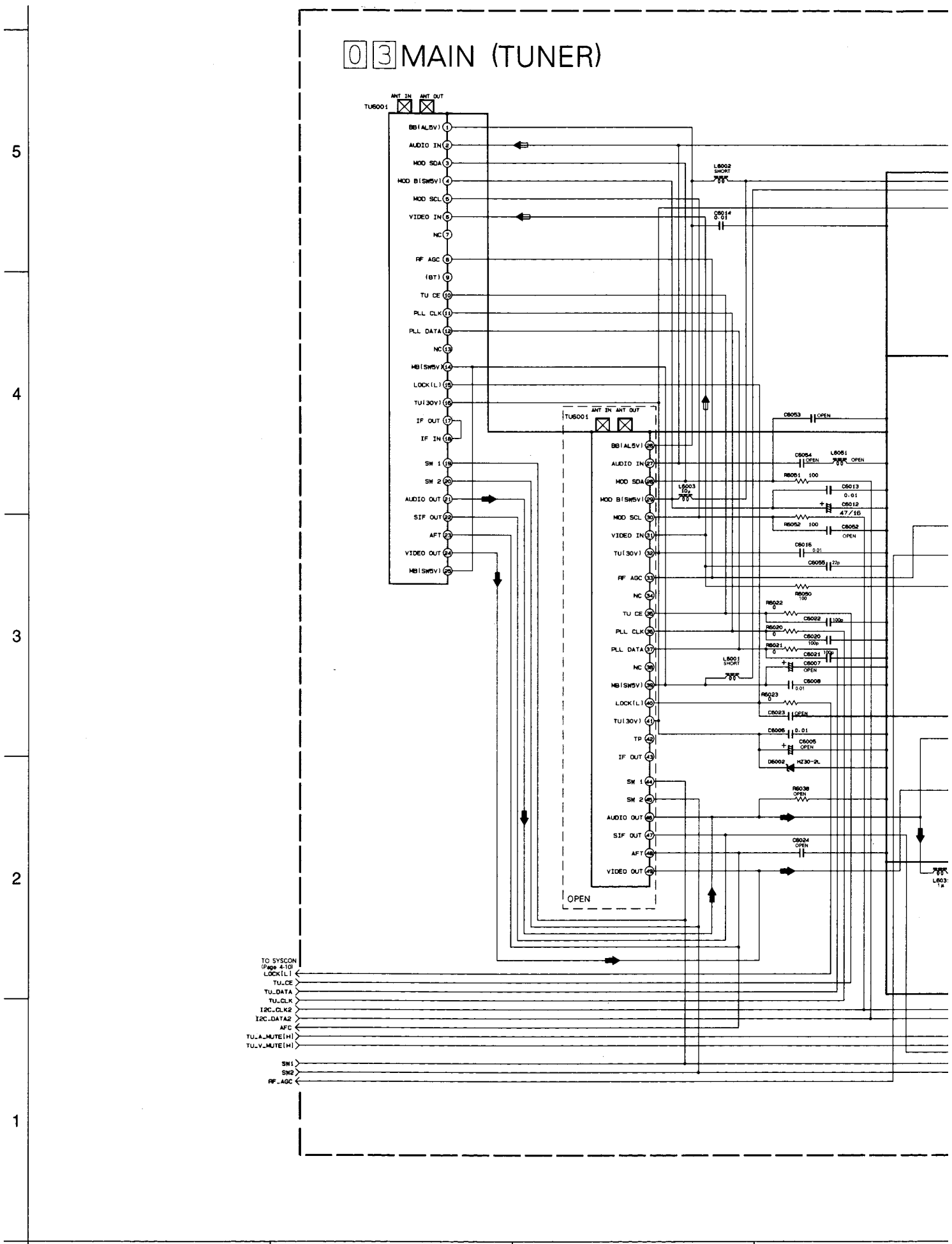
I of the DOCTOR SYSTEM.

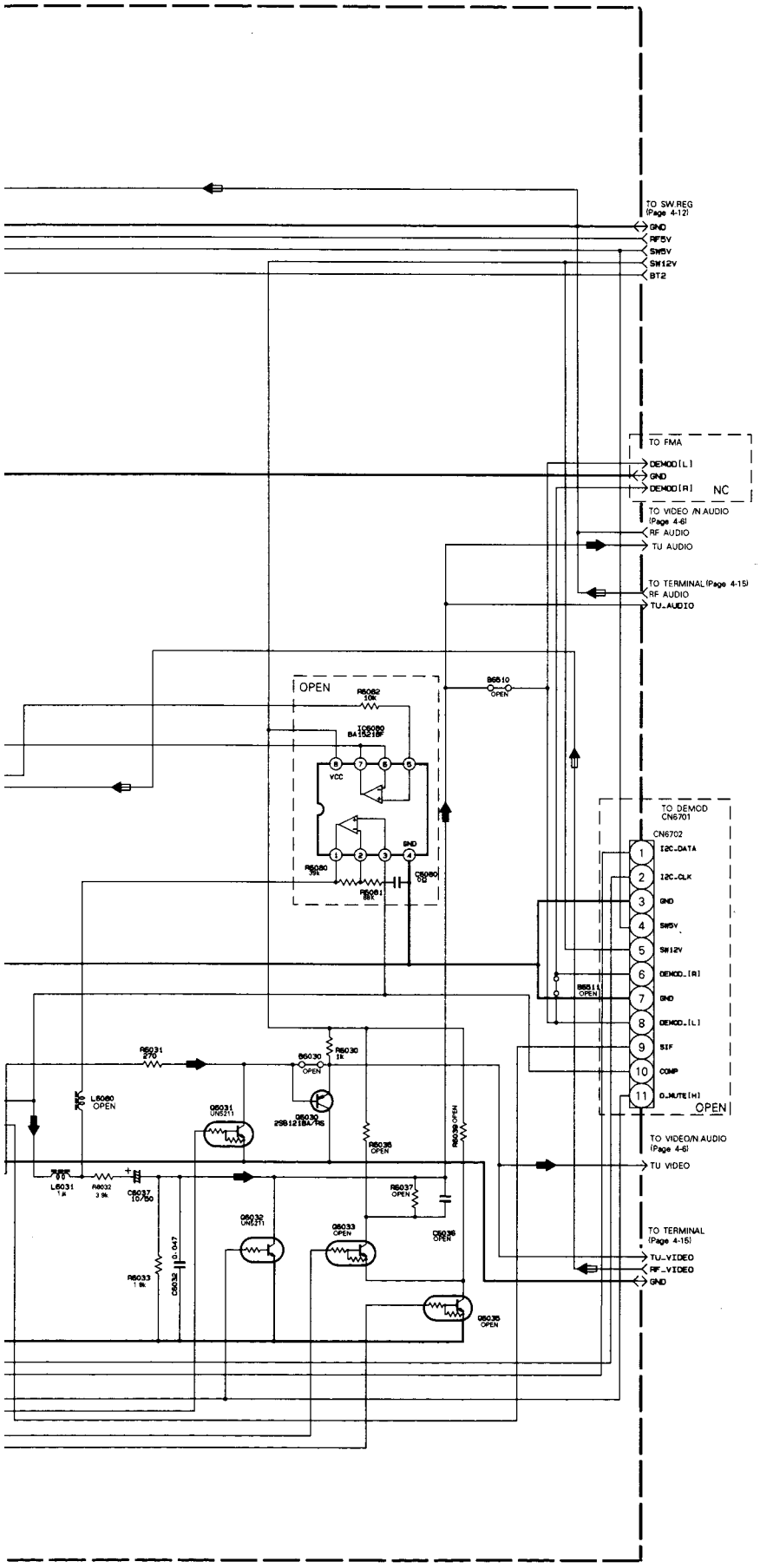
4.5 SWITCHING REGULATOR SCHEMATIC DIAGRAM



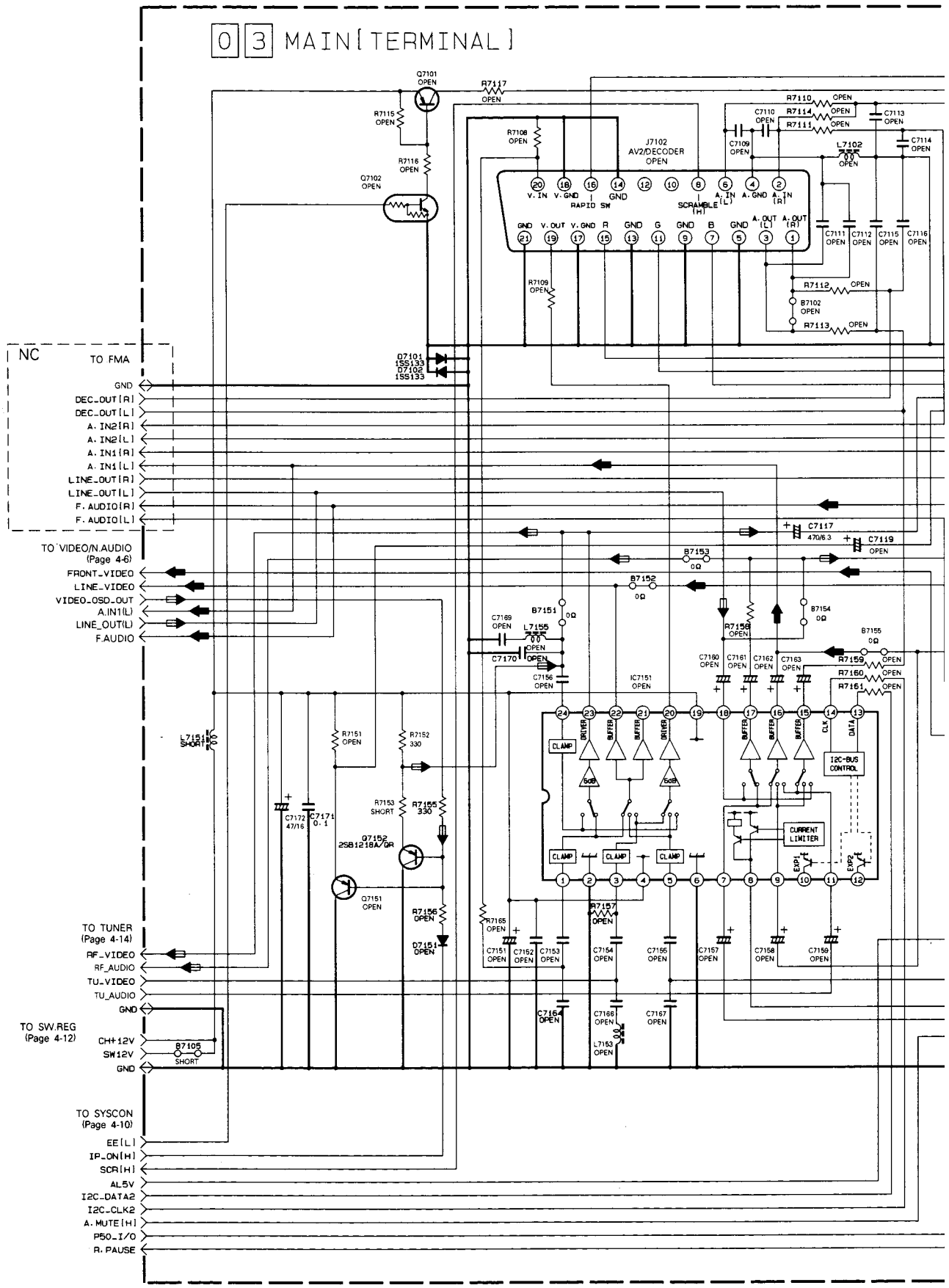

R5301 2.2
R5314 OPEN
PC5301 OPEN
D5309 OPEN
Q5310 OPEN
DC3.5V[+]
DC3.5V[-]
TO SW/DISPLAY (Page 4-18)
P.SAVE[L]
IC5301 LA5613
VCC2 VO2 STB GND VO1 -FIL VO1 VCC1 SENSE NF VOERR
SW5V
P.CTL[H]
SW12V
DRUM_12V
GND
TO SYSCON (Page 4-9)
B5301 0Ω
Q5306 2SB1256
R5310 4.7K
R5311 2.2K
D5308 1SS133
Q5307 DTA114EU
Q5308 DTC114EU
Q5309 DTC114EU
R5315 47K
R5325 12K
R5316 10K
D5307 1SS133
OPEN
C5310 OPEN
R5326 0
R5306 33K
D5302 MTZJ6.8A
C5301 220/6.3
C5302 10/50
C5303 100/16
R5327 OPEN
C5304 0.018/50
SW5V
SW12V
GND
TO VIDEO/N.AUDIO (Page 4-5)
48V
M12V
AL5.8V
GND
TO SYSCON (Page 4-9)
CP5301 ICP-N3B
Q5303 2SD2144S/UVW
L5301 100μ
B5302 OPEN
Q5304 2SD1450/ST
B5305 OPEN
Q5305 UN5111
R5319 510
R5320 470
C5307 22/16
C5306 100/10
R5321 220
R5322 47K
C5308 47/16
D5310 OPEN
C5309 100/16
R5324 1K
D5311 RD5.1ES/B3
C5207 220/16
D5306 OPEN
CH+12V
SW12V
GND
TO TERMINAL (Page 4-15)
SW5V
SW12V
GND
TO FMA
NC
B5304 0Ω
Q5311 2SA1576A/RS
R5317 27K
R5318 27K
OPEN
SW5V
SW12V
GND
RF5V
BT2
TO TUNER (Page 4-14)
RCU5V
-29V
TO SW/DISPLAY (Page 4-18)

4.6 TUNER SCHEMATIC DIAGRAM



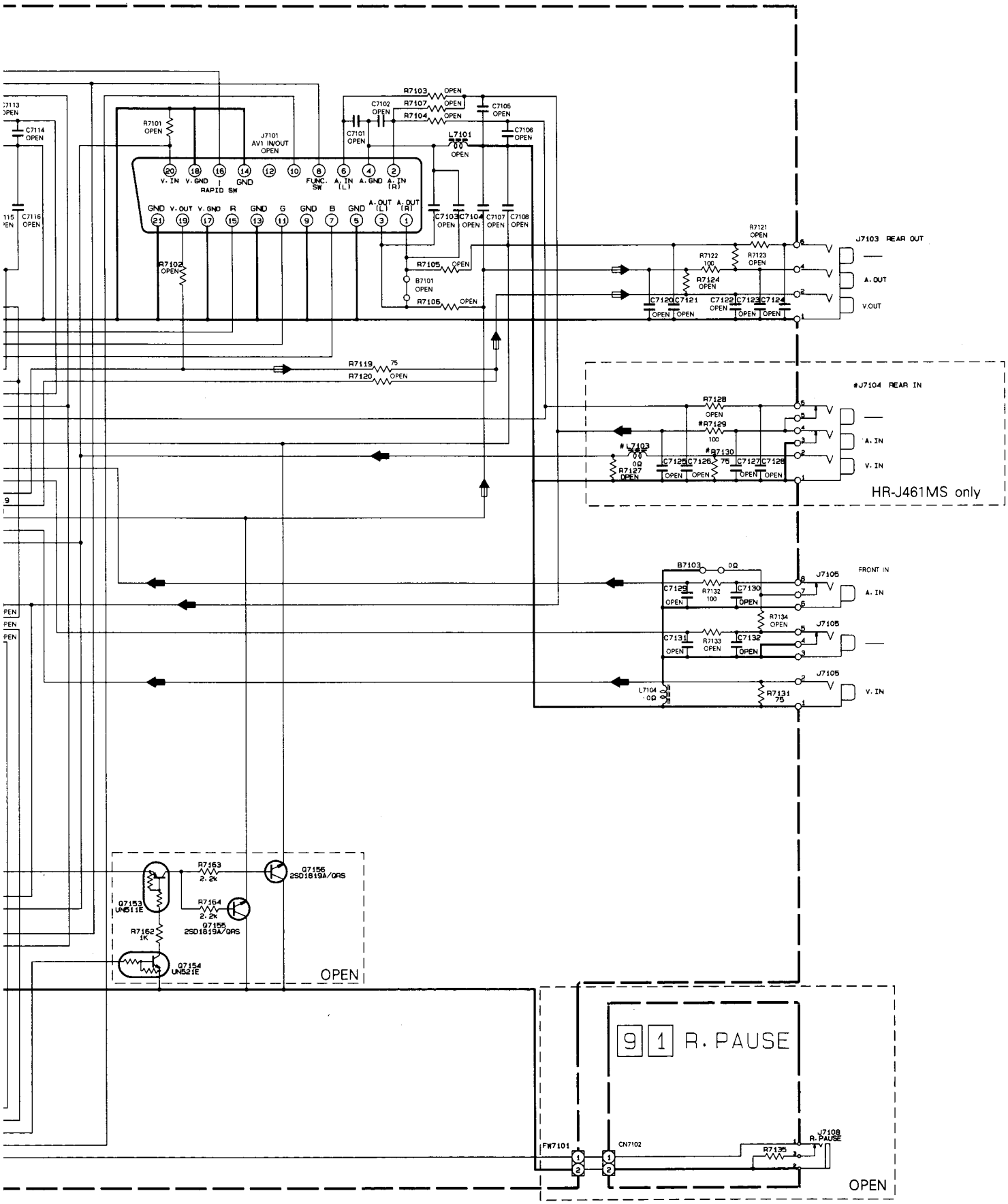

TO SW.REG (Page 4-12)
GND
RF5V
SW5V
SW12V
BT2
TO FMA
DEMOD[L]
GND
DEMOD[R]
NC
TO VIDEO /N AUDIO (Page 4-6)
RF AUDIO
TU AUDIO
TO TERMINAL (Page 4-15)
RF AUDIO
TU_AUDIO
OPEN
R6082 10K
R6080 39K
R6081 88K
C6080 100
VCC
GND
R6510 OPEN
TO DEMOD CN6701
CN6702
1 I2C_DATA
2 I2C_CLK
3 GND
4 SW5V
5 SW12V
6 DEMOD_[R]
7 GND
8 DEMOD_[L]
9 SIF
10 COMP
11 D.MUTE[H]
OPEN
R6511 OPEN
R6031 270
R6030 1K
Q6031 UN5211
Q6030 2SB1218A/RS
L6080 OPEN
R6035 OPEN
R6038 OPEN
L6031 1μ
R6032 3.9K
C6037 10/50
R6037 OPEN
C6036 OPEN
Q6032 UN5211
Q6033 OPEN
R6033 1.8K
C6032 0.047
Q6035 OPEN
TO VIDEO/N AUDIO (Page 4-6)
TU VIDEO
TO TERMINAL (Page 4-15)
TU_VIDEO
RF_VIDEO
GND

4.7 TERMINAL SCHEMATIC DIAGRAM

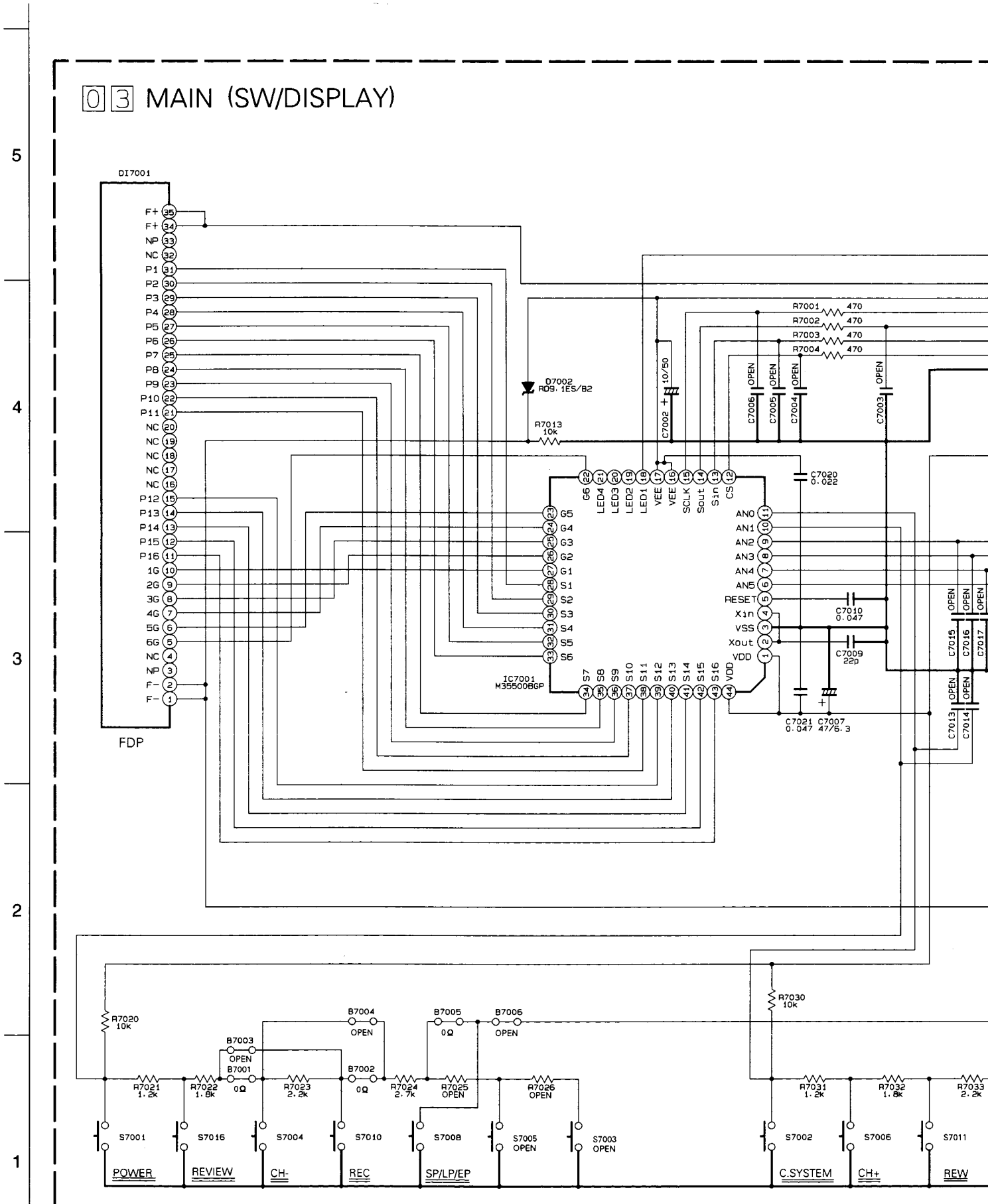


NOTE: COMPARISON CHART OF MODELS & MARKS(#).

MODEL	REF.NO.	R7129,R7130	L7103	J7104
	HR-J261MS	NOT USED	NOT USED	NOT USED
	HR-J461MS	USED	USED	USED

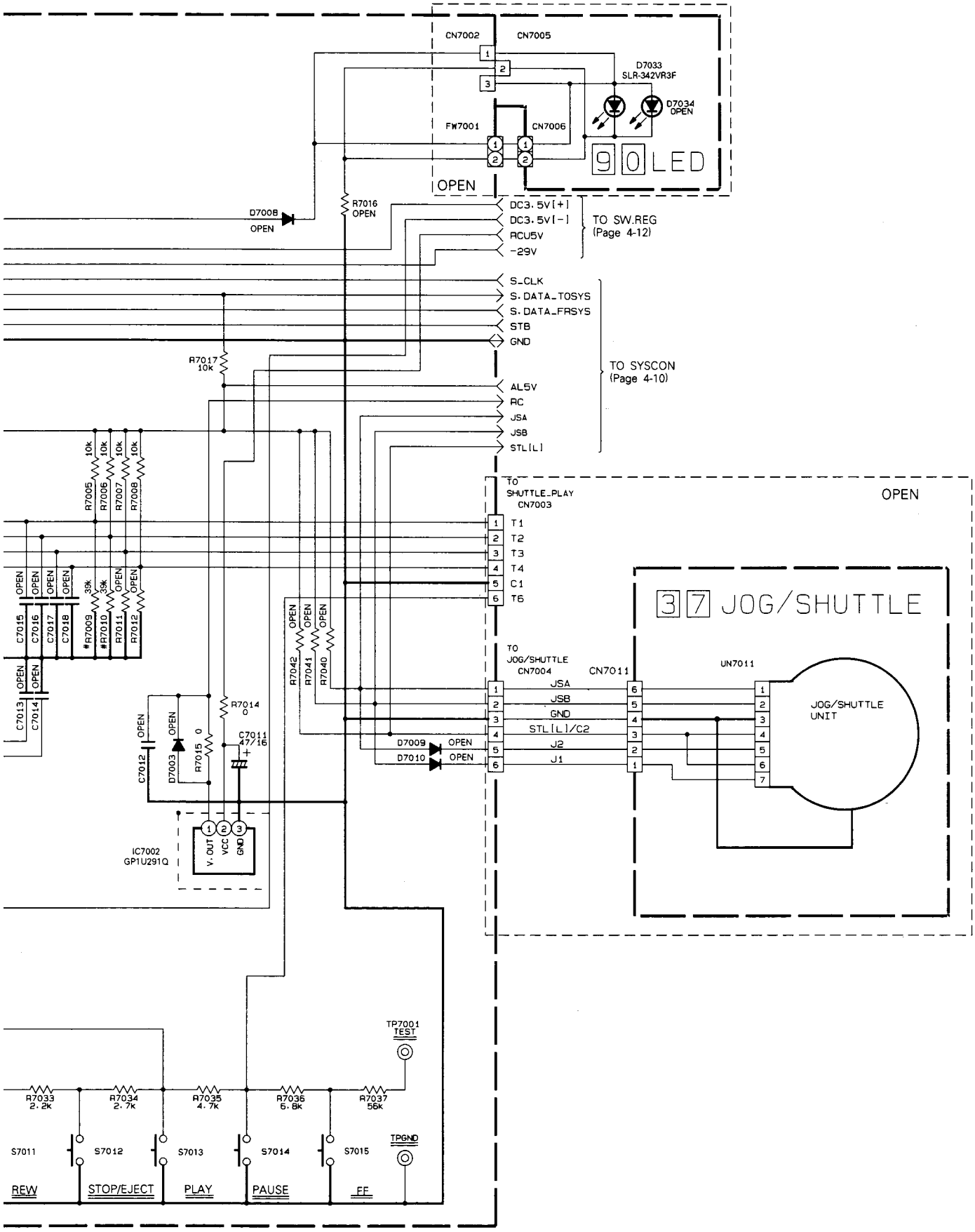

J7101
AV1 IN/OUT
OPEN
V. IN
V. GND
RAPID SW
GND
FUNC. SW
A. IN (L)
A. GND
A. IN (R)
GND
V. OUT
V. GND
R
G
B
A. OUT (L)
A. OUT (R)
R7101 OPEN
R7102 OPEN
R7103 OPEN
R7104 OPEN
R7105 OPEN
R7106 OPEN
R7107 OPEN
R7108 OPEN
R7109 OPEN
R7110 OPEN
R7111 OPEN
R7112 OPEN
R7113 OPEN
R7114 OPEN
R7115 OPEN
R7116 OPEN
R7117 OPEN
R7118 OPEN
R7119 75
R7120 OPEN
C7101 OPEN
C7102 OPEN
C7103 OPEN
C7104 OPEN
C7105 OPEN
C7106 OPEN
C7107 OPEN
C7108 OPEN
L7101 0Ω OPEN
B7101 OPEN
J7103 REAR OUT
R7121 OPEN
R7122 100
R7123 OPEN
R7124 OPEN
C7120 C7121 C7122 C7123 C7124 OPEN
A. OUT
V. OUT
#J7104 REAR IN
R7128 OPEN
#R7129 100
#R7130 75
#L7103 0Ω
R7127 OPEN
C7125 C7126 C7127 C7128 OPEN
A. IN
V. IN
HR-J461MS only
B7103 0Ω
J7105
FRONT IN
C7129 OPEN
R7132 100
C7130 OPEN
R7134 OPEN
C7131 OPEN
R7133 OPEN
C7132 OPEN
L7104 0Ω
R7131 75
A. IN
V. IN
Q7153 UN511E
R7162 1K
R7163 2.2k
R7164 2.2k
Q7154 UN521E
Q7155 2SD1819A/QRS
Q7156 2SD1819A/QRS
OPEN
9 1 R. PAUSE
FW7101
CN7102
J7108
R. PAUSE
R7135
OPEN

4.8 SWITCH/DISPLAY SCHEMATIC DIAGRAM



NOTE: Comparison chart of models & marks(#).

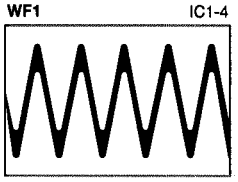
	REF.NO.	R7009	R7010
MODEL	HR-J261MS	USED	NOT USED
	HR-J461MS	NOT USED	USED


CN7002
CN7005
D7033
SLR-342VR3F
D7034
OPEN
FW7001
CN7006
9 0 LED
OPEN
D7008
OPEN
R7016
OPEN
DC3.5V[+]
DC3.5V[-]
RCU5V
-29V
TO SW.REG
(Page 4-12)
S_CLK
S.DATA_TOSYS
S.DATA_FRSYS
STB
GND
TO SYSCON
(Page 4-10)
R7017
10k
AL5V
RC
JSA
JSB
STL[L]
R7005
R7006
R7007
R7008
10k
TO
SHUTTLE_PLAY
CN7003
OPEN
T1
T2
T3
T4
C1
T6
3 7 JOG/SHUTTLE
TO
JOG/SHUTTLE
CN7004
CN7011
UN7011
JSA
JSB
GND
STL[L]/C2
J2
J1
JOG/SHUTTLE
UNIT
C7015
C7016
C7017
C7018
C7013
C7014
OPEN
#R7009
#R7010
R7011
R7012
33k
R7042
R7041
R7040
R7014
0
C7012
D7003
R7015
C7011
47/16
D7009
D7010
IC7002
GP1U291Q
V.OUT
VCC
GND
TP7001
TEST
R7033
2.2k
R7034
2.7k
R7035
4.7k
R7036
6.8k
R7037
56k
S7011
S7012
S7013
S7014
S7015
TPGND
REW
STOP/EJECT
PLAY
PAUSE
FF

WAVEFORMS

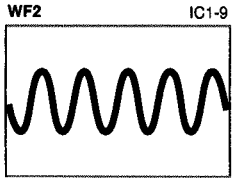
— VIDEO/N.AUDIO —

WF1 IC1-4



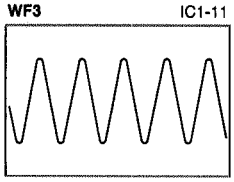
REC 1.2 Vp-p
20 mV/0.5 msec/DIV

WF2 IC1-9



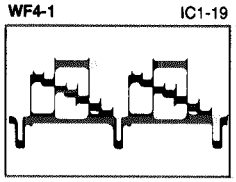
REC 0.17 Vp-p
5 mV/0.5 msec/DIV

WF3 IC1-11



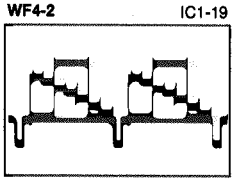
PB 0.9 Vp-p
20 mV/0.5 msec/DIV

WF4-1 IC1-19



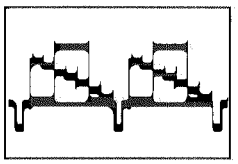
REC 0.5 Vp-p
20 mV/20 µsec/DIV

WF4-2 IC1-19



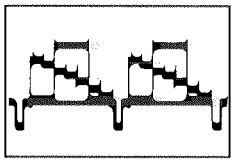
PB 0.56 Vp-p
20 mV/20 µsec/DIV

WF5-1 IC1-23



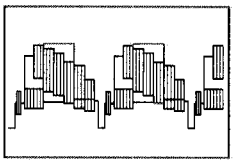
REC 0.47 Vp-p
20 mV/20 µsec/DIV

WF5-2 IC1-23



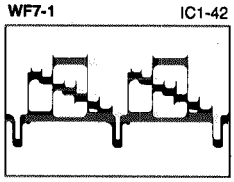
PB 0.54 Vp-p
20 mV/20 µsec/DIV

WF6 IC1-30



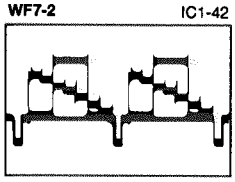
REC 0.88 Vp-p
50 mV/20 µsec/DIV

WF7-1 IC1-42



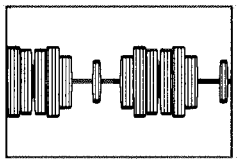
REC 0.4 Vp-p
10 mV/20 µsec/DIV

WF7-2 IC1-42



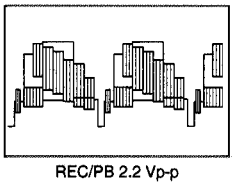
PB 0.46 Vp-p
10 mV/20 µsec/DIV

WF8 IC1-46



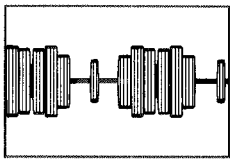
REC/PB 0.4 Vp-p
10 mV/20 µsec/DIV

WF9 IC1-52



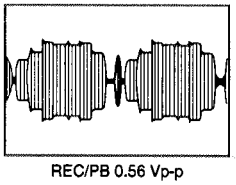
REC/PB 2.2 Vp-p
0.1 V/20 µsec/DIV

WF10 IC1-55



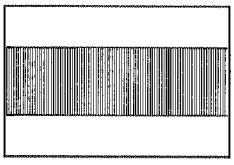
PB 0.58 Vp-p
20 mV/20 µsec/DIV

WF11 IC1-58



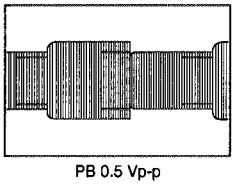
REC/PB 0.56 Vp-p
20 mV/20 µsec/DIV

WF12 IC1-87



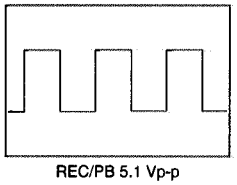
REC 1.8 Vp-p
50 mV/1 msec/DIV

WF13 TP106 PB FM



PB 0.5 Vp-p
20 mV/1 msec/DIV

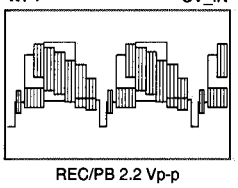
WF14 TP111 D.FF



REC/PB 5.1 Vp-p
0.2 V/10 msec/DIV

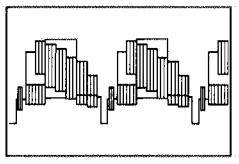
— ON SCREEN —

WF1 IC201-15 CV_IN



REC/PB 2.2 Vp-p
50 mV/20 µsec/DIV

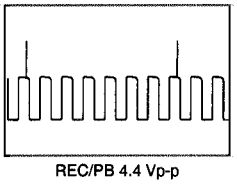
WF2 IC201-13 CVOUT



REC/PB 2.2 Vp-p
50 mV/20 µsec/DIV

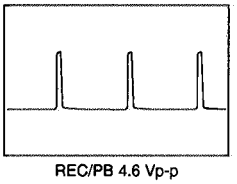
— SYSCON —

WF1 CN3001-5 D.FG



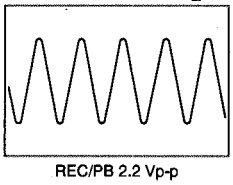
REC/PB 4.4 Vp-p
0.2 V/5 msec/DIV

WF2 CN3001-4 D.PG



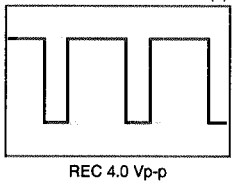
REC/PB 4.6 Vp-p
0.2 V/10 msec/DIV

WF3 CN3003-2 CAP_FG



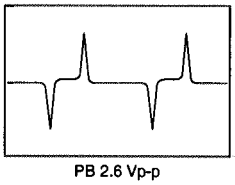
REC/PB 2.2 Vp-p
50 mV/0.5 msec/DIV

WF4 IC3001-1 CTL(+)



REC 4.0 Vp-p
0.1 V/10 msec/DIV

WF5 TP4001 CTL.P



PB 2.6 Vp-p
50 mV/10 msec/DIV

COMPONENT PARTS LOCATION GUIDE <MAIN>

REF.NO.	LOCATION
CAPACITOR	
C1	A D 11N
C3	B C 13O
C5	B A 13N
C7	B A 12O
C9	B C 13N
C11	B C 13N
C12	B C 13M
C13	B A 13M
C14	B C 13M
C16	B B 13L
C18	B C 14L
C20	B A 13K
C21	B C 13K
C23	B C 13K
C24	B C 14K
C25	B B 14K
C27	B C 13L
C29	B A 13J
C30	B C 13K
C31	A B 12L
C32	A C 12K
C34	B A 11K
C36	B C 12L
C37	B A 12K
C40	A B 12K
C41	B B 11L
C42	B C 10J
C43	B B 11K
C44	B C 11K
C45	B B 11L
C46	B C 10K
C48	B A 11L
C49	B C 10L
C51	B A 10L
C52	B C 10L
C53	B A 10L
C54	B C 10M
C55	B A 10M
C56	B C 10M
C57	B A 10M
C58	B C 10L
C59	B B 9M
C60	B C 9M
C61	B B 10N
C62	B C 10N
C63	B B 10N
C64	B C 10N
C65	A B 11N
C74	A C 12K
C81	B B 13N
C82	B C 13N
C83	B B 13N
C84	B C 13N
C85	B B 14L
C86	B C 14L
C104	A B 10L
C107	B C 12L
C108	B B 12L
C121	B B 9M
C122	B C 9L
C123	B B 11K
C124	B C 10N
C134	B B 11L
C135	B C 11L
C136	B B 12N
C145	B C 11K
C151	B B 6I
C152	B C 13M
C153	B A 12J
C154	B C 9L
C155	B B 9K
C164	B C 13N
C165	B B 14N
C168	B C 11N
C169	B B 11K
C182	B C 9L
C183	B B 9L
C191	B C 9I
C192	B B 12J
C193	B C 9K
C201	A B 20F
C202	B C 19G
C204	B B 19F
C206	B C 19G
C207	B B 19G
C209	B C 19G
C210	B B 18G
C211	B C 18G
C212	B B 18G
C213	B C 17G
C214	A B 18G
C215	B C 18G
C216	B A 18G
C217	B C 19G
C218	B A 19G
C219	B C 19H
C221	B A 19G
C222	B C 19H
C223	B A 18H
C224	B C 18H
C225	B A 17H
C226	B C 18H
C227	B A 18G
C228	B C 17G
C301	A B 8J
C302	B C 7K
C303	B A 7J
C304	B C 7J
C305	B A 7J
C306	B C 6K
C307	B A 7K
C308	B C 7J
C309	B B 7J
C310	B C 6K
C311	B B 7K
C312	B C 6J
C313	B A 6J
C314	B C 6J
C315	B A 6I
C316	B C 7J
C317	B B 7I
C318	B C 8J
C319	B B 8I
C320	B C 8J
C321	B B 7J
C322	B C 7J
C331	B B 6J
C2001	A C 12N
C2002	A B 12O
C2003	A C 12N
C2004	A D 11O
C2005	B C 11O
C2006	A D 12N
C2007	B A 12O
C2008	B C 12O
C2009	A D 11O
C2010	A D 12N
C2011	B C 11N
C2012	B C 11N
C2013	B C 11N
C2015	A D 10N
C2016	A D 10O
C2021	B C 10O
C2051	B A 9O
C2052	A C 9N
C2053	B C 8M
C2054	B C 9M
C2055	A D 8N
C2151	B C 15J
C2152	B A 15K
C2201	A D 17M
C2202	A D 17M
C2203	A D 17N
C2204	A D 16N
C2205	A D 16N
C2206	A D 16O
C2207	A D 15O
C2208	A D 15O
C2209	A D 16O
C2210	A D 15K
C2211	A D 15L
C2212	A D 15L
C2213	A D 15K
C2214	B C 15L
C2215	A D 15L
C2216	A D 15K
C2217	A D 16K
C2218	A D 16L
C2219	A D 16L
C2220	A D 16L
C2221	A D 17L
C2222	A D 17L
C2223	B C 17L
C2224	B C 17L
C2225	A D 17L
C2226	A D 17M
C2227	A D 17L
C2230	B C 16N
C2231	B C 15N
C2232	A D 15M
C2233	B C 15M
C2234	B C 15M
C2251	B C 15N
C2252	B C 15N
C2253	B C 15N
C2254	B C 15N
C2255	B C 15N
C2256	B C 14N
C2257	B C 15N
C2258	B C 15N
C2259	B C 14N
C2260	B C 14M
C2261	B C 14N
C3001	B C 7N
C3002	A C 6M
C3003	A C 6M
C3004	B C 6L
C3010	A C 2D
C3011	A C 2D
C3012	A C 4D
C3013	A C 5D
C3014	A C 8F
C3016	B C 11E
C3017	B C 10D
C3018	B C 11D
C3019	B C 11D
C3020	B C 12D
C3021	B C 12D
C3022	B C 16E
C3023	A C 16E
C3024	B C 14D
C3025	A C 14D
C3026	B C 15E
C3027	A C 15E
C3028	B C 14D
C3029	B C 14D
C3030	A C 15D
C3031	B C 13E
C3032	B C 14F
C3033	B C 13G
C3034	B C 15E
C3035	B C 15E
C3036	B C 14E
C3037	B C 14D
C3038	B C 14F
C3039	B C 14F
C3040	B C 9D
C3041	B C 14D
C3042	A C 5N
C4001	A C 8G
C4002	A C 11G
C4003	A C 9G
C4004	A C 8F
C4005	A C 8F
C4006	A C 9F
C4007	A C 9F
C4008	A C 9F
C4009	A C 9G
C4010	B C 7F
C4011	A C 12G
C4012	A C 13G
C4013	A C 13G
C4014	A C 13G
C4015	A C 12G
C4016	A C 13G
C5001	A C 3P
C5002	A C 1N
C5003	A C 4P
C5005	A C 1L
C5006	A C 2M
C5101	A C 3K
C5102	A C 3K
C5103	A C 2L
C5104	A C 3L
C5105	A C 2K
C5106	A C 3M
C5107	A C 2K
C5201	A C 1I
C5202	A C 2H
C5203	A C 2G
C5204	A C 3H
C5205	A C 1H
C5207	A C 2F
C5208	A C 2F

REF.NO.	LOCATION
CONNECTOR	
CN1	A D 14O
CN2001	A D 9O
CN2002	A D 19L
CN3001	A D 9P
CN3002	A D 7N
CN3003	A D 7L
CN3004	A D 9F
CN3005	A D 10P
CN3006	A D 3D
CN5001	A D 1P
CN6702	A D 22F
CN7002	A D 13O
CN7004	A D 2C
DIODE	
D21	A D 8H
D22	A D 11K
D23	A D 11J
D201	A D 16G
D202	A D 16G
D203	A D 16G
D2001	A D 7M
D2201	A D 15K
D2251	A D 15G
D3001	A D 12H
D3002	A D 6F
D3003	A D 8D
D3004	A D 5C
D3005	A D 6C
D3006	A D 7F
D3007	A D 10E
D3008	A D 10E
D4001	A D 14H
D4002	A D 14G
D5001	B C 2M
D5101	A D 3K
D5102	A D 3K
D5103	A D 3L
D5104	A D 3M
D5105	A D 2K
D5201	A D 1I
D5203	A D 3I
D5204	A D 2I
D5205	A D 3I
D5207	A D 2I
D5210	A D 3I
D5211	A D 2H
D5212	A D 2I
D5301	A D 2L
D5302	A D 2F
D5303	A D 1F
D5304	A D 1F
D5306	A D 2L
D5307	A D 3H
D5308	A D 3F
D5309	A D 4D
D5310	A D 4H
D5311	A D 5D
D6002	A D 21M
D7002	A D 14A
D7003	A D 9B
D7008	A D 15B
D7009	A D 5B
D7010	A D 5B
D7101	A D 17O
D7102	A D 17O
D7151	A D 19M
IC	
IC1	B C 12M
IC201	A D 19F
IC301	A D 8J
IC2201	B C 16M
IC3001	B C 13F
IC3002	B C 15E
IC3003	A D 16E
IC3004	A D 7M
IC5301	A D 1E
IC6080	B C 22J
IC7001	B C 12B
IC7002	A D 8A
IC7151	A D 20K
JACK	
J7101	A D 16P
J7102	A D 12P
J7103	A D 21P
J7104	A D 20P
J7105	A D 20A
COIL	
L1	A D 12O
L2	A D 14L
L4	A D 14J
L7	A D 10K
L8	A D 10N
L9	A D 9O
L16	A D 14L
L17	A D 13L
L18	A D 13K
L20	A D 10K
L24	A D 11K
L104	A D 10L
L106	A D 9L
L151	A D 12J
L181	A D 9L
L201	A D 18F
L202	A D 19E
L203	A D 19F
L204	A D 17G
L206	A D 19H
L301	A D 6K
L302	A D 7K
L303	A D 7J
L2001	A D 12O
L2201	A D 15K
L2251	A D 14N
L2252	A D 14M
L3001	A D 6M
L5201	A D 3G
L5202	A D 2F
L5301	A D 4D
L6001	A D 21M
L6002	A D 21O
L6003	A D 21N
L6031	A D 21I
L6051	A D 21O
L6080	A D 21J
L7101	B C 17P
L7102	B C 13P
L7103	B C 20P
L7104	B C 20A
L7151	A D 20J
L7153	A D 20K
L7155	A D 21L
TRANSISTOR	
Q1	B C 13J
Q31	B C 9N
Q34	B C 13N
Q35	B C 13N
Q36	B C 13O
Q37	B C 13O
Q38	B C 11K
Q39	B C 11K
Q51	B C 14M
Q52	B C 11K
Q106	B C 9L
Q151	B C 13L
Q152	B C 13M
Q153	B C 12K
Q154	B C 12K
Q155	B C 13J
Q157	B C 9M
Q158	B C 9K
Q159	B C 9K
Q183	B C 9J
Q301	B C 7K
Q302	B C 8J
Q311	B C 8J
Q312	B C 8K
Q313	B C 7I
Q2001	B C 10O
Q2002	B C 10O
Q2003	B C 10O
Q2051	B C 9M
Q2052	B C 8M
Q2053	B C 8M
Q2054	B C 8M
Q2055	B C 8M
Q2151	B C 15J
Q2152	B C 15J
Q2251	B C 14N
Q2252	B C 15N
Q2253	B C 14M
Q3001	B C 6M
Q3002	A D 4I
Q3003	A D 19I
Q3004	B C 9D
Q3005	B C 5D
Q3006	B C 10P
Q3007	B C 9E
Q3008	B C 9E
Q4001	B C 8F
Q5101	A D 2L
Q5102	A D 2L
Q5303	A D 3D
Q5304	A D 3G
Q5305	A D 3G
Q5306	A D 2F
Q5307	B C 3E
Q5308	B C 3E
Q5309	B C 3E
Q5310	B C 4E
Q5311	B C 3F
Q5312	B C 1E
Q6030	B C 21K
Q6031	B C 21K
Q6032	B C 21I
Q6033	B C 21H
Q6035	B C 21H
Q7101	B C 18J
Q7102	B C 18J
Q7151	B C 19M
Q7152	B C 19M
Q7153	B C 15F
Q7154	B C 15F
Q7155	B C 20N
Q7156	B C 20N
RESISTOR	
R1	B C 13M
R2	B C 14K
R3	B C 13K
R4	B C 14J
R5	B C 13K
R6	B C 13K
R7	B C 13K
R20	B C 10L
R21	B C 9M
R22	B C 9M
R23	B C 9N
R24	B C 10N
R25	B C 10N
R52	A D 12O
R62	A D 8L
R63	A B 12K
R102	B C 9H
R107	B C 12L
R110	B C 10N
R120	B C 14N
R121	B C 14N
R122	B C 11K
R123	B C 11K
R124	B C 11K
R131	B A 6J
R151	B C 13L
R152	B C 14L
R153	B C 14L
R154	B C 12K
R155	B C 14L
R156	B C 12K
R157	B C 12J
R158	B C 12J
R159	A B 11J
R161	B C 9L
R162	B C 9L
R163	B C 9L
R164	B C 9L
R165	B C 9L
R166	B C 9K
R167	B C 9J
R181	B C 9M
R186	B C 13L
R190	B C 11K
R191	B C 11J
R192	B C 10M
R193	A D 12J
R194	A B 8K
R202	B C 16G
R203	B C 16G
R204	B C 16G
R209	B C 18G
R210	B C 17F
R211	B C 18H
R213	B C 19H
R214	B C 16H
R216	B C 19G
R218	B C 18H
R219	B C 17G
R223	B C 19H
R301	B C 8J
R302	B C 7J
R303	B C 7K
R304	B C 8K
R305	B C 8K
R306	B C 7J
R307	B C 8K
R308	B C 7K
R309	B C 6J
R310	B C 7J
R311	B C 7I
R312	B C 8J
R313	B C 8J
R314	B C 8J
R315	B C 8J
R316	B C 8J
R321	B C 8K
R322	B C 6J
R323	B C 7J
R324	B C 8I
R325	B C 7I
R326	B C 7J
R327	B C 7I
R328	B C 8I
R329	B C 7J
R2001	A D 12O
R2002	A D 8L
R2003	B C 12N
R2004	B C 12O
R2005	B C 11O
R2006	B C 11O
R2007	B C 11O
R2009	B C 11O
R2010	B C 11O
R2011	B C 11N
R2012	B C 11N
R2013	B C 11N
R2014	B C 11N
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R2018	B C 10O
R2019	B C 10O
R2051	B C 9N
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R2055	B C 9M
R2056	B C 8M
R2057	B C 8M
R2058	B C 8M
R2059	B C 8M
R2060	B C 8M
R2151	B C 15J
R2152	B C 16J
R2201	B C 17N
R2202	B C 17N
R2203	B C 17M
R2204	B C 17N
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R2208	B C 16O
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R2217	B C 16N
R2218	B C 16K
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R2225	B C 17L
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R2227	B C 17L
R2228	B C 17M
R2229	B C 17M
R2230	B C 17M
R2231	B C 17N
R2236	B C 15N
R2237	B C 15N
R2238	B C 15M
R2239	B C 15L
R2240	B C 15L
R2251	B C 15L
R2252	B C 15M
R2254	B C 14J
R3011	A D 11G
R3012	A D 11G
R3013	A D 11G
R3014	B C 10F
R3015	A D 11F
R3016	A D 10G
R3017	A D 10G
R3018	B C 10F
R3020	A D 11F
R3021	A D 11F
R3022	A D 10G
R3025	B C 10F
R3026	B C 10F
R3027	B C 10F
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R3030	B C 10E
R3031	B C 10E
R3033	B C 9E
R3034	B C 9E
R3035	B C 9E
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R3076	B C 15E
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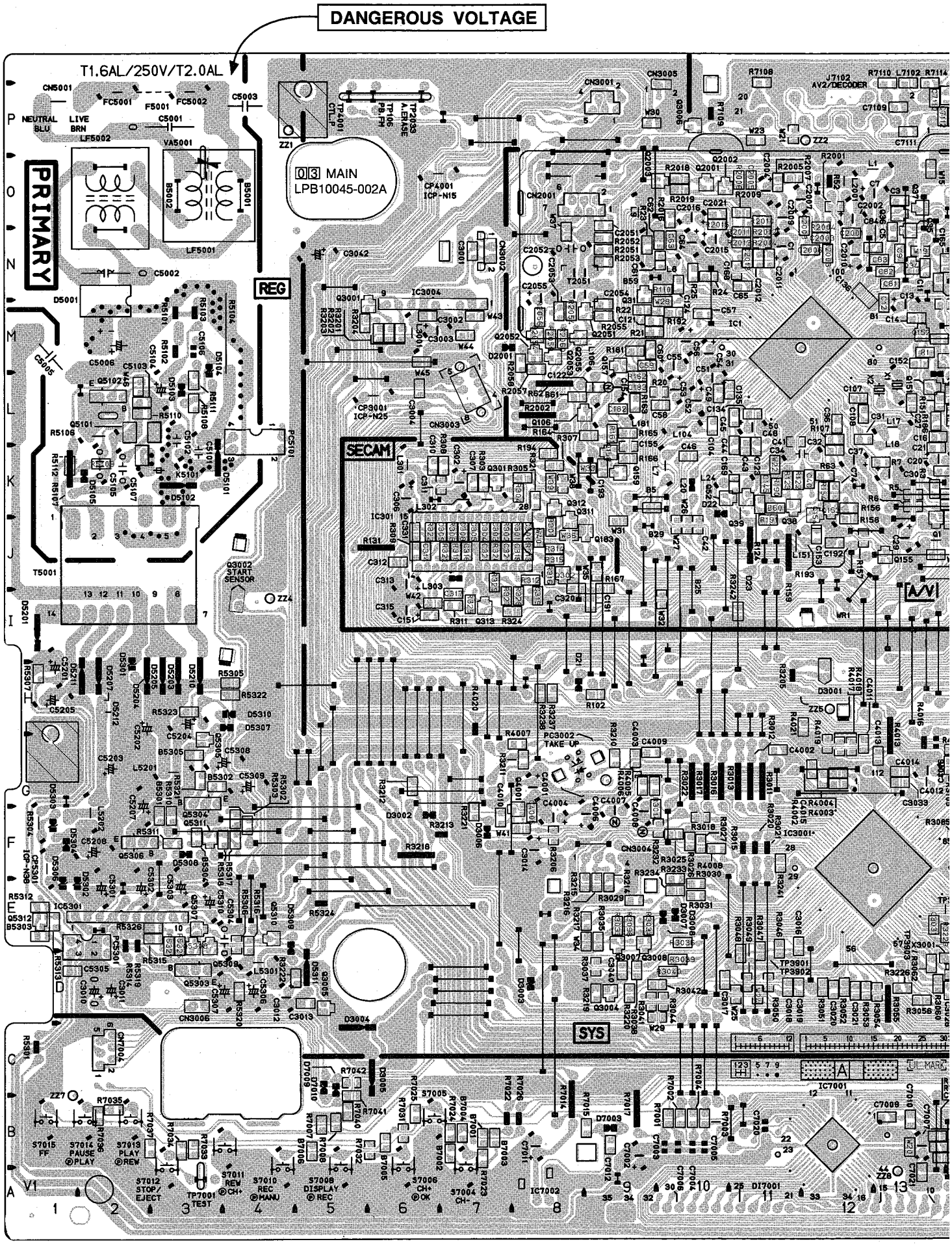
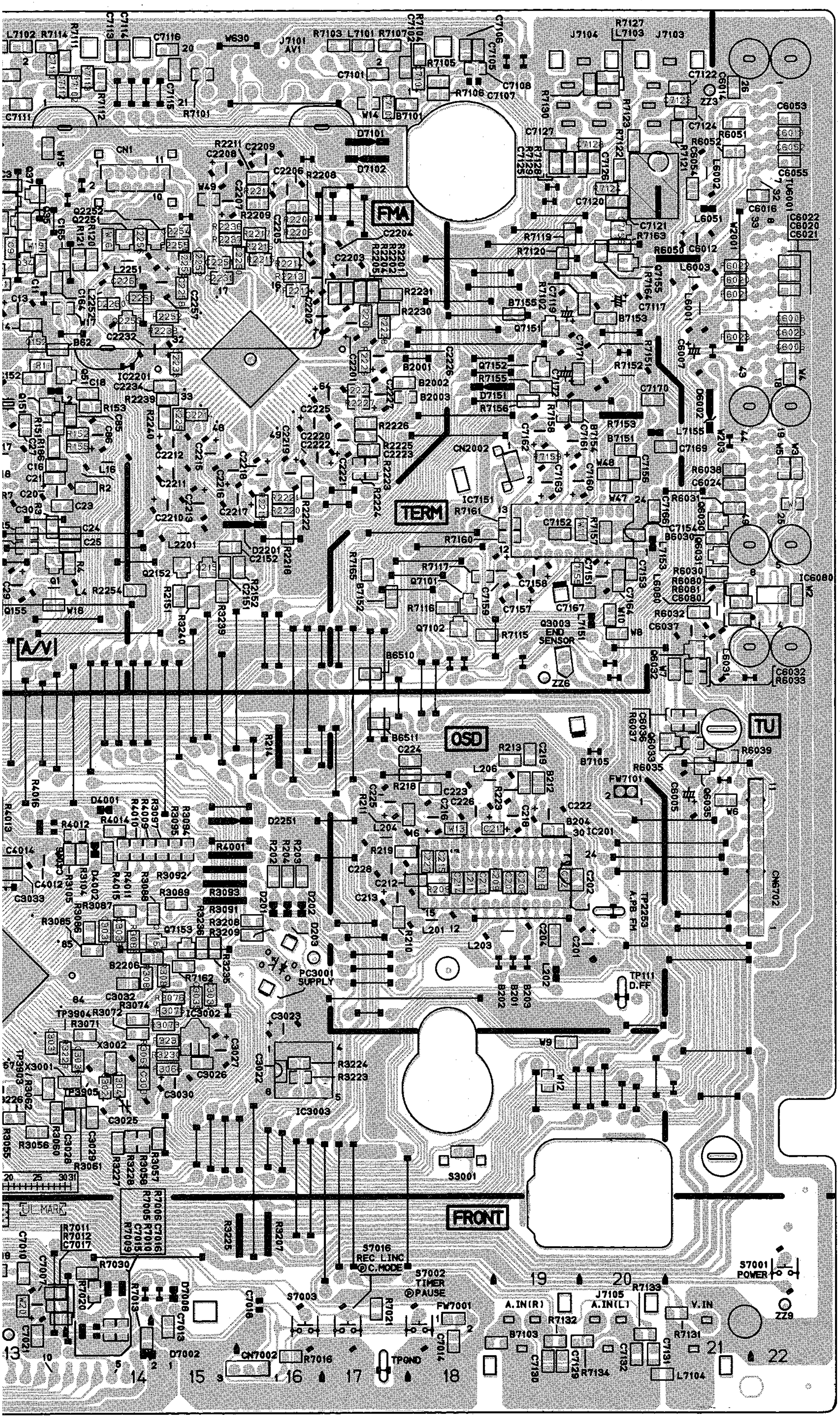
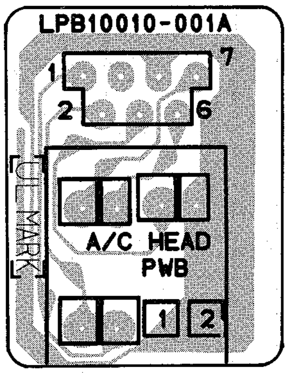
R3083	B C 14F
R3085	B C 14F
R3086	B C 14F
R3087	B C 14F
R3088	B C 15F
R3089	B C 15F
R3091	A D 16G
R3092	A D 16G
R3093	A D 16G
R3094	B C 15G
R3095	B C 15G
R3097	B C 15G
R3098	B C 9E
R3104	B C 14G
R3105	B C 14G
R3201	B C 6M
R3202	B C 6M
R3203	B C 6M
R3204	B C 5M
R3205	A D 11H
R3206	A C 8F
R3207	A D 16B
R3208	B C 16F
R3209	B C 16F
R3210	B C 9G
R3211	B C 8G
R3212	B C 6G
R3213	A D 7F
R3214	B C 9E
R3215	B C 9E
R3216	B C 9E
R3217	B C 9E
R3218	A D 7F
R3219	B C 9D
R3220	B C 9D
R3221	B C 7F
R3222	B C 5D
R3223	B C 16D
R3224	B C 16E
R3225	A D 16B
R3226	B C 13D
R3227	B C 14D
R3228	B C 14D
R3229	B C 14E
R3230	B C 15E
R3231	B C 15E
R3232	B C 10F
R3233	B C 10E
R3234	B C 10E
R3235	B C 15F
R3236	B C 15F
R3237	B C 8H
R3238	B C 8H
R3239	B C 15J
R3240	B C 15J
R3241	B C 11F
R3242	B C 11I
R4001	A D 16G
R4002	B C 12G
R4003	B C 12G
R4004	B C 12G
R4005	B C 9G
R4006	B C 9G
R4007	B C 8G
R4008	B C 10F
R4009	B C 14G
R4010	B C 14G
R4011	B C 14G
R4012	B C 14G
R4013	A D 13G
R4014	B C 14G
R4015	A D 14G
R4016	A D 13G
R4017	B C 12G
R4018	B C 12G
R4019	B C 12G
R4020	A D 7G
R4021	A D 12H
R5101	A D 3M
R5102	A D 3M
R5103	A D 3M
R5104	A D 4N
R5106	A D 2L
R5107	A D 1K
R5108	B C 3L
R5109	B C 2K
R5110	B C 2L
R5111	B C 3L
R5112	B C 1K
R5301	A D 1C
R5302	B C 4F
R5303	B C 4F
R5304	B C 1F
R5305	A D 4H
R5306	B C 4E
R5307	B C 1H
R5310	B C 3F
R5311	B C 3F
R5312	B C 1E
R5313	A D 1E
R5314	A D 2D
R5315	B C 3E
R5316	B C 4F
R5317	B C 4F
R5318	B C 4F
R5319	A D 2D
R5320	A D 4D
R5321	B C 3G
R5322	B C 4H
R5323	B C 3H
R5324	B C 5E
R5325	A D 3E
R5326	B C 3E
R5327	B C 3E
R6020	B C 21N
R6021	B C 21N
R6022	B C 21N
R6023	B C 21M
R6030	B C 21J
R6031	B C 21K
R6032	B C 21J
R6033	B C 21I
R6035	B C 21H
R6037	B C 21I
R6038	B C 21L
R6039	B C 21H
R6050	A D 21N
R6051	B C 21P
R6052	B C 21O
R6080	B C 21J
R6081	B C 21J
R7001	B C 10B
R7002	B C 10B
R7003	B C 10B
R7004	A D 10B
R7005	A D 14B
R7006	A D 14B
R7007	B C 5B
R7008	B C 5B
R7009	A D 14A
R7010	B C 14A
R7011	B C 13B
R7012	B C 13B
R7013	B C 14A
R7014	A D 8B
R7015	B C 9B
R7016	B C 16A
R7017	A D 9B
R7020	A D 6B
R7021	B C 7B
R7022	A D 7B
R7023	B C 7B
R7024	B C 7B
R7025	B C 6B
R7026	A D 8B
R7030	B C 14B
R7031	B C 6B
R7032	B C 6B
R7033	B C 3B
R7034	B C 3B
R7035	B C 2B
R7036	B C 2B
R7037	B C 3B
R7040	B C 5B
R7041	B C 5B
R7042	B C 5C
R7101	B C 15P
R7102	B C 20M
R7103	B C 17P
R7104	B C 18P
R7105	B C 18P
R7106	B C 18P
R7107	B C 17P
R7108	A D 11P
R7109	A D 10P
R7110	B C 13P
R7111	B C 14P
R7112	B C 14P
R7113	B C 14P
R7114	B C 13P
R7115	B C 18J
R7116	B C 18J
R7117	B C 18J
R7119	B C 19N
R7120	B C 19N
R7121	B C 21O
R7122	B C 20O
R7123	B C 20O
R7124	B C 20O
R7127	B C 20P
R7128	B C 20O
R7129	B C 19O
R7130	B C 20P
R7131	B C 21B
R7132	B C 19A
R7133	B C 20A
R7134	B C 20A
R7151	A D 20M
R7152	A D 20M
R7153	A D 20L
R7155	B C 19M
R7156	B C 19L
R7157	B C 20K
R7158	B C 19L
R7159	B C 19L
R7160	B C 19K
R7161	B C 19K
R7162	B C 15F
R7163	B C 20N
R7164	B C 20N
R7165	B C 17J
SWITCH	
S3001	A D 18C
S7001	A D 22B
S7002	A D 18B
S7003	A D 16B
S7004	A D 7B
S7005	A D 6B
S7006	A D 6B
S7008	A D 5B
S7010	A D 4B
S7011	A D 4B
S7012	A D 3B
S7013	A D 2B
S7014	A D 2B
S7015	A D 1B
S7016	A D 17B
TEST POINT	
TP106	A D 6P
TP111	A D 20E
TP2033	A D 6P
TP2253	A D 20G
TP3901	B C 11D
TP3902	B C 11D
TP3903	B C 13D
TP3904	B C 14E
TP3905	B C 14D
TP4001	A D 5P
TP7001	A D 3A
TPGND	A D 17A
OTHER	
CP3001	A D 6L
CP4001	A D 7O
CP5301	A D 1F
DI7001	A D 12A
F5001	A D 2P
FW7001	A D 18B
FW7101	A D 20H
K5101	A D 3K
LF5001	A D 4O
LF5002	A D 2N
PC3001	A D 16F
PC3002	A D 8G
PC5101	A D 4L
PC5301	A D 2E
T2051	A D 9N
T5001	A D 1K
TU6001	A D 22P
VA5001	A D 4O
WR1	A D 13J
X1	A D 13L
X2	A D 13L
X3001	A D 13D
X3002	A D 14E

4.9 MAIN AND A/C HEAD CIRCUIT BOARDS




FMA
TERM
A/V
OSD
TU
FRONT

— A/C HEAD —

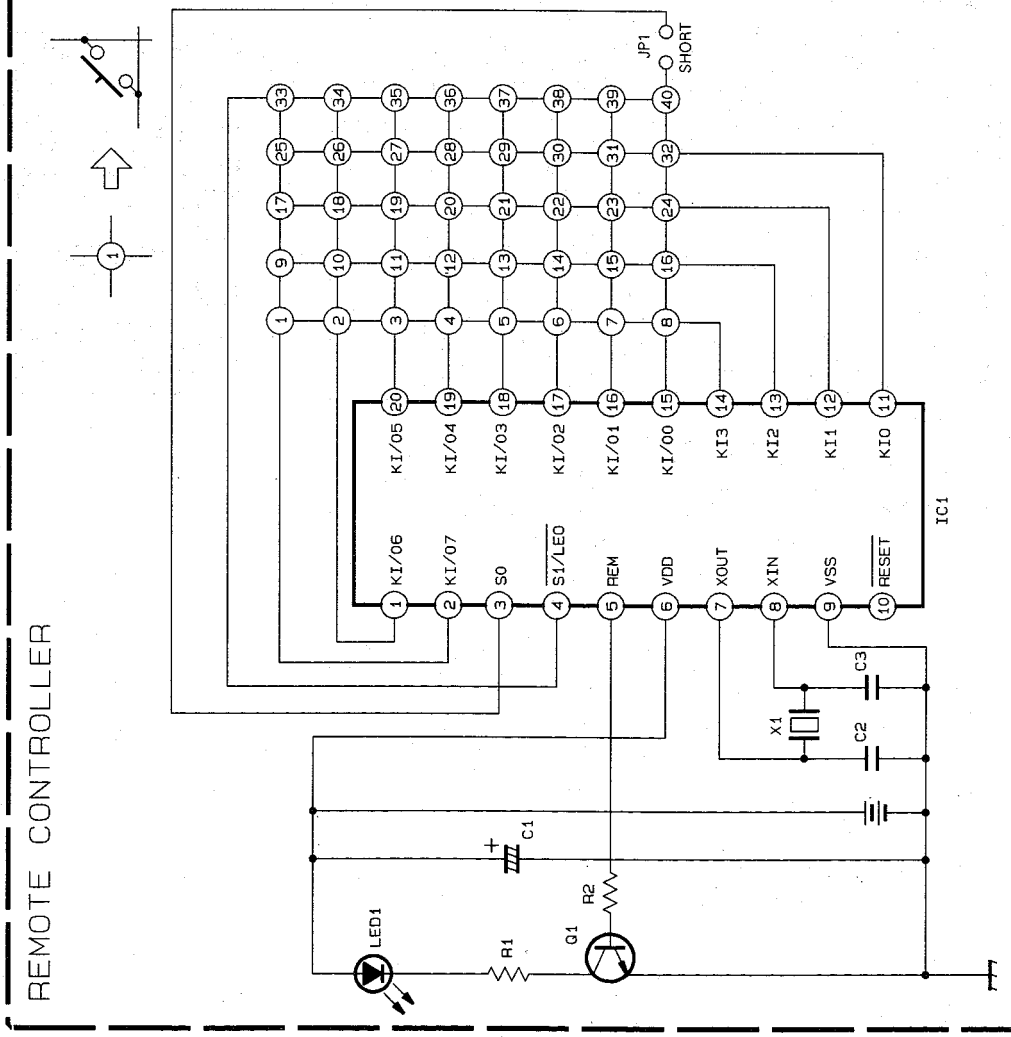

LPB10010-001A
1
7
2
6
UL MARK
A/C HEAD
PWB
1
2

4.10 REMOTE CONTROL SCHEMATIC DIAGRAM [HR-J261MS]

NOTES:
1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
   Avoid replacing individual parts.
   Replace the entire unit only.

Key No.	Key Name
1	TV
2	3
3	6
4	TIMER
5	STOP+
6	0
7	REW
8	REC
9	RE-VIEW
10	TV/VCR
11	///
12	START+
13	DATE+
14	DATE-
15	PLAY
16	STOP
17	1
18	4
19	7
20	AUDIO MONITOR
21	TV PROG+
22	TV PROG-
23	△/TV CH+
24	▽/TV CH-
25	2
26	5
27	8
28	CANCEL
29	MENU
30	OK
31	FF
32	PAUSE
33	STOP-
34	◁/TV VOL-
35	▷/TV VOL+
36	START-
37	POWER
38	PROG
39	PRG CHECK
40	9
8+15	REC START
8+32	REC PAUSE

Key No.	Key Name
1+10	TV TV/VCR
1+37	TV OPERATE
1+20	TV MUTE
1+11	TV MAIN/SUB
1+23	TV PROG+
1+24	TV PROG-
1+35	TV VOL+
1+34	TV VOL-

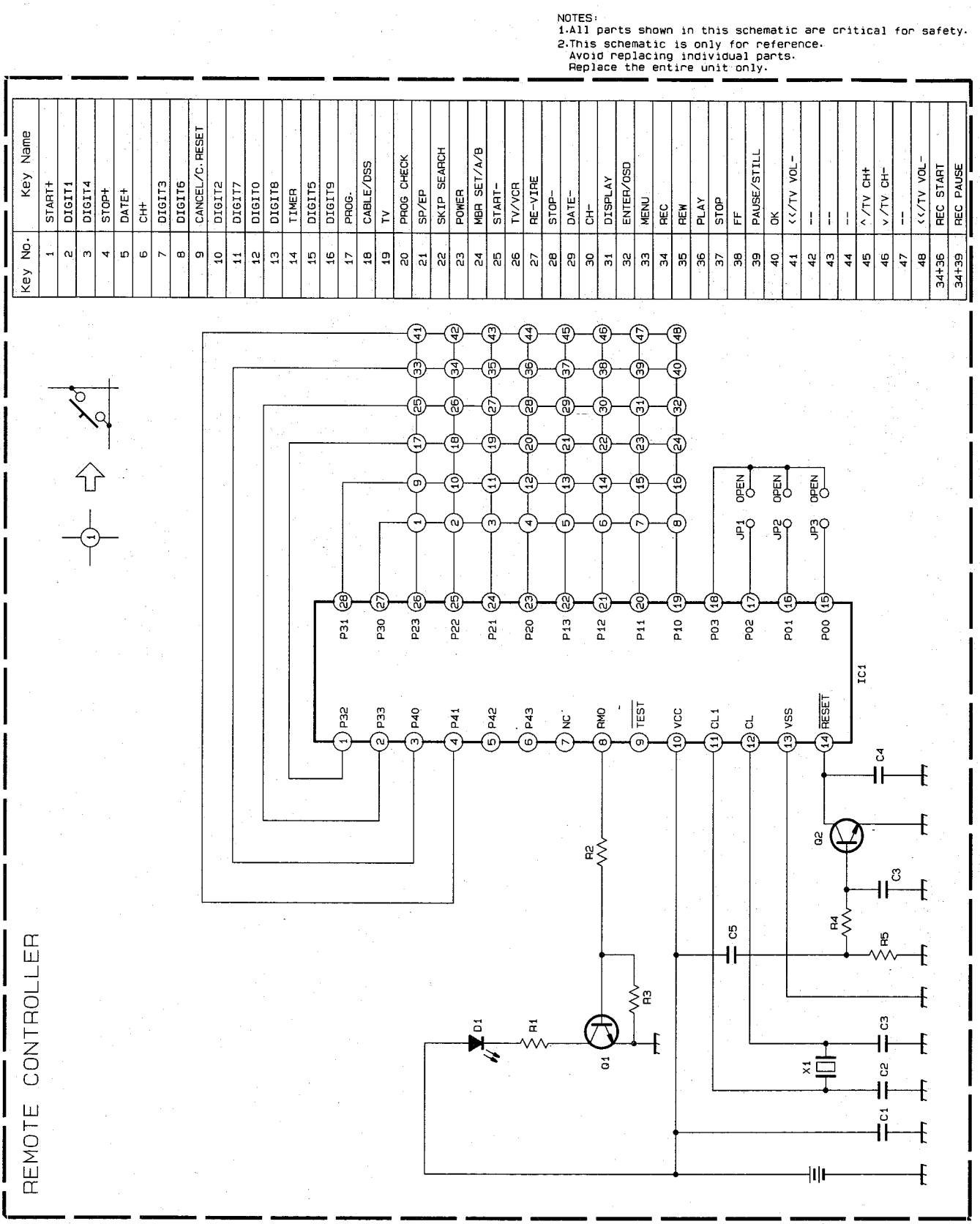


REMOTE CONTROLLER

4.11 REMOTE CONTROL SCHEMATIC DIAGRAM [HR-J461MS]

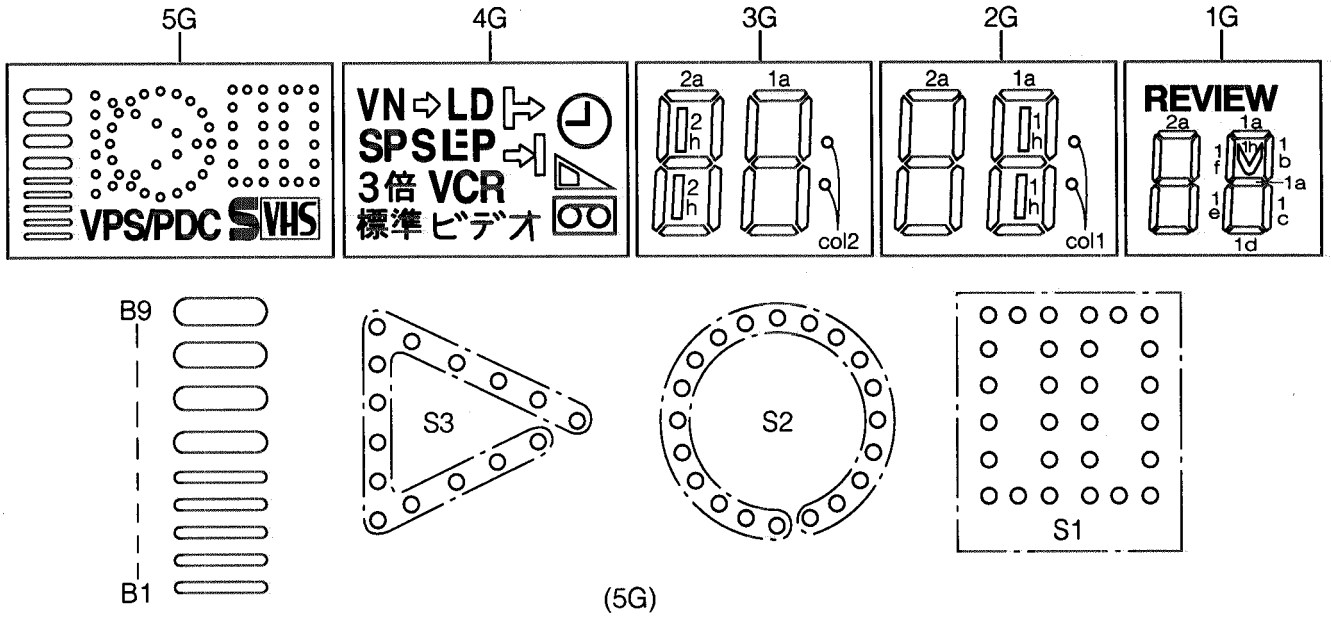
NOTES:
1.All parts shown in this schematic are critical for safety.
2.This schematic is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.

Key No.	Key Name
1	START+
2	DIGIT1
3	DIGIT4
4	STOP+
5	DATE+
6	CH+
7	DIGIT3
8	DIGIT6
9	CANCEL/C.RESET
10	DIGIT2
11	DIGIT7
12	DIGIT0
13	DIGIT8
14	TIMER
15	DIGIT5
16	DIGIT9
17	PROG.
18	CABLE/DSS
19	TV
20	PROG CHECK
21	SP/EP
22	SKIP SEARCH
23	POWER
24	MBR SET/A/B
25	START-
26	TV/VCR
27	RE-VIRE
28	STOP-
29	DATE-
30	CH-
31	DISPLAY
32	ENTER/OSD
33	MENU
34	REC
35	REW
36	PLAY
37	STOP
38	FF
39	PAUSE/STILL
40	OK
41	<</TV VOL-
42	--
43	--
44	--
45	^/TV CH+
46	v/TV CH-
47	--
48	<</TV VOL-
34+36	REC START
34+39	REC PAUSE



4.12 FDP GRID ASSIGNMENT AND ANODE CONNECTION

GRID ASSIGNMENT



ANODE CONNECTION

	5G	4G	3G	2G	1G
P 1	S2	⇨	1a	1a	1a
P 2	S1	⇨	1b	1b	1b
P 3	S3	3倍	1f	1f	1f
P 4	VPS/PDC	標準	1g	1g	1g
P 5	SVHS	🕘	1c	1c	1c
P 6	—	◺	1e	1e	1e
P 7	—	📼	1d	1d	1d
P 8	B9	VCR	col2	1h	1h
P 9	B8	ビデオ	2a	2a	2a
P10	B7	⇨	2b	2b	2b
P11	B6	VN	2f	2f	2f
P12	B5	LD	2g	2g	2g
P13	B4	SP	2c	2c	2c
P14	B3	S (SEP)	2e	2e	2e
P15	B2	: (SEP)	2d	2d	2d
P16	B1	LP (SEP)	2h	col1	REVIEW

4.13 VOLTAGE CHARTS

<VIDEO/N.AUDIO>

MODE PIN NO.	REC	PLAY
IC1		
1	2.5	2.5
2	2.5	2.5
3	0	0
4	2.2	2.5
5	0	0
6	2.8	2.8
7	2.5	2.5
8	2.5	2.5
9	2.5	2.5
10	2.5	2.5
11	2.5	2.5
12	5.0	5.0
13	1.9	1.5
14	1.9	1.5
15	2.6	3.0
16	1.5	0.8
17	0.3	0.7
18	2.3	2.3
19	3.0	3.0
20	2.8	2.8
21	2.3	2.3
22	1.9	2.1
23	3.0	3.0
24	2.1	2.1
25	1.4	1.4
26	2.1	2.1
27	0	0
28	2.8	2.8
29	1.9	1.9
30	2.8	2.8
31	2.8	2.8
32	0	0
33	0	0
34	0	0
35	3.1	3.1
36	5.1	5.1
37	0	0
38	5.1	5.1
39	3.3	3.3
40	5.1	5.1
41	5.1	5.1
42	2.0	2.0

MODE PIN NO.	REC	PLAY
43	5.1	5.1
44	2.6	2.6
45	0	0
46	2.0	2.0
47	0	0
48	0	0
49	0	0
50	0.4	0.4
51	0.1	0.1
52	2.3	2.3
53	2.8	2.8
54	2.0	2.0
55	2.1	2.1
56	2.3	2.3
57	0	0
58	3.1	3.1
59	2.8	2.8
60	2.1	2.1
61	5.0	5.0
62	5.1	5.1
63	5.0	5.0
64	0	0
65	1.1	2.3
66	5.0	5.0
67	5.0	5.0
68	0	0
69	2.8	2.8
70	2.6	2.6
71	-	-
72	2.3	2.3
73	-	-
74	2.6	1.0
75	-	-
76	2.3	2.3
77	4.7	4.7
78	2.7	2.7
79	4.4	2.0
80	-	-
81	-	-
82	1.2	1.2
83	2.3	2.3
84	0	2.0
85	0	0

MODE PIN NO.	REC	PLAY
86	2.4	2.2
87	2.4	2.2
88	2.5	2.3
89	2.5	2.3
90	5.0	5.0
91	0	0
92	0	0
93	0	0
94	0	0
95	0.4	0.4
96	5.0	5.0
97	0	0
98	5.1	5.1
99	0.5	2.6
100	2.5	2.5
Q38		
E	1.7	1.7
C	5.0	5.0
B	2.3	2.3
Q39		
E	2.3	2.3
C	0	0
B	1.7	1.7
Q152		
E	5.0	2.7
C	0	0
B	4.4	2.0
Q154		
E	-	-
C	0	0
B	-	-
Q2001		
E	-12.7	0
C	0	0
B	-19.2	0.7
Q2002		
E	-12.7	0
C	0	0
B	-18.9	0.7
Q2003		
E	5.1	5.1
C	-19.0	5.0
B	5.0	0

MODE PIN NO.	REC	PLAY
Q2051		
E	0	0
C	8.2	0.2
B	0.5	0.2
Q2052		
E	11.8	11.8
C	11.6	0.6
B	11.0	11.7
Q2053		
E	0	0
C	0	11.7
B	5.0	0
Q2054		
E	11.6	0.6
C	11.4	0.1
B	10.8	0.6
Q2055		
E	0	0
C	0	0.6
B	5.0	0
CN1		
1	0	0
2	0	0
3	0	0
4	0	0
5	2.5	2.2
6	2.5	2.2
7	2.4	2.2
8	2.4	2.2
9	-	-
10	-	-
11	-	-
CN2001		
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	2.3	2.6
7	2.5	2.5
CN2002		
1	0	0
2	0	0

<ON SCREEN>

MODE PIN NO.	REC	PLAY
IC201		
1	0	0
2	2.7	2.7
3	5.1	5.1
4	-	-
5	-	-
6	2.5	2.5
7	2.5	2.5
8	5.1	5.1
9	3.2	3.2
10	4.6	4.6
11	3.7	0.9
12	5.1	5.1
13	2.3	2.3
14	0	0
15	2.3	2.3
16	0.4	1.0
17	5.1	5.1
18	2.9	2.9
19	-	-
20	-	-
21	5.1	5.1
22	3.7	3.7
23	5.1	5.1
24	5.1	5.1

<SYSCON>

MODE PIN NO.	REC	PLAY
IC3001		
1	2.9	2.6
2	0	0
3	2.0	2.5
4	2.6	2.6
5	-	-
6	2.6	2.6
7	2.5	2.5
8	2.6	2.6
9	5.1	5.1
10	5.1	5.1
11	0	0
12	-	-
13	0	2.0
14	5.0	5.0
15	5.0	5.0
16	-	-
17	-	-
18	-	-
19	-	-
20	4.7	4.7
21	-	-
22	4.3	0
23	0	0
24	5.0	5.0
25	0	0
26	5.2	5.2
27	5.2	5.2
28	5.1	5.1
29	5.1	5.1
30	-	-
31	-	-
32	0	0
33	-	-
34	-	-
35	0	0
36	0	0
37	-	-
38	5.1	5.1

MODE PIN NO.	REC	PLAY
39	0.3	0.3
40	0	0
41	5.2	5.2
42	4.7	4.7
43	0	0
44	5.0	5.0
45	5.1	5.1
46	-	-
47	-	-
48	-	-
49	5.0	5.0
50	5.0	5.0
51	5.2	5.2
52	3.6	0.9
53	4.6	4.6
54	-	-
55	-	-
56	0	0
57	0	0
58	0	0
59	-	-
60	0	0
61	0	0
62	0	0
63	0	0
64	-	-
65	-	-
66	-	-
67	-	-
68	0	0
69	-	-
70	5.1	5.1
71	5.1	5.1
72	5.0	5.0
73	5.1	5.1
74	5.1	5.1
75	4.3	4.3
76	4.4	4.4
77	-	-

MODE PIN NO.	REC	PLAY
78	-	-
79	-	-
80	0	0
81	-	-
82	5.1	5.1
83	-	-
84	0	0
85	-	-
86	-	-
87	5.1	0
88	-	-
89	-	-
90	-	-
91	3.1	3.1
92	5.1	5.1
93	5.1	5.1
94	-	-
95	-	-
96	-	-
97	5.1	0
98	0.3	0.3
99	-	-
100	-	-
101	2.5	2.5
102	1.3	1.3
103	-	-
104	-	-
105	0	5.1
106	-	-
107	0	0
108	1.6	1.6
109	5.1	5.1
110	0	0
111	0	0
112	2.6	2.6
IC3002		
1	5.1	5.1
2	5.1	5.1
3	0	0

MODE PIN NO.	REC	PLAY
IC3003		
1	0	0
2	0	0
3	0	0
4	0	0
5	4.4	4.4
6	4.4	4.4
7	0	0
8	5.2	5.2
IC3004		
1	0	0
2	12.5	12.5
3	0.2	0.2
4	-	-
5	0	0
6	12.5	12.5
7	0.3	0.3
8	12.5	12.5
9	0	0
Q3001		
E	0	0
C	12.5	12.5
B	0	0
Q3002		
E	0	0
C	5.0	5.0
Q3003		
E	0	0
C	5.0	5.0
Q3004		
E	0	0
C	0	0
B	0.7	0.7
Q3005		
E	5.1	5.1
C	5.9	5.9
B	5.8	5.8
Q4001		
E	0	0

MODE PIN NO.	REC	PLAY
C	0	0
B	5.0	5.0
CN3001		
1	12.4	12.4
2	0	0
3	1.4	1.4
4	0	0
5	1.6	1.6
CN3002		
1	0.1	0.1
2	0.1	0.1
CN3003		
1	0	0
2	2.5	2.5
3	2.5	2.5
4	5.1	5.1
5	0	0
6	5.1	5.1
7	-	-
8	12.4	12.4
CN3004		
1	5.2	5.2
2	5.2	5.2
3	0	0
4	0	0
CN3005		
1	-	-
2	0	0

<SW.REG>

MODE PIN NO.	REC	PLAY
IC5301		
1	6.0	6.0
2	5.1	5.1
3	4.8	4.8
4	0	0
5	12.4	12.4
6	11.8	11.8
7	12.5	12.5
8	12.5	12.5
9	1.3	1.3
10	11.2	11.2
Q5101		
S	-	-
D	150.0	-
G	-	-
Q5102		
E	0	0
C	-	-
B	-	-
Q5303		
E	5.3	5.3
C	6.0	6.0
B	5.9	5.9

<TUNER>

MODE PIN NO.	REC	PLAY
Q6030		
E	0.7	0.7
C	0	0
B	0	0
Q6031		
E	0	0
C	0	0
B	4.6	4.6
Q6032		
E	0	0
C	0	0
B	4.1	4.1

<TERMINAL>

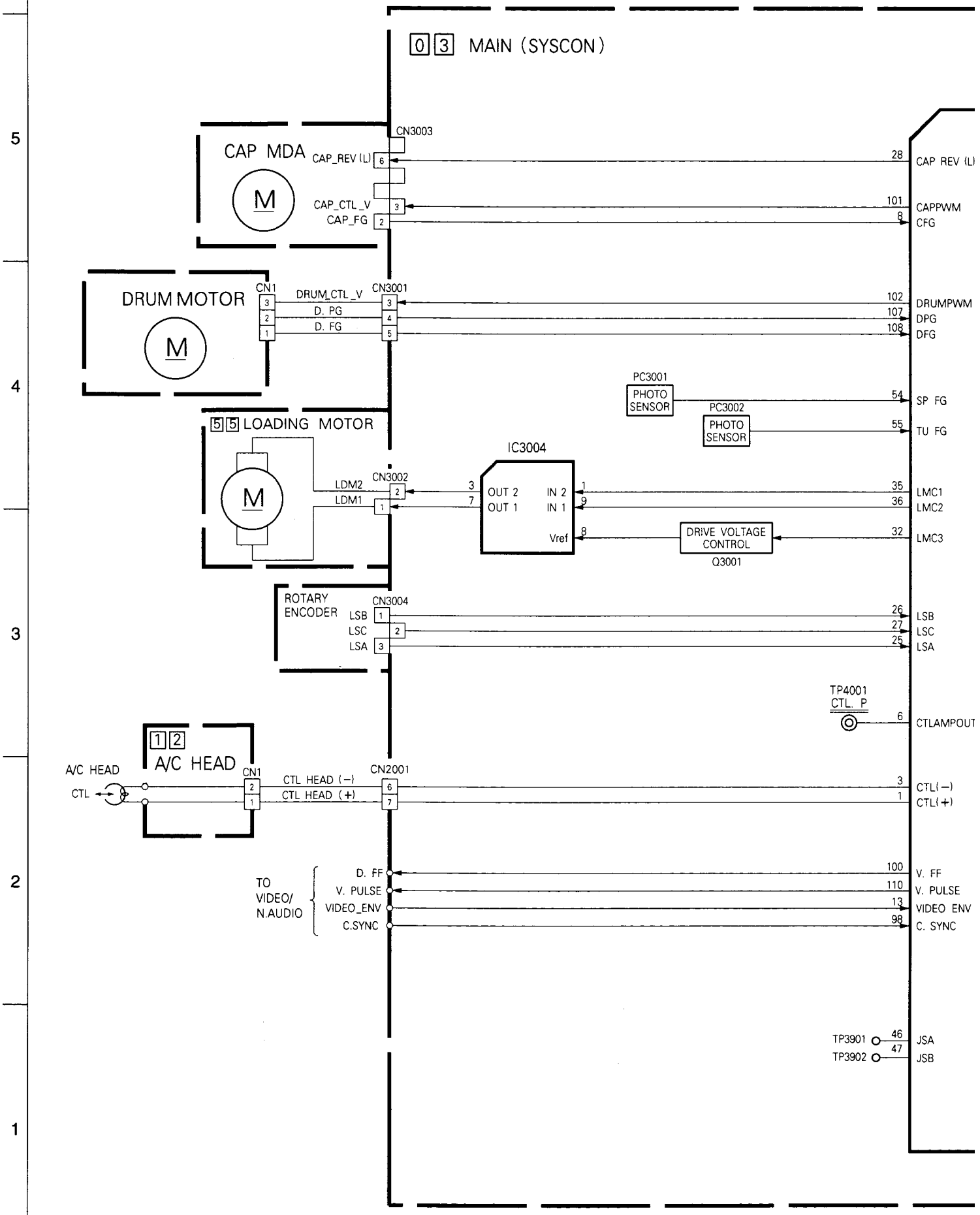
MODE PIN NO.	REC	PLAY
Q7152		
E	3.0	3.0
C	0	0
B	2.3	2.3

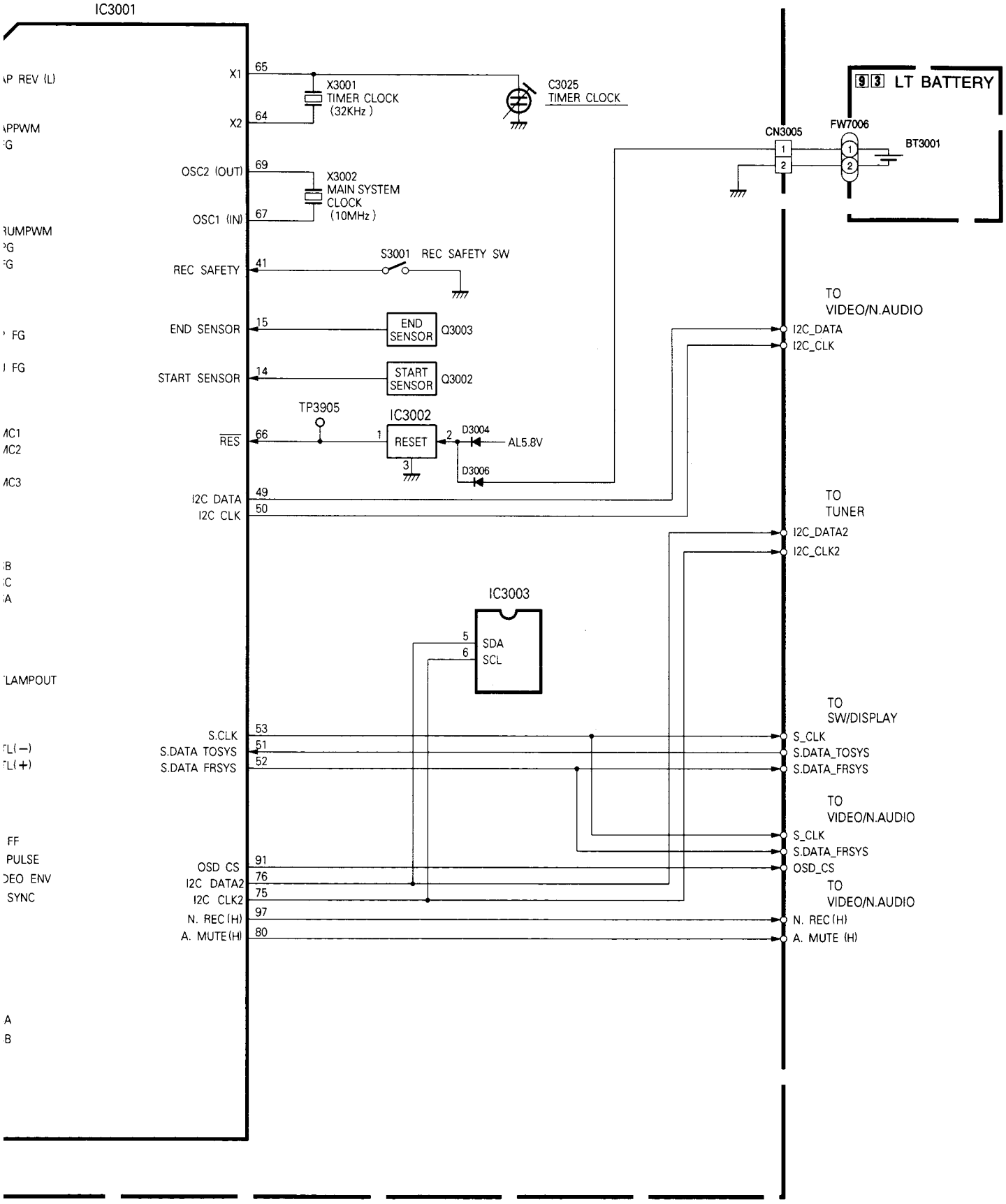
<SW/DISPLAY>

MODE PIN NO.	REC	PLAY
IC7001		
1	5.2	5.2
2	2.2	2.2
3	0	0
4	2.2	2.2
5	5.2	5.2
6	5.1	5.1
7	4.1	4.1
8	5.1	5.1
9	5.1	5.1
10	5.1	5.1
11	5.1	5.1
12	4.9	4.9
13	3.6	0.8
14	5.1	5.1
15	4.7	4.7
16	-29.6	-29.6
17	-29.6	-29.6
18	-29.4	-29.4
19	-29.4	-29.4
20	-29.4	-29.4
21	-25.0	-25.0
22	-	-
23	-	-
24	-	-
25	-	-
26	-	-
27	-	-
28	-	-
29	-	-
30	-	-
31	-	-
32	-	-
33	-	-
34	-	-
35	-	-
36	-	-
37	-	-
38	-	-

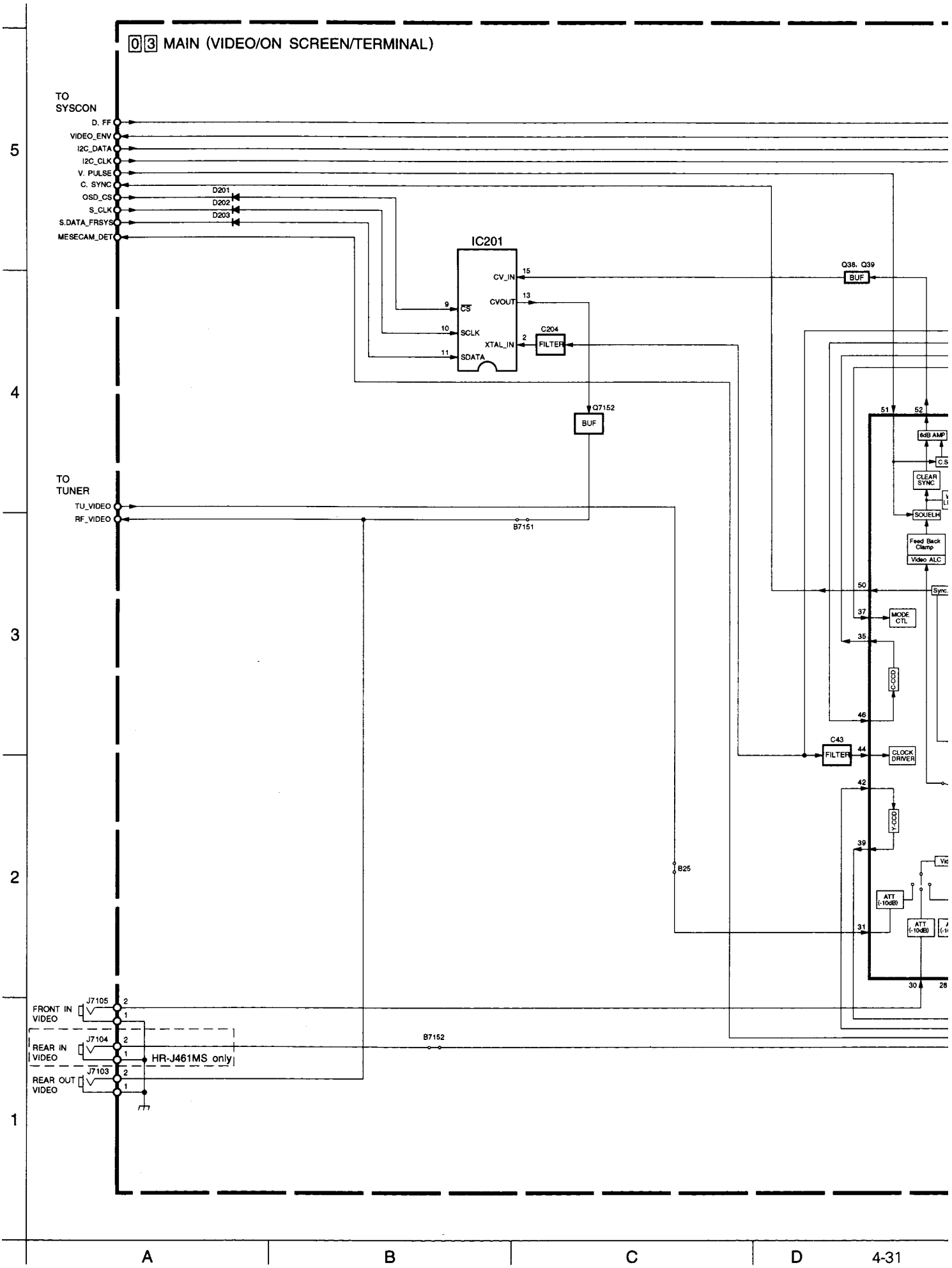
MODE PIN NO.	REC	PLAY
39	-	-
40	-	-
41	-	-
42	-	-
43	-	-
44	5.2	5.2
IC7002		
1	5.1	5.1
2	5.1	5.1
3	0	0

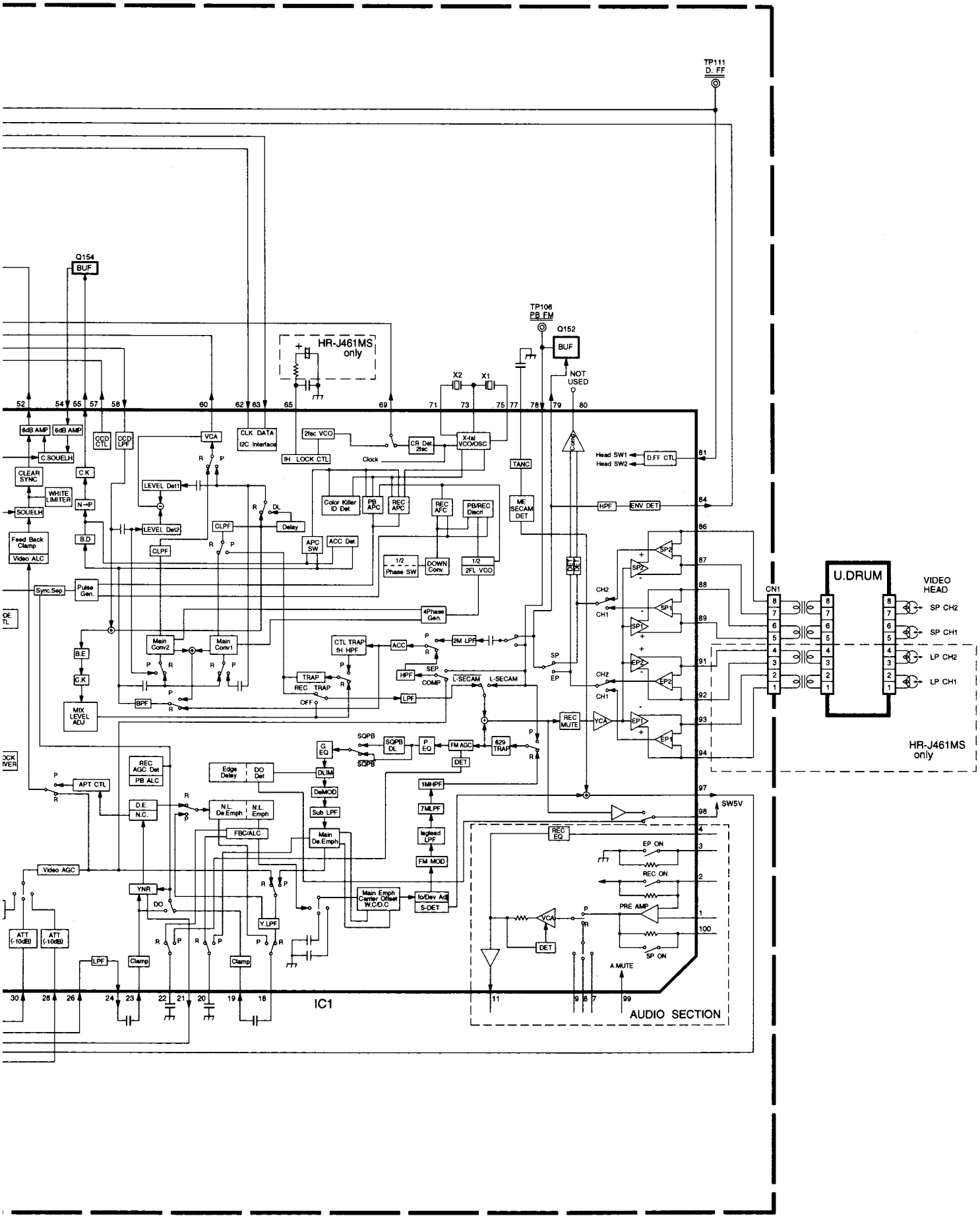
4.14 SYSTEM CONTROL BLOCK DIAGRAM



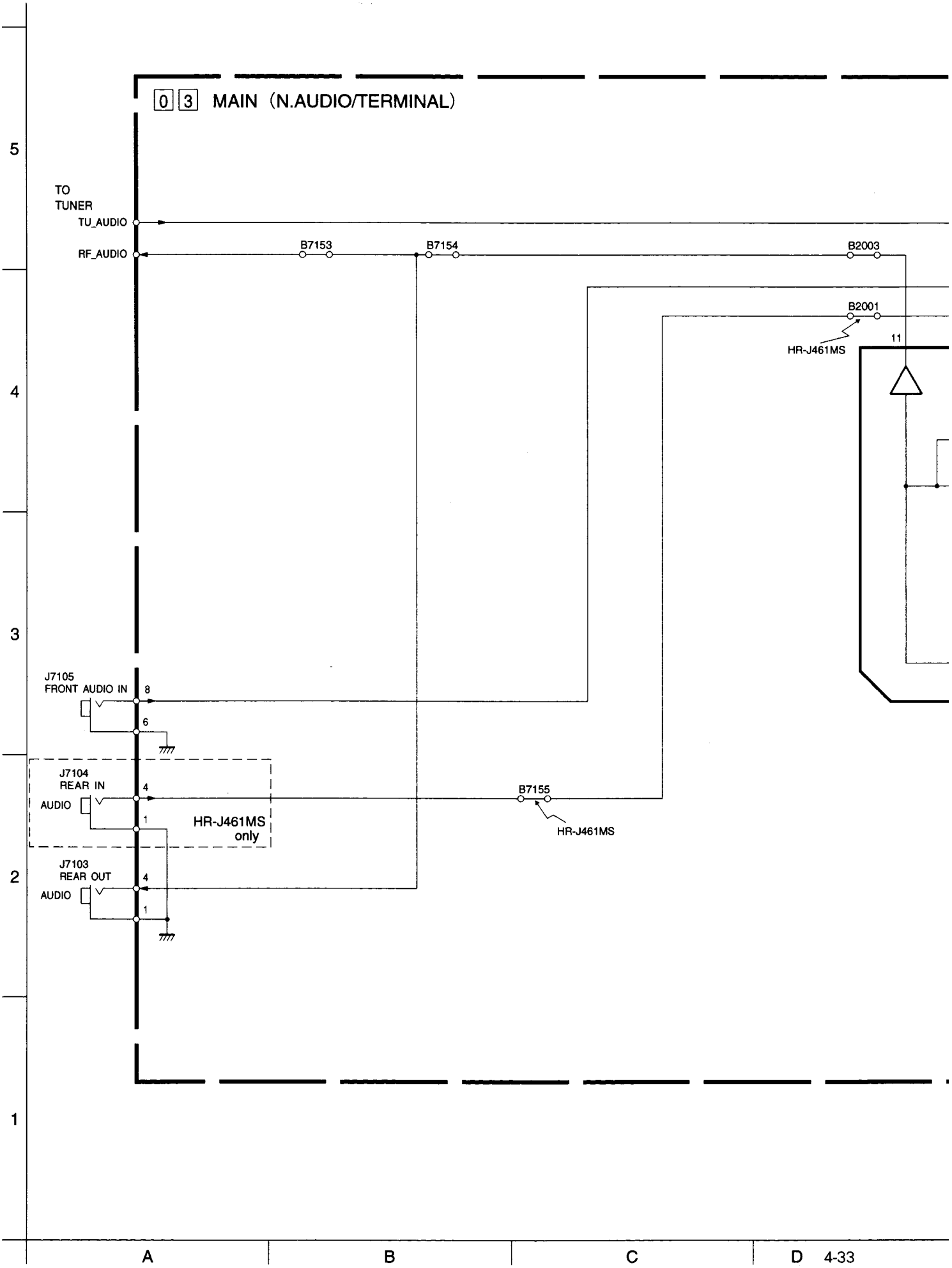

IC3001
X1
X2
OSC2 (OUT)
OSC1 (IN)
REC SAFETY
END SENSOR
START SENSOR
RES
I2C DATA
I2C CLK
S.CLK
S.DATA TOSYS
S.DATA FRSYS
OSD CS
I2C DATA2
I2C CLK2
N. REC (H)
A. MUTE (H)
65
64
69
67
41
15
14
66
49
50
53
51
52
91
76
75
97
80
X3001
TIMER CLOCK
(32KHz)
C3025
TIMER CLOCK
X3002
MAIN SYSTEM
CLOCK
(10MHz)
S3001 REC SAFETY SW
END SENSOR
Q3003
START SENSOR
Q3002
TP3905
IC3002
RESET
D3004
AL5.8V
D3006
IC3003
SDA
SCL
CN3005
FW7006
BT3001
LT BATTERY
TO VIDEO/N.AUDIO
I2C_DATA
I2C_CLK
TO TUNER
I2C_DATA2
I2C_CLK2
TO SW/DISPLAY
S_CLK
S.DATA_TOSYS
S.DATA_FRSYS
TO VIDEO/N.AUDIO
S_CLK
S.DATA_FRSYS
OSD_CS
TO VIDEO/N.AUDIO
N. REC (H)
A. MUTE (H)

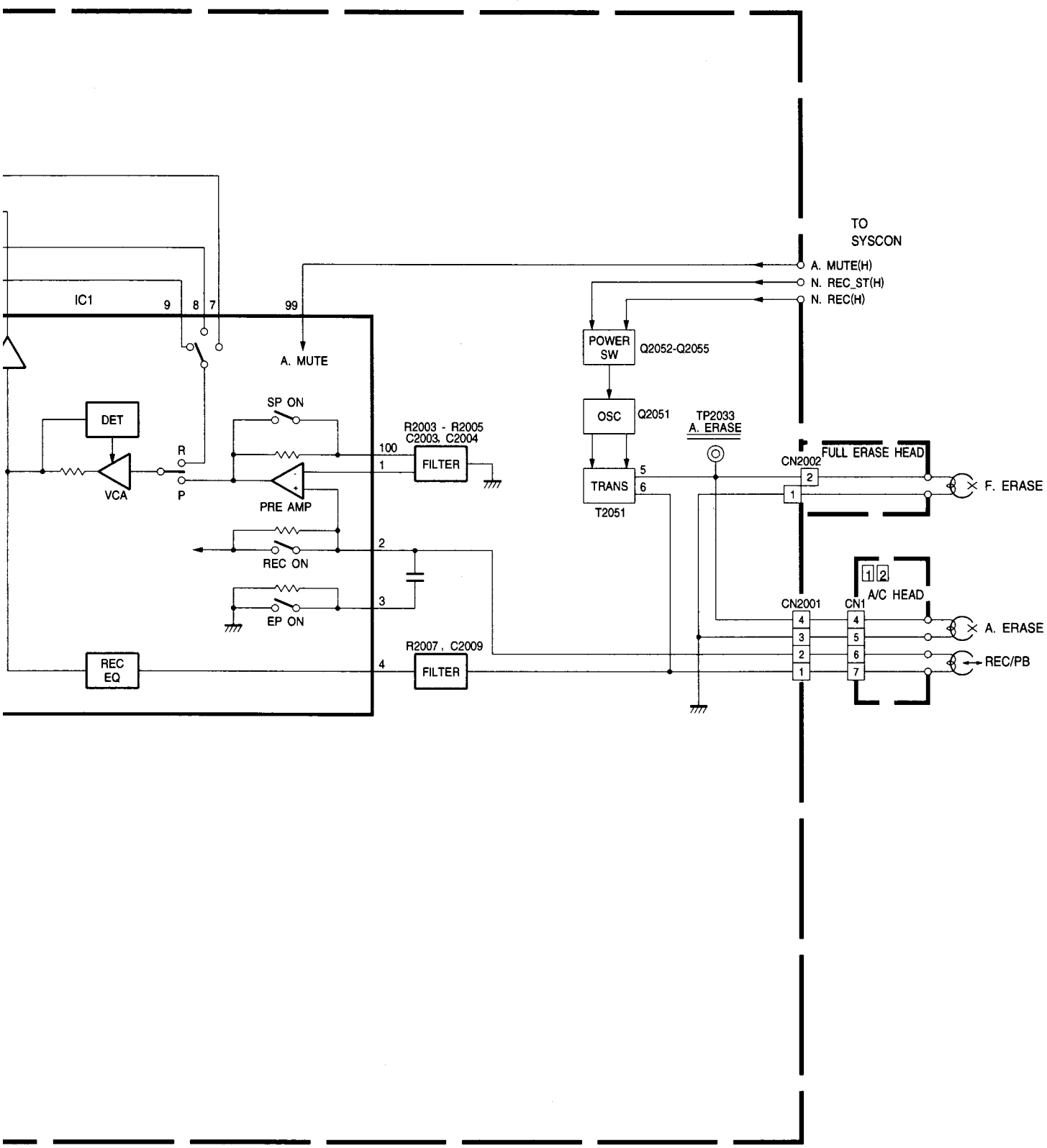
4.15 VIDEO BLOCK DIAGRAM




TP111
D. FF
Q154
BUF
TP106
PB FM
Q152
BUF
NOT USED
HR-J461MS only
X2
X1
52 54 55 57 58 60 62 63 65 69 71 73 75 77 78 79 80
6dB AMP
6dB AMP
CCD CTL
CCD LPF
VCA
CLK DATA I2C Interface
2fsc VCO
IH LOCK CTL
CR Det 2fsc
X-tal VCO/OSC
Clock
TANC
Head SW1
Head SW2
D.FF CTL
81
C.SOUELH
CLEAR SYNC
C.K
WHITE LIMITER
N→P
SOUELH
LEVEL Det1
LEVEL Det2
CLPF
Delay
Color Killer ID Det
PB APC
REC APC
REC AFC
PB/REC Discri
ME SECAM DET
HPF
ENV DET
84
Feed Back Clamp
Video ALC
B.D
CLPF
APC SW
ACC Det
1/2 Phase SW
DOWN Conv.
1/2 2FL VCO
86
87
Sync.Sep
Pulse Gen.
4Phase Gen.
88
CH2
CH1
U.DRUM
CN1
VIDEO HEAD
SP CH2
SP CH1
LP CH2
LP CH1
89
B.E
C.K
Main Conv2
Main Conv1
CTL TRAP fH HPF
ACC
2M LPF
SP
EP
91
CH2
CH1
TRAP
REC TRAP
OFF
HPF
SEP
COMP
L-SECAM
L-SECAM
LPF
92
MIX LEVEL ADJ
BPF
REC MUTE
YCA
93
94
HR-J461MS only
SQPB
SQPB DL
SQPB
P EQ
FM AGC
629 TRAP
DET
G EQ
DLIM
DeMOD
Sub LPF
Main De-Emph
1MHPF
7MLPF
Ingiead LPF
FM MOD
97
SW5V
98
REC AGC Det
PB ALC
APT CTL
Edge Delay
DO Det
D.E.
N.C.
N.L. De-Emph
N.L. Emph
FBC/ALC
REC EQ
EP ON
REC ON
PRE AMP
SP ON
A.MUTE
VCA
DET
Video AGC
YNR
DO
Y.LPF
Main Emph Carrier Offset W.C/D.C
fo/Dev Adj
S-DET
ATT (-10dB)
ATT (-10dB)
LPF
Clamp
Clamp
30 28 26 24 23 22 21 20 19 18
IC1
11 9 8 7 99
AUDIO SECTION

4.16 AUDIO BLOCK DIAGRAM




TO
SYSCON
A. MUTE(H)
N. REC_ST(H)
N. REC(H)
IC1
9
8
7
99
A. MUTE
POWER SW
Q2052-Q2055
OSC
Q2051
TRANS
T2051
TP2033
A. ERASE
DET
VCA
R
P
SP ON
PRE AMP
REC ON
EP ON
R2003 - R2005
C2003, C2004
100
1
FILTER
2
3
4
R2007, C2009
FILTER
REC EQ
5
6
CN2002
2
1
FULL ERASE HEAD
F. ERASE
CN2001
CN1
1 2
A/C HEAD
4
3
2
1
4
5
6
7
A. ERASE
REC/PB

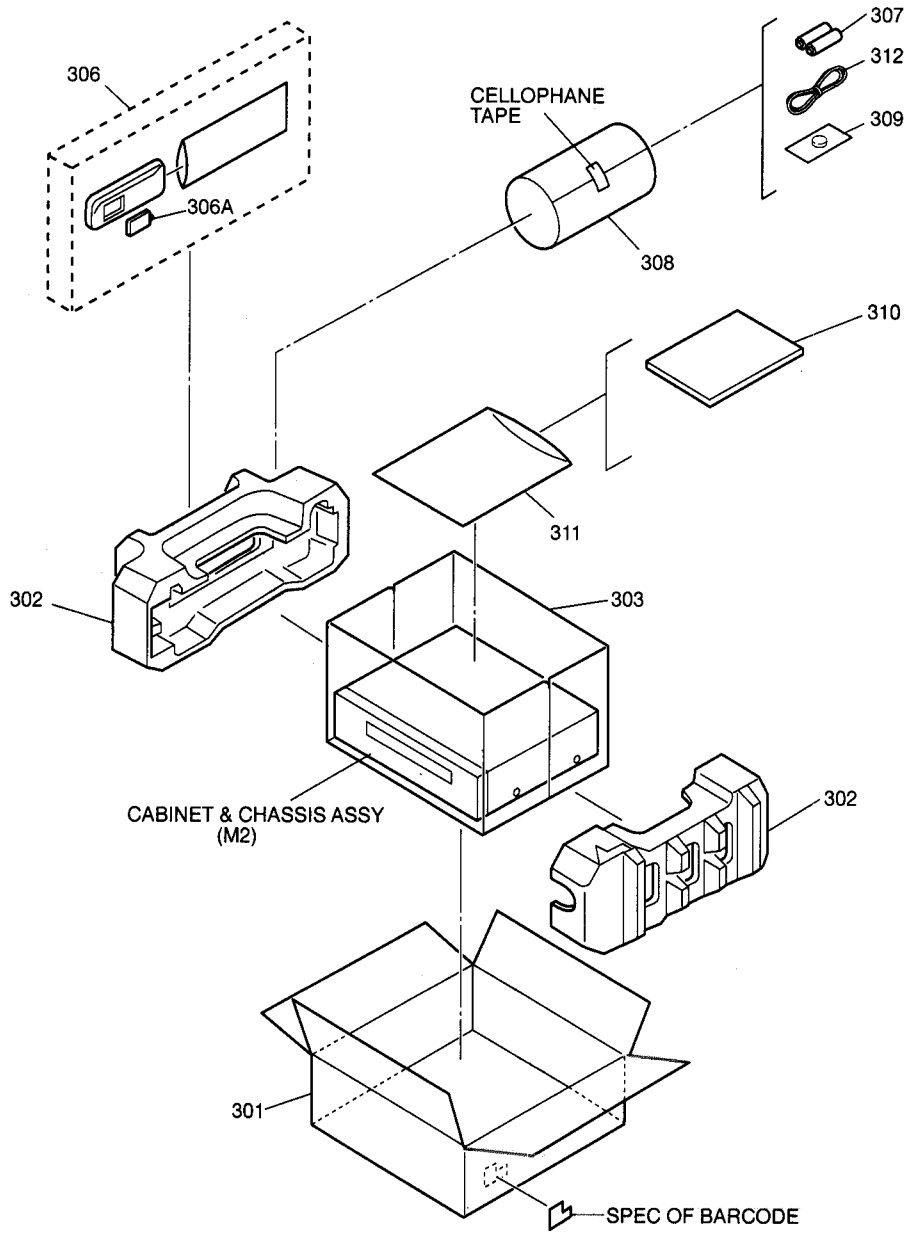
SECTION 5
PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

5.1 PACKING AND ACCESSORY ASSEMBLY <M1>

The instruction manual to be provided with this product will differ according to the destination.



#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION

****

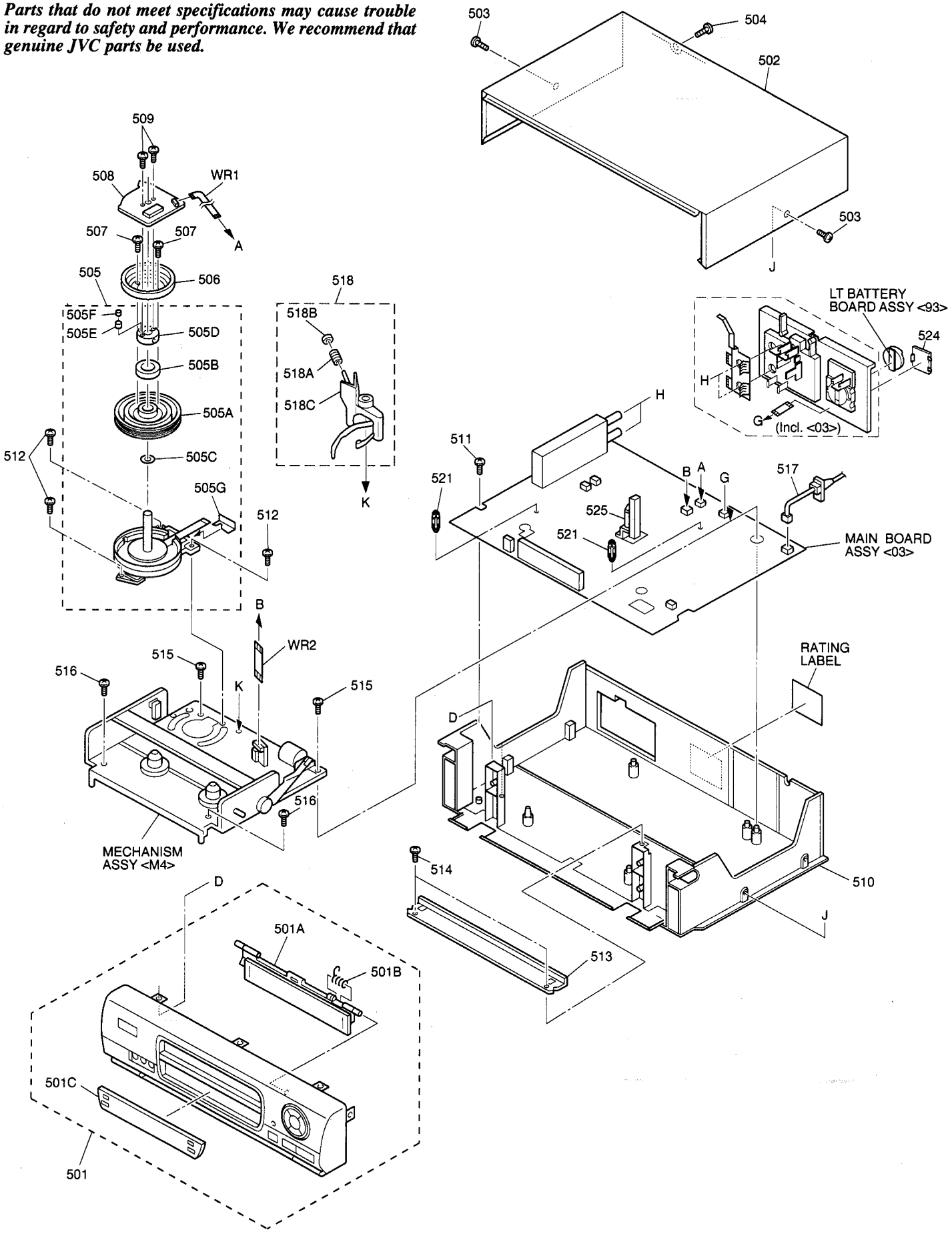
PACKING AND ACCESSORY ASSEMBLY <M1>

	301	LP30535-039A	PACKING CASE,J261MS
		LP30535-029A	PACKING CASE,J461MS
	302	LP30536-001B	CUSHION ASSY
	303	PQM30021-93	POLY BAG
	306	LP20034-016B	REMOTE CONTROLLER,J261MS
		LP20337-008A	REMOTE CONTROLLER,J461MS
	306A	LP40033-002A	BATTERY CAP,J261MS
		LP40254-002B	COVER(BATTERY),J461MS
	307	—	BATTERY,X2("R6" TYPE)
	308	QPC02202215P	POLY BAG
⚠	309	PECA0903	LI BATTERY
⚠	310	LPT0278-001A	INST.BOOK(EN),J461MS
⚠		LPT0278-002A	INST.BOOK(CH.RU),J461MS
⚠		LPT0285-001A	INST.BOOK(EN),J261MS
⚠		LPT0285-002A	INST.BOOK(CH.RU),J261MS
	311	QPC02503515P	POLY BAG
	312	PU59168-7	RF CABLE

5.2 CABINET AND CHASSIS ASSEMBLY <M2>

BEWARE OF BOGUS PARTS

Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.



#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION

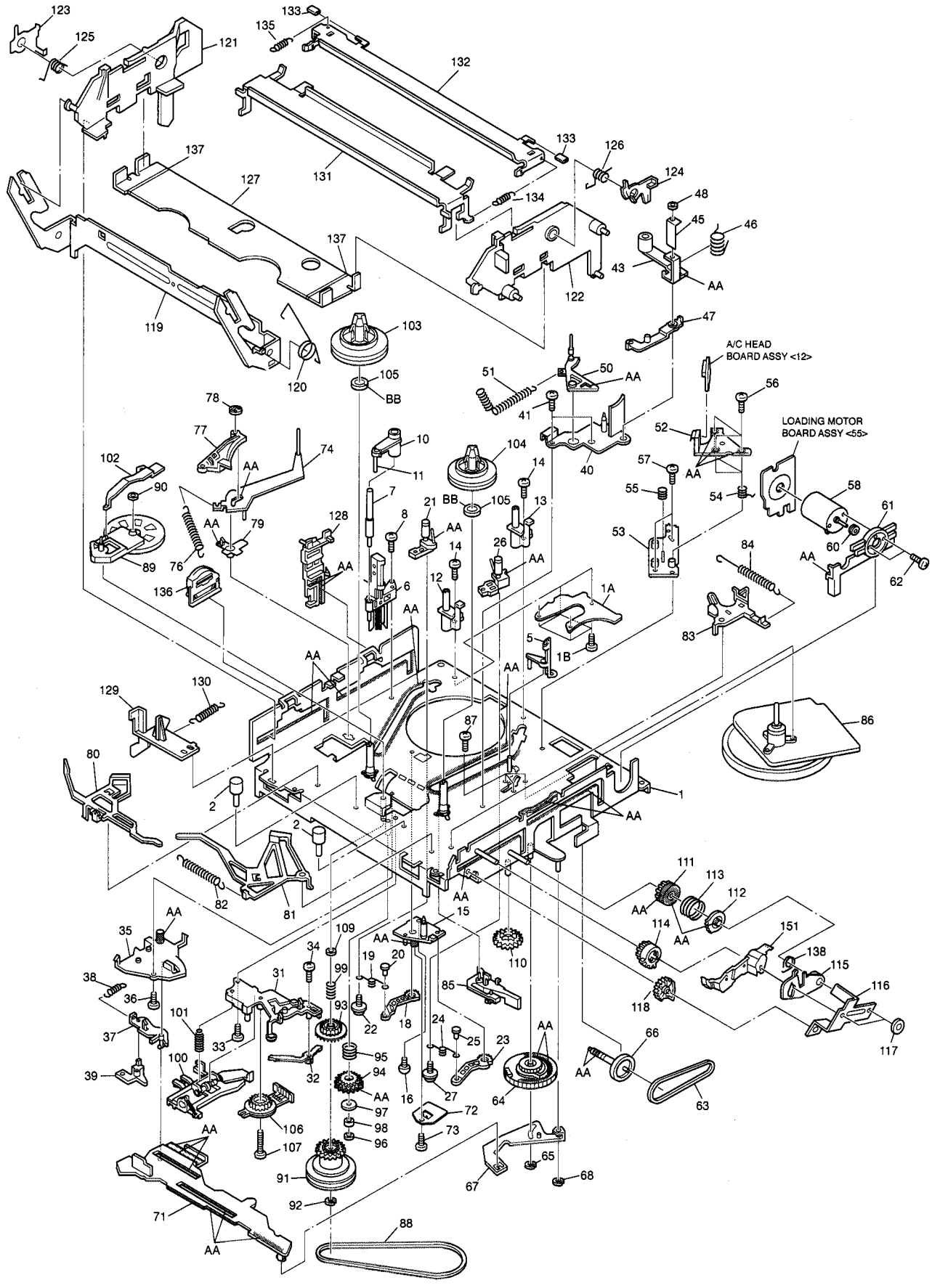
****

CABINET AND CHASSIS ASSEMBLY <M2>

⚠	501	LP10212-027A	FRONT PANEL ASSY,J461MS
⚠		LP10212-032A	FRONT PANEL ASSY,J261MS
	501A	PQ21884-147	CASSETTE DOOR,J461MS
		PQ21884-149	CASSETTE DOOR,J261MS
	501B	PQ46448	TORSION SPRING
	501C	LP20326-062A	DISPLAY WINDOW,J461MS
		LP20326-066A	DISPLAY WINDOW,J261MS
⚠	502	LP10013-021B	TOP COVER
	503	QYTDSF3010M	SCREW,X2 TOP COVER(SIDE)
	504	QYTDSF3010M	SCREW,TOP COVER(REAR)
	505	LP20617-004A	DRUM SUB ASSY,J461MS
		LP20617-005A	DRUM SUB ASSY,J261MS
	505A	LP20084-003A	UPPER DRUM ASSY,J261MS
		LP20084-006A	UPPER DRUM ASSY,J461MS
	505B	PDM4439	CAP
	505C	PDM4444-19-2	WASHER
	505D	LP40028-002A	COLLAR ASSY
	505E	LP40323-001A	CONTACT
	505F	LP30004-014A	COMPRESSION SPRING
	505G	LP40174-001B	FPC PLATE
	506	PDZ0179-1-4	ROTOR ASSY
	507	QYSPSP3006Z	SCREW,X2
	508	PDZ0180-1-2	STATOR ASSY
	509	QYSPSPL2607Z	SCREW,X2
⚠	510	LP10108-009B	BOTTOM CHASSIS
	511	QYTDSF3010Z	SCREW,MAIN
	512	QYSDST2610Z	SCREW,X3 DRUM
	513	LP30312-001B	BRACKET(CHASSIS)
	514	QYTDSF3010Z	SCREW,X2
	515	QYTDSF4012Z	SCREW,X2 MECHA
	516	QYTDSF3010Z	SCREW,X2 MECHA
⚠	517	QMP4A10-170	POWER CORD
	518	LP40369-003B	CLEANER ASSY
	518A	PQ46418-1-2	CLEANER ROLLER
	518B	LP40537-001B	CLEANER 2
	518C	LP30407-001D	CLEANER ARM
	521	LP40226-001A	PC SUPPORT,X2
	524	LP30336-001A	CAP,LT BATTERY
	525	LP40253-001B	STOPPER
	WR1	QUQ212-0518CG	FFC WIRE,DRUM CN3001
	WR2	WJT0005-002A	E-CARD WIRE,A/C HEAD CN2001

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION

5.3 MECHANISM ASSEMBLY <M4>



Classification	Part No.	Symbol in drawing
Grease	KYODO-SH-P	AA
Oil	COSMO-HV56	BB

NOTE: The section marked in AA and BB indicate lubrication and greasing areas.

MECHANISM ASSEMBLY <M4>

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION
1			LP20228-008H	MAIN DECK ASSY
1A			LP40275-003A	PLATE(SUPPLY)
1B			QYTDST2606Z	SCREW,X4 PLATE(SUPPLY)
2			PQ46302-1-3	ADJUST PIN,X2
5			LP30492-002B	GUIDE POLE GUARD
6			NAH0001-001	FULL ERASE HEAD
7			LP40098-001B	GUIDE POLE(SUPPLY)
8			QYTDST2608Z	SCREW,FE HEAD
10			LP30459-002A	TENSION STUD BASE
11			LP40367-002A	TENSION STUD
12			LP30409-002C	UV CATCHER 2(SUPPLY)
13			LP30409-002C	UV CATCHER 2(TAKE UP)
14			QYTPST2606Z	SCREW,X2 UV CATCHER
15			LP30223-003C	LOADING ARM GEAR SHAFT
16			QYTDST2606Z	SCREW
18			LP30224-001A	LOADING ARM GEAR(SPPLY)
19			LP40099-001A	TORSION ARM
20			LP40100-001A	PIN
21			LP40101-002C	POLE BASE ASSY(SUPPLY)
22			QYSPSTG2606Z	SCREW
23			LP40103-002B	LOADING ARM GEAR(TAKE UP)
24			LP40099-001A	TORSION ARM
25			LP40100-001A	PIN
26			LP40104-003A	POLE BASE ASSY(TAKE UP)
27			QYSPSTG2606Z	SCREW
31			LP20233-003J	ROTARY ENCODER GUIDE
32			LP30499-001C	BRAKE LEVER
33			QYTPST2606Z	SCREW
34			QYTPST2608Z	SCREW
35			LP30226-004B	CONTROL PLATE GUIDE
36			QYTPST2605Z	SCREW
37			LP30249-003B	TAKE UP LEVER
38			LP30003-006A	TENSION SPRING
39			LP40119-002A	T.UP HEAD
40			LP20234-004B	LID GUIDE
41			QYTDST2606Z	SCREW,X2
43			LP40105-001B	PINCH ROLLER ARM ASSY
45			LP40382-001A	PINCH ROLLER SHEET2
46			LP40148-002A	TORSION SPRING
47			LP40149-001B	P.LEVER ASSY
48			LP30016-002A	SLIT WASHER
50			LP40106-002E	GUIDE ARM ASSY
51			LP40134-001C	TENSION SPRING
52			QAH0010-004	AC HEAD
53			LP30228-001A	HEAD BASE
54			LP30004-013A	COMPRESSION SPRING,X3
55			LP40236-001A	COMPRESSION SPRING
56			LP40213-002B	SPECIAL SCREW,X3
57			QYTDST2608Z	SCREW,X2 HEAD BASE
58			QAR0023-001	LOADING MOTOR
60			PQ43546-1-2	MOTOR PULLEY
61			LP30230-003A	MOTOR GUIDE
62			QYTPSP3003Z	SCREW,X2
63			LP30005-003A	BELT,LOADING MOTOR
64			LP20791-002B	CONTROL CAM
65			PQM30017-24	SLIT WASHER
66			LP40120-001A	WORM GEAR
67			LP40107-002A	LINK LEVER ASSY
68			PQM30017-24	SLIT WASHER
71			LP10201-002D	CONTROL PLATE
72			LP40379-001A	CTL BRACKET(1)
73			QYTDSF2608M	SCREW
74			LP40108-002A	TENSION ARM ASSY
76			LP30003-010A	TENSION SPRING
77			LP40109-003D	TENSION BRAKE ASSY
78			PQ46302-1-3	ADJUST PIN
79			LP30232-002A	T.ARM BEARING
80			LP40532-004A	MAIN BRAKE ASSY (SUPPLY)
81			LP40111-006A	MAIN BRAKE ASSY (TAKE-UP)
82			LP30003-002A	TENSION SPRING
83			LP40112-001F	SUB BRAKE ASSY(TAKE UP)
84			LP40357-002A	TENSION SPRING
85			LP40461-001A	CAPSTAN BRAKE ASSY
86			QAR0087-003	CAPSTAN MOTOR
87			QYTDSF2606M	SCREW,X3
88			LP30005-007A	BELT,CAPSTAN MOTOR
89			LP40114-008A	IDLER ARM ASSY
90			LP30016-001A	SLIT WASHER
91			LP40459-003D	CLUTCH UNIT
92			PQM30017-47	SLIT WASHER
93			LP40446-002B	CLUTCH GEAR 1
94			LP40442-001A	DIRECT GEAR
95			LP40483-002A	COMPRESSION SPRING
96			LP30016-001A	SLIT WASHER
97			LP30017-014A	SPACER,D.GEAR
98			QYWFM264713	WASHER,D.GEAR
99			LP40554-001A	COMPRESSION SPRING,C.GEAR1
100			LP40484-001E	CHANGE LEVER ASSY
101			LP40512-002B	COMRESSION SPRING
102			LP30236-002B	IDLER LEVER
103			LP40420-001A	REEL DISK (SUPPLY)
104			LP40421-001A	REEL DISK (TAKE-UP)
105			LP30017-015A	SPACER,X2
106			QSW0554-003	ROTARY ENCODER
107			QYTPST2620Z	SCREW,ROTARY ENCODER
109			LP30017-019A	SPACER,C.GEAR 1
110			LP30237-002B	CASSETTE GEAR
111			LP30239-002F	LIMIT GEAR(1)
112			LP30240-002G	LIMIT GEAR(2)
113			LP40136-001E	TORSION SPRING
114			LP30242-002A	RELAY GEAR
115			LP30339-002D	OPENER GUIDE
116			LP40214-001B	C.H.BRACKET
117			PQM30017-47	SLIT WASHER,X2
118			LP30243-001D	DRIVE GEAR
119			LP20240-001C	DRIVE ARM
120			LP40137-001A	TORSION SPRING
121			LP10081-002L	SIDE HOLDER(L)
122			LP10082-002M	SIDE HOLDER(R)
123			LP30255-006A	LOCK LEVER(L)
124			LP30256-001H	LOCK LEVER(R)
125			LP40168-001A	TORSION SPRING(L)
126			LP40218-001B	TORSION SPRING(R)
127			LP30257-001E	CASSETTE HOLDER
128			LP30244-002G	GUIDE RAIL
129			LP30245-002E	REC SAFETY LEVER
130			LP30003-004A	TENSION SPRING
131			LP20578-001C	TOP GUIDE
132			LP30500-001C	HOLD PLATE
133			LP40450-003A	PAD,X2 HOLD PLATE
134			LP30003-025B	TENSION SPRING(TAKE UP)
135			LP30003-024A	TENSION SPRING(SUPPLY)
136			LP40481-003A	ROLLER CAM ASSY
137			LP30019-014A	PAD,X2 CASSETTE HOLDER
138			LP40545-001A	TORSION SPRING,OPENER GUIDE
151			LP20324-002E	DOOR OPENER

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION

****

MAIN BOARD ASSEMBLY <03>

		PW1	LPA10045-28B1	MAIN BOARD ASSY,J461MS
			LPA10045-33B1	MAIN BOARD ASSY,J261MS
		IC1	JCP8017-MSA	IC
		IC201	LC74789N-9770	IC (OSD)
		IC3001	HD6432192A09F	IC (MCU)
		IC3002	S-80727AN-DQ-X	IC
			or S-80827ANUP-W	IC
		IC3003	M24C04-BN6	IC
			or S-24C04ADP	IC
			or 24LC04B/P	IC
			or AT24C04A-10PC	IC
		IC3004	TA7291S	IC
		IC5301	LA5613	IC
		IC7001	M35500BGP	IC
			or M35500AGP	IC
		IC7002	GP1U291Q	IR DETECT UNIT
			or PNA4652M00YC	IR DETECT UNIT
		Q38	2SD1819A/QRS/-X	TRANSISTOR
			or 2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q39	2SB1218A/QR/-X	TRANSISTOR
			or 2PA1576/R/-X	TRANSISTOR
			or 2SA1576A/QR/-X	TRANSISTOR
		Q152	2SB1218A/QR/-X	TRANSISTOR
			or 2SA1576A/QR/-X	TRANSISTOR
			or 2PA1576/R/-X	TRANSISTOR
		Q154	2SB1218A/QR/-X	TRANSISTOR
			or 2SA1576A/QR/-X	TRANSISTOR
			or 2PA1576/R/-X	TRANSISTOR
		Q2001	2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
			or 2SD1819A/QRS/-X	TRANSISTOR
		Q2002	2SC4081/QRS/-X	TRANSISTOR
			or 2SD1819A/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q2003	UN511E	TRANSISTOR
			or RN2309	TRANSISTOR
			or DTA144WU	TRANSISTOR
			or PDTA144WU	TRANSISTOR
		Q2051	2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
			or 2SD1819A/QRS/-X	TRANSISTOR
		Q2052	2SA1576A/QR/-X	TRANSISTOR
			or 2SB1218A/QR/-X	TRANSISTOR
			or 2PA1576/R/-X	TRANSISTOR
		Q2053	UN521E	TRANSISTOR
			or RN1309	TRANSISTOR
			or DTC144WU	TRANSISTOR
			or PDTC144WU	TRANSISTOR
		Q2054	2SA1576A/QR/-X	TRANSISTOR
			or 2PA1576/R/-X	TRANSISTOR
			or 2SB1218A/QR/-X	TRANSISTOR
		Q2055	UN521E	TRANSISTOR
			or PDTC144WU	TRANSISTOR
			or RN1309	TRANSISTOR
			or DTC144WU	TRANSISTOR

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION
		Q3001	2SD1819A/QRS/-X	TRANSISTOR
			or 2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q3002	PTZ-NV16	PHOTO TRANSISTOR
			or PTZ-NV16A	IC(PHOTO COUPLE
		Q3003	PTZ-NV16	PHOTO TRANSISTOR
			or PTZ-NV16A	IC(PHOTO COUPLE
		Q3004	2SD1819A/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
			or 2SC4081/QRS/-X	TRANSISTOR
		Q3005	2SD1819A/QRS/-X	TRANSISTOR
			or 2SC4081/QRS/-X	TRANSISTOR
			or 2PC4081/R/-X	TRANSISTOR
		Q4001	UN5211	TRANSISTOR
			or PDTC114EU	TRANSISTOR
			or RN1302	TRANSISTOR
			or DTC114EU	TRANSISTOR
		Q5101	2SK3255	POWER MOS FET
			or 2SK3255-CB14	POWER MOS FET
		Q5102	2SD2144S/UV/-T	TRANSISTOR
		Q5303	2SD2144S/UVW/-T	TRANSISTOR
		Q6030	2SB1218A/RS/-X	TRANSISTOR
		Q6031	UN5211	TRANSISTOR
			or RN1302	TRANSISTOR
			or DTC114EU	TRANSISTOR
			or PDTC114EU	TRANSISTOR
		Q6032	UN5211	TRANSISTOR
			or RN1302	TRANSISTOR
			or DTC114EU	TRANSISTOR
			or PDTC114EU	TRANSISTOR
		Q7152	2SB1218A/QR/-X	TRANSISTOR
			or 2SA1576A/QR/-X	TRANSISTOR
			or 2PA1576/R/-X	TRANSISTOR
		D201	1SS133	DIODE
		D202	1SS133	DIODE
		D203	1SS133	DIODE
		D2001	1SS133	DIODE
		D3001	LNB2301L01VI	LE DIODE
		D3002	1SS133	DIODE
		D3003	RD39ES/B3/-T2	ZENER DIODE
			or MTZJ39C	ZENER DIODE
		D3004	11ES2	DIODE
		D3005	11ES2	DIODE
	⚠	D3006	RB721Q-40-T2	SB DIODE
		D4001	1SS133	DIODE
		D4002	1SS133	DIODE
		D5001	S1WB(A)60F4102	BRIDGE DIODE
			or S1WB(A)60F4062X	BRIDGE DIODE
			or S1WB(A)60F4072X	BRIDGE DIODE
		D5101	AU01	FR DIODE
			or ERA18-04-T2	FR DIODE
			or PG104RS	FR DIODE
			or 1SR153-400-T2	FR DIODE
			or 10ELS4	FR DIODE
		D5102	AU01	FR DIODE
			or ERA18-04-T2	FR DIODE
			or PG104RS	FR DIODE
			or 10ELS4	FR DIODE
			or 1SR153-400-T2	FR DIODE
		D5103	1SS133	DIODE
		D5201	AU01Z	FR DIODE

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
			or 10ELS2	FR DIODE	
		D5203	AU01Z	FR DIODE	
			or PG104RS	FR DIODE	
			or 1SR153-400-T2	FR DIODE	
			or 10ELS2	FR DIODE	
			or ERA18-02-T2	FR DIODE	
		D5204	AU01Z	FR DIODE	
			or ERA18-02-T2	FR DIODE	
			or PG104RS	FR DIODE	
			or 10ELS2	FR DIODE	
			or 1SR153-400-T2	FR DIODE	
		D5205	AU01Z	FR DIODE	
			or ERA18-02-T2	FR DIODE	
			or 1SR153-400-T2	FR DIODE	
			or 10ELS2	FR DIODE	
			or PG104RS	FR DIODE	
		D5207	AK04	DIODE	
			or 1S4	SB DIODE	
			or 11EQS04	SB DIODE	
		D5210	AU01Z	FR DIODE	
			or ERA18-02-T2	FR DIODE	
			or 1SR153-400-T2	FR DIODE	
			or 10ELS2	FR DIODE	
			or PG104RS	FR DIODE	
		D5211	AU01Z	FR DIODE	
			or ERA18-02-T2	FR DIODE	
			or PG104RS	FR DIODE	
			or 10ELS2	FR DIODE	
			or 1SR153-400-T2	FR DIODE	
		D5301	MTZJ15A	ZENER DIODE	
			or RD15ES/B1/-T2	ZENER DIODE	
		D5302	MTZJ6.8A	ZENER DIODE	
			or RD6.8ES/B1/-T2	ZENER DIODE	
		D5303	MTZJ30A	ZENER DIODE	
			or RD30ES/B1/-T2	ZENER DIODE	
		D5304	1SS133	DIODE	
		D5311	RD5.1ES/B3/-T2	ZENER DIODE	
			or MTZJ5.1C	ZENER DIODE	
		D6002	HZ30-2L-T2	ZENER DIODE	
			or HZ30-2LTD	Z DIODE (M)	
		D7002	RD9.1ES/B2/-T2	ZENER DIODE	
			or MTZJ9.1B	ZENER DIODE	
		D7101	1SS133	DIODE	
		D7102	1SS133	DIODE	
		R1	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R2	NRSA02J-821X	MG RESISTOR	820Ω,1/10W
		R3	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
		R7	NRSA02J-472X	MG RESISTOR,J461MS	4.7kΩ,1/10W
		R23	NRSA02J-822X	MG RESISTOR	8.2kΩ,1/10W
		R24	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R25	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
		R122	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R123	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R124	NRSA02J-681X	MG RESISTOR	680Ω,1/10W
		R131	QRE141J-0R0Y	RESISTOR	0Ω,1/4W
		R154	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R155	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R157	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
		R158	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R190	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R192	NRSA02J-106X	MG RESISTOR	10MΩ,1/10W

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		R193	QRE141J-0R0	RESISTOR	0Ω,1/4W
		R194	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R213	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R214	QRE141J-0R0Y	RESISTOR	0Ω,1/4W
		R216	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R218	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R2001	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R2002	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R2003	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R2004	NRSA02J-224X	MG RESISTOR	220kΩ,1/10W
		R2005	NRSA02J-181X	MG RESISTOR	180Ω,1/10W
		R2006	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
		R2007	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R2009	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R2011	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2012	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R2013	NRSA02J-473X	MG RESISTOR,J461MS	47kΩ,1/10W
		R2014	NRSA02J-153X	MG RESISTOR,J461MS	15kΩ,1/10W
		R2015	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2016	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R2018	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2019	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2053	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2054	NRSA02J-123X	MG RESISTOR	12kΩ,1/10W
		R2055	NRSA02J-3R3X	MG RESISTOR	3.3Ω,1/10W
		R2056	NRSA02J-820X	MG RESISTOR	82Ω,1/10W
		R2057	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2058	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R2059	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2060	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R3011	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R3013	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R3014	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3015	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R3016	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R3017	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R3020	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R3022	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R3025	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3026	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3027	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3029	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3035	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3036	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3038	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3039	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3040	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3041	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3042	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3044	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3049	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R3050	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R3051	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R3052	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R3053	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R3054	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3055	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3056	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3057	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3058	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3060	NRSA02J-471X	MG RESISTOR	470Ω,1/10W

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		R3061	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R3062	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3066	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3069	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R3071	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3072	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3073	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3074	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3075	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R3076	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R3080	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R3087	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3091	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3092	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R3093	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3097	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3105	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
		R3201	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3202	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3203	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3204	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R3205	QRE141J-181Y	RESISTOR	180Ω,1/4W
		R3206	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R3207	QRE141J-183Y	RESISTOR	18kΩ,1/4W
		R3208	NRSA02J-181X	MG RESISTOR	180Ω,1/10W
		R3209	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
		R3210	NRSA02J-181X	MG RESISTOR	180Ω,1/10W
		R3211	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
		R3212	NRSA02J-474X	MG RESISTOR	470kΩ,1/10W
		R3213	QRE141J-334Y	RESISTOR	330kΩ,1/4W
		R3214	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3215	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3216	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3217	NRSA02J-562X	MG RESISTOR	5.6kΩ,1/10W
		R3218	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R3219	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3220	NRSA02J-104X	MG RESISTOR	100kΩ,1/10W
	⚠	R3221	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3222	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3223	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
		R3224	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
		R3225	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R3229	NRSA02J-105X	MG RESISTOR	1MΩ,1/10W
		R3230	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3231	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3235	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
		R3236	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
		R3239	NRSA02J-104X	MG RESISTOR	100kΩ,1/10W
		R3240	NRSA02J-104X	MG RESISTOR	100kΩ,1/10W
		R3242	NRSA02J-104X	MG RESISTOR	100kΩ,1/10W
		R4001	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R4003	NRSA02J-561X	MG RESISTOR	560Ω,1/10W
		R4004	NRSA02J-561X	MG RESISTOR	560Ω,1/10W
		R4005	NRSA02J-562X	MG RESISTOR	5.6kΩ,1/10W
		R4007	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4008	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4009	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4011	NRSA02J-392X	MG RESISTOR	3.9kΩ,1/10W
		R4012	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R4013	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R4014	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R4015	NRSA02J-223X	MG RESISTOR	22kΩ,1/10W
		R4016	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R4017	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4018	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4019	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R4020	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R4021	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R5101	QRE141J-224Y	RESISTOR	220kΩ,1/4W
		R5102	QRE141J-224Y	RESISTOR	220kΩ,1/4W
		R5103	QRE141J-683Y	RESISTOR	68kΩ,1/4W
		R5104	QRG029J-154G	OMF RESISTOR	150kΩ,2W
		R5106	QRT01DJ-R39X	MF RESISTOR	0.39Ω,1W
		R5107	QRE121J-331Y	RESISTOR	330Ω,1/2W
		R5108	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R5109	NRSA02J-681X	MG RESISTOR	680Ω,1/10W
		R5110	NRSA02J-224X	MG RESISTOR	220kΩ,1/10W
		R5111	NRSA02J-821X	MG RESISTOR	820Ω,1/10W
		R5301	QRE141J-2R2Y	RESISTOR	2.2Ω,1/4W
		R5302	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R5303	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
	⚠	R5304	QRZ9005-221X	FUSI RESISTOR	220Ω,1/4W
		R5305	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R5306	NRSA02J-333X	MG RESISTOR	33kΩ,1/10W
		R5319	QRE141J-511Y	RESISTOR	510Ω,1/4W
		R5320	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R5324	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R5326	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R6020	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R6021	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R6022	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R6023	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R6030	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R6031	NRSA02J-271X	MG RESISTOR	270Ω,1/10W
		R6032	NRSA02J-392X	MG RESISTOR	3.9kΩ,1/10W
		R6033	NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W
		R6050	QRE141J-101Y	RESISTOR	100Ω,1/4W
		R6051	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R6052	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R7001	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R7002	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R7003	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R7004	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R7005	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R7006	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R7007	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7008	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7009	QRE141J-393Y	RESISTOR,J261MS	39kΩ,1/4W
		R7010	NRSA02J-393X	MG RESISTOR,J461MS	39kΩ,1/10W
		R7013	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7014	QRE141J-0R0Y	RESISTOR	0Ω,1/4W
		R7015	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R7017	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R7020	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7021	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
		R7022	QRE141J-182Y	RESISTOR	1.8kΩ,1/4W
		R7023	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R7024	NRSA02J-272X	MG RESISTOR	2.7kΩ,1/10W
		R7030	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7031	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
		R7032	NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W
		R7033	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		R7034	NRSA02J-272X	MG RESISTOR	2.7kΩ,1/10W
		R7035	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R7036	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R7037	NRSA02J-563X	MG RESISTOR	56kΩ,1/10W
		R7119	NRSA02J-750X	MG RESISTOR	75Ω,1/10W
		R7122	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R7129	NRSA02J-101X	MG RESISTOR,J461MS	100Ω,1/10W
		R7130	NRSA02J-750X	MG RESISTOR,J461MS	75Ω,1/10W
		R7131	NRSA02J-750X	MG RESISTOR	75Ω,1/10W
		R7132	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R7152	QRE123J-331X	RESISTOR	330Ω,1/2W
		R7155	NRSA02J-331X	MG RESISTOR	330Ω,1/10W
		C1	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C3	NCF21CZ-105X	CAPACITOR,J461MS	1μF,16V
		C5	NCF21CZ-105X	CAPACITOR,J461MS	1μF,16V
		C7	QEKJ0JM-107	E CAPACITOR	100μF,6.3V
		C9	NCF21CZ-105X	CAPACITOR	1μF,16V
		C11	NCF21CZ-105X	CAPACITOR	1μF,16V
		C12	NCB21CK-473X	CAPACITOR	0.047μF,16V
		C13	QEKJ1HM-335	E CAPACITOR	3.3μF,50V
		C14	NCB21EK-333X	CAPACITOR	0.033μF,25V
		C16	NCF21CZ-105X	CAPACITOR	1μF,16V
		C20	QEKJ1HM-225	E CAPACITOR	2.2μF,50V
		C21	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C23	NCB21EK-223X	CAPACITOR	0.022μF,25V
		C24	NCB21CK-474X	CAPACITOR	0.47μF,16V
		C25	NCB21CK-224X	CAPACITOR	0.22μF,16V
		C29	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
		C30	QEKJ1EM-475	E CAPACITOR,J461MS	4.7μF,25V
		C31	NCB21EK-223X	CAPACITOR,J461MS	0.022μF,25V
			NRSA02J-0R0X	MG RESISTOR,J261MS	0Ω,1/10W
		C32	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C34	QCC11EK-104	CAPACITOR	0.1μF,25V
		C37	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C40	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C41	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C42	NCB21EK-103X	CAPACITOR	0.01μF,25V
		C43	NCF21HZ-103X	CAPACITOR	0.01μF,50V
		C45	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C48	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C49	NDC21HJ-331X	CAPACITOR	330pF,50V
		C51	QEQF1HM-225	NP E CAPACITOR	2.2μF,50V
		C52	QERF1HM-105	E CAPACITOR	1μF,50V
		C53	QERF1HM-105	E CAPACITOR,J461MS	1μF,50V
		C54	QEKJ1HM-225	E CAPACITOR	2.2μF,50V
		C55	QERF1CM-106	E CAPACITOR	10μF,16V
		C56	QEKJ1HM-335	E CAPACITOR	3.3μF,50V
		C57	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C58	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C59	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C60	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C61	NDC21HJ-330X	CAPACITOR	33pF,50V
		C62	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C63	NDC21HJ-151X	CAPACITOR	150pF,50V
		C64	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C65	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C74	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		C81	NDC21HJ-150X	CAPACITOR	15pF,50V
		C82	NDC21HJ-150X	CAPACITOR	15pF,50V
		C83	NDC21HJ-150X	CAPACITOR,J461MS	15pF,50V
			NRSA02J-0R0X	MG RESISTOR,J261MS	0Ω,1/10W

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		C84	NDC21HJ-150X	CAPACITOR,J461MS	15pF,50V
			NRSA02J-0R0X	MG RESISTOR,J261MS	0Ω,1/10W
		C85	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C107	NDC21HJ-4R0X	CAPACITOR	4pF,50V
		C108	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C121	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C134	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C135	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C136	NCB11EK-104X	CAPACITOR	0.1μF,25V
		C152	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C153	NDC21HJ-390X	CAPACITOR	39pF,50V
		C204	NCB21EK-103X	CAPACITOR	0.01μF,25V
		C206	NDC21HJ-330X	CAPACITOR	33pF,50V
		C207	NDC21HJ-330X	CAPACITOR	33pF,50V
		C209	NCB21CK-474X	CAPACITOR	0.47μF,16V
		C210	NDC21HJ-100X	CAPACITOR	10pF,50V
		C211	NDC21HJ-100X	CAPACITOR	10pF,50V
		C214	NCB21CK-224X	CAPACITOR	0.22μF,16V
		C217	NDC21HJ-560X	CAPACITOR	56pF,50V
		C218	QERF1HM-105	E CAPACITOR	1μF,50V
		C222	QERF1HM-105	E CAPACITOR	1μF,50V
		C226	QERF0JM-107	E CAPACITOR	100μF,6.3V
		C2002	QEKJ1CM-476	E CAPACITOR	47μF,16V
		C2003	NCB21HK-123X	CAPACITOR	0.012μF,50V
		C2004	QEKJ1CM-226	E CAPACITOR	22μF,16V
		C2005	NCB21HK-102X	CAPACITOR	0.001μF,50V
		C2006	NCB21HK-331X	CAPACITOR	330pF,50V
		C2007	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C2008	NCB21HK-152X	CAPACITOR	0.0015μF,50V
		C2009	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
		C2010	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
		C2011	NCB21EK-333X	CAPACITOR	0.033μF,25V
		C2012	NCB21EK-333X	CAPACITOR	0.033μF,25V
		C2013	NCB21EK-333X	CAPACITOR,J461MS	0.033μF,25V
		C2015	QEKJ1CM-226	E CAPACITOR	22μF,16V
		C2016	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
		C2051	NCB21HK-331X	CAPACITOR	330pF,50V
		C2052	QFLC1HJ-823Z	F CAPACITOR	0.082μF,50V
		C2053	NCB21HK-472X	CAPACITOR	0.0047μF,50V
		C2054	NCB21HK-223X	CAPACITOR	0.022μF,50V
		C2055	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C3001	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C3002	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C3003	QEKJ1HM-106	E CAPACITOR	10μF,50V
		C3004	NCB21CK-473X	CAPACITOR	0.047μF,16V
		C3011	QETL0JM-108	E CAPACITOR	1000μF,6.3V
		C3012	QEKJ0JM-107	E CAPACITOR	100μF,6.3V
		C3013	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C3014	QERF1CM-476	E CAPACITOR	47μF,16V
		C3016	NCB21CK-473X	CAPACITOR	0.047μF,16V
		C3019	NDC21HJ-101X	CAPACITOR	100pF,50V
		C3020	NDC21HJ-101X	CAPACITOR	100pF,50V
		C3021	NDC21HJ-101X	CAPACITOR	100pF,50V
		C3022	NCB21CK-473X	CAPACITOR	0.047μF,16V
		C3023	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C3024	NDC21HJ-220X	CAPACITOR	22pF,50V
		C3025	QAT7001-300Z	TRIM CAPACITOR,TIMER CLOCK	
		C3026	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C3027	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C3028	NDC21HJ-101X	CAPACITOR	100pF,50V
		C3029	NDC21HJ-101X	CAPACITOR	100pF,50V

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		C3030	QEKJ1CM-476	E CAPACITOR	47μF,16V
		C3031	NCB21CK-473X	CAPACITOR	0.047μF,16V
		C3032	NCB21CK-473X	CAPACITOR	0.047μF,16V
		C3033	NCB21CK-473X	CAPACITOR	0.047μF,16V
		C3036	NDC21HJ-180X	CAPACITOR	18pF,50V
		C3037	NDC21HJ-120X	CAPACITOR	12pF,50V
		C3038	NDC21HJ-101X	CAPACITOR	100pF,50V
		C3039	NDC21HJ-101X	CAPACITOR	100pF,50V
		C3040	NCB21CK-473X	CAPACITOR	0.047μF,16V
		C4001	QERF1CM-476	E CAPACITOR	47μF,16V
		C4002	NCB21CK-473X	CAPACITOR	0.047μF,16V
		C4003	NCB21HK-102X	CAPACITOR	0.001μF,50V
		C4004	QERF1CM-226	E CAPACITOR	22μF,16V
		C4005	NCB21HK-222X	CAPACITOR	0.0022μF,50V
		C4006	QEKJ1CM-476	E CAPACITOR	47μF,16V
		C4008	QEQF1HM-105	NP E CAPACITOR	1μF,50V
		C4009	NCB21HK-563X	CAPACITOR	0.056μF,50V
		C4010	NCB21EK-223X	CAPACITOR	0.022μF,25V
		C4011	NCB21CK-104X	CAPACITOR	0.1μF,16V
		C4012	QEKJ1HM-224	E CAPACITOR	0.22μF,50V
		C4013	NCB21HK-563X	CAPACITOR	0.056μF,50V
		C4014	NDC21HJ-101X	CAPACITOR	100pF,50V
		C4015	NCB21HJ-102X	CAPACITOR	0.001μF,50V
	⚠	C5001	QFZ9051-683	F CAPACITOR	0.068μF,250V
	⚠	C5005	QCZ9071-222	CAPACITOR	0.0022μF,250V
		C5006	QEZ0374-826	E CAPACITOR	82μF,400V
		C5101	QCZ0212-472	CAPACITOR	0.0047μF,1kV
		C5102	QCZ0136-101Z	CAPACITOR,J461MS	100pF,1kV
			QCZ0302-330Z	CAPACITOR,J261MS	33pF,1kV
		C5104	QETC1HM-105	E CAPACITOR	1μF,50V
		C5105	QFN31HJ-183	F CAPACITOR	0.018μF,50V
		C5106	QCBB1HJ-271	CAPACITOR	270pF,50V
		C5107	QFV11HJ-104	F CAPACITOR	0.1μF,50V
		C5201	QEMU0JM-227	E CAPACITOR	220μF,6.3V
		C5202	QEMT1CM-827	E CAPACITOR	820μF,16V
		C5203	QEMT1AM-687	E CAPACITOR	680μF,10V
		C5204	QETN2AM-475	E CAPACITOR	4.7μF,100V
		C5205	QETC1HM-106	E CAPACITOR	10μF,50V
		C5207	QETN1CM-227	E CAPACITOR	220μF,16V
		C5208	QETN1AM-227	E CAPACITOR	220μF,10V
		C5301	QEMU0JM-227	E CAPACITOR	220μF,6.3V
		C5302	QETC1HM-106	E CAPACITOR	10μF,50V
		C5303	QETN1CM-107	E CAPACITOR	100μF,16V
		C5304	QFLC1HJ-183Z	F CAPACITOR	0.018μF,50V
		C5305	NCF21HZ-103X	CAPACITOR	0.01μF,50V
		C5306	QETN1AM-107	E CAPACITOR	100μF,10V
		C5307	QETN1CM-226	E CAPACITOR	22μF,16V
		C6006	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C6008	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C6012	QEKJ1CM-476	E CAPACITOR	47μF,16V
		C6013	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C6014	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C6016	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C6020	NDC21HJ-101X	CAPACITOR	100pF,50V
		C6021	NDC21HJ-101X	CAPACITOR	100pF,50V
		C6022	NDC21HJ-101X	CAPACITOR	100pF,50V
		C6032	NCB21HK-473X	CAPACITOR	0.047μF,50V
		C6037	QEKJ1HM-106	E CAPACITOR	10μF,50V
		C6055	NDC21HJ-220X	CAPACITOR	22pF,50V
		C7002	QEKJ1HM-106	E CAPACITOR	10μF,50V
		C7007	QEKJ0JM-476	E CAPACITOR	47μF,6.3V

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		C7009	NDC21HJ-220X	CAPACITOR	22pF,50V
		C7010	NCB21CK-473X	CAPACITOR	0.047μF,16V
		C7011	QEKJ1CM-476	E CAPACITOR	47μF,16V
		C7020	QDVB1EZ-223Y	CAPACITOR	0.022μF,25V
		C7021	NCB21CK-473X	CAPACITOR	0.047μF,16V
		C7117	QETN0JM-477	E CAPACITOR	470μF,6.3V
		C7171	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C7172	QEKC1CM-476	E CAPACITOR	47μF,16V
		L1	QQL29BJ-100Z	COIL	10μH
		L4	QQL29BJ-100Z	COIL	10μH
		L7	QQL29BK-R22Z	COIL	0.22μH
		L8	QQL29BJ-101Z	COIL	100μH
		L9	QQL29BJ-100Z	COIL	10μH
		L16	QQL29BJ-100Z	COIL	10μH
		L17	QQL01BJ-120Z	COIL	10μH
		L151	QQL29BJ-680Z	COIL	68μH
		L201	QQL29BK-1R0Z	COIL	1μH
		L203	QQL29BJ-220Z	COIL	22μH
		L206	QQL29BJ-220Z	COIL	22μH
		L5201	PELN1184	COIL	33μH
		L5202	PELN1184	COIL	33μH
		L5301	QQL01BK-101Z	COIL	100μH
		L6003	QQL29BJ-100Z	COIL	10μH
		L6031	QQL29BK-1R0Z	COIL	10μH
		L7103	NRSA02J-0R0X	MG RESISTOR,J461MS	0Ω,1/10W
		L7104	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		X1	QAX0530-001	CRYSTAL RESONATOR	
		X2	QAX0435-001	CRYSTAL RESONATOR	
		X3001	QAX0445-001	CRYSTAL RESONATOR	
		X3002	QAX0527-001	CRYSTAL RESONATOR	
		S3001	QSW0602-003	PUSH SWITCH,REC SAFETY	
		S7001	QSW0456-002Z	TACT SWITCH,STAND BY	
		S7002	QSW0456-002Z	TACT SWITCH,C.SYSTEM	
		S7004	QSW0456-002Z	TACT SWITCH,CH-	
		S7006	QSW0456-002Z	TACT SWITCH,CH+	
		S7008	QSW0456-002Z	TACT SWITCH,DISPLAY	
		S7010	QSW0456-002Z	TACT SWITCH,REC	
		S7011	QSW0456-002Z	TACT SWITCH,REW	
		S7012	QSW0456-002Z	TACT SWITCH,STOP/EJECT	
		S7013	QSW0456-002Z	TACT SWITCH,PLAY	
		S7014	QSW0456-002Z	TACT SWITCH,PAUSE	
		S7015	QSW0456-002Z	TACT SWITCH,FF	
		S7016	QSW0456-002Z	TACT SWITCH,ST BOX	
		K5101	QQR0678-001Z	FERRITE BEAD	
		PC3001	GP3S123	IC(PHOTO SENSOR)	
		PC3002	GP3S123	IC(PHOTO SENSOR)	
	⚠	PC5101	PC123F2	PH COUPLER	
		T2051	PELN0832	OSC TRANSFORMER	
	⚠	T5001	QQS0030-001	SW TRANSFORMER	
		TU6001	QAU0107-001	TUNER	
	⚠	TB1	LP20383-004A	TERMINAL BOARD,J261MS	
	⚠		LP20383-006A	TERMINAL BORAD,J461MS	
		ET1	PQ21623-2-5	EARTH PLATE(RF)	
	⚠	HS1	LP40090-001A	HEAT SINK,Q5101	
		SD1	LP30530-001B	SHIELD CASE(PRE)	
		OT1	QYTDST3006Z	SCREW,Q5101	
		DI7001	QLF0031-001	FL TUBE	
		HD1	PQ35479-1-4	HOLDER(FDP),DI7001	
		FC5001	QNG0006-001Z	FUSE CLIP,F5001	
		FC5002	QNG0006-001Z	FUSE CLIP,F5001	
		J7103	QNN0292-002	PIN JACK,REAR OUT	

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		J7104	QNN0291-002	PIN JACK,REAR IN,J461MS	
		J7105	QNN0289-002	PIN JACK,REAR IN,J261MS	
			QNN0290-002	PIN JACK,FRONT IN,J461MS	
	⚠	LF5002	QQR0532-001	LINE FILTER	
	⚠	VA5001	QAF0026-621	VARISTOR	
		CN1	QGF1028C3-04	FPC CONNECTOR,(5-8)U.DRUM J261MS	
			QGF1028C2-08	FPC CONNECTOR,(1-8)U.DRUM J461MS	
		CN2001	QGF1207C1-07	FPC CONNECTOR,(1-7)A/C HEAD	
		CN2002	QGB2532J1-02	CONNECTOR,(1-2)FE HEAD	
		CN3001	QGF1207C1-05	FPC CONNECTOR,(1-5)DRUM MDA	
		CN3002	QGB2532J1-02	CONNECTOR,(1-2)L.MOTOR	
		CN3003	QGB2015M2-08	CONNECTOR,(1-8)CAP.MOTOR	
		CN3004	QGB2534J2-04	CONNECTOR,(1-4)R.ENCODER	
		CN3005	QGD2001C1-02	CONNECTOR,(1-2)LT BATTERY	
	⚠	CN5001	QGA7901C3-02	CONNECTOR,(1-2)AC IN	
	⚠	CP3001	ICP-N25	CIRCUIT PROTECTOR	
	⚠	CP4001	ICP-N15	CIRCUIT PROTECTOR	
	⚠	CP5301	ICP-N38	CIRCUIT PROTECTOR	
	⚠	F5001	QMF51E2-2R0J1	FUSE	T2.0A,AC250V

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AUDIO CONTROL HEAD BOARD ASSEMBLY <12>

	PW1	LPA10010-01A1	A/C HEAD BOARD ASSY
	CN1	QGF1208F1-07	FPC CONNECTOR

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LOADING MOTOR BOARD ASSEMBLY <55>

	PW2	LPA10010-01A2	LOADING MOTOR BOARD ASSY
	CN1	QGB2533K1-02	CONNECTOR

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LITHIUM BATTERY BOARD ASSEMBLY <93>

	PW4	LPA10045-02A4	LT BATTERY BOARD ASSY
	HD1	QNZ0032-001	BATTERY HOLDER
	FW7006	QUM032-16A4BF	PARA RIBON WIRE

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