

FUNAI

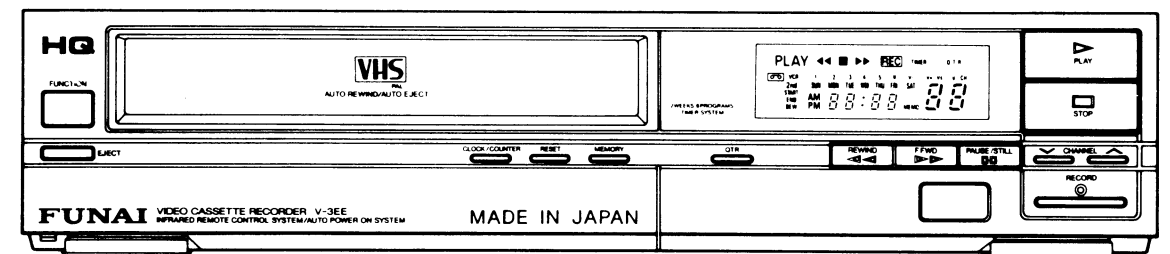
MODEL **V-3EE**

VHS **HQ**
PAL

VIDEO CASSETTE RECORDER

HQ

Video cassette recorders bearing the "HQ" mark incorporate VHS high quality technology. Note that there is interchangeability with former VHS video cassette recorder.



SERVICE MANUAL

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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 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 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 below.

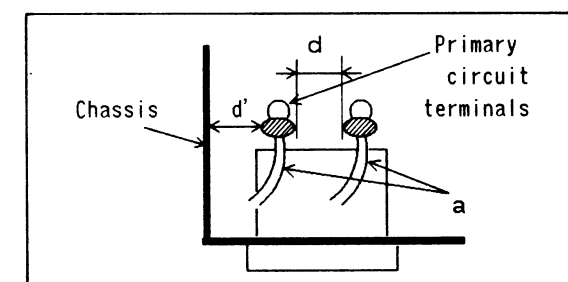


Table 1 : Ratings for selected areas

AC Line Voltage	Region	Insulation Resistance	Dielectric Strength	Clearance Distance (d) (d')
110 to 130 V	USA & Canada	---	900 V 1minute	≥ 3.2 mm
* 110 to 130 V	Europe	≥ 10 M Ω	3 kV 1minute	≥ 4 mm (d)
200 to 240 V	Australia	/500 V DC		≥ 6 mm (d')

* Class II model only.

Note: This table is unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

4. Leakage current test

Confirm specified or lower leakage current between B (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 B (earth ground, power cord plug prongs) and exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure and following table.

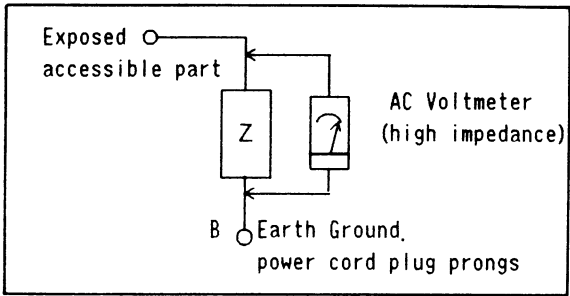
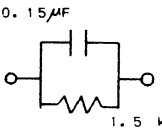
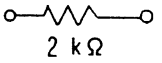
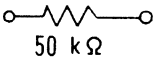


Table 2 : Leakage current ratings for selected areas

AC Line Voltage	Region	Load Z	Leakage Current(i)	Earth Ground (B) to:
110 to 130 V	USA & Canada		$i \leq 0.5 \text{ mA rms}$	Exposed accessible parts
110 to 130 V 200 to 240 V	Europe Australia		$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Antenna terminals
			$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Other terminals

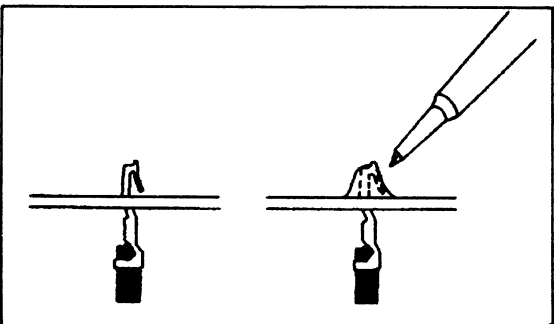
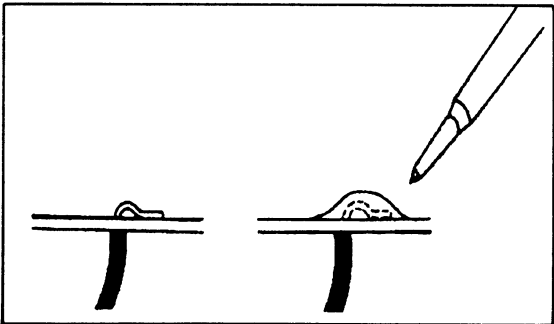
Note: This table is unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

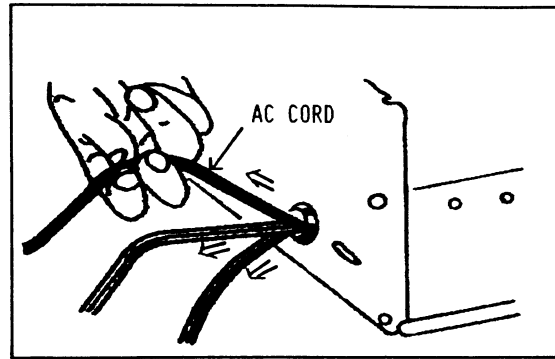
IMPORTANT SAFETY PRECAUTIONS

Prior to shipment from the factory, our products are strictly inspected to conform 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 inscribed 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 parts are critical for safety. Replace only with specified part numbers.
- 3. Use specified internal wiring. Note especially :
 - 1) Wires covered with PVC tubing
 - 2) Double insulated wires
 - 3) High voltage leads
- 4. Use specified insulating materials for hazardous live parts. Note especially :
 - 1) Insulation Tape
 - 2) PVC tubing
 - 3) Spacers
 - 4) Insulation sheets for transistors



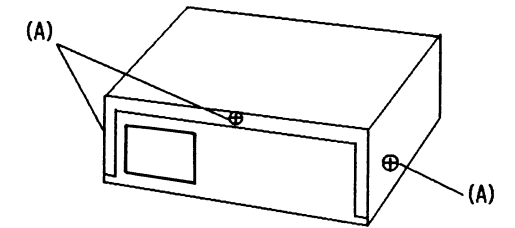


5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely around the terminals before soldering.
6. Observe that wires do not contact heat producing parts (heat sinks, oxide metal film resistors, fusible resistors, etc.)
7. Check that replaced wires do not contact sharp edged or pointed parts.
8. When a power cord has been replaced, check that 10-15 kg of force in any direction will not loosen it.
9. Also check areas surrounding repaired locations.

1. DISASSEMBLY INSTRUCTIONS (SET)

1-1 Top Cabinet Removal (Fig. 1-1)

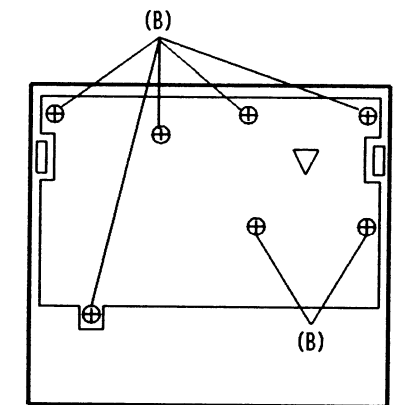
- Remove 3 screws (A).



(Fig. 1-1 Rear)

1-2 Bottom Panel Removal (Fig. 1-2)

- Remove 7 screws (B).



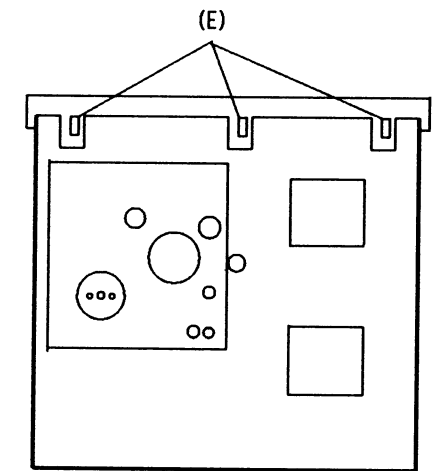
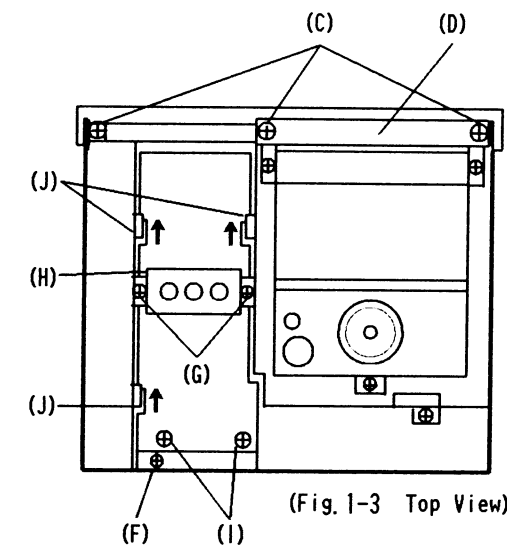
(Fig. 1-2 Bottom View)

1-3 Front Ass'y Removal (Figs. 1-3 and 1-4)

- Remove 3 screws (C).
- Remove Deck Angle (D).
- Unfasten 3 hooks (E) from Cabinet top and bottom.

1-4 Main PCB Removal (Fig. 1-3)

- Remove 1 screw (F).
- Remove 2 screws (G).
- Remove Supporter Holder (H).
- Remove 2 screws (I).
- Unfasten 3 hooks (J) from Cabinet.



(Fig. 1-4 Bottom View)

1-5 Deck Ass'y Removal (Fig. 1-5)

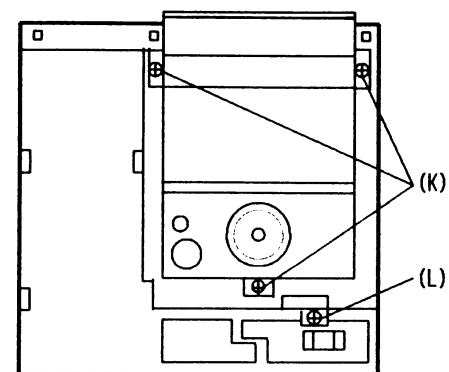
- Remove 3 screws (K).
- Remove 1 screw (L).

1-6 Power Supply PCB Removal (Figs. 1-6 and 1-7)

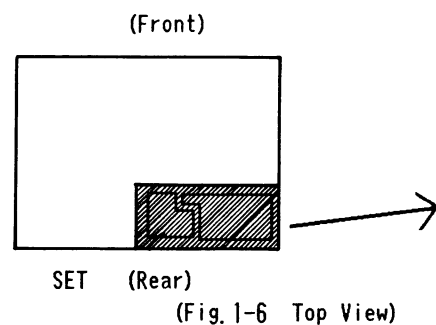
- Remove 2 screws (M). (Power Supply PCB)
- Remove 2 screws (N). (Power Trans)

1-7 Tuner PCB Removal (Figs. 1-6 and 1-7)

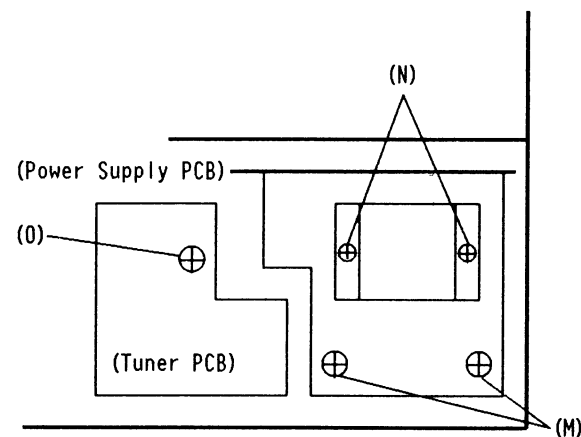
- Remove 1 screw (O).



(Fig. 1-5 Top View)



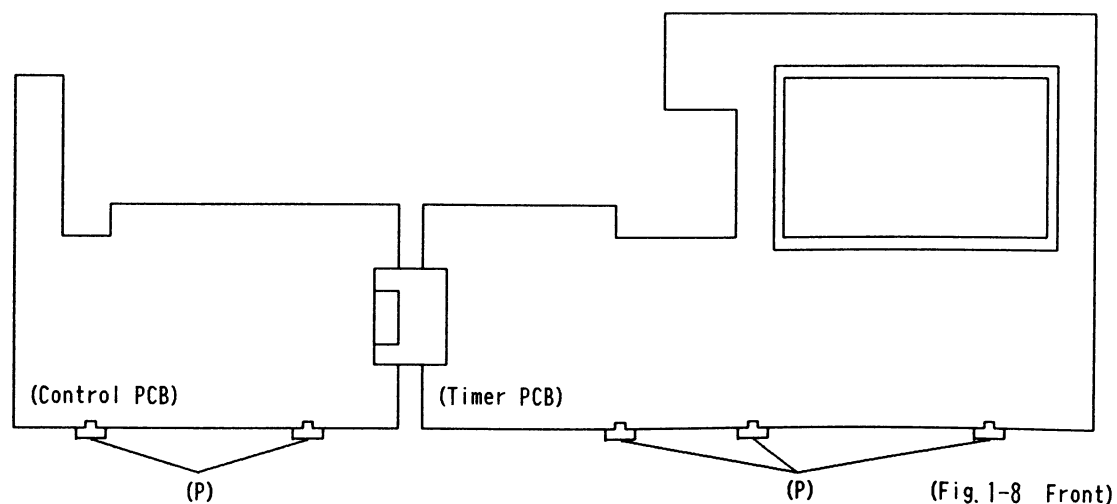
(Fig. 1-6 Top View)



(Fig. 1-7 Top View)

1-8 Timer PCB and Control PCB Removal (Fig. 1-8)

- Release 5 hooks (P) from Main Cabinet.



(Fig. 1-8 Front)

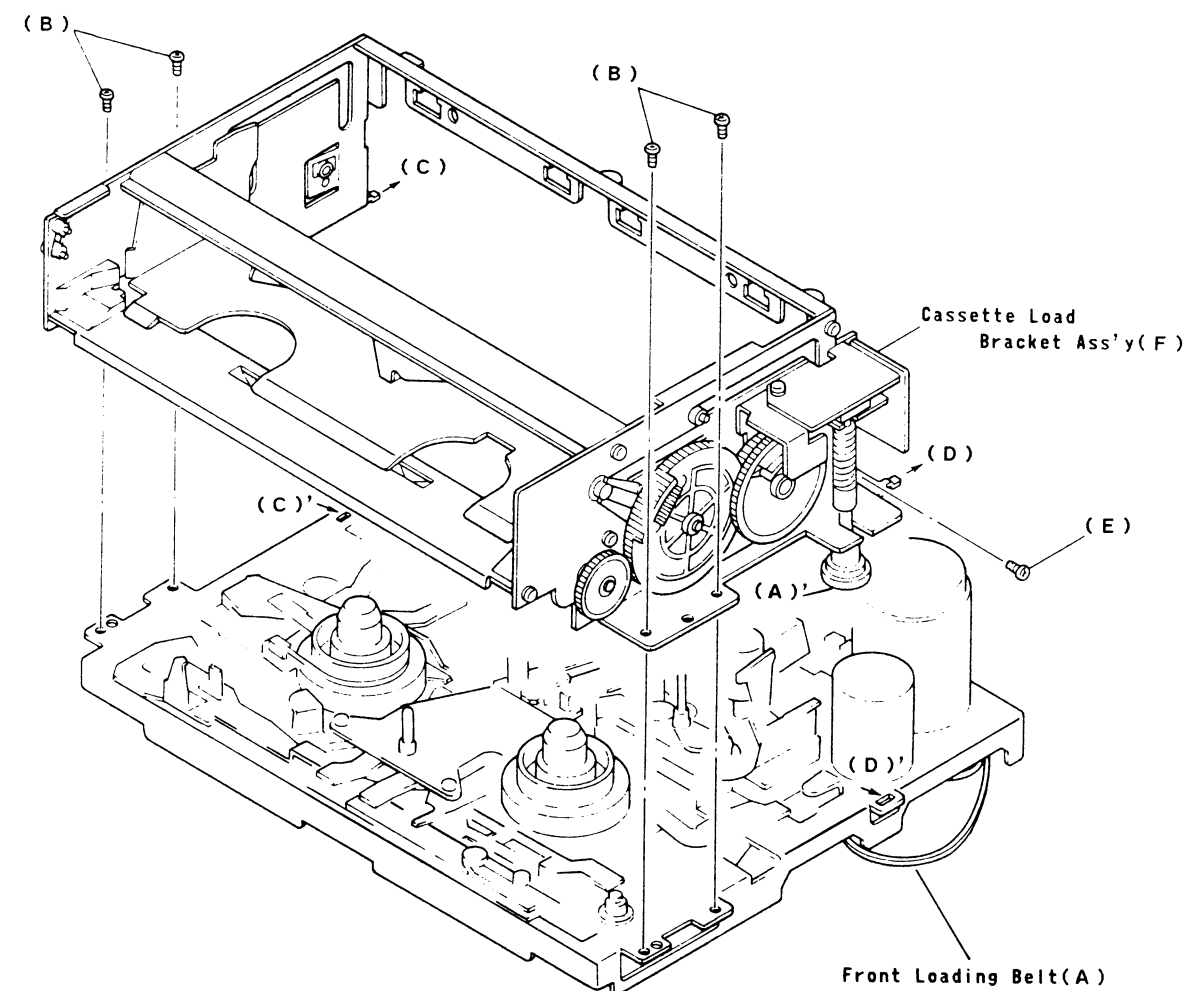
2. DISASSEMBLY INSTRUCTIONS (DECK)

(1) FRONT LOADING UNIT

1. Remove Front Loading Belt (A).
(Hook the Front Loading Belt (A) to (A').)
2. Remove 4 screws (B).
3. Take off Left side hook (C) and Right side hook (D).
(To unfasten the hook, hold the front loading unit and lift up and down to this side to take off the hook (C). Similarly to the above, take off hook (D) and hook (C).)

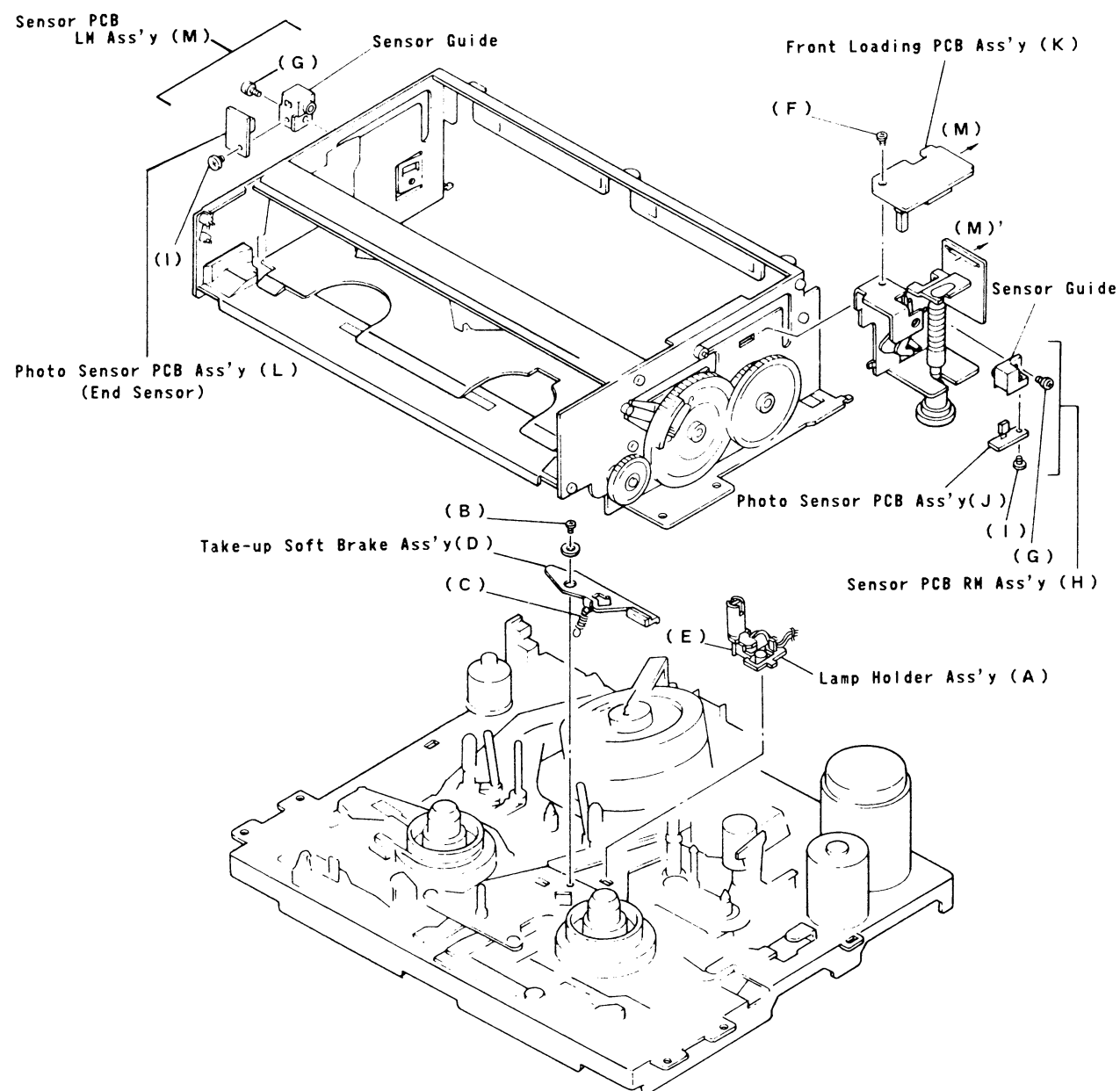
(2) CASSETTE LOAD BRACKET ASS'Y

1. Remove 1 screw (E).
2. Take off the Cassette Load Bracket Ass'y (F).



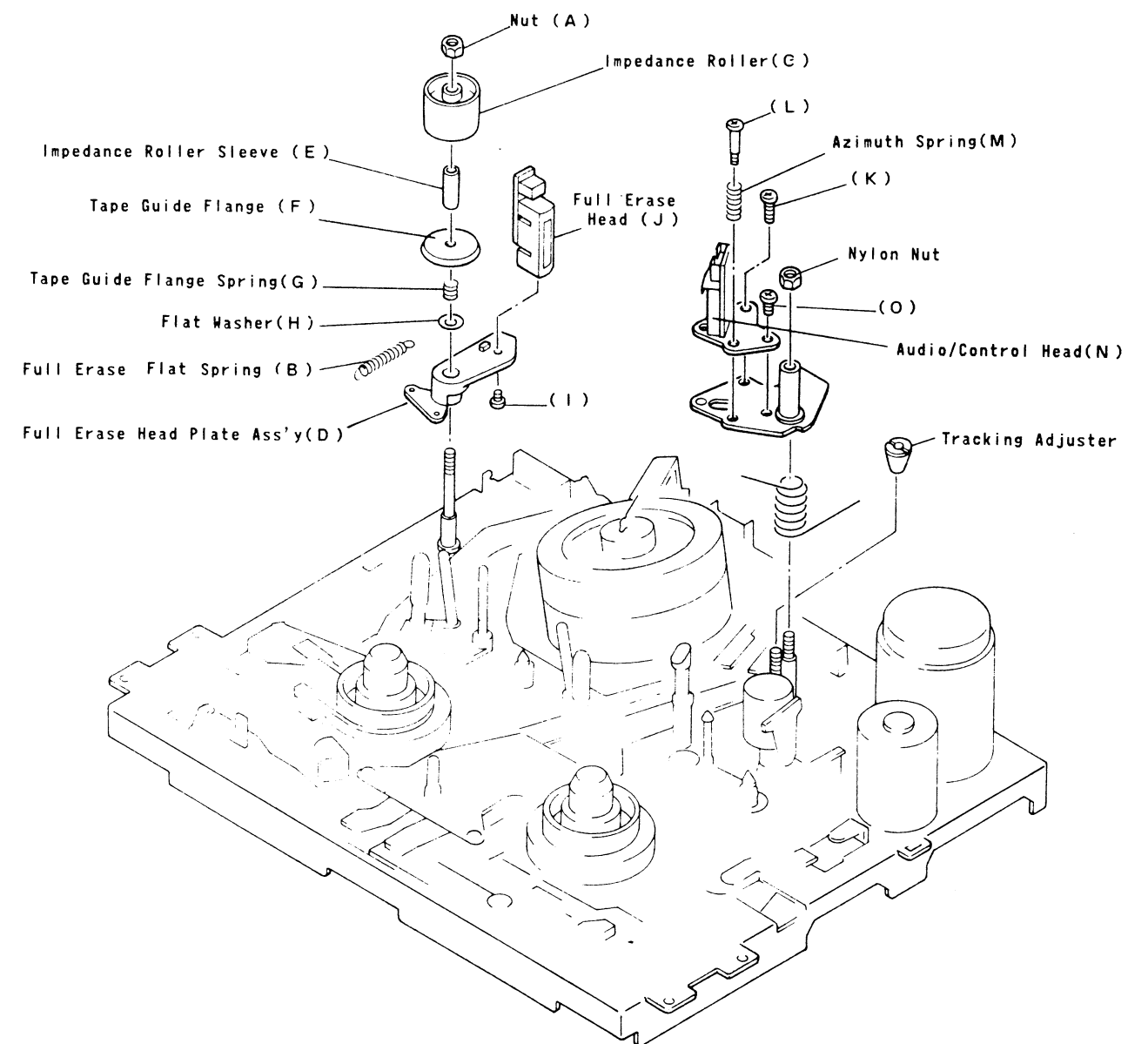
(3) PHOTO SENSOR

1. Replacement of Lamp Holder Ass'y (A).
 - (1) Remove 1 screw (B), and take off the Take-up Soft Brake Ass'y (D).
(At this time, never take off the spring (C).)
 - (2) Hold Lamp Holder Ass'y (A) and pull up to remove the hook (E) from the chassis.
 - (3) Turn the Lamp Holder Ass'y (A) counterclockwise and take out the Lamp Holder Ass'y (A).
2. Replacement of Photo (Start) Sensor.
 - (1) Remove 1 screw (F) and take off the Front Loading PCB Ass'y (K).
 - (2) Remove 1 screw (G) and take off the Sensor PCB RM Ass'y (H).
 - (3) Remove 1 screw (I) and take off the Photo Sensor PCB Ass'y (J).
3. Replacement of Photo (End) Sensor (L).
 - (1) Remove 1 screw (G) and take off the Sensor PCB LM Ass'y (M).
 - (2) Remove 1 screw (I) and take off the Photo Sensor PCB Ass'y (L).



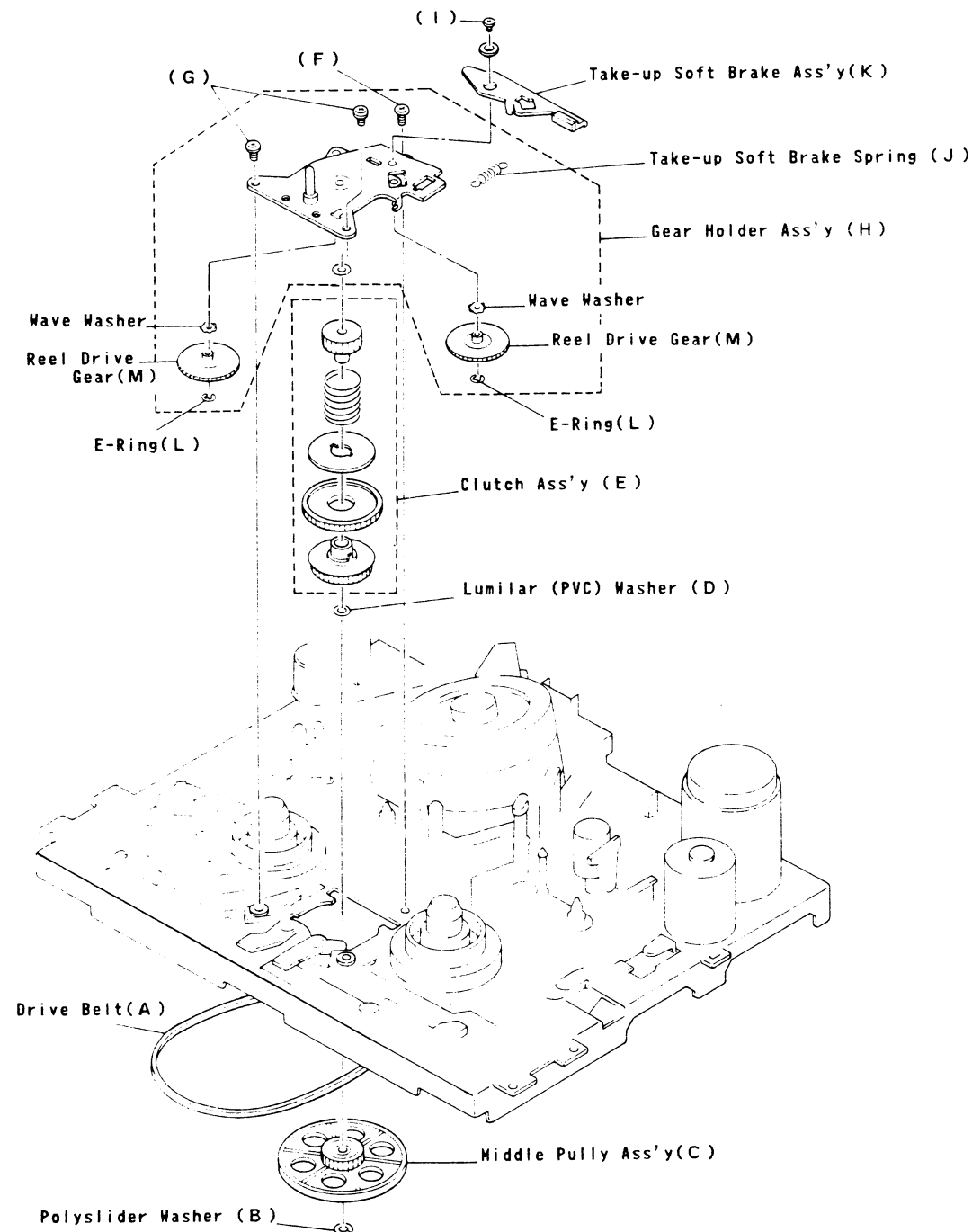
(4) FULL ERASE HEAD / AUDIO CONTROL HEAD

1. Erase Head (except Play Only Model)
 - (1) Remove Nut (A).
 - (2) Remove Spring (B).
 - (3) Take out the Impedance Roller (C), and pull up the Full Erase Head Plate Ass'y (D).
(Take care not to lose parts (E) (F) (G) (H) at the time of the Full Erase plate removal.)
 - (4) Remove 1 screw (I) and take off the Full Erase Head (J).
2. Audio / Control Head
 - (1) Remove 1 screw (K), 1 screw (L) 1 screw (O) and Azimuth Spring (M).
 - (2) Remove Audio/Control Head (N).



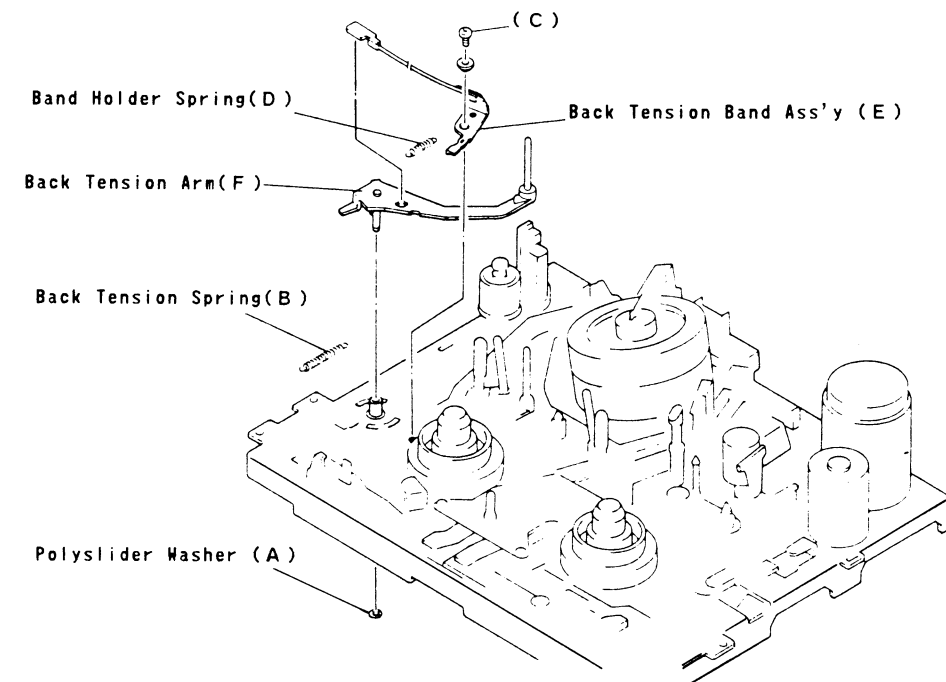
(5) GEAR HOLDER ASS'Y

1. Remove the Front Loading Unit (2. (I) on page 2-1).
2. Remove Drive Belt (A).
3. Remove Polyslider Washer (B) and middle Pulley Ass'y (C).
4. Remove Lumilar (PVC) Washer (D) and take off the Clutch Ass'y (E).
5. Remove 1 screw (F) and 2 screws (G) and take off the Gear Holder Ass'y (H).
6. Remove 1 screw (I) and take off the Take-up Soft Brake Spring (J).
7. Take off the Take-up Soft Brake Ass'y(K).
8. Remove 2 E-Rings (L) and take off the 2 Reel Drive Gears (M).



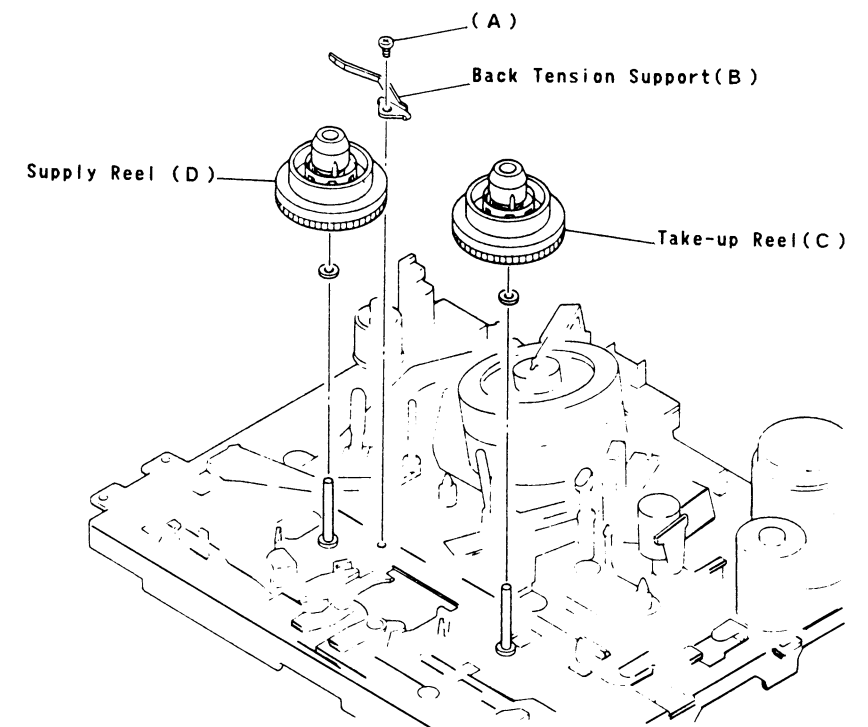
(6) TENSION ARM ASS'Y

1. Remove the Front Loading Unit (2. (I) on page 2-1).
2. Remove Polyslider Washer (A) and Back Tension Spring (B) from the Back Tension Arm (F).
3. Remove 1 screw (C) and Band Holder Spring (D).
4. Take off the Back Tension Band Ass'y (E) from the Back Tension Arm (F).



(7) REEL (Take-up and Supply)

1. Remove the Front Loading Unit, Gear Holder Ass'y and Back Tension Band Ass'y.
2. Remove 1 screw (A) and the Back Tension Support (B).
3. Remove the Take-up Reel (C) and the Supply Reel (D).

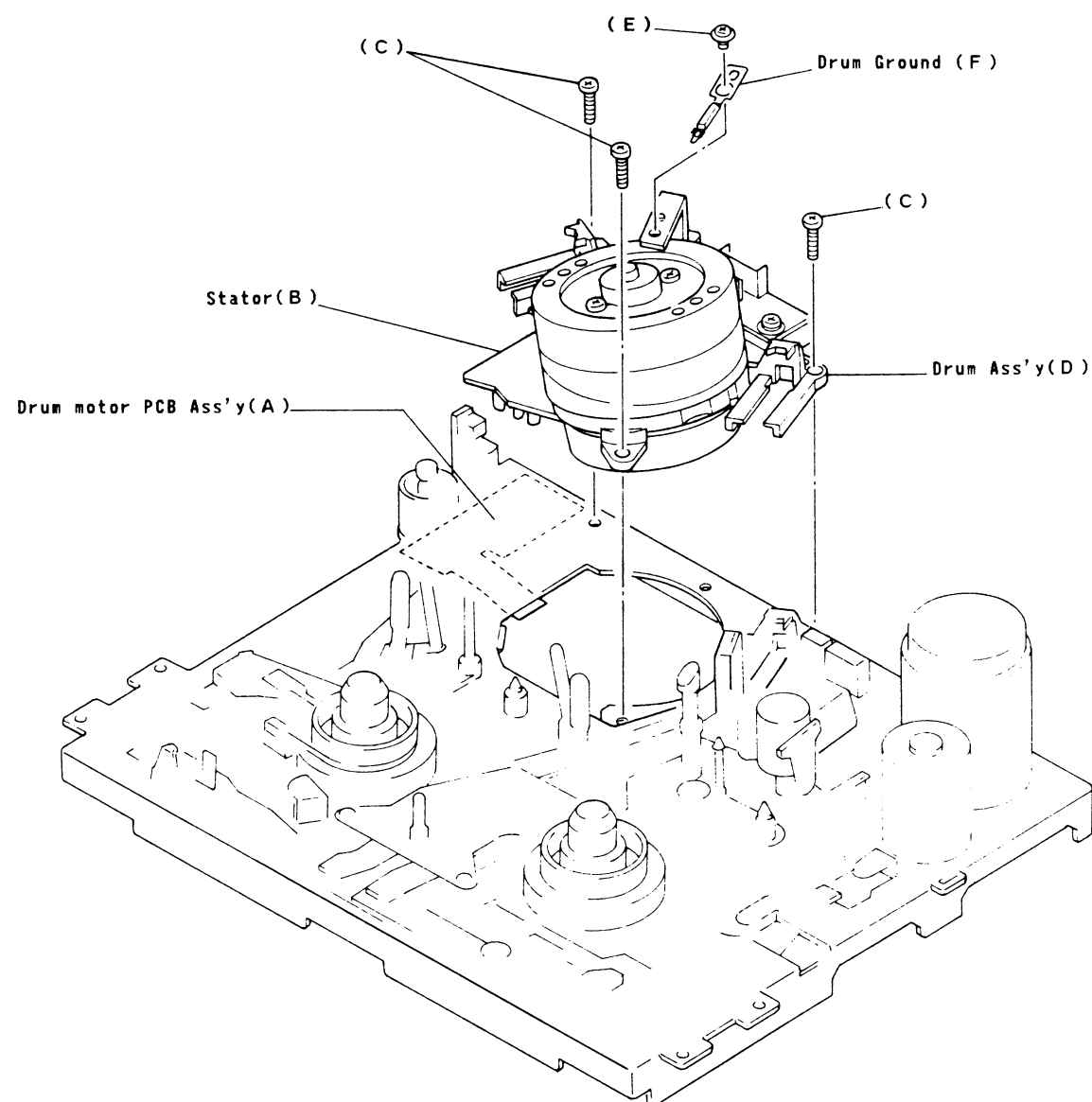


(8) DRUM ASS'Y

1. Remove the Front Loading Unit (2. (1) on page 2-1).
2. Pull out the Drum Motor PCB Ass'y (A) from the Stator (B).
3. Remove 1 screw (E) and take off the Drum Ground (F).
4. Remove 3 screws (C) and take off the Drum Ass'y (D).

≡Remarks≡

Take off the Drum Ass'y (D) carefully without any damage.

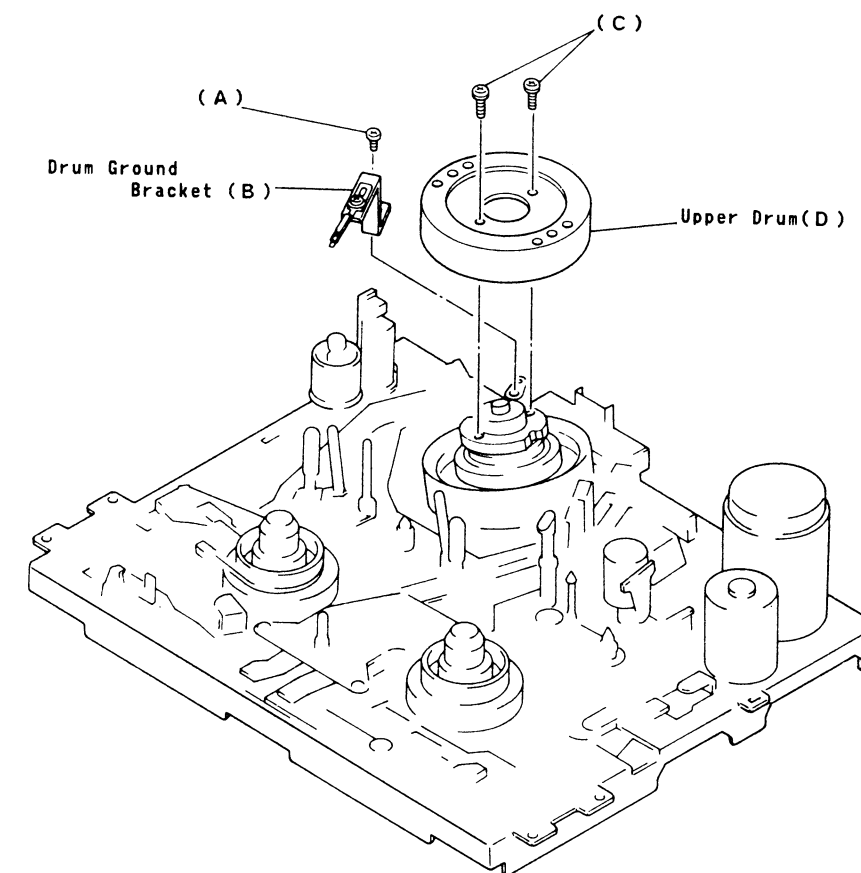
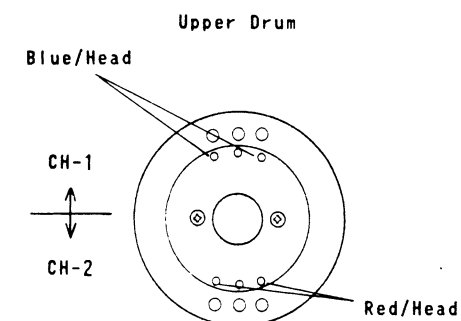


(9) UPPER DRUM

1. Remove the Front Loading Unit (2. (1) on page 2-1).
2. Remove 1 screw (A) and take off the Drum Ground Bracket (B).
3. Remove 2 screws (C) and take off the Upper Drum (D).

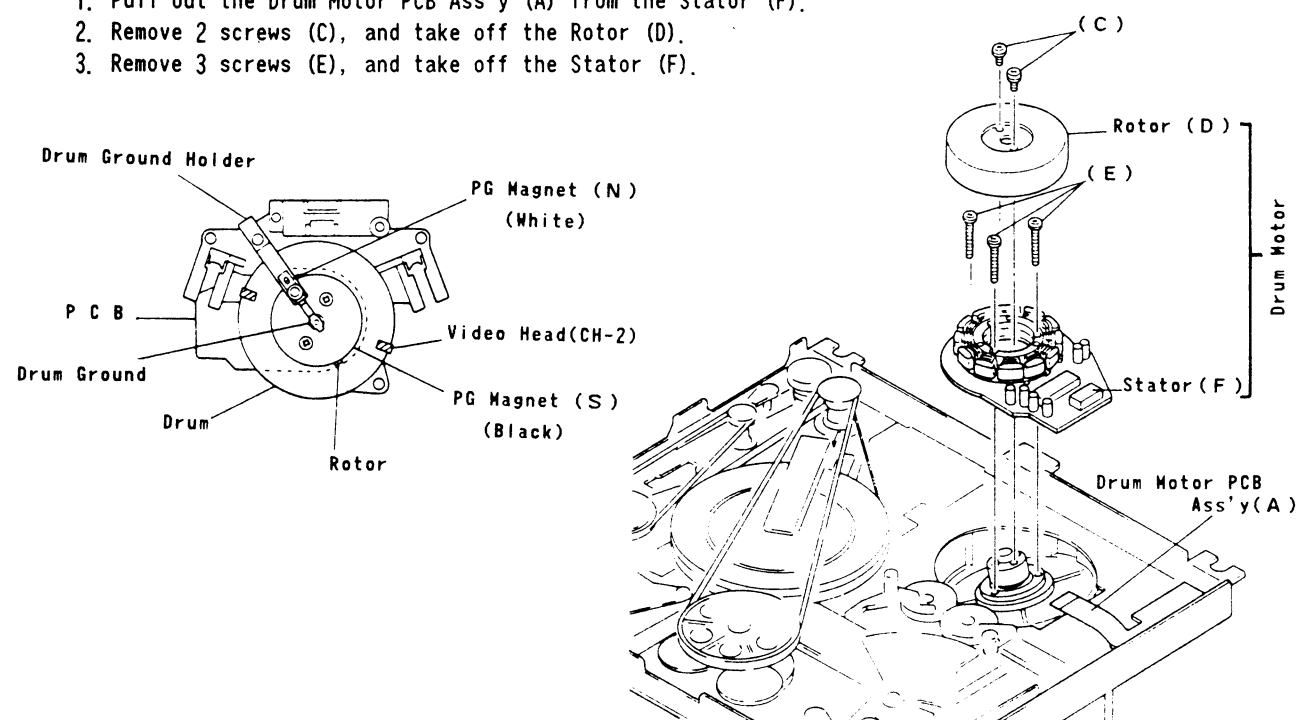
≡Remark≡

1. Use gloves and do not touch the drum surface with bare fingers.
2. If the Video Head is defective, replace the complete upper drum with the Head.



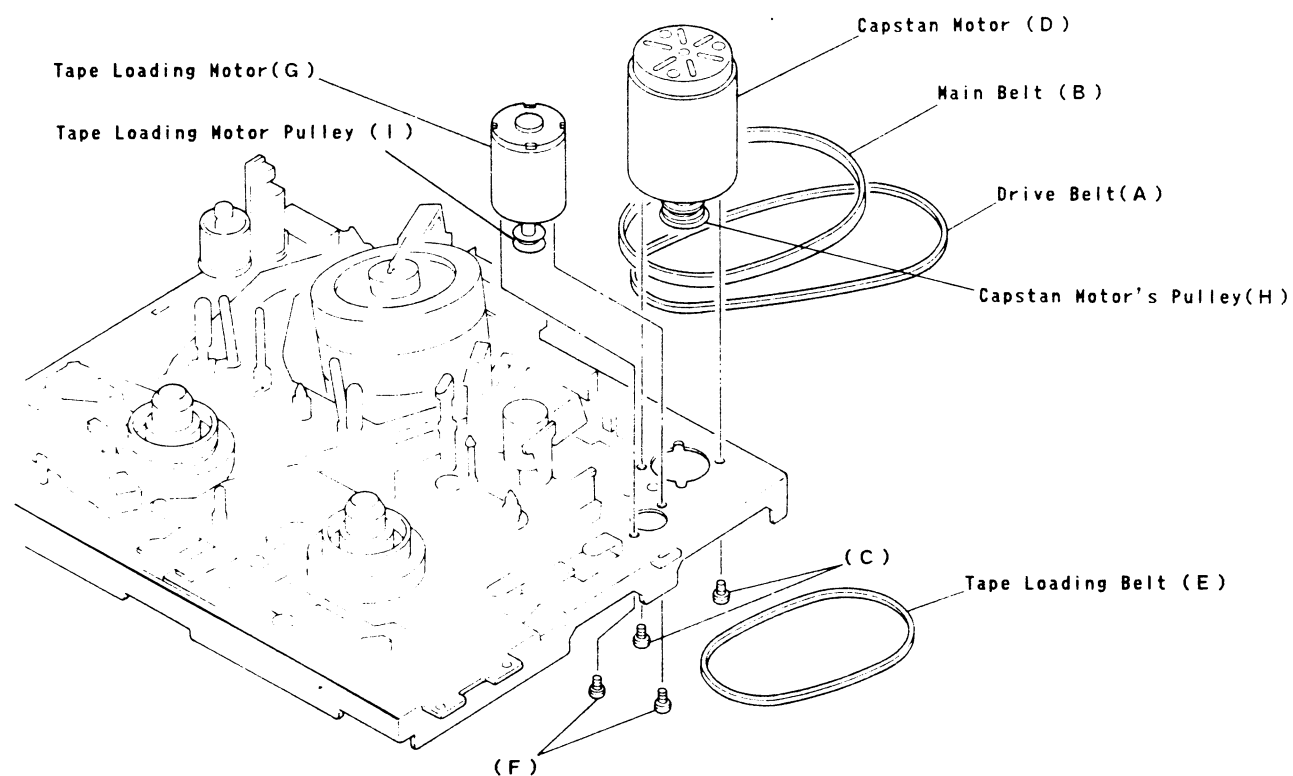
(10) DRUM MOTOR

1. Pull out the Drum Motor PCB Ass'y (A) from the Stator (F).
2. Remove 2 screws (C), and take off the Rotor (D).
3. Remove 3 screws (E), and take off the Stator (F).



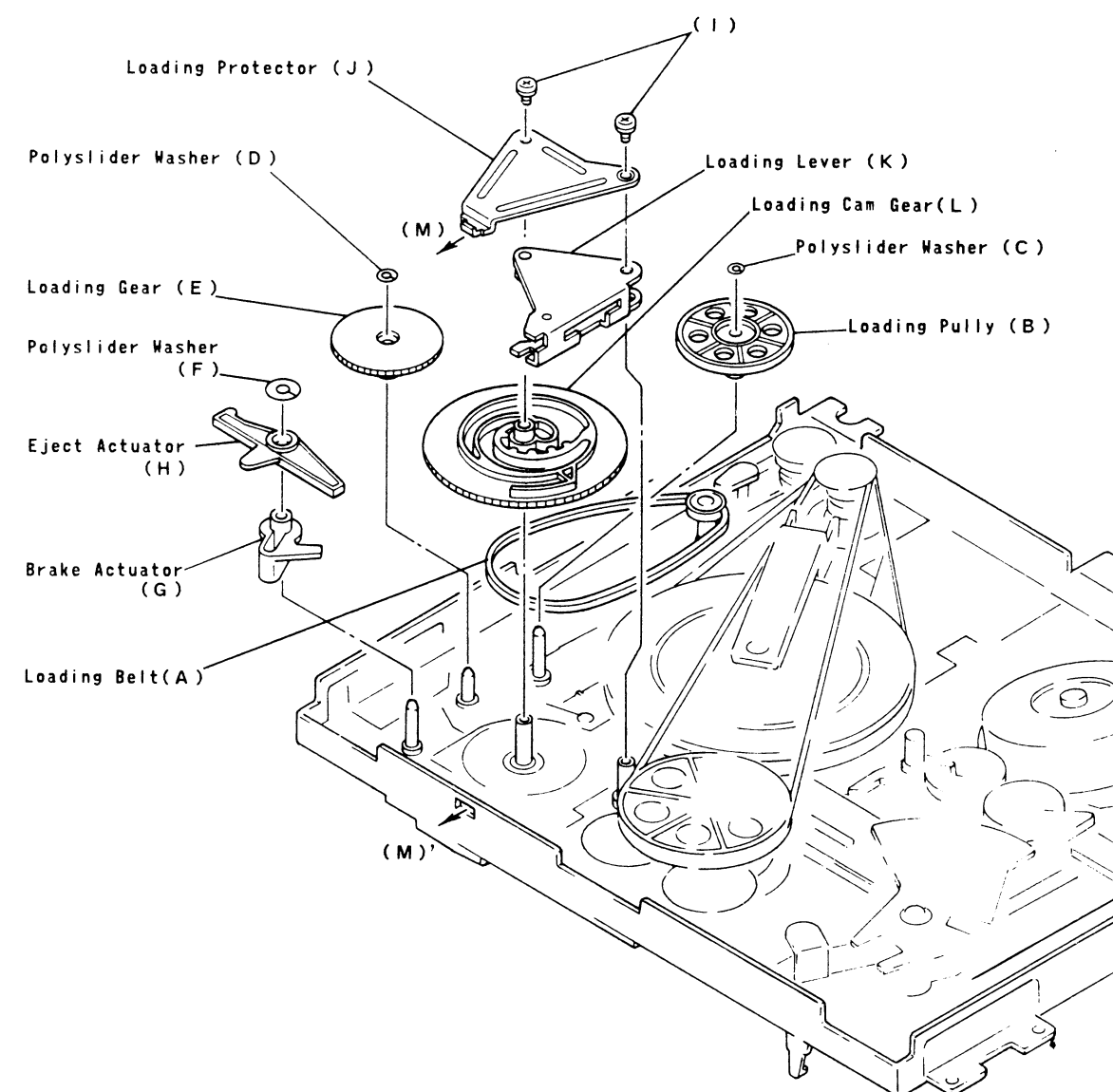
(11) CAPSTAN MOTOR / TAPE LOADING MOTOR

1. Capstan Motor
 - (1) Take off the Drive Belt (A) and Main Belt (B) from the Capstan Motor's Pulley (H).
 - (2) Remove 2 screws (C), and take off the Capstan Motor (D).
2. Tape Loading Motor
 - (1) Take off the Tape Loading Belt (E) from the Tape Loading Motor's Pulley (I).
 - (2) Remove 2 screws (F), and take off the Tape Loading Motor (G).



(12) LOADING CAM GEAR

1. Take off the Loading Belt (A) from the Loading Pulley (B).
2. Remove Polyslider Washer (C), and take off the Loading Pulley (B).
3. Remove Polyslider Washer (D), and take off the Loading Gear (E).
4. Remove Polyslider Washer (F), and take off the Eject Actuator (H) and the Brake Actuator (G).
5. Remove 2 screws (I), and take off the Loading Protector (J) and the Loading Lever (K).
6. Take off the Loading Cam Gear (L).

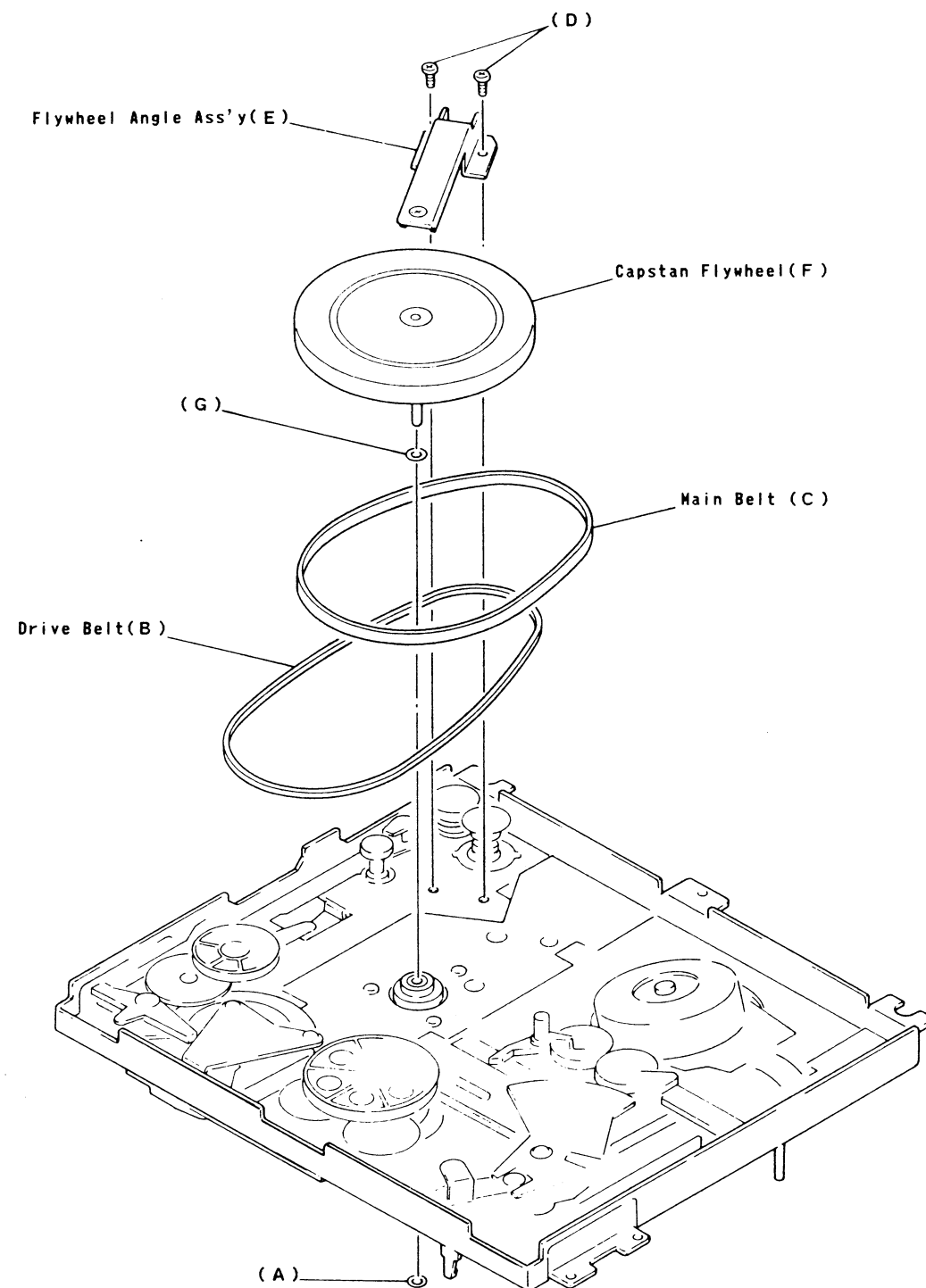


(13) CAPSTAN FLYWHEEL

1. Remove the Washer (A).
2. Take off the Drive Belt (B) and Main Belt (C).
3. Remove 2 screws (D), and Take off the Flywheel Angle Ass'y (E).
4. Take off the Capstan Flywheel (F).

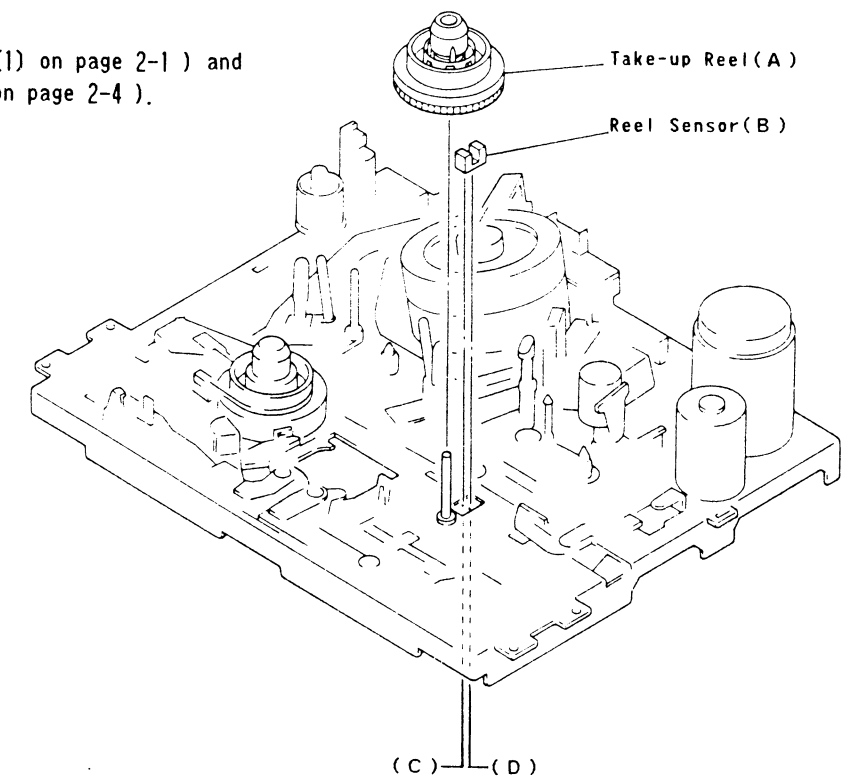
≡Remark≡

Do not miss the Washer (A) and (G) when pulling out the Capstan Flywheel.



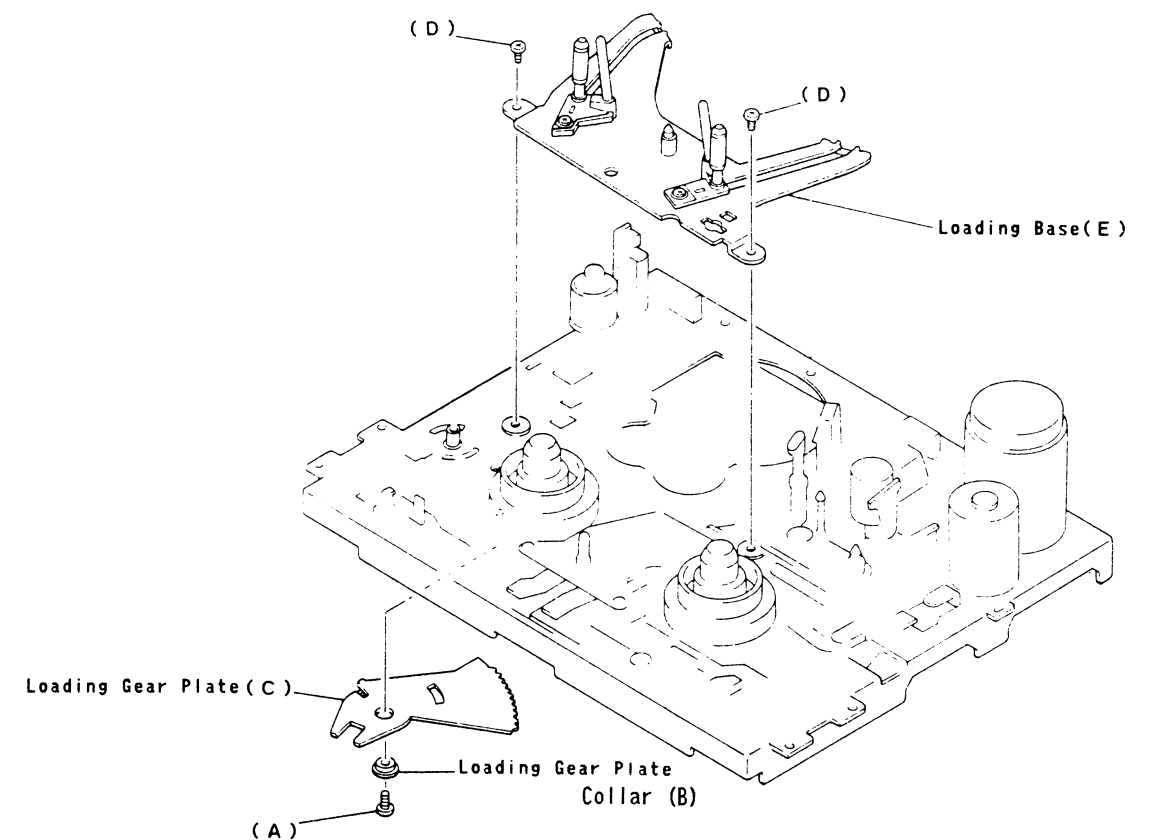
(14) REEL SENSOR

1. Remove Front Loading Unit (2. (1) on page 2-1) and the Gear Holder Ass'y (2. (5) on page 2-4).
2. Remove Take-up Reel (A).
3. Remove Reel Sensor (B).
(Unsolder (C), (D) for bottom.)



(15) LOADING BASE

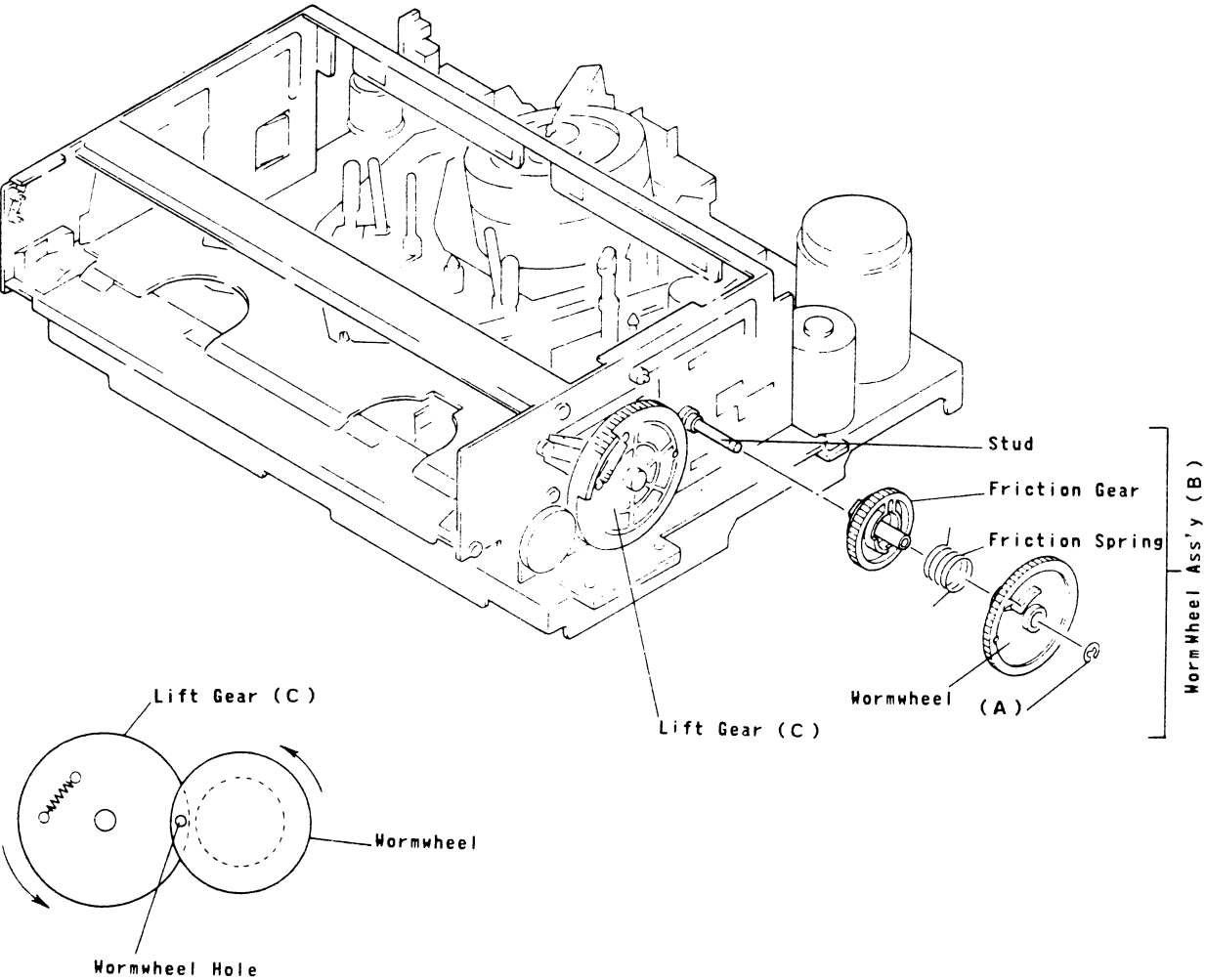
1. Remove Drum Ass'y, Tension Arm Ass'y and Photo Sensor. (Sensor Lamp)
2. Remove 1 screw (A) and Loading Gear Plate Collar (B), Loading Gear Plate (C).
3. Remove 2 screws (D).
4. Take off the Loading Base (E).



(16) FRONT LOADING WORMWHEEL UNIT

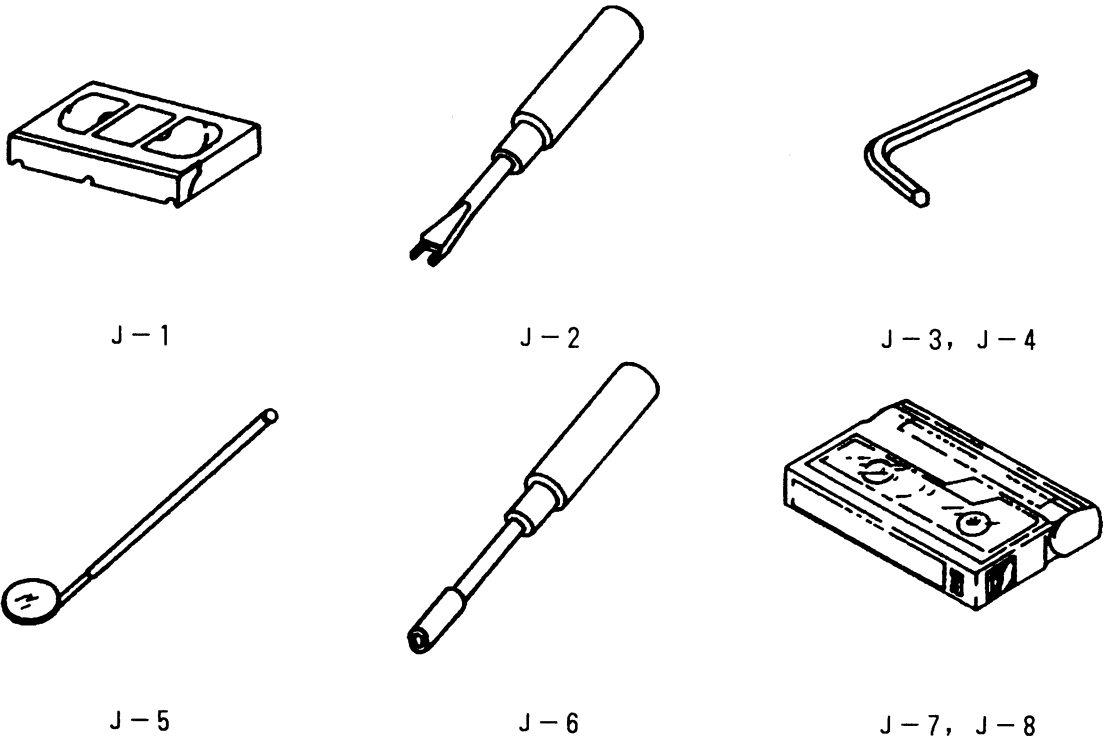
1. Disassembly
- (1) Remove Front Loading Belt and Bracket Ass'y.
- (2) Remove E-Ring (A).
- (3) Remove Wormwheel Ass'y (B). (Wormwheel, Friction Spring, Friction Gear)
2. Assembly
- (1) Turn the Lift Gear (C) fully counterclockwise.
- (2) Restore Wormwheel Ass'y (B) to the stud.

≡Remark≡
Match Lift Gear (C) to the wormwheel hole as illustrated.



3. SERVICE JIG AND TOOLS

Ref No.	Jig Item	Part No.	Adjustment
J - 1	Torque Meter	FSJ-VHT-063	Back Tension
J - 2	Driver (Special)	FSJ-0001	Control Head / Tape Guide Height
J - 3	Wrench M2 Hexagon (0.9 mm)	FSJ-0002	Guide Roller Setting
J - 4	Wrench M3 Hexagon (1.5 mm)	FSJ-0003	A/C Head Tilt
J - 5	Mirror	FSJ-0004	Tape Transportation Check
J - 6	Box Driver M3	FSJ-0005	Guide Pole / A/C Head Height
J - 7	Alignment Tape	F6-N	FM Output Level / Azimuth Adjustment
J - 8	Alignment Tape	F6-A	Audio Output Adjustment



4. STANDARD MAINTENANCE

4-1 SERVICE SCHEDULE OF COMPONENT

○:Check ●:Change

D E C K		Periodic Service Schedule			
Ref. No.	Parts Name	1000 h	2000 h	3000 h	4000 h
2	Upper Drum	○	●	○	●
134	Pinch Roller(A)		●		●
171	Capstan Motor Assembly		●		●
229	Clutch Assembly		●		●
281	LM Assembly			●	
173	Main Belt		●		●
196	Back Tension Band		●		●
233	Drive Belt		●		●
251	Brake Shoe		●		●
285	Loading Belt		●		●
373	Front Loading Belt		●		●
14	Drum Ground			●	
82	ACE Head			●	
92	Full Erase Head			●	
121	Reel Assembly			●	

NOTE:

- Clean all parts for the tape transport.
Upper Drum with video head / Pinch Roller
Audio Control Head / Full Erase Head
- After cleaning up the parts, perform all DECK ADJUSTMENT.

4-2 CLEANING

1. CLEANING OF VIDEO HEAD

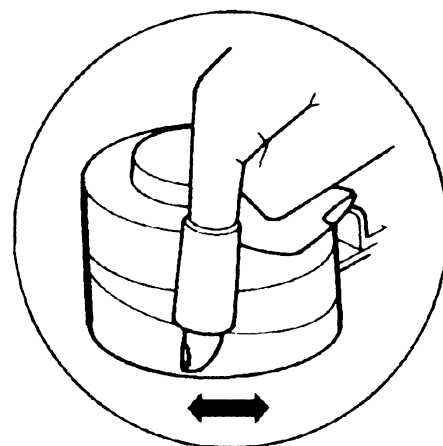
Head cleaning by using a chamois skin.

— Procedure —

- (1) Remove the top cabinet.
- (2) Put on a glove (thin type) to avoid touching the upper drum and lower drum with bare hand.
- (3) Put a few drops of alcohol on the Chamois skin, and by slightly placing it against the head tip, allow the upper drum to turn the right and left.

— Remark —

- (1) The video head is of very hard material, but since it is very thin, avoid cleaning it vertically.
- (2) Wait for the cleaned part to dry out, before operating the unit.
- (3) Do not reuse the stained chamois skin.



2. CLEANING OF AUDIO CONTROL HEAD

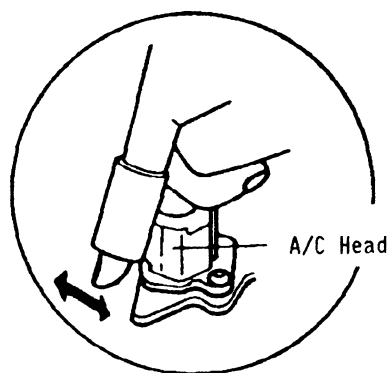
Head cleaning by using a chamois skin.

— Procedure —

- (1) Remove the Top Cabinet.
- (2) Put a few drops of alcohol on the chamois skin, Clean up the audio control head, being careful not to damage the upper drum and other tape running parts.

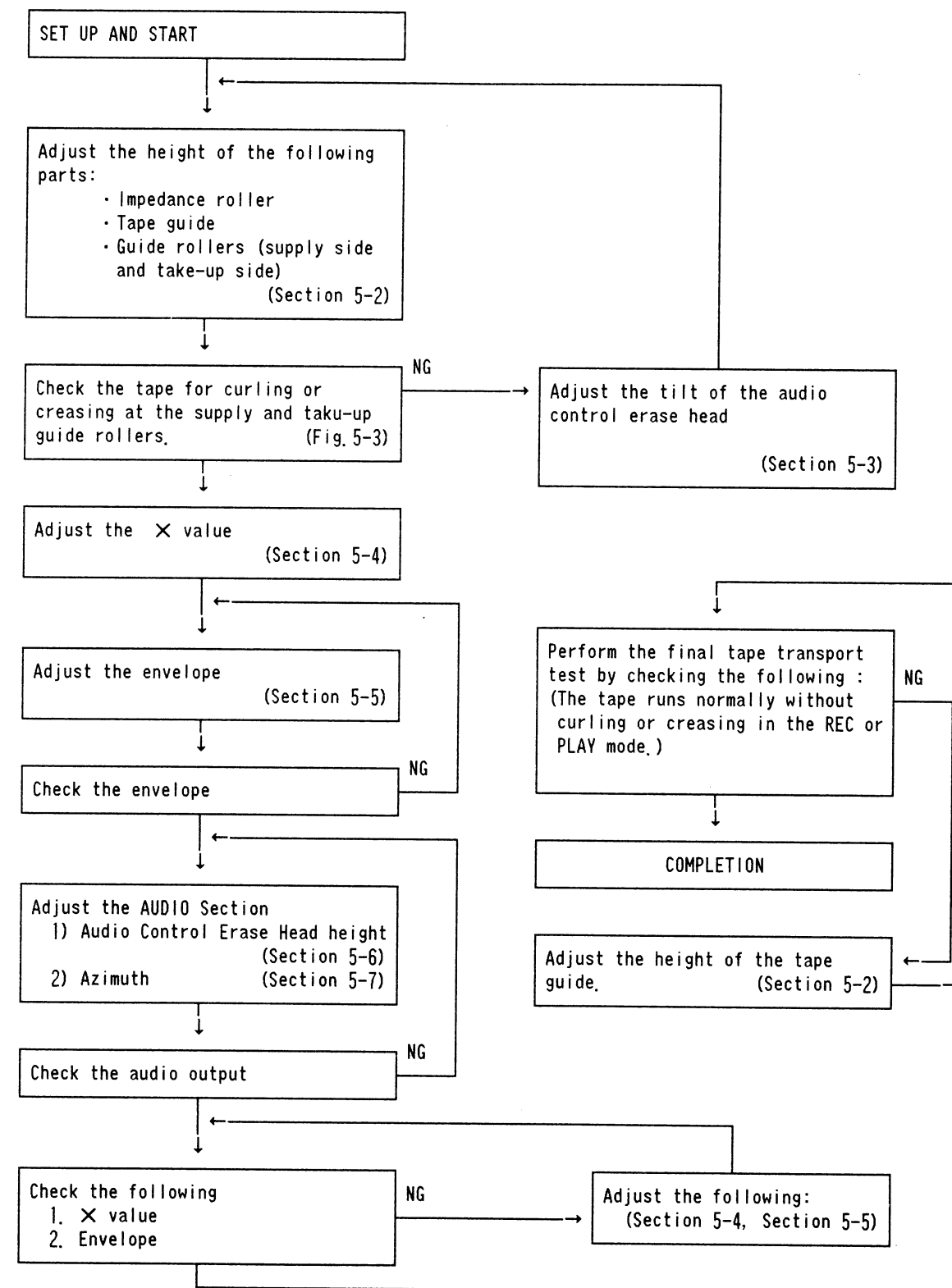
— Remark —

- (1) Avoid cleaning audio control head vertically.
- (2) Wait for the cleaned part to dry well, before operating the unit.



5. MECHANICAL ADJUSTMENT

5-1 TAPE TRANSPORT ADJUSTMENT FLOW CHART



5-2 TAPE RUNNING POSITION ADJUSTMENT (GUIDE ROLLER/TAPE GUIDE/IMPEDANCE ROLLER)

1. Perform the height adjustment for the following items to obtain the proper tape running position.

- ① Impedance Roller
- ② Guide Roller (Supply side)
- ③ Guide Roller (Take-up side)
- ④ Tape Guide

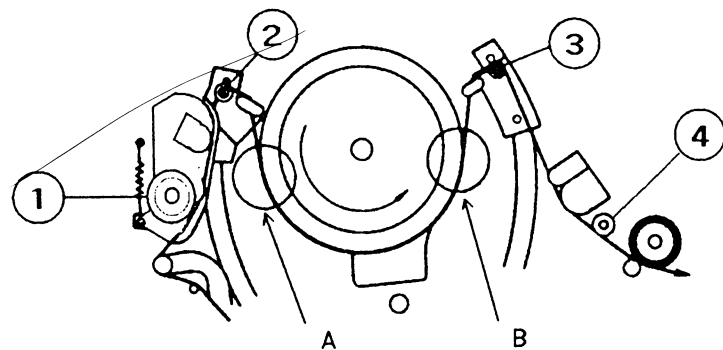


Fig. 5-1

2. Load a blank tape and set the VCR to the PLAY mode. Check the tape transport at points "A" and "B" as shown in Fig. 5-1.
3. Operate the VCR between the PLAY and STOP modes several times.
4. Observe the tape transport at the lead surface of the cylinder during the PLAY mode, and confirm that the tape runs smoothly along the lead surface of the cylinder without slipping downward or upward. (Refer to Fig. 5-2.)

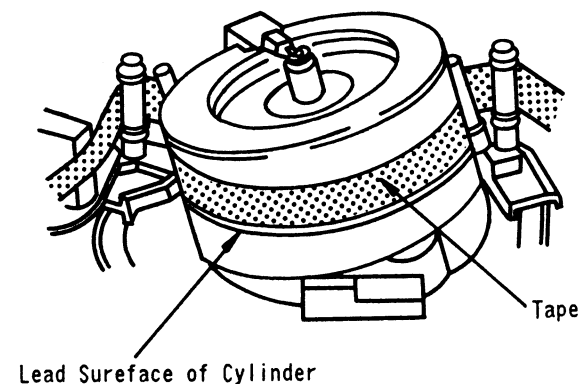
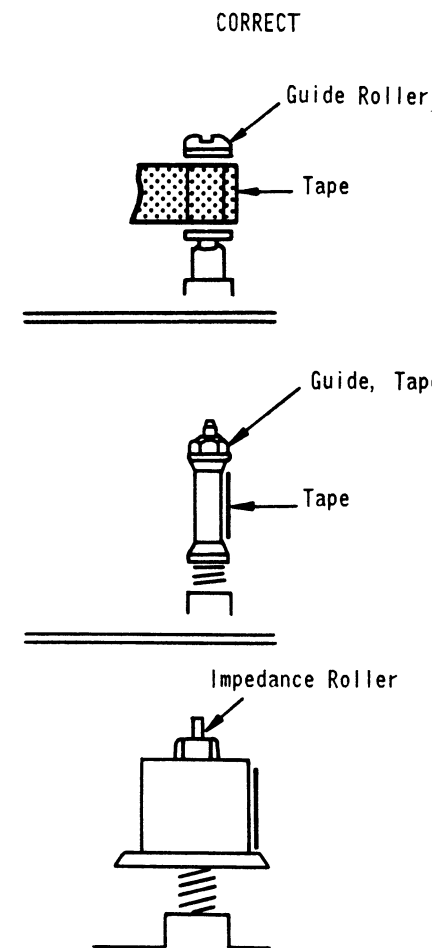


Fig. 5-2

5. During loading, play and unloading, observe the tape at the supply and take-up guide rollers, tape guide and impedance roller. Confirm that there is no curling or creasing etc., as shown in Fig. 5-3.



INCORRECT

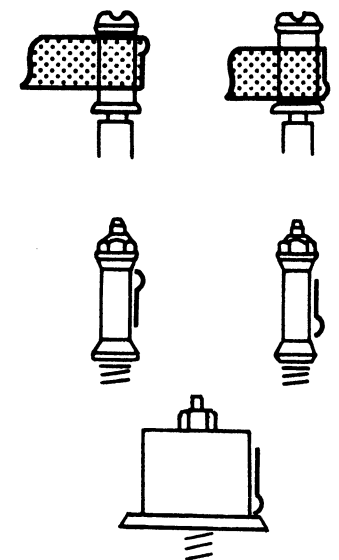


Fig. 5-3

6. If any curling or creasing is noted, adjust tape guide roller and impedance roller first. In this case, adjust the impedance roller in both PLAY and REV modes so that tape runs as shown in Fig. 5-4.

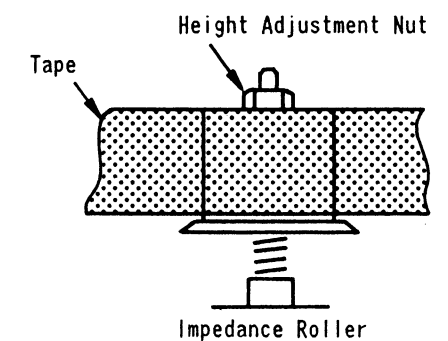


Fig. 5-4.

7. Next, adjust the guide roller height. Insert the adjustment driver (FSJ-0001) into the guide roller top (Refer to Fig. 5-5).
Adjust the height by turning the driver slightly so that the tape runs on the guide roller as shown in Fig. 5-3, and the lower edge of the tape runs along the lead surface of the cylinder.

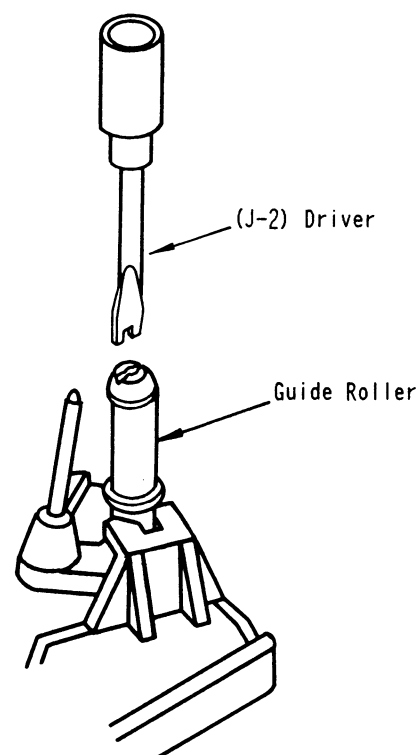


Fig. 5-5

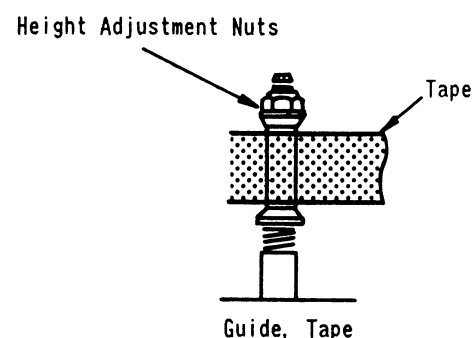


Fig. 5-6

8. After completion of the supply side guide roller adjustments, adjust tape guide so that tape runs as shown in Fig. 5-6, and adjust the take-up side guide roller by using the same procedures as for the supply side adjustments. In this case, adjust the guide roller height first.
9. Confirm that there is no curling or creasing at the impedance roller. (Both PLAY and REV modes.) If there is any curling or creasing at the impedance roller, adjust the same procedures of Fig. 5-6.
10. Finally, confirm that there is no curling or creasing at the take-up side guide roller and tape guide. If there is any curling or creasing between the take-up side guide roller and the audio control erase head, adjust the audio control erase head.

5-3 AUDIO CONTROL ERASE HEAD ADJUSTMENT

1. Load a recorded tape and set the VCR to PLAY mode.
2. Adjust the height of the edge of the audio track on the audio control head by using the height adjustment nut (A) and the tilt adjustment screw (C) so that the tape transport is smooth at the take-up guide pole. Align the audio control head height. (Refer to Fig. 5-7.)

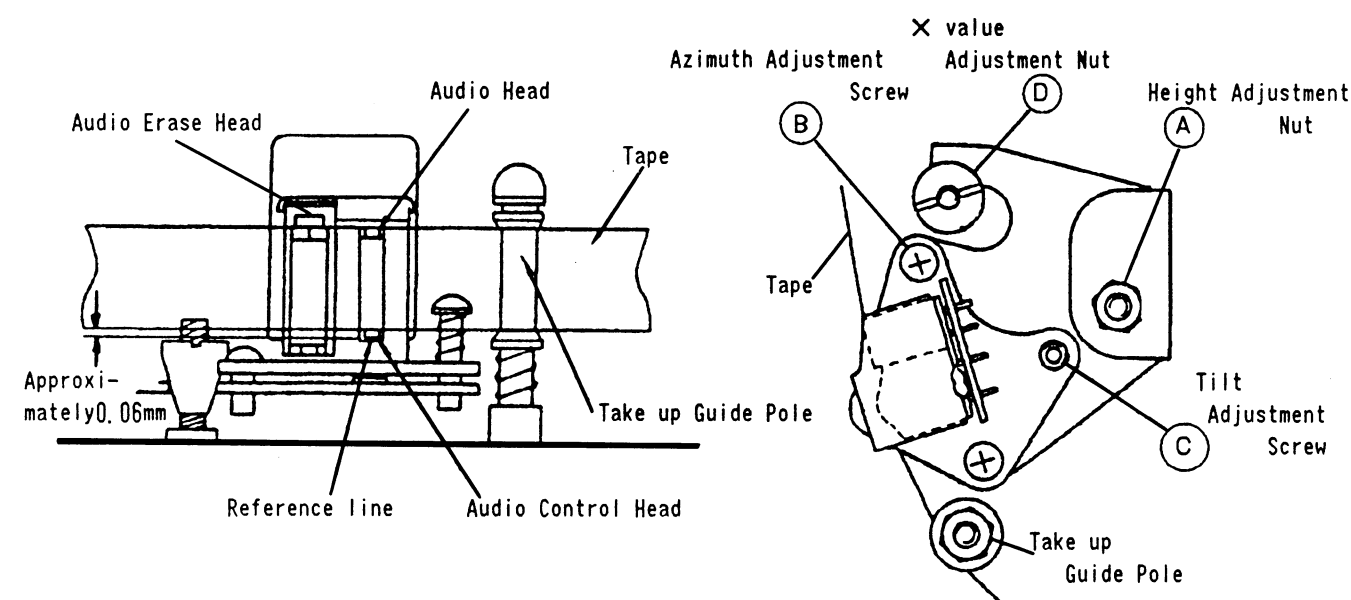


Fig. 5-7

3. The fine adjustment is not required at this time. The following conditions are sufficient :
 - (a) Proper tape transport between the audio control head and the take-up guide pole.
 - (b) Stable SERVO system operation. (proper pickup of tape's recorded control signal.)

5-4 X VALUE ADJUSTMENT (PB FM PEAK ADJUSTMENT)

MEASURING METHOD

Measuring Point	Measuring Equip.	ADJ. Condition
TP 9 (PB FM) GND TP401 (SW PULSE)	Oscilloscope	PLAY (SP) MODE Test tape F6-N
ADJ. Location		ADJ. Value
X value adjustment nut		Maximum level (CH1 PB FM Signal)

TEST EQUIPMENT CONNECTING DIAGRAMS

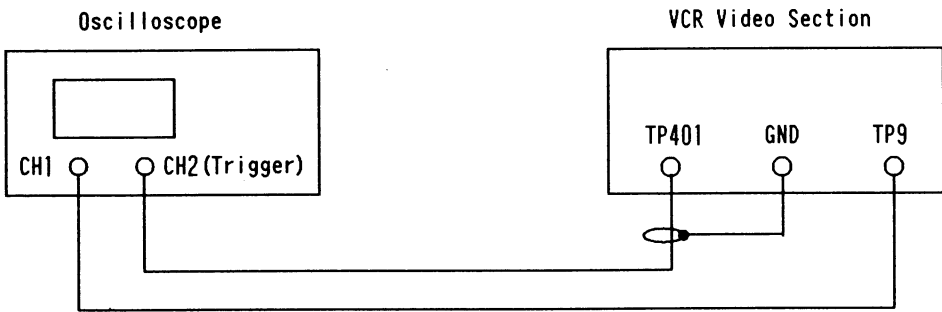


Fig. 5-8

1. Connect the equipment as shown in Fig. 5-8.
2. Adjust VR801 (Tracking Volume) to its center position.
3. Adjust the X value adjustment nut ④ for maximum PB FM Signal for CH1 by using F6-N test tape (Refer to Fig. 5-9).
4. After adjusting the X value, check that the output level of the PB FM Signal for CH1 changes symmetrically by rotating VR801 (Tracking Volume).

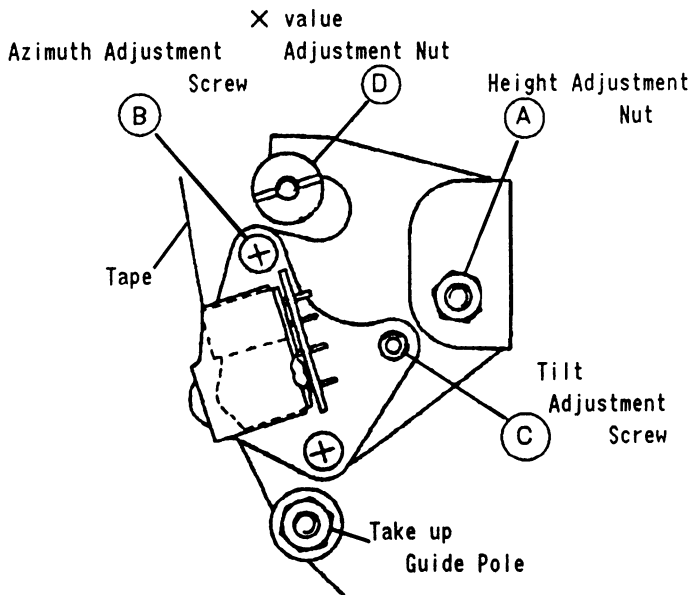


Fig. 5-9

5-5 ENVELOPE WAVEFORM ADJUSTMENT

MEASURING METHOD

Measuring Point	Measuring Equip.	ADJ. Condition
TP 9 (PB FM) GND TP401 (SW PULSE)	Oscilloscope	PLAY (SP) MODE Test tape F6-N
ADJ. Location		ADJ. Value
Guide rollers		Maximum level and correct waveform (PB FM Signal)

TEST EQUIPMENT CONNECTING DIAGRAMS

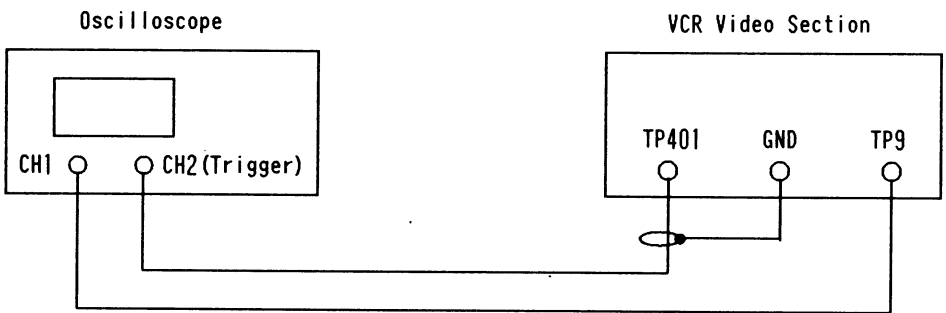


Fig. 5-10

1. Connect equipment as shown in Fig. 5-10.
2. Playback the test tape F6-N.
3. The envelope waveform can be performed by adjusting the height of both the supply side and take-up side guide rollers. Finely adjust the height of guide rollers so that the envelope waveform is as flat as possible.
4. Set VR801 (Tracking Volume) to its center position and confirm that a nearly maximum level is obtained. Then rotate the VR801 (Tracking Volume) in both directions while adjusting the height of guide rollers, in order to obtain the envelope waveform which is as flat as possible. If the tape is above or low the helical tape position, the envelope waveforms will take the shape as shown in Fig. 5-11 and Fig. 5-12.
5. Adjust for maximum flatness of the envelope waveform according to the Fig. 5-11 and Fig. 5-12.
6. After adjustment, rotate VR801 (Tracking Volume) to counter-clockwise and clockwise, and check that the waveform changes symmetrically.
7. Check the tape curl (Refer to Section 5-2).

	Tape is too high	
	Supply side	Take-up side
When the tracking volume is rotated counterclockwise and clockwise directions.		
Adjustment	Supply side guide roller rotated clockwise direction (lowers guide roller) to flatten envelope.	Take-up side guide roller rotated clockwise direction (lowers guide roller) to flatten envelope.

Fig. 5-11

	Tape is too low	
	Supply side	Take-up side
When the tracking volume is rotated counterclockwise and clockwise directions.		
Adjustment	Supply side guide roller rotated counterclockwise direction (raises guide roller) to flatten envelope.	Take-up side guide roller rotated counterclockwise direction (raises guide roller) to flatten envelope.

Fig. 5-12

5-6 AUDIO CONTROL ERASE HEAD HEIGHT/ AUDIO CONTROL ERASE HEAD TILT ADJUSTMENT

MEASURING METHOD

Measuring Point	Measuring Equip.	ADJ. Condition
AUDIO OUTPUT	Oscilloscope AC voltmeter	PLAY (SP) MODE Test tape F6-A
ADJ. Location		ADJ. Value
Height adjustment nut Azimuth adjustment screw		Maximum level (AC voltmeter)
Tilt adjustment screw		

TEST EQUIPMENT CONNECTING DIAGRAMS

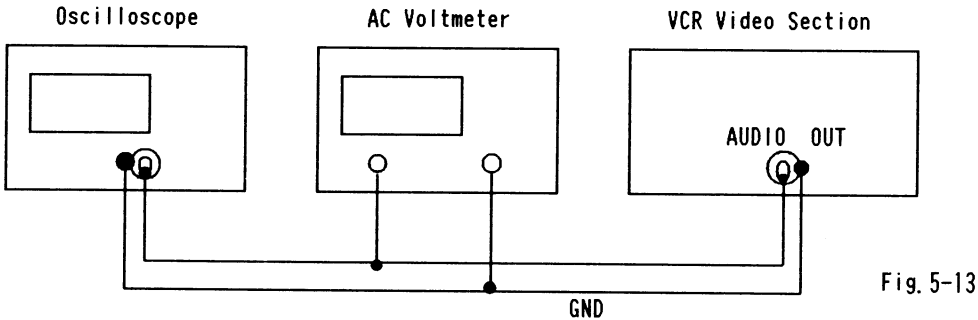


Fig. 5-13

1. Connect equipment as shown in Fig. 5-13.
2. Confirm that the tape running between the take-up guide roller and the audio control erase head has no slack. If the tape has slack, take it up by turning the tilt adjustment screw (C). (Refer to Fig. 5-7.) Then readjust GUIDE ROLLER HEIGHT in section 5-2 and the X value in section 5-4.
3. After confirming on the oscilloscope that a 1 kHz audio signal is being output by playing back F6-A test tape, adjust the height adjustment nut (A) so that the AC voltmeter's reading is brought to its maximum level (Refer to Fig. 5-14).
4. Adjust the azimuth adjustment screw (B) so that the AC voltmeter's reading is brought to its maximum level (Refer to Fig. 5-14).

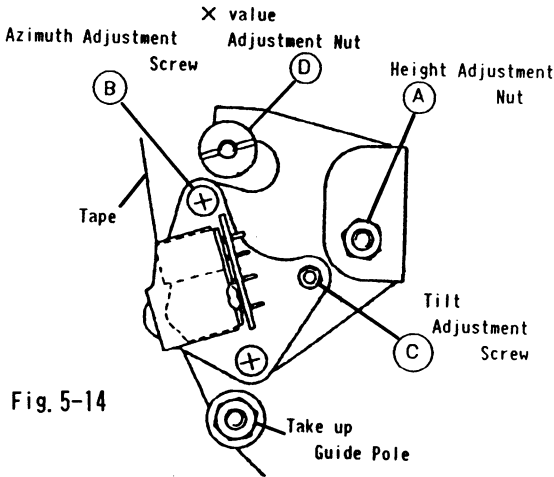
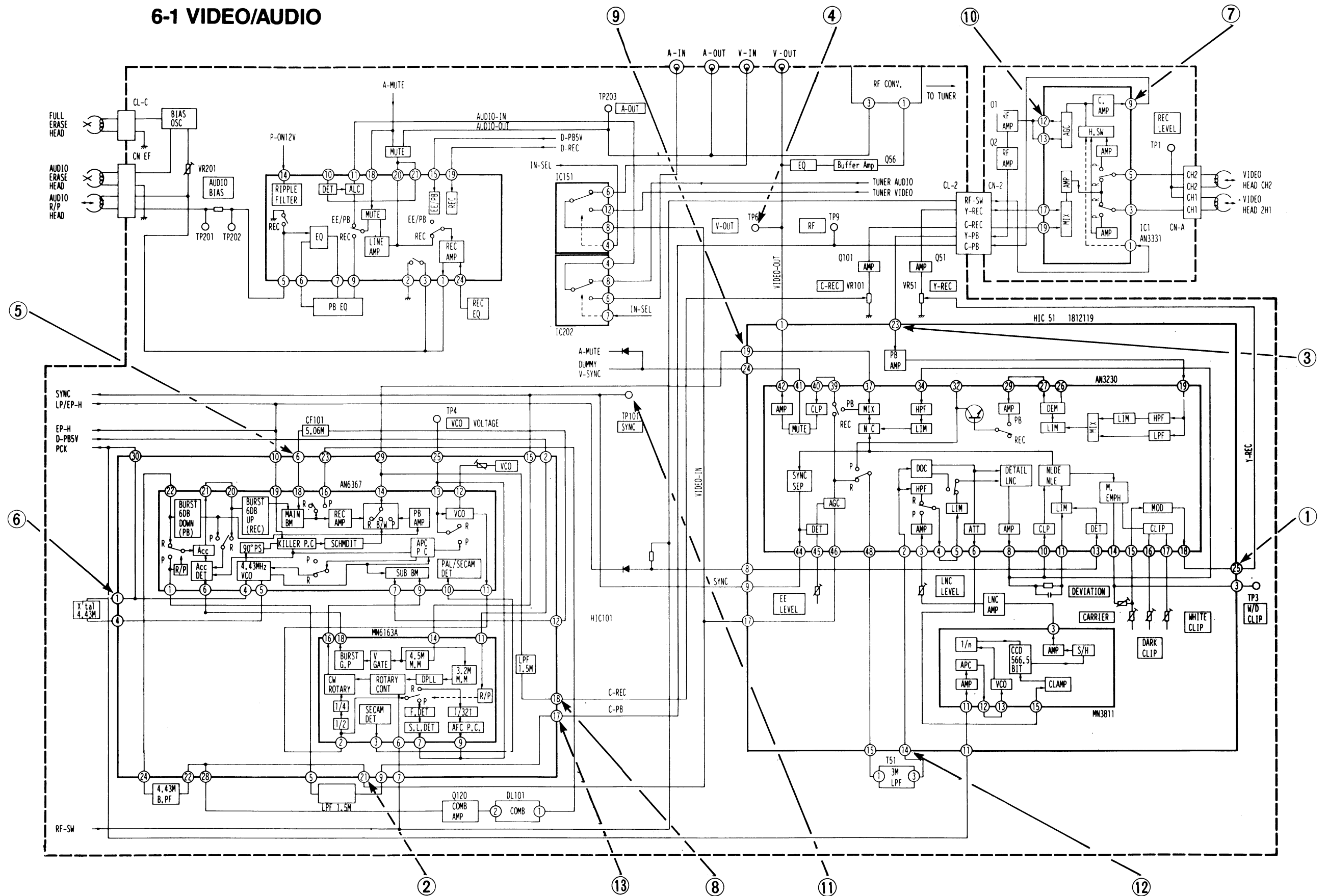
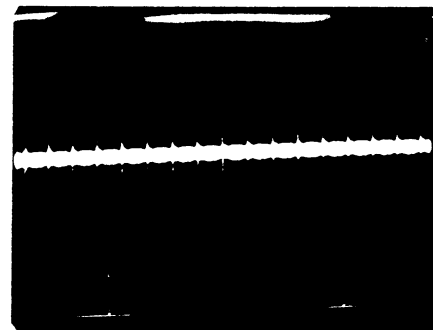


Fig. 5-14

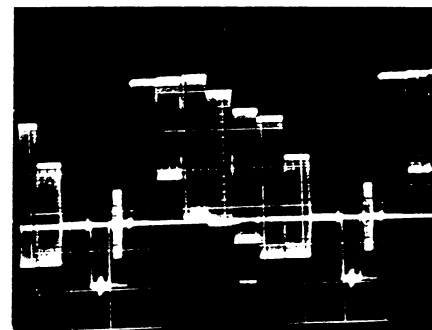
6-1 VIDEO/AUDIO



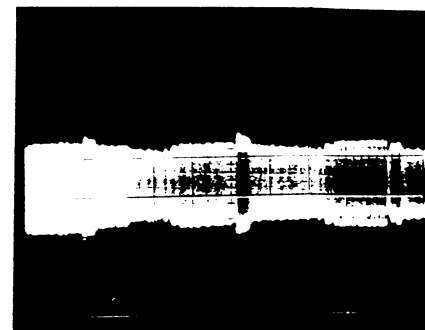
WAVE FORM



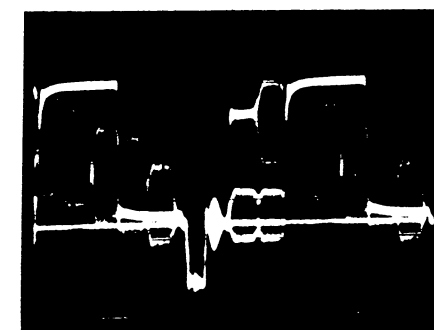
① 0.1mS/div 5mV/div
Mode : REC
Test Tape : Blank Tape
HIC51 Pin 25



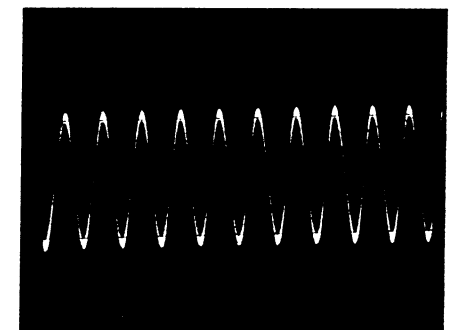
② 10mS/div 20mV/div
Mode : REC
Test Tape : Blank Tape
TP-21



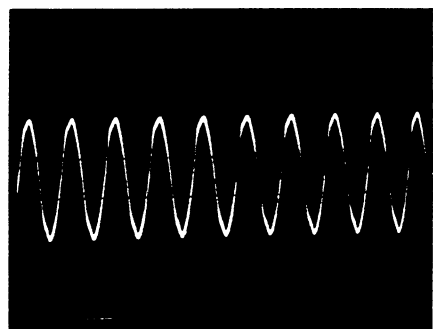
③ 5mS/div 20mV/div
Mode : PLAY
Test Tape : F6-A
HIC51 Pin 23



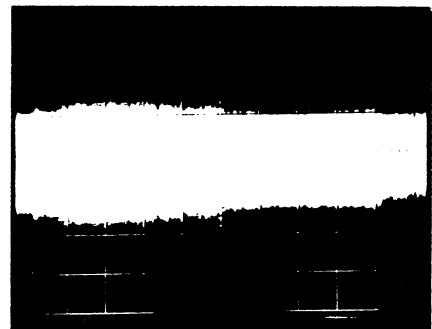
④ 10mS/div 20mV/div
Mode : PLAY
Test Tape : F6-A
TP-6



⑤ 0.2uS/div 5mV/div
Mode : PLAY
Test Tape : F6-A
HIC101 Pin 6



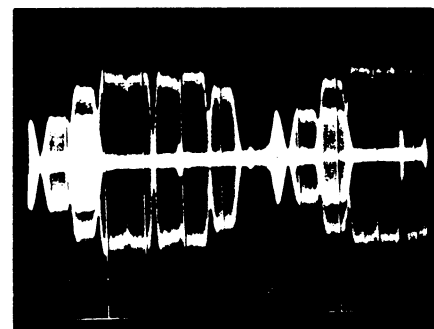
⑥ 0.2uS/div 20mV/div
Mode : PLAY
Test Tape : F6-4
HIC101 Pin 1



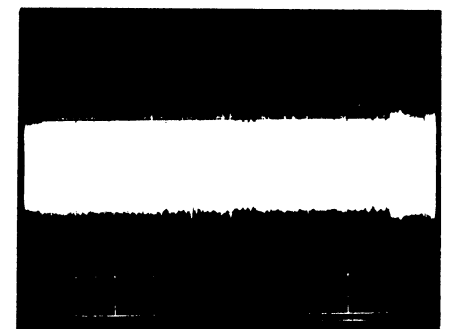
⑦ 2mS/div 10mV/div
Mode : PLAY
Test Tape : F6-A
IC1 Pin 9



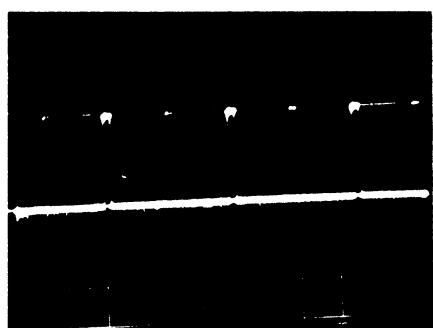
⑧ 20uS/div 10mV/div
Mode : REC
Test Tape : Blank Tape
HIC101 Pin 18



⑨ 10uS/div 20mV/div
Mode : PLAY
Test Tape : F6-A
HIC51 Pin 19



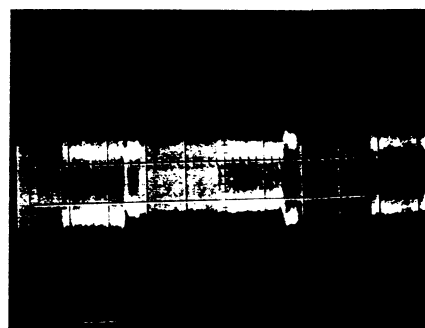
⑩ 2mS/div 10mV/div
Mode : PLAY
Test Tape : F6-A
IC1 Pin 12



⑪ 20uS/div 0.2V/div
Mode : PLAY
Test Tape : F6-A
TP101

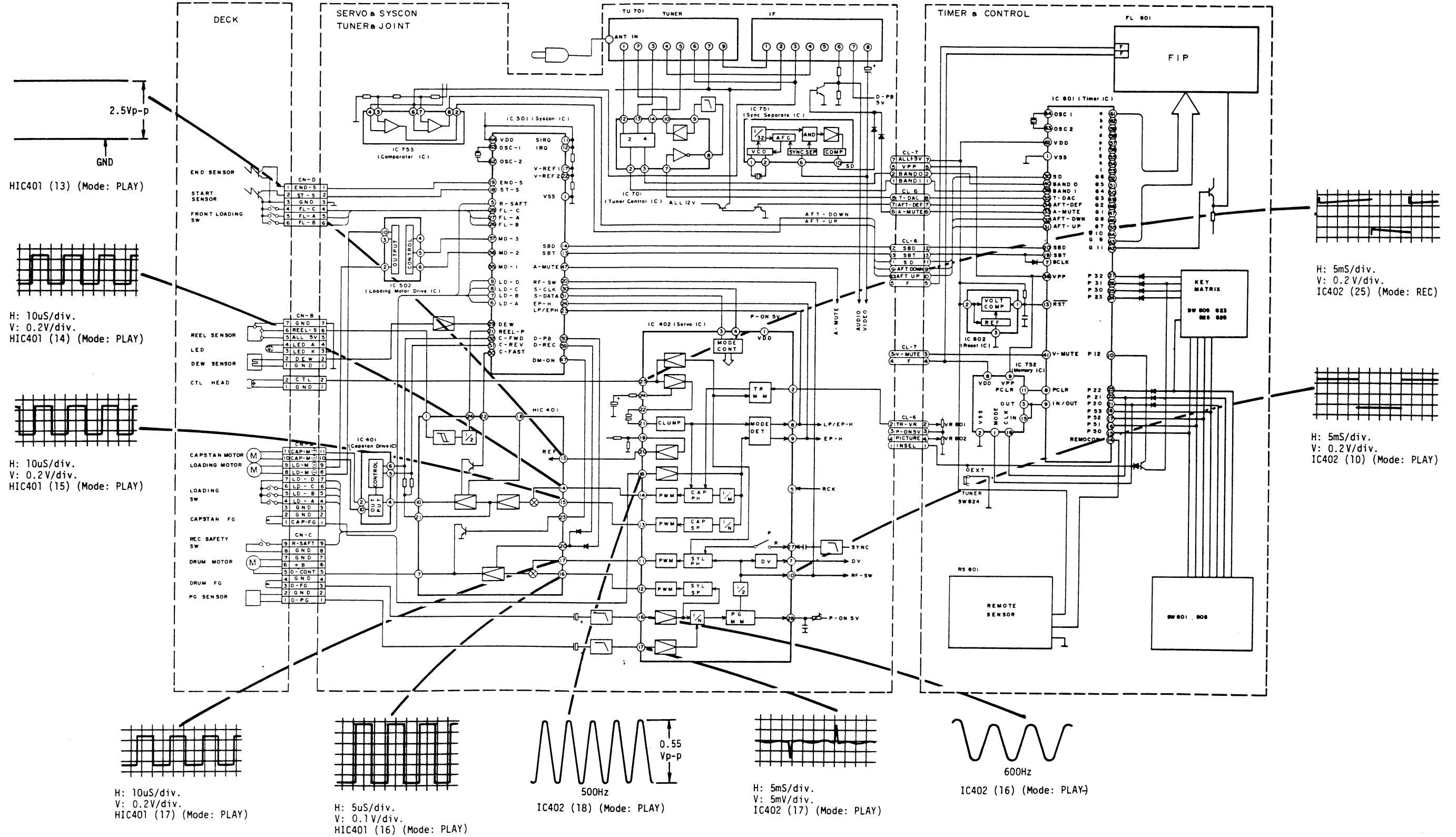


⑫ 10uS/div 10mV/div
Mode : PLAY
Test Tape : F6-A
HIC51 Pin 14



⑬ 5mS/div 10mV/div
Mode : PLAY
Test Tape : F6-A
HIC101 Pin 17

6-2 SYSTEM CONTROL/SERVO/TIMER



7. IC PIN FUNCTION DESCRIPTION

14DN363 (IC402, SERVO IC)

Pin No	IN/OUT	Signal name	Function
1	IN	V _{DD}	POWER TERMINAL "H" INPUT (5V) DEGITAL SEC
2	IN	TRMM	TRACKING MONO-MULT CONTROL (25Hz)
3	IN	SDAT	MODE TRANSFER (DATA SIGNAL)
4	IN	SCLK	MODE TRANSFER (CLOCK SIGNAL)
5	IN	RCK	CLOCK BASE (4.43MHz)
6	IN	TEST	TEST INPUT
7	OUT	VLP	DUMMY V (50Hz)
8	OUT	MOD 0	REC MODE
9	OUT	MOD 1	REC MODE
10	OUT	HSW	VIDEO HEAD SWITCH (25Hz)
11	OUT	PWM 2	CYLINDER SERVO PHASE ERROR (34.5kHz)
12	OUT	PWM 1	CYLINDER SERVO SPEED ERROR (69.4kHz)
13	OUT	PWM 3	CAPSTAN SERVO SPEED ERROR (34.5kHz)
14	OUT	PWM 4	CAPSTAN SERVO PHASE ERROR (34.5kHz)
15	IN	V _{SS}	POWER TERMINAL "L" INPUT (GND) DIGITAL SEC
16	IN	YFG	CYLINDER FG AMP (600Hz)
17	IN	YPG	SYLINDER PG AMP (25Hz)
18	IN	FGI	CAPSTAN FG AMP (504Hz)
19	IN	RI	REFERENCE AMP
20	OUT	VRO	REFERENCE AMP
21	IN	C 1	CONTROL PEAK CLAMP
22	OUT	C 0	CONTROL F/R AMP (25Hz)
23	IN	CTLG	CONTROL GND
24	IN	CTLA	PLAY CONTROL HEAD AMP (NEGATIVE INPUT)
25	IN/OUT	CTLH	PLAY CONTROL HEAD AMP POSITIVE INPUT, REC CONTROL OUTPUT
26	IN	AV	POWER TERMINAL "H" INPUT (5V) ANALOG SEC
27	IN	V-SYNC	V-SYNC SIGNAL (50Hz)
28	IN	PGMM	PG MONO-MULT CONTROL

14DN348 (IC501, SYSCON IC)

Pin No	IN/OUT	Signal name	Function
1	IN	Vss	GND
2	IN	SAFT	POWER ABNORMAL DETECTOR
3	—	—	
4	—	—	
5	IN	R-SAFT	ERASURE PREVENTION SWITCH
6	IN	LD-A	TAPE LOADING POSITION DETECTOR
7	IN	LD-B	TAPE LOADING POSITION DETECTOR
8	IN	LD-C	TAPE LOADING POSITION DETECTOR
9	IN	LD-D	TAPE LOADING POSITION DETECTOR
10	—	—	
11	—	—	
12	—	—	
13	IN/OUT	SBT	SERIAL TRANSFER TIMING CLOCK IN/OUT (BETWEEN CLOCK)
14	IN/OUT	SBD	SERIAL TRANSFER DATA IN/OUT (BETWEEN CLOCK)
15	—	—	
16	IN	RST	RESET
17	IN	V-REF	COMPARATOR INPUT REFERENCE VOLTAGE
18	IN	ST-S	TAPE START POSITION DETECTOR
19	IN	END-S	TAPE END POSITION DETECTOR
20	IN	RF-SW	SWITCHING PULSE
21	IN	REEL-P	COUNTER INPUT PULSE
22	IN	V-REF	COMPARATOR OUTPUT REFERENCE VOLTAGE
23	IN	LP/EP-H	TAPE SPEED
24	IN	EP-HWN	TAPE SPEED
25	—	—	
26	IN	FL-B	CASSETTE OUT DETECTOR
27	IN	FL-A	CASSETTE IN START DETECTOR
28	IN	FL-C	CASSETTE DOWN DETECTOR
29	IN	DEW	DEW SENSOR
30	OUT	S-CLK	SERVO IC TIMING CLOCK
31	OUT	S-DATA	SERVO IC DATA
32	—	—	
33	—	—	
34	—	—	

Pin No	IN/OUT	Signal name	Function
35	—	—	
36	—	—	
37	—	—	
38	—	—	
39	—	—	
40	—	—	
41	—	—	
42	—	—	
43	—	—	
44	—	—	
45	—	—	
46	OUT	TV/VCR	TV/VCR CONTROL
47	OUT	A-MUTE	SOUND MUTE OUTPUT
48	OUT	PAUSE	PAUSE CONTROL
49	OUT	DM-ON	DRUM ROTATION OUTPUT
50	OUT	C-FAST	CAPSTAN MOTOR HIGH SPEED
51	OUT	C-REV	CAPSTAN MOTOR REVERSE
52	OUT	C-FWD	CAPSTAN MOTOR FORWARD
53	—	—	
54	—	—	
55	—	—	
56	OUT	LD-REV	TAPE LOADING/CASSETTE LOADING MOTOR CONTROL
57	OUT	LD-FWD	TAPE LOADING/CASSETTE LOADING MOTOR CONTROL
58	—	—	
59	OUT	D-REC	RECORD CONTROL
60	OUT	D-PB	PLAY CONTROL
61	OUT	P-ON	POWER ON CONTROL
62	OUT	OSC-2	CLOCK OSCILLATION
63	IN	OSC-1	CLOCK OSCILLATION
64	IN	V _{DD}	POWER + 5V

14DN487 (IC801, TIMER IC)

Pin No	IN/OUT	Signal name	Function
1	IN	Vss	GND
2	—	—	
3	—	—	
4	—	—	
5	—	—	
6	—	—	
7	OUT	SCLK	8 BIT SERIAL TRANSFER CLOCK (OUTPUT FOR SYSCON IC)
8	OUT	PCLR	N MOS CONTROL SIGNAL
9	IN/OUT	IN/OUT	M MOS DATA INPUT / M MOS CONTROL SIGNAL
10	OUT	P 12	OPERATION SW KEY SCAN
11	OUT	P 13	OPERATION SW KEY SCAN
12	—	—	
13	IN	RST	RESET AT RESET SIGNAL INPUT “L”, NORMAL AT “H”
14	IN	REMOCON	REMOTE CONTROL SERIAL SIGNAL
15	IN	P 50	KEY SCAN 4 BIT PARALLEL SIGNAL
16	IN	P 51	KEY SCAN 4 BIT PARALLEL SIGNAL
17	IN	P 52	KEY SCAN 4 BIT PARALLEL SIGNAL
18	IN	P 53	KEY SCAN 4 BIT PARALLEL SIGNAL
19	IN	SBT	8 BIT SERIAL TRANSFER CLOCK INPUT (INPUT FROM SYSCON IC)
20	IN/OUT	SBD	8 BIT SERIAL TRANSFER DATA IN / OUT (IN / OUT FOR SYSCON IC)
21	OUT	P 20	KEY SCAN SIGNAL OUTPUT
22	OUT	P 21	KEY SCAN SIGNAL OUTPUT
23	OUT	P 22	KEY SCAN SIGNAL OUTPUT
24	OUT	P 23	KEY SCAN SIGNAL OUTPUT
25	OUT	P 30	KEY SCAN SIGNAL OUTPUT
26	OUT	P 31	KEY SCAN SIGNAL OUTPUT
27	OUT	P 32	KEY SCAN SIGNAL OUTPUT
28	—	—	
29	—	—	
30	IN	SD	TUNER VIDEO SIGNAL SYNC SIGNAL INPUT, “L” AT SYNC SIGNAL
31	IN	AFT UP	TUNER AFT VOLTAGE INPUT, “H” AT OVER 8V OF AFT VOLTAGE
32	IN	AFT DOWN	TUNER AFT VOLTAGE INPUT, “L” AT UNDER 4V OF AFT VOLTAGE
33	OUT	A-MUTE	AUDIO MUTE SIGNAL
34	OUT	AFT-DEF	AFT DEFEAT SIGNAL
35	OUT	T-DAC	TUNER TUNING VOLTAGE CONTROL SIGNAL (14 BIT PWM)
36	IN	Vpp	

Pin No	IN/OUT	Signal name	Function
37	—	—	
38	—	—	
39	OUT	BAND 1	TUNER BAND SET SIGNAL
40	OUT	BAND 0	TUNER BAND SET SIGNAL
41	OUT	V-MUTE	VIDEO SIGNAL MUTE SIGNAL
42	OUT	G 11	DISPLAY DIGIT
43	OUT	G 9	DISPLAY DIGIT
44	OUT	G 10	DISPLAY DIGIT
45	OUT	G 7	DISPLAY DIGIT
46	OUT	G 8	DISPLAY DIGIT
47	OUT	G 1	DISPLAY DIGIT
48	OUT	G 2	DISPLAY DIGIT
49	OUT	G 3	DISPLAY DIGIT
50	OUT	G 4	DISPLAY DIGIT
51	OUT	G 5	DISPLAY DIGIT
52	OUT	G 6	DISPLAY DIGIT
53	OUT	i	DISPLAY SEGMENT
54	OUT	h	DISPLAY SEGMENT
55	OUT	g	DISPLAY SEGMENT
56	OUT	f	DISPLAY SEGMENT
57	OUT	e	DISPLAY SEGMENT
58	OUT	d	DISPLAY SEGMENT
59	OUT	c	DISPLAY SEGMENT
60	OUT	b	DISPLAY SEGMENT
61	OUT	a	DISPLAY SEGMENT
62	IN	Vdd	5V (POWER)
63	OUT	OSC-2	CRYSTAL OSCILLATOR 4.19MHz
64	IN	OSC-1	CRYSTAL OSCILLATOR 4.19MHz

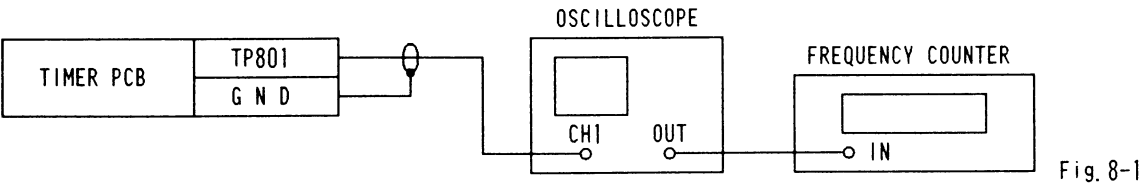
8. ALIGNMENT INSTRUCTIONS

PREPARATION

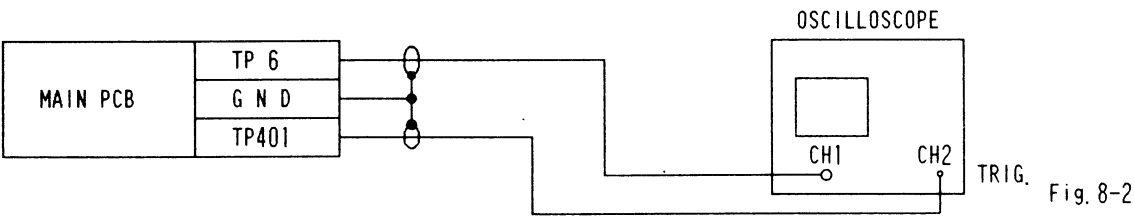
Electrical adjustments are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.

REQUIRED TEST EQUIPMENT

1. Oscilloscope : Dual-trace with 10:1 probe.
2. Frequency Counter
3. Color Monitor
4. Pattern Generator (Color bar with 100% white)
5. AC Voltmeter (RMS)
6. Alignment Tape F6-A (Color bar with 100% white)

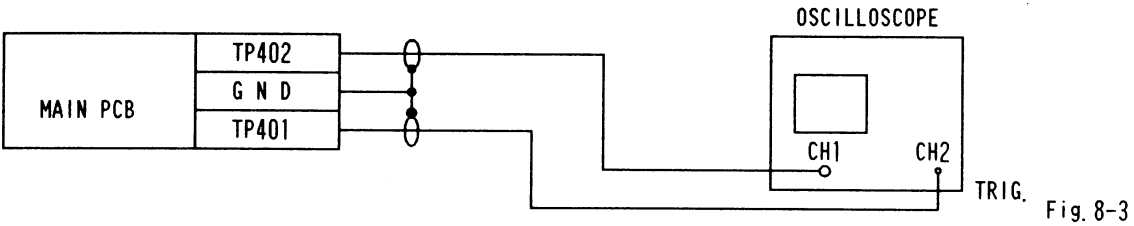


No.	Item	Test Point	Adjustment point	Method	Connection Figure
8-1	Timer clock E-E Mode	TP801 Ground	TC801	1. Connect CH1 oscilloscope across TP801 and Ground. 2. Connect the frequency counter to oscilloscope out. 3. Make adjustment by TC801 so that the indication of frequency counter becomes 524.288 kHz $\pm$ 1 Hz.	Fig. 8-1



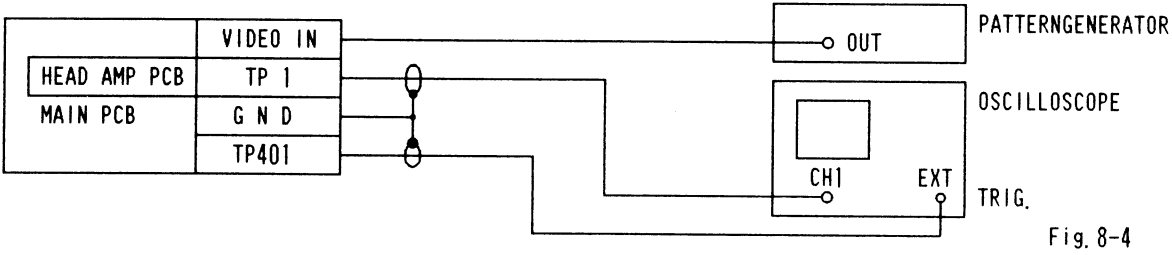
No.	Item	Test Point	Adjustment point	Method	Connection Figure
8-2	Switching point Adjustment Test Tape (F6-A)	TP6 TP401	VR401	1. Connect CH1 to TP6 of VIDEO-OUT and CH2 to TP401 and set EXT. Trigger mode (+) Trigger. 2. Playback the tape and adjust VR401 so that the V-sync front edge of CH1 video output waveform comes the position where 6.5H is delayed from the rising of CH2 Head Switching Pulse waveform.	Fig. 8-2

CH1
CH2
Switching pulse



No.	Item	Test Point	Adjustment point	Method	Connection Figure
8-3	CTL Preset Adjustment (P. B. Mode) Test tape F6-A	TP402 TP401	VR402	1. Connect CH1 of oscilloscope across TP402 and Ground. 2. Connect CH2 of oscilloscope across TP401 and Ground. 3. Set oscilloscope mode to EXT. Trigger(+) Trigger. 4. Playback the tape by setting tracking volume at center click position. 5. Adjust VR402 to make a position of CTL signal where delayed 2.3msec. from switching pulse starting position.	Fig. 8-3

CH1
CH2
Switching pulse
CTL Signal
2.3m sec.



No.	Item	Test Point	Adjustment point	Method	Connection Figure
8-4	Rec. Current Adjustment (Rec. Mode) Blank tape	TP1 (GND) TP401	VR51 VR101	1. Connect CH1 of oscilloscope across TP1 and Ground. 2. Connect EXT. Trigger of oscilloscope across TP401 and Ground. 3. Turn VR51 to fully clockwise direction. 4. Input RED only signal to VIDEO INPUT. 5. Adjust by VR101 so that chrominance level become 25 mVp-p $\pm$ 3 mV. 6. Adjust by VR51 so that V-Sync level becomes 140 mVp-p $\pm$ 10 mV.	Fig. 8-4

25 mVp-p
140 mVp-p
V-Sync

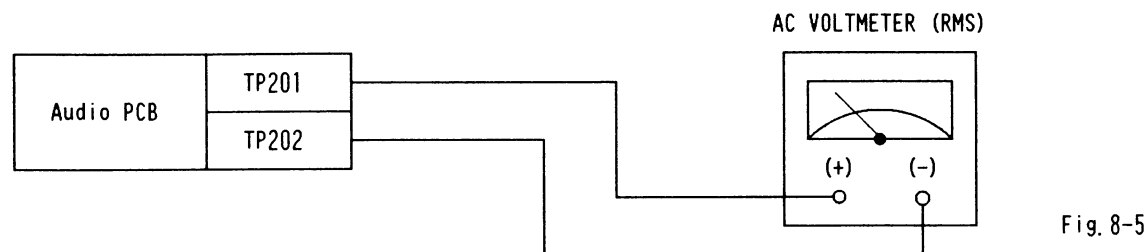


Fig. 8-5

No.	Item	Test Point	Adjustment point	Method	Connection Figure
8-5	REC. Bias Current	TP201 TP202	VR201	1. Set the REC status by the blank tape. (Do not set the PAUSE. In PAUSE mode, the bias oscillation is stopped.) 2. Connect the AC voltmeter to TP201 and TP202. 3. Adjust by VR201 so that the voltage becomes 22 mV.	Fig. 8-5

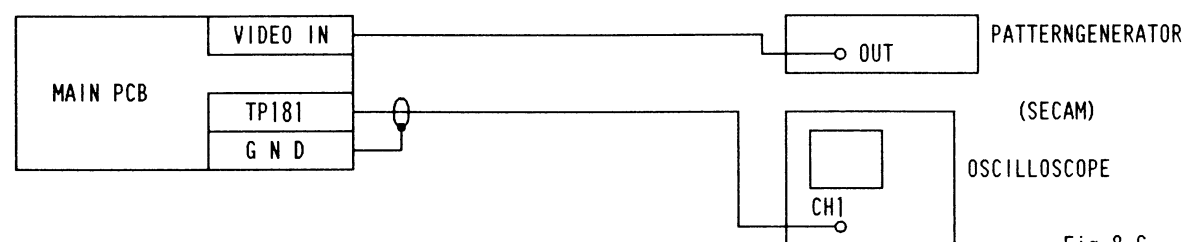
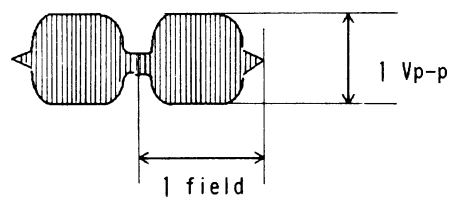
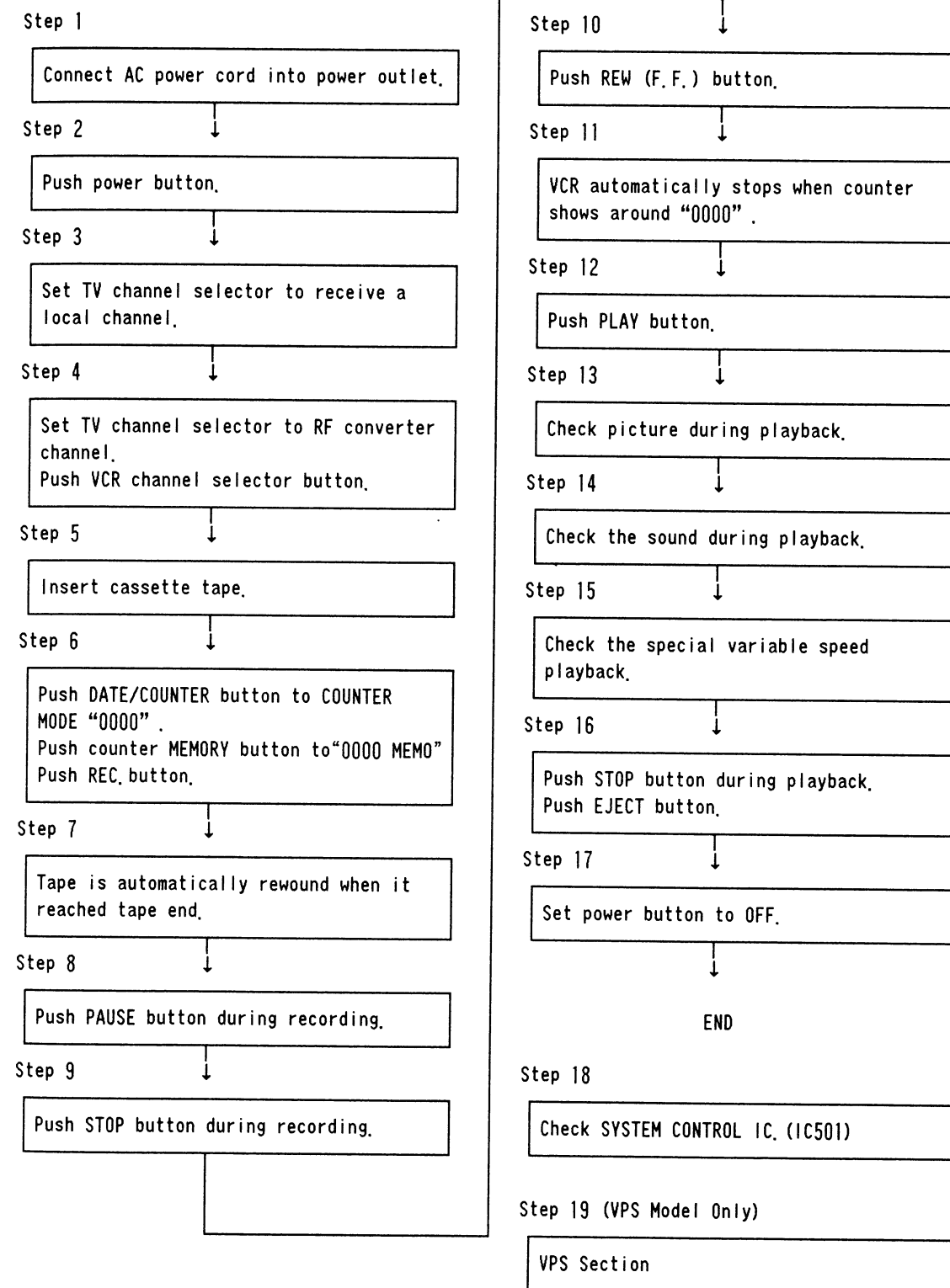


Fig. 8-6

No.	Item	Test Point	Adjustment point	Method	Connection Figure
8-6 *	SECAM 1/2 fH Tune Adjustment (Rec. Mode) Blank tape	TP181 GND	L181	1. Connect CH1 of oscilloscope across TP181 and Ground. 2. Input SECAM color bar signal to VIDEO INPUT. 3. Adjust by L181 so that output level becomes maximum. 	Fig. 8-6

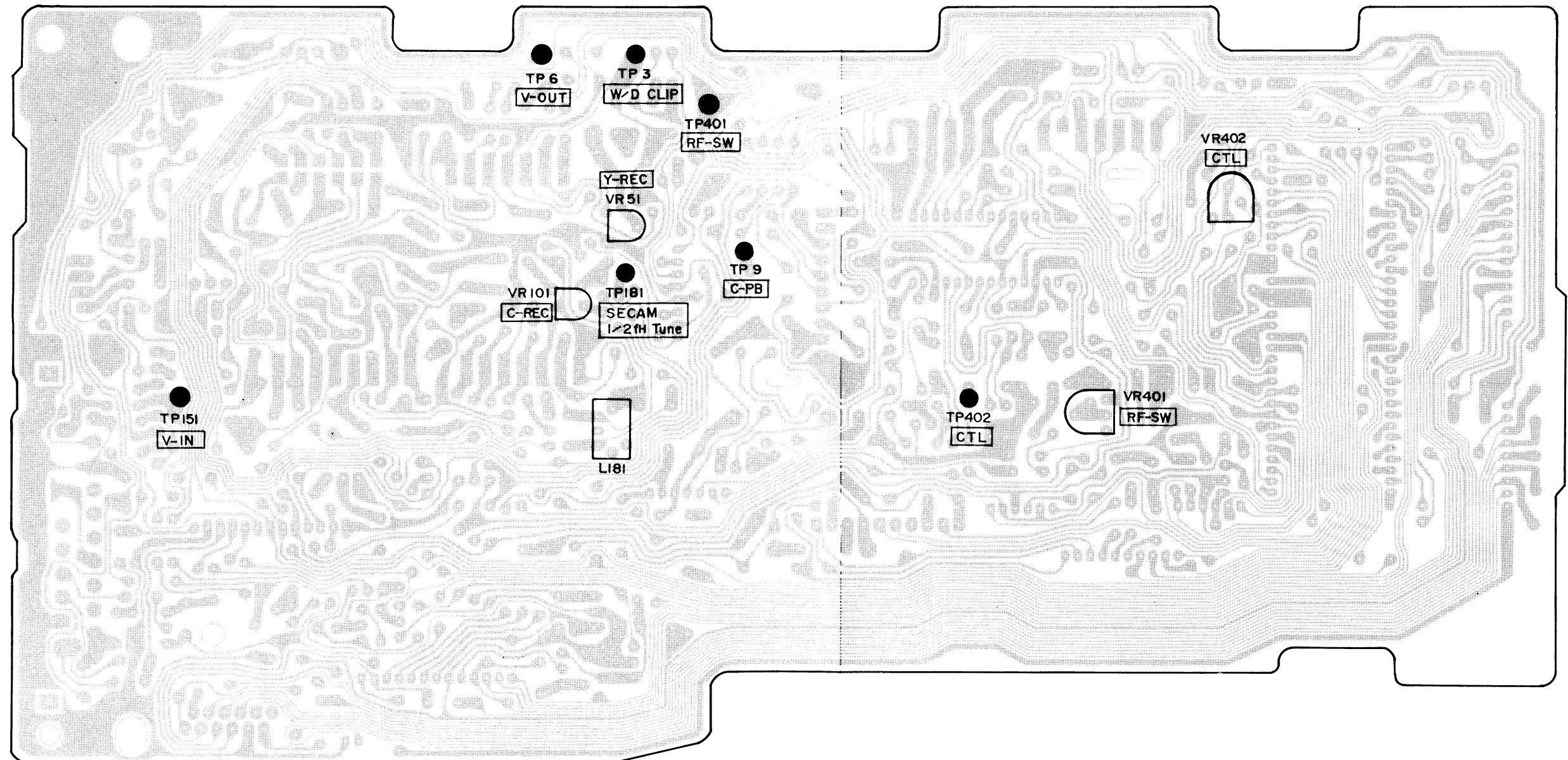
* Note : Require this adjustment for ME-SECAM model only.

10. TROUBLESHOOTING GUIDES

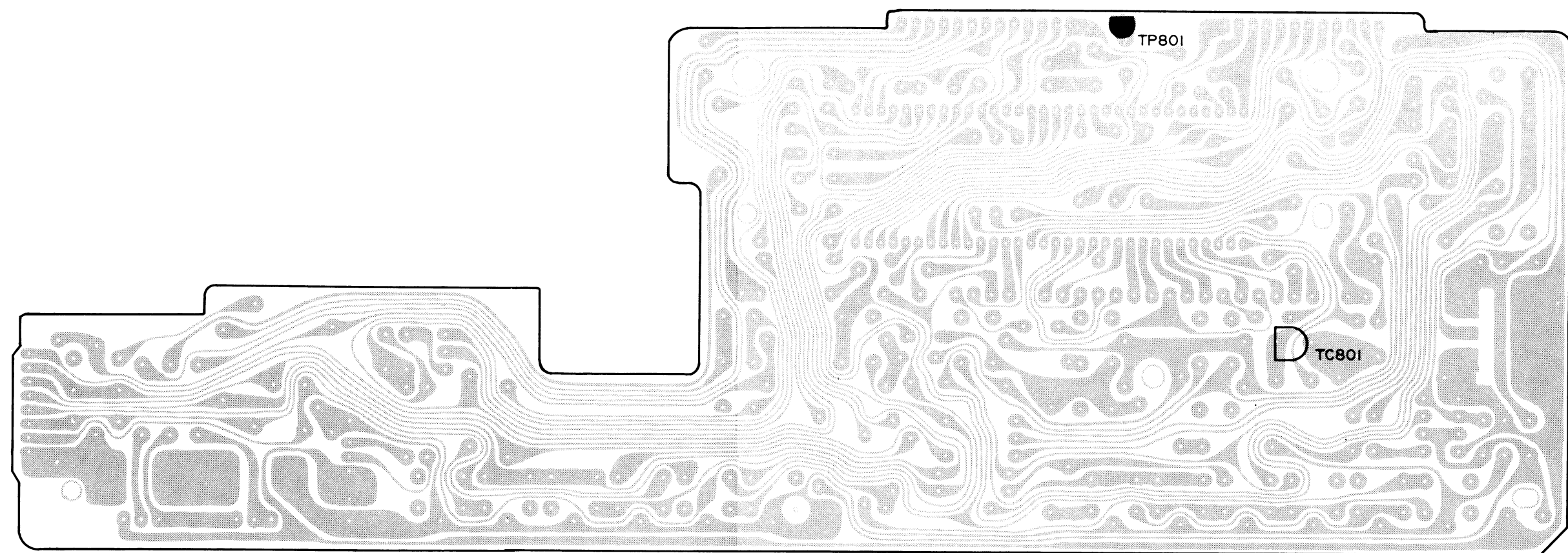


9. TEST POINT

9-1 MAIN P.C.BOARD

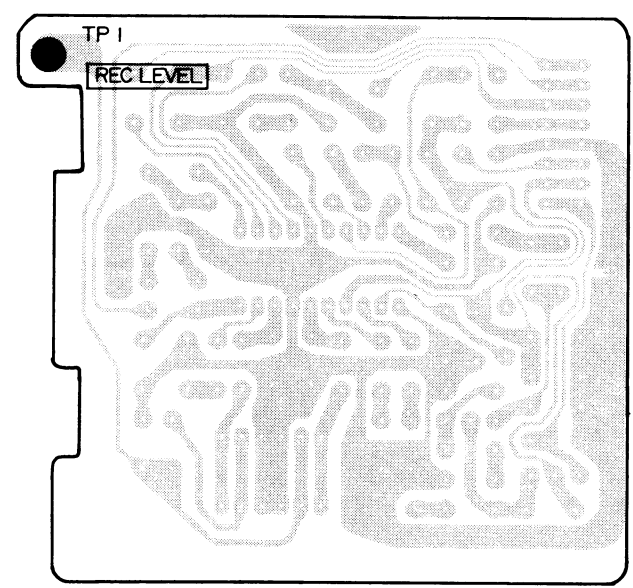


9-2 TIMER P.C.BOARD



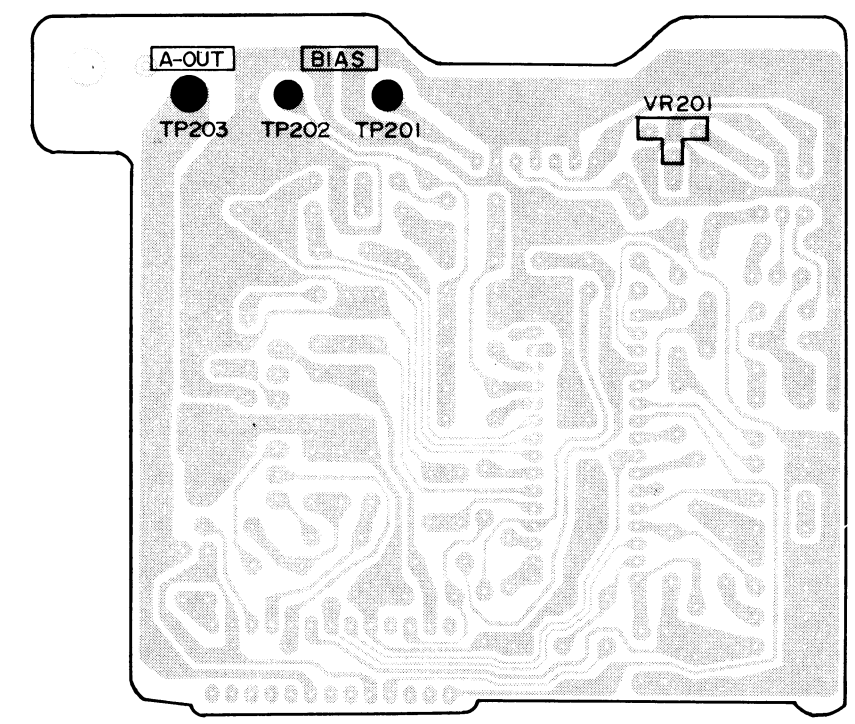
TPT-1

9-3 HEAD AMP P.C.BOARD

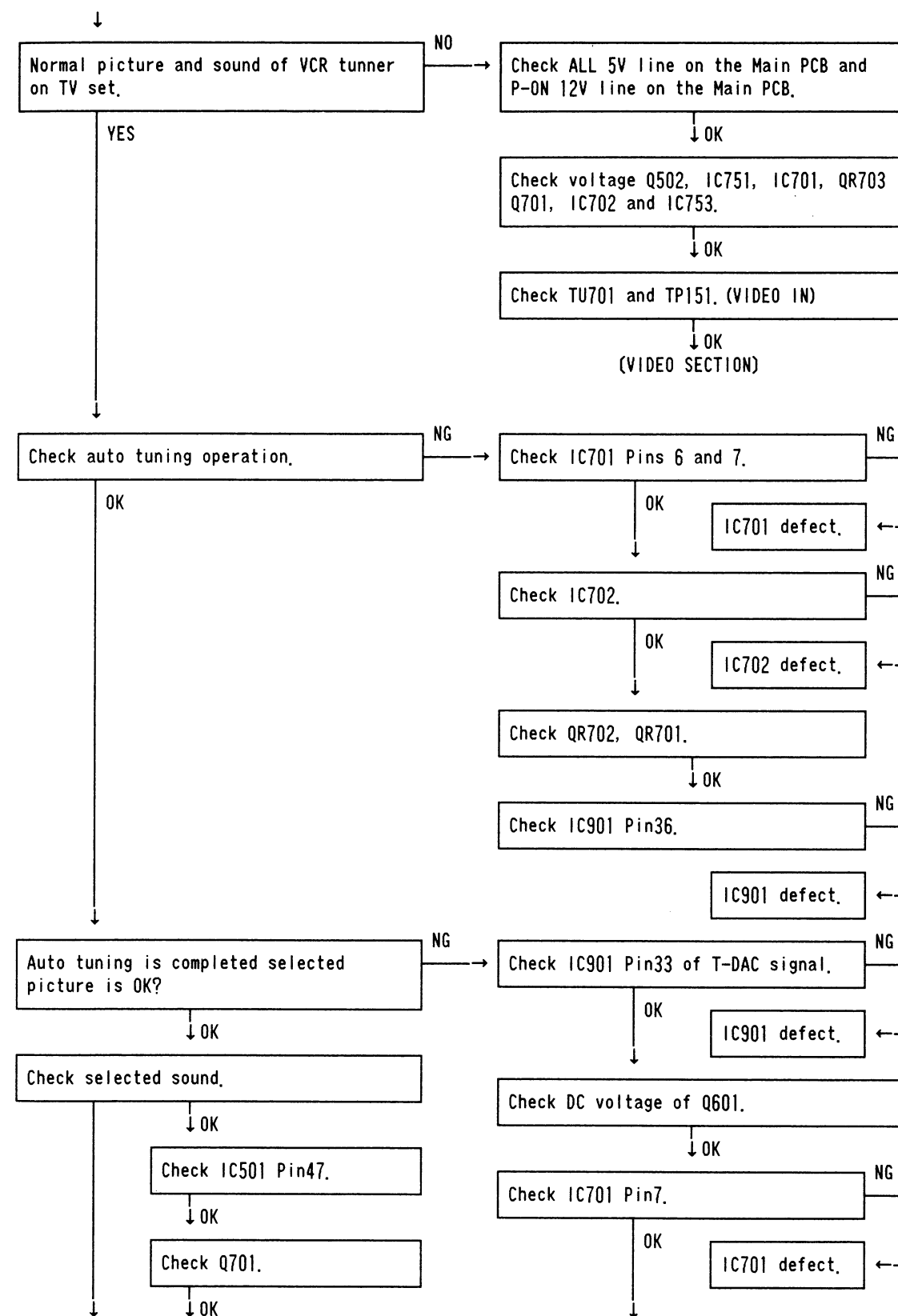
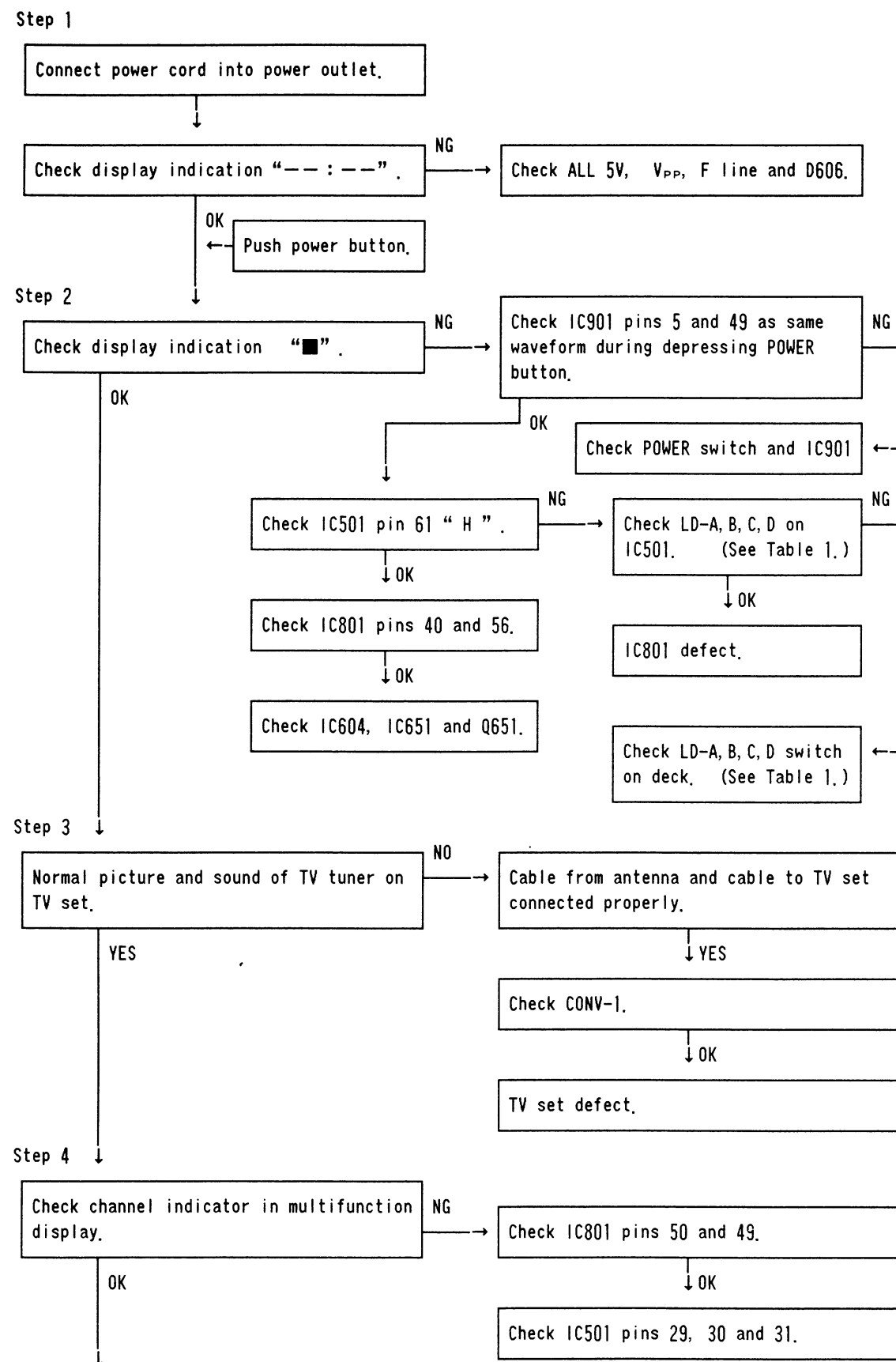


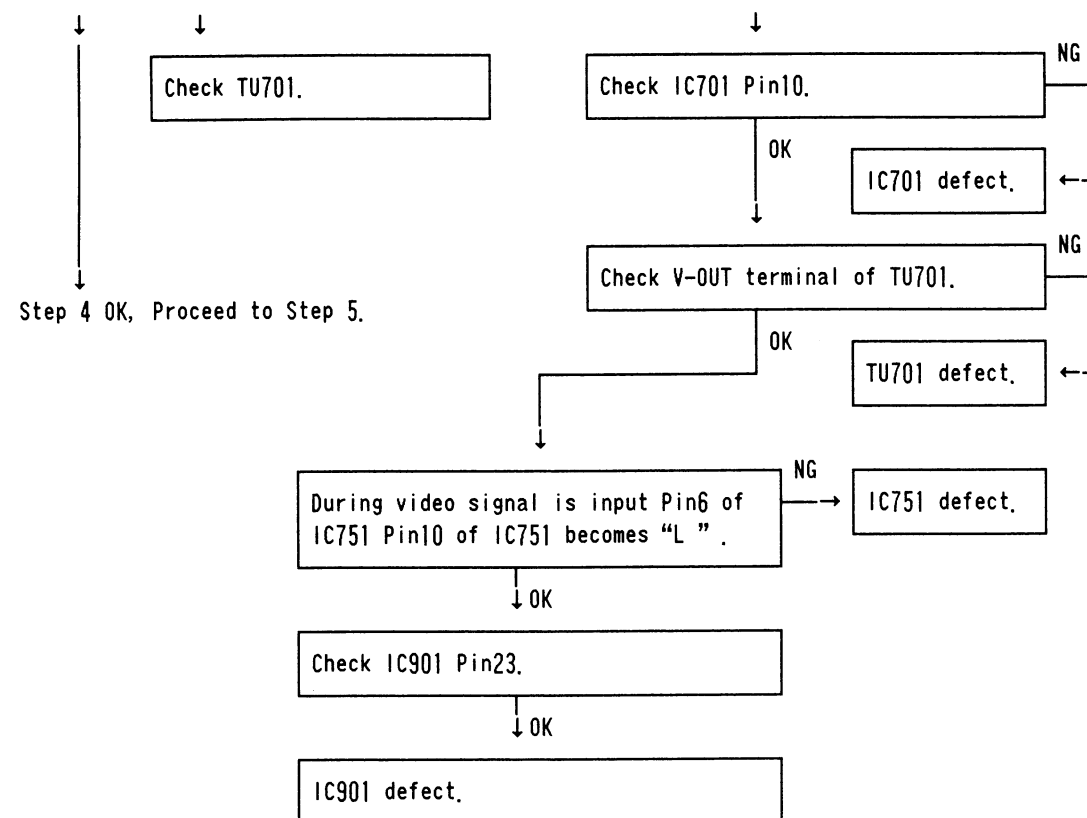
TPH-1

9-4 AUDIO P.C.BOARD

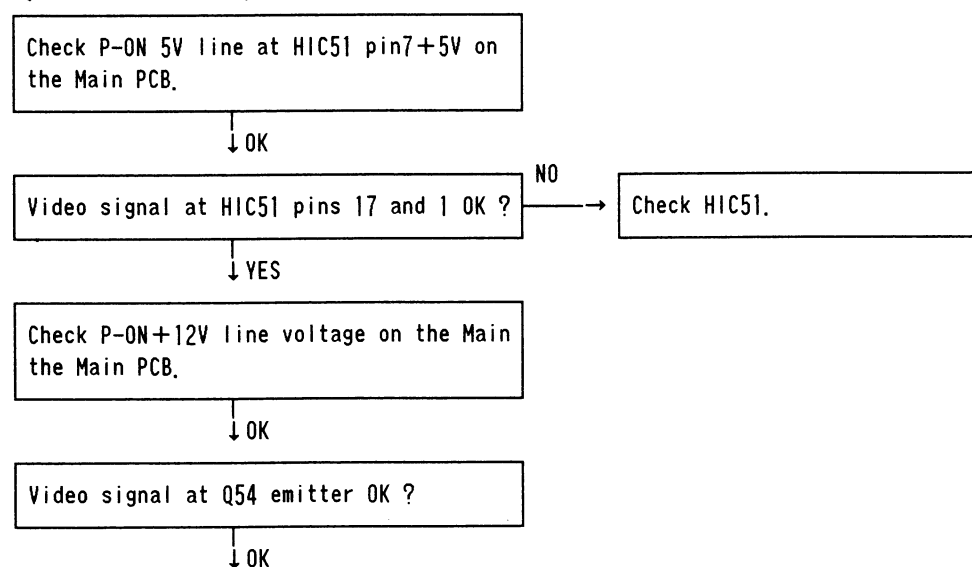


TPA-1



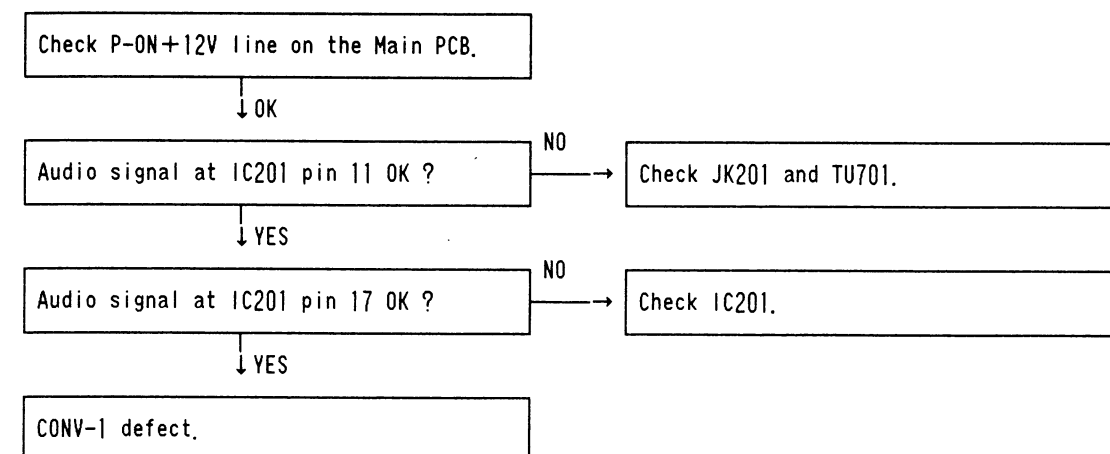


(VIDEO SECTION)

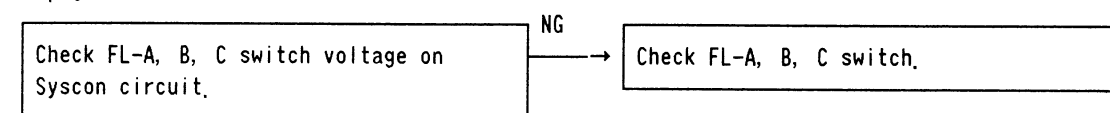


AUDIO SECTION

(AUDIO SECTION)

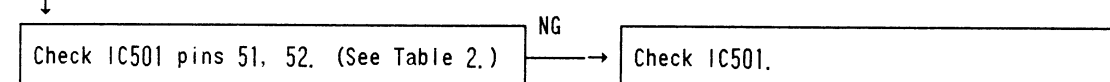


Step 5



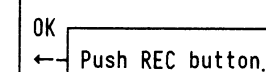
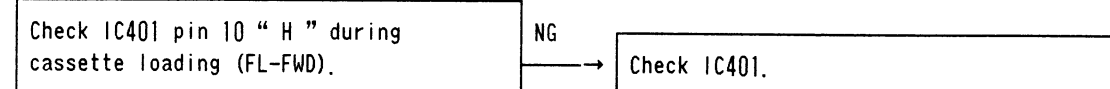
FL-A	"L" at ON CASSETTE IN detection
FL-B	"L" at ON CASSETTE UP detection
FL-C	"L" at ON CASSETTE DOWN detection

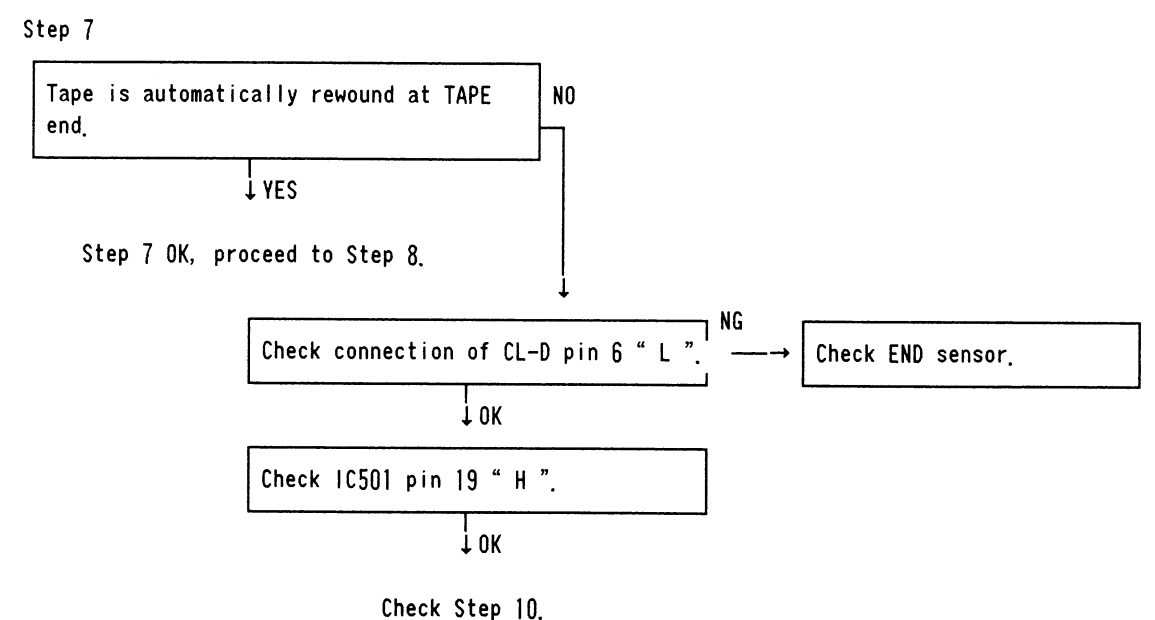
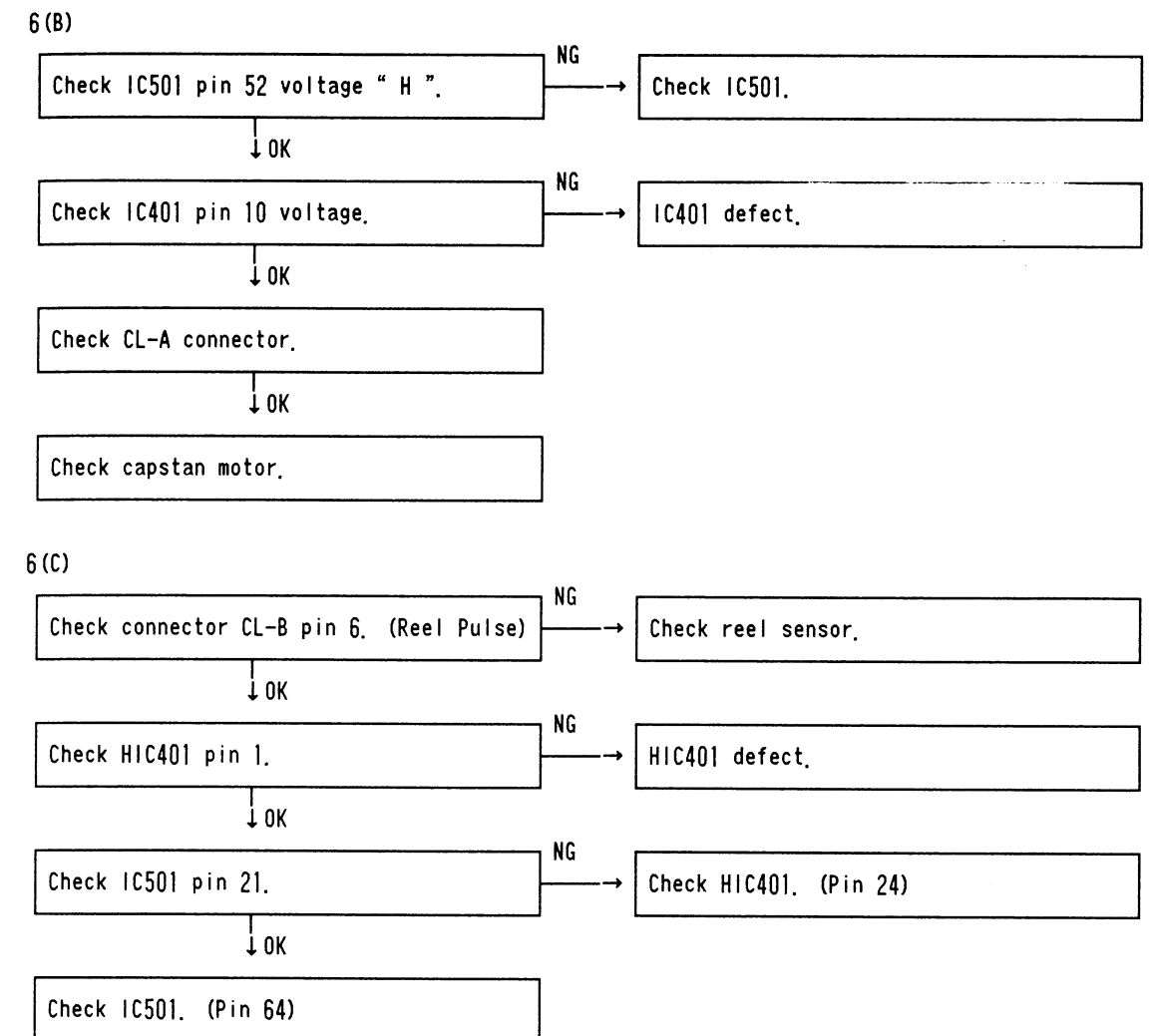
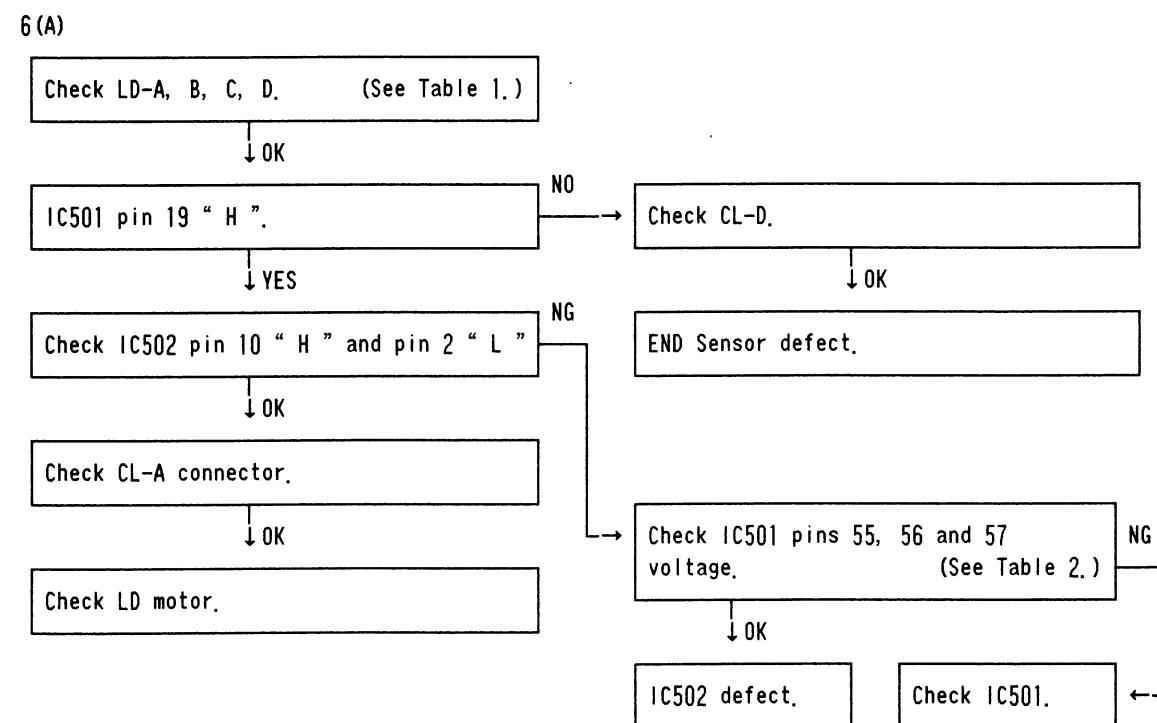
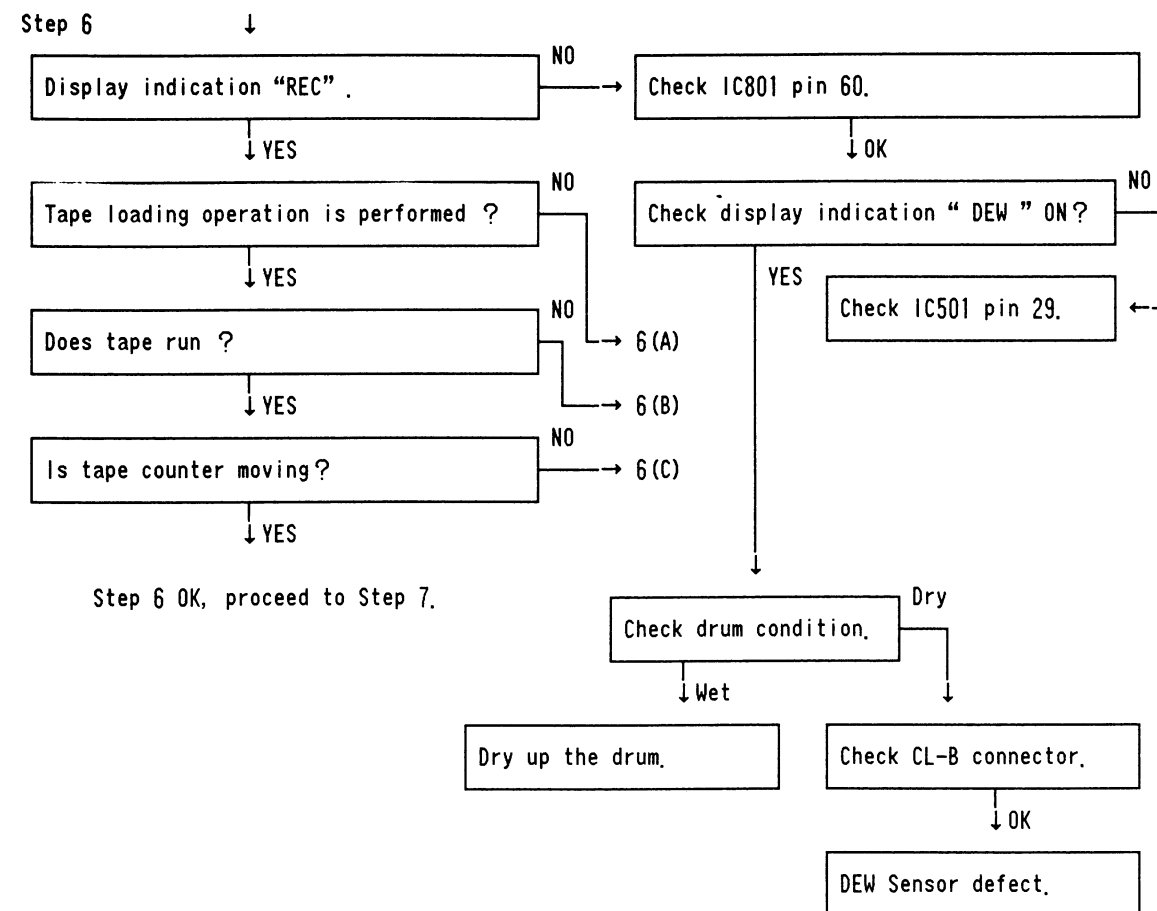
	FL-A START	FL-B OUT	FL-C IN
CASSETTE IN	H	H	L
CASSETTE OUT	H	L	H

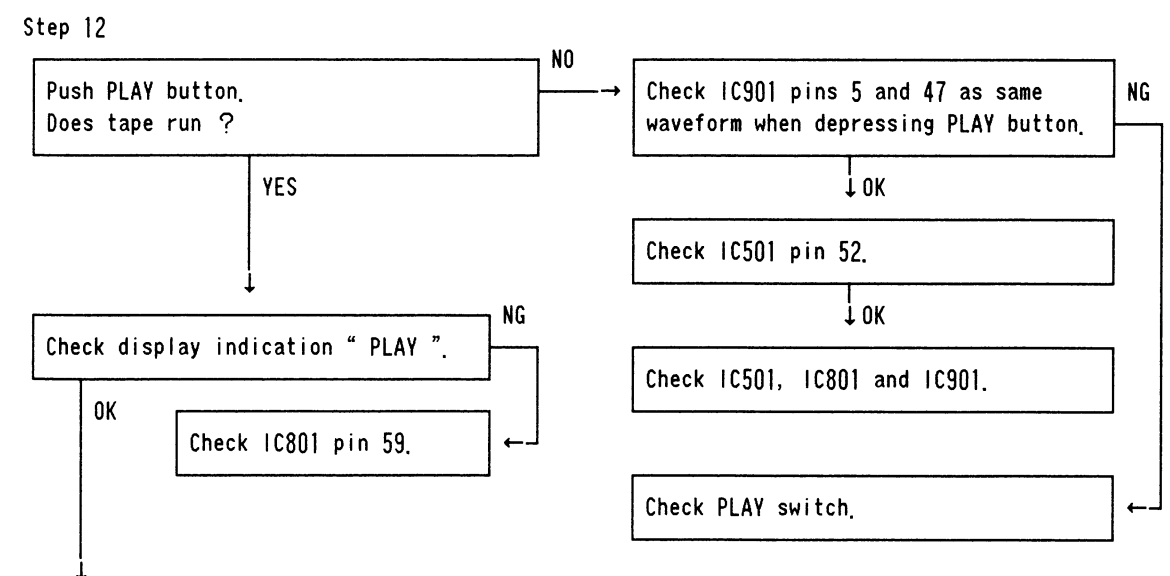
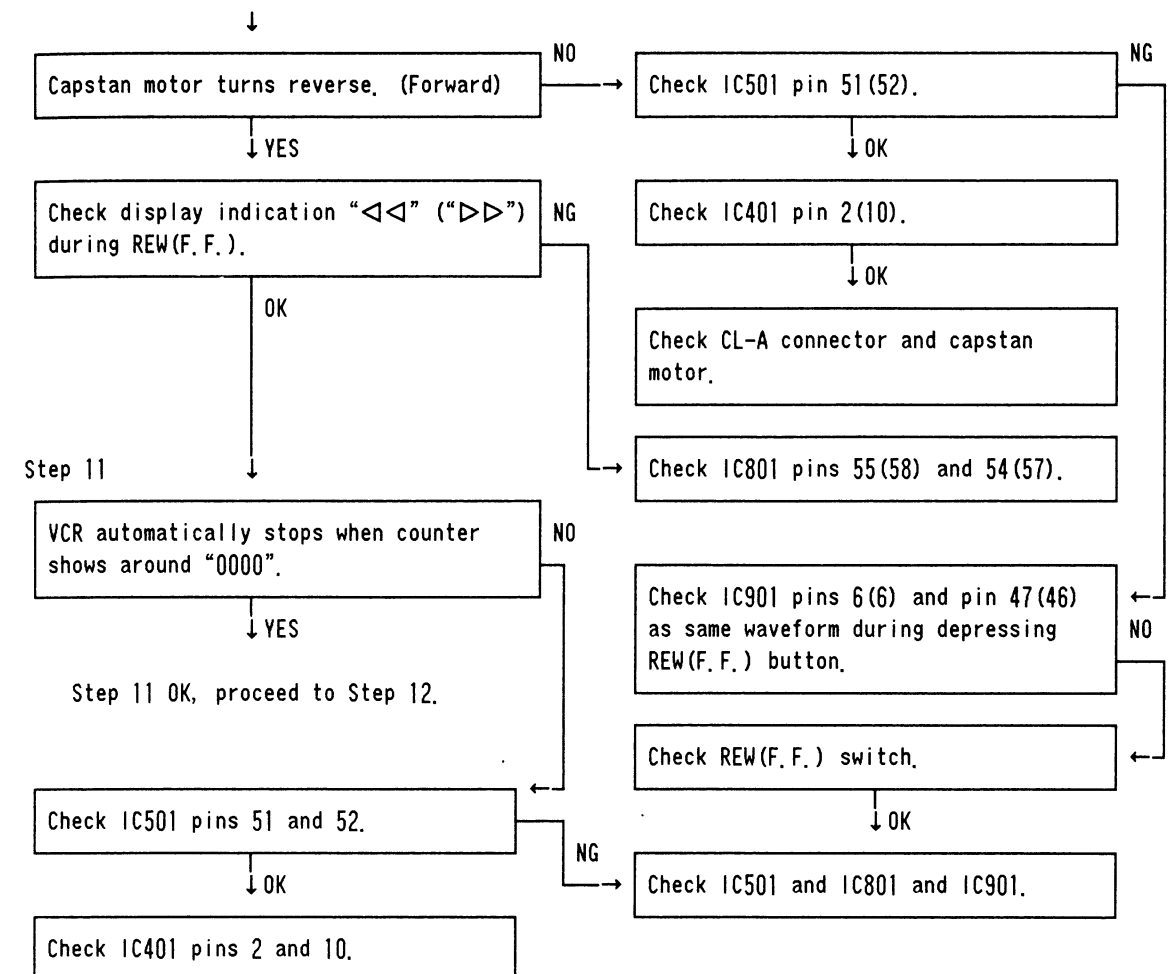
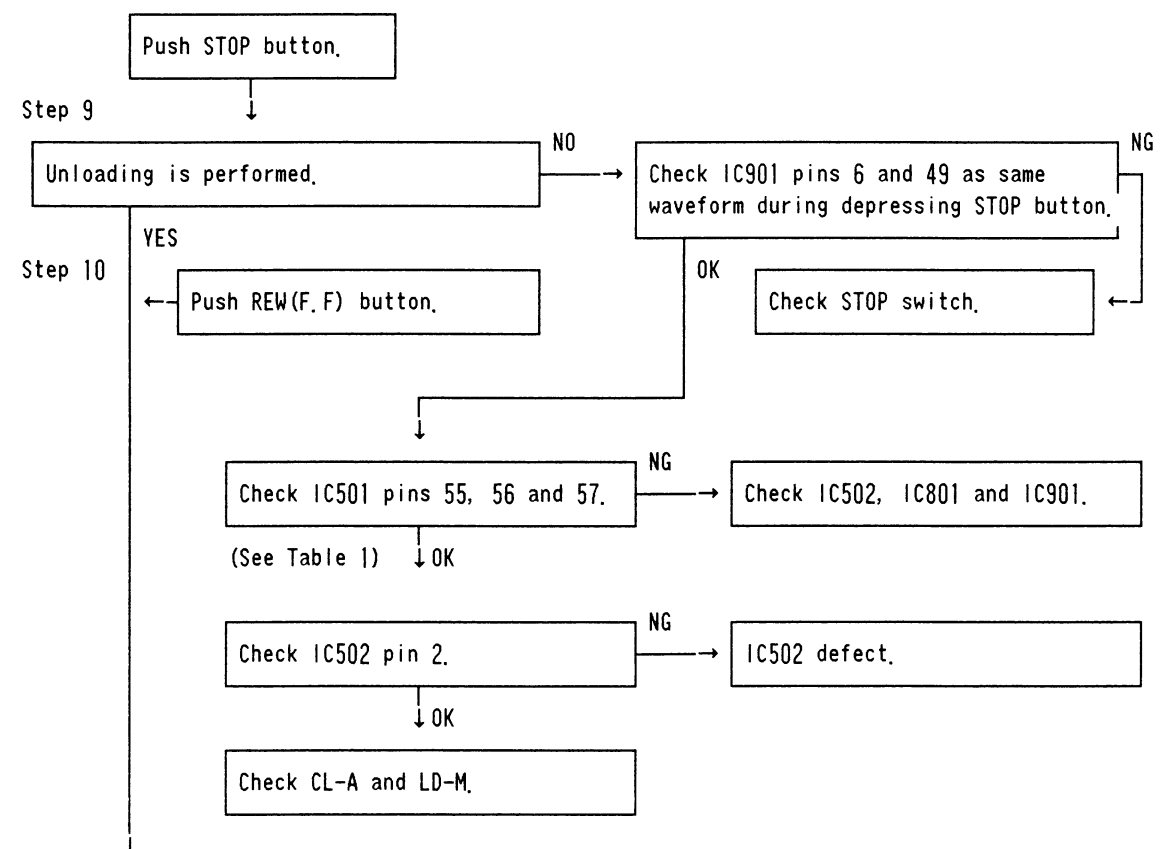
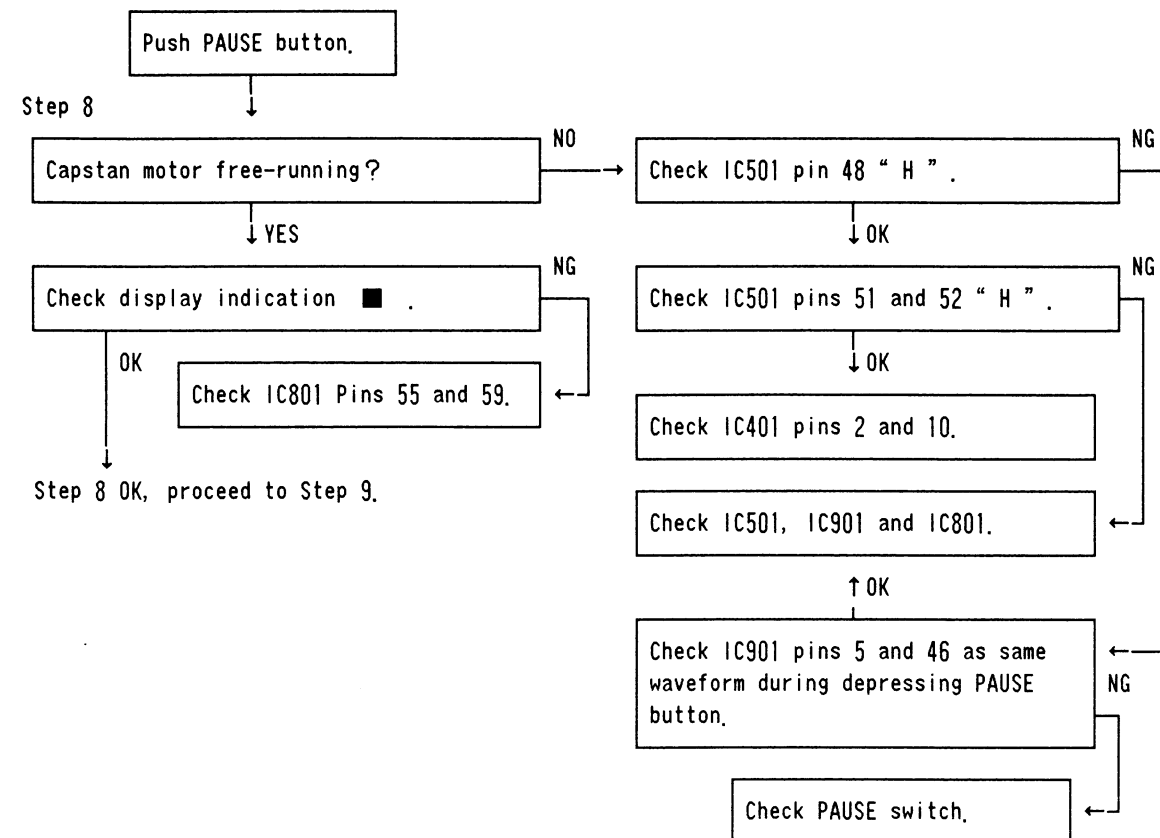


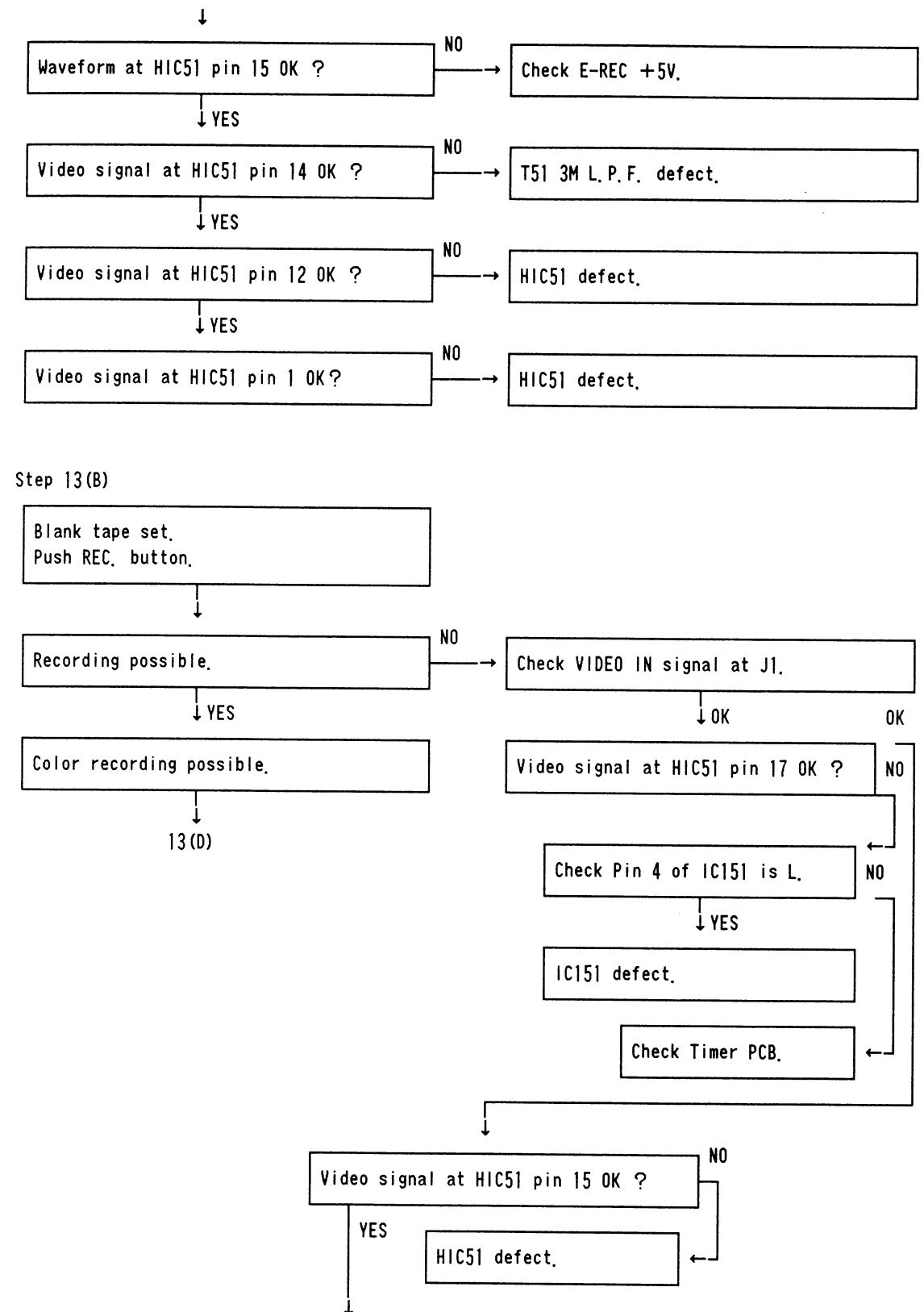
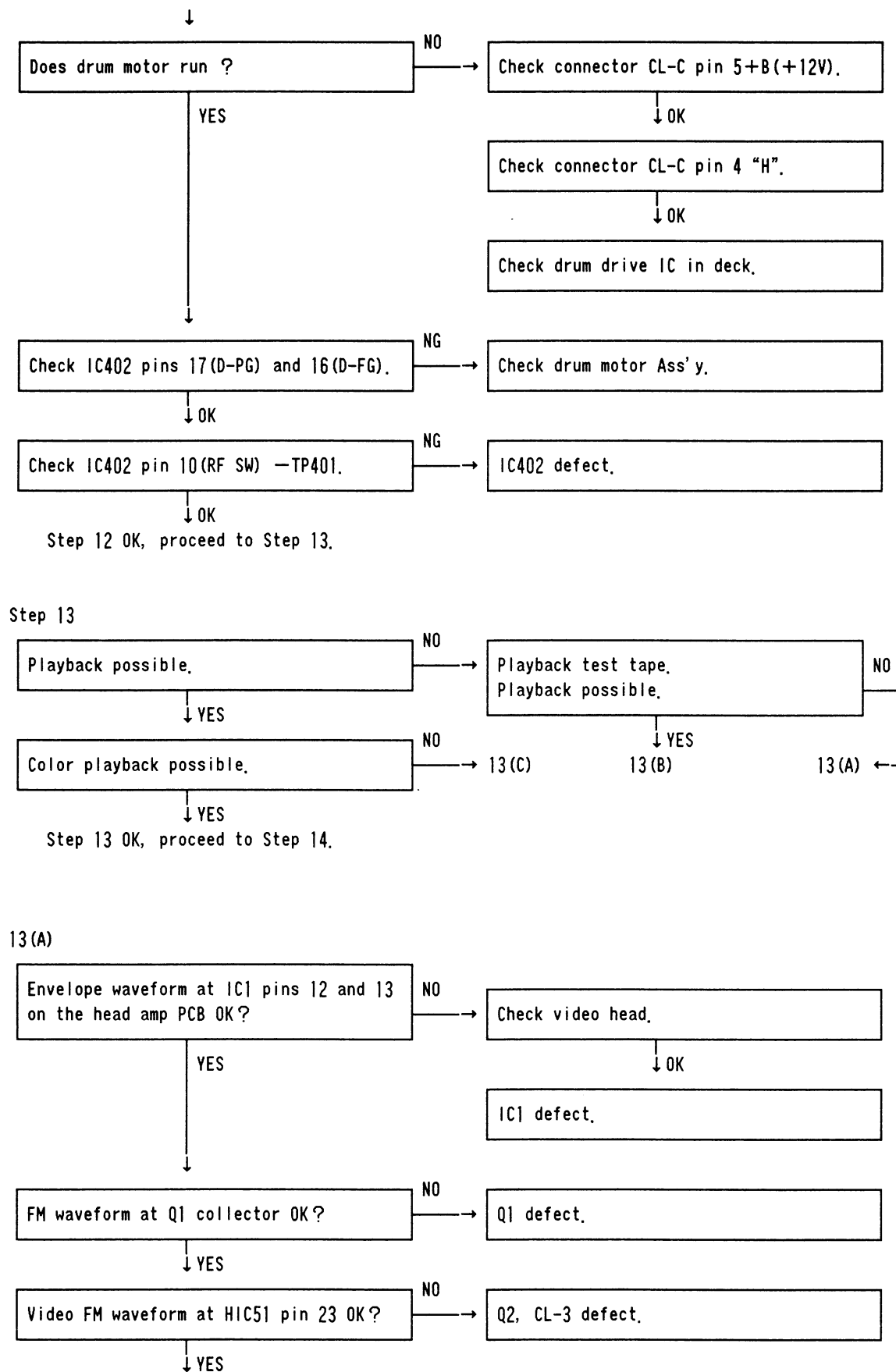
CAP-FWD (52 Pin)	CAP-REV (51 Pin)	MOTOR	MODE
L	L	STOP	Stop Without Brake
H	L	FWD	Capstan Motor FWD Direction, Reel FWD Direction, Cassette Unload Direction.
L	H	RVS	Capstan Motor RVS Direction, Reel RVS Direction, Cassette Load Direction.
H	H	STOP	Stop With Brake.

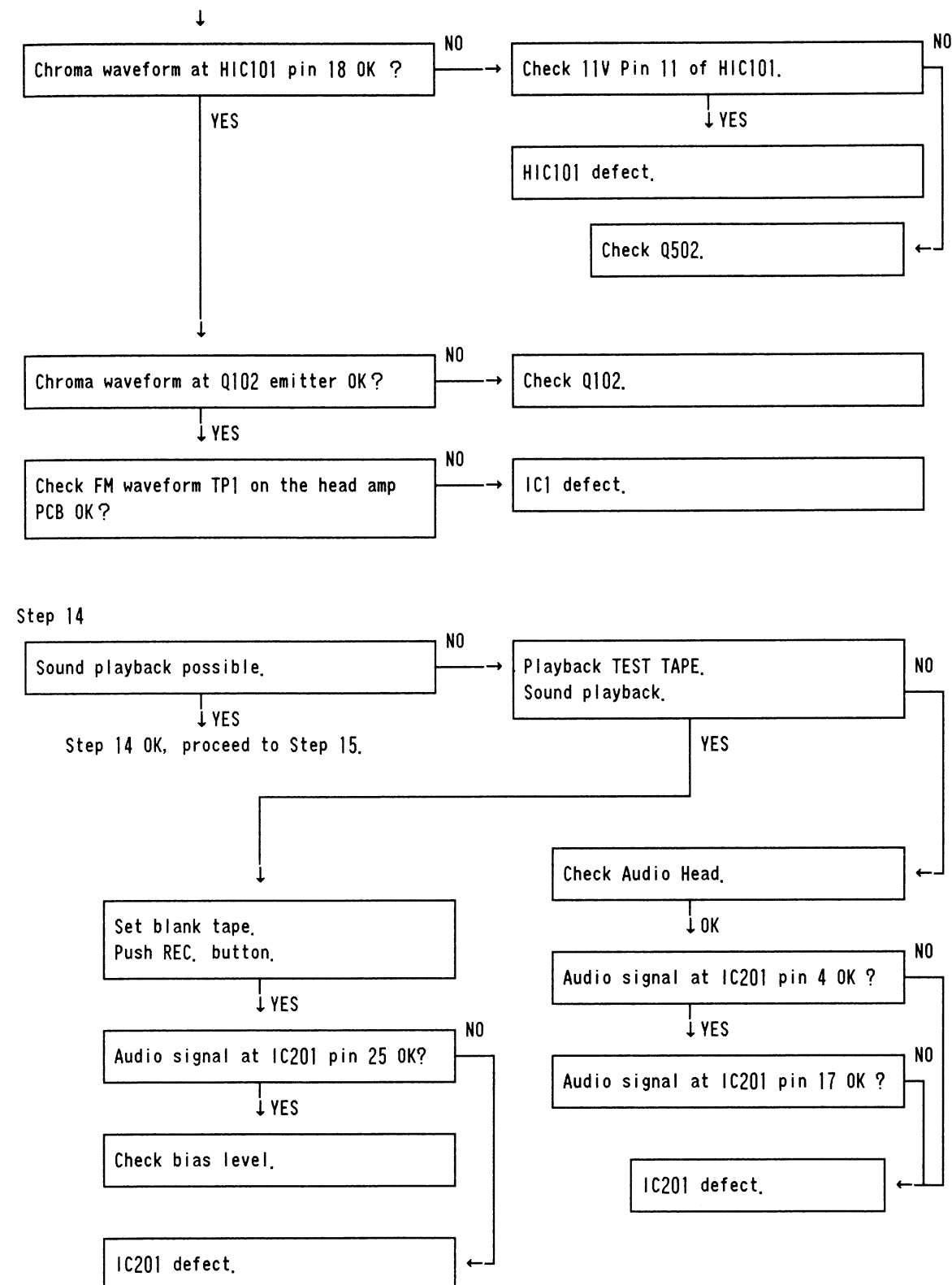
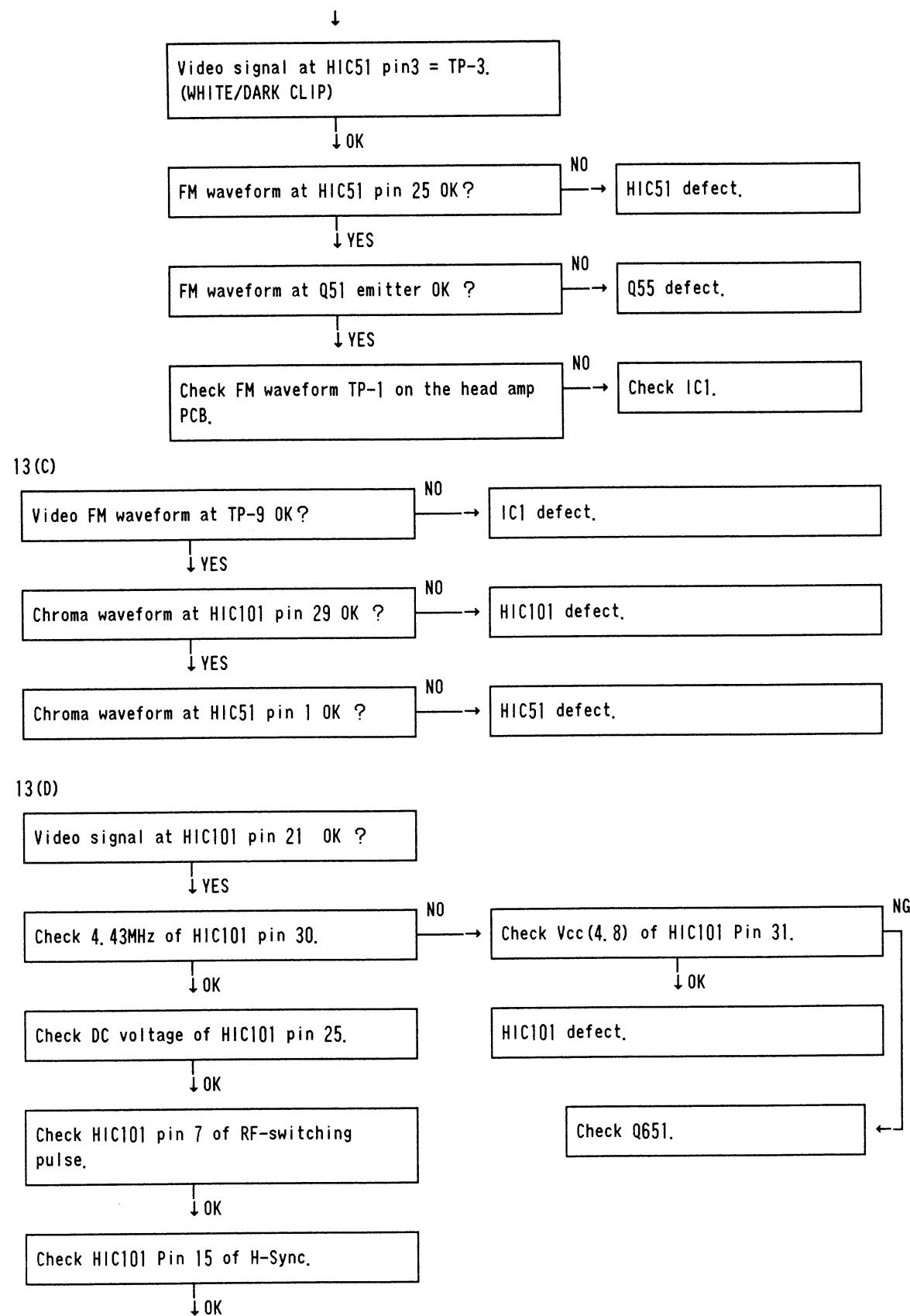
Table 2



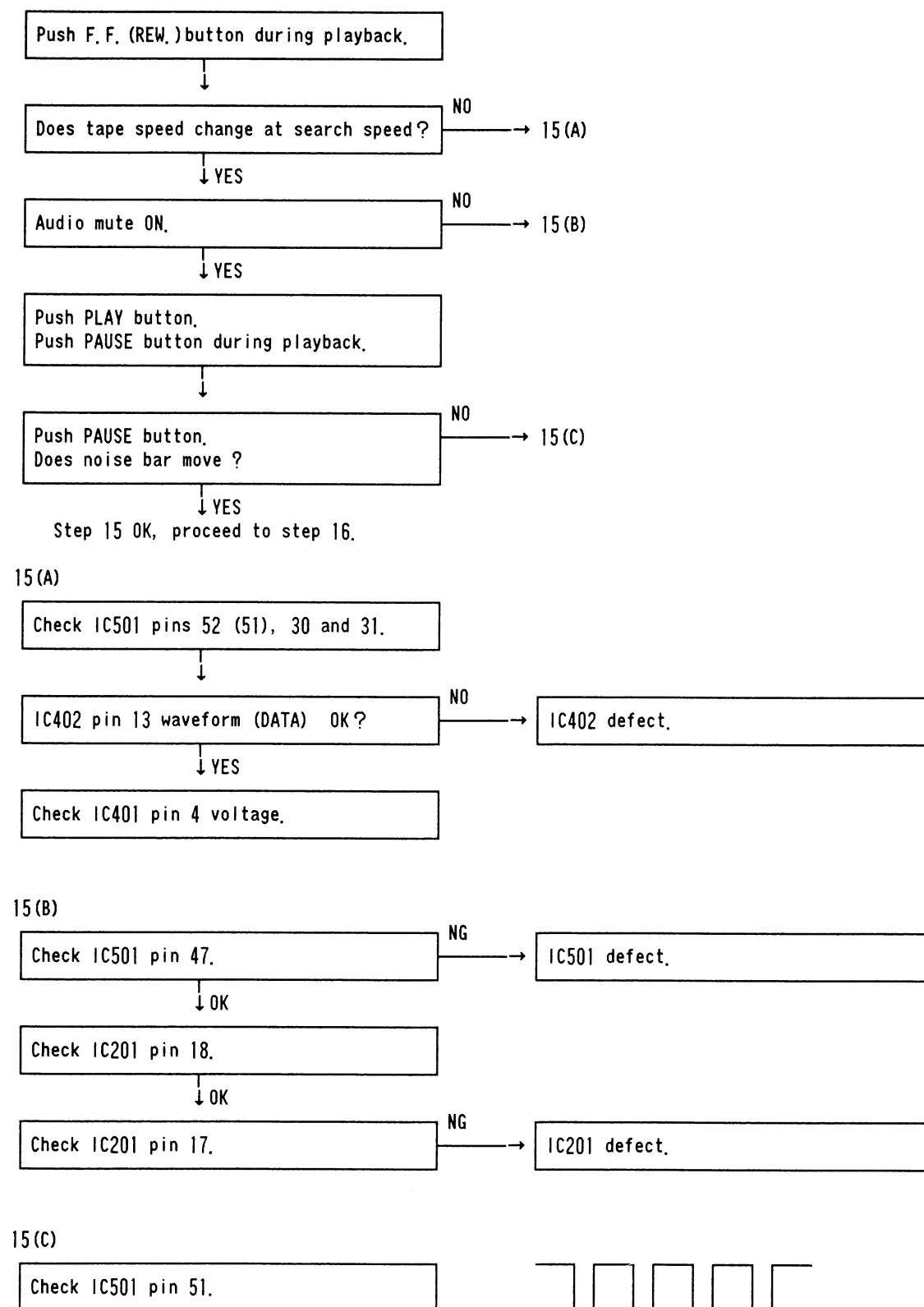




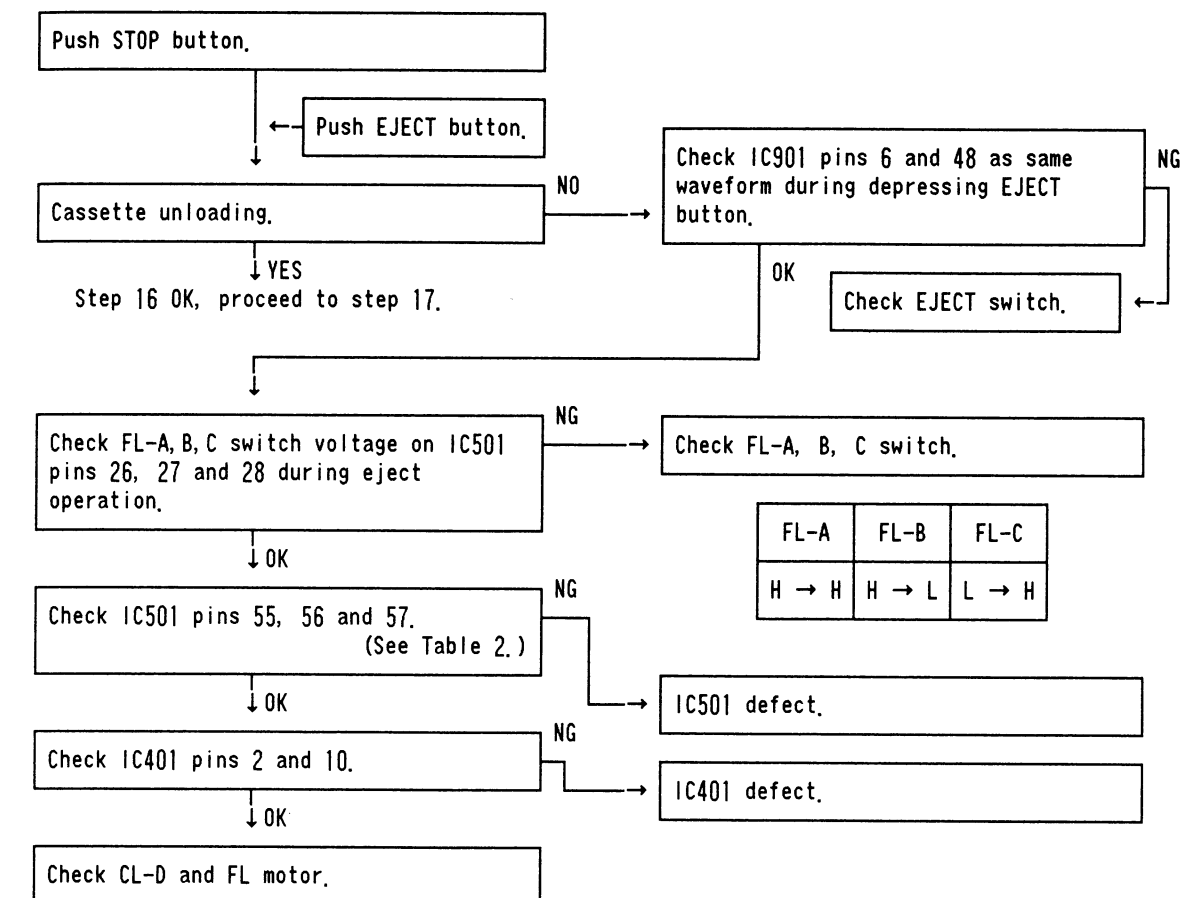




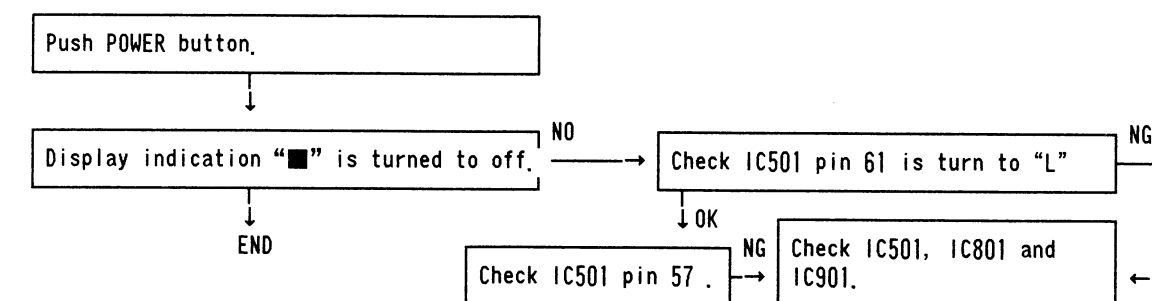
Step 15



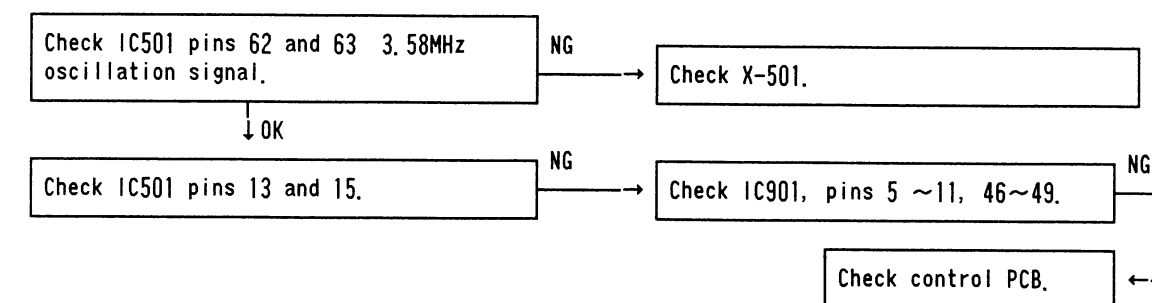
Step 16



Step 17



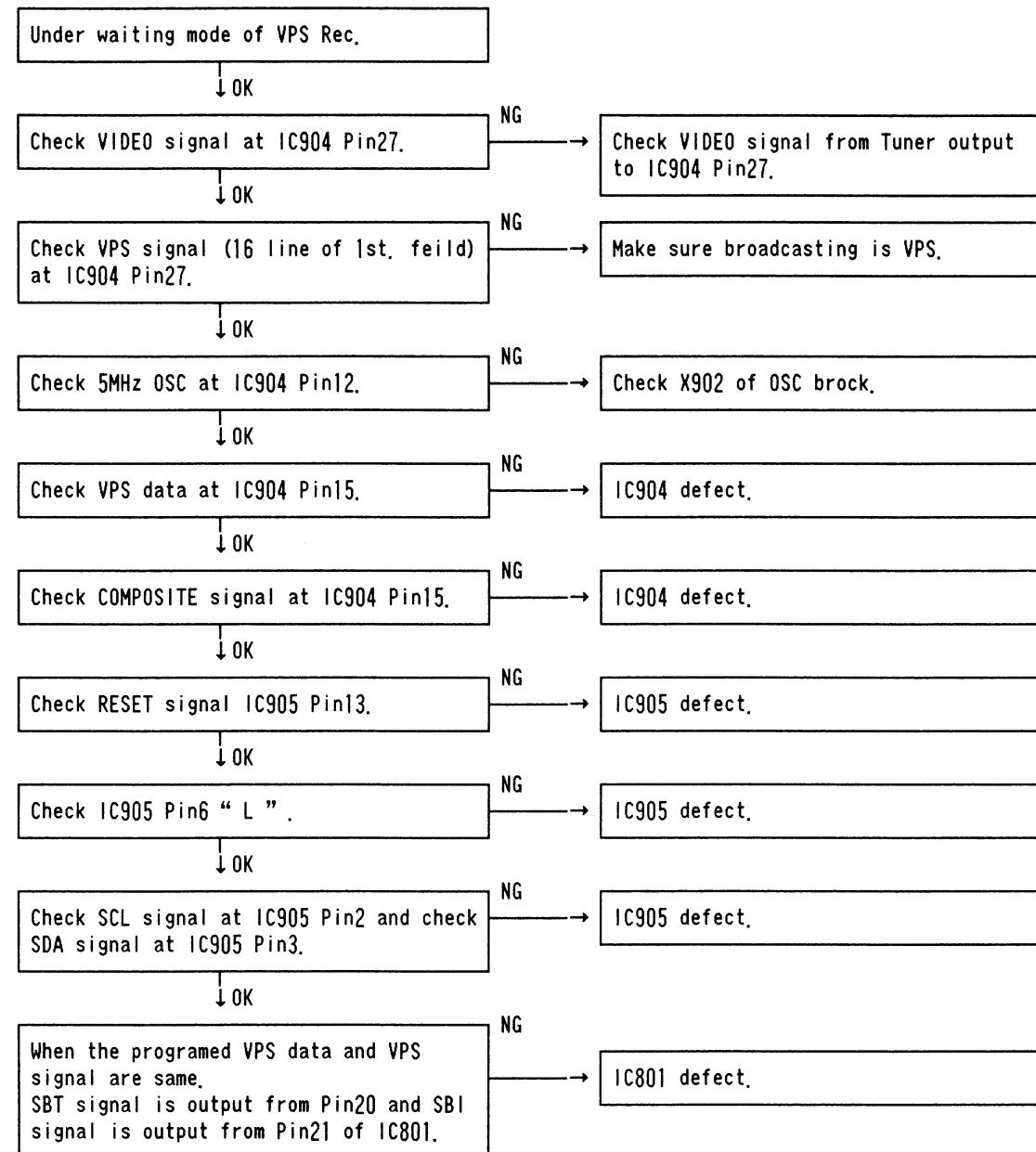
Step 18



* When SYSTEM CONTROL IC has locked up SYSTEM CONTROL IC will not accept any mode. At this time, disconnect AC cord to reset the SYSTEM CONTROL IC.

Step 19

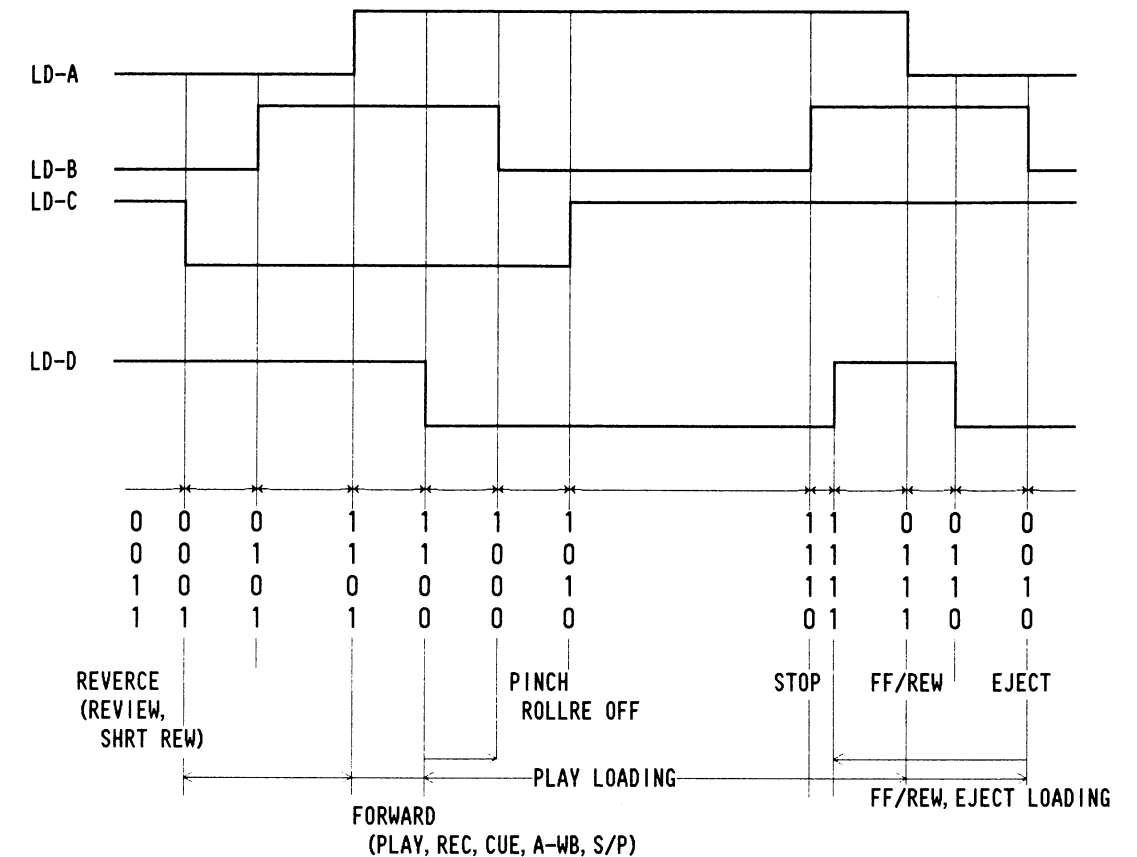
Before checking the VPS section, make sure other function expect VPS is working perfectly.



※ When display indication becomes abnormal, or would not access the key input, push reset switch as follows;

1. Unplug the power cord from AC outlet, and wait about 30 seconds.
2. Connect the power cord to AC outlet again.
3. Push reset switch (located on the timer control panel) thru hole with pencil chip.

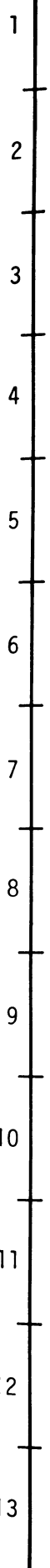
— — : — — appears on the display and shows initial mode.



LD-SW				Symbol	Position
A	B	C	D		
L	L	H	L	EJ	Front loading, Eject
L	H	H	L	EU	Intermediate
L	H	H	H	FR	FF, REW
H	H	H	H	FU	Intermediate
H	H	H	L	UN	Stop
H	L	H	L	LU	Tape Loading
H	L	L	L	PA	Gear Change
H	H	L	L	AU	Intermediate
H	H	L	H	AL	Play (Pause)
L	H	L	H	FS	Intermediate
L	L	L	H	RU	Intermediate
L	L	H	H	RS	Review

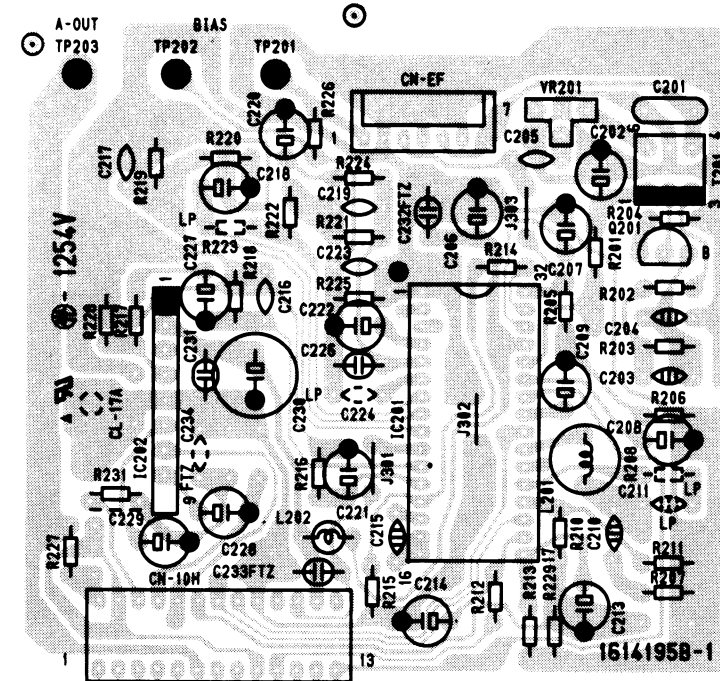
$$\begin{pmatrix} H = "1" \\ L = "0" \end{pmatrix}$$

Table 1



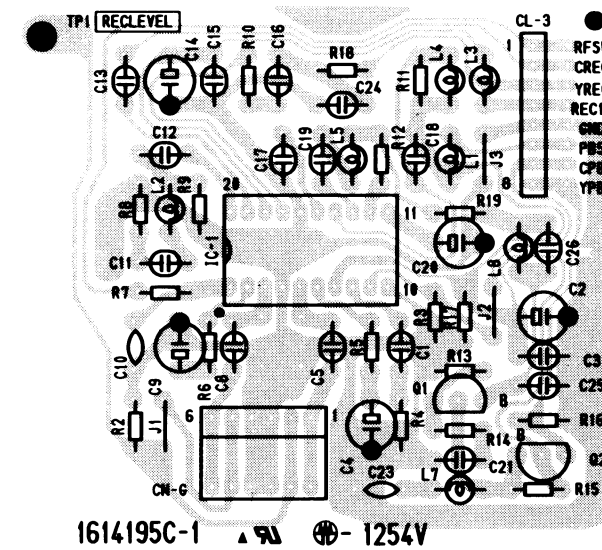
11-2

11-2-1 AUDIO P.C.BOARD TOP VIEW



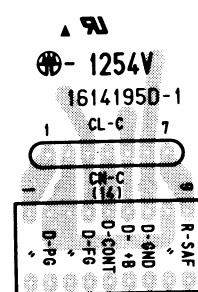
195B1-1

11-3-1 HEAD AMP P.C.BOARD TOP VIEW



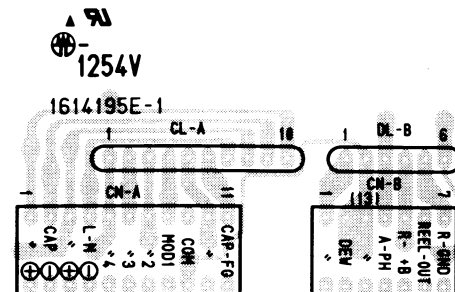
195C1-1

11-4-1 CONNECTOR A P.C.BOARD TOP VIEW



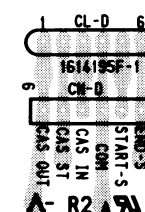
195D1-1

11-5-1 CONNECTOR B P.C.BOARD TOP VIEW



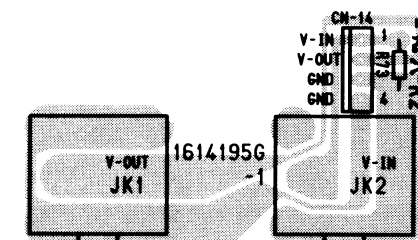
195E1-1

11-6-1 CONNECTOR C P.C.BOARD TOP VIEW



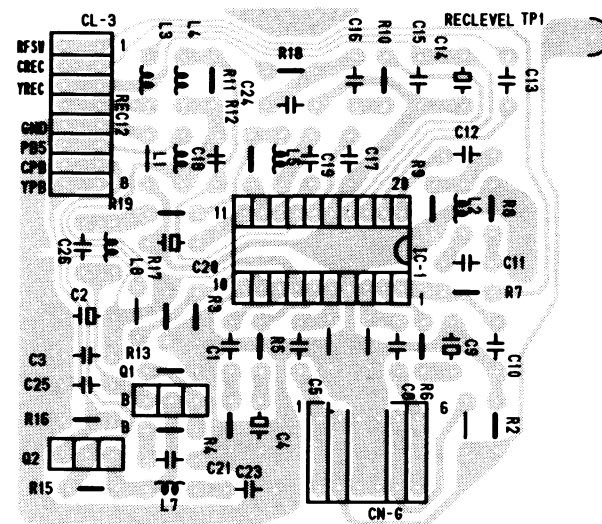
195F1-1

11-7-1 JACK P.C.BOARD TOP VIEW



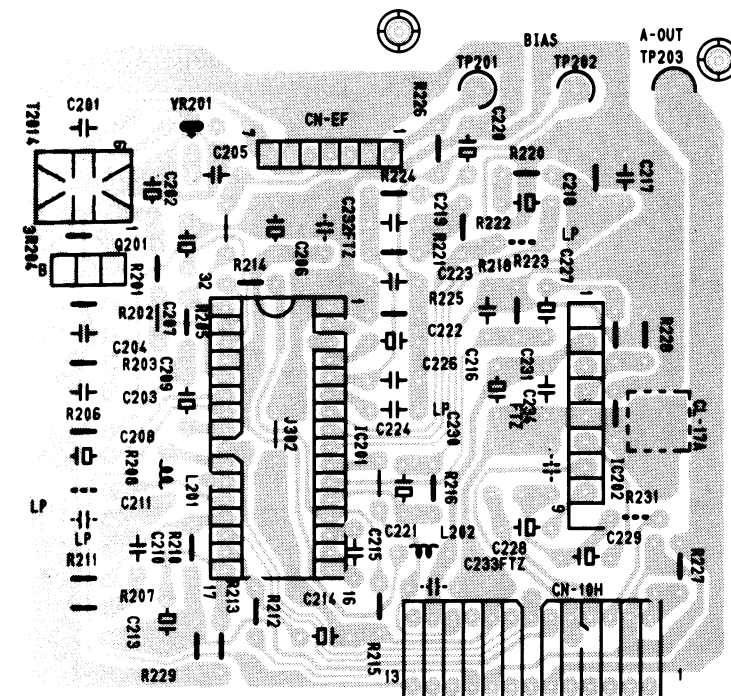
195G1-1

11-3-2 HEAD AMP P.C.BOARD BOTTOM VIEW



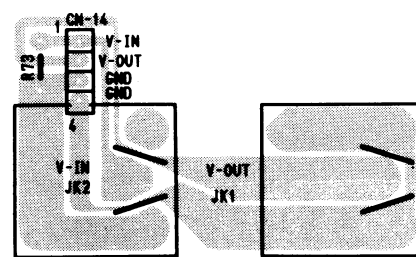
195C1-1

11-2-2 AUDIO P.C.BOARD BOTTOM VIEW



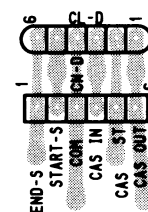
195B1-1

11-7-2 JACK P.C.BOARD
BOTTOM VIEW



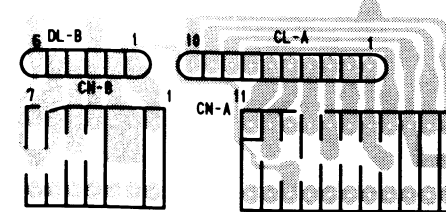
195G1-1

11-6-2 CONNECTOR C
P.C.BOARD BOTTOM VIEW



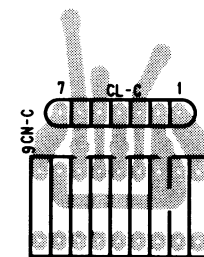
195F1-1

11-5-2 CONNECTOR B
P.C.BOARD BOTTOM VIEW



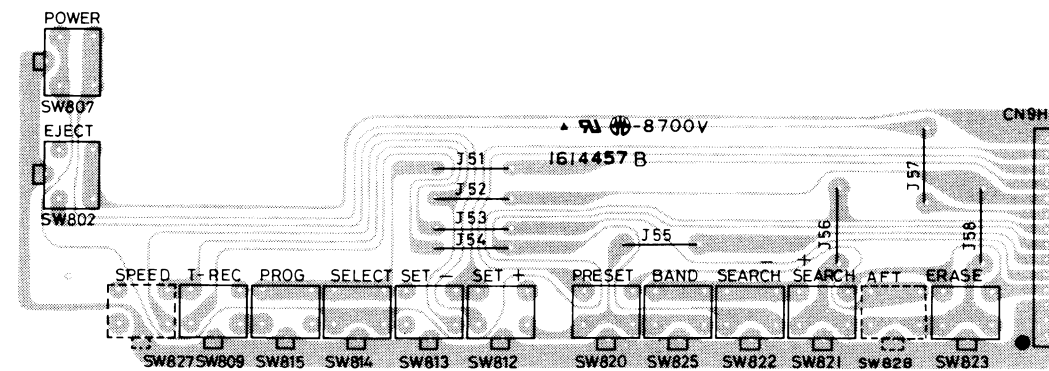
195E1-1

11-4-2 CONNECTOR A
P.C.BOARD BOTTOM VIEW



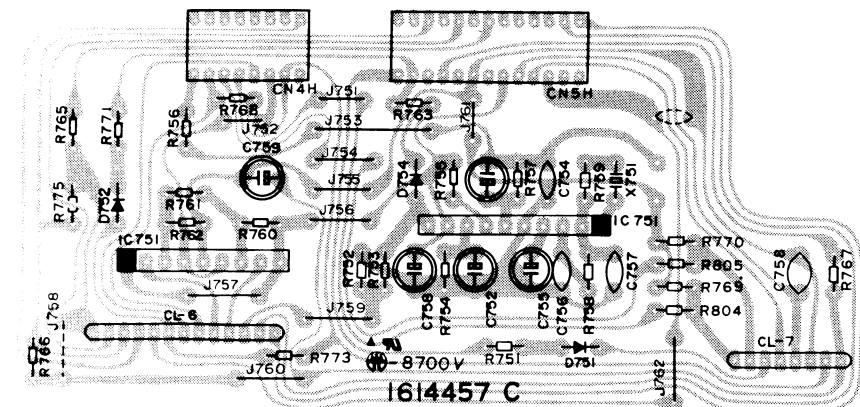
195D1-1

11-8-1 CONTROL P.C.BOARD TOP VIEW



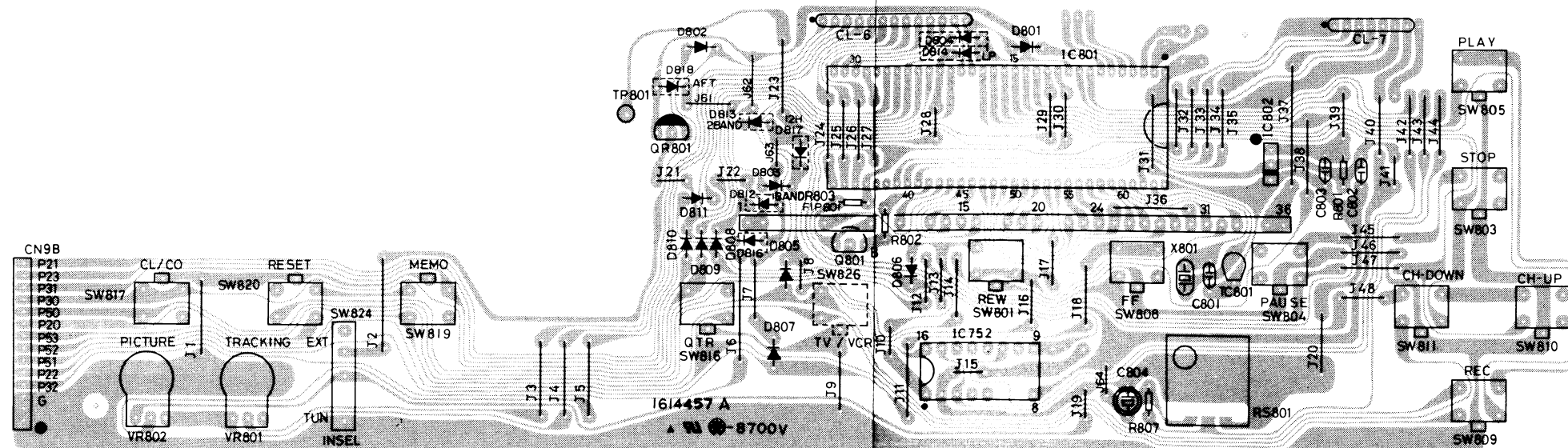
457B

11-10-1 JOINT P.C.BOARD TOP VIEW



457C

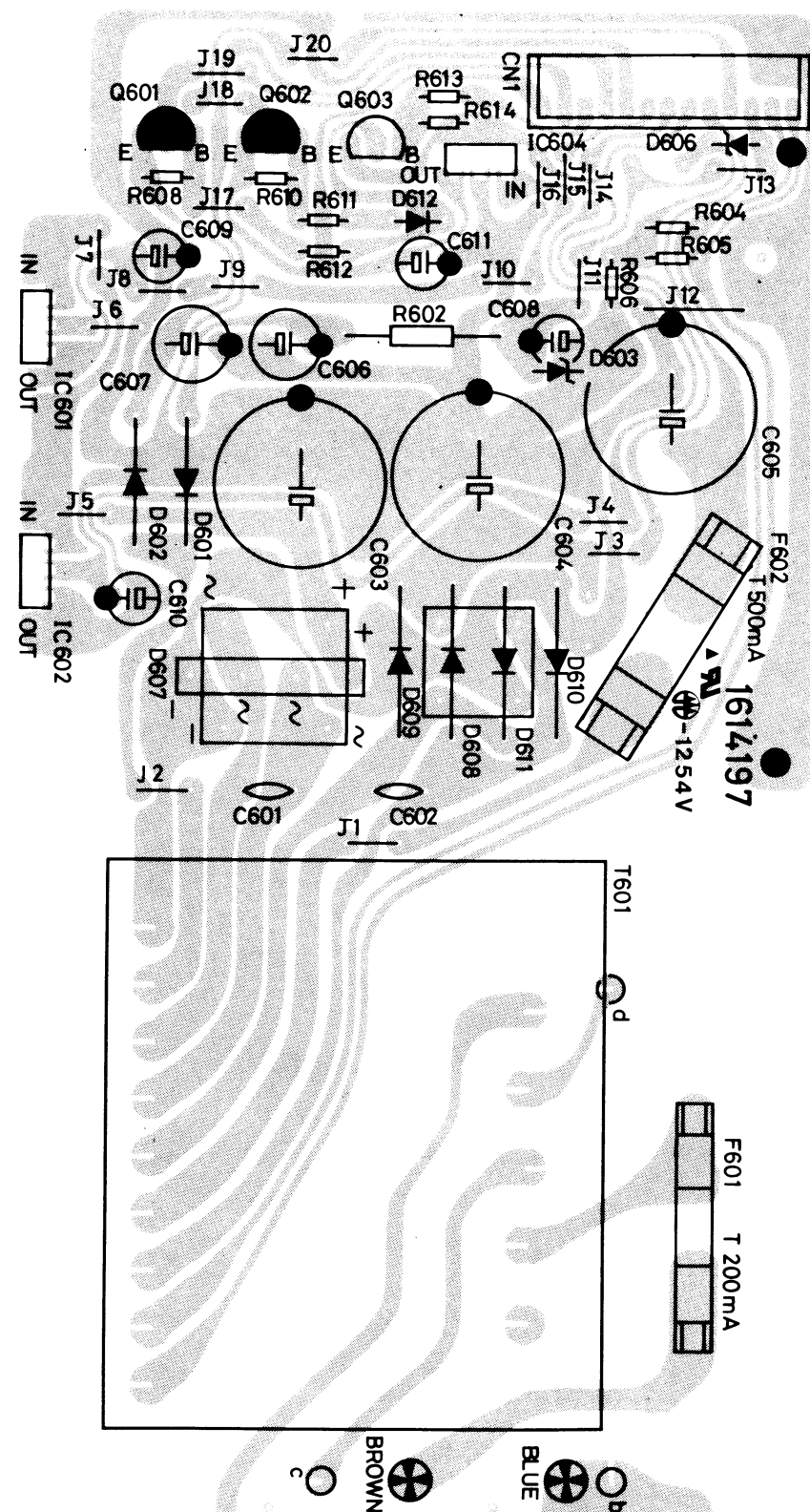
11-9-1 TIMER P.C.BOARD TOP VIEW



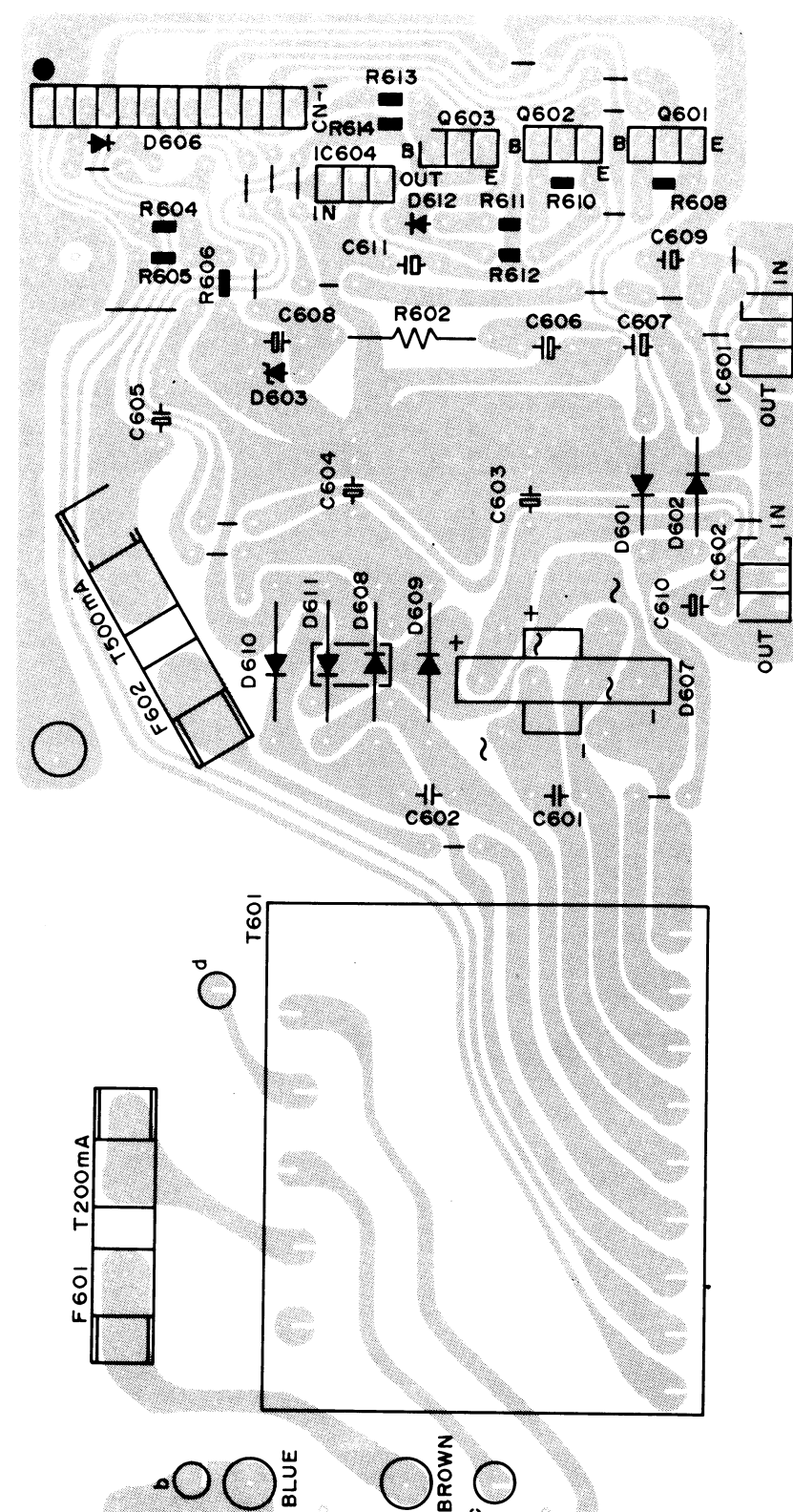
11-5

457A

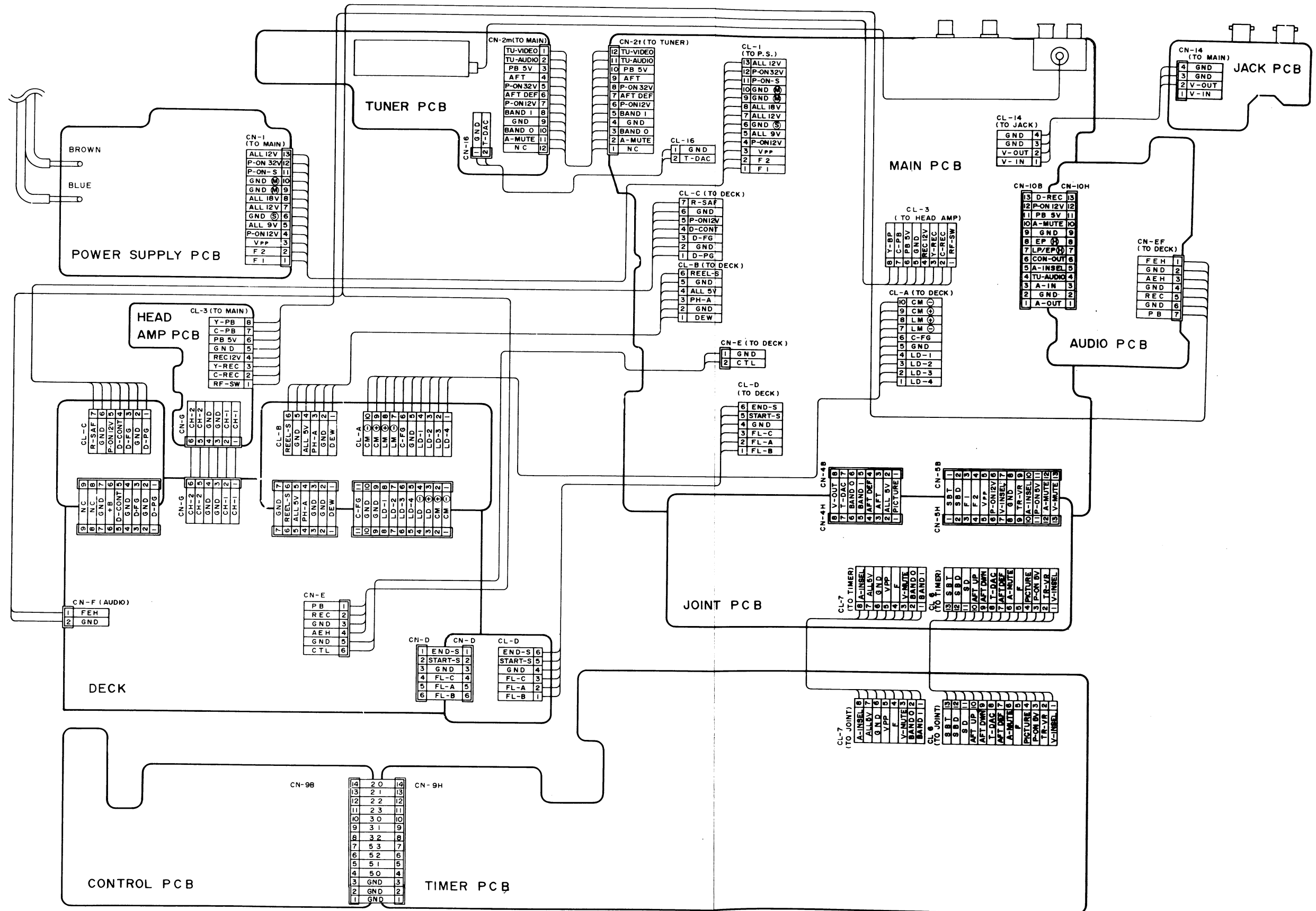
11-12-1 POWER SUPPLY P.C.BOARD TOP VIEW



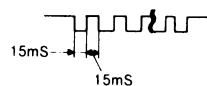
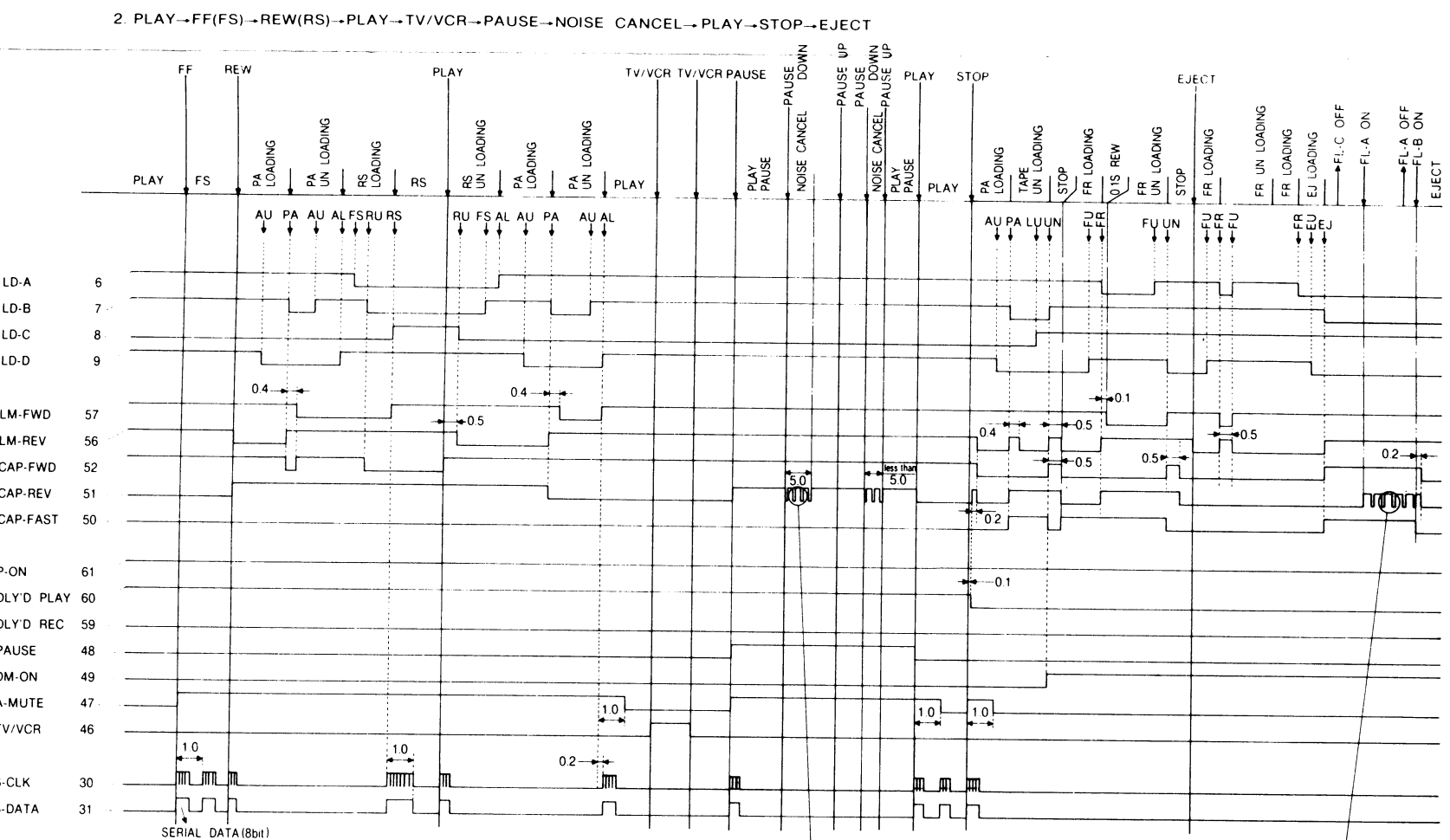
11-12-2 POWER SUPPLY P.C.BOARD BOTTOM VIEW



12. WIRING DIAGRAM

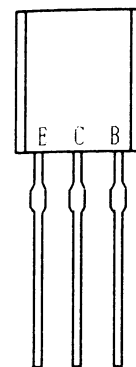


REC STOP

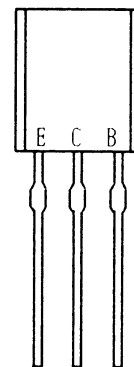


SERIAL DATA (8bit)

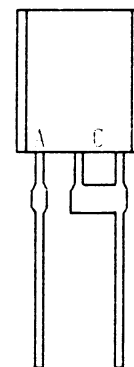
14. LEAD IDENTIFICATIONS



2SA933
2SC1740
2SA608SP
2SA1317
2SC536SP
2SC2839
2SD1468SR
2SD1012
2SA854



DTA124
DTC124
DTA143XS
2SC3400
2SA1346
DTA114YS

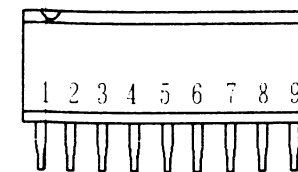


L5631
 μ PC574J

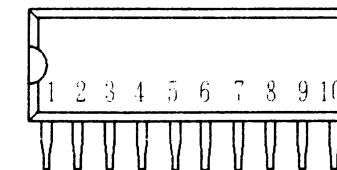
A: Anode
C: Cathode



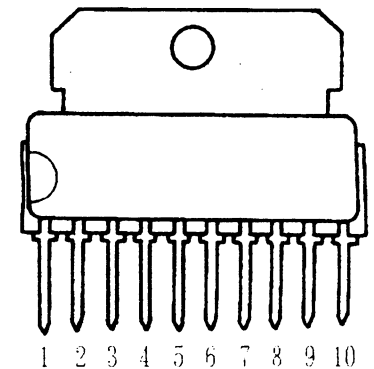
AN7812F
AN7818F
AN78N05
 μ PC7818HF



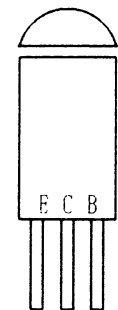
AN6913
BA7021
NJM2903S
BA6993N



LA7210



BA6219B
BA6209



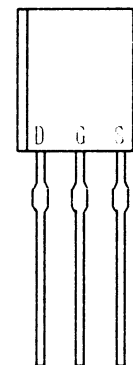
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2SC2058
2SA1038
2SA1016K



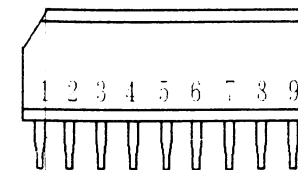
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2SD1384
2SB892
2SD1207
2SC2060
2SD400



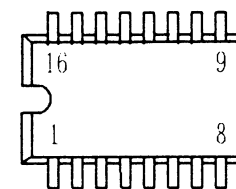
AN78L05
NJM78L05A



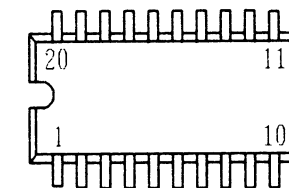
2SK128TAPQ
2SK304



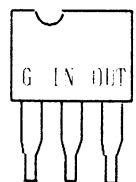
NJM2233S



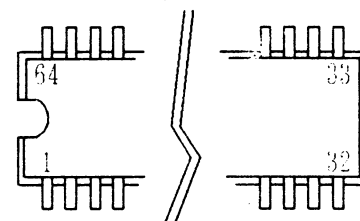
LA7913
MN1225



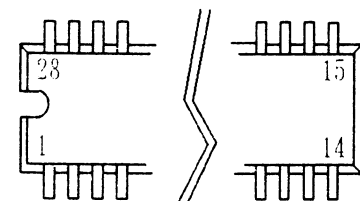
AN3331K



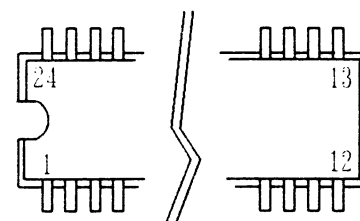
MN1280Q



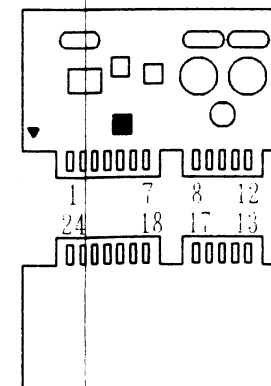
FEVSY 14DN348
FEVTI 14DN487
FEVTI 14DN332A



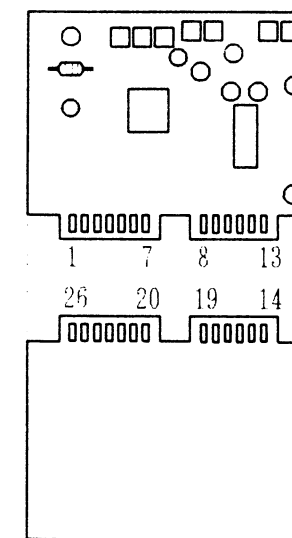
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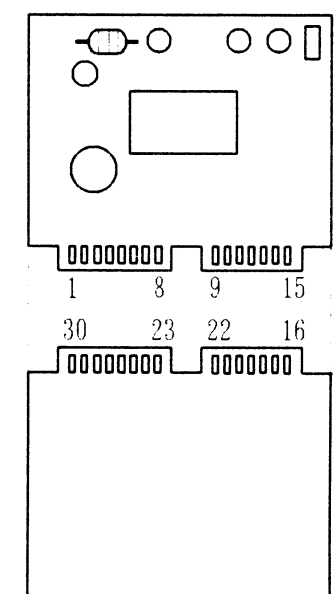
μ PC2308



1812455
(SERVO)
HIC 401



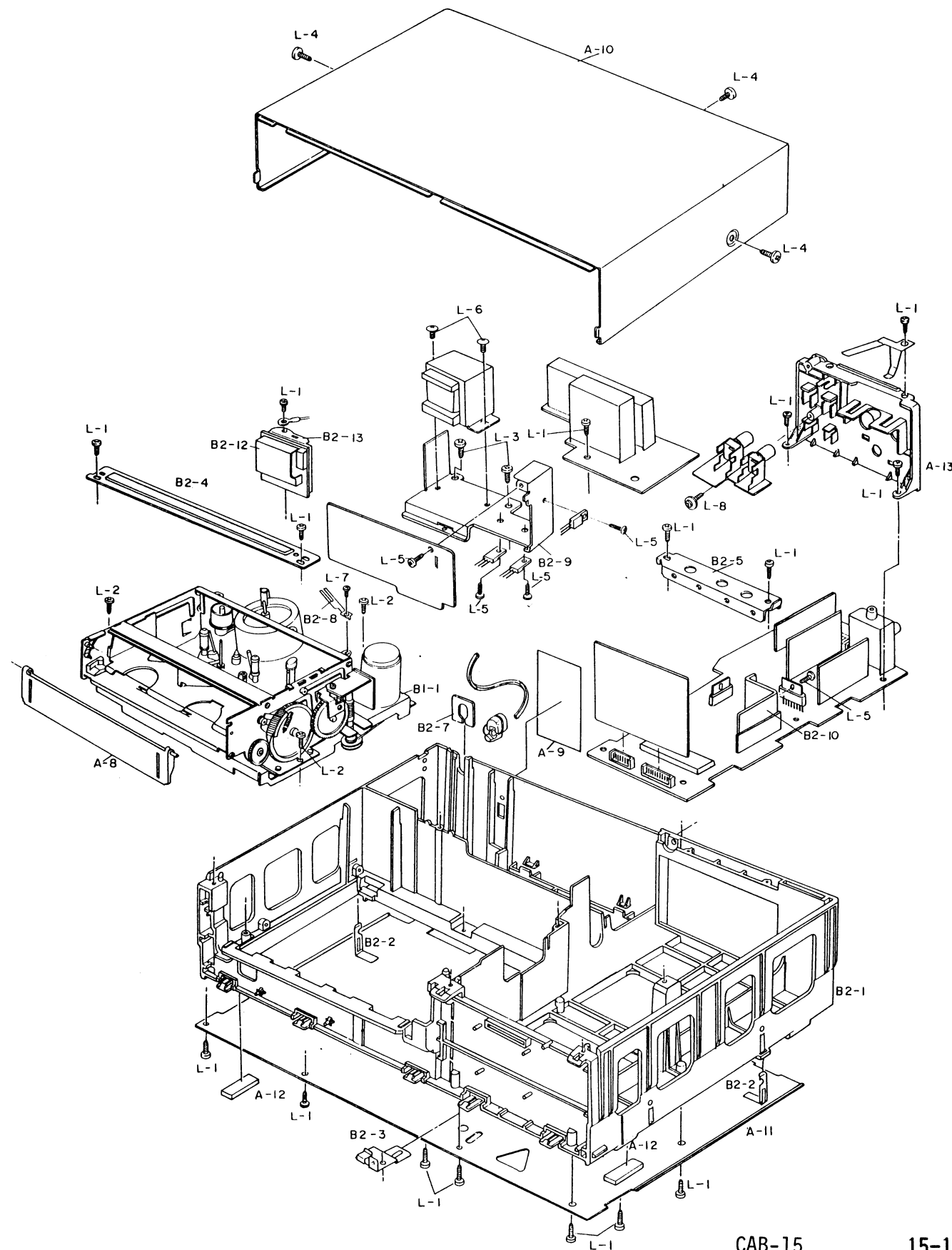
1812119
(VIDEO-Y)
HIC 51



1812422
(VIDEO-C)
HIC 101

15. EXPLODED VIEW/MECHANICAL PARTS LIST

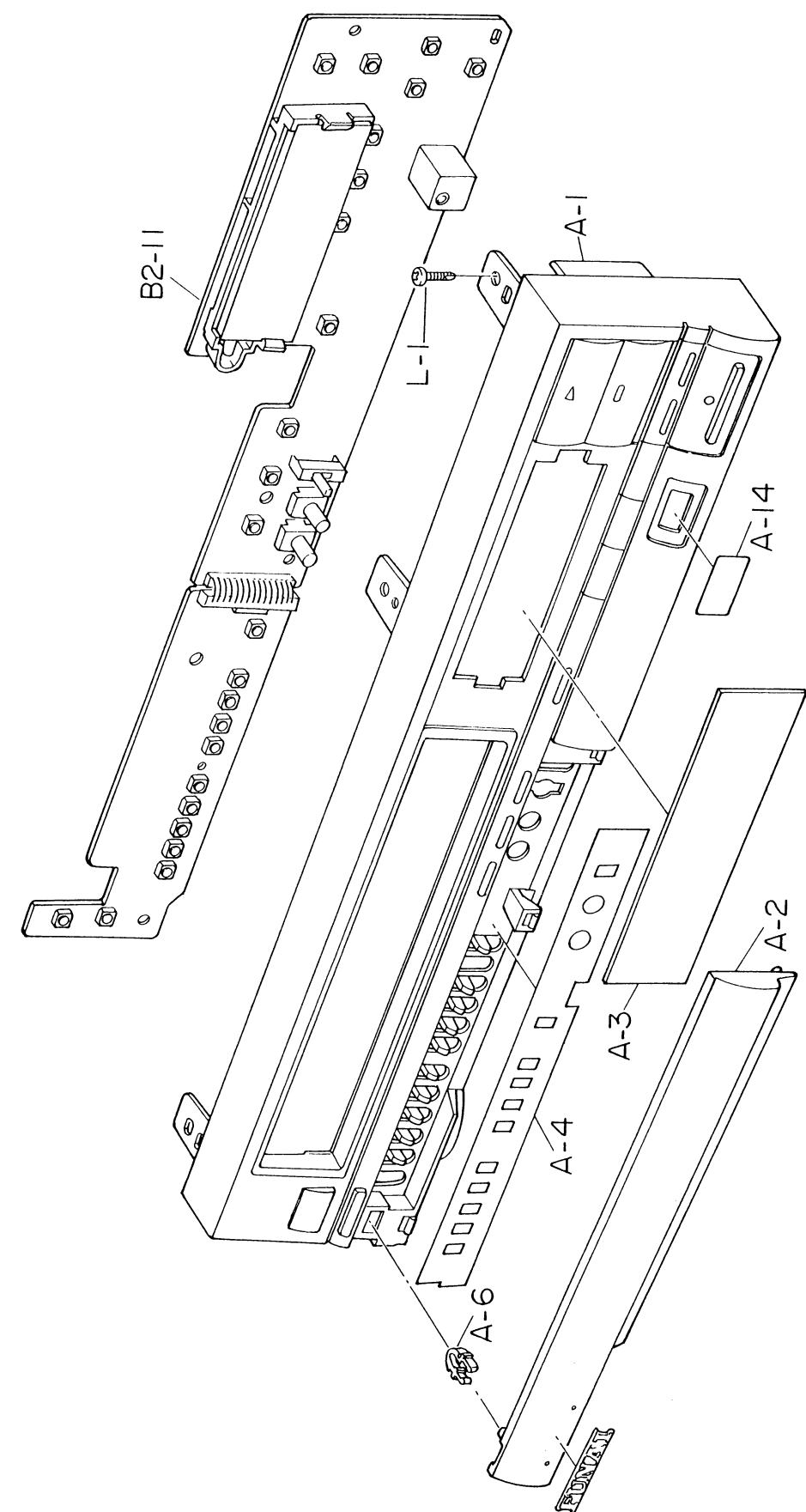
15-1 EXPLODED VIEW (CABINET)



CAB-15

15-1

15-2 EXPLODED VIEW (FRONT)



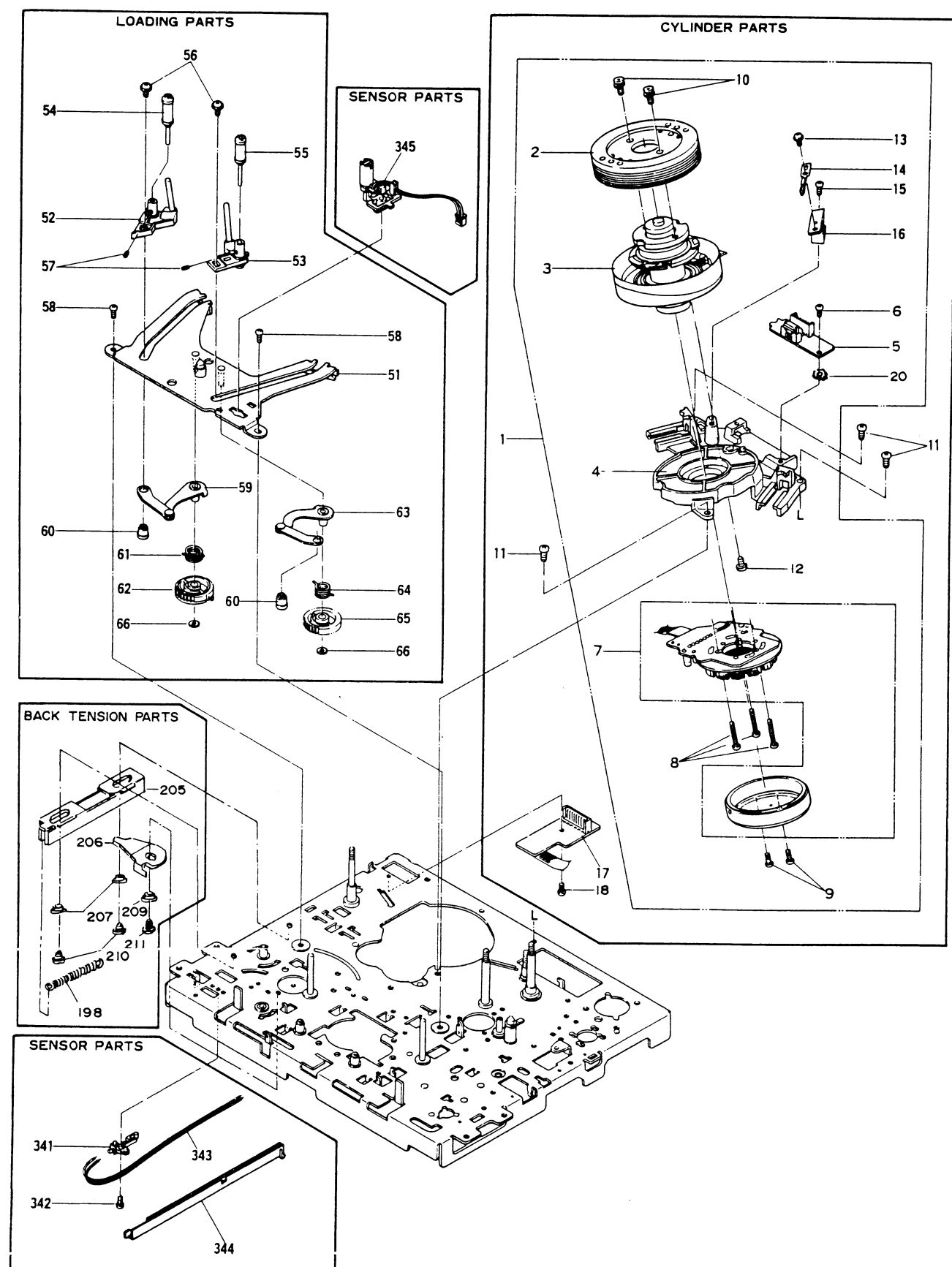
R3299

15-3 MECHANICAL PARTS LIST

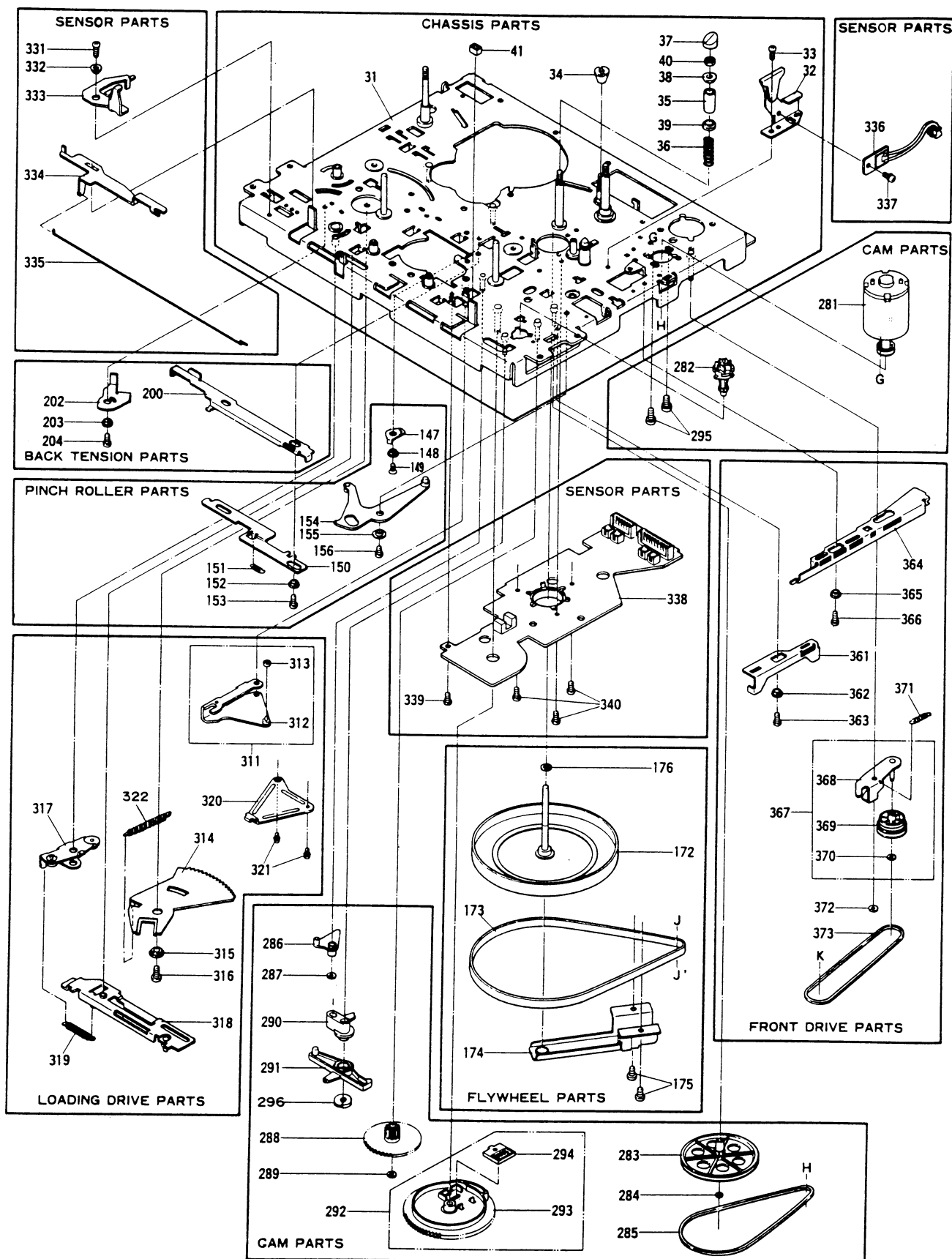
	Description	Ref. No	Parts No.	Q' ty
	Front Ass'y consists of follwing Front Panel Ass'y (Non-repairable)	A-1X	6A50907	(1)
		A-1	6A50907X	1
	Door, Timer	A-2	6D52057	1
	Plate, Counter	A-3	6E51400	1
	Plate, Timer	A-4	6E51998	1
	Filter, Remote Control	A-5	6E51399	1
	Latch	A-6	6D51218	1
	Badge	A-7	6H50181	1
△	Door, Cassette	A-8	6D51580	1
	Label, Type	A-9	6E51996	1
	Case, Top	A-10	6G50084	1
	Panel, Bottom	A-11	6G50085	1
	Foot	A-12	6E50453	2
	Jack Board	A-13	6C50693	1
	Deck Ass'y (See Deck List)	B1-1	TN5900 P2SRN104	1
	Cabinet, Main	B2-1	6C50300	1
	Ground Plate, Main	B2-2	6S50356	2
	Ground Plate, PCB	B2-3	6S50367	1
	Holder, Supporter	B2-5	6S50355	1
	Stopper Holder, AC Cord	B2-7	6S50286	1
	Plate, Ground	B2-8	6S50212	1
	Plate, Ground (RF Converter)	B2-14	6S50447	1
	Heat Sink	B2-9	6S50368	1
	Heat Sink, IC	B2-10	6S50354	1
	Holder, FIP	B2-11	6N50151	1
	Shield, Top	B2-12	6S50357	1
	Shield, Bottom	B2-13	6S50358	1

	Description	Ref. No	Parts No.	Q' ty
	Screw, P-Tight, Bind Head M3 X10 (for Holder, Supporter---2pc.) (for Jack Board---3pcs.) (for Tuner, PCB---1pc.) (for Shield, Bottom---1pc.)	L-1	GBMP310	7
	Screw, P-Tight, Brazier, Flange M3 X10 (for Deck Ass'y---3pcs.)	L-2	GCMP310	3
	Screw, P-Tight, Bind Head M4 X12 (for Holder, Transformer----2pcs.)	L-3	GBMP412	2
	Screw, Tapping, Bind Head M3 X10 (for Power Supply PCB---1pc.) (for Heat Sink---3pcs.) (for Heat Sink IC---1pc.)	L-5	DBM1310	5
	Screw, C-Tight or CE-Tight M4 X8 (for Transformer---2pcs.)	L-6	GTMC408 or GZMC408	2
	Screw, Sems, Pan Head M3 X5 (for Plate, Ground---1pc.)	L-7	CPM3305	1
	Screw, P-Tight, Pan Head M3 X8 (for BNC Jack---1pc.)	L-8	23X9251	1
Hardware Kits				
	Screw, P-Tight, Bind Head M3 X10 (for Front Ass'y---1pc.) (for Panel, Bottom---7pcs.)	L-1	GBMP310	8
	Screw, P-Tight, Bind Head M4 X12 (for Case, Top---3pcs.)	L-4	GBKP412	3
Accessory				
△	RF Cord		1750967 or 1750665	1
	Remote Control Box		1813081	1
	Owner's Manual		7E51070	1

15-4 DECK PARTS LIST

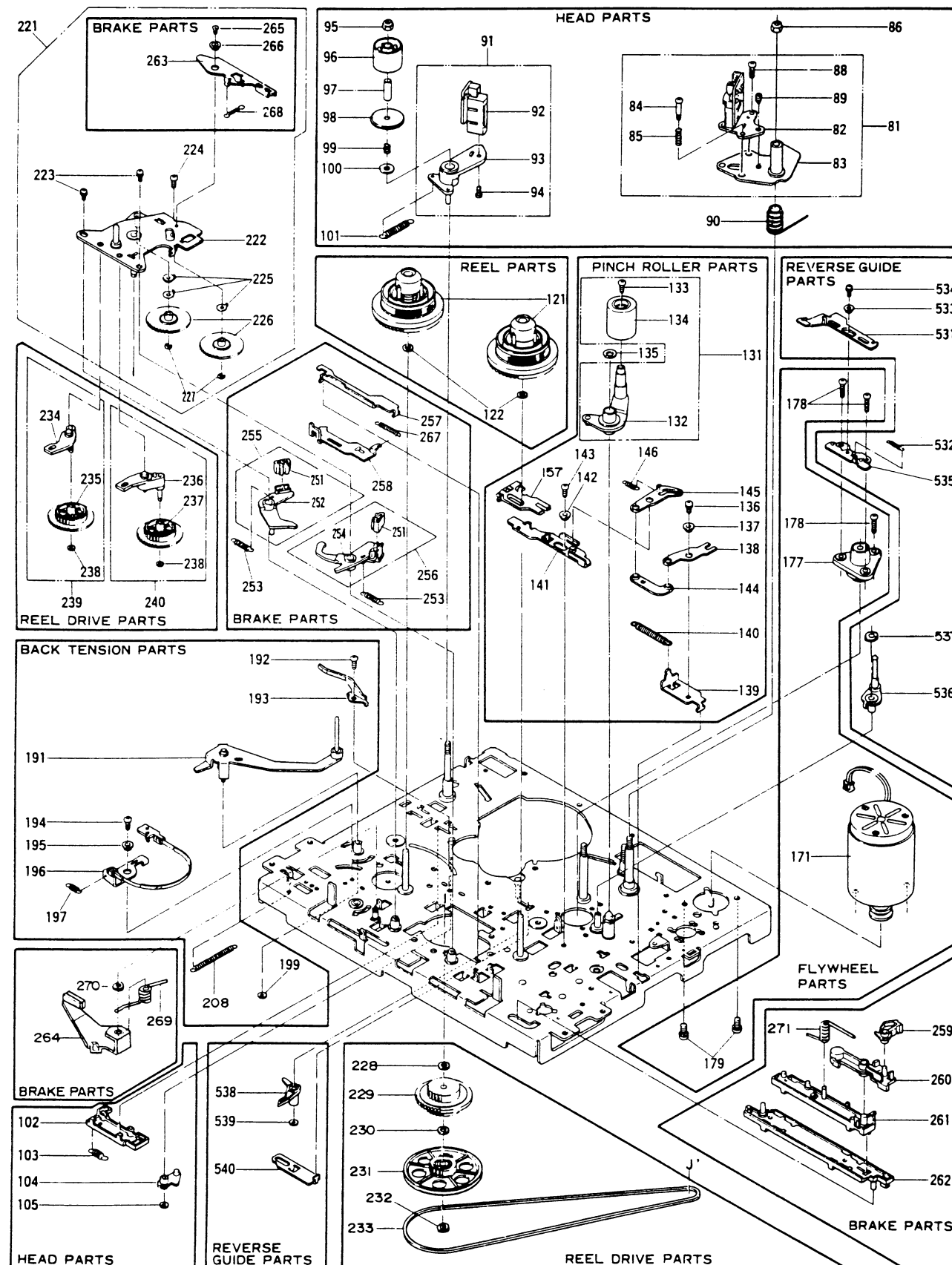


CYLINDER PARTS			
Ref No.	Description	MFR' No.	Q' ty
1	Cylinder Assembly (Consists of 2-10, 12-16, 20)	8059-01-310	1
2	Drum, Upper	8059-01-19	1
3	Drum Assembly, Lower	8059-01-304	1
4	Mount, Cylinder	8059-01-01	1
5	P.C.B. Assembly, Video Out	8059-01-305	1
6	Screw, W Sems, M2.6 X6	9973-00-00	1
7	Motor TM82	6004-09-01	1
8	Screw, Sems, M2.6 X20	9050-00-00	3
9	Screw, Sems, M2.6 X6	9098-00-00	2
10	Screw, Bind Sems, M3X8	9972-00-00	2
12	Screw (For Camera) M2 X5	9552-00-00	1
13	Screw, Cap, M2.6X3	9665-00-00	1
14	Ground, Durm	8059-01-23	1
15	Screw, C Tapping, M2.6X5	9192-00-00	1
16	Bracket, Drum Ground	8059-01-02	1
20	Washer, Toothed Lock, M2.6	9715-00-00	1
11	Screw, C Tapping, M3X10	9205-00-00	3
17	P.C.B. Assembly, DM	8059-01-303	1
18	Screw, C Tapping, M2.6X5	9192-00-00	1
LOADING PARTS			
51	Loading Base	8059-03-501	1
52	Block (L), Loading	8059-03-04	1
53	Block (R), Loading	8059-03-05	1
54	SIS, Roller Post	8000-03-33	1
55	ST, Roller Post	8000-03-37	1
56	Screw, Cup, M2.6X3	9665-00-00	2
57	Screw, Set, M2.0X3 (Plane Type)	9952-00-00	2
58	Screw, C Tapping, M2.6X5	9192-00-00	2
59	Plate (L), Loading	8059-03-502	1
60	Boss, Loading	8059-03-14	2
61	Spring (L), Loading Gear	8059-03-08	1
62	Gear (L), T Loading	8059-03-06	1
63	Plate (R), Loading	8059-03-503	1
64	Spring (R), Loading Gear	8059-03-09	1
65	Gear (R), T Loading	8059-03-07	1
66	Washer, Polyslider, ø2.6 X ø6 X t0.5	9884-00-00	2
BACK TENSION PARTS			
198	Spring, Back Tension	8059-08-13	1
205	Plate, BT Actuate	8059-08-19	1
206	Lever, BT Actuate	8059-08-18	1
207	Collar, BT Actuate Plate	8059-08-21	2
209	Collar	8059-06-18	1
210	Screw, S Tapping (For Camera) M2.6X3.5	9840-00-00	2
211	Screw, C Tapping M2.6 X5	9192-00-00	1
SENSOR PARTS			
341	Switch, Leaf	6401-01-151	1
342	Screw, C Tapping, M2.6X5	9192-00-00	1
343	Wire	8059-13-08	2
344	Holder, Wire	8059-13-10	1
345	Lamp Holder Assembly	8059-13-303	1



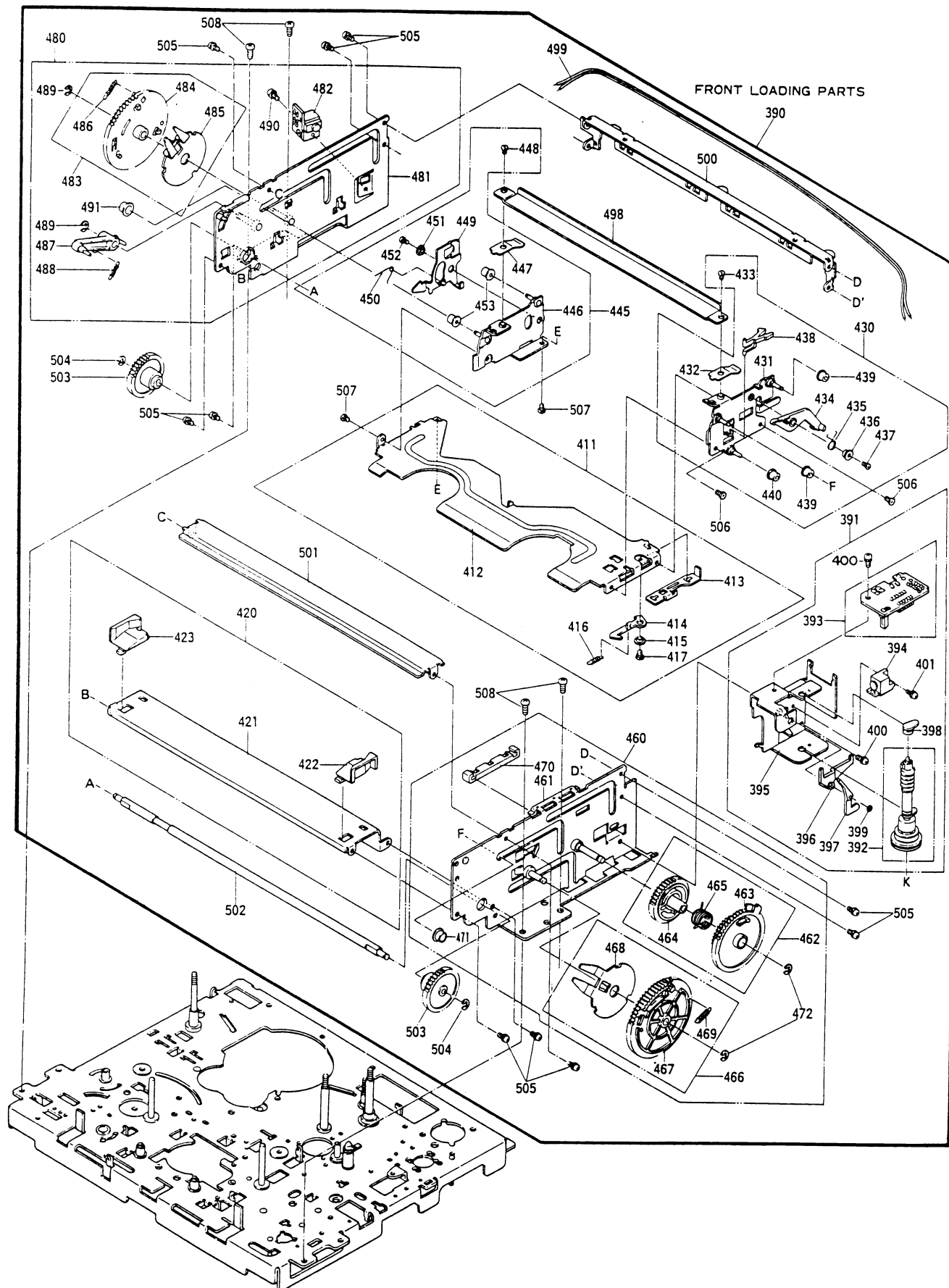
CHASSIS PARTS			
Ref No.	Description	MFR' No.	Q' ty
31	Chassis	8059-02-501	1
32	Angle Assembly, Open	8059-02-301	1
33	Screw, C Tapping, M2.6×4	9191-00-00	1
34	Adjuster, Tracking	8000-03-16	1
35	Guide, Tape	8000-03-14	1
36	Spring, Tape Guide	8059-02-26	1
37	Cap, Guide	8000-03-19	1
38	Flange (C), Tape Guide	8059-03-28	1
39	Flange (F), Tape Guide	8059-02-25	1
40	Nut M3.0	9453-00-00	1
41	Rubber, Damper	8059-02-23	1
PINCH ROLLER PARTS			
147	Crank, P	8059-06-12	1
148	Collar, P Crank	8059-06-13	1
149	Screw, C Tapping FH (For Camera), M2.6×4	9999-18-10	1
150	Slider, P	8059-06-10	1
151	Spring, P Slider	8059-06-23	1
152	Collar, P Slider	8059-06-11	1
153	Screw, C Tapping, Screw, M2.6 × 5	9192-00-00	1
154	Leber, P Cam	8059-06-502	1
155	Collar, P Cam Lever	8059-06-17	1
156	Screw, C Tapping, M2.6×5	9192-00-00	1
FLYWHEEL PARTS			
172	Capstan, Flywheel	8059-07-14	1
173	Belt, Main	8059-07-10	1
174	Angle Assembly, Flywheel	8059-07-303	1
175	Screw, C Tapping, M3×5	9202-00-00	2
176	Washer, $\phi 3.1 \times \phi 6 \times t 0.5$	9912-00-00	1
FRONT DRIVE PARTS			
361	Actuator, Eject	8059-15-08	1
362	Collar	8059-06-18	1
363	Screw, C Tapping, M2.6×5	9192-00-00	1
364	Plate, L Brake	8059-15-07	1
365	Collar	8059-06-18	1
366	Screw, C Tapping, M2.6×5	9192-00-00	1
367	Arm Assembly, E Idler (Consists of 368-370)	8059-15-303	1
368	Arm Semi Assembly, E Idler	8059-15-502	1
369	Pulley, Eject	8059-15-15	1
370	Washer, Polyslider, $\phi 2.1 \times \phi 6 \times t 0.5$	9876-00-00	1
371	Spring, Idler Arm	8059-15-11	1
372	Washer, Polyslider, $\phi 2.1 \times \phi 6 \times t 0.5$	9876-00-00	1
373	Belt, Front Loading	8059-15-06	1

LOADING DRIVE PARTS			
Ref No.	Description	MFR' No.	Q'ty
311	Lever Assembly, Loading (Consists of 312-313)	8059-12-301	1
312	Lever Semi Assembly, Loading	8059-12-501	1
313	Roller, Cam	8059-12-13	1
314	Plate, Loading Gear	8059-12-09	1
315	Collar, Loading Gear Plate	8059-12-10	1
316	Screw, C Tapping, M3X6	9203-00-00	1
317	Lever Semi Assembly, Loading Actuate	8059-12-502	1
318	Plate, Semi Assembly, Loading Actuate	8059-12-503	1
319	Spring, Loading Actuate	8059-12-05	1
320	Plate, Loading Lever Reinforce	8059-12-11	1
321	Screw, Sems, M2 X4	9077-00-00	2
322	Spring, L Gear Plate	8059-12-12	1
SENSOR PARTS			
331	Screw, C Tapping, M2.6X5	9192-00-00	1
332	Collar	8059-06-18	1
333	Lever, REC	8059-13-06	1
334	Actuator, REC	8059-13-07	1
335	Spoke, REC Actuate	8059-13-11	1
336	Sensor, DEW	6808-08-04	1
337	Screw, Sems, M2.6 X4	9096-00-00	1
338	Plate, Base	8059-13-302	1
339	Screw, S Tapping (For Camera), M2.6X5	9691-00-00	1
340	Screw, C Tapping, M2.6X6	9193-00-00	3
BACK TENSION PARTS			
200	Plate, BT Change	8059-08-10	1
202	Lever, BT Return	8059-08-23	1
203	Collar	8059-06-18	1
204	Screw, C Tapping, M2.6X5	9192-00-00	1
CAM PARTS			
281	LM Assembly	8059-11-301	1
282	Bearing Assembly, Trigger	8059-11-302	1
283	Pulley, Loading	8059-11-03	1
284	Washer, Polyslider, $\phi 1.6 \times \phi 3.8 \times t 0.3$	9743-00-00	1
285	Belt, Loading	8059-11-06	1
286	Arm (B), Search	8059-11-12	1
287	Washer, Polyslider, $\phi 2.6 \times \phi 6 \times t 0.5$	9884-00-00	1
288	Gear, Loading	8059-11-04	1
289	Washer, Polyslider, $\phi 2.1 \times \phi 5 \times t 0.5$	9876-00-00	1
290	Arm, Brake Actuate	8059-11-13	1
291	Arm, Eject Actuate	8059-11-14	1
292	Cam Assembly, Loading (Consists of 293-294)	8059-11-303	1
293	Cam, Loading	8059-11-01	1
294	Brush, S	8059-11-02	1
295	Screw, C Tapping, M3X4	9105-00-00	2
296	Washer, Polyslider, $\phi 2.6 \times \phi 8 \times t 0.5$	9999-03-10	1



HEAD PARTS			
Ref No.	Description	MFR' No.	Q'ty
81	Head Base Assembly (Consists of 82-85, 88-89)	8059-04-303	1
82	Head, ACE	6204-15-06	1
83	Base, Head	8059-04-501	1
84	Screw, Azimuth Spring	8000-06-26	1
85	Spring, Azimuth	8000-06-04	1
88	Screw, M2.6 X7	9041-00-00	1
89	Screw, Set, M3X6 (Shape Type)	9999-20-25	1
86	Nut, Nylon M3	9953-00-00	1
87	Not used		
90	Spring, Head	8059-04-15	1
91	Plate Assembly, Full Erase (Consists of 92-94)	8059-04-302	1
92	Head, Full Erase	6204-15-03	1
93	Plate, Full Erase	8059-04-04	1
94	Screw, Flange Bind, M2X3	9114-00-00	1
95	Nut, Nylon M3	9953-00-00	1
96	Roller, Impedance	8059-04-05	1
97	Sleeve, Impedance Roller	8059-04-06	1
98	Flange (A), Tape Guide	8059-04-07	1
99	Spring, Tape Guide Flange	8059-04-09	1
100	Washer, Plane φ3 X φ8 X t0.5	9337-00-00	1
101	Spring, FE Plate	8059-04-08	1
102	Plate, FE Slide	8059-04-10	1
103	Spring, FE Actuate	8059-04-12	1
104	Lever, FE Actuate	8059-04-11	1
105	Washer, Polyslider, φ2.1 X φ5 X t0.5	9876-00-00	1
REEL PARTS			
121	Reel Assembly	8059-05-301	2
122	Washer, φ3.1 X φ6 X t0.5	9912-00-00	2
PINCH ROLLER PARTS			
131	Arm Assembly, Pinch Roller (Consists of 132-134)	8059-06-301	1
132	Arm Pinch Roller	8059-06-501	1
133	Screw, M2.6 X4	9038-00-00	1
134	Roller (A), Pinch	8000-09-22	1
135	Washer, Polyslider, φ5 X φ8 X t0.5	9999-03-11	1
136	Screw, Sems, M2.6 X4	9096-00-00	1
137	Collar	8059-06-18	1
138	Angle, P Actuate	8059-06-05	1
139	Holder, P Angle	8059-06-19	1
140	Spring, P Roller	8059-06-20	1
141	Plate (A), P Slide	8059-06-24	1
142	Collar	8059-06-18	1
143	Screw, C Tapping, M2.6X5	9192-00-00	1
144	Joint Plate	8059-06-06	1
145	Arm, P Actuate	8059-06-04	1
146	Spring, P Actuate Arm	8059-06-09	1
157	Plate (B), P Slide	8059-06-25	1
FLYWHEEL PARTS			
171	Motor Assembly, Capstan	8059-07-302	1
177	Housing Assembly, Metal	8059-07-301	1
178	Screw, C Tapping, M2.6X8	9195-00-00	3
179	Screw, Sems, M3 X4	9105-00-00	2
BACK TENSION PARTS			
191	Arm, Back Tension	8059-08-501	1
192	Screw, C Tapping, M2.6X4	9191-00-00	1
193	Support, Back Tension	8059-08-09	1
194	Screw, C Tapping, M2.6X4	9191-00-00	1
195	Collar, Band Holder	8059-08-15	1
196	Band, BT	8059-08-302	1
197	Spring, Band Holder	8059-08-17	1
199	Washer, Polyslider, φ2.1 X φ4 X t0.5	9999-03-15	1
208	Spring, BT Actuate Plate	8059-08-20	1

BRAKE PARTS			
Ref No.	Description	MFR' No.	Q'ty
221	Plate Assembly (Consists of 222-227, 263, 265-266, 268)	8059-09-307	1
222	Plate Semi Assembly	8059-09-501	1
223	Screw, Sems, M2 X4	9077-00-00	2
224	Screw, C Tapping, M2.6X4	9191-00-00	1
225	Washer, Wave	8000-10-25	3
226	Gear, Reel Drive	8059-09-06	2
227	E Ring S 1.5	9500-00-00	2
263	Brake, Take-up soft	8059-10-303	1
265	Screw, SL FH (For Camera), M2 X3	9974-00-00	1
266	Collar, Take-up Soft Brake Arm	8059-10-07	1
268	Spring, Take-up Soft Brake Arm	8059-10-06	1
228	Washer, Nylon, φ3.1 X φ6 X t0.3	9853-00-00	1
229	Clutch Assembly	8059-09-302	1
230	Washer, Nylon, φ2.98Xφ6 X t0.3	9999-06-04	1
231	Pulley Assembly, Middle	8059-09-301	1
232	Washer, Polyslider, φ2.6 X φ6 X t0.5	9884-00-00	1
233	Belt, Drive	8059-09-17	1
REEL DRIVE PARTS			
239	Gear Assembly, P (Consists of 234-235, 238)	8059-09-305	1
234	Arm Assembly, P Gear	8059-09-303	1
235	Gear, Play	8059-09-20	1
238	Washer, Polyslider, φ1.6 X φ3.8 X t0.3	9743-00-00	1
240	Gear Assembly, RF (Consists of 236-237, 238)	8059-09-306	1
236	Arm Assembly, RF Gear	8059-09-304	1
237	Gear, FF	8059-09-22	1
238	Washer, Polyslider, φ1.6 X φ3.8 X t0.3	9743-00-00	1
BRAKE PARTS			
253	Spring, Brake Arm	8059-10-02	2
255	Arm Assembly, S Brake (Consists of 251-252)	8059-10-301	1
251	Shoe, Brake	8059-10-19	1
252	Arm, S Brake	8059-10-01	1
256	Arm Assembly, T Brake (Consists of 251, 254)	8059-10-302	1
251	Shoe, Brake	8059-10-19	1
254	Arm, T Brake	8059-10-03	1
257	Lifter, Brake	8059-10-16	1
258	Actuator, L Brake	8059-10-17	1
259	Hook, Trigger	8059-10-14	1
260	Lever, Trigger	8059-10-13	1
261	Plate, Brake	8059-10-11	1
262	Brake Actuate, Base	8059-10-09	1
264	Brake, S Soft	8059-10-304	1
267	Spring, L Brake Actuator	8059-10-18	1
269	Spring, S Soft Brake	8059-10-22	1
270	Washer, Polyslider, φ2.1 X φ5 X t0.5	9876-00-00	1
271	Spring, Trigger Lever	8059-10-23	1
REVERSE GUIDE PARTS			
531	Plate, RG Slide	8059-17-03	1
532	Spring, RG Slide	8059-17-11	1
533	Collar, RG Slide Plate	8059-17-10	1
534	Screw, Sems, M2 X4	9077-00-00	1
535	Base, RG Slide	8059-17-09	1
536	Arm Semi Assembly, RG	8059-17-501	1
537	Washer, Polyslider, φ2.6 X φ6 X t0.5	9884-00-00	1
538	Arm, RG Actuate	8059-17-01	1
539	Washer, Polyslider, φ2.1 X φ5 X t0.5	9876-00-00	1
540	RG Actuator	8059-17-02	1



FRONT LOADING PARTS			
Ref No.	Description	MFR' No.	Q'ty
390	Loading Assembly, Front (Consists of 391, 411, 420, 430, 455, 460, 480, 498-508)	8059-16-317	1
391	Bracket Assembly, Cassette Load (Consists of 392-401)	8059-16-318	1
392	Clutch Assembly, Front Loading	8059-16-319	1
393	P.C.B. Assembly, Front Loading	8059-16-320	1
394	Sensor, P.C.B. (RM)	8059-16-316	1
395	Bracket Semi Assembly, Cassette Load	8059-16-506	1
396	Lever, IN SW	8059-16-34	1
397	Lever, S SW	8059-16-33	1
398	Bearing (A), F Worm	8059-16-06	1
399	Washer, Polyslider, $\phi 1.6 \times \phi 3.8 \times t 0.3$	9743-00-00	1
400	Screw, Sems, M2.6 $\times$ 4	9096-00-00	2
401	Screw, Sems, M2 $\times$ 5	9078-00-00	1
FRONT LOADING PARTS			
411	Holder Assembly, Cassette (Consists of 412-417)	8059-16-306	1
412	Holder, Cassette	8000-22-03	1
413	Plate, Slide	8000-22-13	1
414	Plate (A), C Lock	8000-22-12	1
415	Collar	8059-06-18	1
416	Spring, Lock	8059-16-29	1
417	Screw, SL (For Camera), M2.6 $\times$ 3	9968-00-00	1
FRONT LOADING PARTS			
430	Plate (R) Assembly, Side (Consists of 431-440)	8059-16-308	1
431	Plate (R), Side	8059-16-502	1
432	Plate, Cassette Push	8059-16-28	1
433	Screw (For Camera), M2.3 $\times$ 2	9833-00-00	1
434	Lever, Open	8000-22-25	1
435	Spring, Open Lever	8000-22-44	1
436	Lever Collar, Open	8000-22-42	1
437	Screw, SL (For Camera), M2 $\times$ 4	9967-00-00	1
438	Lever, Lock Release	8000-22-16	1
439	Roller, Guide	8000-22-75	2
440	Roller, Guide	8000-22-23	1
FRONT LOADING PARTS			
445	Plate (L) Assembly, Side (Consists of 446-453)	8059-16-309	1
446	Plate (L), Side	8059-16-503	1
447	Plate, Cassette Push	8059-16-28	1
448	Screw (For Camera), M2.3 $\times$ 2	9833-00-00	1
449	Plate (L), C Lock	8000-22-66	1
450	Spring (L), Lock Plate	8059-16-30	1
451	Collar, Lock Plate	8000-19-63	1
452	Screw (For Camera), M2 $\times$ 2.5	9966-00-00	1
453	Roller, Guide	8000-22-75	2

FRONT LOADING PARTS			
Ref No.	Description	MFR' No.	Q'ty
460	Frame (R) Assembly (Consists of 461-462, 466, 470-472)	8059-16-322	1
461	Frame (R)	8059-16-504	1
462	Wheel Assembly, Worm (Consists of 463-465)	8059-16-321	1
463	Wheel, Worm	8059-16-36	1
464	Gear, Friction	8059-16-45	1
465	Spring, Friction	8059-16-31	1
466	Gear (R) Assembly, Lift (Consists of 467-469)	8059-16-312	1
467	Gear (R), Lift	8059-16-21	1
468	Arm, Lift	8000-22-11	1
469	Spring, LP	8000-22-45	1
470	Guide, Open Lever	8000-22-26	1
471	Sleeve, Guide	8000-22-24	1
472	E Ring S 2.5	9504-00-00	2
FRONT LOADING PARTS			
480	Frame (L) Assembly (Consists of 481-483, 487-491)	8059-16-313	1
481	Frame (L)	8059-16-505	1
482	Sensor, P.C.B. (LM)	8059-16-301	1
483	Gear (L) Assembly, Lift (Consists of 484-486)	8059-16-314	1
484	Gear, Lift	8059-16-22	1
485	Arm, Lift	8000-22-11	1
486	Spring, LP	8000-22-45	1
487	Lever, Lift	8000-22-76	1
488	Spring, Lift Lever	8000-22-47	1
489	E Ring S 2.5	9504-00-00	2
490	Screw, Sems, M2.6 $\times$ 7	9099-00-00	1
491	Sleeve, Guide	8000-22-24	1
FRONT LOADING PARTS			
498	Stay, Top	8000-22-65	1
499	Wire, End Sensor	8059-16-19	1
500	Angle, Rear	8059-16-09	1
501	Plate, Upper	8000-22-07	1
502	Shaft, Synchronize	8000-22-46	1
503	Gear (A), Synchronize	8059-16-17	2
504	E Ring S 2.5	9504-00-00	2
505	Screw, Sems, M2.6 $\times$ 4	9096-00-00	10
506	Screw (For Camera), M2.6 $\times$ 3	9556-00-00	2
507	Screw (For Camera), M2.3 $\times$ 2.5	9991-00-00	2
508	Screw, C Tapping, M2.6 $\times$ 5	9192-00-00	4
FRONT LOADING PARTS			
420	Angle Assembly, Front (Consists of 421-423)	8059-16-307	1
421	Angle, Front	8059-16-18	1
422	Guide (R), Tape	8059-16-25	1
423	Guide (L), Tape	8059-16-24	1

16. ELECTRICAL PARTS LIST

PRODUCT SAFETY NOTE : Products marked with a Δ have special characteristics important to safety.
Before replacing any of these components, read carefully the product safety notice of the Service Manual.
Don't degrade the safety of the product through improper servicing.

Description	Ref. No.	Parts No.	Q'ty
PCB Ass'y, Main Main PCB		MSV52AX 1614195A Not available at once	(1) 1
Cap. Ceramic 10 pF/ 50V $\pm 5\%$ SL	C62	3S41100	1
Cap. Ceramic 33 pF/ 50V $\pm 5\%$ SL	C59	3S41330	1
Cap. Ceramic 68 pF/ 50V $\pm 5\%$ SL	C63	3S41680	1
Cap. Ceramic 120 pF/ 50V $\pm 5\%$ SL	C60, C103	1270121	2
Cap. Ceramic 150 pF/ 50V $\pm 5\%$ SL	C64, C104	1270151	2
Cap. Ceramic 220 pF/ 50V $\pm 5\%$ SL	C66, C71, C105, C155	1270221	4
Cap. Ceramic 220 pF/ 50V $\pm 5\%$	C72	3B41221	1
Cap. Ceramic 0.01 μ F / 16V + 80/ -20%	C101, C102	1220842 or 3Y4D103	2
Cap. Ceramic 0.022 μ F / 25V + 80/ -20%	C67, C152	1220843 or 122Z122	2
Cap. Ceramic 0.022 μ F / 50V + 80/ -20%	C109	12F3223	1
Cap. Ceramic 0.0039 μ F / 50V $\pm 10\%$	C252	12B3392	1
Cap. Semi-Conductive 0.0047 μ F / 25V $\pm 10\%$	C425, C426	12Y2472	2
Cap. Semi-Conductive 0.01 μ F / 25V $\pm 10\%$	C421	12Y2103	1
Cap. Semi-Conductive 0.047 μ F / 25V $\pm 10\%$	C415	12Y2473	1
Cap. Semi-Conductive 0.047 μ F / 16V + 80/-20%	C106, C107, C68, C412	1220523	4
Cap. Semi-Conductive 0.1 μ F / 12V $\pm 10\%$	C423, C427	12Y1104	2
Cap. Semi-Conductive 0.1 μ F / 25V + 80/-20%	C401, C403, C404, C505, C506, C405	1220461 or 1220520	6
Cap. Semi-Conductive 0.022 μ F / 25V $\pm 10\%$	C409	12Y2223	1
Cap. Electrolytic 0.22 μ F / 50V $\pm 20\%$	C153, C406	126F224	2
Cap. Electrolytic 1 μ F / 50V $\pm 20\%$	C408, C411, C414, C654, C181, C652	126F105	6
Cap. Electrolytic 1 μ F / 50V $\pm 20\%$ (NP)	C410	126X105	1
Cap. Electrolytic 2.2 μ F / 50V $\pm 20\%$	C503	126F225	1
Cap. Electrolytic 2.2 μ F / 50V $\pm 20\%$ (NP)	C417	126X225	1
Cap. Electrolytic 8.2 μ F / 16V $\pm 20\%$	C418	126C825	1
Cap. Electrolytic 10 μ F / 16V $\pm 20\%$	C53, C54, C57, C151 C154, C416, C420, C653, C651	126C106	9
Cap. Electrolytic 10 μ F / 16V $\pm 20\%$ (NP)	C58	126U106	1
Cap. Electrolytic 22 μ F / 16V $\pm 20\%$	C65	126C226	1
Cap. Electrolytic 47 μ F / 6.3V $\pm 20\%$	C419	126A476	1
Cap. Electrolytic 47 μ F / 10V $\pm 20\%$	C422	126B476	1
Cap. Electrolytic 47 μ F / 16V $\pm 20\%$	C51, C52	126C476	2
Cap. Electrolytic 100 μ F / 16V $\pm 20\%$	C56, C504	126C107	2
Cap. Electrolytic 100 μ F / 25V $\pm 20\%$	C402	126D107	1
Cap. Electrolytic 220 μ F / 6.3V $\pm 20\%$	C61, C108	126A227	2
Cap. Electrolytic 330 μ F / 6.3V $\pm 20\%$	C69, C70	126A337	2
Cap. Electrolytic 470 μ F / 16V $\pm 20\%$	C428	626C477	1
Cap. Electrolytic 1000 μ F / 6.3V $\pm 20\%$	C55	126A108	1

	Description	Ref. No.	Parts No.	Q' ty
	Cap. Polyester Film 0.033 μ F / 50V $\pm$ 5 %	C424	1254333	1
	Cap. Polyester Film 0.082 μ F / 50V $\pm$ 5 %	C182	1254823	1
	Cap. Polyester Film 0.15 μ F / 50V $\pm$ 5 %	C407	1254154	1
	Coil, Microinductor 5 mH	L181	113D747 or 113M747 or 113N747	1
	Coil, Microinductor 22 μ H	L51	2165220	1
	Coil, Microinductor 39 μ H	L52	2165390	1
	Coil, Microinductor 68 μ H	L103	2165680	1
	Coil, Microinductor 82 μ H	L55	2165820	1
	Coil, Microinductor 100 μ H	L54, L57	2162101	2
	Coil, Microinductor 100 μ H	L53	2165101	1
	Coil, Microinductor 180 μ H	L56	2165181	1
	Coil, Microinductor 330 μ H	L101	2162331	1
	Coil, Microinductor 680 μ H	L102	117D491 or 117M491	1
	Coil, Choke 200 μ H	L401, L402	117B441 or 117J441	2
	EQ Coil	T51	1810585 or 1810710 or 1812895	1
	Diode, 1SS254 or US1040M or GMB01B	D51, D54, D101, D402, D403, D501, D503, D504, D506, D151, D152, D401, D502, D507	1SS254 or US1040M or GMB01B	14
	Filter, LPF 1.5MHz	T101	113D621 or 113M621	1
	Filter, LPF 3MHz	T52	1810805 or 1810994	1
	Filter, BPF 4.43MHz	T102	1810804 or 1810770	1
	Filter, Comb	DL101	1812112 or 1812215	1
	Filter, Ceramic 4.5 MHz	CF181	1810359	1
	Filter, Ceramic 5.06MHz	CF101	1810497	1
	IC MN158461 FVAM (Mos / Microprocessor) (System control)	IC501	14DN348	1
	IC MN6748 FVAP (Mos / other) (Servo)	IC402	14DN363	1
	IC BA6209 (Linear) (Motor Drive)	IC502	14L0106	1
△	IC BA6219B (Linear) (Capstan Drive)	IC401	14LF232	1
	IC BA7021 (Linear) (Input Selector)	IC151	14LF276	1
△	IC AN78L05 or NJM78L05A (Linear) (3 terminal Voltage Regulator)	IC51, IC651	AN78L05 or J78L05A	2
△	IC AN78N05 (Linear) (3 terminal Voltage Regulator)	IC52, IC652	AN78N05	2
	Hybrid C (Color HIC) (Other)	HIC101	1812422	1
	Hybrid Y (Luminance) (Other)	HIC51	1812119	1
	Hybrid Servo (Servo) (Other)	HIC401	1812455	1

	Description	Ref. No.	Parts No.	Q' ty
	Res. Carbon 68 ohm 1 / 5W $\pm$ 5 %	R61	1324680	1
	Res. Carbon 82 ohm 1 / 5W $\pm$ 5 %	R73, R156	1324820	2
	Res. Carbon 100 ohm 1 / 5W $\pm$ 5 %	R419	1324101	1
	Res. Carbon 150 ohm 1 / 5W $\pm$ 5 %	R431	1324151	1
	Res. Carbon 180 ohm 1 / 5W $\pm$ 5 %	R512	1324181	1
	Res. Carbon 270 ohm 1 / 5W $\pm$ 5 %	R104	1324271	1
	Res. Carbon 390 ohm 1 / 5W $\pm$ 5 %	R63	1324391	1
	Res. Carbon 560 ohm 1 / 5W $\pm$ 5 %	R58	1324561	1
	Res. Carbon 680 ohm 1 / 5W $\pm$ 5 %	R65	1324681	1
	Res. Carbon 1k ohm 1 / 5W $\pm$ 5 %	R60, R64, R69, R105 R181, R418	1324102	6
	Res. Carbon 1.2k ohm 1 / 5W $\pm$ 5 %	R59, R503, R651	1324122	3
	Res. Carbon 1.5k ohm 1 / 5W $\pm$ 5 %	R67, R411, R434, R253	1324152	4
	Res. Carbon 1.8k ohm 1 / 5W $\pm$ 5 %	R103	1324182	1
	Res. Carbon 2.2k ohm 1 / 5W $\pm$ 5 %	R68, R106, R414, R416, R422	1324222	5
	Res. Carbon 2.7k ohm 1 / 5W $\pm$ 5 %	R402, R404, R514, R515, R516	1324272	5
	Res. Carbon 3.6k ohm 1 / 5W $\pm$ 5 %	R510	1324362	1
	Res. Carbon 4.7k ohm 1 / 5W $\pm$ 5 %	R51, R408, R415, R501	1324472	4
	Res. Carbon 5.6k ohm 1 / 5W $\pm$ 5 %	R102	1324562	1
	Res. Carbon 6.8k ohm 1 / 5W $\pm$ 5 %	R66, R435	1324682	2
	Res. Carbon 10k ohm 1 / 5W $\pm$ 5 %	R154, R407, R426, R505, R508, R652, R427	1324103	7
	Res. Carbon 10k ohm 1 / 5W $\pm$ 2 %	R420, R421	1354103	2
	Res. Carbon 12k ohm 1 / 5W $\pm$ 5 %	R252	1324123	1
	Res. Carbon 13k ohm 1 / 5W $\pm$ 5 %	R432	1324133	1
	Res. Carbon 18k ohm 1 / 5W $\pm$ 5 %	R57	1324183	1
	Res. Carbon 33k ohm 1 / 5W $\pm$ 5 %	R430	1324333	1
	Res. Carbon 39k ohm 1 / 5W $\pm$ 5 %	R403, R405	1324393	2
	Res. Carbon 47k ohm 1 / 5W $\pm$ 5 %	R412, R433, R504, R509, R511	1324473	5
	Res. Carbon 56k ohm 1 / 5W $\pm$ 5 %	R70	1324563	1
	Res. Carbon 82k ohm 1 / 5W $\pm$ 5 %	R502	1324823	1
	Res. Carbon 100k ohm 1 / 5W $\pm$ 5 %	R155	1324104	1
	Res. Carbon 470k ohm 1 / 5W $\pm$ 5 %	R413, R506, R507	1324474	3
△	Res. Oxide Film 1.5 ohm 1W $\pm$ 5 %	R429	1330391 or 1330317	1
△	Res. Oxide Film 3.3 ohm 1W $\pm$ 5 %	R513	1330395 or 1330320	1
△	Res. Oxide Film 3.3 ohm 2W $\pm$ 5 %	R401	1330460 or 1330318	1
△	Res. Oxide Film 330 ohm 1W $\pm$ 5 %	R62	1330419 or 1330363	1
	Res. Semi-Fixed 1k ohm (B)	VR51, VR101	138J777 or 638A102	2
	Res. Semi-Fixed 200k ohm (B)	VR402	138J786 or 638A224	1
	Res. Semi-Fixed 200k ohm (B) (Metal)	VR401	238J017 or 1380832	1

Description	Ref. No.	Parts No.	Q' ty
Transistor, 2SA933Q, R or 2SA608SPE, F	Q54	A933Q, R or A608SE, F	1
Transistor, 2SA854SQ, R or 2SA1317S, T	Q502	A854SQ, R or A1317S, T	1
Transistor, 2SC1740Q, R or 2SC536SPE, F	Q53, Q55, Q101, Q401, Q501, Q102	C1740Q, R or C536SE, F	6
Transistor, 2SD1384Q, R or 2SD1207S, T	Q651	D1384Q, R or D1207S, T	1
Transistor, 2SB892S, T or 2SB1010Q, R	Q403	B892S, T or B1010Q, R	1
Digital Transistor, DTA124ES or 2SA1346	QR101, QR503	A124ES or A1346	2
Digital Transistor, DTC124ES or 2SC3400	QR401, QR402, QR501, QR504	C124ES or C3400	4
Digital Transistor, DTA143XS	QR502, QR505	A143XS	2
Digital Transistor, DTA114YS	QR506	A114YS	1
Connector Base 2P (Top)	CN-E	1740764	1
Connector Base 8P (Top)	CN-4B	1770628	1
Connector Base 13P (Top)	CN-5B, CN-10B	1770633	2
Connector Base (FFC) 12P (Top)	CN-2m	1770586 or 1770587	1
RCA Plug Cord		5750160	1
X' tal 4.43MHz	X101	1811259	1
Resonator, Ceramic 3.58MHz	X501	1812206 or 1811211	1
Heat Sink		6S50354	1
RF Conv.	CONV-1	1812726	1
RCA Jack	JK3, JK4	1780176	1
PCB Ass'y, Head Amp		MSV52CX	(1)
Head Amp PCB		1614195C	1
	Not available at once		
Cap. Ceramic 12 pF/ 50V ±5 % SL	C11	3S41120	1
Cap. Ceramic 22 pF/ 50V ±5 % SL	C18, C25	3S41220	2
Cap. Ceramic 27 pF/ 50V ±5 % SL	C26	3S41270	1
Cap. Ceramic 56 pF/ 50V ±5 % SL	C21	3S41560	1
Cap. Ceramic 82 pF/ 50V ±5 %	C24	3B41820	1
Cap. Ceramic 100 pF/ 50V ±5 %	C19	3B41101	1
Cap. Ceramic 390 pF/ 50V ±5 % SL	C23	1270391	1
Cap. Ceramic 1000 pF/ 50V ±5 % YB	C10	12B3102	1
Cap. Ceramic 0.033 μF / 12V +80/-20%	C5, C8	1220887	2
Cap. Ceramic 0.01 μF / 16V +80/-20%	C1, C3, C12, C13, C15, C16, C17	1220842 or 3Y4D103	7
Cap. Electrolytic 1 μF / 50V ±20%	C4, C9, C20	526W105	3
Cap. Electrolytic 47 μF / 16V ±20%	C14	526T476	1
Cap. Electrolytic 220 μF / 6.3V ±20%	C2	526R227	1

MCV211+MSV52

Description	Ref. No.	Parts No.	Q' ty
Coil, Microinductor 18 μH	L8	2165180	1
Coil, Microinductor 27 μH	L2	2165270	1
Coil, Microinductor 33 μH	L4	2165330	1
Coil, Microinductor 47 μH	L5	2165470	1
Coil, Microinductor 100 μH	L1, L3	2162101	2
Coil, Microinductor 180 μH	L7	2165181	1
IC AN3331K (Linear) (Head AMP)	IC1	14LN235	1
Res. Carbon 4.7 ohm 1 / 5W ±5 %	R2	1324479	1
Res. Carbon 270 ohm 1 / 5W ±5 %	R14	1324271	1
Res. Carbon 470 ohm 1 / 5W ±5 %	R4, R11	1324471	2
Res. Carbon 560 ohm 1 / 5W ±5 %	R6, R8, R19	1324561	3
Res. Carbon 680 ohm 1 / 5W ±5 %	R9	1324681	1
Res. Carbon 820 ohm 1 / 5W ±5 %	R12	1324821	1
Res. Carbon 1k ohm 1 / 5W ±5 %	R5, R10, R15	1324102	3
Res. Carbon 1.5k ohm 1 / 5W ±5 %	R3	1324152	1
Res. Carbon 1.8k ohm 1 / 5W ±5 %	R13	1324182	1
Res. Carbon 2.2k ohm 1 / 5W ±5 %	R16, R17, R18	1324222	3
Res. Carbon 10k ohm 1 / 5W ±5 %	R7	1324103	1
Transistor, 2SC1740Q R or 2SC536SPE F	Q2	C1740Q, R or C536SE, F	1
Transistor, 2SC2058Q R or 2SC2839E F	Q1	C2058Q, R or C2839E, F	1
Connector Housing 6P (Side)	CN-G	1770601	1
Top Shield		6S50357	1
Bottom Shield		6S50358	1

MCV211+MSV52

	Description	Ref. No.	Parts No.	Q' ty
	PCB Ass'y, Connector A Connector A PCB	Not available at once	MSV52DX 1614195D	(1) 1
	Connector Housing 9P (Side)		CN-C 1770645	1
	PCB Ass'y, Connector B Connector B PCB	Not available at once	MSV52EX 1614195E	(1) 1
	Connector Housing 7P (Side) Connector Housing 11P (Side)		CN-B CN-A 1770602 1770606	1 1
	PCB Ass'y, Connector C Connector C PCB	Not available at once	MSV52FX 1614195F	(1) 1
	Connector Base 6P (Top)		CN-D 1770626	1
	PCB Ass'y, Jack Jack PCB	Not available at once	MSV52GX 1614195G	(1) 1
	BNC Jack		JK1, JK2 1780207	2
	Connector Base 4P (Top)		CN-14 1770916	1

	Description	Ref. No.	Parts No.	Q' ty
	PCB Ass'y, Timer Timer PCB	Not available at once	TSV58 1614457A	(1) 1
	Cap. Ceramic 10pF ± 0.5 pF / 50V (NP) Cap. Ceramic 0.0022 μ F / 25V +80/-20%		C801 C802, C803 3C41100 122Z122 or 1220843	1 2
	Cap. Electrolytic 220 μ F / 6.3V $\pm 20\%$		C804 526R227	1
	Diode, US1040M or 1SS254 or GMB01B		D801, D802, D803, D805, D806, D807, D808, D809, D810, D811	10
	IC MN1225 (Mos / Memory) (Memory) IC MN1280Q (Mos / other) (Reset) IC MN15283FVBH or MN15283FVAE-2 (Mos / Micro Processor) (Timer)		IC752 IC802 IC801 14DN269 14DN185 14DN487 or 14DN332A	1 1 1
	Switch, Push		SW801, SW803, SW804, SW805, SW806, SW808, SW810, SW811, SW816, SW817, SW818, SW819	12
	Switch, Slide IC-2P		SW824 1621752	1
	Res. Carbon 2.2k ohm 1/5W $\pm 5\%$ Res. Carbon 10k ohm 1/5W $\pm 5\%$ Res. Carbon 33k ohm 1/5W $\pm 5\%$ Res. Carbon 47k ohm 1/5W $\pm 5\%$		R802 R807 R803 R801 1324222 1324103 1324333 1324473	1 1 1 1
	Potentiometer 250k ohm (B) (Tracking) Potentiometer 20k ohm (B) (Picture)		VR801 VR802 539N661 539N703	1 1
	Transistor, 2SC1740Q, R or 2SC536SPE, F		Q801 C1740Q, R or C536SE, F	1
	Digital Transistor, DTA124ES or 2SA1346		QR801 A124ES or A1346	1
	X' tal 4.19MHz Remote Sensor FIP Holder FIP FIP11BAM6 Trimer cap. 20pF		X801 RS801 FIP801 TC801 1811191 1812501 6N50151 1812397 1280154 or 1280122	1 1 1 1
	Connector Base 14P (Side)		CN-9B 1770871	1

Description	Ref. No.	Parts No.	Q'ty
PCB Ass'y, Control Control PCB		TSV58BX 1614457B Not available at once	(1) 1
Switch, Push	SW802, SW807, SW812, SW813, SW814, SW815, SW809, SW820, SW821, SW822, SW823, SW825	5622101 or 5622102 or 5622123	12
Connector Housing 14P (Side)	CN-9H	1770868	1
PCB Ass'y, Joint Joint PCB		TSV58CX 1614457C Not available at once	(1) 1
Cap. Ceramic 270 pF / 50V ±5 % SL	C754	1270271	1
Cap. Ceramic 330 pF / 50V ±5 % SL	C756	1270331	1
Cap. Ceramic 680 pF / 50V ±5 % SL	C760	1270681	1
Cap. Ceramic 0.001 μF / 50V ±10% YB	C757	12B3102	1
Cap. Ceramic 0.022 μF / 25V +80/-20%	C758	122Z122 or 1220843	1
Cap. Electrolytic 0.47 μF / 50V ±5 %	C752, C755	126F474	2
Cap. Electrolytic 1 μF / 50V ±5 %	C753	126F105	1
Cap. Electrolytic 47 μF / 6.3V ±5 %	C759	126A476	1
Cap. Electrolytic 47 μF / 16V ±5 %	C751	126C476	1
Diode, US1040M or 1SS254 or GMB01B	D751, D752, D754	US1040M or 1SS254 or GMB01B	3
IC AN6913 or NJM2903S or BA6993N (Linear) (Comparater)	IC753	AN6913 or J2903S or 14LF330	1
IC LA7210 (Linear) (Sync Separate)	IC751	14LQ115	1
Res. Carbon 750 ohm 1/ 5W ±5 %	R759	1324751	1
Res. Carbon 820 ohm 1/ 5W ±5 %	R756	1324821	1
Res. Carbon 1k ohm 1/ 5W ±5 %	R758, R763	1324102	2
Res. Carbon 1.5k ohm 1/ 5W ±5 %	R768, R766	1324152	2
Res. Carbon 3.3k ohm 1/ 5W ±5 %	R804, R805	1324332	2
Res. Carbon 4.7k ohm 1/ 5W ±5 %	R751, R771, R773	1324472	3
Res. Carbon 10k ohm 1/ 5W ±5 %	R752, R753	1324103	2
Res. Carbon 12k ohm 1/ 5W ±2 %	R760, R761, R762	1354123	3
Res. Carbon 15k ohm 1/ 5W ±5 %	R765	1324153	1
Res. Carbon 22k ohm 1/ 5W ±5 %	R755, R767	1324223	2
Res. Carbon 47k ohm 1/ 5W ±5 %	R769, R770	1324473	2
Res. Carbon 100k ohm 1/ 5W ±5 %	R754	1324104	1
Res. Carbon 330k ohm 1/ 5W ±5 %	R757	1324334	1
Connector Housing 8P (Side)	CN-4H	1770603	1
Connector Housing 13P (Side)	CN-5H	1770608	1
Ceramic Resonator 500kHz	X751	1811103 or 1810414	1

TMV61+TSV58

Description	Ref. No.	Parts No.	Q'ty
PCB Ass'y, Tuner Tuner PCB		TSV58DX 1614457D Not available at once	(1) 1
Cap. Ceramic 0.022 μF / 25V +80/-20%	C712	122Z122 or 1220843	1
Cap. Ceramic 0.0022 μF / 50V ±10% YB	C710	12B3222	1
Cap. Semi-conductive 0.033 μF / 50V +80/-20%	C705, C708	1220887	2
Cap. Electrolytic 0.1 μF / 50V ±20%	C703, C704	126F104	2
Cap. Electrolytic 10 μF / 16V ±20%	C709	126C106	1
Cap. Electrolytic 47 μF / 35V ±20%	C701	126E476	1
Cap. Electrolytic 100 μF / 16V ±20%	C702	126C107	1
Cap. Electrolytic 1000 μF / 6.3V ±20%	C711	126A108	1
Cap. Polyester Film 0.015 μF / 50V ±5 %	C706, C707	1254153	2
Diode, US1040M or 1SS254 or GMB01B	D701	US1040M or 1SS254 or GMB01B	1
IC LA7913 (Linear) (Tuner Control)	IC701	14LQ237	1
IC L5631 or μpc574J (Liner) (Zener IC)	IC702	L5631 or μpc574J	1
Res. Carbon 1.5k ohm 1/ 2W ±5 %	R708	1322152	1
Res. Carbon 3.3k ohm 1/ 5W ±5 %	R711	1324332	1
Res. Carbon 3.9k ohm 1/ 5W ±5 %	R712	1324392	1
Res. Carbon 10k ohm 1/ 5W ±5 %	R709, R716	1324103	2
Res. Carbon 15k ohm 1/ 5W ±5 %	R713	1324153	1
Res. Carbon 22k ohm 1/ 5W ±5 %	R702	1324223	1
Res. Carbon 33k ohm 1/ 5W ±5 %	R707	1324333	1
Res. Carbon 47k ohm 1/ 5W ±5 %	R714	1324473	1
Res. Carbon 56k ohm 1/ 5W ±5 %	R710	1324563	1
Res. Carbon 220k ohm 1/ 5W ±5 %	R703, R704, R705	1324224	3
Res. Carbon 470k ohm 1/ 5W ±5 %	R706	1324474	1
Res. Carbon 1M ohm 1/ 5W ±5 %	R717	1324105	1
Digital Transistor, DTC124ES or 2SC3400	QR702, QR703	C124ES or C3400	2
Digital Transistor, DTA124ES or 2SA1346	QR701	A124ES or A1346	1
Transistor, 2SD1012F, G or 2SD1468SR, S	Q701	D1012F, G or D1468SR, S	1
Connector Base 2P (Top)	CN-16	1740764	1
Connector Base 12P (Top) (FFC)	CN-2t	1770586 or 1770587	1
Tuner IF F.E.T 2SK128TAP, Q or 2SK304C, D	TU701 Q702	1812924 K128P, Q or K304C or K304D	1 1

TMV61+TSV58

	Description	Ref. No.	Parts No.	Q' ty
	PCB Ass'y, Power Supply		1614197X	(1)
	Cap. Ceramic 0.022 μ F / 50V +80/-20%	C601, C602	12F3223	2
	Cap. Electrolytic 22 μ F / 63V $\pm$ 20%	C606	126G226	1
	Cap. Electrolytic 47 μ F / 16V $\pm$ 20%	C610, C611	126C476	2
	Cap. Electrolytic 47 μ F / 25V $\pm$ 20%	C609	126D476	1
	Cap. Electrolytic 47 μ F / 35V $\pm$ 20%	C608	126E476	1
	Cap. Electrolytic 47 μ F / 63V $\pm$ 20%	C607	126G476	1
	Cap. Electrolytic 2200 μ F / 25V $\pm$ 20%	C604	626D228	1
	Cap. Electrolytic 2200 μ F / 35V $\pm$ 20%	C603	626E228	1
	Cap. Electrolytic 3300 μ F / 16V $\pm$ 20%	C605	626C338	1
	Diode, 1SS252 or GMA01U or US1090M	D612	1SS252 or GMA01U or US1090M	1
	Diode, UZ6.2BSC or MTZ6.2B	D606	UZ6.2BSC or MTZ6.2B	1
	Diode, MTZ30A or MTZ30B or UZ30BSC	D603	MTZ30A or MTZ30B or UZ30BSC	1
	Diode, KBL02L or RS403L or S4VB20	D607	KBL02L or RS403L or S4VB20	1
	Diode, 1N4003 or GP10-4003	D601, D602, D608, D609, D610, D611,	1N4003F2 or MPL5209	6
△	IC AN7818F or μ pc7818HF (Linear) (3 terminal Voltage Regulator)	IC601	AN7818F or pc7818HF	1
△	IC AN7812F (Linear) (Voltage Regulator)	IC602, IC604	AN7812F	2
	Res. Carbon 100 ohm 1 / 5W $\pm$ 5 %	R604, R605	1324101	2
	Res. Carbon 1.2k ohm 1 / 5W $\pm$ 5 %	R611	1324122	1
	Res. Carbon 22k ohm 1 / 5W $\pm$ 5 %	R606, R613, R614	1324223	3
	Res. Carbon 47k ohm 1 / 5W $\pm$ 5 %	R608, R612	1324473	2
	Res. Carbon 100k ohm 1 / 5W $\pm$ 5 %	R610	1324104	1
△	Res. Oxide Film 1.2k ohm 1W $\pm$ 5 %	R602	534A122	1
	Transistor, 2SA1038R, S or 2SA1016KF, G	Q601	A1038R, S or A1016KF, G	1
	Transistor, 2SB892S, T or 2SB1010Q, R	Q602	B892S, T or B1010Q, R	1
	Transistor, 2SC2808R, S	Q603	C2808R, S	1

	Description	Ref. No.	Parts No.	Q' ty
	Connector Base 12P (Side)	CN-1	1740785	1
△	Power Trans	T601	1150637 or 115M637	1
△	AC Cord		5750192	1
△	Cord Stopper (SR-4N-4)		1790173	1
	Heat Sink		6S50368	1
	Fuse Holder		1790424	1
△	Fuse, T-200mA	F601	1790474	1
	Fuse, T-500mA	F602	1790478	1

	Description	Ref. No.	Parts No.	Q' ty
	PCB Ass'y, Audio Audio PCB		AFV12bX 1614577	(1)
		Not available at once		1
	Cap. Ceramic 220 pF/ 50V $\pm 5\%$ SL	C205	1270221	1
	Cap. Ceramic 330 pF/ 50V $\pm 5\%$ SL	C234	1270331	2
	Cap. Ceramic 1200 pF/ 50V $\pm 10\%$	C208	12B3122	1
	Cap. Ceramic 1500 pF/ 50V $\pm 10\%$	C214, C235	12B3152	1
	Cap. Ceramic 0.01 μF / 16V +80/-20%	C231	3Y4D103	
	Cap. Ceramic 0.022 μF / 25V +80/-20%	C221	122Z122 or 1220843	4
	Cap. Semi-conductive 0.01 μF / 25V $\pm 10\%$	C203, C204, C209, C216	12Y2103	1 2
	Cap. Electrolytic 0.47 μF / 50V $\pm 20\%$	C215	126F474	5
	Cap. Electrolytic 1 μF / 50V $\pm 20\%$	C212, C219	126F105	
	Cap. Electrolytic 10 μF / 16V $\pm 20\%$	C206, C210, C218, C228, C229	126C106	1 1
	Cap. Electrolytic 22 μF / 16V $\pm 20\%$	C213	126C226	1
	Cap. Electrolytic 47 μF / 16V $\pm 20\%$	C223	126C476	2
	Cap. Electrolytic 47 μF / 16V $\pm 20\%$	C202	626C476	1
	Cap. Electrolytic 100 μF / 16V $\pm 20\%$	C222, C230	126C107	
	Cap. Polyester Film 0.047 μF / 100V $\pm 5\%$	C201	6255473	1
	Coil, Microinductor 18 mH	L201	117D657 or 117M547 or 1170524 or 117D498 or 117M500	1
	Coil, Microinductor 100 μH	L202	2162101	1
	Audio OSC	T201	113M686 or 1130686	
				1
				1
	IC $\mu pc2308CA$ (Linear) (Audio IC)	IC201	14LV414	
	IC NJM2233S (Linear) (Video Switch)	IC202	14L0325	
	Res. Carbon 4.7 ohm 1 / 5W $\pm 5\%$	R204	1324479	1
	Res. Carbon 22 ohm 1 / 5W $\pm 5\%$	R201	1324220	1
	Res. Carbon 47 ohm 1 / 5W $\pm 5\%$	R202	1324470	1
	Res. Carbon 100 ohm 1 / 5W $\pm 5\%$	R226	1324101	1
	Res. Carbon 120 ohm 1 / 5W $\pm 5\%$	R212	1324121	1
	Res. Carbon 330 ohm 1 / 2W $\pm 5\%$	R219	1324331	1
	Res. Carbon 470 ohm 1 / 5W $\pm 5\%$	R227	1324471	1
	Res. Carbon 560 ohm 1 / 5W $\pm 5\%$	R223	1324561	1
	Res. Carbon 1k ohm 1 / 5W $\pm 5\%$	R206	1324102	1
	Res. Carbon 6.8k ohm 1 / 5W $\pm 5\%$	R203, R221	1324682	2
	Res. Carbon 10k ohm 1 / 5W $\pm 5\%$	R217, R229	1324103	2
	Res. Carbon 12k ohm 1 / 5W $\pm 5\%$	R211	1324123	1
	Res. Carbon 15k ohm 1 / 5W $\pm 5\%$	R207	1324153	1
	Res. Carbon 22k ohm 1 / 5W $\pm 5\%$	R208, R214, R218	1324223	3

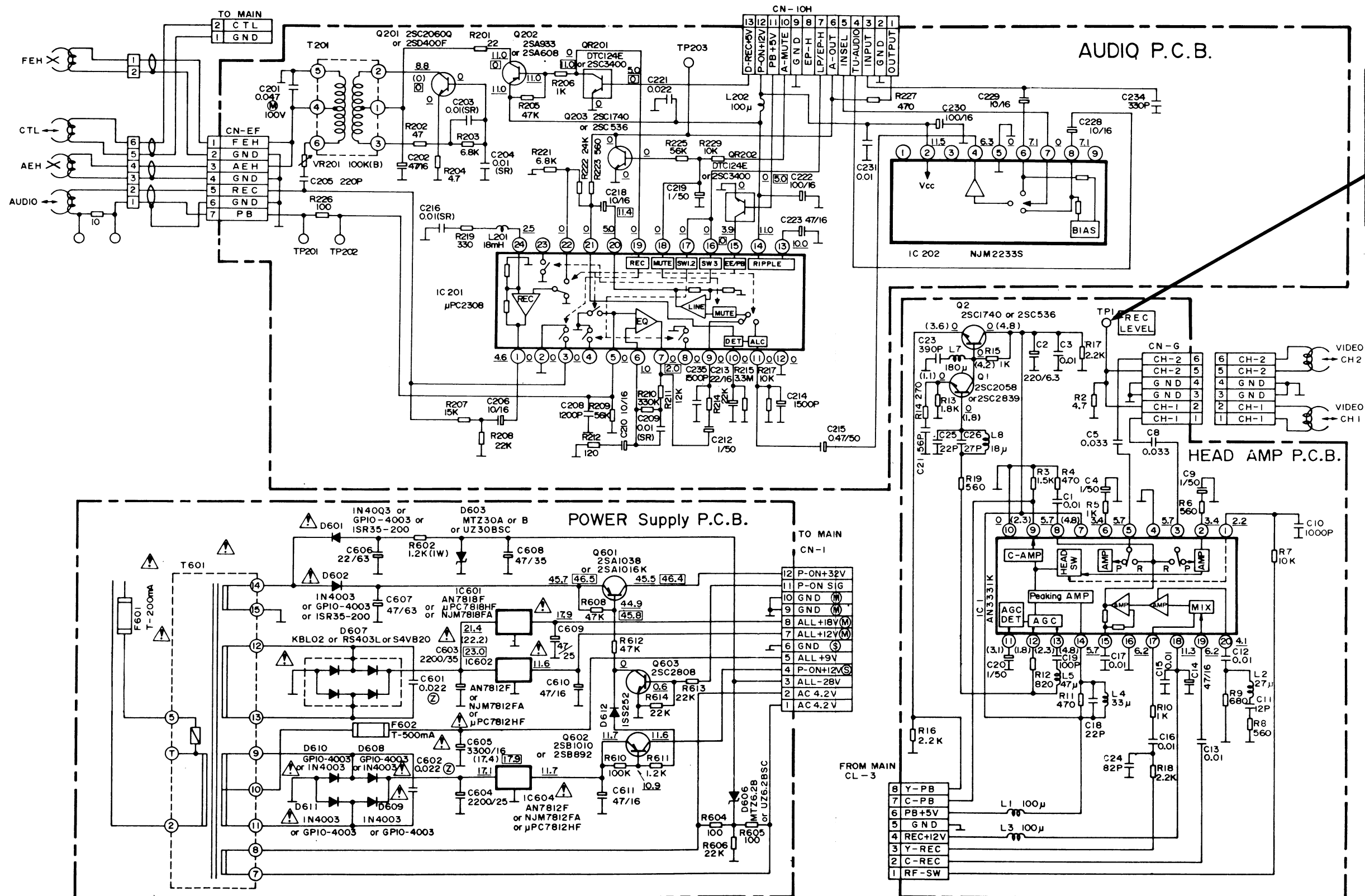
AFV12b

	Description	Ref. No.	Parts No.	Q' ty
	Res. Carbon 24k ohm 1 / 5W $\pm 5\%$	R222	1324243	1
	Res. Carbon 47k ohm 1 / 5W $\pm 5\%$	R205	1324473	1
	Res. Carbon 56k ohm 1 / 5W $\pm 5\%$	R209, R225	1324563	2
	Res. Carbon 330k ohm 1 / 5W $\pm 5\%$	R210	1324334	1
	Res. Carbon 3.3M ohm 1 / 5W $\pm 5\%$	R215	1324335	1
	Res. Semi-Fixed 100k ohm (B)	VR201	138A965 or 138J921	1
	Transistor, 2SD400F or 2SC2060Q	Q201	D400F or C2060Q	1
	Transistor, 2SA933Q, R or 2SA608SPE, F	Q202	A933Q, R or A608SE, F	1
	Transistor, 2SC1740Q, R or 2SC536SPE, F	Q203	C1740Q, R or C536SE, F	1
	Digital Transistor, DTC124ES or 2SC3400	QR201, QR202	C124ES or C3400	2
	Connector Housing 13P (Side)	CN-10H	1770608	1
	Connector Base 7P (Side)	CN-EF	1740777	1
	Cusion		6P50155	1

AFV12b

17. SCHEMATIC DIAGRAM

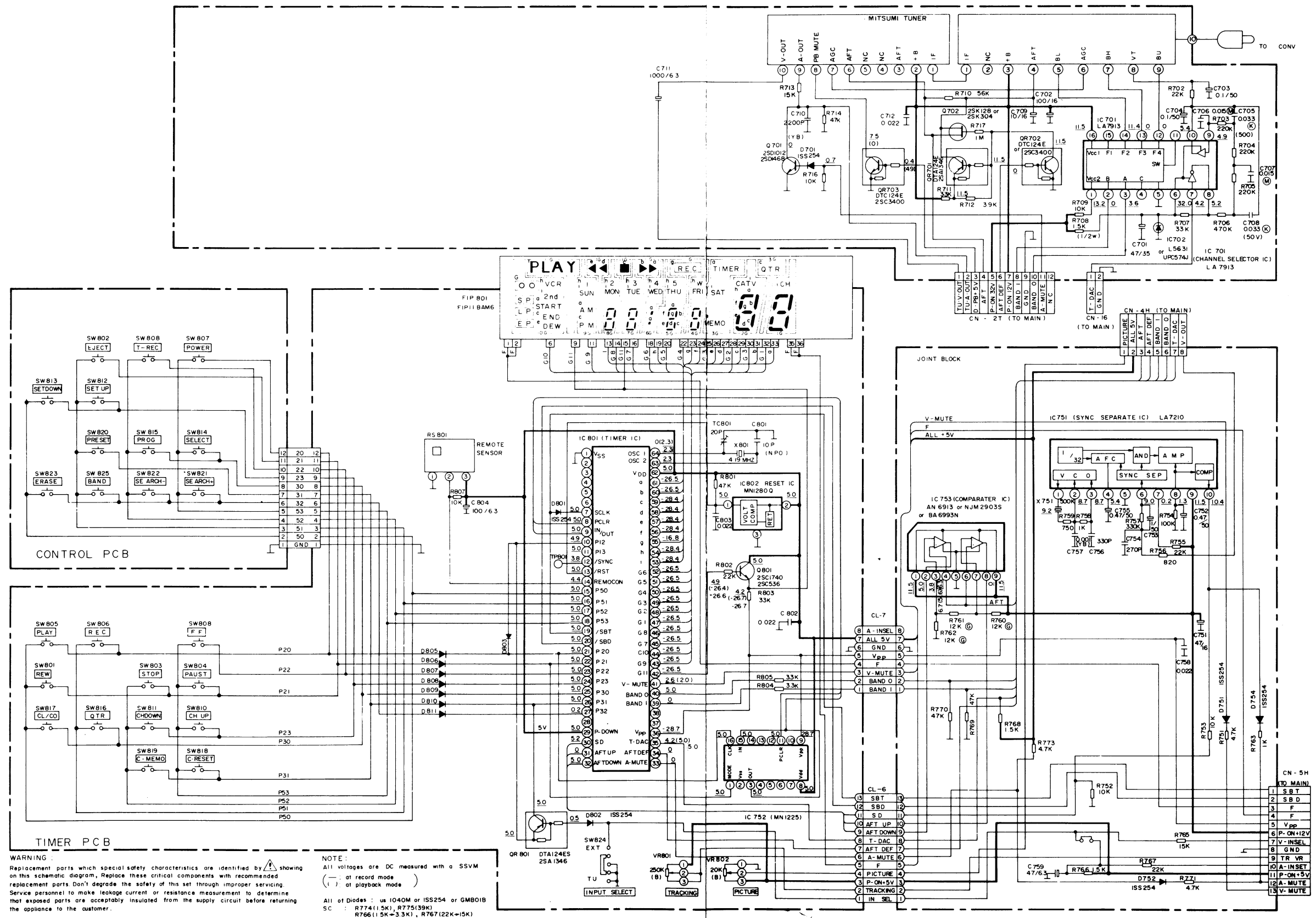
17-1 AUDIO/HEAD AMP/POWER SUPPLY



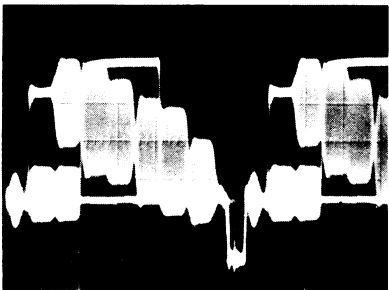
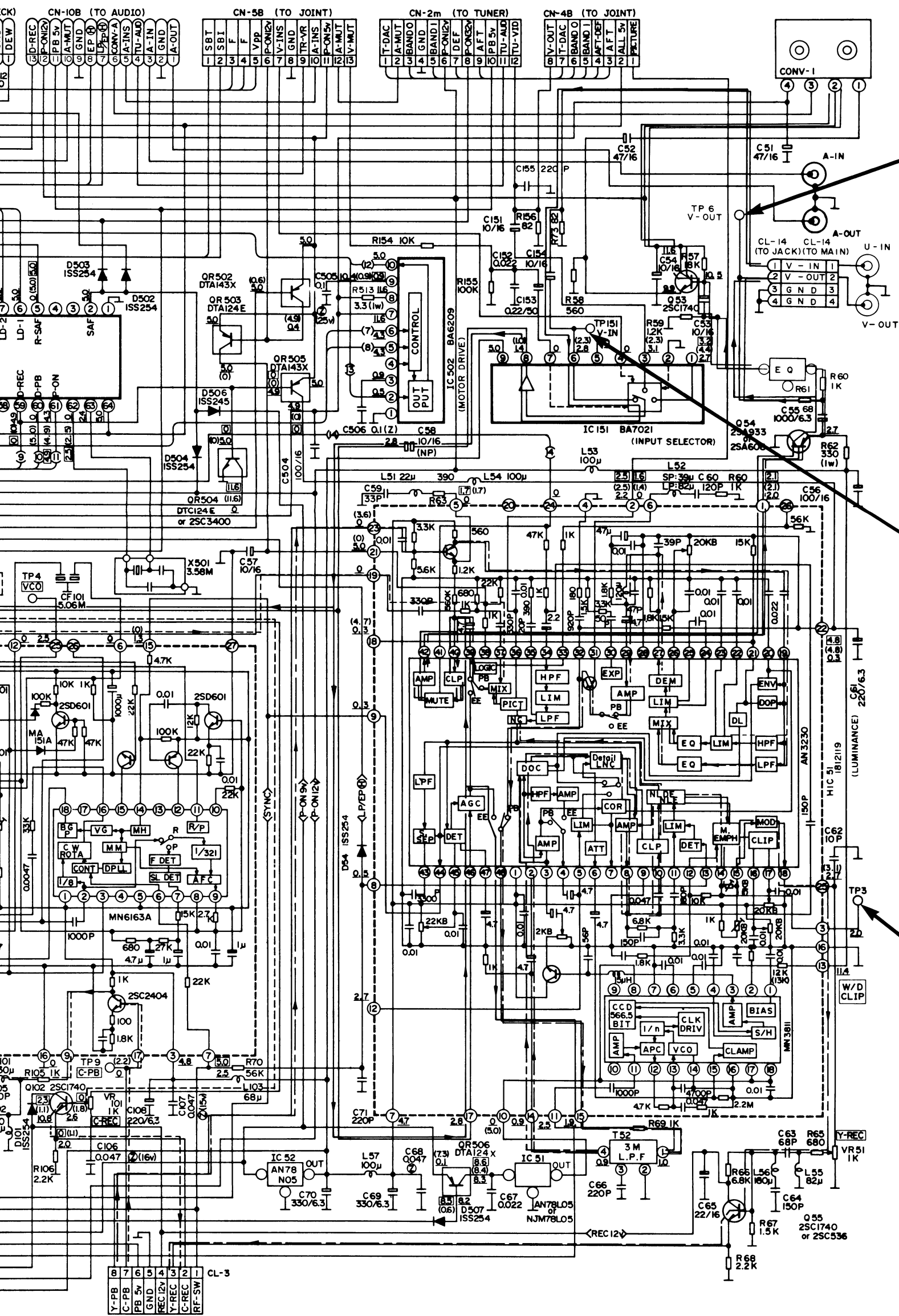
WARNING: Replacement parts which special safety characteristics are identified by  this schematic diagram. Replace these critical components with recommended replacement parts. Don't degrade the safety of this set through improper servicing.

Service personnel to make leakage current or resistance measurement to determine that exposed parts are acceptably insulated from the supply circuit before returning the appliance to the customer.

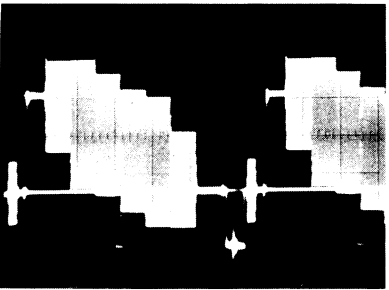
17-2 TIMER/CONTROL/TUNER/JOINT



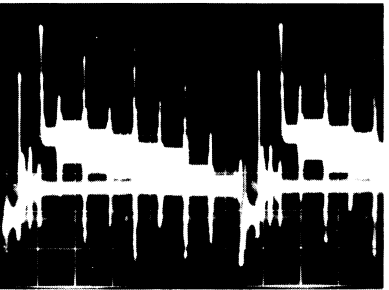
——— Luminance + Chrominance(PLAY) ——— Luminance + Chrominance(REC)
 ——— Luminance(PLAY) ——— Luminance(REC)
 - - - Chrominance(PLAY) - - - Chrominance(REC)



10uS/div.
20mV/div. PLAY MODE



10uS/div.
20uV/div. E-E MODE



10mV/div.
10uS/div. REC MODE

WARNING:
 REPLACEMENT PARTS WHICH HAVE SPECIAL SAFETY CHARACTERISTICS ARE IDENTIFIED BY  SHOWING ON THIS SCHEMATIC DIAGRAM. REPLACE THESE CRITICAL COMPONENTS WITH RECOMMENDED REPLACEMENT PARTS. DON'T DEGRADE THE SAFETY OF THIS SET THROUGH IMPROPER SERVICING. SERVICE PERSONNEL SHOULD MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

- NOTES:
1. ALL RESISTANCE VALUES ARE INDICATED IN OHM (K = 10³, M=10⁶).
 2. ALL CAPACITANCE VALUES ARE INDICATED IN μF (P = 10⁻⁶ μF).
 3. VOLTAGES ARE MEASURED WITH SSVM (Z: > 10K OHM) FRONT POINT INDICATED TO CHASSIS GROUND AT NO SIGNAL CONDITION UNLESS OTHERWISE NOTED. (SEE VOLTAGE CHART.)
 4. CAPACITOR TYPES ARE (PL) = POLYPROPYLENE, (SC) = SEMI-CONDUCTIVE, (M) = MYLAR, OTHERS ARE CERAMIC.

Chrominance(P)

