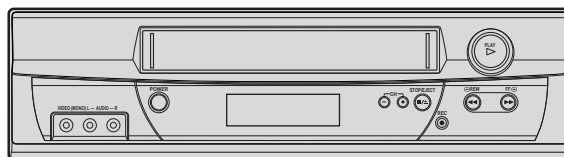


JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER

HR-A590U/A591U



SPECIFICATIONS *(The specifications shown pertain specifically to the model HR-A591U.)*

GENERAL

Power requirement	: AC 120 V, 60 Hz
Power consumption	
Power on	: 9 W
Power off	: 1.7 W
Temperature	
Operating	: 5°C to 40°C (41°F to 104°F)
Storage	: -20°C to 60°C (-4°F to 140°F)
Operating position	: Horizontal only
Dimensions (W x H x D)	: 360 mm x 95 mm x 224 mm (14-3/16" x 3-3/4" x 8-13/16")
Weight	: 3.2 kg (7.1 lbs)
Format	: VHS NTSC standard
Maximum recording time	
SP	: 210 min. with ST-210 video cassette
EP	: 630 min. with ST-210 video cassette

VIDEO/AUDIO

Signal system	: NTSC-type color signal and EIA monochrome signal, 525 lines/60 fields
Recording/Playback system	: DA-4 (Double Azimuth) head helical scan system
Signal-to-noise ratio	: 42 dB
Horizontal resolution	: 230 lines
Frequency range	
Normal audio	: 100 Hz to 10,000 Hz
Hi-Fi audio	: 20 Hz to 20,000 Hz
Input/Output	: RCA connectors (IN x 1, OUT x 1)

TUNER

Tuning system	: Frequency-synthesized tuner
Channel coverage	
VHF	: Channels 2-13
UHF	: Channels 14-69
CATV	: 113 Channels
RF output	: Channel 3 or 4 (switchable; preset to Channel 3 when shipped) 75 ohms, unbalanced

TIMER

Clock reference	: Quartz
Program capacity	: 1-month programmable timer/8 programs
Memory backup for timer	: Approx. 5 sec.

ACCESSORIES

Provided accessories	: RF cable (F-type), Infrared remote control unit, "AAA" battery x 2
Specifications shown are for SP mode unless specified otherwise. E. & O.E. Design and specifications subject to change without notice.	

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The following table lists the differing points between Models (HR-A591U, HR-A591U(C) and HR-A590U(C) in this series.


ITEM	MODEL	HR-A591U	HR-A591U(C)	HR-A590U(C)
INSTRUCTION LANGUAGE		ENGLISH	ENGLISH, FRENCH	ENGLISH, FRENCH
REGISTRATION CARD		USED	NOT USED	NOT USED
GUARANTEE CARD		NOT USED	USED	USED
SERVICE STAION LIST		NOT USED	USED	USED
FRONT INDICATOR		FDP	FDP	LED
RF OUTPUT SWITCH		NOT USED	NOT USED	USED

Important Safety Precautions

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

●Precautions during Servicing

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

2. Parts identified by the  symbol and shaded (■) parts are critical for safety.
Replace only with specified part numbers.

Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

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

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

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

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

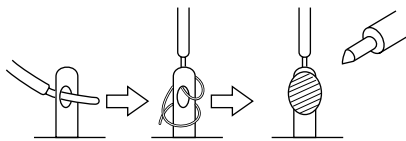


Fig.1

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

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

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

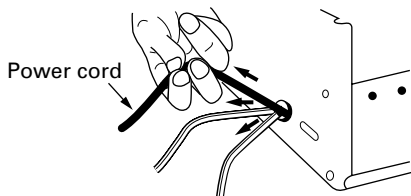


Fig.2

10. Also check areas surrounding repaired locations.

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

12. Crimp type wire connector

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

1) **Connector part number** : E03830-001

2) **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.

3) **Replacement procedure**

(1) Remove the old connector by cutting the wires at a point close to the connector.

Important : Do not reuse a connector (discard it).

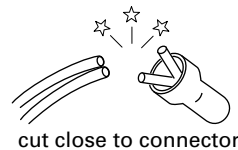


Fig.3

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

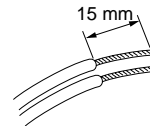


Fig.4

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

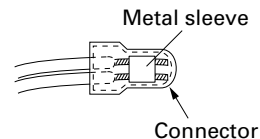


Fig.5

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

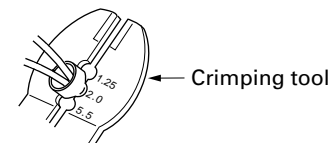


Fig.6

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

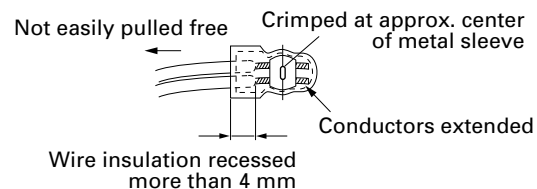


Fig.7

● Safety Check after Servicing

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

1. Insulation resistance test

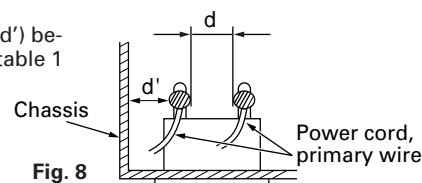
Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. Dielectric strength test

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

3. Clearance distance

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

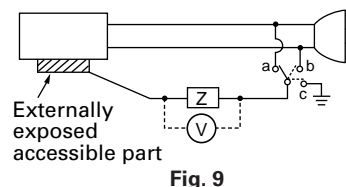


4. Leakage current test

Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

Measuring Method : (Power ON)

Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.



5. Grounding (Class I model only)

Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).

Measuring Method:

Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

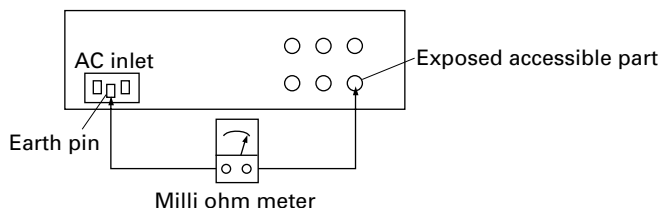


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	$Z \leq 0.1 \text{ ohm}$
Europe & Australia	$Z \leq 0.5 \text{ ohm}$

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

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	$1 \text{ k}\Omega$	$i \leq 1 \text{ mA rms}$	Exposed accessible parts
110 to 130 V	USA & Canada	$0.15 \mu\text{F}$ and $1.5 \text{ k}\Omega$	$i \leq 0.5 \text{ mA rms}$	Exposed accessible parts
110 to 130 V	Europe & Australia	$2 \text{ k}\Omega$	$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Antenna earth terminals
220 to 240 V		$50 \text{ k}\Omega$	$i \leq 0.7 \text{ mA peak}$ $i \leq 2 \text{ mA dc}$	Other terminals

Table 2 Leakage current specifications for each region

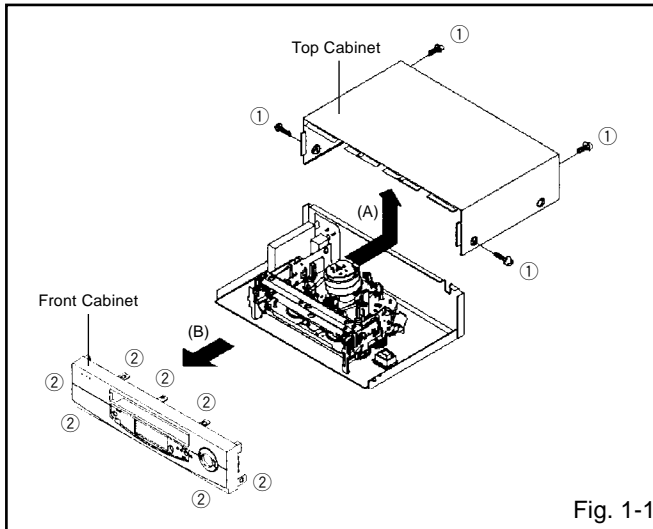
Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

DISASSEMBLY INSTRUCTIONS

1. REMOVAL OF MECHANICAL PARTS AND P.C. BOARDS

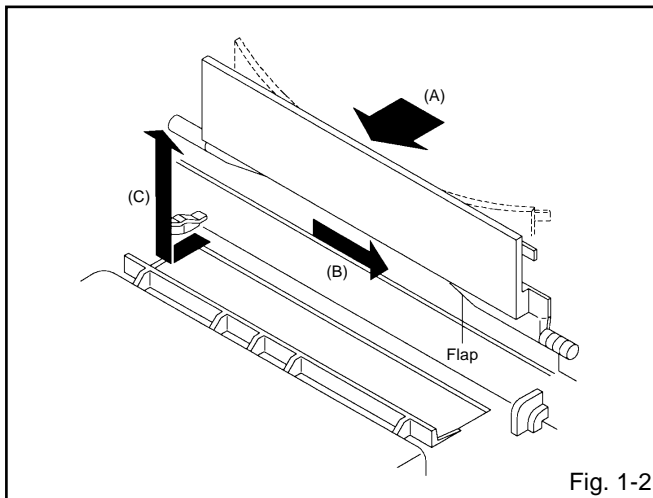
1-1: TOP CABINET AND FRONT CABINET (Refer to Fig. 2-1)

1. Remove the 4 screws ①.
2. Remove the Top Cabinet in the direction of arrow (A).
3. Unlock the 7 supports ②.
4. Remove the Front Cabinet in the direction of arrow (B).



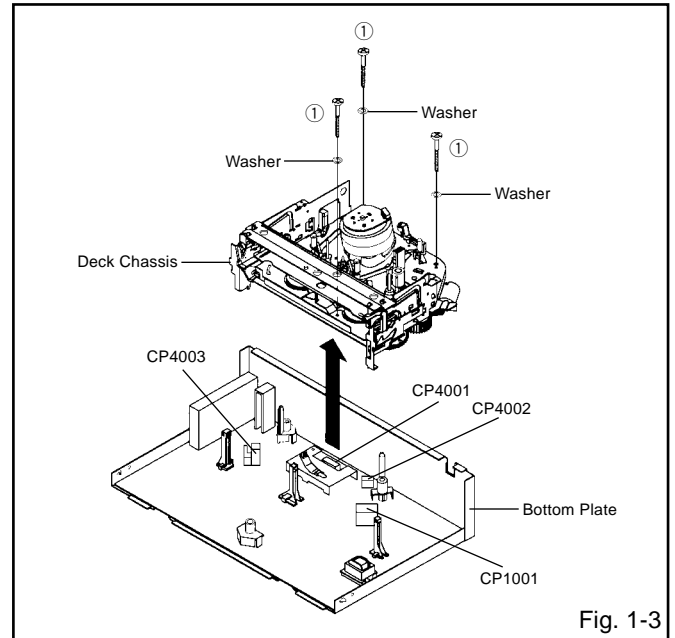
1-2: FLAP (Refer to Fig. 1-2)

1. Open Flap to 90° and flex in direction of arrow (A), at the same time slide in direction of arrow (B).
2. Then lift in direction of arrow (C).



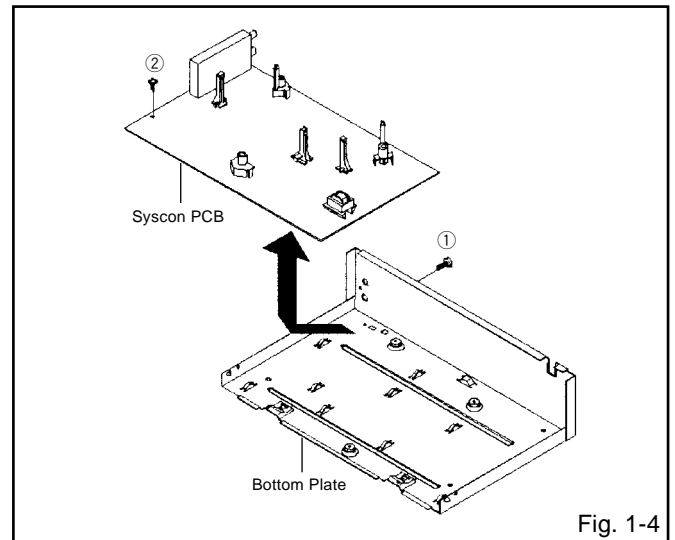
1-3: DECK CHASSIS (Refer to Fig. 1-3)

1. Remove the 3 screws ①.
2. Disconnect the following connectors: (CP1001, CP4001, CP4002 and CP4003).
3. Remove the Deck Chassis in the direction of arrow.



1-4: SYSCON PCB (Refer to Fig. 1-4)

1. Remove the screw ①.
2. Remove the screw ②.
3. Remove the Syscon PCB in the direction of arrow.



DISASSEMBLY INSTRUCTIONS

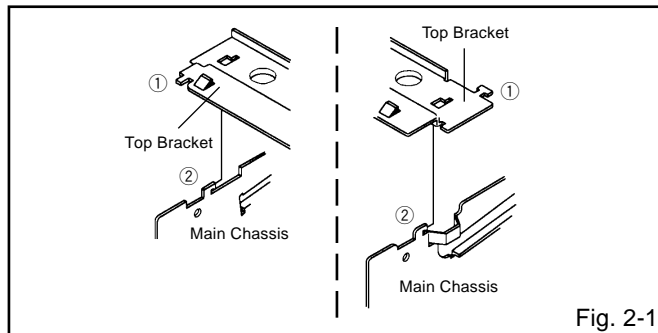
2. REMOVAL OF DECK PARTS

2-1: TOP BRACKET (Refer to Fig. 2-1)

1. Extend the 2 supports ①.
2. Slide the 2 supports ② and remove the Top Bracket.

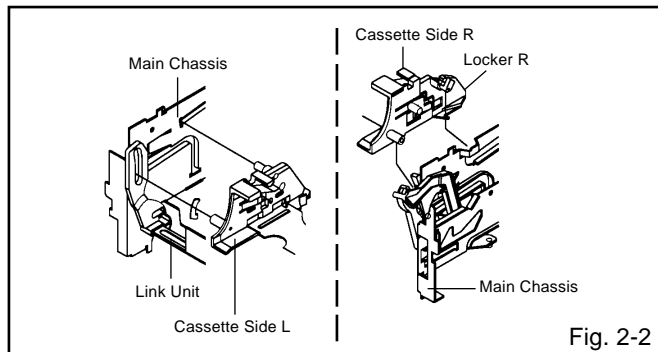
NOTE

1. After the installation of the Top Bracket, bend the support ① so that the Top Bracket is fixed.



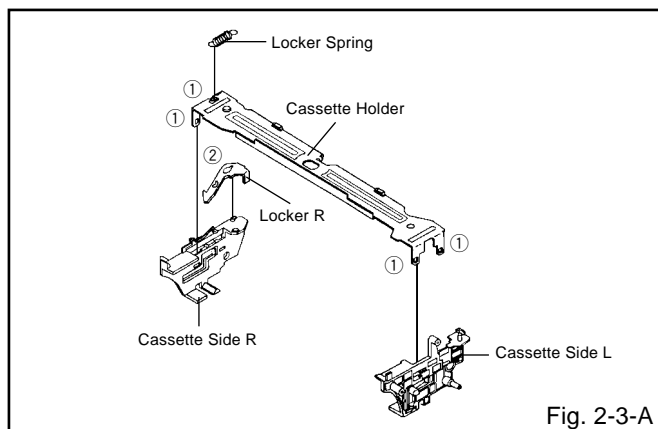
2-2: CASSETTE HOLDER ASS'Y (Refer to Fig. 2-2)

1. Move the Cassette Holder Ass'y to the front side.
2. Push the Locker R to remove the Cassette Side R.
3. Remove the Cassette Side L.



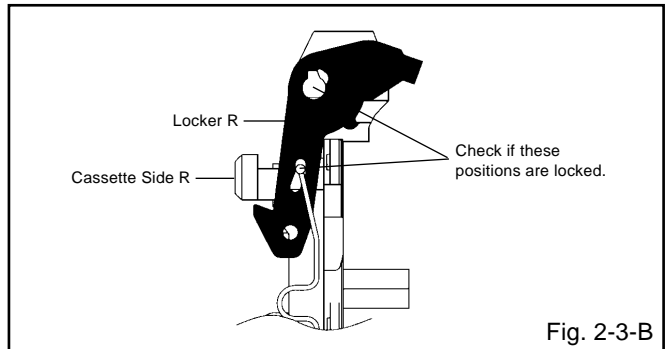
2-3: CASSETTE SIDE L/R (Refer to Fig. 2-3-A)

1. Remove the Locker Spring.
2. Unlock the 4 supports ① and then remove the Cassette Side L/R.
3. Unlock the support ② and then remove the Locker R.



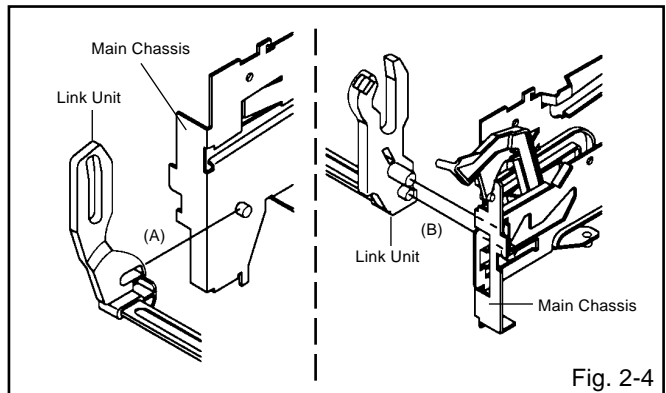
NOTE

1. In case of the Locker R installation, check if the two positions of Fig. 2-3-B are correctly locked.
2. When you install the Cassette Side R, be sure to move the Locker R after installing.



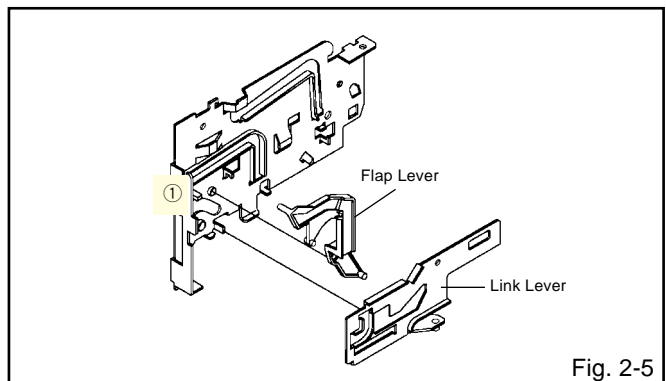
2-4: LINK UNIT (Refer to Fig. 2-4)

1. Set the Link Unit to the Eject position.
2. Unlock the support ①.
3. Remove the (A) side of the Link Unit first, then remove the (B) side.



2-5: LINK LEVER/FLAP LEVER (Refer to Fig. 2-5)

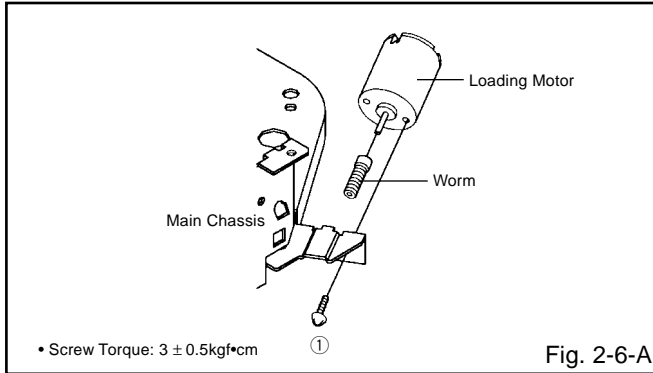
1. Extend the support ①.
2. Remove the Link Lever.
3. Remove the Flap Lever.



DISASSEMBLY INSTRUCTIONS

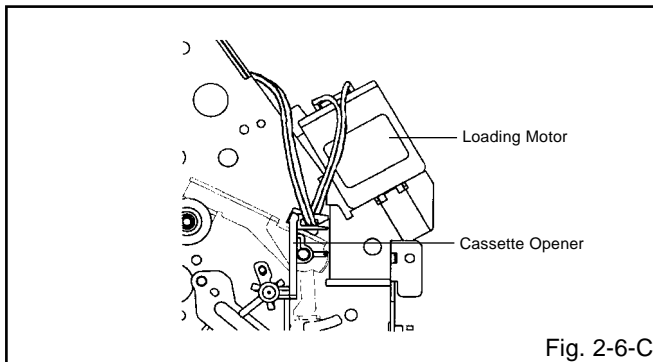
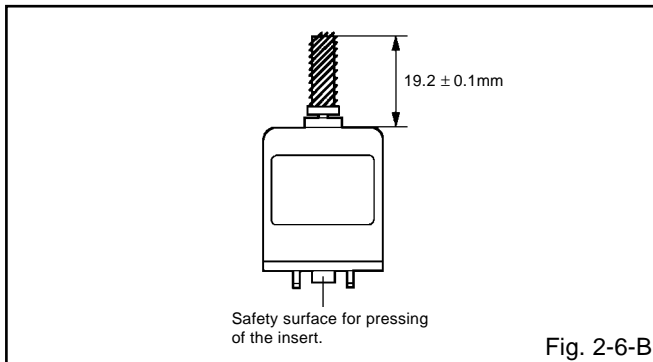
2-6: LOADING MOTOR/WORM (Refer to Fig. 2-6-A)

1. Remove the screw ①.
2. Remove the Loading Motor.
3. Remove the Worm.



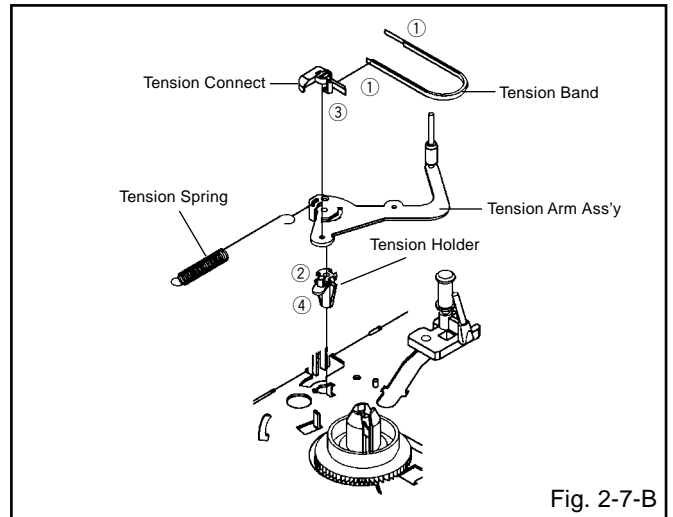
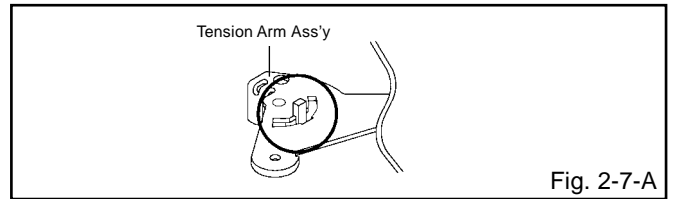
NOTE

1. In case of the Worm installation, check if the value of the Fig. 2-6-B is correct.
2. In case of the Loading Motor installation, hook the wire on the Cassette Opener as shown Fig. 2-6-C.



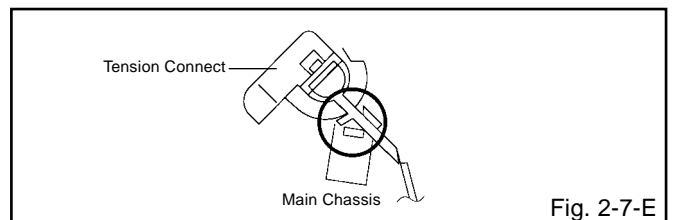
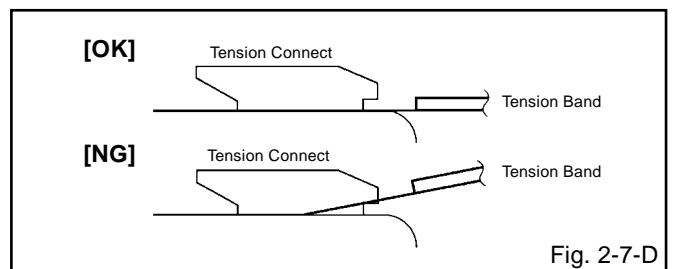
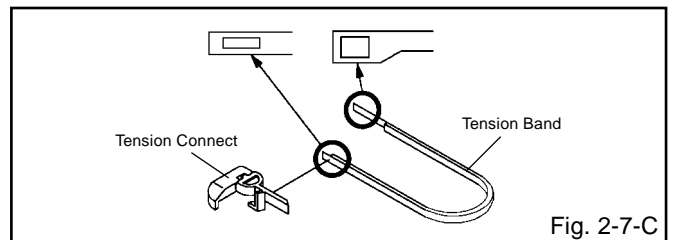
2-7: TENSION ASS'Y (Refer to Fig. 2-7-B)

1. Turn the Pinch Roller Cam clockwise so that the Tension Holder hook is set to the position of Fig. 2-7-A to move the Tension Arm Ass'y.
2. Remove the Tension Spring.
3. Unlock the 2 supports ① and remove the Tension Band.
4. Unlock the support ② and remove the Tension Arm Ass'y.
5. Unlock the support ③ and remove the Tension Connect.
6. Float the hook ④ and turn it clockwise then remove the Tension Holder.



NOTE

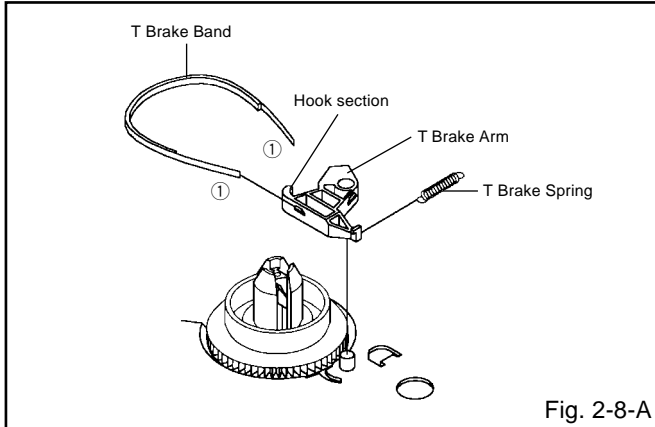
1. In case of the Tension Band installation, note the direction of the installation. (Refer to Fig. 2-7-C)
2. In case of the Tension Band installation, install correctly as Fig. 2-7-D.
3. In case of the Tension Connect installation, install as the circled section of Fig. 2-7-E.



DISASSEMBLY INSTRUCTIONS

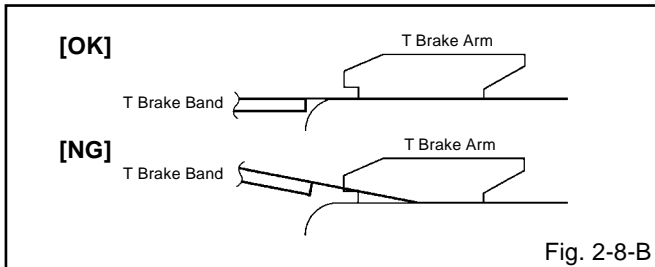
2-8: T BRAKE ARM/T BRAKE BAND (Refer to Fig. 2-8-A)

1. Remove the T Brake Spring.
2. Turn the T Brake Arm clockwise and bend the hook section to remove it.
3. Unlock the 2 supports ① and remove the T Brake Band.



NOTE

1. In case of the T Brake Band installation, install correctly as Fig. 2-8-B.

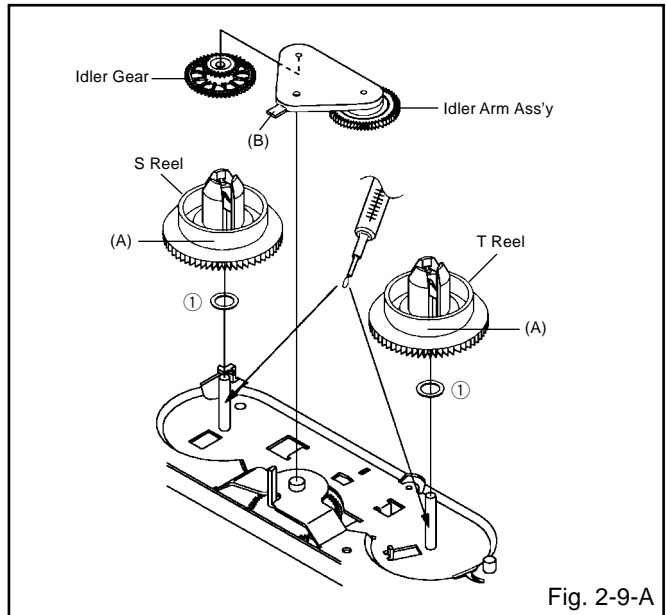


2-9: S REEL/T REEL/IDLER ARM ASS'Y/IDLER GEAR (Refer to Fig. 2-9-A)

1. Remove the S Reel and T Reel.
2. Remove the 2 Polyslider Washers ①.
3. Remove the Idler Arm Ass'y and Idler Gear.

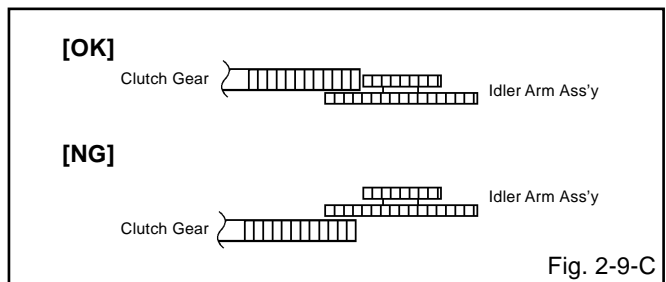
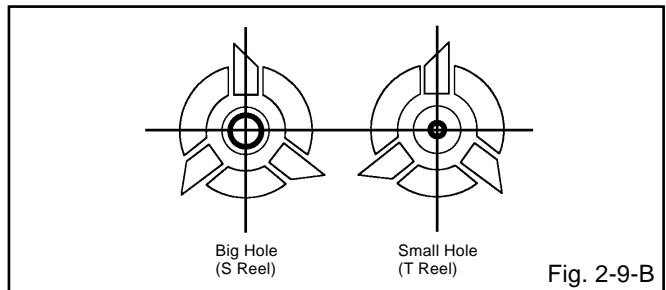
NOTE

1. Take care not to damage the gears of the S Reel and T Reel.
2. The Polyslider Washer may be remained on the back of the reel.
3. Take care not to damage the shaft.
4. Do not touch the section "A" of S Reel and T Reel. (Use gloves.) (Refer to Fig. 2-9-A) Do not adhere the stains on it.
5. When you install the reel, clean the shaft and grease it (FG-84M). (If you do not grease, noise may be heard in FF/REW mode.)
6. After installing the reel, adjust the height of the reel. (Refer to MECHANICAL ADJUSTMENT)



NOTE

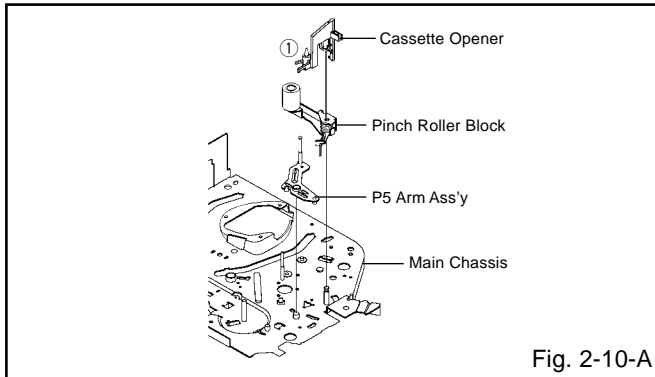
1. In case of the S Reel and T Reel installation, check if the correct parts are installed. (Refer to Fig. 2-9-B)
2. In case of the Idler Arm Ass'y installation, install correctly as Fig. 2-9-C. And also set it so that the section "B" of Fig. 2-9-A is placed under the Main Chassis tab.



DISASSEMBLY INSTRUCTIONS

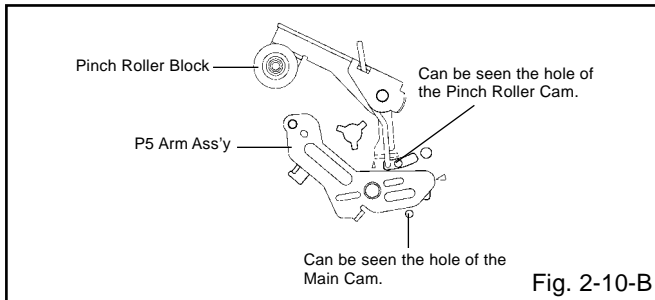
2-10: CASSETTE OPENER/PINCH ROLLER BLOCK/P5 ARM ASS'Y (Refer to Fig. 2-10-A)

1. Unlock the support ① and remove the Cassette Opener.
2. Remove the Pinch Roller Block and P5 Arm Ass'y.



NOTE

1. Do not touch the Pinch Roller. (Use gloves.)
2. In case of the Pinch Roller Block and the Pinch Roller Cam installation, install correctly as Fig. 2-10-B.

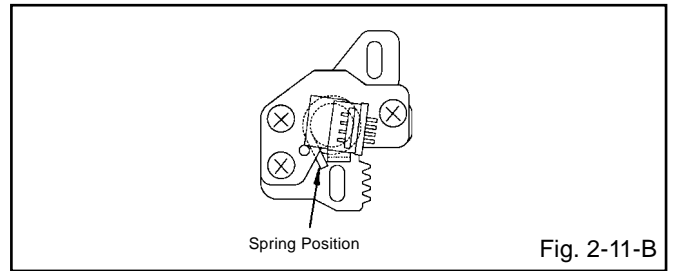
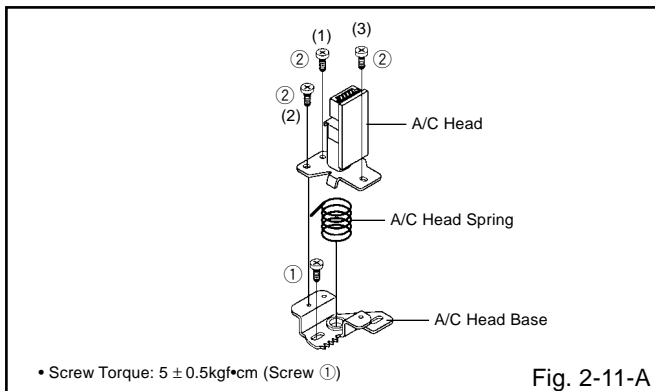


2-11: A/C HEAD (Refer to Fig. 2-11-A)

1. Remove the screw ①.
2. Remove the A/C Head Base.
3. Remove the 3 screws ②.
4. Remove the A/C Head and A/C Head Spring.

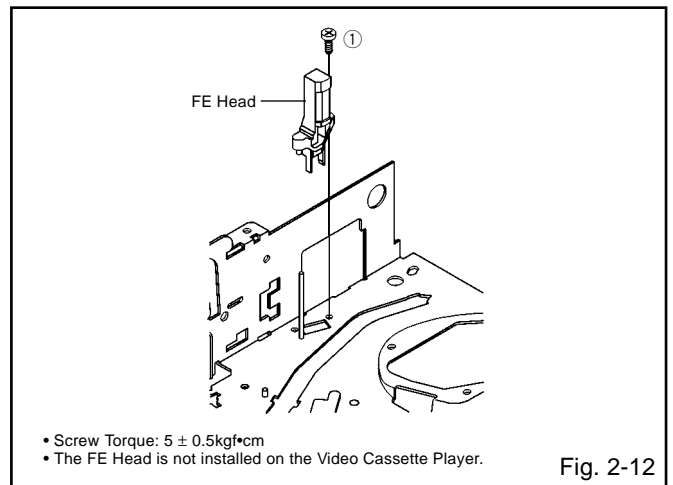
NOTE

1. Do not touch the A/C Head. (Use gloves.)
2. When you install the A/C Head Spring, install as shown in Fig. 2-11-B.
3. When you install the A/C Head, tighten the screw (1) first, then tighten the screw (2), finally tighten the screw (3).



2-12: FE HEAD (RECORDER ONLY) (Refer to Fig. 2-12)

1. Remove the screw ①.
2. Remove the FE Head.



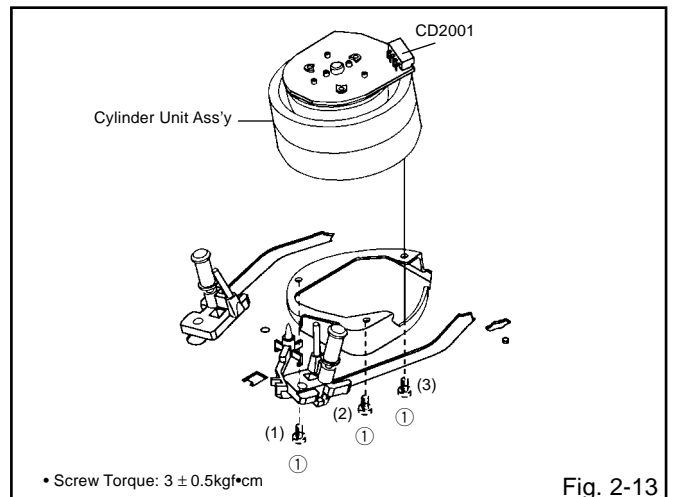
- Screw Torque: $5 \pm 0.5 \text{ kgf} \cdot \text{cm}$
- The FE Head is not installed on the Video Cassette Player.

2-13: AHC ASS'Y/CYLINDER UNIT ASS'Y (Refer to Fig. 2-13)

1. Disconnect the following connector: (CD2001)
2. Remove the 3 screws ①.
3. Remove the Cylinder Unit Ass'y.

NOTE

1. When you install the Cylinder Unit Ass'y, tighten the screws from (1) to (3) in order while pulling the Ass'y toward the left front direction.

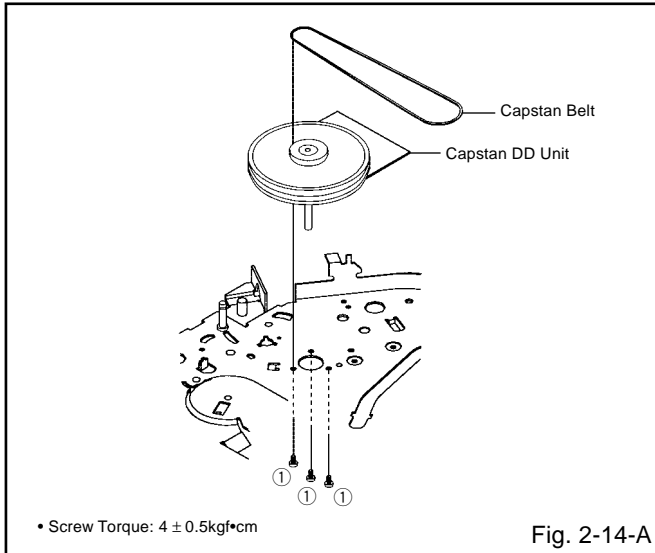


- Screw Torque: $3 \pm 0.5 \text{ kgf} \cdot \text{cm}$

DISASSEMBLY INSTRUCTIONS

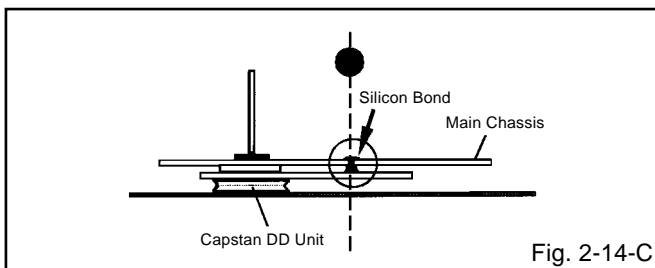
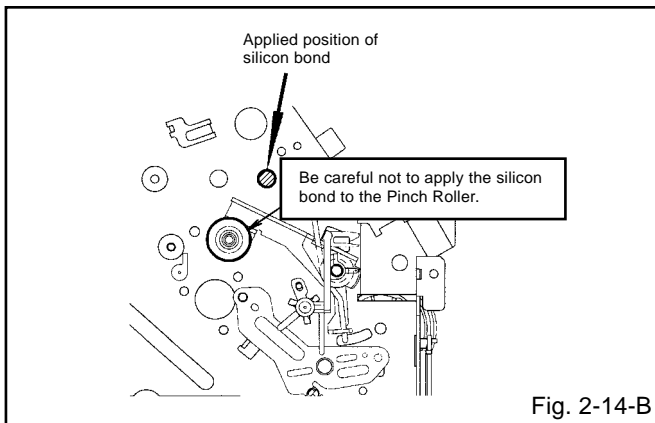
2-14: CAPSTAN DD UNIT (Refer to Fig. 2-14-A)

1. Remove the Capstan Belt.
2. Remove the 3 screws ①.
3. Remove the Capstan DD Unit.



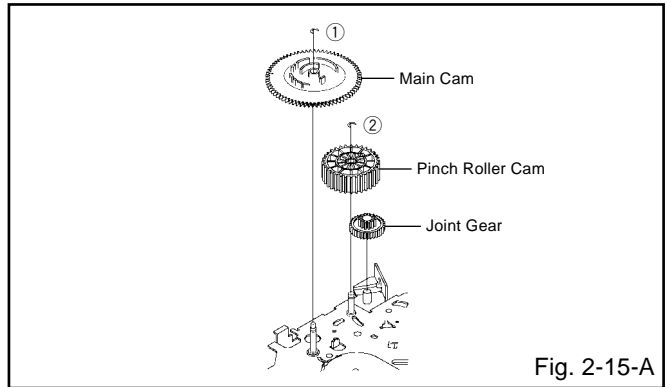
NOTE

1. In case of the Capstan DD Unit installation, apply the silicon bond (TSE3843-W) on the position Fig. 2-14-B correctly. (If no silicon bond applied, abnormal noise will be heard on the deck operation.)
(Refer to Fig. 2-14-B, C)



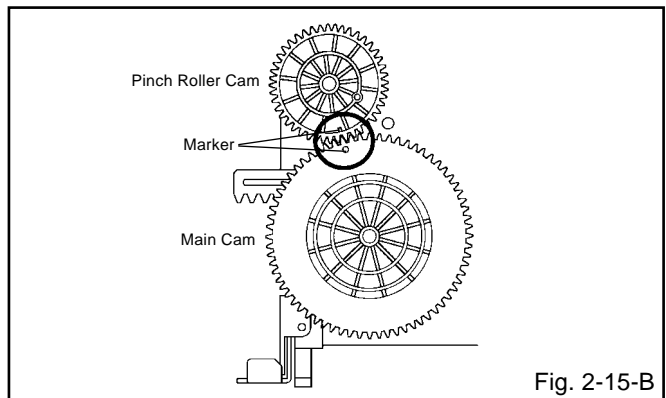
2-15: MAIN CAM/PINCH ROLLER CAM/JOINT GEAR (Refer to Fig. 2-15-A)

1. Remove the E-Ring ①, then remove the Main Cam.
2. Remove the E-Ring ②, then remove the Pinch Roller Cam and Joint Gear.



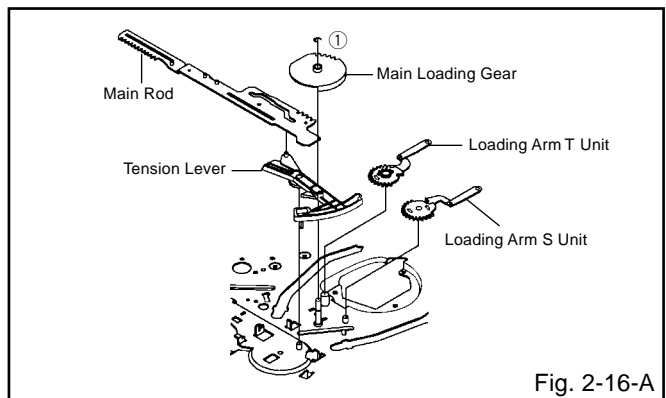
NOTE

1. In case of the Pinch Roller Cam and Main Cam installation, install them as the circled section of Fig. 2-15-B so that the each markers are met. (Refer to Fig. 2-15-B)
And also can be seen the Main Chassis hole through the Main Cam maker hole.



2-16: LOADING GEAR S/T UNIT (Refer to Fig. 2-16-A)

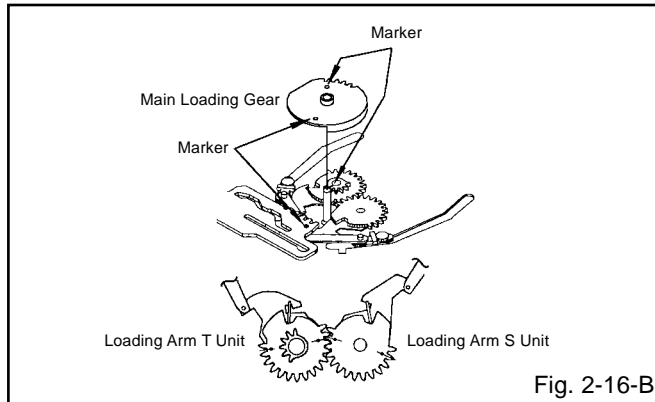
1. Remove the E-Ring ① and remove the Main Loading Gear.
2. Remove the Main Rod, Tension Lever, Loading Arm S Unit and Loading Arm T Unit.



DISASSEMBLY INSTRUCTIONS

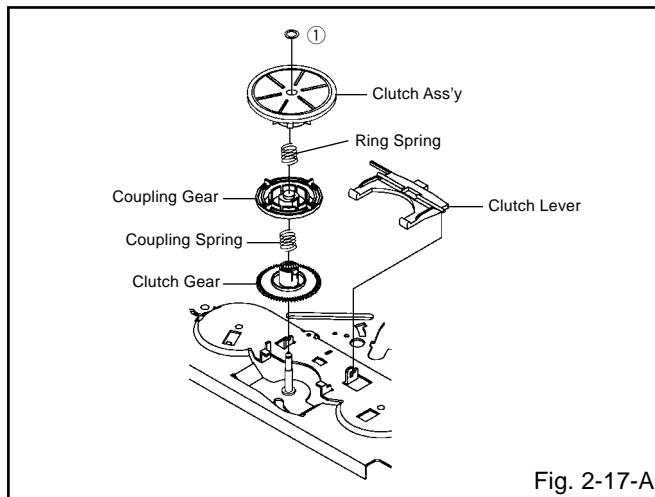
NOTE

1. When you install the Loading Arm S Unit, Loading Arm T Unit and Main Loading Gear, align each marker. (Refer to Fig. 2-16-B)



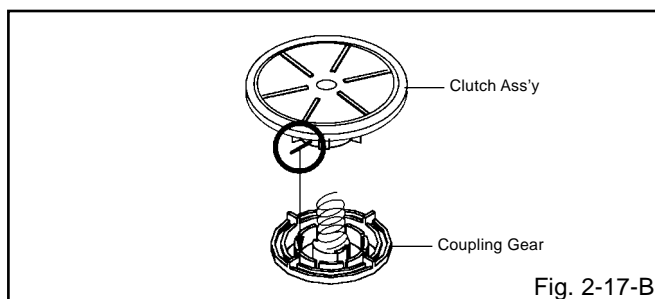
2-17: CLUTCH ASS'Y/RING SPRING/CLUTCH LEVER/ CLUTCH GEAR (Refer to Fig. 2-17-A)

1. Remove the Polyslider Washer ①.
2. Remove the Clutch Ass'y and Ring Spring.
3. Remove the Clutch Lever.
4. Remove the Coupling Gear, Coupling Spring and Clutch Gear.



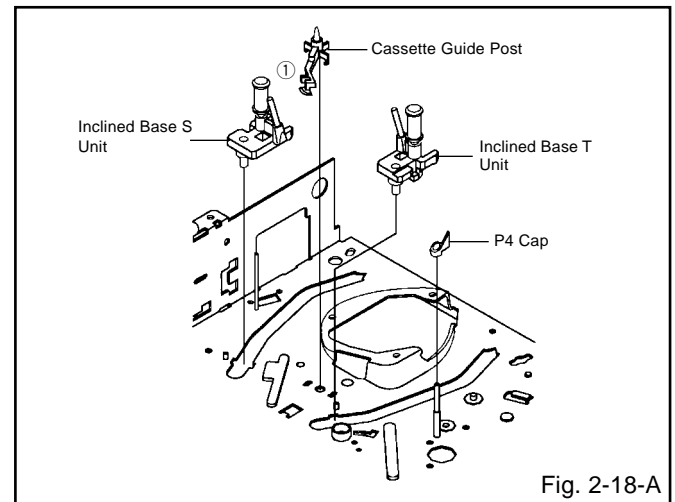
NOTE

1. In case of the Clutch Ass'y installation, install it with inserting the spring of the Clutch Ass'y into the dent of the Coupling Gear. (Refer to Fig. 2-17-B)



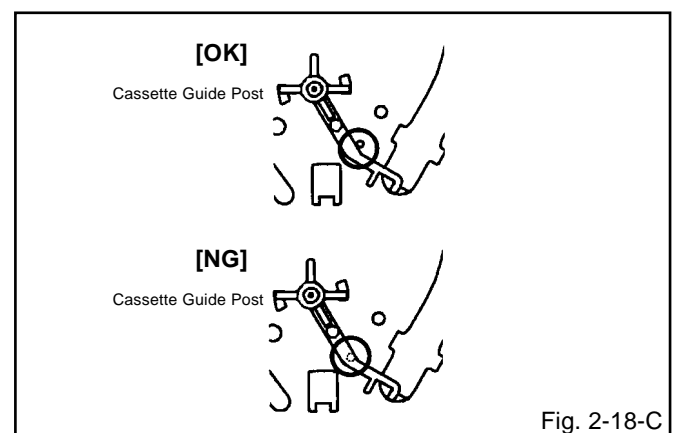
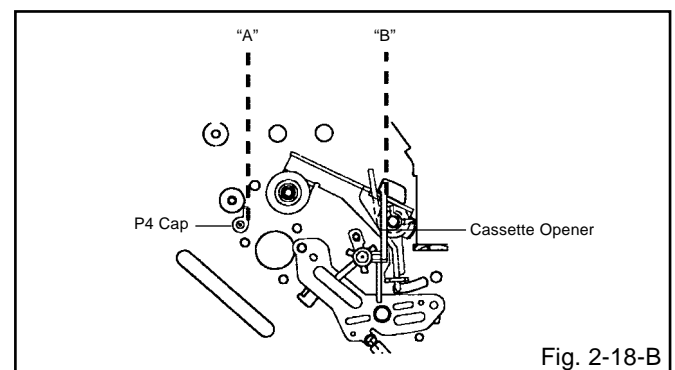
2-18: CASSETTE GUIDE POST/INCLINED BASE S/T UNIT/P4 CAP (Refer to Fig. 2-18-A)

1. Remove the P4 Cap.
2. Unlock the support ① and remove the Cassette Guide Post.
3. Remove the Inclined Base S Unit and Inclined Base T Unit.



NOTE

1. Do not touch the roller of Guide Roller.
2. In case of the P4 Cap installation, install it with parallel for "A" and "B" of Fig. 2-18-B.
3. In case of the Cassette Guide Post installation, install correctly as the circled section of Fig. 2-18-C.



DISASSEMBLY INSTRUCTIONS

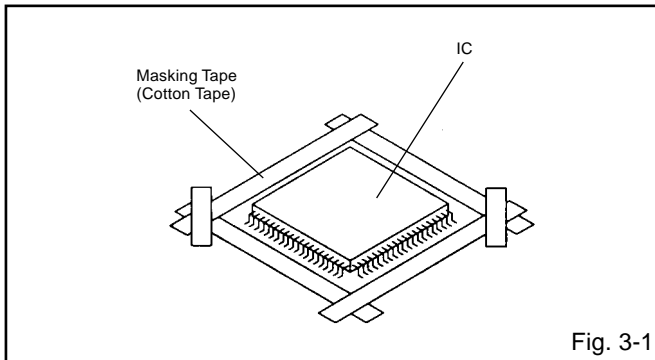
3. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC

REMOVAL

1. Put the Masking Tape (cotton tape) around the Flat Package IC to protect other parts from any damage. (Refer to Fig. 3-1.)

NOTE

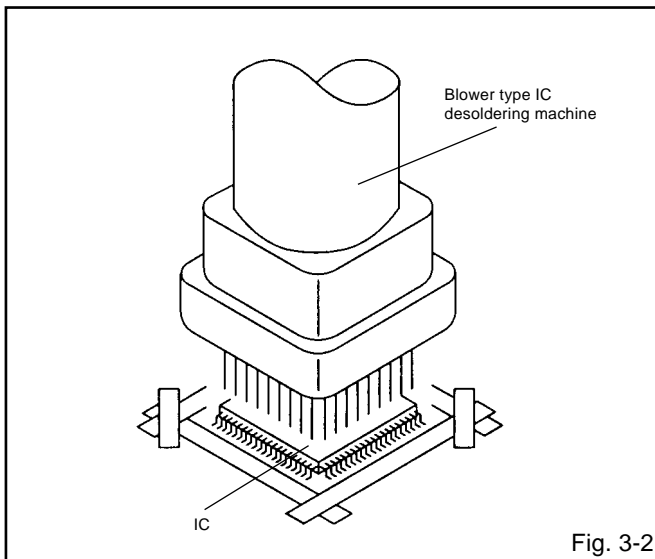
Masking is carried out on all the parts located within 10 mm distance from IC leads.



2. Heat the IC leads using a blower type IC desoldering machine. (Refer to Fig. 3-2.)

NOTE

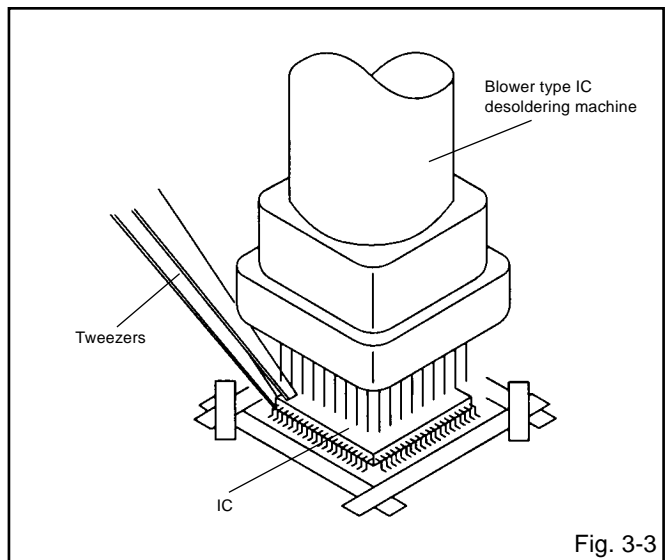
Do not add the rotating and the back and forth directions force on the IC, until IC can move back and forth easily after desoldering the IC leads completely.



3. When IC starts moving back and forth easily after desoldering completely, pickup the corner of the IC using a tweezers and remove the IC by moving with the IC desoldering machine. (Refer to Fig. 3-3.)

NOTE

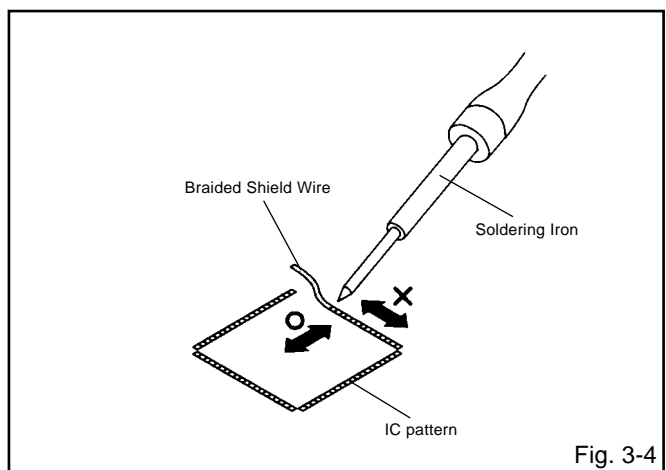
Some ICs on the PCB are affixed with glue, so be careful not to break or damage the foil of each IC leads or solder lands under the IC when removing it.



4. Peel off the Masking Tape.
5. Absorb the solder left on the pattern using the Braided Shield Wire. (Refer to Fig. 3-4.)

NOTE

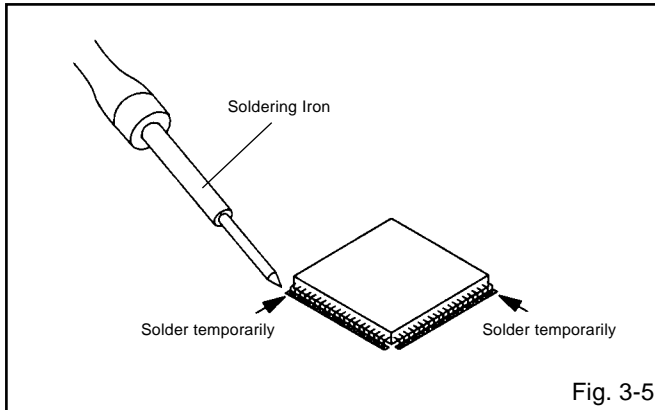
Do not move the Braided Shield Wire in the vertical direction towards the IC pattern.



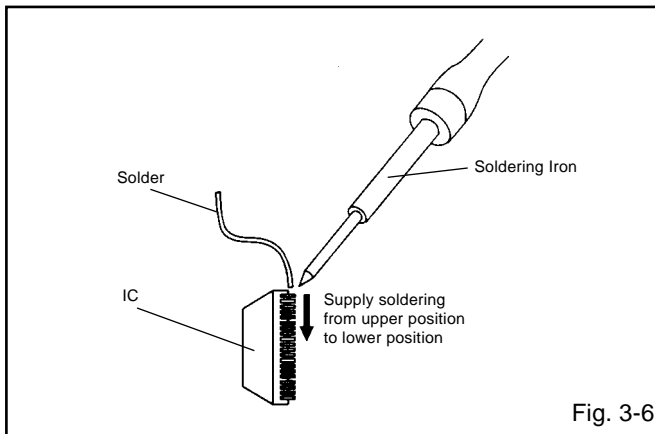
DISASSEMBLY INSTRUCTIONS

INSTALLATION

1. Take care of the polarity of new IC and then install the new IC fitting on the printed circuit pattern. Then solder each lead on the diagonal positions of IC temporarily. (Refer to Fig. 3-5.)



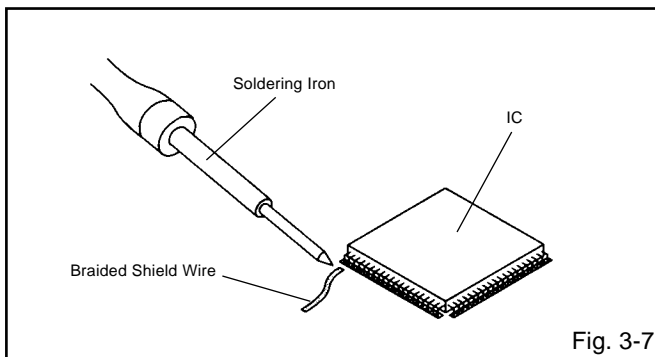
2. Supply the solder from the upper position of IC leads sliding to the lower position of the IC leads. (Refer to Fig. 3-6.)



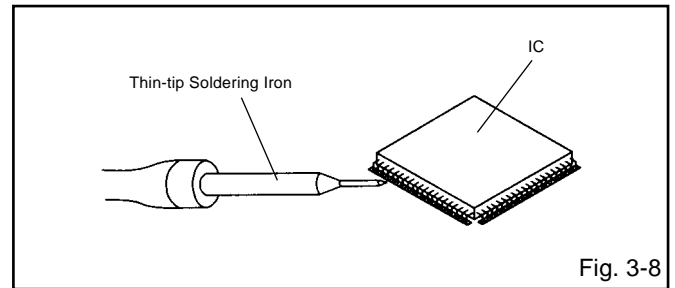
3. Absorb the solder left on the lead using the Braided Shield Wire. (Refer to Fig. 3-7.)

NOTE

Do not absorb the solder to excess.



4. When bridge-soldering between terminals and/or the soldering amount are not enough, resolder using a Thin-tip Soldering Iron. (Refer to Fig. 3-8.)



5. Finally, confirm the soldering status on four sides of the IC using a magnifying glass. Confirm that no abnormality is found on the soldering position and installation position of the parts around the IC. If some abnormality is found, correct by resoldering.

NOTE

When the IC leads are bent during soldering and/or repairing, do not repair the bending of leads. If the bending of leads are repaired, the pattern may be damaged. So, be always sure to replace the IC in this case.

KEY TO ABBREVIATIONS

A	A/C	: Audio/Control	H.SW	: Head Switch	
	ACC	: Automatic Color Control	Hz	: Hertz	
	AE	: Audio Erase	I	IC	: Integrated Circuit
	AFC	: Automatic Frequency Control		IF	: Intermediate Frequency
	AFT	: Automatic Fine Tuning		IND	: Indicator
	AFT DET	: Automatic Fine Tuning Detect		INV	: Inverter
	AGC	: Automatic Gain Control	K	KIL	: Killer
	AMP	: Amplifier	L	L	: Left
	ANT	: Antenna		LED	: Light Emitting Diode
	A.PB	: Audio Playback		LIMIT AMP	: Limiter Amplifier
	APC	: Automatic Phase Control		LM, LDM	: Loading Motor
	ASS'Y	: Assembly		LP	: Long Play
	AT	: All Time		L.P.F	: Low Pass Filter
	AUTO	: Automatic		LUMI.	: Luminance
	A/V	: Audio/Video	M	M	: Motor
B	BGP	: Burst Gate Pulse		MAX	: Maximum
	BOT	: Beginning of Tape		MINI	: Minimum
	BPF	: Bandpass Filter		MIX	: Mixer, mixing
	BRAKE SOL	: Brake Solenoid		MM	: Monostable Multivibrator
	BUFF	: Buffer		MOD	: Modulator, Modulation
	B/W	: Black and White		MPX	: Multiplexer, Multiplex
C	C	: Capacitance, Collector		MS SW	: Mecha State Switch
	CASE	: Cassette	N	NC	: Non Connection
	CAP	: Capstan		NR	: Noise Reduction
	CARR	: Carrier	O	OSC	: Oscillator
	CH	: Channel		OPE	: Operation
	CLK	: Clock	P	PB	: Playback
	CLOCK (SY-SE)	: Clock (Syscon to Servo)		PB CTL	: Playback Control
	COMB	: Combination, Comb Filter		PB-C	: Playback-Chrominance
	CONV	: Converter		PB-Y	: Playback-Luminance
	CPM	: Capstan Motor		PCB	: Printed Circuit Board
	CTL	: Control		P. CON	: Power Control
	CYL	: Cylinder		PD	: Phase Detector
	CYL-M	: Cylinder-Motor		PG	: Pulse Generator
	CYL SENS	: Cylinder-Sensor		P-P	: Peak-to Peak
D	DATA (SY-CE)	: Data (Syscon to Servo)	R	R	: Right
	dB	: Decibel		REC	: Recording
	DC	: Direct Current		REC-C	: Recording-Chrominance
	DD Unit	: Direct Drive Motor Unit		REC-Y	: Recording-Luminance
	DEMOD	: Demodulator		REEL BRK	: Reel Brake
	DET	: Detector		REEL S	: Reel Sensor
	DEV	: Deviation		REF	: Reference
E	E	: Emitter		REG	: Regulated, Regulator
	EF	: Emitter Follower		REW	: Rewind
	EMPH	: Emphasis		REV, RVS	: Reverse
	ENC	: Encoder		RF	: Radio Frequency
	ENV	: Envelope		RMC	: Remote Control
	EOT	: End of Tape		RY	: Relay
	EQ	: Equalizer	S	S. CLK	: Serial Clock
	EXT	: External		S. COM	: Sensor Common
F	F	: Fuse		S. DATA	: Serial Data
	FBC	: Feed Back Clamp		SEG	: Segment
	FE	: Full Erase		SEL	: Select, Selector
	FF	: Fast Forward, Flipflop		SENS	: Sensor
	FG	: Frequency Generator		SER	: Search Mode
	FL SW	: Front Loading Switch		SI	: Serial Input
	FM	: Frequency Modulation		SIF	: Sound Intermediate Frequency
	FSC	: Frequency Sub Carrier		SO	: Serial Output
	FWD	: Forward		SOL	: Solenoid
G	GEN	: Generator		SP	: Standard Play
	GND	: Ground		STB	: Serial Strobe
H	H.P.F	: High Pass Filter		SW	: Switch

KEY TO ABBREVIATIONS

S	SYNC	:	Synchronization
	SYNC SEP	:	Sync Separator, Separation
T	TR	:	Transistor
	TRAC	:	Tracking
	TRICK PB	:	Trick Playback
	TP	:	Test Point
U	UNREG	:	Unregulated
V	V	:	Volt
	VCO	:	Voltage Controlled Oscillator
	VIF	:	Video Intermediate Frequency
	VP	:	Vertical Pulse, Voltage Display
	V.PB	:	Video Playback
	VR	:	Variable Resistor
	V.REC	:	Video Recording
	VSF	:	Visual Search Fast Forward
	VSR	:	Visual Search Rewind
	VSS	:	Voltage Super Source
	V-SYNC	:	Vertical-Synchronization
	VT	:	Voltage Tuning
X	X'TAL	:	Crystal
Y	Y/C	:	Luminance/Chrominance

PREVENTIVE CHECKS AND SERVICE INTERVALS

The following standard table depends on environmental conditions and usage.

Parts replacing time does not mean the life span for individual parts.

Also, long term storage or misuse may cause transformation and aging of rubber parts.

The following list means standard hours, so the checking hours depends on the conditions.

Parts Name \ Time	500 hours	1,000 hours	1,500 hours	2,000 hours	2,500 hours	Notes
Audio Control Head	■	■	■	●	●	Clean those parts in contact with the tape.
Full Erase Head (Recorder only)	■	■	■	●	●	
Capstan Belt		●	●	●	●	Clean the rubber, and parts which the rubber touches.
Pinch Roller	■	●	●	●	●	
Capstan DD Unit		●	●	●	●	
Loading Motor					●	
Tension Band		●	●	●	●	
T Brake Band		●	●	●	●	
Clutch Ass'y		●	●	●	●	
Idler Arm Ass'y		●	●	●	●	
Capstan Shaft	■	■	■	■	■	Replace when rolling becomes abnormal.
Tape Running Guide Post	■	■	■	■	■	
Cylinder Unit	■	●	●	●	●	Clean the Head

■ : Clean

● : Check it and if necessary, replace it.

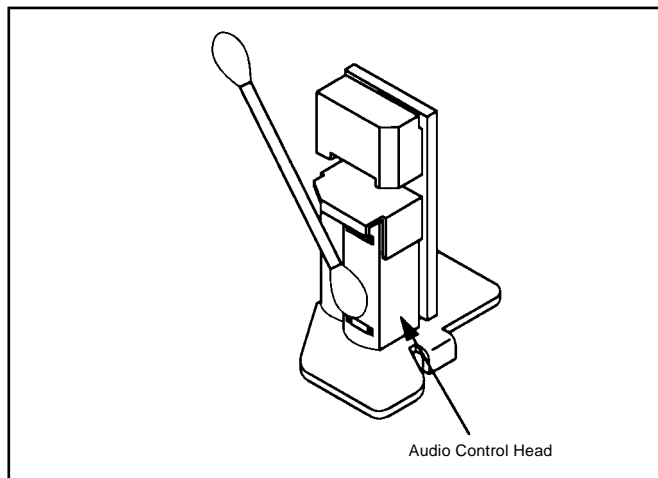
CLEANING

NOTE

After cleaning the heads with isopropyl alcohol, do not run a tape until the heads dry completely. If the heads are not completely dry and alcohol gets on the tape, damage may occur.

1. AUDIO CONTROL HEAD

Clean the Audio Control Head with the cotton stick soaked by alcohol. Clean the full erase head in the same manner. (Refer to the figure below.)



2. TAPE RUNNING SYSTEM

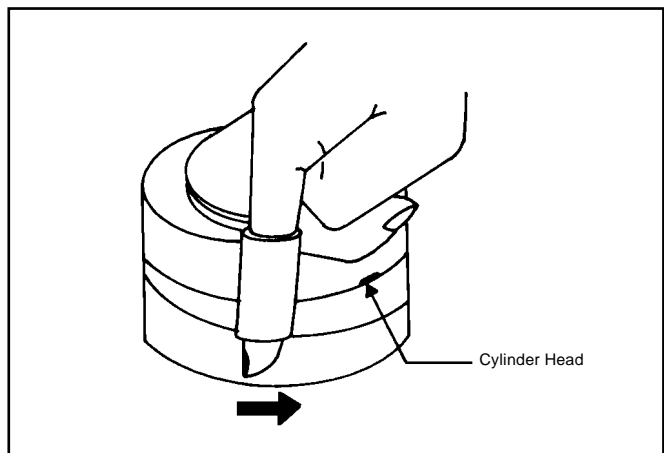
When cleaning the tape transport system, use the gauze moistened with isopropyl alcohol.

3. CYLINDER

Wrap a piece of chamois around your finger. Dip it in isopropyl alcohol. Hold it to the cylinder head softly. Turn the cylinder head counterclockwise to clean it (in the direction of the arrow). (Refer to the figure below.)

NOTE

Do not exert force against the cylinder head. Do not move the chamois upward or downward on the head. Use the chamois one by one.

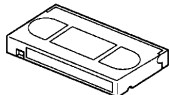
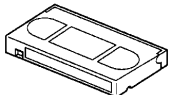
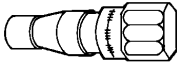

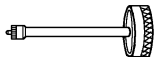
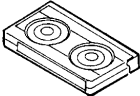
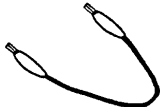


SERVICE MODE LIST

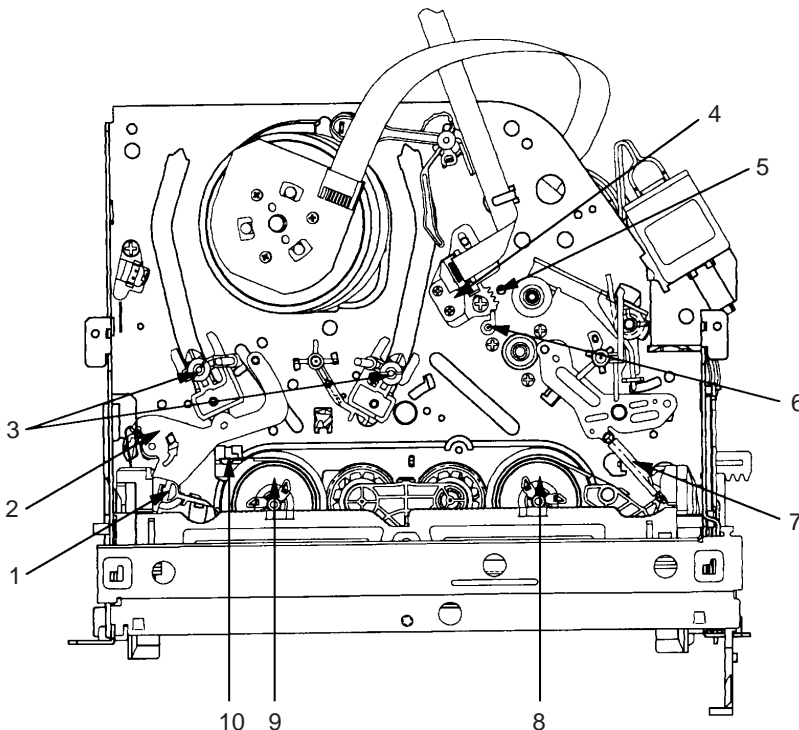
This unit provided with the following SERVICE MODES so you can repair, examine and adjust easily.

Method	Operations
Press the ATR button on the remote control for more than 2 seconds during PLAY.	Adjusting of the Tracking to the center position. Refer to the "MECHANICAL ADJUSTMENT" (GUIDE ROLLER) and "ELECTRICAL ADJUSTMENT" (SWITCHING POINT).
Make the short circuit between the test point of SERVICE and the GND.	The BOT, EOT, and the Reel Sensor do not work and the deck can be operated without a cassette tape. Refer to the "PREPARATION FOR SERVICING"

SERVICING FIXTURES AND TOOLS

VHS Alignment Tape MHP 	VHS Alignment Tape MHP-L 	Torque Gauge PUJ48075-2 	Roller Driver PTU94002-2 	X-JG153 X Value Adjustment Screwdriver 
Torque Tape PUJ48076-2 	Short Jumper 			

MECHANISM ADJUSTMENT PARTS LOCATION GUIDE

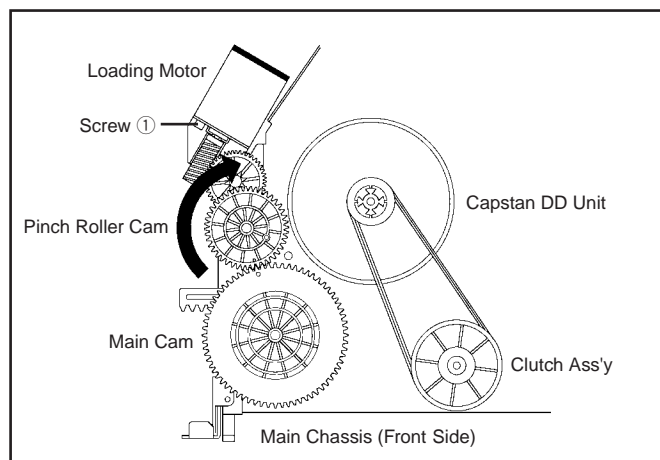


1. Tension Connect
2. Tension Arm
3. Guide Roller
4. Audio/Control Head
5. X value adjustment driver hole
6. P4 Post
7. T Brake Spring
8. T Reel
9. S Reel
10. Adjusting section for the Tension Arm position

MECHANICAL ADJUSTMENTS

TAPE REMOVAL METHOD AT NO POWER SUPPLY

1. Remove the Top Cabinet and Front Cabinet.
(Refer to item 1 of the DISASSEMBLY INSTRUCTIONS.)
2. Remove the screw ① of the Deck Chassis and remove the Loading Motor.
3. Rotate the Pinch Roller Cam in the direction of the arrow by hand to slacken the Video Tape.
4. Rotate the Clutch Ass'y either of the directions to wind the Video Tape in the Cassette Case.
5. Repeat the above step 3~4. Then take out the Video Cassette from the Deck Chassis.
Be careful not to scratch on the tape.



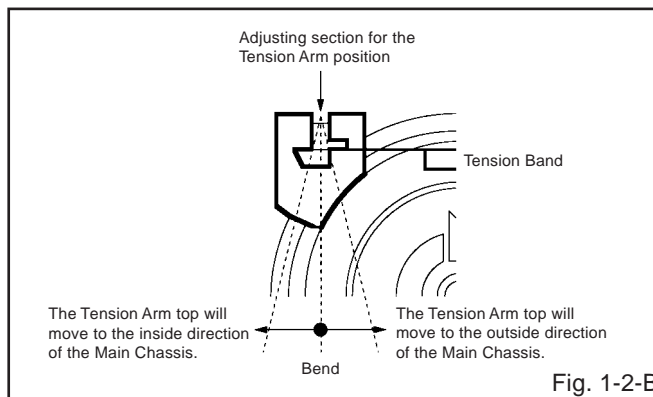
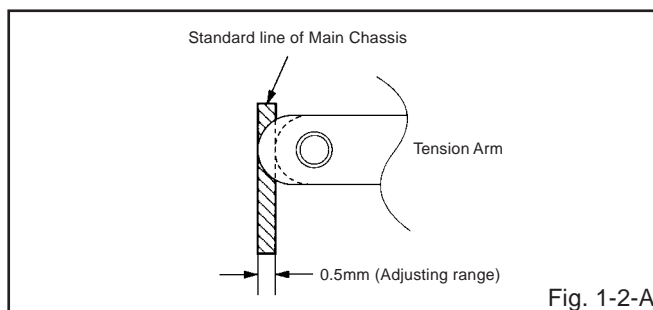
1. CONFIRMATION AND ADJUSTMENT

Read the following NOTES before starting work.

- Place an object which weighs between 450g~500g on the Cassette Tape to keep it steady when you want to make the tape run without the Cassette Holder. (Do not place an object which weighs over 500g.)

1-1: CONFIRMATION AND ADJUSTMENT OF TENSION POST POSITION

1. Set to the PLAY mode.
2. Adjust the adjusting section for the Tension Arm position so that the Tension Arm top is within the standard line of Main Chassis.
3. While turning the S Reel clockwise, confirm that the edge of the Tension Arm is located in the position described above.



1-2: CONFIRMATION OF PLAYBACK TORQUE AND BACK TENSION TORQUE DURING PLAYBACK

1. After confirmation and adjustment of Tension Post position (Refer to item 1-2), load the cassette type torque tape and set to the PLAY mode.
2. Confirm that the right meter of the torque tape indicates 50~90gf•cm during playback in SP mode.
3. Confirm that the left meter of the torque tape indicates 25~40gf•cm during playback in SP mode.

1-3: CONFIRMATION OF VSR TORQUE

1. Install the Torque Gauge on the S Reel. Set to the Picture Search (Rewind) mode. (Refer to Fig.1-4-B)
2. Then, confirm that it indicates 120~180gf•cm.

NOTE

Install the Torque Gauge on the reel disk firmly. Press the REW button to turn the reel disk.

MECHANICAL ADJUSTMENTS

1-4: CONFIRMATION OF REEL BRAKE TORQUE

(S Reel Brake) (Refer to Fig. 1-4-B)

1. Once set to the Fast Forward mode then set to the Stop mode. While, unplug the AC cord when the Pinch Roller Block is on the position of **Fig. 1-4-A**.
2. Move the Idler Ass'y from the S Reel.
3. Install the Torque Gauge on the S Reel. Turn the Torque Gauge clockwise.
4. Then, confirm that it indicates 60~100gf•cm.

(T Reel Brake) (Refer to Fig. 1-4-B)

1. Once set to the Fast Forward mode then set to the Stop mode. While, unplug the AC cord when the Pinch Roller Block is on the position of **Fig. 1-4-A**.
2. Move the Idler Ass'y from the T Reel.
3. Install the Torque Gauge on the T reel. Turn the Torque Gauge counterclockwise.
4. Then, confirm that it indicates 30~50gf•cm.

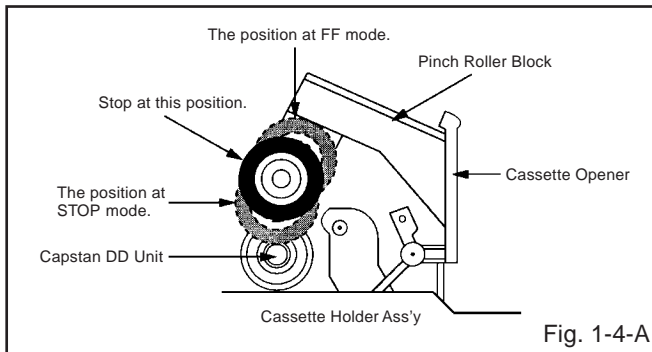


Fig. 1-4-A

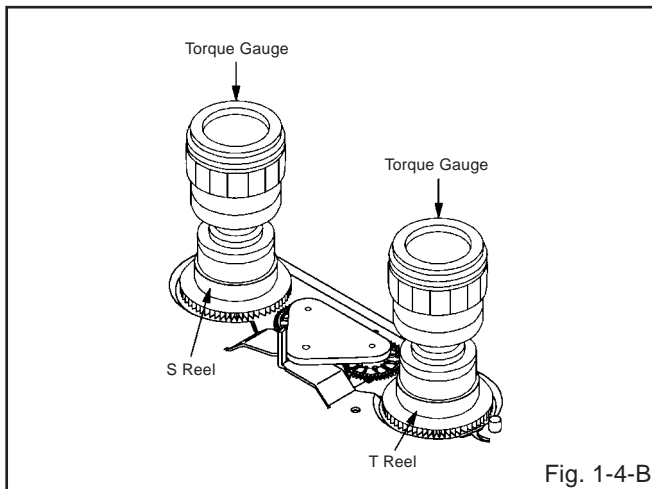


Fig. 1-4-B

NOTE

If the torque is out of the range, replace the following parts.

Check item	Replacement Part
1-3	Idler Ass'y/Clutch Ass'y
1-4	S Reel side: S Reel/Tension Band/Tension Connect/Tension Arm Ass'y T Reel side: T Reel/T Brake Band/T Brake Spring/T Brake Arm

2. CONFIRMATION AND ADJUSTMENT OF TAPE RUNNING MECHANISM

Tape Running Mechanism is adjusted precisely at the factory. Adjustment is not necessary as usual. When you replace the parts of the tape running mechanism because of long term usage or failure, the confirmation and adjustment are necessary.

2-1: GUIDE ROLLER

1. Playback the VHS Alignment Tape (**MHP**).
2. Connect CH-1 of the oscilloscope to **TP4001 (Envelope)** and CH-2 to **TP1002 (SW Pulse)**.
3. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
4. Trigger with SW Pulse and observe the envelope. (Refer to Fig. 2-1-A)
5. When observing the envelope, adjust the Roller Driver (**PTU94002-2**) slightly until the envelope will be flat. Even if you press the Tracking Button, adjust so that flatness is not moved so much. (Refer to Fig. 2-1-B)
6. Adjust so that the A : B ratio is better than 3 : 2 as shown in Fig. 2-1-C, even if you press the Tracking Button to move the envelope (The envelope waveform will begin to decrease when you press the Tracking Button).
7. Adjust the SWITCHING POINT during playback. (Refer to the **ELECTRICAL ADJUSTMENTS**)

NOTE

After adjustment, confirm and adjust A/C head. (Refer to item 2-2)

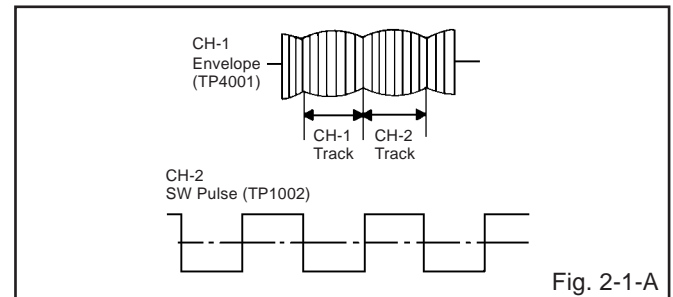


Fig. 2-1-A

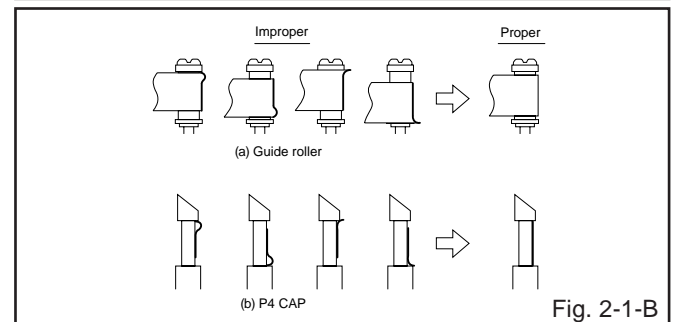


Fig. 2-1-B

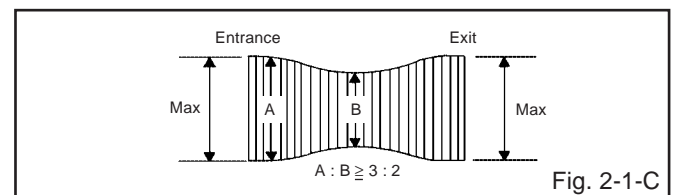


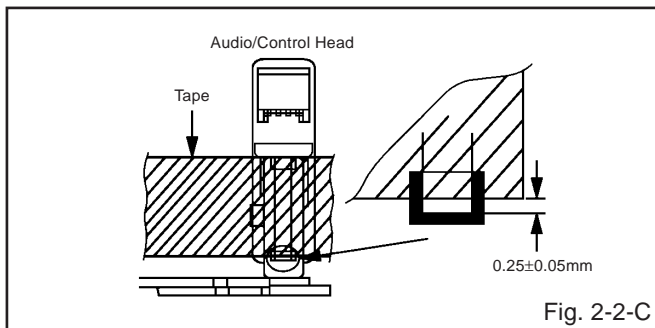
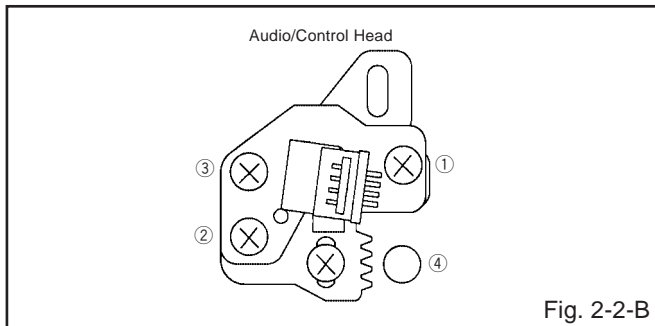
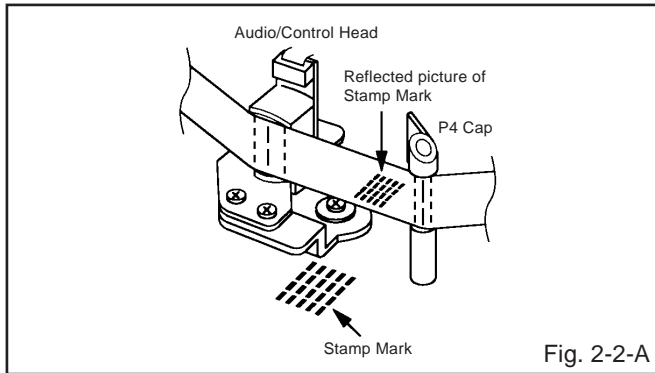
Fig. 2-1-C

MECHANICAL ADJUSTMENTS

2-2: CONFIRMATION AND ADJUSTMENT OF AUDIO/CONTROL HEAD

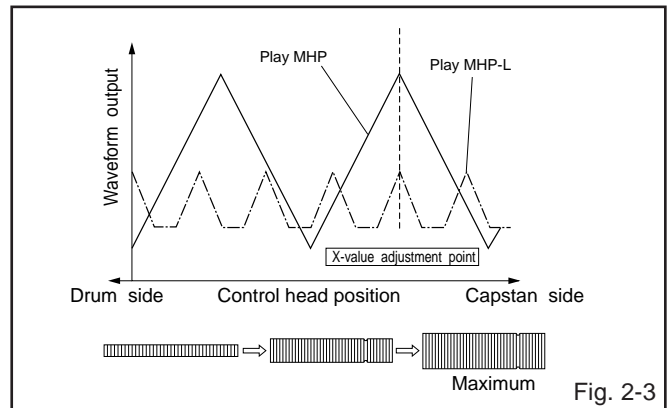
When the Tape Running Mechanism does not work well, adjust the following items.

1. Playback the VHS Alignment Tape (**MHP**).
2. Confirm that the reflected picture of stamp mark is appeared on the tape prior to P4 Post as shown in **Fig. 2-2-A**.
 - a) When the reflected picture is distorted, turn the screw ① clockwise until the distortion is disappeared.
 - b) When the reflected picture is not distorted, turn the screw ① counterclockwise until little distortion is appeared, then adjust the a).
3. Turn the screw ② to set the audio level to maximum.
4. Confirm that the bottom of the Audio/ Control Head and the bottom of the tape is shown in **Fig. 2-2-C**.
 - c) When the height is not correct, turn the screw ③ to adjust the height. Then, adjust the 1~3 again.



2-3: TAPE RUNNING ADJUSTMENT (X VALUE ADJUSTMENT)

1. Confirm and adjust the position of the Tension Post. (**Refer to item 1-1**)
2. Adjust the Guide Roller. (**Refer to item 2-1**)
3. Confirm and adjust the Audio/Control Head. (**Refer to item 2-2**)
7. Connect CH-1 of the oscilloscope to **TP1002**, CH-2 to **TP4001** and CH-3 to **HOT side of Audio Out Jack**.
5. Playback the VHS Alignment Tape (**MHP**).
6. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
7. Set the X Value adjustment driver (**X-JG153**) to the ④ of **Fig. 2-2-B**. At first, turn the Audio/Control Head position fully toward the capstan side. Then adjust X Value to turn it back gradually toward the cylinder side and stop on the second peak point position of the envelope.



8. Perform tracking operation and confirm the envelope is maximum on the tracking center position.
9. Playback the VHS Alignment Tape(**MHP-L**).
10. Perform tracking operation and confirm the envelope is maximum on the tracking center position. If envelope is not maximum, should be fine-tune the X-VALUE.

ELECTRICAL ADJUSTMENTS

Read and perform this adjustment when repairing the circuits or replacing electrical parts or PCB assemblies.

1. BASIC ADJUSTMENT

1-1: SWITCHING POINT

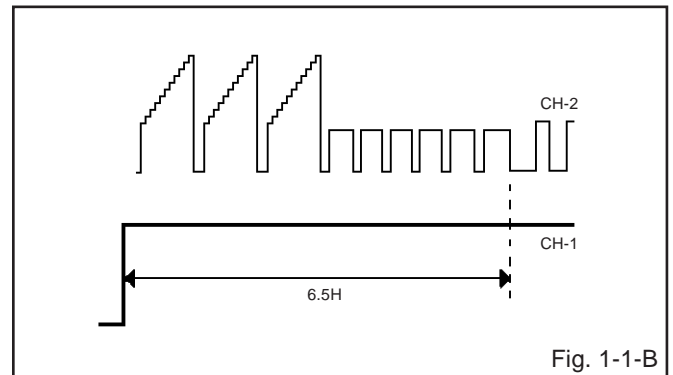
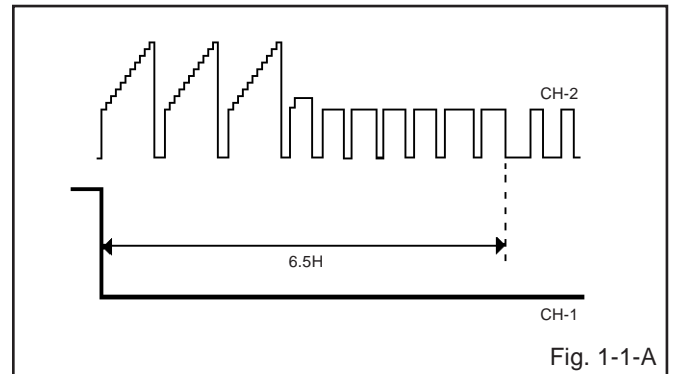
CONDITIONS

MODE-PLAYBACK

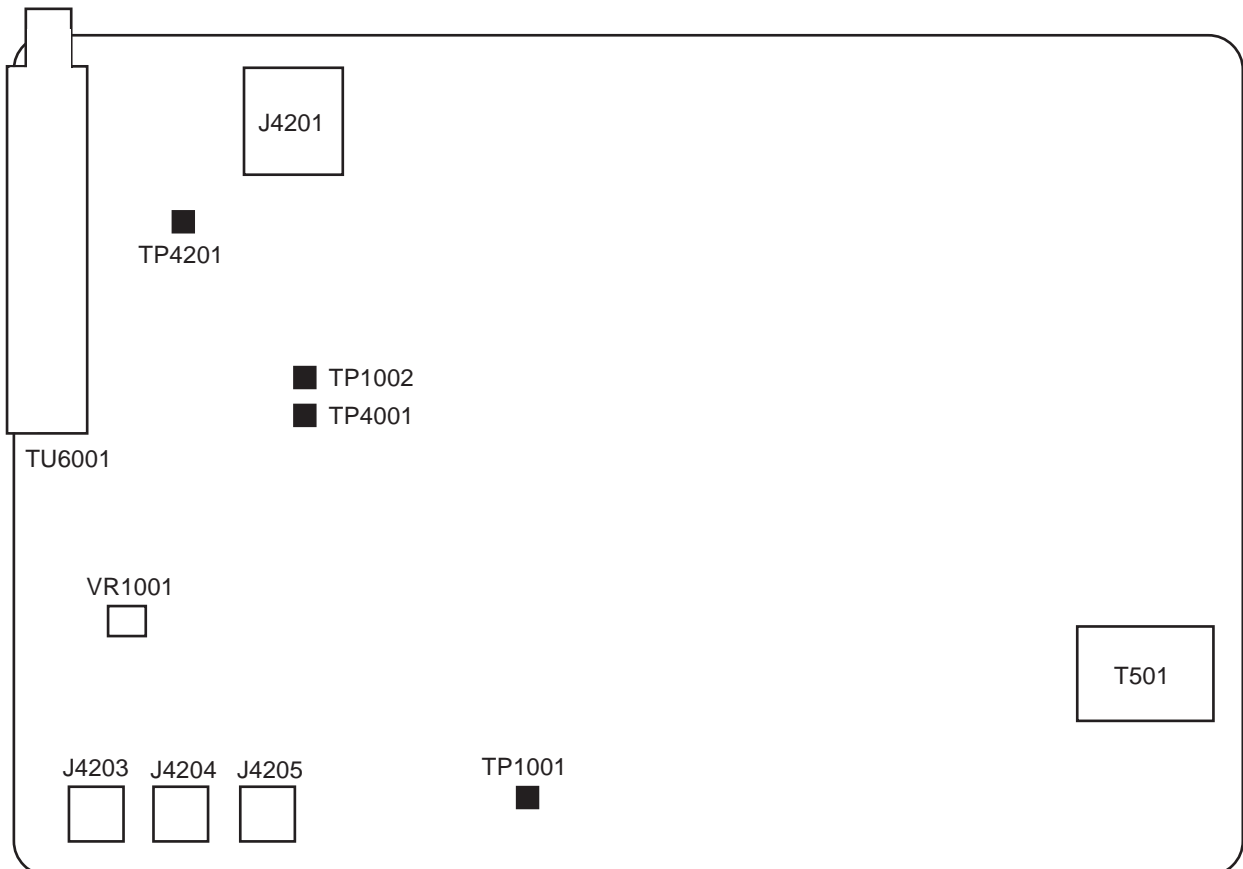
Input Signal-Alignment Tape (**MHP**)

INSTRUCTIONS

1. Connect CH-1 on the oscilloscope to **TP1002** and CH-2 to **TP4201**.
2. Playback the alignment tape. (**MHP**)
3. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
4. Adjust the **VR1001** until the waveform of the oscilloscope measures $6.5 \pm 0.5(H)$ at both leading and trailing edges. (**Refer to Fig. 1-1-A, B**)



ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE



SYSCON PCB

IC DESCRIPTIONS

SYSCON PCB OEC0115A (IC1001)

No.	PORT	PIN NAME	I/O	DESCRIPRION
1	P10	SEG8	OUT	LEM(LED Module) control terminal.
2	AVSS	AVSS	-	Ground.
3	P07/AN7	BOT-H	IN	Tape start sensor input signal.
4	P06/AN6	HI-FI_ENV	IN	Input terminal of HiFi RF envelope.
5	P05/AN5	PGMM	IN	Input voltage from Variable Resistor of PG SHIFTER.
6	P04/AN4	MS_SEN-B	IN	Input terminal of mecha state sensor.
7	P03/AN3	MS_SEN-A	IN	
8	P02/AN2	KEY-B	IN	Main unit key input.
9	P01/AN1	KEY-A	IN	
10	P00/AN0	STEREO_SEL	IN	Input terminal for the judgement of voice reception condition.
11	AN-B	AFT-S_CURVE	IN	AFT S CURVE input for tuner.
12	AN-A	EOT-H	IN	Tape end sensor input signal.
13	AN9	SLOW OFFSET	IN	Terminal for the offset of Slow.
14	AN8	ENV_DET	IN	Input terminal of video RF envelope.
15	AVDD	AVDD	-	ON/OFF control Micon AD section.
16	/RESET	/RESET	IN	RESET will be done when the voltage goes to HIGH after the reset signal.
17	P74	GND	IN	Ground.
18	P73	IIC CLK	OUT	CLOCK terminal for IIC BUS communication.
19	P72	IIC DATA	OUT/IN	DATA terminal for IIC BUS communication.
20	P71	Y/C CS	OUT	Control terminal for Y/C selection.
21	P70	CAP_FULL	OUT	Output the HIGH during the acceleration force of capstan motor at SLOW mode.
22	VDD	VDD	-	Power of CPU.
23	AUDIO_FF	HI-FI H.SW	OUT	Output terminal of HI-FI Head SW.
24	VIDEO_FF	H.SW	OUT	Output terminal of Video Head SW.
25	CAP_PWM	CAP_PWM	OUT	PWM output of Capastan control.
26	DRUM_PWM	DRUM_PWM	OUT	PWM output of Cylinder control.
27	V-PULSE	DUMMY_V-SYNC	OUT	Virtual V Pulse output.
28	C.ROTARY	C.ROTARY	OUT	Color Rotary Control output.
29	H.AMP.SW	H.AMP.SW	OUT	Switching output of Head Amp SW.
30	COMP	COMP	IN	Comparison results input of Playback Envelope level on SP/LP heads (4 heads).
31	CTL-H(+)	CTL-H(+)	-	Input and output terminal of Control Head.
32	CTL-H(-)	CTL-H(-)	-	
33	SV VSS	SV VSS	-	Ground.
34	CTL_GAIN_SW	CTL_GAIN_SW	-	Output terminal for gain.
35	CTL_AMP(-)	CTL_AMP(-)	-	Output terminal for amp control.
36	CTL_BIAS	CTL_BIAS	-	Output terminal for bias.

IC DESCRIPTIONS

SYSCON PCB OEC0115A (IC1001)

No.	PORT	PIN NAME	I/O	DESCRIPTION
37	CTL_AMP	CTL_AMP	OUT	Output terminal for amp out.
38	DFG	DFG	IN	Input terminal for DRUM FG signal detection.
39	DPG	DPG	IN	Input terminal for DRUM PG signal detection.
40	CFG	CFG	IN	Input terminal for CAPSTAN FG signal detection.
41	SV VDD	VCC(SV)	-	+ 5V
42	OSD VDD	VCC(OSD)	-	+ 5V
43	CV_IN	CV_IN	IN	Composite Video input terminal.
44	V_REF	V_REF	OUT	Capacity connection for Sync Chip Clamp composite Video input.
45	CV_OUT	CV_OUT	OUT	Composite Video output.
46	CHR_BIAS	CHR_BIAS	IN	Brightness(Brilliant)level setting of OSD character Indications.
47	AFC_LPF	AFC_LPF	IN	Condenser connection for AFC LPF.
48	AFC_OSC	AFC_OSC	IN	Condenser connection for AFC OSC.
49	OSD_VSS	OSD_VSS	-	Ground.
50	DOSC_IN	DOSC_IN	IN	Dot Clock pulse(Oscillator)of OSD character indications.
51	DOSC_OUT	DOSC_OUT	OUT	Dot Clock pulse(Oscillator)of OSD character indications.
52	4FSC_OUT	4FSC_OUT	OUT	4 FSC pulse.
53	4FSC_IN	4FSC_IN	IN	4 FSC pulse.
54	SYNC	SYNC	IN	Input terminal for composite SYNC.
55	P67/Vsync	POWER_OFF_L	OUT	4FSC_MUTE control output of power off.
56	P66/YC01	V_REC_ST-H	OUT	On control of A/V recording(Whole width erase) circuit.
57	P65/YE01	2/4 HEAD	IN	The initial settings of 2 head or 4 head.
58	P64/YC02	TUNER-L	OUT	Output low at tuner and output high at external input/play.
59	P63/YE02	A.MUTE-H	OUT	Mute signal of audio mute.
60	P57	CAP_FWD-H	OUT	Capstan forward and backward command.
61	P56	CENTER LED	OUT	The CENTER LED light-up/put-off control output.
62	P55	RF CH OUT	OUT	Switching of a RF channel.
63	P54	LDM CTL	OUT	Loading motor control terminal.
64	P53/TM0	POWER ON-H	OUT	For control the user power switch ON/OFF.
65	P52/PWM2	CYL_SPEED_UP	OUT	Output terminal for correct cylinder during SLOW.
66	P51/PWM1	CAP_LIMIT	OUT	Switch the maximum output current of the Capstan Motor.
67	P50/BUZZ	SERVICE	IN	Input terminal for Service Mode.
68	TEST	TEST	IN	Ground.
69	X2	X2	OUT	Subclock pulse(32.768KHz)
70	X1	X1	IN	
71	DVSS	VSS	-	Ground.
72	OSC1	OSC1	IN	Connect the main crystal(10MHz)
73	OSC2	OSC2	OUT	
74	P47	GND	-	GND
75	P46	GRID5	OUT	LEM(LED Module) control terminal.

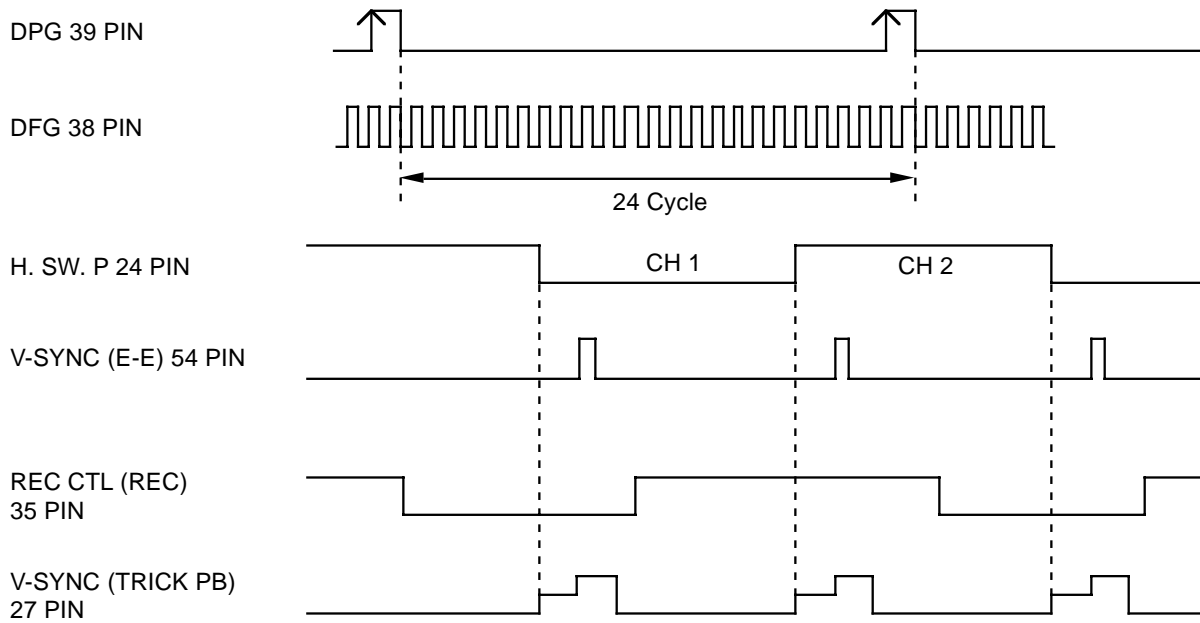
IC DESCRIPTIONS

SYSCON PCB OEC0115A (IC1001)

No.	PORT	PIN NAME	I/O	DESCRIPRION
76	P45	GRID4	OUT	LEM(LED Module) control terminal.
77	P44	GRID3	OUT	LEM(LED Module) control terminal.
78	P43	GRID2	OUT	LEM(LED Module) control terminal.
79	P42	GRID1	OUT	LEM(LED Module) control terminal.
80	P41	TAB SW	IN	Input terminal for judge the tape if it has TAB or not.
81	P40	POWER_ON_L	OUT	For control the user power switch ON/OFF.
82	P37/IC	REM_IN	IN	Receive the remote control signal.
83	P36/NM1	CFG IN2	IN	Input terminal for CAPSTAN FG signal detection.
84	P35/IRQ5	VCR-H	OUT	ON/OFF control of RF Modulator.
85	P34/IRQ4	SEG9	OUT	LEM(LED Module) control terminal.
86	P33/IRQ3	SEG10	OUT	LEM(LED Module) control terminal.
87	P32/IRQ2	REEL-T	IN	Input terminal of reel sensor take up.
88	P31/IRQ1	NC	OUT	Not used.
89	P30/IRQ0	POWER_FAIL	IN	Input terminal of Power fail signal.
90	P23	AC/32KHz	IN	The initial setting that is whether it does with subclock pulse or it does the counting of the clock with an AC pulse
91	P22	SP-L	OUT	Tape speed SP mode at the time of LOW.
92	P21	EP-L	OUT	Tape speed EP mode at the time of LOW.
93	P20	AUDIO_OUT_MUTE	OUT	L for at AUDIO MUTE and POWER OFF. H for except above case.
94	P17/PWM14	SEG1TV/CATV	OUT/IN	LEM(LED Module) control terminal.And this terminal uses it for the initial setting of TV/CATV mode.
95	P16/SCK2	SEG2 LANG SEL	OUT/IN	LEM(LED Module) control terminal.And this terminal uses it for the initial setting of language select.
96	P15/SI1	SEG3 INDEX	OUT/IN	LEM(LED Module) control terminal.And this terminal uses it for the initial setting of INDEX on/off.
97	P14/S01	SEG4	OUT	LEM(LED Module) control terminal.
98	P13/SCK2	SEG5	OUT	LEM(LED Module) control terminal.
99	P12/SI2	SEG6	OUT	LEM(LED Module) control terminal.
100	P11/SO2	SEG7	OUT	LEM(LED Module) control terminal.

SERVO TIMING CHART

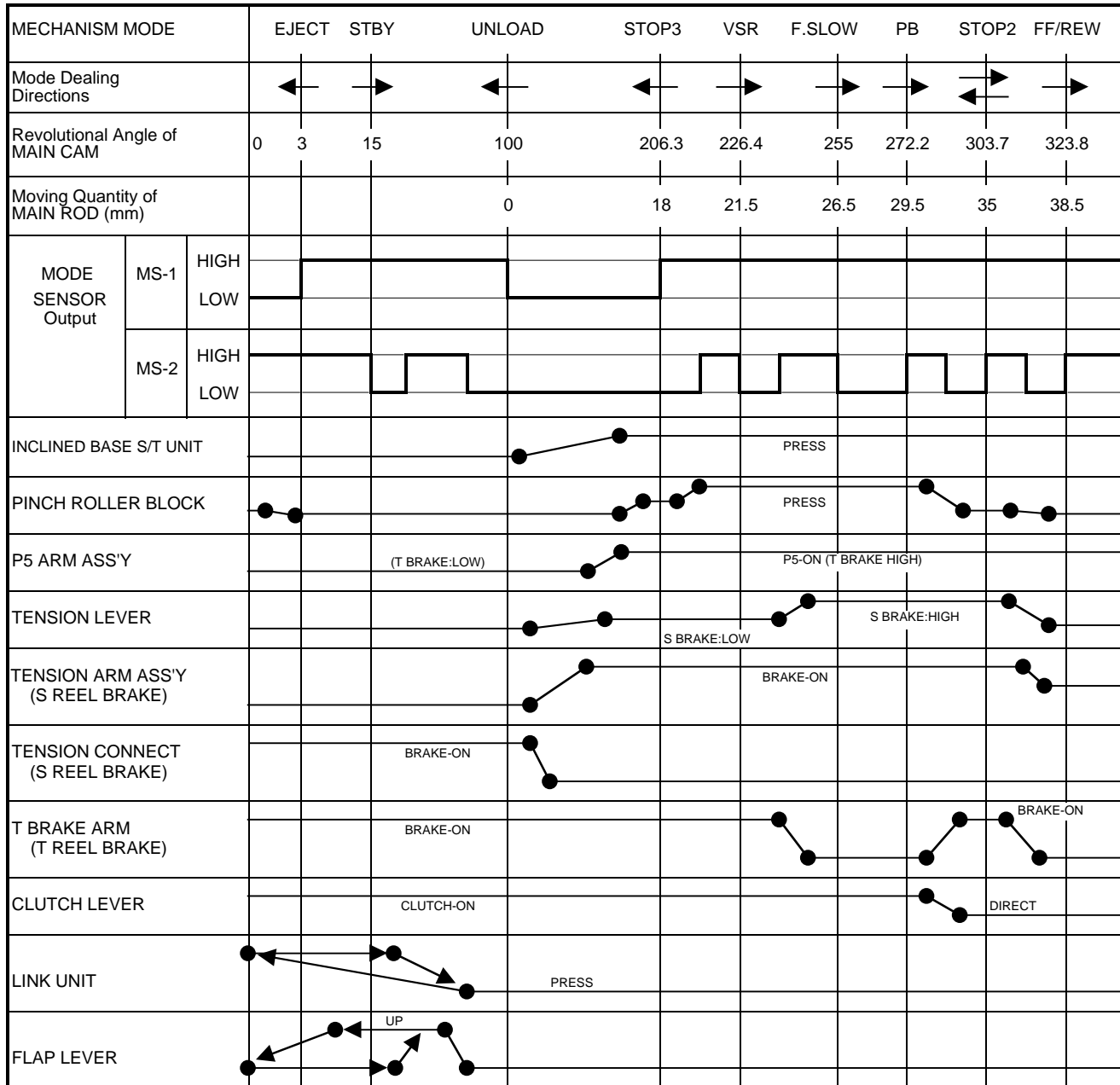
SYSCON PCB IC1001 (OEC0114A)



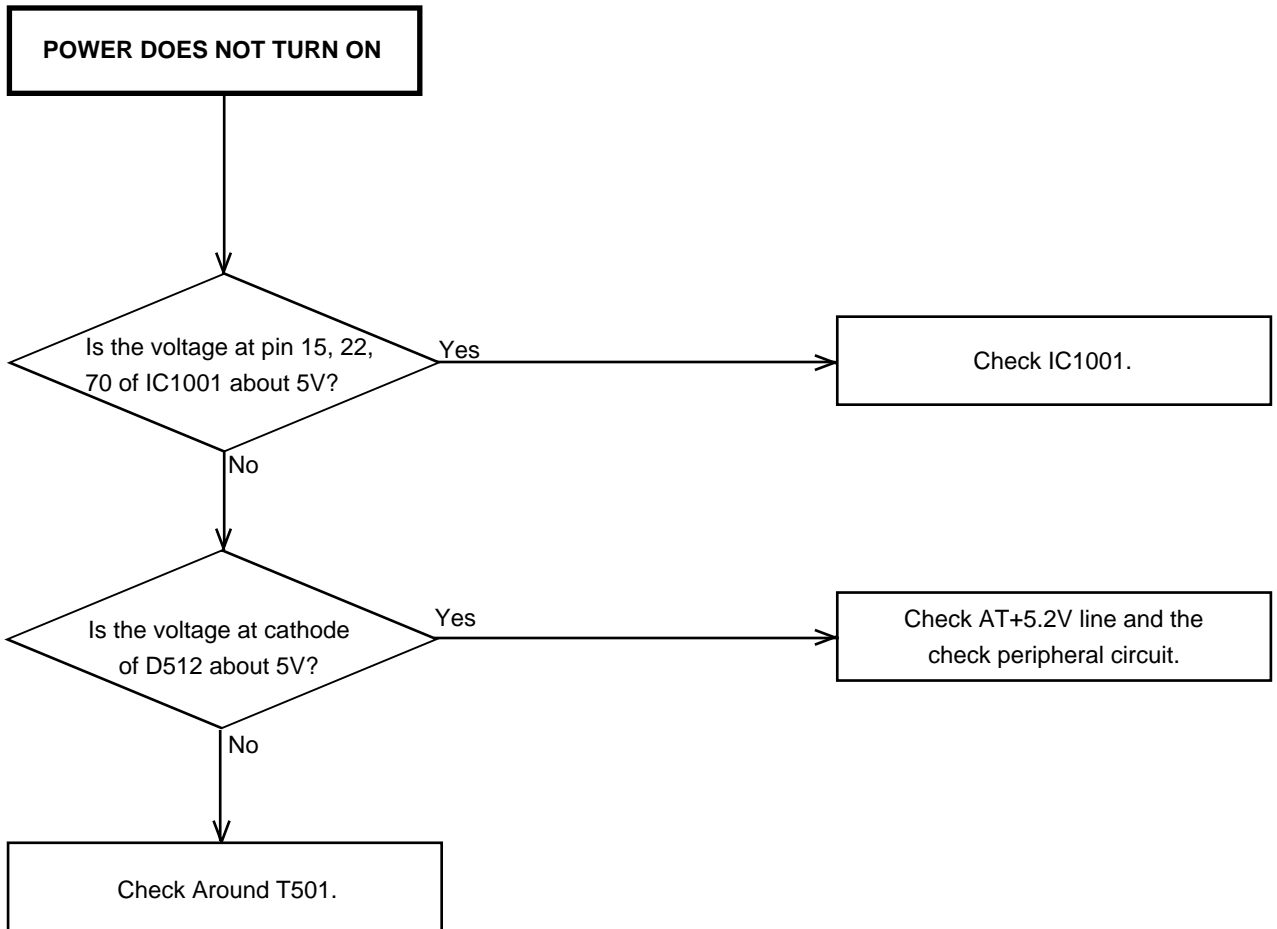
• WAVEFORM CHANGES DEPENDED ON THE TAPE SPEED

MECHANISM TIMING CHART

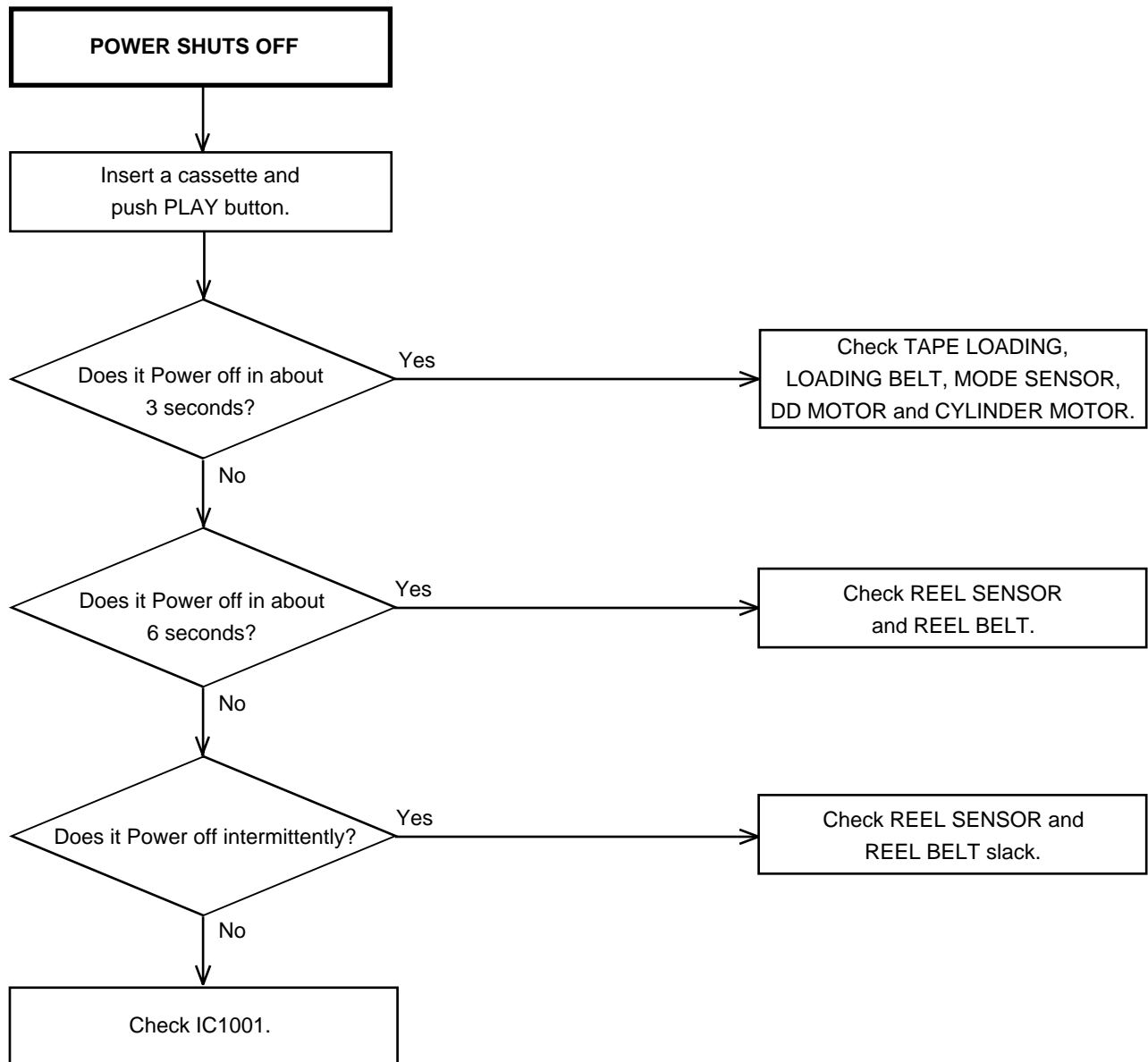
Please see the list below for the operational timing and the mode sensor output of the main parts on each mechanism modes.



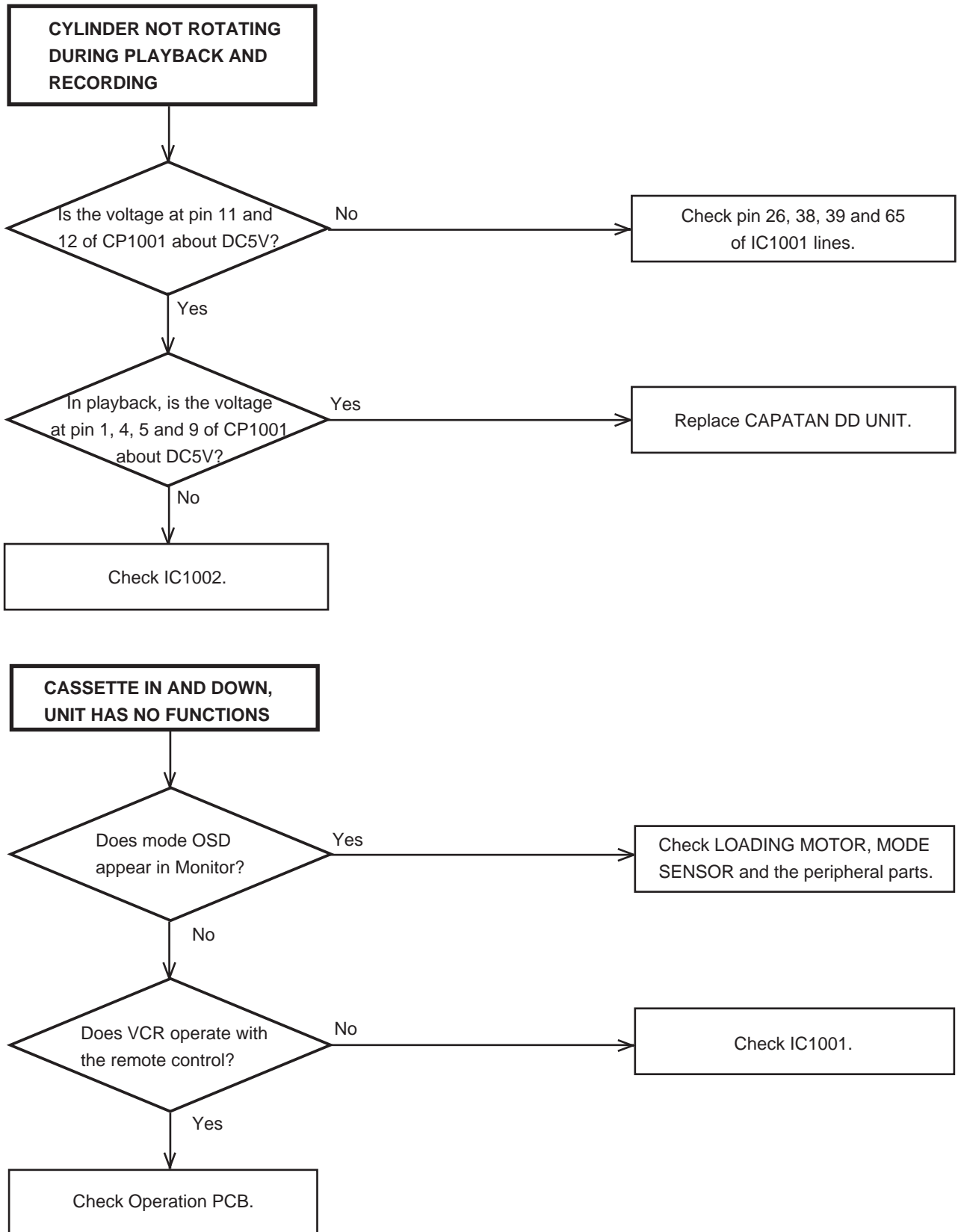
TROUBLESHOOTING GUIDE



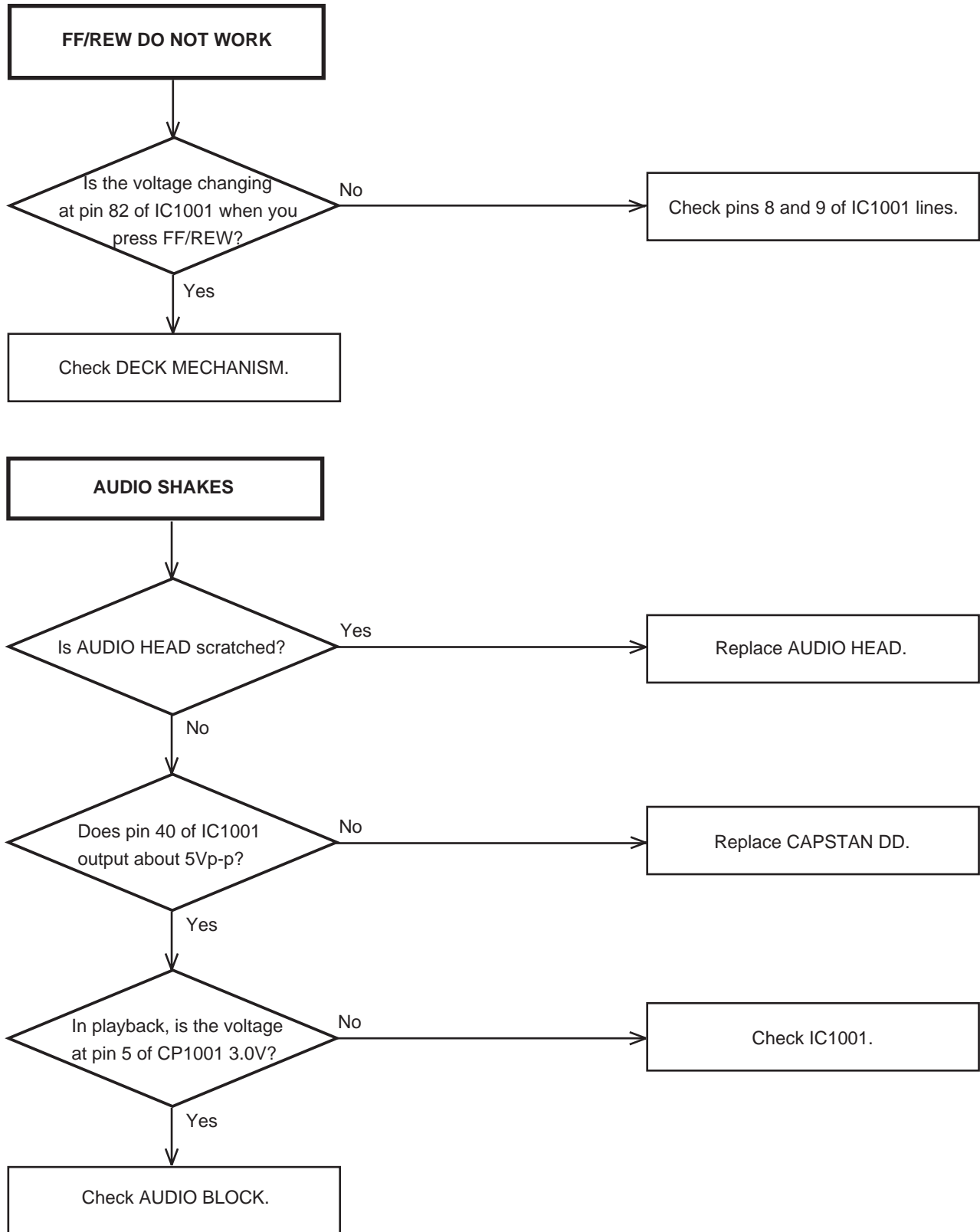
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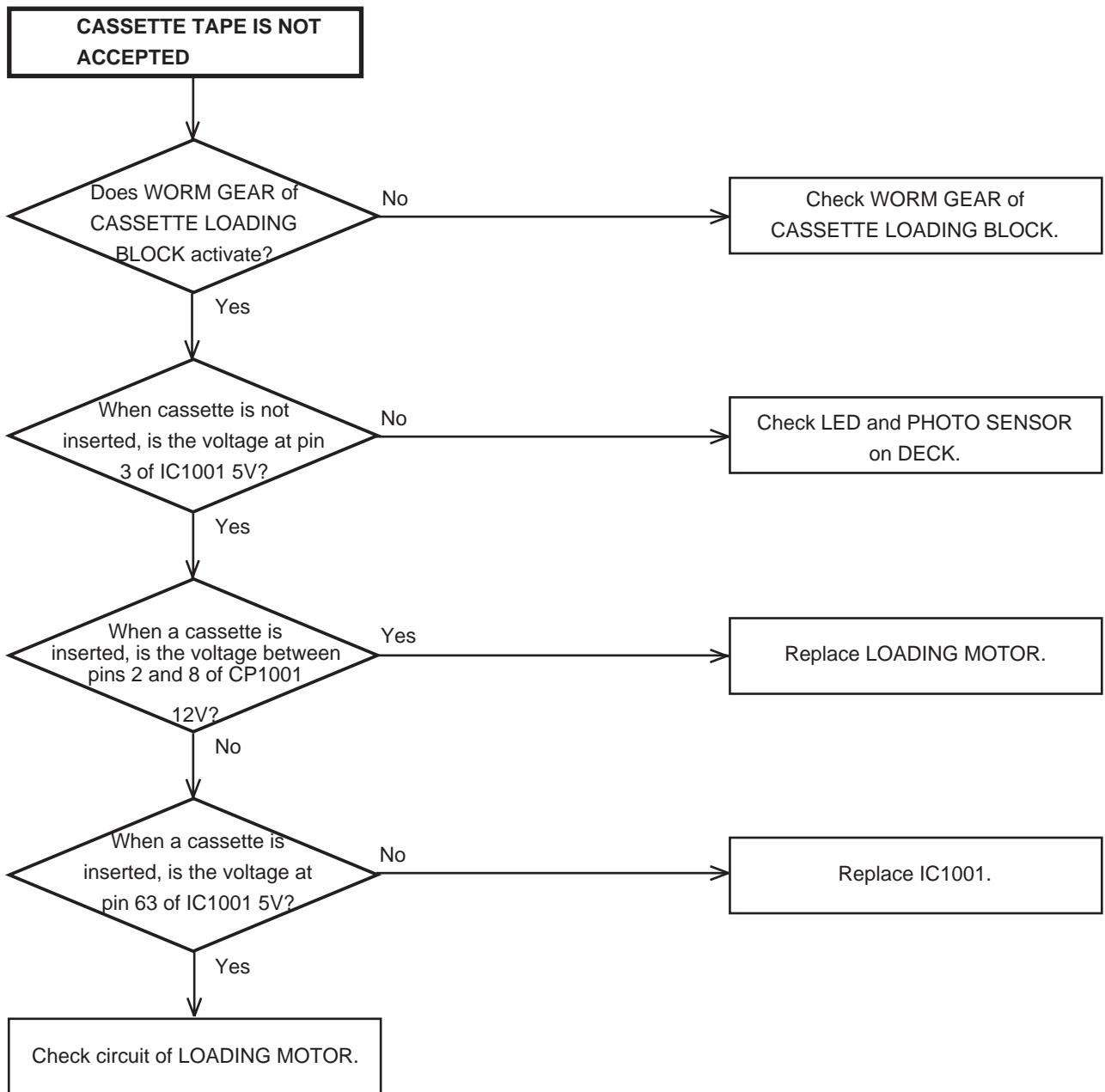
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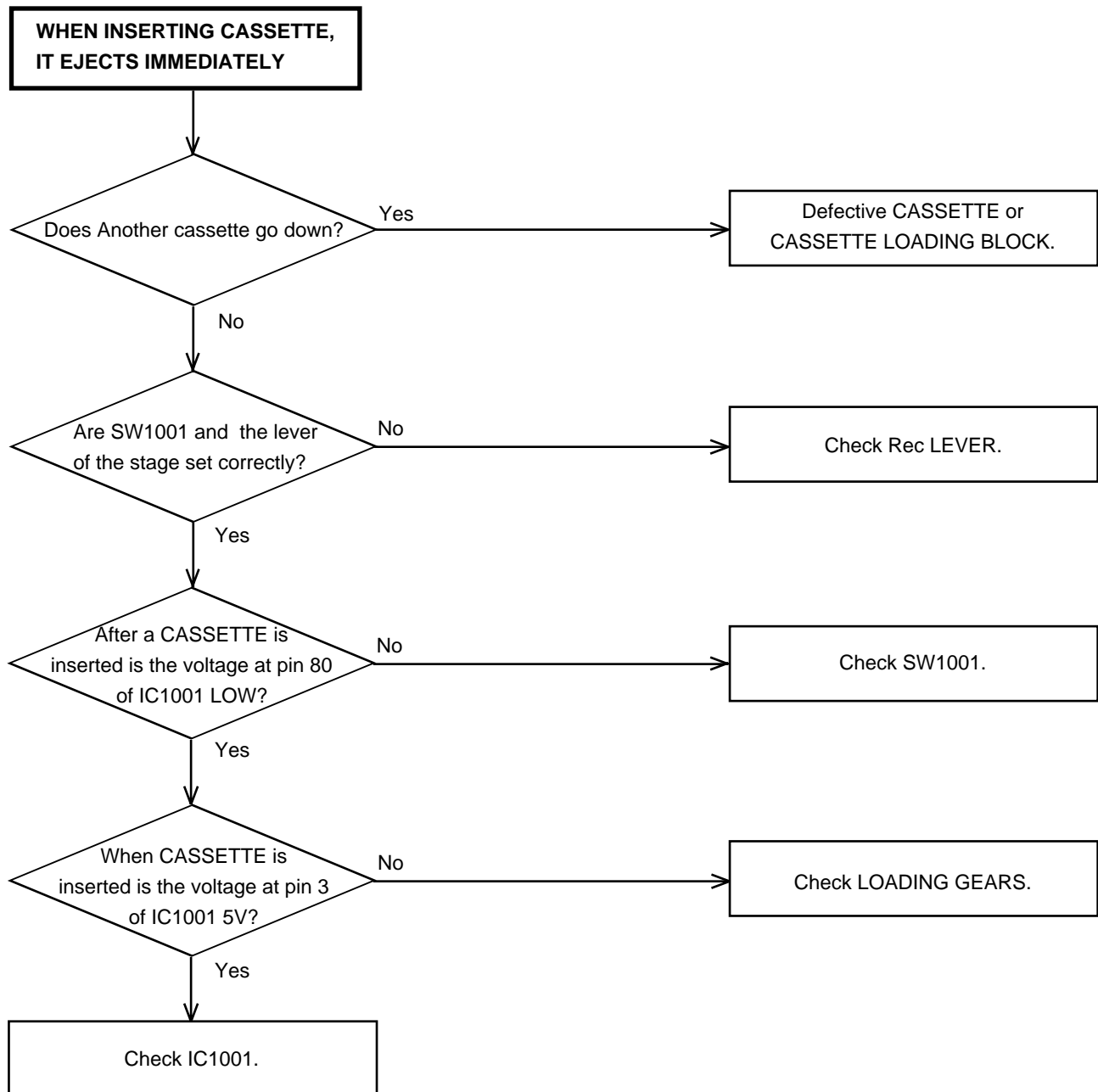
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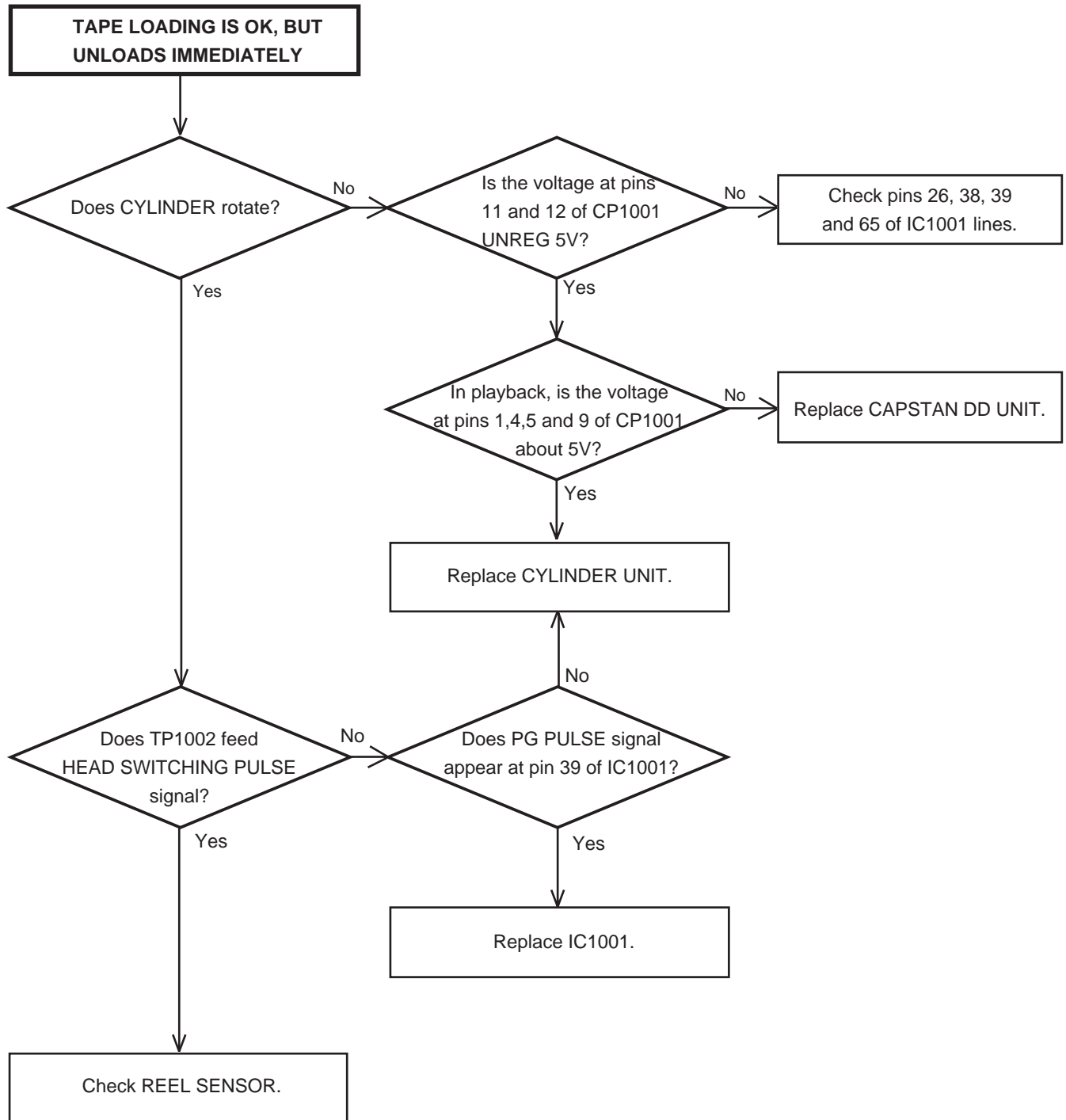
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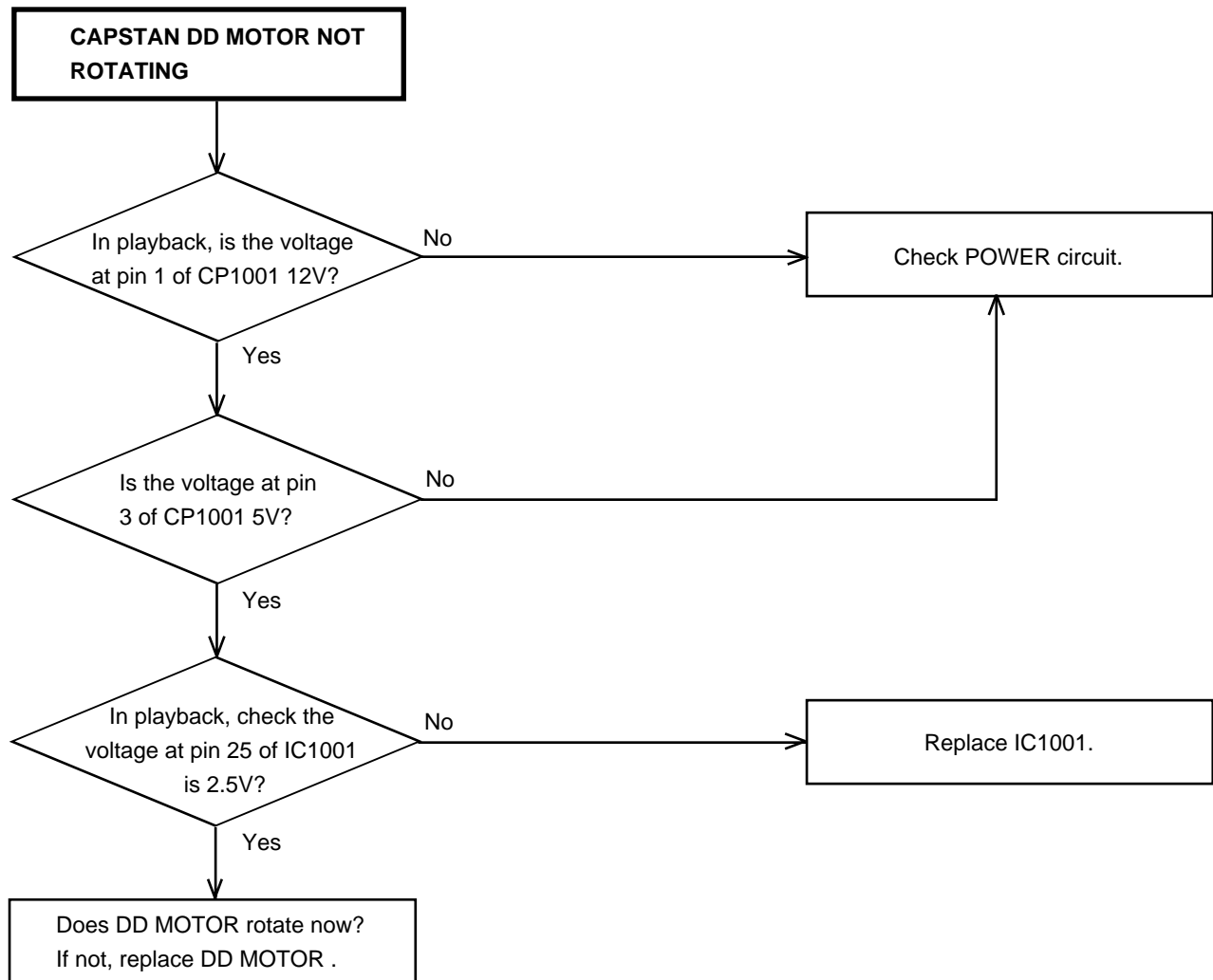
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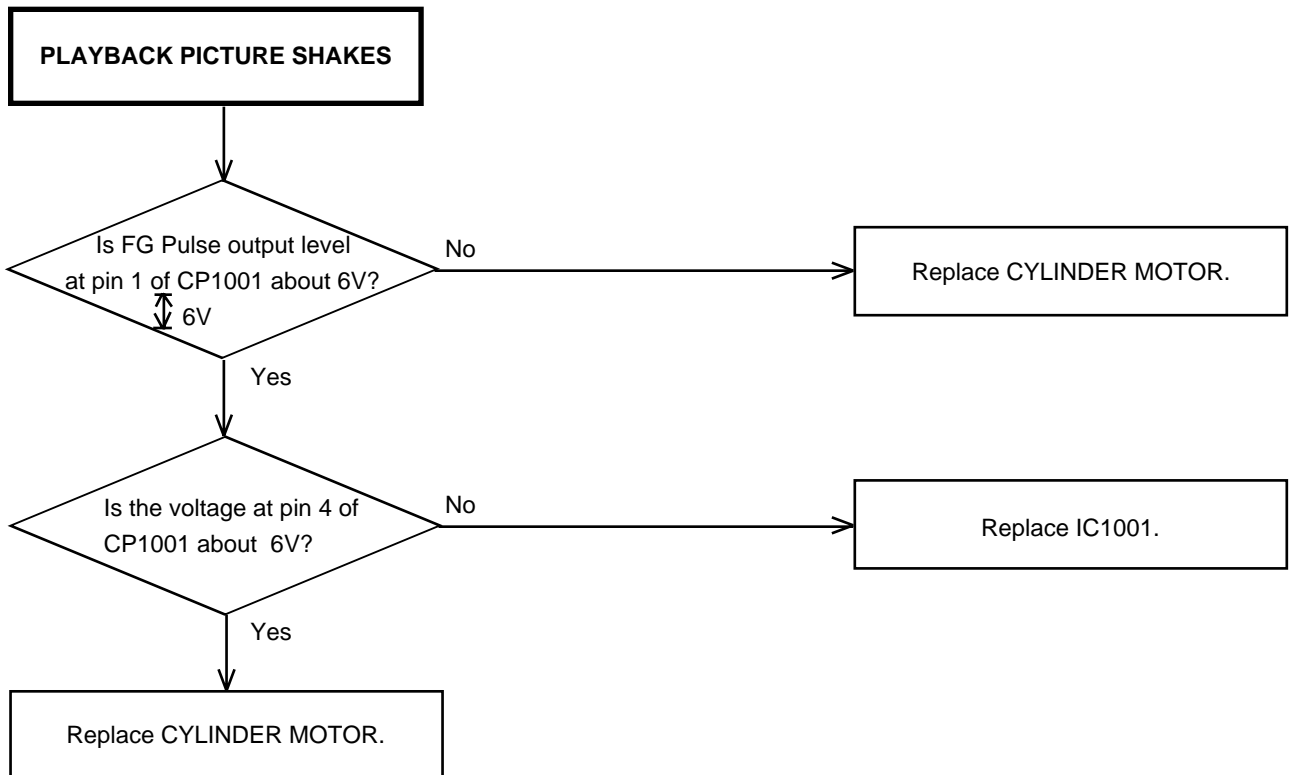
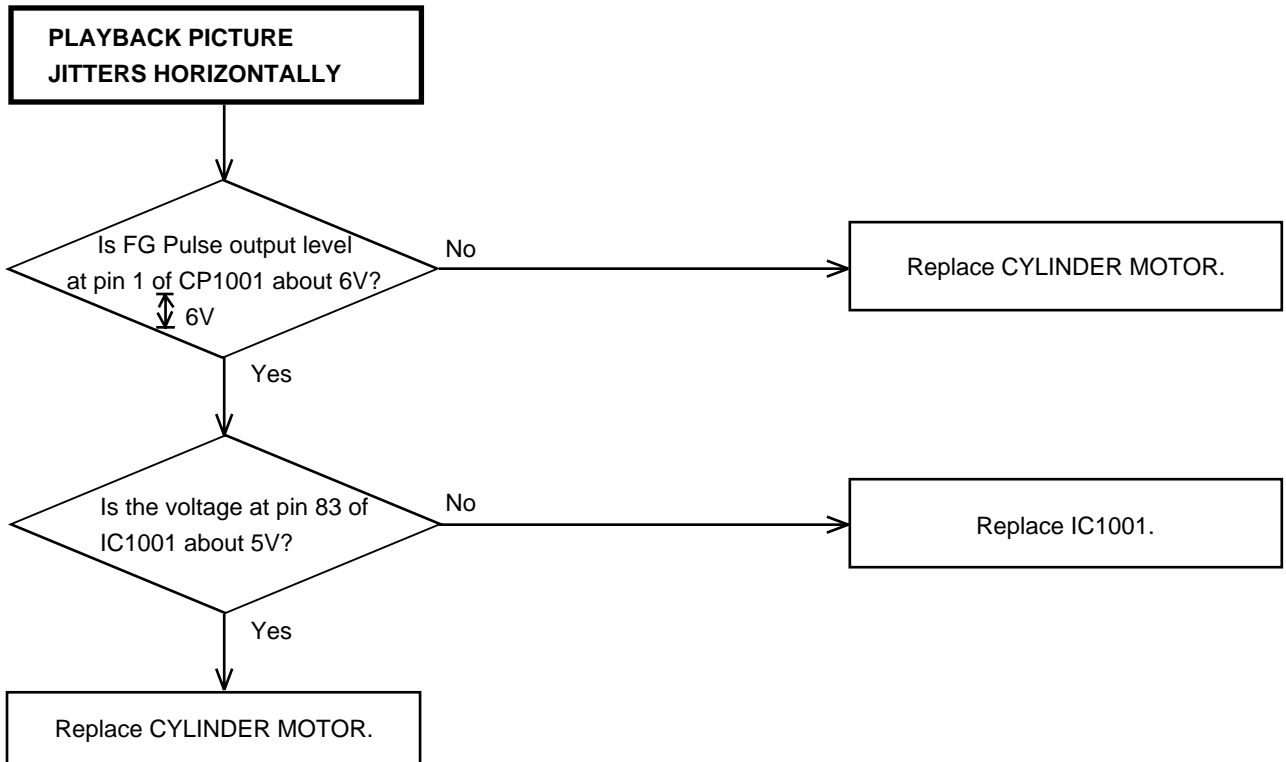
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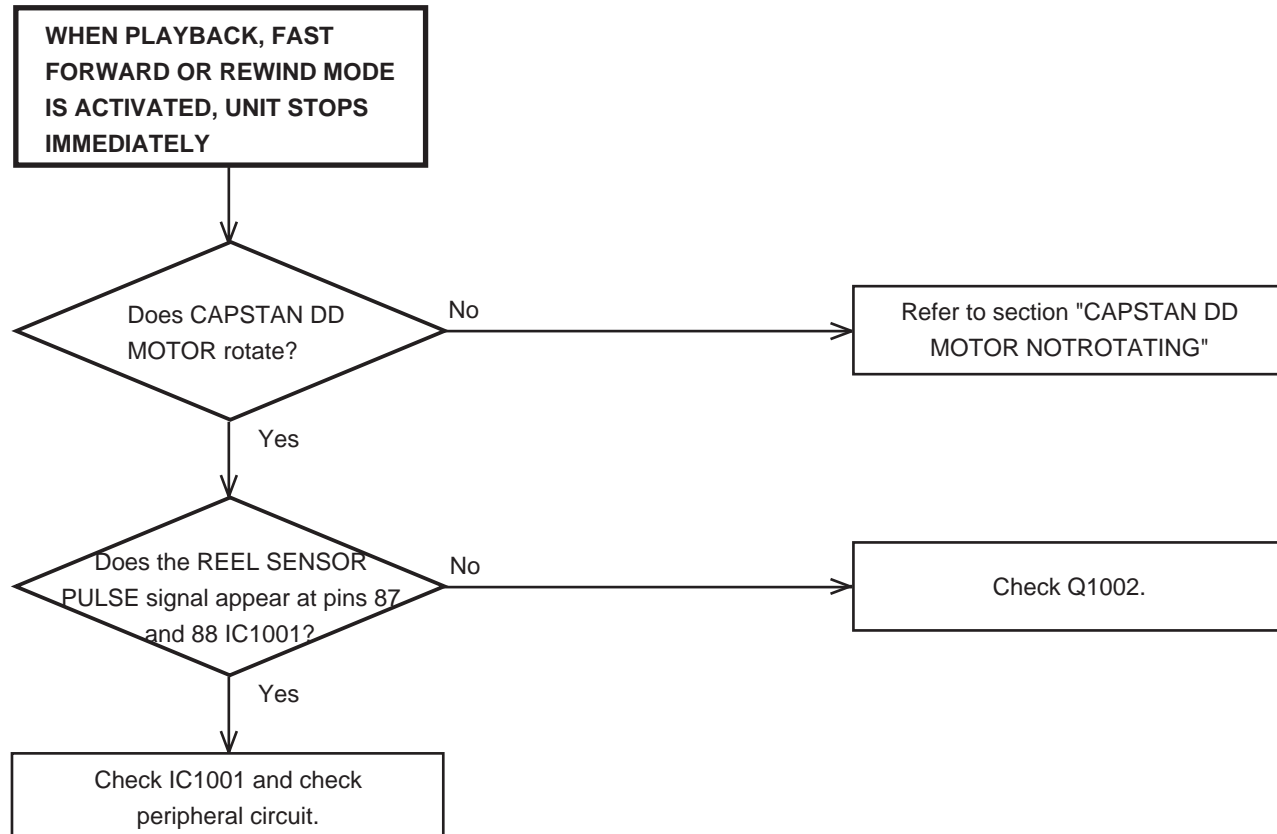
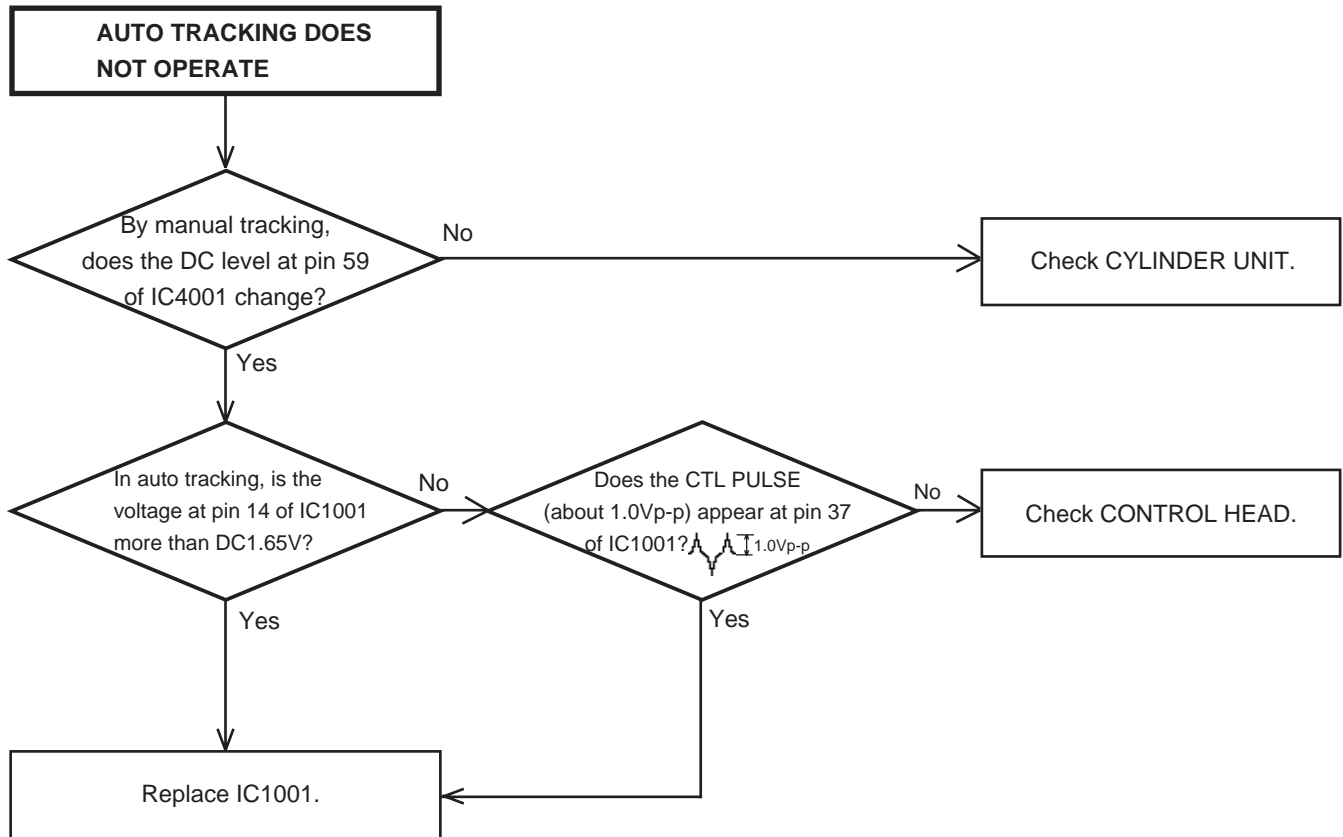
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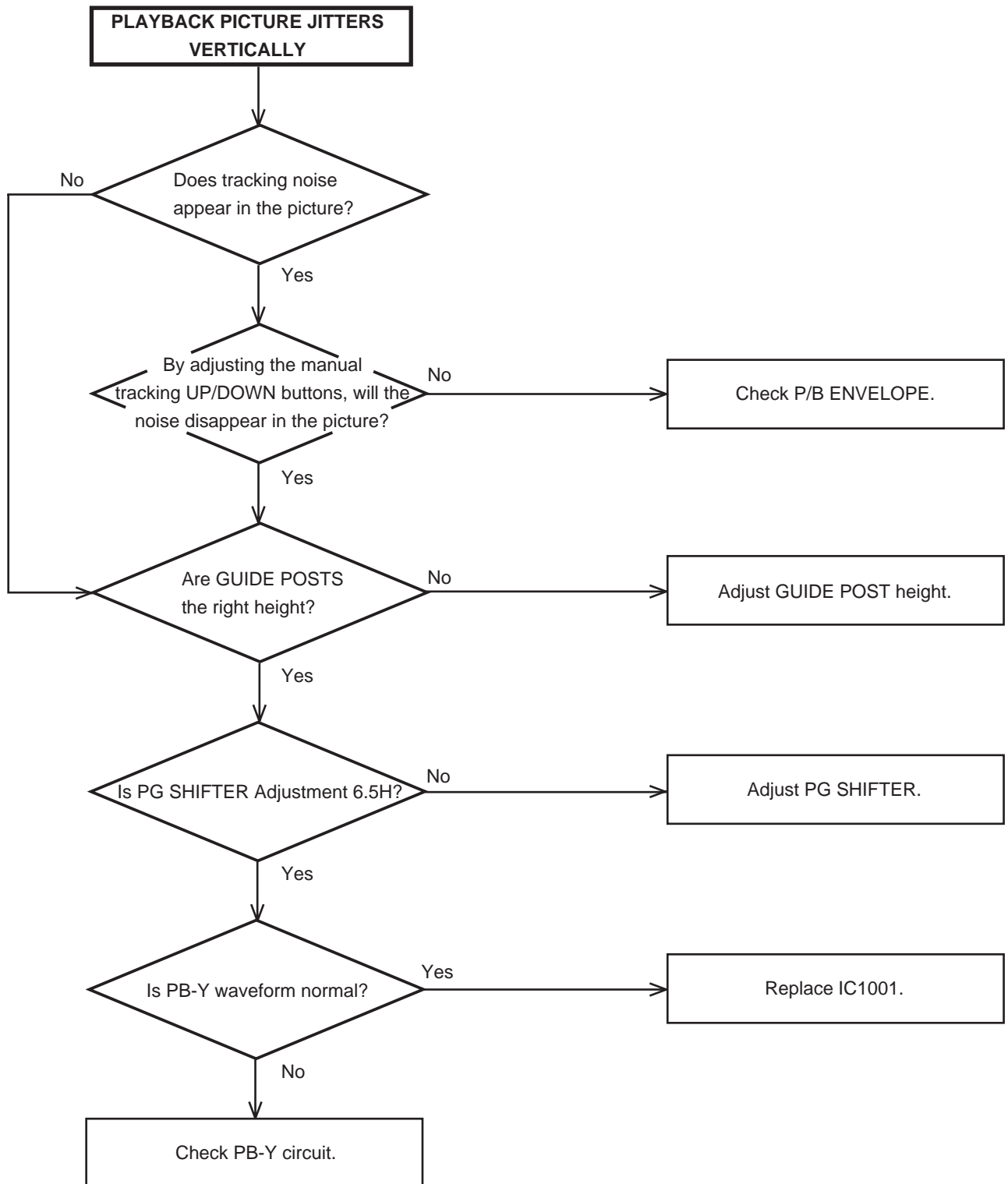
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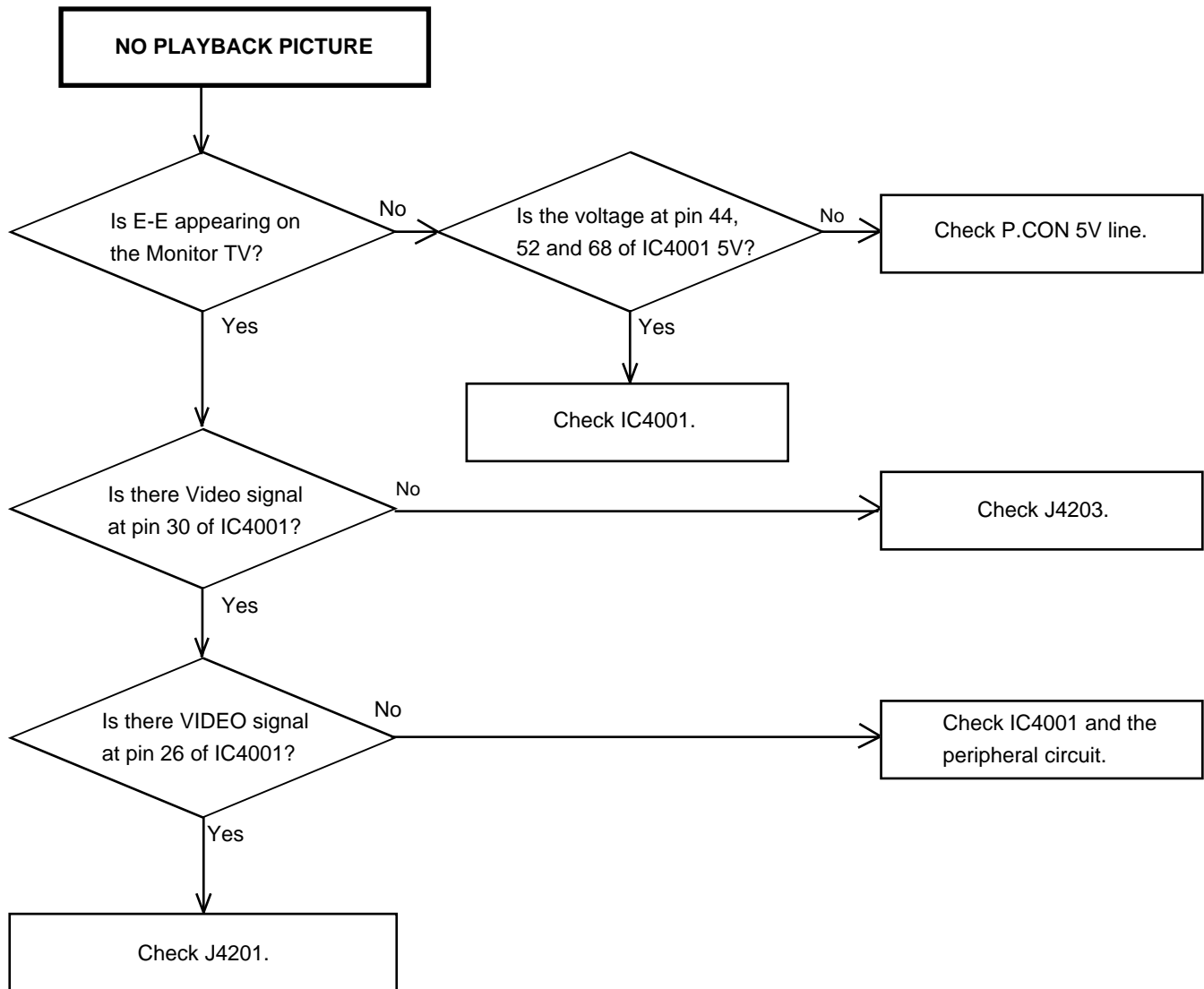
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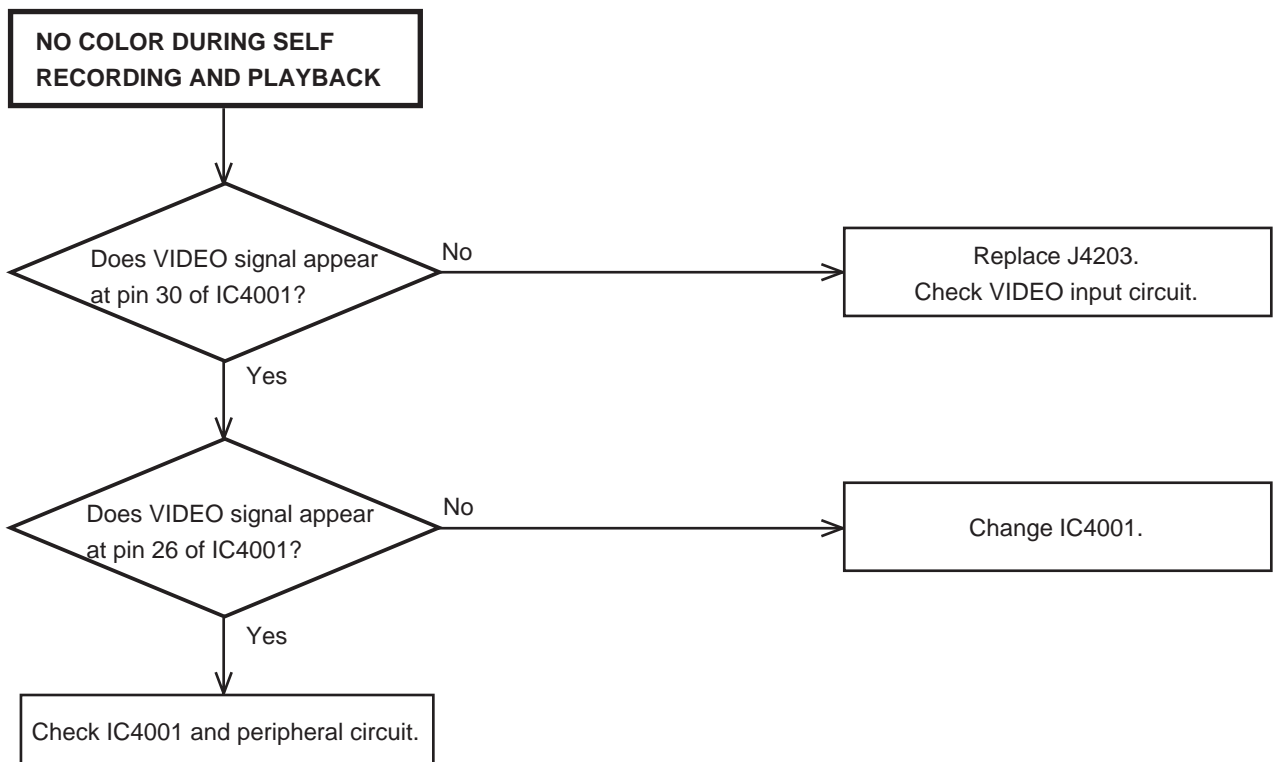
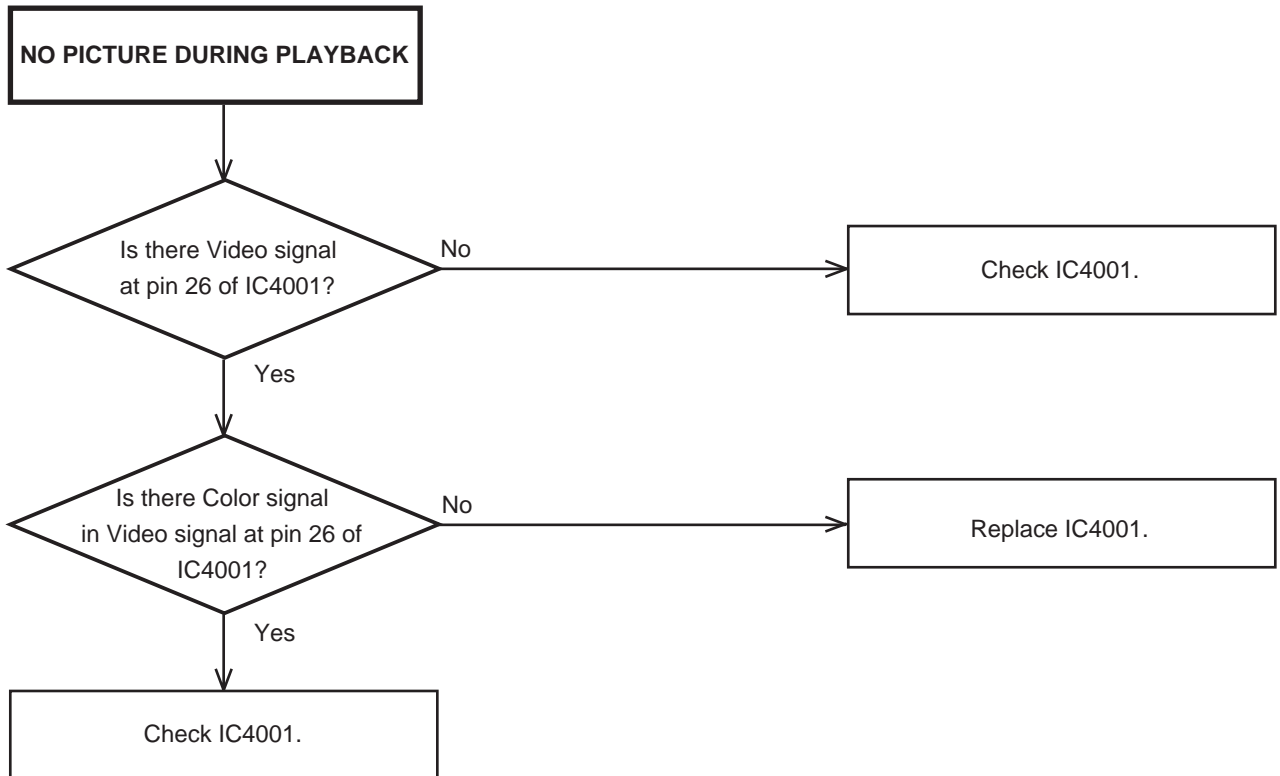
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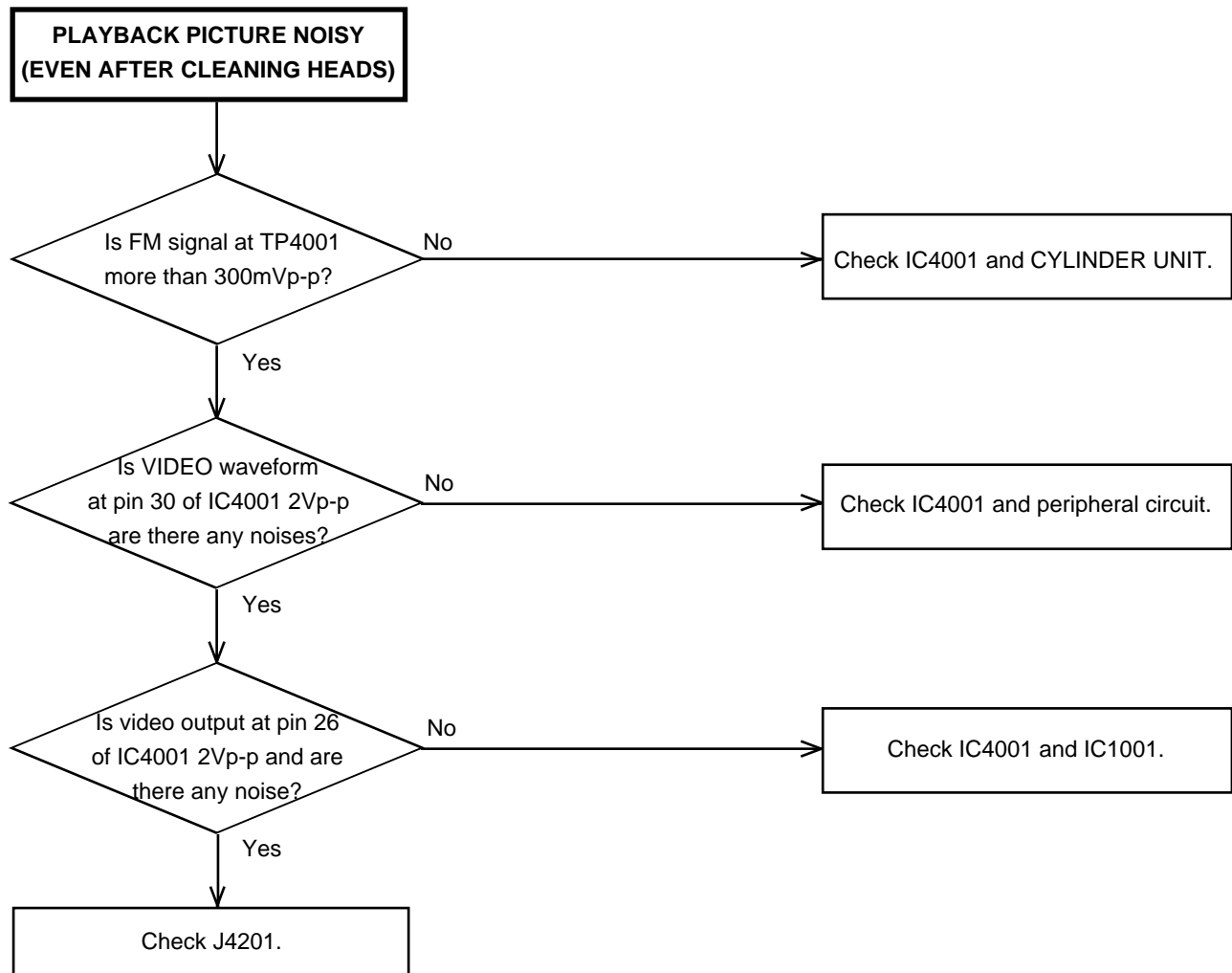
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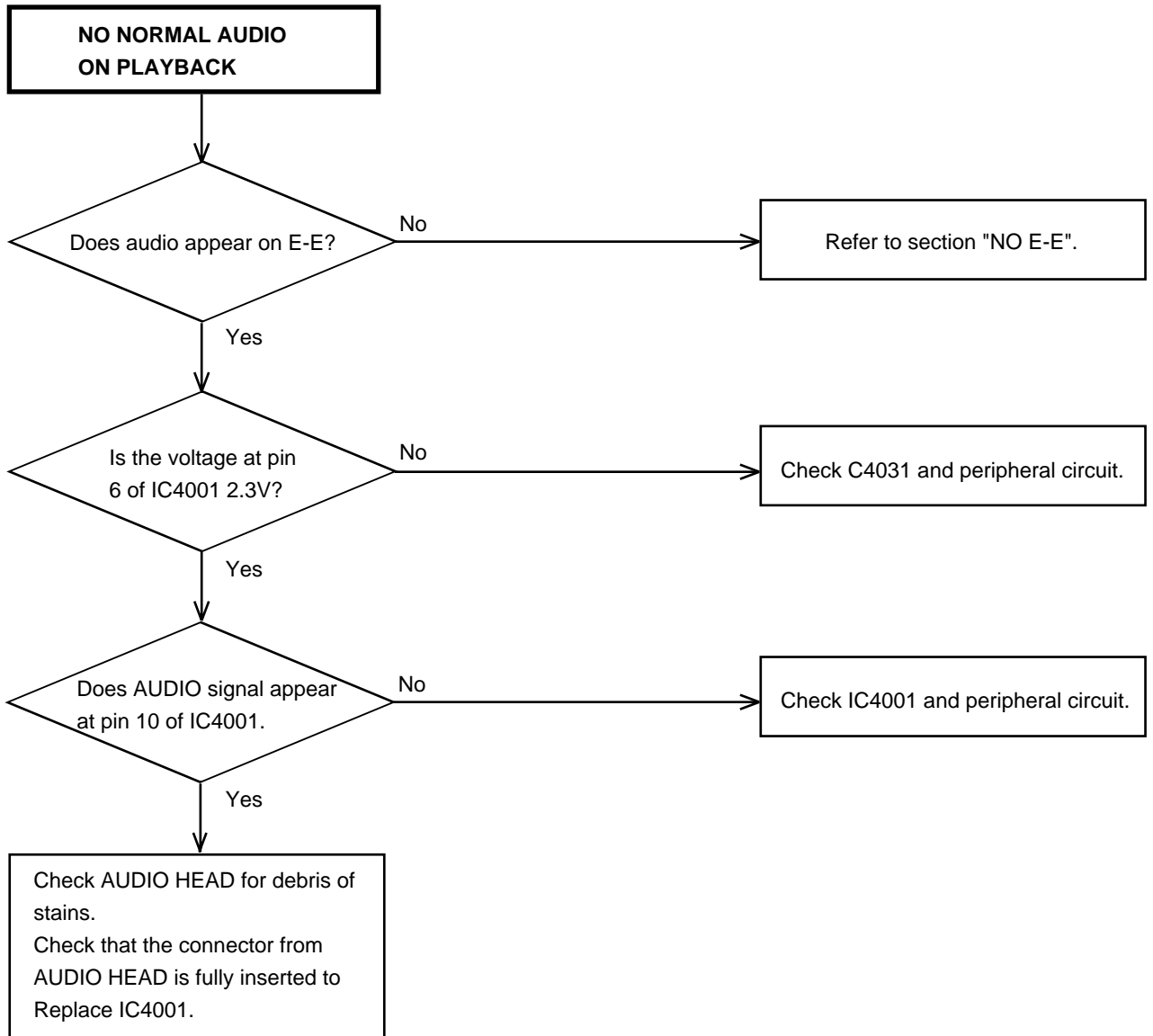
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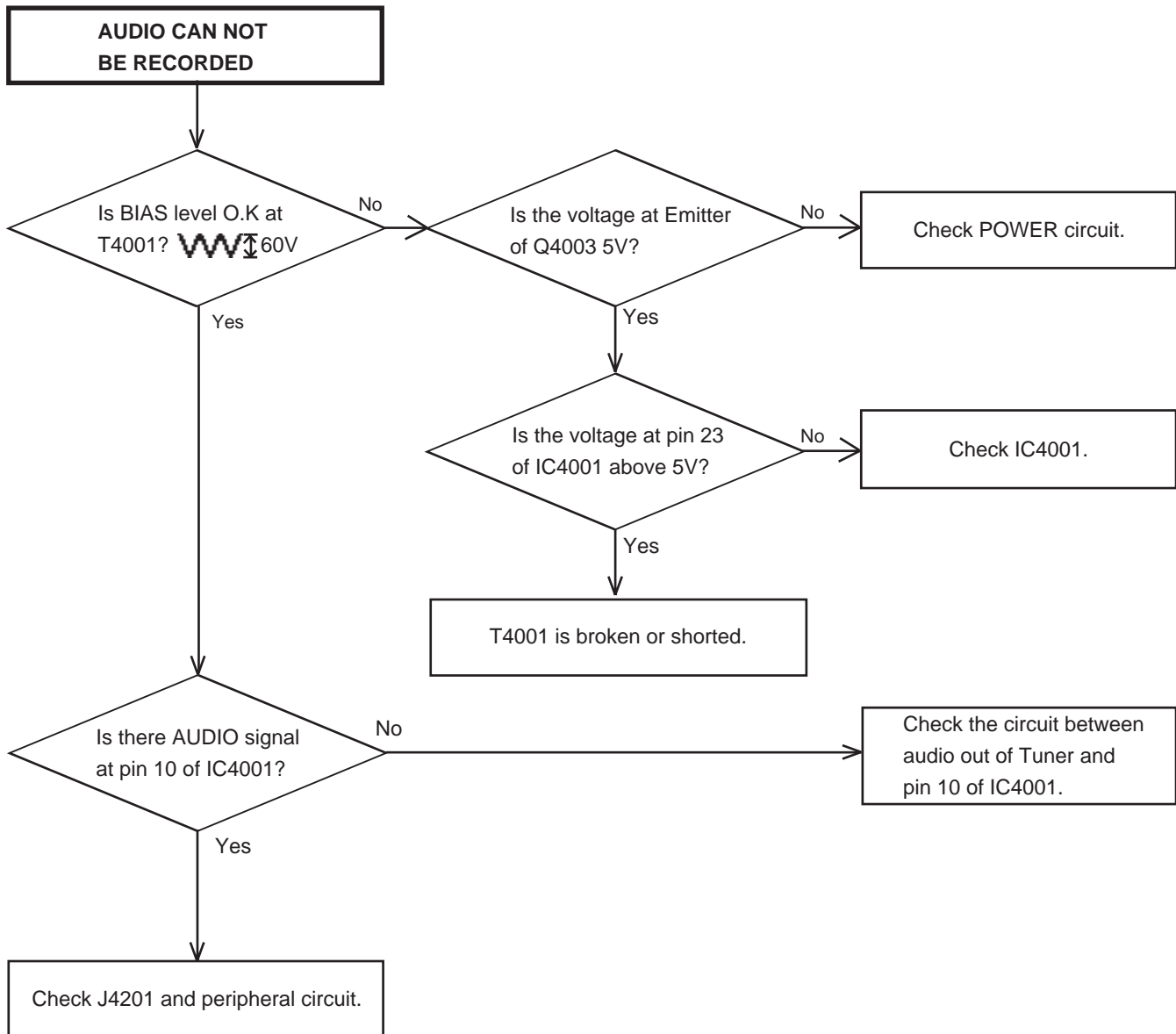
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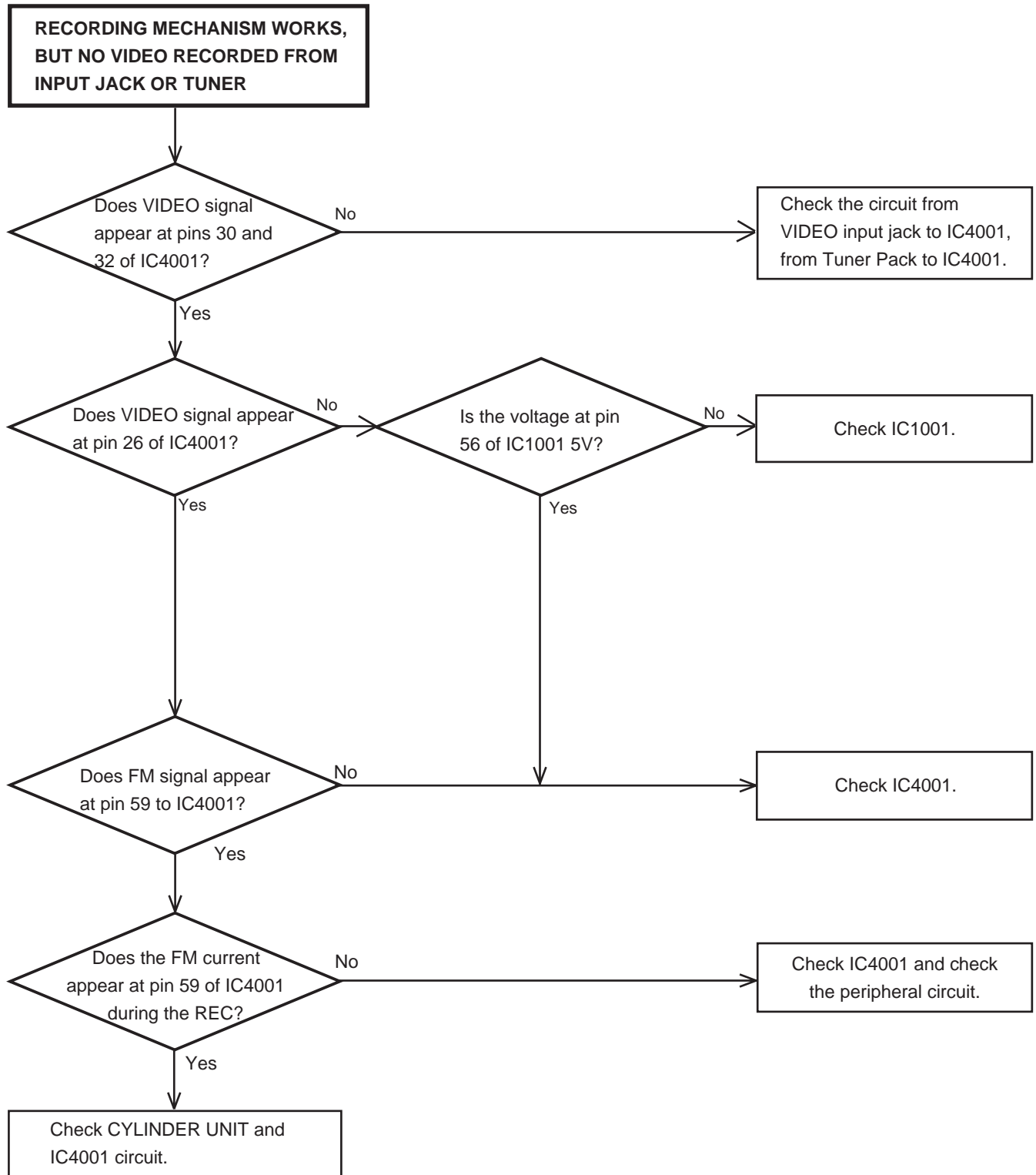
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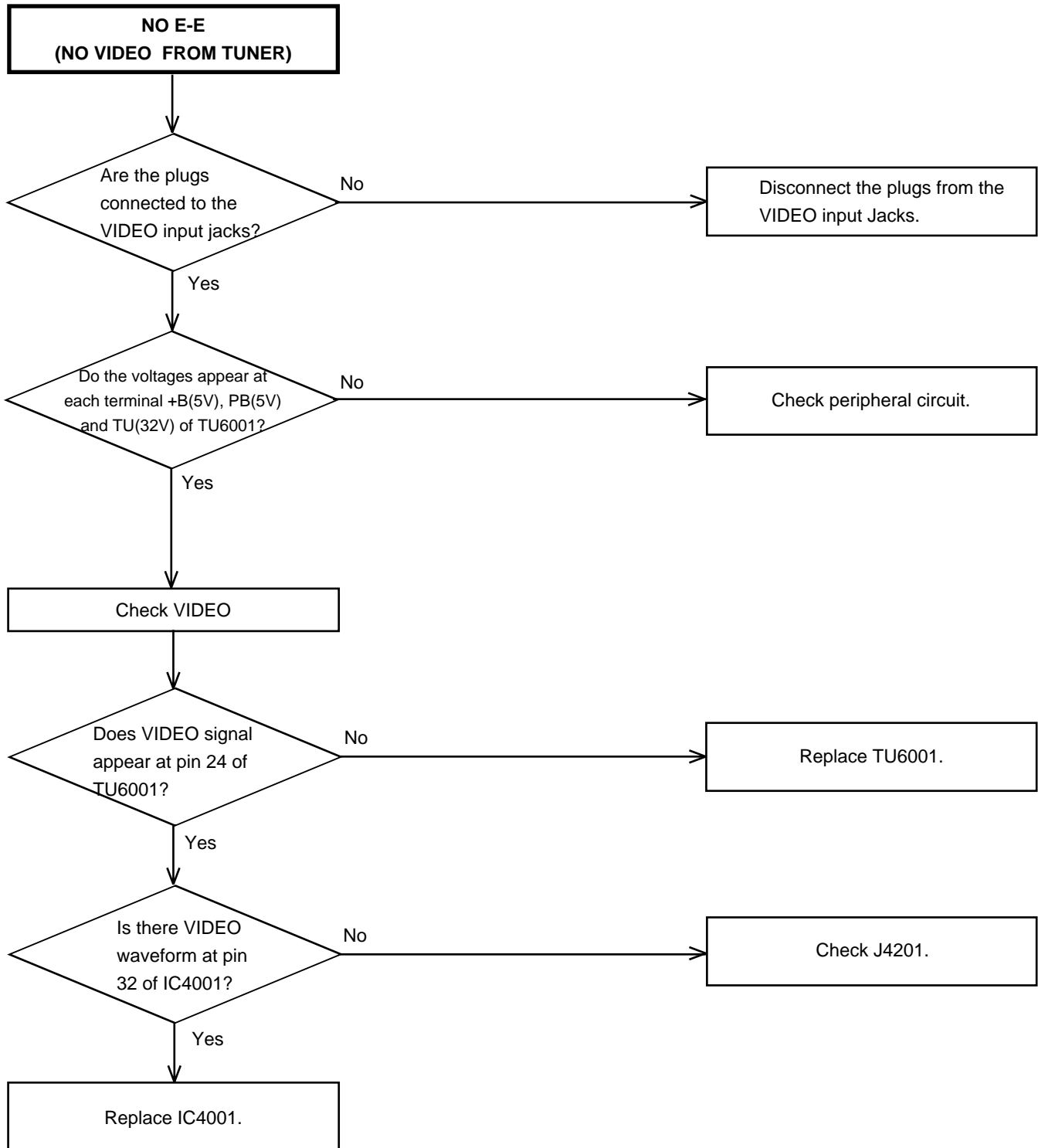
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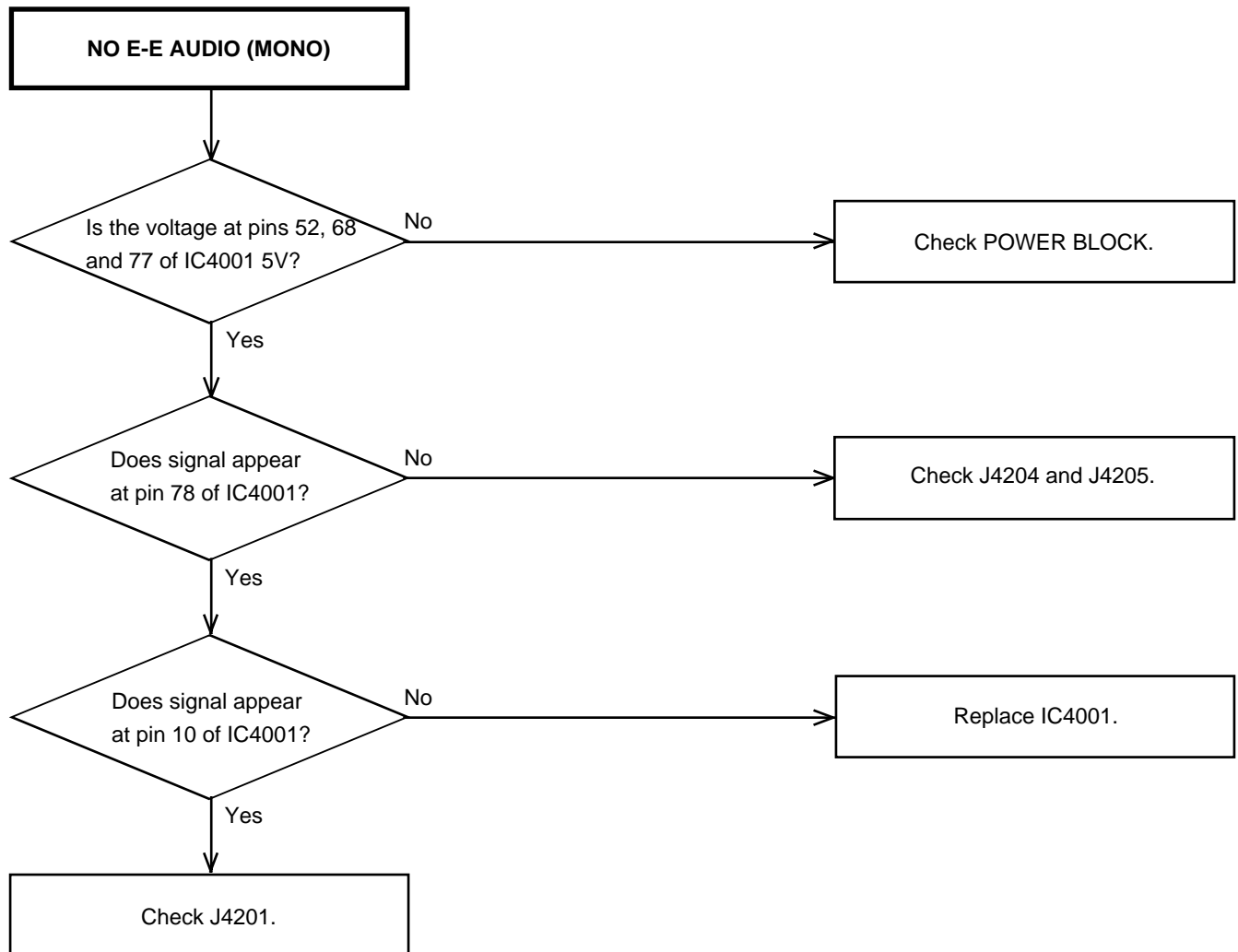
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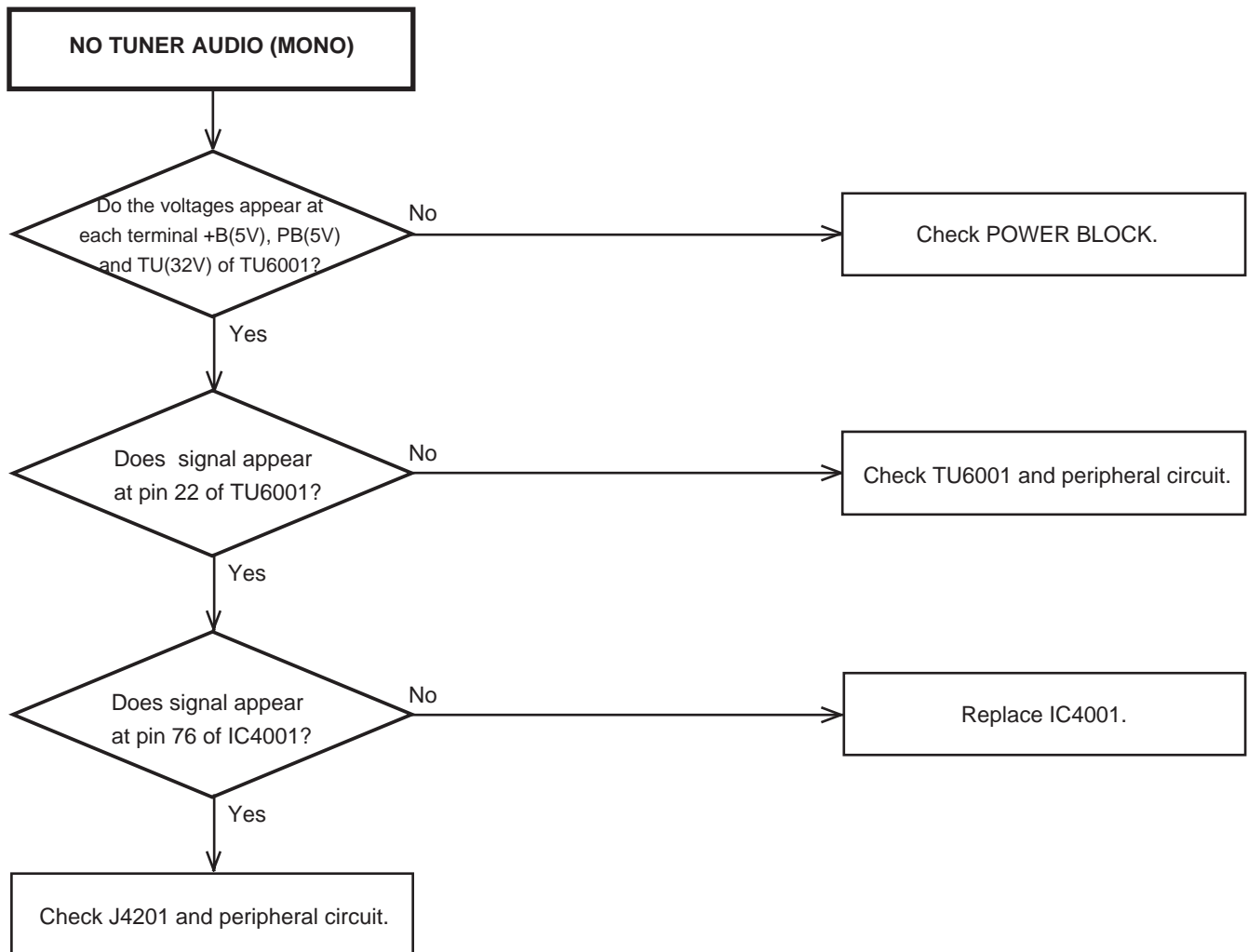
TROUBLESHOOTING GUIDE



TROUBLESHOOTING GUIDE



TROUBLESHOOTING GUIDE



GENERAL SPECIFICATIONS [HR-A591U/A591U(C)]

G-1	VCR System	System	VHS Player / Recorder
		Video System	NTSC
		Hi-Fi STEREO	Yes
		NTSC PB(PAL60Hz)	No
		Deck	DECK
		Loading System	OVD-7
		Motor	Front
		Heads	3
		Video Head	4Head
		FM Audio Head	2Head
		Normal Audio /Control	Mono / Yes
		Erase(Full Track Erase)	Yes
		Tape Speed	Rec PAL
		NTSC	-
		Play PAL	SP/EP(SLP)
		NTSC	-
G-2	Tuning System	Fast Forward / Rewind Time (Approx.)	FF:4'50"/REW:2'30"
		with Cassette	T-120
		Forward/Reverse	NTSC or PAL-M
		Picture Search	PAL or SECAM
		Frame Advance	SP/EP(SLP)=3x,5x/9x,15x
		Slow Speed	-
		Broadcasting System	US System M
		Tuner and	1Tuner
		Receive CH	Destination
		System	USA(w/CATV)
		Tuning System	F-Synth
		Input Impedance	VHF/UHF 75 OHM
		CH Coverage	2-69,4A,A-5~ A-1,A-I,J~ W
		Intermediate	W+1-W+84
		Frequency	Picture(FP)
		Sound(FS)	45.75MHz
G-3	Power	FP-FS	41.25MHz
		Preset CH	4.50MHz
		RF Converter Output	No
		Channel	Yes
		Level/Impedance	3 or 4 ch
		Sound Selector	66dBu /75ohm
		Stereo/Dual TV Sound	No
		Power Source	Yes(US-ST)
		AC	120V,60Hz
		DC	-
		Power Consumption	Power On(at AC)
		Stand by (at AC)	9W at 120V 60Hz
		Per Year	1.7W at 120V 60Hz
		Protector	- kWh/Year
		Power Fuse	Yes
		Dew Sensor	No
G-4	Regulation	Safety	UL / CSA
		Radiation	FCC / DOC
G-5	Temperature	Operation	5oC - 40oC
		Storage	-20oC - 60oC
G-6	Operating Humidity		Less then 80% RH
G-7	Signal	Video Signal	Input Level
		Output Level	1 V p-p/75 ohm
		S/N Ratio (Weighted)	1 V p-p/75 ohm
		Horizontal Resolution at SP Mode	50
		Audio Signal	230Line
		Input Level	-8dBm/50Kohm
		Output Level	-8dBm/1Kohm
		S/N Ratio at SP (Weighted)	42dB
		Harmonic Distortion at SP(1KHz) typ.	1.5%
		Frequency Response at SP	100Hz - 10kHz
		at LP	-
		at SLP	100Hz - 4kHz
		Hi-Fi Audio Signal	Dynamic Range : More than
		Frequency Response	90dB
		Wow And Flutter : Less than	20Hz ~20kHz
		Channel Separation : More than	0.01 %Wrms
		Harmonic Distortion : Less than	60 dB
			0.01

GENERAL SPECIFICATIONS [HR-A591U/A591U(C)]

G-8	On Screen Display	Menu	Menu Type	Yes
			ATS	Character No
			Timer Rec Set	Yes
			Auto Repeat On/Off	Yes
			SAP On Off	Yes
			CH Set-Up	Yes
			TV/CATV	Yes
			Auto CH Memory	Yes
			Add/Delete	Yes
			Pin Code Registration	No
			System Set-Up	No
			Clock Set	Yes (Calendar 12H)
			Language	Yes
			No Noise Back Ground	Yes
			G-CODE(or SHOWVIEW or PLUSCODE)No. Entry	No
			NICAM 1/2,NICAM Off,Audio Output	No
			Stereo,Audio Output,SAP	Yes
			Play/Stop/FF/Rew/Rec/OTR/T-Rec/Pause/Eject/Tape In (Symbol Mark)	Yes
			CH/AV	Yes
			Clock	Yes
			Repeat	Yes
			Pin Code	No
			Tape Counter	Yes
			Index	No
			Hotel Lock	No
			Tape Speed	Yes
			Manual Tracking (Bar Setting)	No
			Hi-Fi	Yes
			S-Repeat/SR-R/SR-Play	No
			VPS	No
			PDC	No
G-9	OSD Language		OSD Language Setting	English French Spanish English
G-10	Clock,Timer and Timer Back-up	Calendar		1990/1/1 ~ 2081/12/31
		Timer Events		8 prog/1 month
		One Touch Recording Max Time		5 Hours
		OTPB Valid Time		No
		Timer Back-up (at Power Off Mode)		5 sec.
G-11	Display	Indicator		Yes
		Indicator Type		LED Module(Amber + Red)
		Clock/Counter,CH,Timer Rec,OTR, Play Rec,FF(Cue),Rew(Rev),Stop,ATR		Yes
		Pause		Yes
		Still		Yes
		Eject(Tape Mark Flash)		Yes
		Slow		Yes
		WKL,Y.M.D,Start,End		No
		AFT		No
		Repeat		No
		A-DUB		No
		VCR	Yes	
		Memory		No
		Index		No
		VPS		No
		PDC		No
		SP		No
		LP		No
		SLP		No
		AM		No
		PM	Yes	
		F1,F2		No
		RF Output CH	Yes	
		Tape In	Yes	

GENERAL SPECIFICATIONS [HR-A591U/A591U(C)]

G-12	Remote Control	Unit	RC-ES
		Glow in Dark Remocon	No
		Format type	JVC
		Custom Code	43 / 03
		Power Source	3V
		Voltage(D.C)	UM-4 x 2 pcs
		UM size x pcs	
		Total Keys	35 Keys
		Keys	Power
			Yes
		1	Yes
		2	Yes
		3	Yes
		4	Yes
		5	Yes
		6	Yes
		7	Yes
		8	Yes
		9	Yes
		0/Input Select	Yes
		CH Up	Yes
		CH Down	Yes
		Input Select	No
		Play /Slow	Yes
		F.Fwd	Yes
		Rew	Yes
		Pause/Still	Yes
		Stop	Yes
		Rec/OTR	Yes
		Eject	No
		Counter Reset/Cancel	Yes
		Speed / Auto Tracking	Yes
		Timer Rec	Yes
		TV Monitor	No
		Quick View	No
		Program	No
		Slow	No
		Auto Tracking	No
		Set/Tracking+	Yes
		Set/ Tracking -	Yes
		Menu	Yes
		Enter	Yes
		Cancel	No
		Display(Clock/Counter+Call)	Yes
		TV/VCR	Yes
		Sleep Timer	No
		Muting	No
		Clock/Counter	No
		Zero Return	No
		CM Skip	No
		Audio Select	Yes
		TV CH+	Yes
		TV CH-	Yes
		TV Input Select	Yes
		TV Volume+	Yes
		TV Volume-	Yes
		TV Power	Yes

GENERAL SPECIFICATIONS [HR-A591U/A591U(C)]

G-13	Features	Auto Head Cleaning			No
		Auto Tracking		Yes	
		Index Search			No
		HQ (VHS Standard High Quality)		Yes	
		Auto Power On, Auto Play, Auto Rewind, Auto Eject		Yes	
		Auto Power Off		Yes	
		Forward/Reverse Picture Search		Yes	
		VIDEO PLUS+(SHOWVIEW,G-CODE)			No
		ATS			No
		PDC			No
		VPS			No
		One Touch Playback			No
		Picture Control			No
		Auto CH Memory		Yes	
		Channel Lock			No
		Hotel Lock			No
		Anti Theft			No
		Audio Dubbing			No
		Remort Control Code 1/2			No
		SQPB		Yes	
		CATV		Yes	
		Energy Star		Yes	
		MTS(SAP)		Yes	
		CM Skip(30sec x 6 Times)			No
G-14	Accessories	Owner's Manual	Language	English	French(A591U(C))
			w/Guarantee Card	Yes	
		Remote Control Unit		Yes	
		Dew Cation Sheet			No
		Video Cassette Tape			No
		Battery		Yes	
			UM size x pcs	UM 4 x 2pcs	
					-
		Safety Tip			No
		Toll Free Insert Sheet			No
		Quick Set-Up Sheet			No
		Information Sheet (Buyer Supply)			No
		75 Ohm Coaxial Cable		Yes	
		Rod Antenna			No
			Poles		
			Terminal		
		Loop Antenna			No
			Terminal		
		U/V Mixer			No
		DC Car Cord (Center+)			No
		Guarantee Card			No
		Warning Sheet			No
		Circuit Diagram			No
		Antenna Change Plug			No
		Service Facility List			No
		Important Safeguard			No
		Dew/AHC Caution Sheet			No
		AC Plug Adapter			No
		Quick Set-up Sheet			No
		AC Cord			No
		AV Cord			No
		Product Registration Card		Yes (Buyer's Supply)	
		PTB Sheet			No
		Tape Rewinder(Buyer Supply)			No
		300 ohm to 75 ohm Antenna Adapter			No

GENERAL SPECIFICATIONS [HR-A591U/A591U(C)]

G-15	Interface	Switch	Front	Power	Yes
				Play	Yes
				Pause/Still	No
				System Select	No
				One Touch Playback	No
				Channel Up	Yes
				Channel Down	Yes
				F.FWD/Cue	Yes
				Eject/Stop	Yes
				Main Power SW	No
				Volume Up	No
				Volume Down	No
				Rew/Rev	Yes
				Rec/OTR	Yes
		Indicator	Rear	RF Output SW	No
				Power	No
				Stand by	No
				Repeat	No
				TV/VCR	No
				Rec	No
				T-Rec	No
				Tape In	No
		Terminals	Front	Video Input	RCA x 1 (Black)
				Audio Input	RCA x 2 (Stereo, Black)
				Other Terminal	No
			Rear	Video Input	No
				Audio Input	No
Video Output	RCA x 1 (Yellow)				
Audio Output	RCA x 2 (Stereo, White/Red)				
Euro Scart	No				
DC Jack 12V(Center +)	No				
VHF/UHF Antenna Input	F Type				
AC Inlet	No				
G-16	Set Size		Approx.	W x D x H (mm)	360 x 224 x 95
G-17	Weight		Net (Approx.)		3.2kg(7.1lbs)
			Gross (Approx.)		3.8kg(8.4lbs)
G-18	Carton	Master Carton		No	
			Content	-	
			Material	-	
			Dimensions W x D x H(mm)	-	
			Description of Origin	-	
		Gift Box		Yes	
			Material	Single/White	
			Dimensions W x D x H(mm)	420x291x160	
			Design	As Per BUYER 's	
			Description of Origin	Yes	
		Drop Test	Natural Dropping At	1Corner / 3Edges / 6Surfaces	
			Height (cm)	80	
	Container Stuffing(40' container)	3136Sets			
G-19	Cabinet Material	Cabinet Front	PS 94V2 or More / DECABROM		

GENERAL SPECIFICATIONS [HR-A590U(C)]

G-1	VCR System	System	VHS Player / Recorder
		Video System	NTSC
		Hi-Fi STEREO	Yes
		NTSC PB(PAL60Hz)	No
		Deck	DECK Loading System Motor
		Heads	OVD-7 Front 3
		Video Head	4Head
		FM Audio Head	2Head
		Normal Audio /Control	Mono / Yes
		Erase(Full Track Erase)	Yes
		Tape Rec	PAL
		Speed	NTSC
		Play	PAL
			NTSC
		Fast Forward / Rewind Time (Approx.)	SP/EP(SLP)
G-2	Tuning System		FF:4'50"/REW:2'30" T-120
		Forward/Reverse	with Cassette
		Picture Search	NTSC or PAL-M
		Frame Advance	PAL or SECAM
		Slow Speed	SP/EP(SLP)=3x,5x/9x,15x
		Broadcasting System	-
		Tuner and Receive CH	System
			Destination
			Tuning System
			Input Impedance
			CH Coverage
		Intermediate Frequency	VHF/UHF 75 OHM
			2-69,4A,A-5~ A-1,A-I,J- W
			W+1-W+84
G-3	Power		45.75MHz
			41.25MHz
			4.50MHz
		Preset CH	No
		RF Converter Output	Yes
		Channel	3 or 4 ch
		Level/Impedance	66dBu /75ohm
		Sound Selector	No
		Stereo/Dual TV Sound	Yes(US-ST)
		Power Source	AC
			DC
		Power Consumption	120V,60Hz
			-
			9W at 120V 60Hz
			1.7W at 120V 60Hz
G-4	Regulation		- kWh/Year
		Protector	Yes
			Power Fuse
			Dew Sensor
			No
		Safety	UL / CSA
		Radiation	FCC / DOC
		Operation	50C - 40oC
		Storage	-20oC - 60oC
		Operating Humidity	Less then 80% RH
		Signal	1 V p-p/75 ohm
		Video Signal	1 V p-p/75 ohm
			S/N Ratio (Weighted)
			Horizontal Resolution at SP Mode
G-5	Temperature		230Line
		Audio Signal	Input Level
		(0dB=0.775Vrms)	-8dBm/50Kohm
			Output Level
			-8dBm/1Kohm
			S/N Ratio at SP (Weighted)
			42dB
			Harmonic Distortion (1KHz)
			1.5%
		Frequency Response	at SP
			100Hz - 10kHz
			at LP
			-
			at SLP
G-6	Signal		100Hz - 4kHz
		Hi-Fi Audio Signal	90dB
			Dynamic Range : More than
			Frequency Response
			20Hz ~20kHz
			Wow And Flutter : Less than
			0.01 %Wrms
			Channel Separation : More than
			60 dB
			Harmonic Distortion : Less than
			0.01

GENERAL SPECIFICATIONS [HR-A590U(C)]

G-8	On Screen Display	Menu	Menu Type	Yes
			ATS	No
			Timer Rec Set	Yes
			Auto Repeat On/Off	Yes
			SAP On Off	Yes
			CH Set-Up	Yes
			TV/CATV	Yes
			Auto CH Memory	Yes
			Add/Delete	Yes
			Pin Code Registration	No
			System Set-Up	No
			Clock Set	Yes (Calendar 12H)
			Language	Yes
			No Noise Back Ground	Yes
			G-CODE(or SHOWVIEW or PLUSCODE)No. Entry	No
			NICAM 1/2,NICAM Off,Audio Output	No
			Stereo,Audio Output,SAP	Yes
			Play/Stop/FF/Rew/Rec/OTR/T-Rec/Pause/Eject/Tape In (Symbol Mark)	Yes
			CH/AV	Yes
			Clock	Yes
			Repeat	Yes
			Pin Code	No
			Tape Counter	Yes
			Index	No
			Hotel Lock	No
			Tape Speed	Yes
			Manual Tracking (Bar Setting)	No
			Hi-Fi	Yes
			S-Repeat/SR-R/SR-Play	No
			VPS	No
			PDC	No
G-9	OSD Language	OSD Language Setting	English French Spanish English	
G-10	Clock,Timer and Timer Back-up	Calendar	1990/1/1 ~ 2081/12/31	
		Timer Events	8 prog/1 month	
		One Touch Recording Max Time	5 Hours	
		OTPB Valid Time	No	
		Timer Back-up (at Power Off Mode)	5 sec.	
G-11	Display	Indicator	No	
		Indicator Type	-	
		Clock/Counter,CH,Timer Rec,OTR, Play Rec,FF(Cue),Rew(Rev),Stop,ATR	-	
		Pause	-	
		Still	-	
		Eject(Tape Mark Flash)	-	
		Slow	-	
		WKL,Y.M.D,Start,End	-	
		AFT	-	
		Repeat	-	
		A-DUB	-	
		VCR	-	
		Memory	-	
		Index	-	
		VPS	-	
		PDC	-	
		SP	-	
		LP	-	
		SLP	-	
		AM	-	
		PM	-	
		F1,F2	-	
		RF Output CH	-	
		Tape In	-	

GENERAL SPECIFICATIONS [HR-A590U(C)]

G-12	Remote Control	Unit	RC-ES
		Glow in Dark Remocon	No
		Format type	JVC
		Custom Code	43 / 03
		Power Source	3V
		Voltage(D.C)	UM-4 x 2 pcs
		UM size x pcs	35 Keys
		Total Keys	
		Keys	
		Power	Yes
		1	Yes
		2	Yes
		3	Yes
		4	Yes
		5	Yes
		6	Yes
		7	Yes
		8	Yes
		9	Yes
		0/Input Select	Yes
		CH Up	Yes
		CH Down	Yes
		Input Select	No
		Play/Slow	Yes
		F.Fwd	Yes
		Rew	Yes
		Pause/Still	Yes
		Stop	Yes
		Rec/OTR	Yes
		Eject	No
		Counter Reset/Cancel	Yes
		Speed / Auto Tracking	Yes
		Timer Rec	Yes
		TV Monitor	No
		Quick View	No
		Program	No
		Slow	No
		Auto Tracking	No
		Set/Tracking+	Yes
		Set/ Tracking -	Yes
		Menu	Yes
		Enter	Yes
		Cancel	No
		Display(Call)	Yes
		TV/VCR	Yes
		Sleep Timer	No
		Muting	No
		Clock/Counter	No
		Zero Return	No
		CM Skip	No
		Audio Select	Yes
		TV CH+	Yes
		TV CH-	Yes
		TV Input Select	Yes
		TV Volume+	Yes
		TV Volume-	Yes
		TV Power	Yes

GENERAL SPECIFICATIONS [HR-A590U(C)]

G-13	Features	Auto Head Cleaning		No
		Auto Tracking	Yes	
		Index Search		No
		HQ (VHS Standard High Quality)	Yes	
		Auto Power On, Auto Play, Auto Rewind, Auto Eject	Yes	
		Auto Power Off	Yes	
		Forward/Reverse Picture Search	Yes	
		VIDEO PLUS+(SHOWVIEW,G-CODE)		No
		ATS		No
		PDC		No
		VPS		No
		One Touch Playback		No
		Picture Control		No
		Auto CH Memory	Yes	
		Channel Lock		No
		Hotel Lock		No
		Anti Theft		No
		Audio Dubbing		No
		Remort Control Code 1/2		No
		SQPB	Yes	
		CATV	Yes	
		Energy Star	Yes	
		MTS(SAP)	Yes	
		CM Skip(30sec x 6 Times)		No
G-14	Accessories	Owner's Manual	Language w/Guarantee Card	English / French
				No
		Remote Control Unit		Yes
		Dew Cation Sheet		No
		Video Cassette Tape		No
		Battery	UM size x pcs	Yes UM 4 x 2pcs
				-
		Safety Tip		No
		Toll Free Insert Sheet		No
		Quick Set-Up Sheet		No
		Information Sheet (Buyer Supply)		No
		75 Ohm Coaxial Cable		Yes
		Rod Antenna		No
			Poles Terminal	
		Loop Antenna		No
			Terminal	
		U/V Mixer		No
		DC Car Cord (Center+)		No
		Guarantee Card		Yes
		Warning Sheet		No
		Circuit Diagram		No
		Antenna Change Plug		No
		Service Station List		Yes
		Important Safeguard		No
		Dew/AHC Caution Sheet		No
		AC Plug Adapter		No
		Quick Set-up Sheet		No
		AC Cord		No
		AV Cord		No
		Registration Card		No
		PTB Sheet		No
		Tape Rewinder(Buyer Supply)		No
		300 ohm to 75 ohm Antenna Adapter		No

GENERAL SPECIFICATIONS [HR-A590U(C)]

G-15	Interface	Switch	Front	Power	Yes
				Play	Yes
				Pause/Still	No
				System Select	No
				One Touch Playback	No
				Channel Up	Yes
				Channel Down	Yes
				F.FWD/Cue	Yes
				Eject/Stop	Yes
				Main Power SW	No
				Volume Up	No
				Volume Down	No
				Rew/Rev	Yes
				Rec/OTR	Yes
		Indicator	Rear	RF Output SW	Yes
				Power	Yes(Green)
				Stand by	No
				Repeat	No
				TV/VCR	Yes(Green)
				Rec	Yes(Red)
				T-Rec	Yes(Red)
				Tape In	No
		Terminals	Front	Video Input	RCA x 1 (Black)
				Audio Input	RCA x 2 (Stereo,Black)
				Other Terminal	No
			Rear	Video Input	No
				Audio Input	No
				Video Output	RCA x 1 (Yellow)
				Audio Output	RCA x 2 (Stereo, White/Red)
				Euro Scart	No
				DC Jack 12V(Center +)	No
				VHF/UHF Antenna Input/Output	F Type
				AC Inlet	No

G-16	Set Size	Approx. W x D x H (mm)	360 x 224 x 95
G-17	Weight	Net (Approx.)	3.2kg(7.1lbs)
		Gross (Approx.)	3.8kg(8.4lbs)

G-18	Carton	Master Carton		No	
			Content	-	
			Material	-	
			Dimensions W x D x H(mm)	-	
		Gift Box	Description of Origin	-	
				Yes	
			Material	Single/White	
			Dimensions W x D x H(mm)	420x291x160	
			Design	As Per BUYER 's	
			Description of Origin	Yes	
			Drop Test	Natural Dropping At	1Corner / 3Edges / 6Surfaces
				Height (cm)	80
		Container Stuffing(40' container)		3136Sets	

G-19	Cabinet Material	Cabinet Front	PS 94V2 or More / DEC
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VICTOR COMPANY OF JAPAN, LIMITED

VIDEO CASSETTE RECORDER

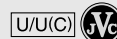
HR-A591U

INSTRUCTIONS

VHS
Hi-Fi
SQPB

LPT0661-001B

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02/01

Dear Customer,

Thank you for purchasing the JVC VHS video cassette recorder. Before use, please read the safety information and precautions to ensure safe use of your new VCR.

CAUTIONS



CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN



CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING:

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

CAUTION:

This video cassette recorder should be used with AC 120V~, 60Hz only.

To prevent electric shocks and fire hazards, DO NOT use any other power source.

CAUTION:

TO PREVENT ELECTRIC SHOCK, MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERT.

ATTENTION:

POUR ÉVITER LES CHOCS ÉLECTRIQUES, INTRODUIRE LA LAME LA PLUS LARGE DE LA FICHE DANS LA BORNE CORRESPONDANTE DE LA PRISE ET POUSSER JUSQU'AU FOND.

Note to CATV system installer:

This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

CAUTION:

Changes or modifications not approved by JVC could void user's authority to operate the equipment.

Failure to heed the following precautions may result in damage to the VCR, Remote or video cassette.

1. **DO NOT** place the VCR . . .
 - ...in an environment prone to extreme temperatures or humidity.
 - ...in direct sunlight.
 - ...in a dusty environment.
 - ...in an environment where strong magnetic fields are generated.
 - ...on a surface that is unstable or subject to vibration.
2. **DO NOT** block the VCR's ventilation openings.
3. **DO NOT** place heavy objects on the VCR or on the Remote.
4. **DO NOT** place anything which might spill on the top of the VCR or on the Remote.
5. **AVOID** violent shocks to the VCR during transport.

For Customer Use:

Enter below the Model No. and Serial No. which are located on the rear of cabinet. Retain this information for future reference.

Model No. _____

Serial No. _____

VHS SQPB HQ



- Cassettes marked "VHS" (or "S-VHS") can be used with this video cassette recorder. However, S-VHS recording is not possible with this model.
- This model is equipped with SQPB (S-VHS QUASI PLAYBACK) that makes it possible to play back S-VHS recordings with regular VHS resolution.
- HQ VHS is compatible with existing VHS equipment.
- As an Energy Star® Partner, JVC has determined that this product or product model meets the Energy Star® guidelines for energy efficiency.

IMPORTANT PRODUCT SAFETY INSTRUCTIONS

Electrical energy can perform many useful functions. But improper use can result in potential electrical shock or fire hazards. This product has been engineered and manufactured to assure your personal safety. In order not to defeat the built-in safeguards, observe the following basic rules for its installation, use and servicing.

ATTENTION:

Follow and obey all warnings and instructions marked on your product and its operating instructions. For your safety, please read all the safety and operating instructions before you operate this product and keep this booklet for future reference.

INSTALLATION

1. Grounding or Polarization

(A) Your product may be equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature.

If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.

(B) Your product may be equipped with a 3-wire grounding-type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type plug.

2. Power Sources

Operate your product only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your product dealer or local power company. If your product is intended to operate from battery power, or other sources, refer to the operating instructions.

3. Overloading

Do not overload wall outlets, extension cords, or integral convenience receptacles as this can result in a risk of fire or electric shock.

4. Power Cord Protection

Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.

5. Ventilation

Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, these openings must not be blocked or covered.

- Do not block the openings by placing the product on a bed, sofa, rug or other similar surface.
- Do not place the product in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.

6. Wall or Ceiling Mounting

The product should be mounted to a wall or ceiling only as recommended by the manufacturer.

ANTENNA INSTALLATION INSTRUCTIONS

1. Outdoor Antenna Grounding

If an outside antenna or cable system is connected to the product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Article 810 of the National Electrical Code, ANSI/NFPA 70, provides information with regard to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding connectors, location of antenna discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

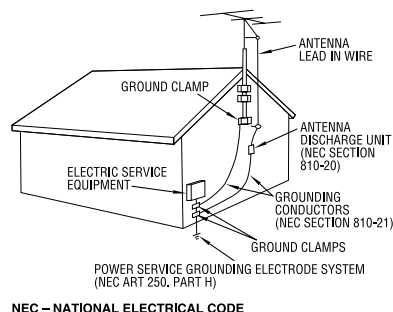
2. Lightning

For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the product due to lightning and power-line surges.

3. Power Lines

An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.

EXAMPLE OF ANTENNA GROUNDING AS PER NATIONAL ELECTRICAL CODE, ANSI/NFPA 70



USE

1. Accessories

To avoid personal injury:

- Do not place this product on an unstable cart, stand, tripod, bracket, or table. It may fall, causing serious injury to a child or adult, and serious damage to the product.
- Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer or sold with the product.
- Use a mounting accessory recommended by the manufacturer and follow the manufacturer's instructions for any mounting of the product.
- Do not try to roll a cart with small casters across thresholds or deep-pile carpets.

2. Product and Cart Combination

A product and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.

3. Water and Moisture

Do not use this product near water—for example, near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement, or near a swimming pool and the like.

4. Object and Liquid Entry

Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.

5. Attachments

Do not use attachments not recommended by the manufacturer of this product as they may cause hazards.

6. Cleaning

Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

7. Heat

The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

SERVICING

1. Servicing

If your product is not operating correctly or exhibits a marked change in performance and you are unable to restore normal operation by following the detailed procedure in its operating instructions, do not attempt to service it yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

2. Damage Requiring Service

Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

- a. When the power supply cord or plug is damaged.
- b. If liquid has been spilled, or objects have fallen into the product.
- c. If the product has been exposed to rain or water.

PORTABLE CART WARNING
(Symbol provided by RETAC)



- d. If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
- e. If the product has been dropped or damaged in any way.
- f. When the product exhibits a distinct change in performance—this indicates a need for service.

3. Replacement Parts

When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or which have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.

4. Safety Check

Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in safe operating condition.

How to use the Remote

Before use, insert two AAA size batteries into the Remote with the polarity (⊕ and ⊖) matched correctly as indicated on the battery compartment or on the lid.

- Point the Remote toward the remote sensor on the target component.
- The maximum operating distance of the remote control is about 5 m.

NOTE:

If the Remote does not work properly, remove its batteries, wait for a few seconds, replace the batteries and then try again.

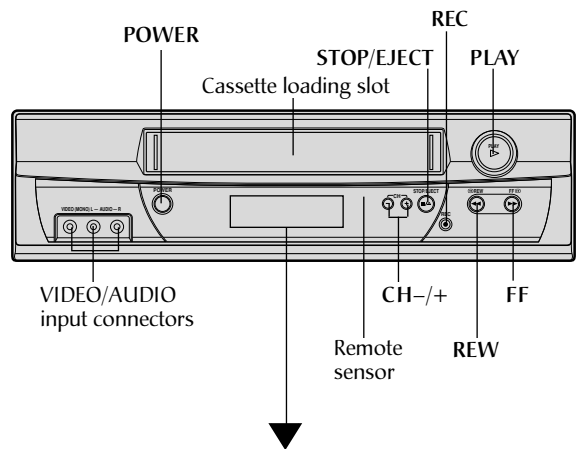
Video heads cleaning

Use a dry cleaning cassette – TCL-2— when:

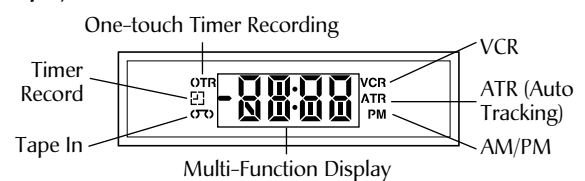
- Rough, poor picture appears while a tape is played back.
- The picture is unclear or no picture appears.

Buttons, Connectors and Indicators

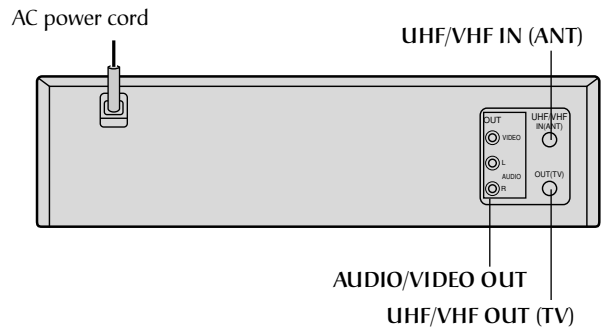
Front Panel



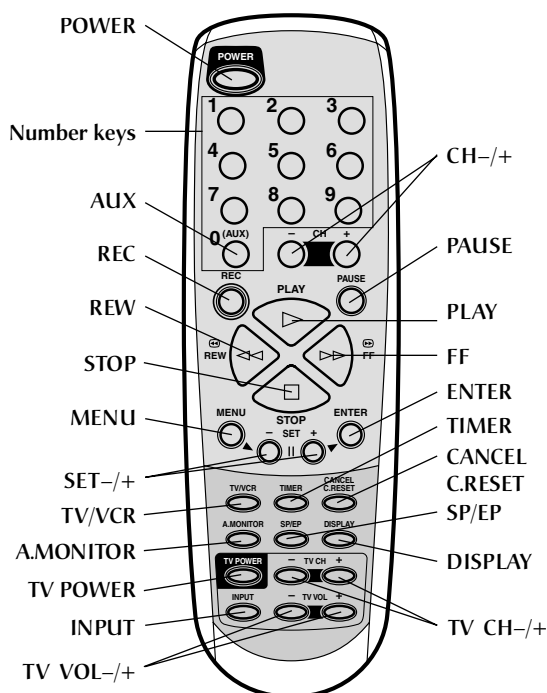
Display Panel



Rear Panel



Remote



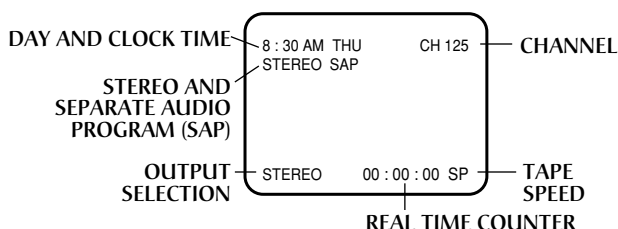
This Remote transmit A code signals only; it is not applicable to B code signals.

On-screen display

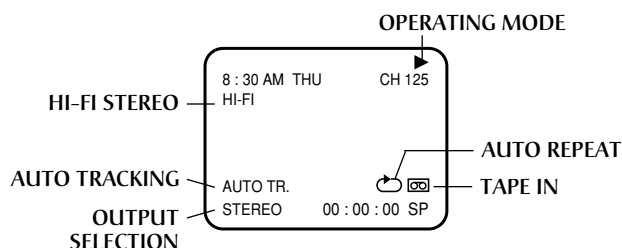
If you press **DISPLAY** on the Remote, you can see the current VCR status on the TV screen. Press **DISPLAY** again to exit on-screen display.

The indications are not recorded even if the VCR is in the recording mode.

WHILE WATCHING TV



WHILE OPERATING A TAPE



Connections and VCR channel Setting

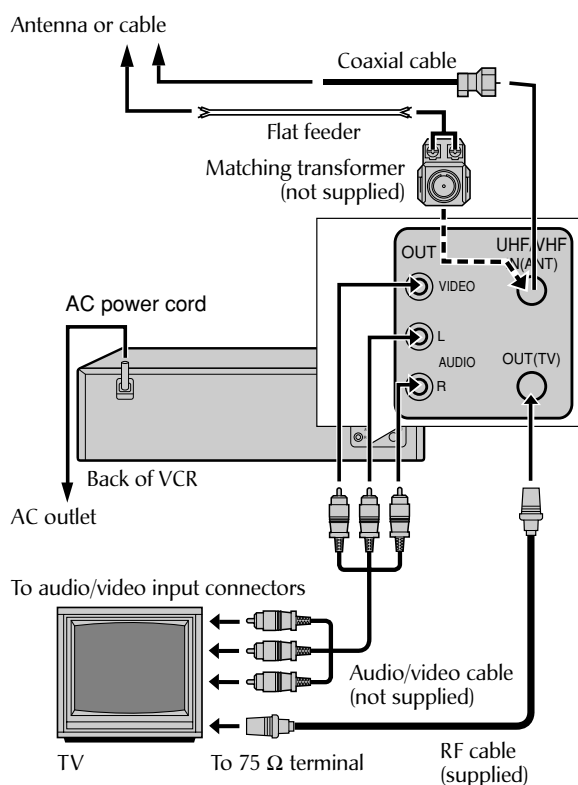
1 Check contents

Make sure the package contains all of the accessories listed in "Specifications".

2 Situate VCR

Place the VCR on a stable, horizontal surface.

3 Connect VCR to TV



RF Connection

- 1 Disconnect the TV antenna from the TV.
- 2 Connect the TV antenna cable to the UHF/VHF IN terminal on the rear of the VCR.
- 3 Connect the supplied RF cable between the UHF/VHF OUT terminal on the rear of the VCR and the TV's antenna input terminal.

AV Connection

(improves picture quality during tape playback.)

If your TV is equipped with audio/video input connectors

- 1 Connect the antenna, VCR and TV as shown in the illustration.
 - 2 Connect an audio/video cable between the AUDIO/VIDEO OUT connectors on the rear of the VCR and the audio/video input connectors on the TV.
- Even if you are using audio/video cables to connect your VCR to your TV, you must also connect it using the RF cable. This will ensure that you can record one show while watching another.

4 Set VCR channel

To view playback of a recorded tape, or to watch a program selected by the VCR's channel selector, the TV must be set to channel 3 or 4 (video channel) when a TV is connected with the 75 ohm coaxial cable only.

- 1 Press and hold **POWER** on the unit for 3 seconds in standby mode. The video channel will start to flash in the display.

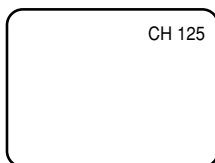
Press **CH** \pm to set the video channel 3 or 4.



- 2 Press **ENTER** to set the selected video channel in step 1 into the memory.

- 3 Turn ON the TV and set to CH 3 or 4 to correspond with the channel selected in step 1.

- 4 Turn on the VCR and select any channel to receive a TV station in your area. The channel number will appear on the screen and display for about 4 seconds.



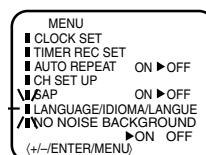
Initial Settings

Language Setting

The default setting is "ENGLISH".

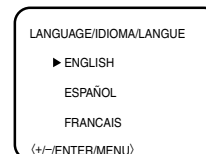
1 Access Menu screen

Press **MENU** on the Remote. Press **SET** \pm to select "LANGUAGE", then press **ENTER**.



2 Select language

This VCR offers you the language choice to view menus and some messages – in English, Spanish or French. Press **SET** \pm to select your desired language, then press **ENTER**. Press **MENU** twice to return to normal screen.

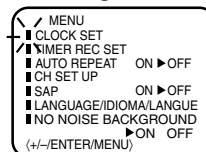


Clock Setting Preparations

You must set the date and time for timer recording.

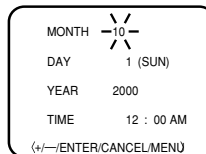
1 Access Menu screen

Press **MENU** on the Remote. Press **SET** \pm to select "CLOCK SET", then press **ENTER**.



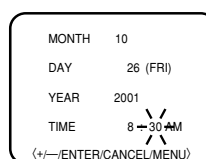
2 Set month, day, year and time

Press **SET** \pm until the desired month appears, then press **ENTER**. Set the day, year and time in the same way.



3 Start clock

Press **MENU** twice and normal screen appears.



To make corrections any time during the process

Press **CANCEL** repeatedly until the item you want to change blinks, then press **SET** \pm .

NOTE:

After a power failure or disconnection of the power, the timer settings will be lost. In this case, reset the present time.

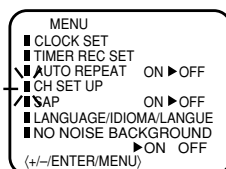
Tuner Setting

This VCR is equipped with a channel memory feature which allows channels to skip up or down to the next channel set into memory, skipping over unwanted channels. Before selecting channels, they must be programmed into the VCR's memory. In addition to normal VHF and UHF channels, this VCR can receive up to 113 Cable TV channels. To use this VCR with an antenna, set the TV/CATV menu option to the TV mode. When shipped from the factory, this menu option is in the CATV mode.

– TV/CATV Selection

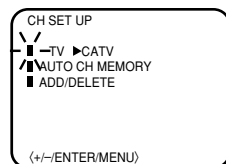
1 Access Menu screen, then CH Set Up screen

Press **MENU** on the Remote. Press **SET** \rightarrow **+** to select "CH SET UP", then press **ENTER**.



2 Perform TV/CATV Selection

Press **SET** \rightarrow **+** to select "TV/CATV", then press **ENTER** to select the TV or CATV mode. The arrow indicates the selected mode.



TV – VHF/UHF channels
CATV – CABLE TV channels

Press **MENU** twice to return to normal screen.

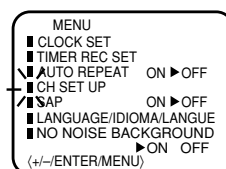
Setting channels automatically

– Auto Channel Memory

The VCR can receive a maximum of 181 channels by presetting the channels into memory.

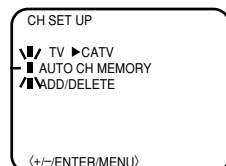
1 Access Menu screen, then CH Set Up screen

Press **MENU** on the Remote. Press **SET** \rightarrow **+** to select "CH SET UP", then press **ENTER**.



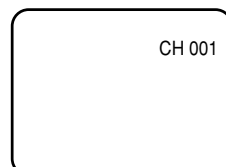
2 Perform Auto Channel Memory

Press **SET** \rightarrow **+** to select "AUTO CH MEMORY", then press **ENTER**.



3 Complete Auto Channel Memory

The auto tuning will start. The channel display will count up and when finished, the screen returns to normal.



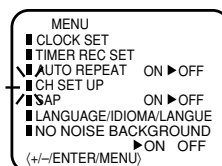
Setting channels manually

– Manual Channel Set

You can add the channels you want or delete the channels you do not want manually.

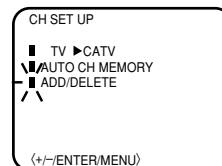
1 Access Menu screen, then CH Set Up screen

Press **MENU** on the Remote. Press **SET** \rightarrow **+** to select "CH SET UP", then press **ENTER**.



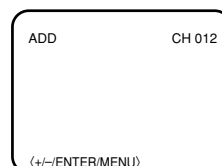
2 Access ADD/DELETE Mode

Press **SET** \rightarrow **+** to select "ADD/DELETE", then press **ENTER**.



3 Add or Delete desired channels

1 Press **SET** \rightarrow **+** on the Remote to select a channel number you want to add or delete.



2 To add channels

Press **ENTER** until "ADD" appears on the screen to set to add the unmemorized channel.

To delete channels

Press **ENTER** until "DELETE" appears on the screen to set to delete the channel from memory.

Repeat 1 to 2 to add or delete other channel.

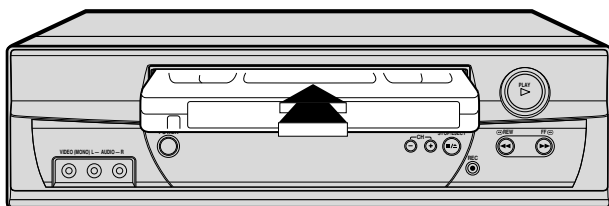
3 Press **MENU** three times to return to normal screen.

NOTE: You can't select "CH SET UP" if you set the channel to "L".

Playback

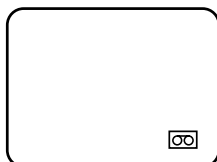
Basic Playback

1 Load a cassette



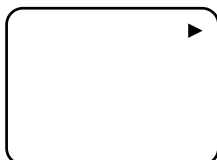
Make sure the window side is up, the rear label side is facing you and the arrow on the front of the cassette is pointing towards the VCR.

- Do not apply too much pressure when inserting.
- The VCR turns on, and the counter on the on-screen display is reset, automatically.
- If the cassette's record safety tab has been removed, playback begins automatically.



2 Start playback

Press **PLAY** (▶) on the Remote.

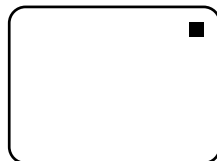


During playback

Stop playback

Press **STOP** (■) on the Remote.

OR Press **STOP/EJECT** (■/▲) on the VCR.



Pause playback and view still picture

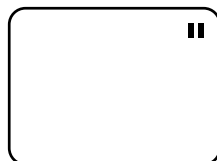
Press **PAUSE**.

- Press **PLAY** (▶) to resume normal playback.



Pause and Frame-by-Frame playback

Press **PAUSE** to pause, then press **PAUSE** repeatedly. Press **PLAY** (▶) to resume normal playback.



Slow-motion

Press **PLAY** (▶) on the Remote.

OR Press **Play** (▶) on the VCR.

- Playback will proceed at 1/10 th of the normal speed.
- Press **PLAY** (▶) to resume normal playback.

NOTE:

During slow motion picture, some noise might appear on the TV screen. Use the **SET-/+** on the Remote to eliminate the noise.

Speed search

Press **REW** (◀◀) or **FF** (▶▶) on the Remote.

OR Press **REW** (◀◀) or **FF** (▶▶) on the VCR.

- Press **PLAY** (▶) to resume normal playback.

Variable speed search

Press **REW** (◀◀) or **FF** (▶▶) repeatedly on the Remote.

OR Press **REW** (◀◀) or **FF** (▶▶) repeatedly on the VCR.

- Press **PLAY** (▶) to resume normal playback.
- Each time you press **REW** (◀◀) or **FF** (▶▶) the playback speed changes.

TAPE SPEED	PICTURE SEARCH SPEED	
	PRESS ONCE	PRESS TWICE
SP	3X	5X
EP	9X	15X

When the tape is not running

Rewind/fast-forward

Press **REW** (◀◀) or **FF** (▶▶) on the Remote.

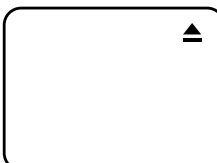
OR Press **REW** (◀◀) or **FF** (▶▶) on the VCR.



Eject the tape

Press **STOP/EJECT** (■/▲) on the VCR.

- You can also eject the cassette when the VCR is turned off.



Turn off the VCR

Press **POWER** on the Remote.

OR Press **POWER** (⏻/⏻) on the VCR.

Playback Features

Adjusting tracking condition

– Tracking Adjustment

Automatic tracking adjustment

Whenever you insert a tape and start playback, automatic tracking starts working and continuously analyzes the signal to enable optimum picture quality during playback.

Manual tracking adjustment

If automatic tracking cannot eliminate noises well during playback, press **SET** \pm on the Remote to eliminate the noises. Press it briefly for a fine adjustment, or press and hold for a coarse adjustment.

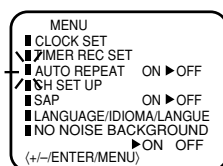
- Press **SP/EP** on the Remote again to reactivate automatic tracking.

Playing back tape repeatedly

– Auto Repeat Play

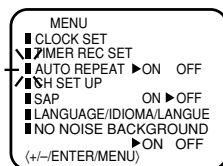
1 Access Menu screen

Press **MENU** on the Remote.
Press **SET** \pm to select "AUTO REPEAT".



2 Select ON/OFF

Press **ENTER** to select "ON" or "OFF".
Press **MENU** to return to normal screen.



3 Start Auto Repeat Play

Press **PLAY**. The tape will play over and over until the repeat mode is canceled.

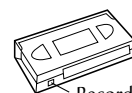
Recording

It may be unlawful to record or play back copyrighted material without the consent of the copyright owner.

Accidental erasure prevention

To prevent accidental recording on a recorded cassette, remove its record safety tab.

To record on it later, cover the hole with adhesive tape.



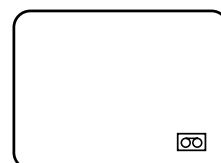
Record safety tab

Basic Recording

1 Load a cassette

Make sure the record safety tab is intact. If not, cover the hole with adhesive tape before inserting the cassette.

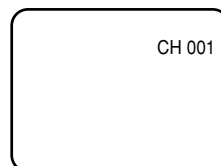
- The VCR turns on, and the counter is reset, automatically.



2 Select recording channel

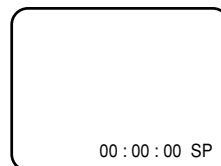
Press **CH** \pm or the **Number** keys on the Remote [**CH** \pm on the VCR].

- If you connect the TV and the VCR only using the RF connection, press **TV/VCR** on the Remote so that the VCR mode indicator lights on the display panel, to view the program to be recorded.



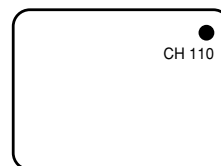
3 Set tape speed

Press **SP/EP**.



4 Start recording

On the VCR, press **REC**. Or on the Remote, while holding **REC**, press **PLAY** (\triangleright).



During recording

Pause recording

Press **PAUSE**.

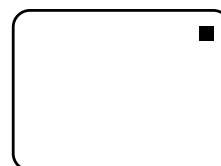
- Press **PAUSE** to resume recording.
- You can select channel in the recording pause mode.



Stop recording

Press **STOP** (\square) on the Remote.

OR Press **STOP/EJECT** ($\blacksquare/\blacktriangle$) on the VCR.



Recording Features

Specifying recording length

– One Touch Timer Recording (OTR)

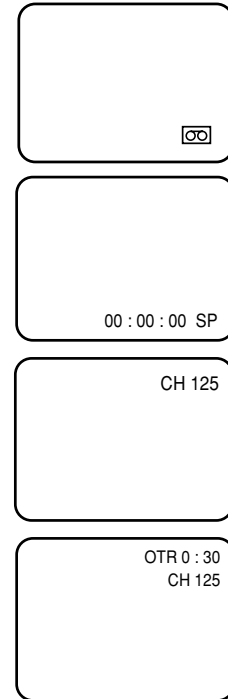
The One-touch Timer Recording feature provides a simple and convenient way to make a timed recording.

EXAMPLE: One-touch Timer Recording for 30 minutes.

When a TV is connected with an audio/video cable, turn the TV on and select the video input mode on the TV.

- 1 Load a cassette tape with the erase prevention tab intact. The clock display will change in the counter display.
- 2 Press **SP/EP** to select the desired tape speed SP or EP. The counter and SP or EP will appear on the screen for about 4 seconds.
- 3 Press the **Number keys** or **CH +/-** to select the channel to be recorded. The channel number will appear on the screen and display for about 4 seconds.
- 4 Press **REC** on the VCR or while holding **REC**, press **PLAY** (▶) on the Remote to begin recording. Press **REC** on the VCR again to stop recording after 30 minutes. Each additional press of **REC** will increase recording time as shown in the chart below, up to a maximum of 5 hours. The OTR and recording time will appear on screen for about 4 seconds.

- NOTES:**
- Press **REC** to increase the time needed for recording (See the chart).
 - To cancel OTR, press **STOP** (□) or turn off the power.



Press	Recording time
once	NORMAL REC
twice	0:30
3 times	1:00
4 times	1:30
5 times	2:00
6 times	3:00
7 times	4:00
8 times	5:00
9 times	NORMAL REC

Watching one program while recording another

During recording...

- If you connect the TV and the VCR only using the RF connection to view pictures from the VCR, press **TV/VCR** on the Remote so that VCR mode indicator goes off from the display panel. (The TV broadcast being recorded disappears.)
- If you are using the AV connection to view pictures from the VCR, change the TV's input mode from AV to TV. Then, select the channel you want to watch, on the TV.

Timer Recording

Timer recording can be programmed on-screen with the remote control. The built-in timer allows automatic unattended recording of up to 8 programs within 1 month.

NOTES:

- After timer recording is completed, the VCR turns off automatically.
- You can program the timer recording while a regular recording is in progress; the menu screens will not be recorded.
- The timer recording will start at 20 seconds before the time you predetermined.

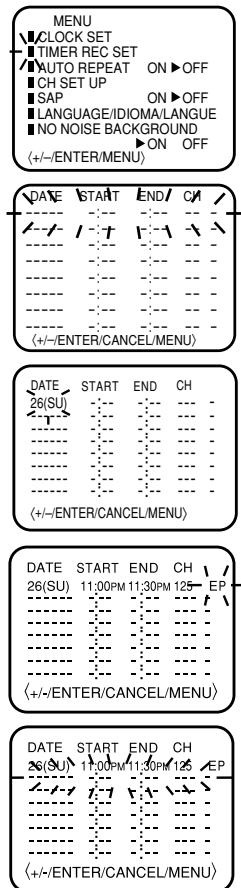
EXAMPLE: Program a timer recording for the 26th day, channel 125 (CATV), 11:00 – 11:30 PM on timer program number 1 (Tape speed: EP).

When a TV is connected with an audio/video cable, turn the TV and this VCR on and select the video input mode on the TV.

- 1 Press **MENU** on the Remote. Check the "TIMER REC SET" option is selected, then press **ENTER**.
- 2 Press **SET +/-** to select one of the program lines, then press **ENTER**.
- 3 Press **SET +/-** to select the date, then press **ENTER**.
- 4 Set the start time, end time, channel and tape speed as in step 3.

NOTE: To record from external source, press **SET +/-** and set the channel to "L". "L" will appear next to CH 125 (or 69).


- 5 To enter other programs, repeat step 2 through 4. Or, press **MENU** twice to return to the normal screen.
- 6 Press **TIMER** on the Remote. The power will go off, the **TIMER REC** indicator (⏻) will light and the VCR stands by for recording.



To use the VCR while it is in timer recording standby mode
Press **TIMER**. After you use the VCR, press **TIMER** again to put the VCR into timer recording standby mode.

TO CORRECT THE SETTINGS

When setting the Timer Recording, press **ENTER** until the desired setting blinks, then re-enter the setting using **SET -/+**. When finished, press **ENTER**.

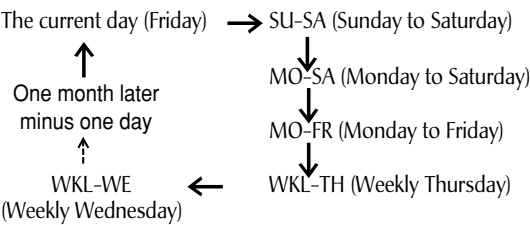
- NOTES:
- The VCR cannot be used while the **TIMER REC** indicator () is lit.
 - After a power failure or disconnection of the power plug, all programmed recording settings must be reset upon resumption of power. In this case, reset the clock and reprogram any timer recordings.
 - Press **CANCEL** to move cursor backward for correction.

TO SET DAILY/WEEKLY TIMER

When setting the date in step 3 in the Setting the Timer Recording section on the previous page, press **SET -** repeatedly.

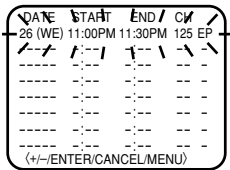
The setting changes as follows:

Example



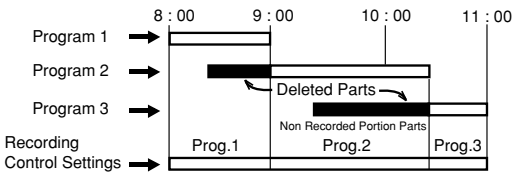
TO CONFIRM THE SETTINGS

Press **SET -/+** to select the "TIMER REC SET" option in the MENU. Then press **ENTER** to display the timer program list. Press **MENU** twice to return to the normal screen.



IF THE PROGRAM OVERLAPS ANOTHER

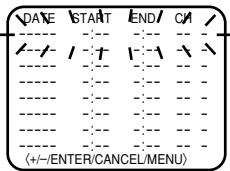
NOTE: Do not overlap programs as portions of the conflicting programs will be lost. The first recording time has priority over the next recording time as shown in the diagram.



- NOTES:
- The everyday/every week recording can be made continuously until the recording is canceled or the tape reaches the end.
 - During timer recording, the automatic rewinding mechanism does not function.

TO CANCEL A PROGRAM

Press the **SET -/+** to select the "TIMER REC SET" option in the MENU. Then press **SET -/+** to select the unnecessary program, and press **CANCEL** to cancel the program.

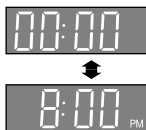


Other Functions

■ Changing display information

Each time you press **DISPLAY**, the display panel shows the time counter and the clock time alternatively.

- When **DISPLAY** on the Remote is pressed, time counter will appear on the TV screen.
- To reset the time counter, press **C. RESET** on the Remote.



■ BLUE BACK – ON/OFF

When this function is set to "ON", the TV screen becomes all blue in the following case:

When receiving a channel not in use.

- 1 Press **MENU** on the remote. Press **SET -/+** to select "NO NOISE BACKGROUND".
- 2 Press **ENTER** to select "ON".
- 3 Press **MENU** to return to normal screen.

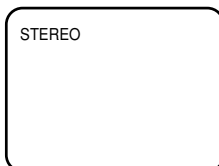
■ STEREO RECORDING AND PLAYBACK

RECORDING STEREO BROADCASTS

The VHS Hi-Fi audio system permits high fidelity recording of MTS STEREO TV broadcasts.

When a MTS STEREO broadcast is received, the STEREO will appear on the screen and the program can be viewed or recorded in stereo.

The Hi-Fi STEREO recording procedure is the same as for normal recordings.



NOTE: When using a CATV system, stereo TV programs may be transmitted over a mono cable channel. In this case the word "STEREO" will not appear and the sound will be in mono.

OUTPUT SELECTION

When viewing an MTS STEREO TV program, or playing a prerecorded VHS Hi-Fi STEREO videotape, press **A.MONITOR** to select how the audio will be heard through the speakers. Normally set to the Hi-Fi STEREO position, this button can be set to the MONO position if the stereo broadcast or videotape audio is of poor quality. The "R" and "L" positions allow the audio from the Right or Left Hi-Fi channel to be heard over both TV speakers. This button has no effect when viewing a MONO videotape or TV program. Each time when you press the button, OUTPUT SELECTION display appears on the screen for several seconds. Refer to the chart below.

OUTPUT SELECTION	SOUND HEARD ON BOTH SPEAKERS
STEREO	STEREO
L ch	LEFT CHANNEL AUDIO
R ch	RIGHT CHANNEL AUDIO
MONO	MONO

NOTES:

- When playing back a tape that is not recorded in Hi-Fi stereo mode, the audio will automatically be monaural.
- When listening to a VHS Hi-Fi video tape or MTS broadcast through the VHF/UHF jack (Audio/Video cord not connected), the sound will be monaural.

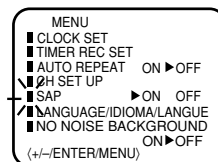
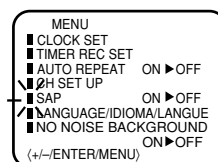
■ SEPARATE AUDIO PROGRAM (SAP)

Your VCR is fitted with an SAP broadcast system which enables you to switch to a SEPARATE AUDIO PROGRAM when viewing a selected channel.

This function applies only when the program is broadcast in multi-languages through the SAP broadcast system.

When a TV is connected with an audio/video cable, turn the TV and this VCR on, and select the video input mode the TV.

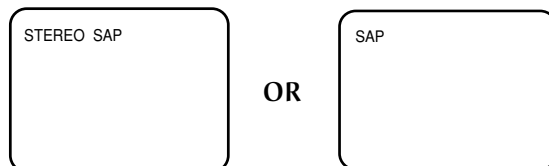
- 1 Press **MENU**.
Press on the Remote **SET -/+** to select "SAP" option.
- 2 Press **ENTER** to select "ON" position.
- 3 Press **MENU** to return to normal screen.



■ LISTENING TO SAP

When the VCR is turned on or a channel selection is made, make certain "SAP" appears on the screen.

This means that the "Separate Audio Program" broadcasting is available.



JVC TV Remote Control

This Remote can control some functions (**TV POWER**, **INPUT**, **TV CH -/+** and **TV VOL -/+**) of a remote controllable JVC TV without setting.

NOTE:

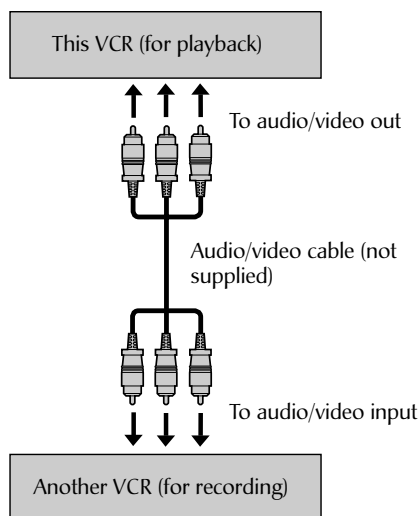
- It's not possible to operate a unit not equipped with a remote sensor.
- This Remote can control a JVC TV only.

Editing

You can use your VCR as the playback or recording VCR. You can use a camcorder as the playback VCR and your VCR as the recording VCR. Refer also to the other components' instruction manuals for connection and its operations.

1 Make connections

Example: When using this VCR as the playback VCR



- When using this VCR as the recording VCR, connect this VCR's audio/video input connectors to the audio/video output connectors on the other VCR. If the playback VCR is monaural, connect the audio output connector on the playback VCR to the left audio input connector on this VCR.

2 Load cassettes

Insert the playback cassette into the playback VCR and the cassette to be recorded on into the recording VCR.

3 Select input mode on recording VCR

Select the correct external input on the recording VCR. On this VCR (when using this VCR as the recording VCR); Select "L" – when connecting the other VCR to the audio/video input connectors on the front panel. Press **O (AUX)** or **CH-/+** on the Remote [**CH-/+** on the VCR].

4 Start playback



Press **PLAY** (▶) on the playback VCR.

5 Start recording

Press **REC** on the recording VCR.

Before Requesting Service

Make sure by first checking the following points.

SYMPTOM	CAUSE	POSSIBLE SOLUTION
POWER		
No power.	The AC power cord is not connected.	Connect the AC power cord to the AC outlet.
Although the power is on, it does not operate.	Cassette is not inserted.	Insert a video cassette.
TV BROADCAST RECEPTION		
A TV program that is selected by the VCR does not appear on the screen.	Antenna connection is not correct.	Connect it correctly.
	Antenna cable is disconnected.	Reconnect the antenna cable.
	The video channel is not in the correct position.	Set it to CH 3 or 4.
	The TV is not set to the video channel 3 or 4.	Set the TV channel selector to the 3 or 4 position.
	The TV/VCR selector is set at TV mode (The TV/VCR indicator is not lit).	Press the TV/VCR selector button (The TV/VCR indicator will light).
	INPUT is set to the LINE mode. The TV/CATV menu option setting.	Press the Number key or CH -/+ button to select your desired TV program.
A TV program selected by the VCR does not appear in color.		Set the TV/CATV menu option to select TV or CATV mode.
RECORDING		
TV recording does not work.	The erase prevention tab of the video cassette is broken off.	Place a piece of vinyl tape over the gap.
	INPUT is set to the LINE mode.	Press the Number key or CH -/+ button to select your desired TV program.
Timer recording does not work.	The time is not set correctly.	Reset the present time.
	The recording start/end time is not set correctly.	Set the start/end time.
	The TIMER button has not been pressed (The TIMER REC symbol  is not lit on the display).	Press the TIMER button (The TIMER REC symbol  is lit on the display).
PLAYBACK		
No picture on screen when playing back a recorded tape.	The TV is not set to the video channel 3 or 4.	Set to the video channel 3 or 4 or adjust the fine tuning button on your TV set.
Noise bars on screen.	Tracking adjustment beyond range of automatic tracking circuit.	Adjust tracking manually using the SET - or + buttons on the remote control.
	Video heads are dirty.	Have the video heads cleaned.
	The tape is worn or damaged.	Try another tape.
REMOTE CONTROL		
Remote control does not work.	It is not aimed at the remote sensor.	Aim it at the remote sensor.
	Distance too far or too much light in the room.	Operate within 15 feet (5 meters) reduce the light in the room.
	There is an obstacle in the path of the beam.	Clear the path of the beam.
	The batteries are weak.	Replace the batteries.
	The +, - polarity of the batteries are not inserted correctly.	Insert correctly.
TV programs cannot be seen using the TV selector.	The TV/VCR function is in the VCR mode.	Set to TV, or turn off the VCR power button.

Specifications

GENERAL

Power requirement	:	AC 120 V, 60 Hz
Power consumption	:	
Power on	:	9 W
Power off	:	1.7 W
Temperature	:	
Operating	:	5°C to 40°C (41°F to 104°F)
Storage	:	-20°C to 60°C (-4°F to 140°F)
Operating position	:	Horizontal only
Dimensions (W x H x D)	:	360 mm x 95 mm x 224 mm (14-3/16" x 3-3/4" x 8-13/16")
Weight	:	3.2 kg (7.1 lbs)
Format	:	VHS NTSC standard
Maximum recording time	:	
SP	:	210 min. with ST-210 video cassette
EP	:	630 min. with ST-210 video cassette

VIDEO/AUDIO

Signal system	:	NTSC-type color signal and EIA monochrome signal, 525 lines/60 fields
Recording/Playback system	:	DA-4 (Double Azimuth) head helical scan system
Signal-to-noise ratio	:	42 dB
Horizontal resolution	:	230 lines
Frequency range	:	
Normal audio	:	100 Hz to 10,000 Hz
Hi-Fi audio	:	20 Hz to 20,000 Hz
Input/Output	:	RCA connectors (IN x 1, OUT x 1)

TUNER

Tuning system	:	Frequency-synthesized tuner
Channel coverage	:	
VHF	:	Channels 2-13
UHF	:	Channels 14-69
CATV	:	113 Channels
RF output	:	Channel 3 or 4 (switchable; preset to Channel 3 when shipped) 75 ohms, unbalanced

TIMER

Clock reference	:	Quartz
Program capacity	:	1-month programmable timer/8 programs
Memory backup for timer	:	Approx. 5 sec.

ACCESSORIES

Provided accessories	:	RF cable (F-type), Infrared remote control unit, "AAA" battery x 2
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Specifications shown are for SP mode unless specified otherwise.
E. & O.E. Design and specifications subject to change without notice.

FOR SERVICING (Only in U.S.A.)

HOW TO LOCATE YOUR JVC SERVICE CENTER

TOLL FREE: 1-800-537-5722

<http://www.jvc.com>

Dear Customer,

In order to receive the most satisfaction from your purchase, please read the instruction booklet before operating the unit. In the event that repair is necessary, or for the address nearest your location within the Continental United States, please call 1-800-537-5722 for your nearest authorized servicer or visit our website at www.JVC.com. Remember to retain your Bill of Sale for Warranty Service.

— JVC

JVC SERVICE & ENGINEERING COMPANY OF AMERICA

DIVISION OF JVC AMERICAS CORP.

Sophisticated electronic products may require occasional service. Just as quality is a keyword in the engineering and production of the wide array of JVC products, service is the key to maintaining the high level performance for which JVC is world famous. The JVC service and engineering organization stands behind our products.

NATIONAL HEADQUARTERS
JVC SERVICE & ENGINEERING COMPANY OF AMERICA
DIVISION OF JVC AMERICAS CORP.
10 New Maple Avenue
Pine Brook, NJ 07058-9641

ACCESSORIES

To purchase accessories for your JVC product, you may contact your local JVC Dealer.

*From the 48 Continental United States call toll free:
1-800-882-2345 or on the web at www.JVC.com*

Don't service the product yourself.

CAUTION

To prevent electrical shock, do not open the cabinet. There are no user serviceable parts inside.

Please refer to qualified service personnel for repairs.

WARRANTY (Only in U.S.A.)

LIMITED WARRANTY

CONSUMER VIDEO 1-90

JVC COMPANY OF AMERICA warrants this product and all parts thereof, except as set forth below ONLY TO THE ORIGINAL PURCHASER AT RETAIL to be FREE FROM DEFECTIVE MATERIALS AND WORKMANSHIP from the date of original retail purchase for the period as shown below. ("The Warranty Period")

PARTS	LABOR
1 YR	90 DAYS

THIS LIMITED WARRANTY IS VALID ONLY IN THE FIFTY (50) UNITED STATES, THE DISTRICT OF COLUMBIA AND IN COMMONWEALTH OF PUERTO RICO.

WHAT WE WILL DO:

If this product is found to be defective, JVC will repair or replace defective parts at no charge to the original owner. Such repair and replacement services shall be rendered by JVC during normal business hours at JVC authorized service centers. Parts used for replacement are warranted only for the remainder of the Warranty Period. All products and parts thereof may be brought to a JVC authorized service center on a carry-in basis except for Television sets having a screen size 25 inches and above which are covered on an in-home basis.

WHAT YOU MUST DO FOR WARRANTY SERVICE:

Return your product to a JVC authorized service center with a copy of your bill of sale. For your nearest JVC authorized service center, please call toll free: (800) 537-5722.

If service is not available locally, box the product carefully, preferably in the original carton, and ship, insured, with a copy of your bill of sale plus a letter of explanation of the problem to the nearest JVC Factory Service Center, the name and location of which will be given to you by the toll-free number.

If you have any questions concerning your JVC Product, please contact our Customer Relations Department.

WHAT IS NOT COVERED:

This limited warranty provided by JVC does not cover:

1. Products which have been subject to abuse, accident, alteration, modification, tampering, negligence, misuse, faulty installation, lack of reasonable care, or if repaired or serviced by anyone other than a service facility authorized by JVC to render such service, or if affixed to any attachment not provided with the products, or if the model or serial number has been altered, tampered with, defaced or removed;
2. Initial installation and installation and removal for repair;
3. Operational adjustments covered in the Owner's Manual, normal maintenance, video and audio head cleaning;
4. Damage that occurs in shipment, due to act of God, and cosmetic damage;
5. Signal reception problems and failures due to line power surge;
6. Video Pick-up Tubes/CCD Image Sensor, Cartridge, Stylus (Needle) are covered for 90 days from the date of purchase;
7. Accessories;
8. Batteries (except that Rechargeable Batteries are covered for 90 days from the date of purchase);

There are no other express warranties except as listed above.

THE DURATION OF ANY IMPLIED WARRANTIES INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY, IS LIMITED TO THE DURATION OF THE EXPRESS WARRANTY HEREIN.

JVC SHALL NOT BE LIABLE FOR THE LOSS OF USE OF THE PRODUCT, INCONVENIENCE, LOSS OR ANY OTHER DAMAGES, WHETHER DIRECT, INCIDENTAL OR CONSEQUENTIAL (INCLUDING, WITHOUT LIMITATION, DAMAGE TO TAPES, RECORDS OR DISCS) RESULTING FROM THE USE OF THIS PRODUCT, OR ARISING OUT OF ANY BREACH OF THIS WARRANTY. ALL EXPRESS AND IMPLIED WARRANTIES, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE, ARE LIMITED TO THE WARRANTY PERIOD SET FORTH ABOVE.

Some states do not allow the exclusion of incidental or consequential damages or limitations on how long an implied warranty lasts, so these limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

JVC COMPANY OF AMERICA
DIVISION OF JVC AMERICAS CORP.

1700 Valley Road
Wayne, New Jersey 07470

REFURBISHED PRODUCTS CARRY A SEPARATE WARRANTY, THIS WARRANTY DOES NOT APPLY. FOR DETAILS OF REFURBISHED PRODUCT WARRANTY, PLEASE REFER TO THE REFURBISHED PRODUCT WARRANTY INFORMATION PACKAGED WITH EACH REFURBISHED PRODUCT.

For customer use:

Enter below the Model No. and Serial No. which is located either on the rear, bottom or side of the cabinet. Retain this information for future reference.

Model No.: _____

Serial No.: _____

Purchase date: _____

Name of dealer: _____

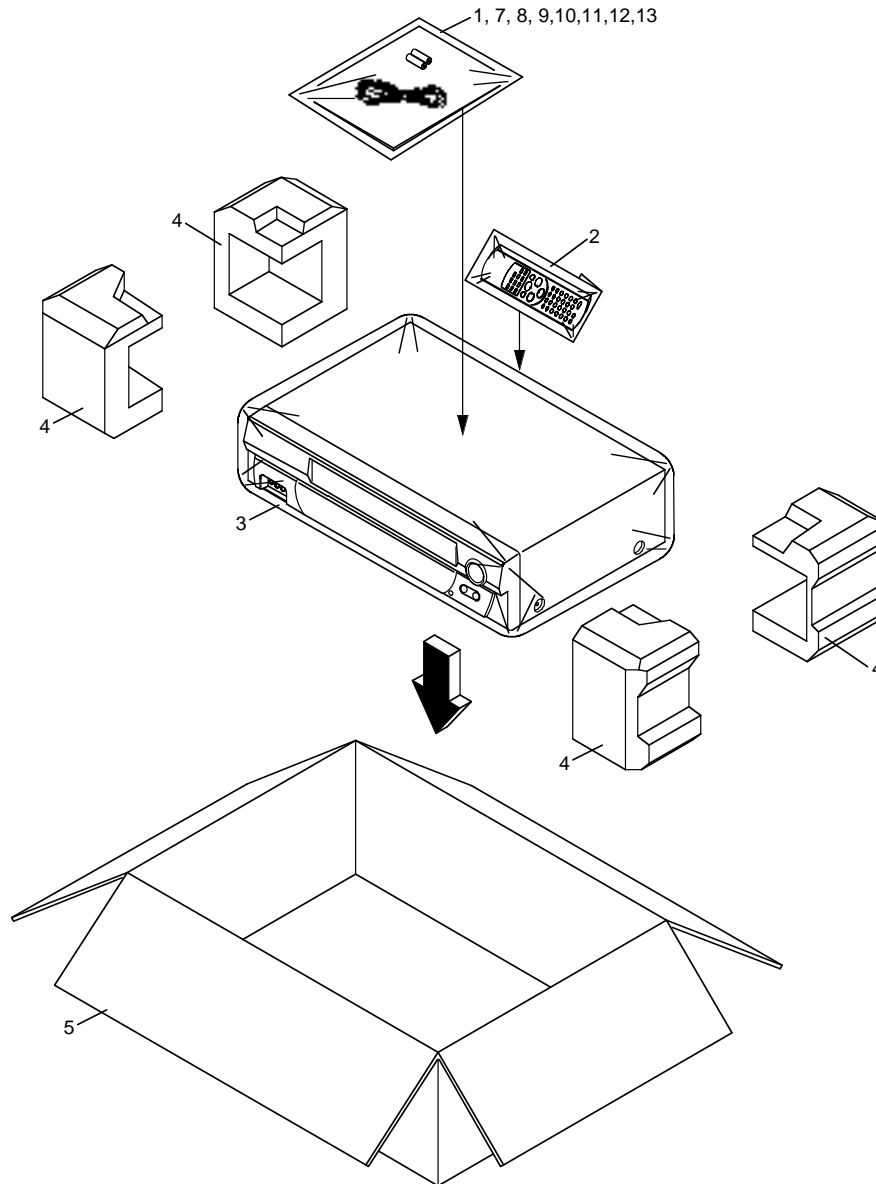
PARTS LIST

SAFETY PRECAUTION

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

3.1 PACKING AND ACCESSORY ASSEMBLY <M1>

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



# \triangle	REF No.	PART No.	PART NAME, DESCRIPTION

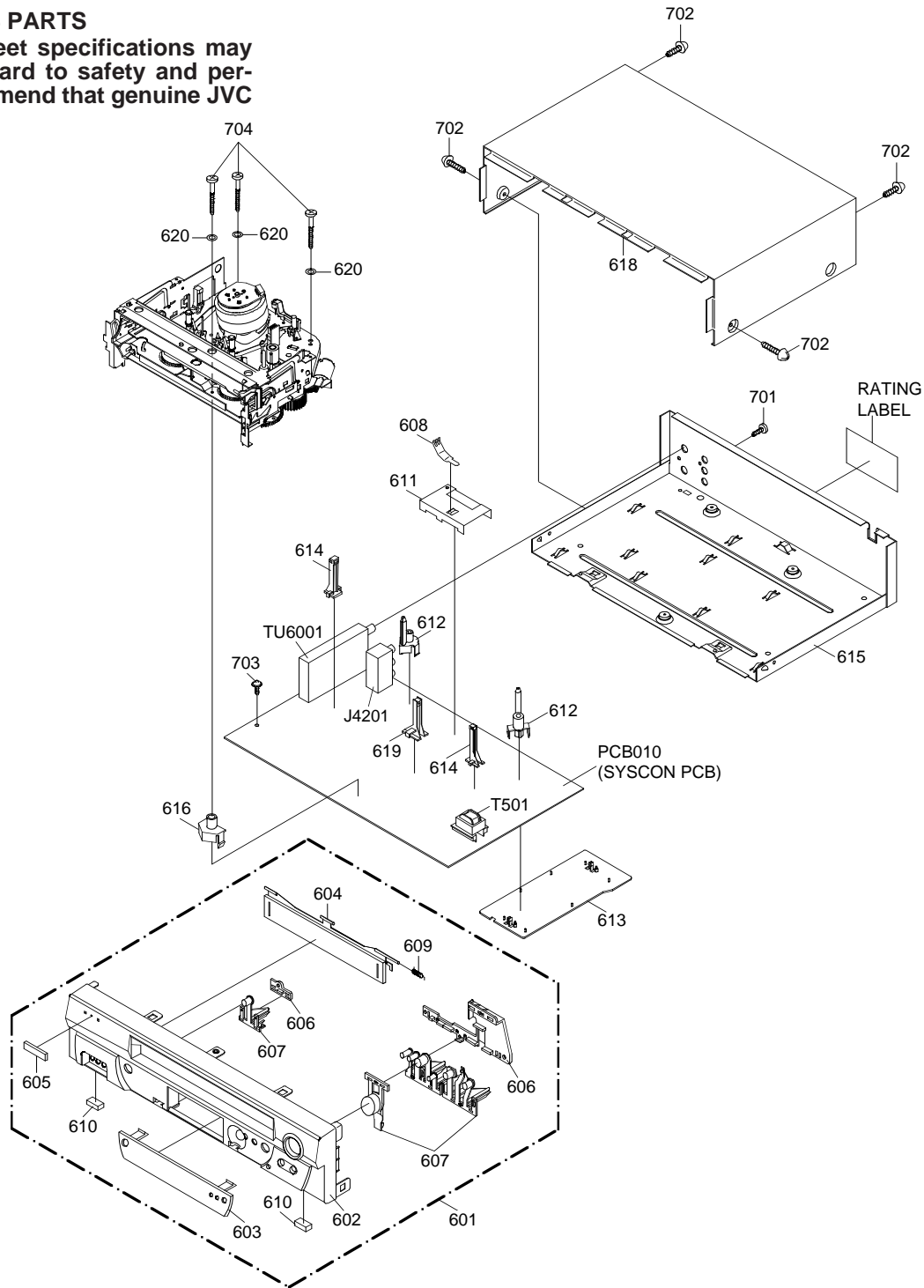
PACKING AND ACCESSORY ASSEMBLY <M1>			
1	PEAC0294-03		RF CABLE
2	X-076N0ES010		REMOTE CONTROLLER
3	X-791WHA0095		GIFT SHEET
4	X-792WHA0343		CUSHION
5	X-793WCDB096		GIFT BOX,HR-A591U/U(C)
	X-793WCDB107		GIFT BOX,HR-A590U(C)
7	X-JB5KD200		POLY BAG,HR-A591U
	X-JJB5KD400		POLY BAG,HR-A591,A590U(C)

# \triangle	REF No.	PART No.	PART NAME, DESCRIPTION
\triangle 8	X-J4F21601		INSTRUCTION BOOK,HR-A591U
	X-J4F21701		INSTRUCTION BOOK(EN),HR-A591U(C)
	X-J4F21901		INSTRUCTION BOOK(EN),HR-A590U(C)
9	X-J5500117		REGISTRATION CARD,HR-A591U
\triangle 10	X-J4F21710		INSTRUCTION BOOK(FR),HR-A591U(C)
	X-J4F21910		INSTRUCTION BOOK(FR),HR-A590U(C)
11	X-J5500112		GUARANTEE CARD,HR-A591,A590U(C)
12	X-J5500115		SERVICE STATION LIST,HR-A591,A590U(C)
13	-		BATTERY,x2

3.2 FINAL ASSEMBLY [HR-A591U/U(C)] <M2>

BEWARE OF BOGUS PARTS

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



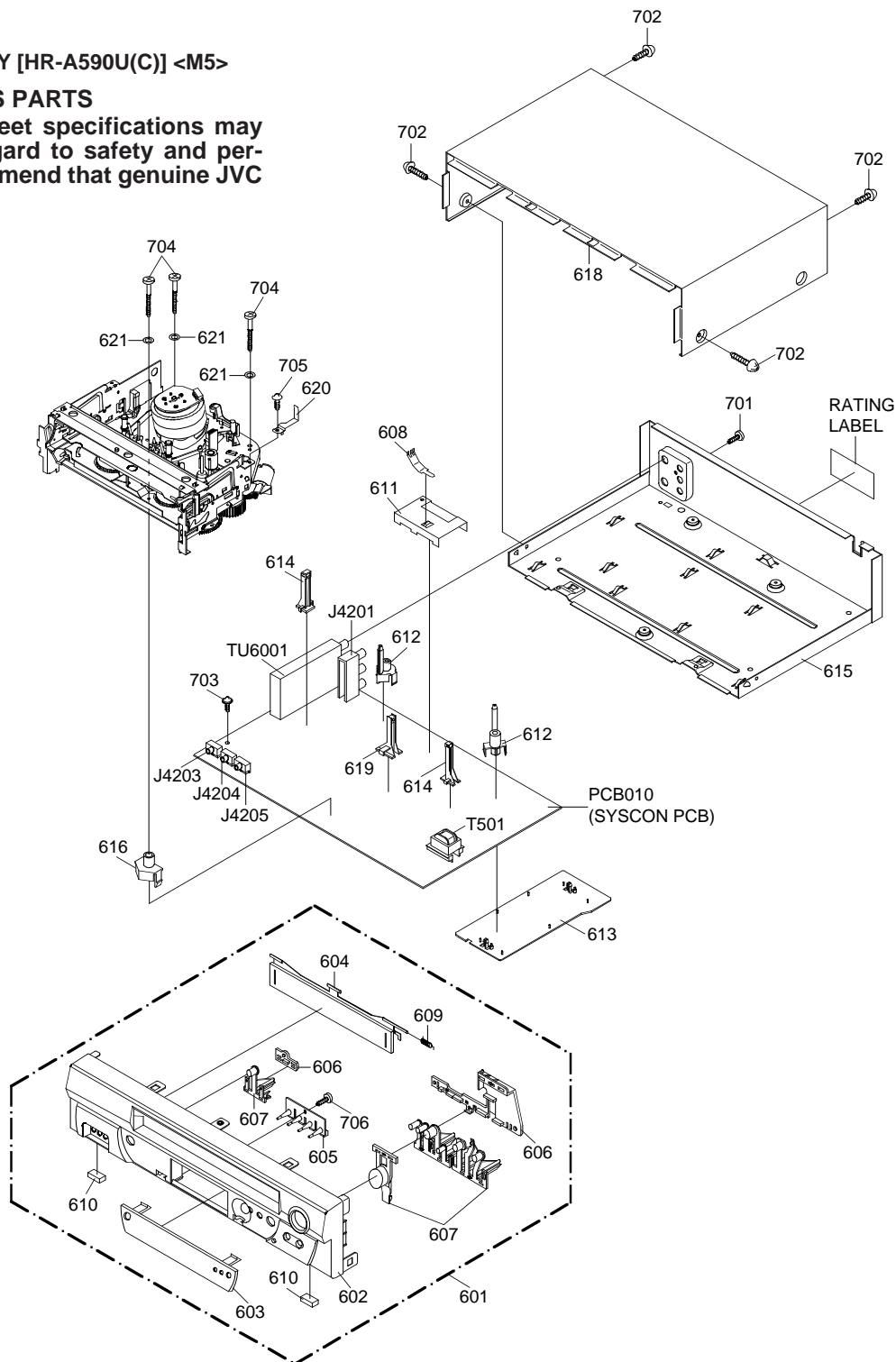
#	△	REF No.	PART No.	PART NAME, DESCRIPTION	#	△	REF No.	PART No.	PART NAME, DESCRIPTION	

FINAL ASSEMBLY <M2>										
△	601	X-A4F216B720		CABINET,FRONT ASSY			611	X-752WSA0230	SHIELD,CASE HEAD AMP	
	602	X-701WPJB608		CABINET,FRONT			612	X-701WPA0680	HOLDER,DECK	
	603	X-711WPDA426		PLATE,DISPLAY		△	613	X-755WPA0020	PLATE,COVER POWER	
	604	X-712WPDA061		FLAP			614	X-85OP700036	HOLDER,EOT SENSOR	
	605	X-723538A001		BADGE,BRAND		△	615	X-702WSA0084	PLATE,BOTTOM	
	606	X-735WPA0602		BUTTON,HOLDER			616	X-701WPA0686	HOLDER,DECK	
	607	X-735WPDA509		BUTTON,FRAME		△	618	X-702WSB0058	CABINET,TOP	
	608	X-753WUAA006		SPRING,EARTH HEAD AMP			619	X-85OP700037	HOLDER,LED	
	609	X-743WKA0032		SPRING,FLAP			620	X-82J3065B50	CURVE WASHER	
	610	X-800WFA0045		CUSHION,LEG			701	X-8110230804	SCREW,TAP	3x8
							702	X-8109230802	SCREW,TAP	3x8
							703	X-8109230704	SCREW,TAP	3x7
							704	X-8109130B94	SCREW,TAP	3x29

3.3 FINAL ASSEMBLY [HR-A590U(C)] <M5>

BEWARE OF BOGUS PARTS

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



REF No. PART No. PART NAME, DESCRIPTION

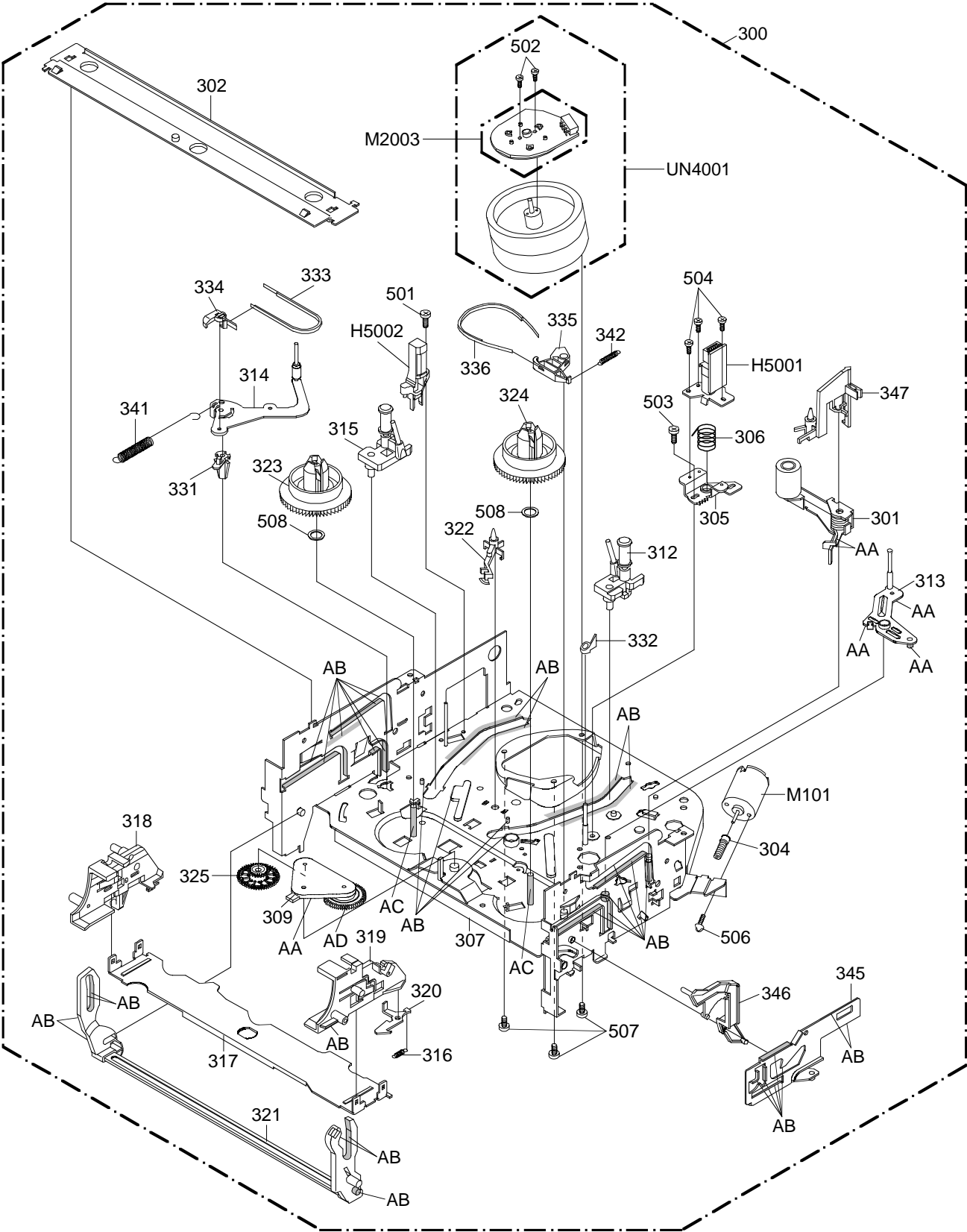
FINAL ASSEMBLY <M5>

	601	X-A4F219B720	CABINET,FRONT ASSY
	602	X-701WPJB609	CABINET,FRONT
	603	X-711WPDA434	PLATE,DISPLAY
	604	X-712WPDA063	FLAP
	605	X-713WPAA036	GLASS,LED
	606	X-735WPA0602	BUTTON,HOLDER
	607	X-735WPDA509	BUTTON,FRAME
	608	X-753WUAA006	SPRING,EARTH HEAD AMP
	609	X-743WKA0032	SPRING,FLAP
	610	X-800WFA0045	CUSHION,LEG
	611	X-752WSA0230	SHIELD,CASE HEAD AMP

REF No. PART No. PART NAME, DESCRIPTION

	612	X-701WPA0680	HOLDER,DECK
	613	X-755WPA0020	PLATE,COVER POWER
	614	X-85OP700036	HOLDER,EOT SENSOR
	615	X-702WSA0083	PLATE,BOTTOM
	616	X-701WPA0686	HOLDER,DECK
	618	X-702WSB0058	CABINET,TOP
	619	X-85OP700037	HOLDER,LED
	620	X-753WUA0053	SPRING,EARTH 3PIN
	621	X-82J3065B50	CURVE WASHER
	701	X-8110230804	SCREW,TAP TITE(P) BIND 3x8
	702	X-8109230802	SCREW,TAP TITE(B) 3x8
	703	X-8109230704	SCREW,TAP TITE(B) R BIND 3x7
	704	X-8109130B94	SCREW,TAP TITE(B) R PAN 3x29
	705	X-8107630604	SCREW,TAP TITE(S) BRAZIER 3x6
	706	X-8110226804	SCREW,TAP TITE(P) BIND 2.6x8

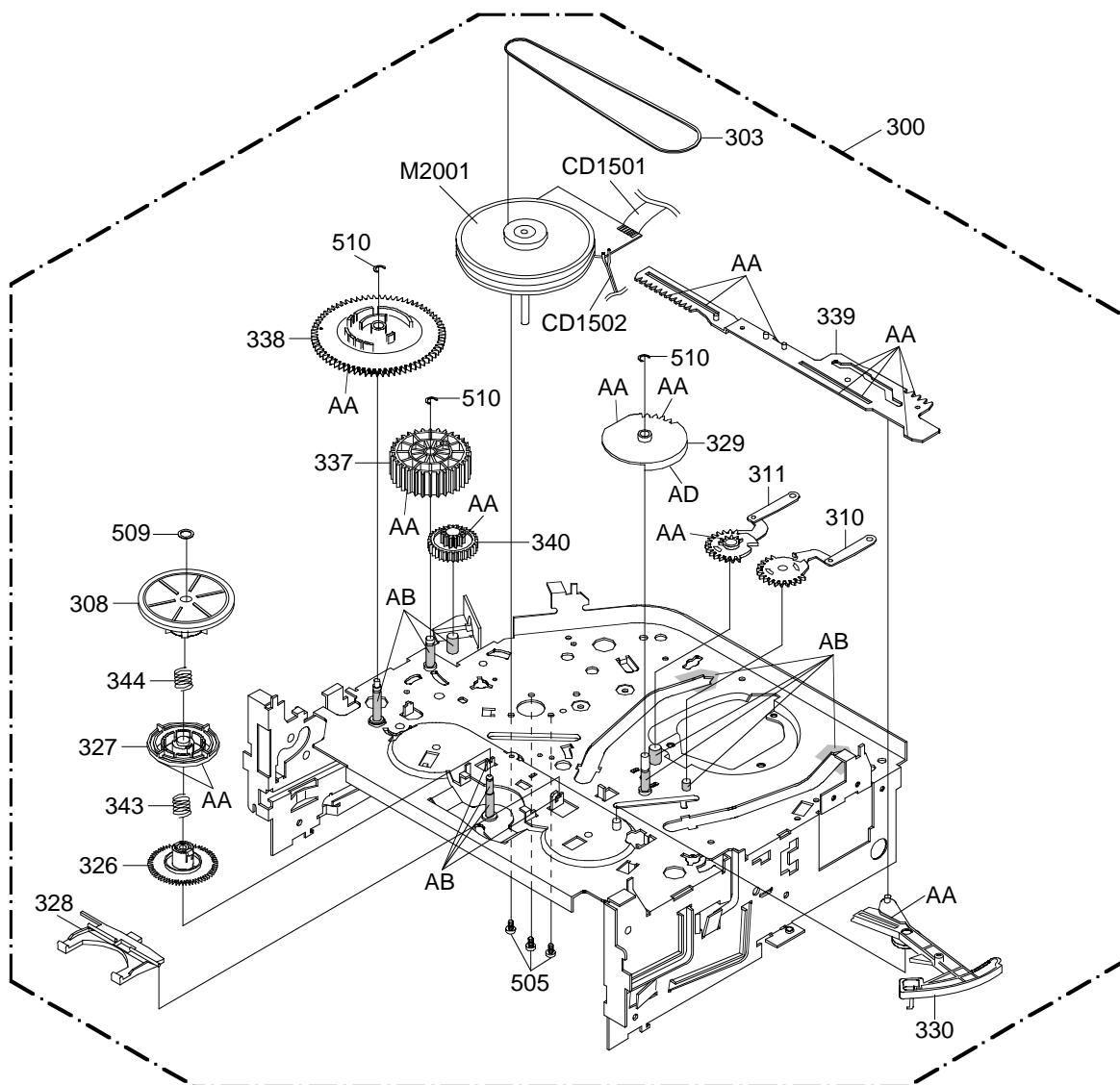
[TOP VIEW]



CLASS	PART NO.	MARK
GREASE	G-555G	AA
	MG-33	AB
	FG-84M	AC
	FL-721	AD

NOTE: Applying positions AA, AB, AC and AD for the grease are displayed for this section.
Check if the correct grease is applied for each position.

[BOTTOM VIEW]



CLASS	PART NO.	MARK
GREASE	G-555G	AA
	MG-33	AB
	FG-84M	AC
	FL-721	AD

NOTE: Applying positions AA, AB, AC and AD for the grease are displayed for this section.
Check if the correct grease is applied for each position.

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

MECHANISM ASSEMBLY <M4>				
301		X-85OA400234	PINCH ROLLER BLOCK	
302		X-85OP900746	BRACKET,TOP 3V	
303		X-85OP200290	BELT,CAPSTAN (S)	
304		X-85OP600581	WORM	
305		X-85OP500083	BASE,AC HEAD	
306		X-85OP800324	SPRING,AC HEAD	
307		X-85OA000459	MAIN CHASSIS ASS'Y	
308		X-85OA200089	CLUTCH ASS'Y	
309		X-85OA200090	ARM IDLER ASS'Y	
310		X-85OA300065	LOADING ARM S UNIT	
311		X-85OA300066	LOADING ARM T UNIT	
312		X-85OA400223	INCLINED BASE T UNIT 3S	
313		X-85OA400232	P5 ARM ASS'Y 2	
314		X-85OA400233	TENSION ARM ASS'Y (WT)	
315		X-85OA400231	INCLINED BASE S UNIT	
316		X-85OP800358	SPRING,LOCKER	
317		X-85OP900736	CASS,HOLDER	
318		X-85OP900748	CASS,SIDE L	
319		X-85OP900749	CASS,SIDE R	
320		X-85OP900739	LOCKER,R	
321		X-85OA900228	LINK UNIT	
322		X-85OP000496	POST,CASS GUIDE	
323		X-85OP200316	REEL,S (S)	
324		X-85OP200317	REEL,T (S)	
325		X-85OP200308	GEAR,IDLER	
326		X-85OP200311	GEAR,CLUTCH	
327		X-85OP200312	GEAR,COUPLING	
328		X-85OP200313	LEVER,CLUTCH	
329		X-85OP300194	GEAR,MAIN LOADING	
330		X-85OP400490	LEVER,TENSION	
331		X-85OP400492	HOLDER,TENSION	
332		X-85OP400520	CAP.P4	
333		X-85OP400539	BAND,TENSION	
334		X-85OP400533	CONNECT,TENSION	
335		X-85OP600573	ARM,BRAKE T	
336		X-85OP600583	BAND,BRAKE T	
337		X-85OP600577	CAM,PINCH ROLLER	
338		X-85OP600578	CAM,MAIN	
339		X-85OP600579	ROD,MAIN	
340		X-85OP600582	GEAR,JOINT	
341		X-85OP800322	SPRING,TENSION	
342		X-85OP800360	SPRING,BRAKE T	
343		X-85OP800355	SPRING,COUPLING	
344		X-85OP800356	SPRING,RING	
345		X-85OP900750	LEVER,LINK 2	
346		X-85OP900744	LEVER,FLAP	
347		X-85OP900745	CASS,OPENER	
501		X-8107226804	SCREW,TAP	2.6x8
502		X-8107226504	SCREW,TAP	2.6x5
503		X-8107226404	SCREW,TAP	2.6x4
504		X-8102120604	SCREW,PAN	M2x6
505		X-8109126604	SCREW,TAP	2.6x6
506		X-810A130404	SCREW/WASHER(A)	M3x4
507		X-810A126504	SCREW/WASHER(A)	M2.6x5
508		X-82Q264713N	WASHER	2.6x4.7xT0.13
509		X-82P184505N	SLIT WASHER	1.8x4.5xT0.5
510		X-83ETW30000	E-RING	3

#	△ REF No.	PART No.	PART NAME, DESCRIPTION
		CD1501 X-122H071603	CORD JUMPER
		CD1502 X-122Y021902	CORD JUMPER
		H5001 X-1523D91034	AUDIO CONTROL HEAD
		H5002 X-1543D02013	FULL ERASE HEAD
△		M101 X-1596P98001	LOADING MOTOR
△		M2001 X-1510S98036	CAPSTAN DD UNIT
△		M2003 X-1589S11015	MICRO MOTOR
△		UN4001 X-A4F216A500	CYLINDER UNIT ASS'Y

3.5 ELECTRICAL PARTS LIST

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

SYSCON BOARD ASSEMBLY <03>				
<div> Note When replacing parts in repair, use chip parts although Melf parts may be used at the time of factory shipment. </div>				
		PCB010	X-A4F216B010	PCB ASS'Y,HR-A591U/U(C)
			X-A4F219B010	PCB ASS'Y,HR-A590U(C)
△		R502	X-R0G3K2335K	RESISTOR 3.3MΩ, 1/2W
		R503	NRSA02J-223X	MG RESISTOR 22KΩ, 1/10W
		R506	NRSA02J-681X	MG RESISTOR 680Ω, 1/10W
		R509	QRE141J-333Y	RESISTOR 33KΩ, 1/4W
		R510	NRSA02J-102X	MG RESISTOR 1KΩ, 1/10W
		R511	X-R002T2121J	RESISTOR 120Ω, 1/2W
△		R512	X-R002T2333J	RESISTOR 33KΩ, 1/2W
△		R514	X-R3X181010J	OMF RESISTOR 1Ω, 1W
		R516	NRSA02F-122X	MG RESISTOR 1.2KΩ, 1/10W±1%
		R518	NRSA02F-132X	MG RESISTOR 1.3KΩ, 1/10W±1%
		R520	QRE141J-223Y	RESISTOR 22KΩ, 1/4W
		R521	QRE141J-221Y	RESISTOR 220Ω, 1/4W
		R523	QRE141J-391Y	RESISTOR 390Ω, 1/4W
		R524	NRSA02J-182X	MG RESISTOR 1.8KΩ, 1/10W
		R525	QRE141J-221Y	RESISTOR 220Ω, 1/4W
		R527	NRSA02J-223X	MG RESISTOR 22KΩ, 1/10W
		R531	QRE141J-154Y	RESISTOR 150KΩ, 1/4W
		R534	X-R002T2334J	RESISTOR 330KΩ, 1/2W
		R537	QRE141J-122Y	RESISTOR 1.2KΩ, 1/4W
		R544	NRSA02J-333X	MG RESISTOR 33KΩ, 1/10W
△		R547	X-R002T2224J	RESISTOR 220KΩ, 1/2W
		R548	QRE141J-102Y	RESISTOR 1KΩ, 1/4W
△		R549	X-R65584331J	FUSI RESISTOR 330Ω, 1/4W
		R651	NRSA02J-332X	MG RESISTOR 3.3KΩ, 1/10W
		R652	NRSA02J-272X	MG RESISTOR 2.7KΩ, 1/10W
		R653	NRSA02J-392X	MG RESISTOR 3.9KΩ, 1/10W
		R654	NRSA02J-682X	MG RESISTOR 6.8KΩ, 1/10W
		R655	NRSA02J-133X	MG RESISTOR 13KΩ, 1/10W
		R656	NRSA02J-332X	MG RESISTOR 3.3KΩ, 1/10W
		R657	X-R002T4561J	RESISTOR,HR-A590U(C) 560Ω, 1/4W
		R658	X-R002T4561J	RESISTOR,HR-A590U(C) 560Ω, 1/4W
		R659	X-R002T4561J	RESISTOR,HR-A590U(C) 560Ω, 1/4W
		R660	X-R002T4561J	RESISTOR,HR-A590U(C) 560Ω, 1/4W
		R661	NRSA02J-821X	MG RESISTOR,HR-A591U/U(C) 820Ω, 1/10W
		R662	QRE141J-181Y	RESISTOR,HR-A591U/U(C) 180Ω, 1/4W
		R663	QRE141J-181Y	RESISTOR,HR-A591U/U(C) 180Ω, 1/4W
		R664	NRSA02J-821X	MG RESISTOR,HR-A591U/U(C) 820Ω, 1/10W
		R665	NRSA02J-181X	MG RESISTOR,HR-A591U/U(C) 180Ω, 1/10W
		R666	QRE141J-181Y	RESISTOR,HR-A591U/U(C) 180Ω, 1/4W
		R667	QRE141J-181Y	RESISTOR,HR-A591U/U(C) 180Ω, 1/4W
		R668	QRE141J-181Y	RESISTOR,HR-A591U/U(C) 180Ω, 1/4W
		R669	QRE141J-821Y	RESISTOR,HR-A591U/U(C) 820Ω, 1/4W
		R670	QRE141J-181Y	RESISTOR,HR-A591U/U(C) 180Ω, 1/4W
		R671	QRE141J-821Y	RESISTOR,HR-A591U/U(C) 820Ω, 1/4W
		R672	QRE141J-181Y	RESISTOR,HR-A591U/U(C) 180Ω, 1/4W
		R673	QRE141J-181Y	RESISTOR,HR-A591U/U(C) 180Ω, 1/4W
		R674	QRE141J-181Y	RESISTOR,HR-A591U/U(C) 180Ω, 1/4W
		R675	QRE141J-821Y	RESISTOR,HR-A591U/U(C) 820Ω, 1/4W
		R1002	QRE141J-181Y	RESISTOR 180Ω, 1/4W
		R1003	QRE141J-332Y	RESISTOR 3.3KΩ, 1/4W

#	△	REF No.	PART No.	PART NAME, DESCRIPTION
		R1004	NRSA02J-822X	MG RESISTOR 8.2KΩ, 1/10W
		R1006	QRE141J-473Y	RESISTOR 47KΩ, 1/4W
		R1007	NRSA02J-822X	MG RESISTOR 8.2KΩ, 1/10W
		R1009	NRSA02J-103X	MG RESISTOR 10KΩ, 1/10W
		R1010	QRE141J-103Y	RESISTOR 10KΩ, 1/4W
		R1013	NRSA02J-103X	MG RESISTOR 10KΩ, 1/10W
		R1014	NRSA02J-682X	MG RESISTOR 6.8KΩ, 1/10W
		R1015	NRSA02J-561X	MG RESISTOR 560Ω, 1/10W
		R1016	QRE141J-153Y	RESISTOR 15KΩ, 1/4W
		R1017	NRSA02J-561X	MG RESISTOR 560Ω, 1/10W
		R1022	QRE141J-102Y	RESISTOR 1KΩ, 1/4W
		R1025	NRSA02J-105X	MG RESISTOR 1MΩ, 1/10W
		R1026	NRSA02J-821X	MG RESISTOR 820Ω, 1/10W
		R1030	NRSA02J-272X	MG RESISTOR 2.7KΩ, 1/10W
		R1031	QRE141J-332Y	RESISTOR 3.3KΩ, 1/4W
		R1033	NRSA02J-105X	MG RESISTOR 1MΩ, 1/10W
		R1034	NRSA021J-563X	MG RESISTOR 56KΩ, 1/10W
		R1037	NRSA021J-563X	MG RESISTOR 56KΩ, 1/10W
		R1038	QRE141J-103Y	RESISTOR 10KΩ, 1/4W
		R1039	NRSA02J-562X	MG RESISTOR 5.6KΩ, 1/10W
		R1040	NRSA02J-105X	MG RESISTOR 1MΩ, 1/10W
		R1041	NRSA02J-271X	MG RESISTOR 270Ω, 1/10W
		R1042	NRSA02J-473X	MG RESISTOR 47KΩ, 1/10W
		R1043	QRE141J-473Y	RESISTOR 47KΩ, 1/4W
		R1044	NRSA02J-332X	MG RESISTOR 3.3KΩ, 1/10W
		R1045	NRSA02J-332X	MG RESISTOR 3.3KΩ, 1/10W
		R1046	NRSA02J-103X	MG RESISTOR 10KΩ, 1/10W
		R1047	NRSA02J-103X	MG RESISTOR 10KΩ, 1/10W
		R1048	NRSA02J-184X	MG RESISTOR 180KΩ, 1/10W
		R1049	NRSA02J-472X	MG RESISTOR 4.7KΩ, 1/10W
		R1050	NRSA02J-101X	MG RESISTOR 100Ω, 1/10W
		R1051	NRSA02J-183X	MG RESISTOR 18KΩ, 1/10W
		R1052	NRSA02J-223X	MG RESISTOR 22KΩ, 1/10W
		R1053	NRSA02J-472X	MG RESISTOR 4.7KΩ, 1/10W
		R1054	NRSA02J-221X	MG RESISTOR 220Ω, 1/10W
		R1055	NRSA02J-473X	MG RESISTOR 47KΩ, 1/10W
		R1058	NRSA02J-222X	MG RESISTOR,HR-A590U(C) 2.2KΩ, 1/10W
		R1061	NRSA02J-474X	MG RESISTOR 470KΩ, 1/10W
		R1062	NRSA02J-222X	MG RESISTOR,HR-A590U(C) 2.2KΩ, 1/10W
		R1065	NRSA02J-103X	MG RESISTOR 10KΩ, 1/10W
		R1066	NRSA02J-103X	MG RESISTOR 10KΩ, 1/10W
		R1070	NRSA02J-223X	MG RESISTOR 22KΩ, 1/10W
		R1072	NRSA02J-103X	MG RESISTOR 10KΩ, 1/10W
		R1075	QRE141J-102Y	RESISTOR 1KΩ, 1/4W
		R1076	QRE141J-102Y	RESISTOR 1KΩ, 1/4W
		R1083	NRSA02J-333X	MG RESISTOR 33KΩ, 1/10W
		R1087	NRSA02J-333X	MG RESISTOR 33KΩ, 1/10W
		R4001	NRSA02J-561X	MG RESISTOR 560Ω, 1/10W
		R4002	NRSA02J-103X	MG RESISTOR 10KΩ, 1/10W
		R4003	NRSA02J-103X	MG RESISTOR 10KΩ, 1/10W
		R4004	QRE141J-150Y	RESISTOR 15Ω, 1/4W
		R4005	QRE141J-103Y	RESISTOR 10KΩ, 1/4W
		R4010	NRSA02J-332X	MG RESISTOR 3.3KΩ, 1/10W
		R4011	NRSA02J-223X	MG RESISTOR 22KΩ, 1/10W
		R4012	NRSA02J-102X	MG RESISTOR 1KΩ, 1/10W
		R4013	NRSA02J-682X	MG RESISTOR 6.8KΩ, 1/10W
		R4017	NRSA02J-822X	MG RESISTOR 8.2KΩ, 1/10W
		R4018	NRSA02J-822X	MG RESISTOR 8.2KΩ, 1/10W
		R4019	NRSA02J-334X	MG RESISTOR 330KΩ, 1/10W
		R4020	QRE141J-221Y	RESISTOR 220Ω, 1/4W
		R4021	NRSA02J-183X	MG RESISTOR 18KΩ, 1/10W

#	△	REF No.	PART No.	PART NAME, DESCRIPTION		#	△	REF No.	PART No.	PART NAME, DESCRIPTION	
R4022			NRSA02J-821X	MG RESISTOR	820Ω,1/10W	C1013			NCB21HK-102X	CAPACITOR	0.001μF,50V
R4023			NRSA02J-153X	MG RESISTOR	15KΩ,1/10W	C1015			X-CS0RCH4H2J	CAPACITOR	220pF,50V
R4024			NRSA02J-682X	MG RESISTOR	6.8KΩ,1/10W	C1016			NCF21HZ-104X	CAPACITOR	0.1μF,50V
R4025			NRSA02J-152X	MG RESISTOR	1.5KΩ,1/10W	C1017			NCB21HK-103X	CAPACITOR	0.01μF,50V
R4033			QRE141J-222Y	RESISTOR	2.2KΩ,1/4W	C1019			X-CS0KCH4H1J	CAPACITOR	22pF,50V
R4034			NRSA02J-823X	MG RESISTOR	82KΩ,1/10W	C1020			QEKJ0JM-476Z	E CAPACITOR	47μF,6.3V
R4035			NRSA02J-104X	MG RESISTOR	100KΩ,1/10W	C1021			QEKJ1CM-106Z	E CAPACITOR	10μF,16V
R4036			NRSA02J-182X	MG RESISTOR	1.8KΩ,1/10W	C1022			QEKJ0JM-226Z	E CAPACITOR	22μF,6.3V
R4037			NRSA02J-102X	MG RESISTOR	1KΩ,1/10W	C1023			QETN0JM-227Z	E CAPACITOR	220μF,6.3V
R4038			NRSA02J-684X	MG RESISTOR	680KΩ,1/10W	C1029			X-E50HU34R7M	E CAPACITOR	4.7μF,25V
R4039			NRSA02J-822X	MG RESISTOR	8.2KΩ,1/10W	C1032			X-CS0RCH4L1J	CAPACITOR	33pF,50V
R4041			NRSA02J-182X	MG RESISTOR	1.8KΩ,1/10W	C1034			X-CS0RCH4K1J	CAPACITOR	27pF,50V
R4042			NRSA02J-152X	MG RESISTOR	1.5KΩ,1/10W	C1036			NCF21HZ-104X	CAPACITOR	0.1μF,50V
R4043			NRSA02J-332X	MG RESISTOR	3.3KΩ,1/10W	C1038			QEKJ0JM-226Z	E CAPACITOR	22μF,6.3V
R4044			NRSA02J-223X	MG RESISTOR	22KΩ,1/10W	C1040			NCB21HK-472X	CAPACITOR	0.0047μF,50V
R4045			QRE141J-123Y	RESISTOR	12KΩ,1/4W	C1041			NCF21HZ-104X	CAPACITOR	0.1μF,50V
R4046			NRSA02J-223X	MG RESISTOR	22KΩ,1/10W	C1053			NCB21HK-223X	CAPACITOR	0.022μF,50V
R4047			QRE141J-123Y	RESISTOR	12KΩ,1/4W	C1054			NCB21EK-104X	CAPACITOR	0.1μF,25V
R4053			QRE141J-103Y	RESISTOR,HR-A591U/U(C)	10KΩ,1/4W	C1055			NCB21HK-223X	CAPACITOR	0.022μF,50V
R4201			X-R002T2471J	RESISTOR	470Ω,1/2W	C4002			X-P235W1223J	CMP	0.022μF,100V MKT
R4202			NRSA02J-750X	MG RESISTOR	75Ω,1/10W	C4004			QETN0JM-227Z	E CAPACITOR	220μF,6.3V
R4204			NRSA02J-103X	MG RESISTOR	10KΩ,1/10W	C4005			NCB21HK-103X	CAPACITOR	0.01μF,50V
R4205			NRSA02J-103X	MG RESISTOR	10KΩ,1/10W	C4006			NCB21HK-153X	CAPACITOR	0.015μF,50V
R4206			NRSA02J-391X	MG RESISTOR	390Ω,1/10W	C4009			QEKJ0JM-476Z	E CAPACITOR	47μF,6.3V
R4207			QRE141J-102Y	RESISTOR	1KΩ,1/4W	C4010			QEKJ0JM-476Z	E CAPACITOR	47μF,6.3V
R4209			NRSA02J-750X	MG RESISTOR	75Ω,1/10W	C4012			QEKJ0JM-226Z	E CAPACITOR	22μF,6.3V
R4210			NRSA02J-101X	MG RESISTOR	100Ω,1/10W	C4013			QCB1HK-104Y	CAPACITOR	0.1μF,50V
R4211			QRE141J-102Y	RESISTOR	1KΩ,1/4W	C4014			QEKJ0JM-226Z	E CAPACITOR	22μF,6.3V
R4212			NRSA02J-391X	MG RESISTOR	390Ω,1/10W	C4015			NCF21HZ-473X	CAPACITOR	0.047μF,50V
R5502			NRSA02J-331X	MG RESISTOR	330Ω,1/10W	C4016			NCB21HK-683X	CAPACITOR	0.068μF,50V
R5503			NRSA02J-102X	MG RESISTOR	1KΩ,1/10W	C4019			NCF21HZ-473X	CAPACITOR	0.047μF,50V
R5507			NRSA02J-473X	MG RESISTOR	47KΩ,1/10W	C4022			NCF21HZ-104X	CAPACITOR	0.1μF,50V
R5508			NRSA02J-682X	MG RESISTOR	6.8KΩ,1/10W	C4023			X-CS0KB04Q2K	CAPACITOR	470pF,50V
R5510			NRSA02J-273X	MG RESISTOR	27KΩ,1/10W	C4025			QETN0JM-227Z	E CAPACITOR	220μF,6.3V
R5513			NRSA02J-225X	MG RESISTOR	2.2MΩ,1/10W	C4027			QEKJ0JM-336Z	E CAPACITOR	33μF,6.3V
R5514			NRSA02J-473X	MG RESISTOR	47KΩ,1/10W	C4028			NCF21HZ-104X	CAPACITOR	0.1μF,50V
R5516			NRSA02J-682X	MG RESISTOR	6.8KΩ,1/10W	C4029			NCB21HK-103X	CAPACITOR	0.01μF,50V
R5519			QRE141J-332Y	RESISTOR	3.3KΩ,1/4W	C4030			QEKJ1CM-106Z	E CAPACITOR	10μF,16V
R6004			QRE141J-102Y	RESISTOR	1KΩ,1/4W	C4031			QEKJ1HM-105Z	E CAPACITOR	1μF,50V
R6005			NRSA02J-223X	MG RESISTOR	22KΩ,1/10W	C4032			NCB21HK-272X	CAPACITOR	0.0027μF,50V
R6006			NRSA02J-103X	MG RESISTOR	10KΩ,1/10W	C4033			NCB21HK-122X	CAPACITOR	0.0012μF,50V
C502			X-C0JTB05K3K	CAPACITOR	0.0027μF,500V	C4034			X-E50HU34R7M	E CAPACITOR	4.7μF,25V
△		C504	X-P2472B223M	CMP	0.022μF,275V PHE840	C4035			QEKJ1HM-105Z	E CAPACITOR	1μF,50V
△		C505	X-CBLLYEMH3M	CAPACITOR	0.0022μF,250V	C4036			X-CS0KB04N2K	CAPACITOR	390pF,50V
		C506	X-CS0RB04G4K	CAPACITOR	0.018μF,50V	C4037			NCF21HZ-104X	CAPACITOR	0.1μF,50V
		C507	NCB21HK-472X	CAPACITOR	0.0047μF,50V	C4038			X-CS0RCH4G2J	CAPACITOR	180pF,50V
△		C508	X-E62QFC470M	E CAPACITOR	47μF,200V	C4039			NDC21HJ-220X	CAPACITOR	22pF,50V
		C509	X-C0JTB0512K	CAPACITOR	100pF,500V	C4040			QCFB1HZ-104Y	CAPACITOR	0.1μF,50V
		C512	X-C0JTB05Q3K	CAPACITOR,HR-A591U/U(C)	0.0047μF,500V	C4044			NCB21EK-104X	CAPACITOR	0.1μF,25V
			X-C0JFE0514M	CAPACITOR,HR-A590U(C)	0.01μF,500V	C4045			X-E50HU0101M	E CAPACITOR	100μF,6.3V
△		C514	X-E02LT0102M	E CAPACITOR	1000μF,6.3V	C4046			QEKJ1HM-105Z	E CAPACITOR	1μF,50V
		C515	X-CS0RB04W3K	CAPACITOR	0.0082μF,50V	C4048			QEKJ1HM-105Z	E CAPACITOR	1μF,50V
		C517	QEKJ1HM-105Z	E CAPACITOR	1μF,50V	C4049			QEKJ1HM-105Z	E CAPACITOR	1μF,50V
△		C518	X-E50HU5100M	E CAPACITOR	10μF,50V	C4050			X-E50HU5R22M	E CAPACITOR	0.22μF,50V
△		C519	QETN1CM-477Z	E CAPACITOR	470μF,16V	C4051			QEKJ0JM-226Z	E CAPACITOR	22μF,6.3V
△		C520	QETN0JM-477Z	E CAPACITOR	470μF,6.3V	C4052			QEKJ1HM-105Z	E CAPACITOR	1μF,50V
△		C522	QETN1CM-227Z	E CAPACITOR	220μF,16V	C4053			QEKJ1HM-105Z	E CAPACITOR	1μF,50V
		C529	X-CS0RB04W3K	CAPACITOR	0.0082μF,50V	C4054			NCF21HZ-104X	CAPACITOR	0.1μF,50V
		C534	X-CS0RB04B4K	CAPACITOR	0.012μF,50V	C4057			X-CS0RCH4L1J	CAPACITOR	33pF,50V
		C1001	QETN1CM-227Z	E CAPACITOR	220μF,16V	C4058			QEKJ0JM-476Z	E CAPACITOR	47μF,6.3V
		C1006	QCFB1HZ-104Y	CAPACITOR	0.1μF,50V	C4059			QCFB1HZ-104Y	CAPACITOR	0.1μF,50V

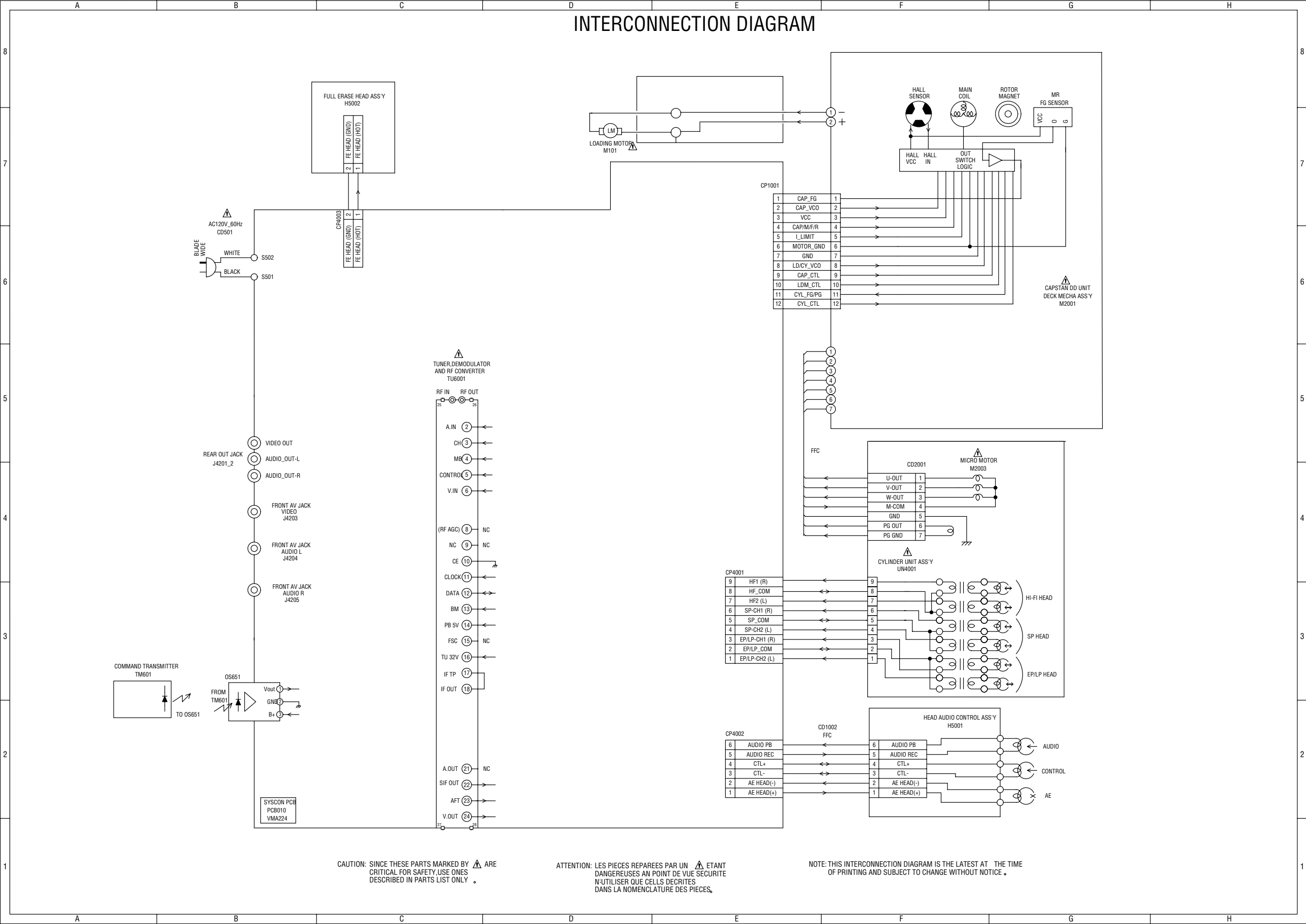
#	△	REF No.	PART No.	PART NAME, DESCRIPTION	#	△	REF No.	PART No.	PART NAME, DESCRIPTION
C4060			NCB21HK-103X	CAPACITOR 0.01μF,50V	C5553			X-CS0KY0313M	CAPACITOR 0.001μF,25V
C4061			NCB21HK-103X	CAPACITOR 0.01μF,50V	C5555			QETN1CM-476Z	E CAPACITOR 47μF,16V
C4062			QEKJ1HM-105Z	E CAPACITOR 1μF,50V	C6003			QEKJ1CM-106Z	E CAPACITOR 10μF,16V
C4063			QETN1CM-476Z	E CAPACITOR 47μF,16V	C6004			NCF21HZ-103X	CAPACITOR 0.01μF,50V
C4064			NCB21HK-223X	CAPACITOR 0.022μF,50V	C6008			QETN0JM-227Z	E CAPACITOR 220μF,6.3V
C4065			QEKJ1HM-105Z	E CAPACITOR 1μF,50V	C6009			NCF21HZ-103X	CAPACITOR 0.01μF,50V
C4066			NCB21HK-223X	CAPACITOR 0.022μF,50V	C6010			QETN0JM-227Z	E CAPACITOR 220μF,6.3V
C4067			QEKJ1HM-105Z	E CAPACITOR 1μF,50V	D501			X-D97U02401B	ZENER MTZJ24B T-77
C4069			NCF21HZ-104X	CAPACITOR 0.1μF,50V	D502			1SS133-T2	DIODE
C4070			QCFB1HZ-104Y	CAPACITOR 0.1μF,50V	△ D505			X-D2WXN40050	DIODE 1N4005-EIC
C4074			NCB21HK-102X	CAPACITOR,HR-A591U/U(C) 0.001μF,50V	D506			1SS133-T2	DIODE
C4201			QETN0JM-477Z	E CAPACITOR 470μF,6.3V	△ D507			1SS133-T2	DIODE
C4209			QEKJ1CM-106Z	E CAPACITOR 10μF,16V	△ D508			X-D2WXN40050	DIODE 1N4005-EIC
C4211			QEKJ1CM-106Z	E CAPACITOR 10μF,16V	D511			X-D2WXGP10J0	FR DIODE RGP10J-EIC
C5501			QEKJ1CM-106Z	E CAPACITOR 10μF,16V	△ D512			X-D2WXS1400	SCHOTTKY SB140-EIC
C5502			X-E50HU34R7M	E CAPACITOR 4.7μF,25V	D513			MTZJ13B-T2	ZENER
C5503			NCB21HK-223X	CAPACITOR 0.022μF,50V	△ D514			X-D2WXB290S0	DIODE SB290S
C5504			NCF21HZ-104X	CAPACITOR 0.1μF,50V	D520			MTZJ33B-T2	ZENER
C5505			NCF21HZ-104X	CAPACITOR 0.1μF,50V	△ D521			1SS244-T2	DIODE
C5506			NCF21HZ-104X	CAPACITOR 0.1μF,50V	△ D523			X-D2WXN40050	DIODE 1N4005-EIC
C5507			NCF21HZ-104X	CAPACITOR 0.1μF,50V	D524			1SS133-T2	DIODE
C5508			NCF21HZ-104X	CAPACITOR 0.1μF,50V	△ D525			MTZJ6.8B-T2	ZENER
C5509			QEKJ1HM-225Z	E CAPACITOR 2.2μF,50V	△ D528			X-D2WXN40050	DIODE 1N4005-EIC
C5510			QEKJ1CM-106Z	E CAPACITOR 10μF,16V	D663			X-0021E5Q200	LED,HR-A590U(C)
C5511			QEKJ0JM-226Z	E CAPACITOR 22μF,6.3V	D664			X-0021E5Q200	LED,HR-A590U(C)
C5512			QEKJ1CM-106Z	E CAPACITOR 10μF,16V	D665			X-0021E2Q140	LED,HR-A590U(C)
C5513			QEKJ1HM-105Z	E CAPACITOR 1μF,50V	D666			X-0021E2Q140	LED,HR-A590U(C)
C5514			NCF21HZ-104X	CAPACITOR 0.1μF,50V	D1001			X-0010100320	INFRARED LED LNA2702L010R
C5515			NCB21HK-223X	CAPACITOR 0.022μF,50V	D1002			1SS133-T2	DIODE
C5516			QEKJ1CM-226Z	E CAPACITOR 22μF,16 V	D1003			1SS133-T2	DIODE
C5517			X-E50HU5R22M	E CAPACITOR 0.22μF,50V	D1004			1SS133-T2	DIODE
C5518			X-E50HU53R3M	E CAPACITOR 3.3μF,50V	D1005			1SS133-T2	DIODE
C5521			X-E50HU5R22M	E CAPACITOR 0.22μF,50V	D5501			1SS133-T2	DIODE
C5523			X-E50HU34R7M	E CAPACITOR 4.7μF,25V	△ IC501			X-I1KJ9A4310	IC KIA431
C5524			NCB21EK-104X	CAPACITOR 0.1μF,25V	IC505			X-0002E00610	PHOTO COUPLER LTV-817M-VB
C5525			QEKJ1CM-106Z	E CAPACITOR 10μF,16V	IC511			X-0002E00610	PHOTO COUPLER LTV-817M-VB
C5526			QEKJ1CM-106Z	E CAPACITOR 10μF,16V	IC1001			X-I54F50115A	IC,HR-A591U/U(C) OEC0115A
C5527			QEKJ1CM-106Z	E CAPACITOR 10μF,16V				X-I54F50114A	IC,HR-A590U(C) OEC0114A
C5528			X-CS0RB04U2K	CAPACITOR 680pF,50V	IC1003			X-IC7J0311A0	IC R3111N311A/C-TR
C5529			QEKJ1CM-106Z	E CAPACITOR 10μF,16V	IC4001			X-I03F3205M0	IC LA71205M-MPB
C5530			NCF21HZ-103X	CAPACITOR 0.01μF,50V	IC5501			AN3663FBP	IC
C5531			X-E50HU0101M	E CAPACITOR 100μF,6.3V	△ Q502			X-TC5T021204	TRANSISTOR,HR-A591U/U(C) 2SC2120Y(TPE2)
C5532			QEKJ1CM-106Z	E CAPACITOR 10μF,16V				X-TD3T007340	TRANSISTOR,HR-A590U(C) 2SD734(E,F)-AA
C5533			QEKJ1HM-105Z	E CAPACITOR 1μF,50V	△ Q503			X-TCWQ4160E0	TRANSISTOR 2SC4160-OEC-YAC1
C5534			QEKJ0JM-336Z	E CAPACITOR 33μF,6.3V	△ Q509			X-TCAT03205Y	TRANSISTOR KTC3205_Y-AT
C5536			QEKJ1CM-106Z	E CAPACITOR 10μF,16V	△ Q512			X-TCAT032034	TRANSISTOR KTC3203_Y-AT
C5537			QEKJ1CM-106Z	E CAPACITOR 10μF,16V	Q513			KRC103S-X	TRANSISTOR
C5538			QEKJ1CM-106Z	E CAPACITOR 10μF,16V	△ Q515			X-TCATC31980	TRANSISTOR KTC3198-AT(Y,GR)
C5539			QEKJ0JM-336Z	E CAPACITOR 33μF,6.3V	Q651			2SA1037AK/RS/-X	TRANSISTOR,HR-A591U/U(C)
C5540			NCB21HK-153X	CAPACITOR 0.015μF,50V	Q652			KRC103S-X	TRANSISTOR,HR-A591U/U(C)
C5541			NCB21HK-103X	CAPACITOR 0.01μF,50V	Q653			KRC103S-X	TRANSISTOR,HR-A591U/U(C)
C5542			NCF21HZ-104X	CAPACITOR 0.1μF,50V	Q654			2SA1037AK/RS/-X	TRANSISTOR,HR-A591U/U(C)
C5543			NCF21HZ-103X	CAPACITOR 0.01μF,50V	Q655			KRC103S-X	TRANSISTOR,HR-A591U/U(C)
C5544			NCF21HZ-103X	CAPACITOR 0.01μF,50V	Q656			KRC103S-X	TRANSISTOR,HR-A591U/U(C)
C5545			NCF21HZ-104X	CAPACITOR 0.1μF,50V	Q657			KRC103S-X	TRANSISTOR,HR-A591U/U(C)
C5546			NCB21HK-153X	CAPACITOR 0.015μF,50V	Q658			KRC103S-X	TRANSISTOR,HR-A591U/U(C)
C5547			QEKJ1CM-106Z	E CAPACITOR 10μF,16V	Q659			2SA1037AK/RS/-X	TRANSISTOR,HR-A591U/U(C)
C5548			QEKJ1CM-106Z	E CAPACITOR 10μF,16V	Q660			KRC103S-X	TRANSISTOR,HR-A591U/U(C)
C5549			X-CHGTF0314Z	CAPACITOR 0.01μF,25V	Q661			2SA1037AK/RS/-X	TRANSISTOR,HR-A591U/U(C)
C5551			X-CS0RB04U2K	CAPACITOR 680pF,50V	Q662			KRC103S-X	TRANSISTOR,HR-A591U/U(C)
C5552			QEKJ1CM-226Z	E CAPACITOR 22μF,16 V	Q663			KRC103S-X	TRANSISTOR,HR-A591U/U(C)

#	△ REF No.	PART No.	PART NAME, DESCRIPTION	#	△ REF No.	PART No.	PART NAME, DESCRIPTION	
		Q664	KRC103S-X	TRANSISTOR,HR-A591U/U(C)	△	F501	X-081PC1R605	FUSE
		Q665	2SA1037AK/RS/-X	TRANSISTOR,HR-A591U/U(C)		FH501	X-06710T0006	FUSE HOLDER
		Q1002	X-0002700590	PHOTO COUPLER		FH502	X-06710T0006	FUSE HOLDER
		Q1004	X-0002700670	PHOTO COUPLER				
		Q1005	X-0002700670	PHOTO COUPLER	△	CD501	X-120R414901	CORD,AC BUSH
		Q1006	X-0000100380	PHOTO TRANSISTOR		CD1002	X-122F061502	CORD,JUMPER
				PNA2604M010R		OS651	X-077Q037001	REMOTE RECEIVER
		Q1007	KRC103S-X	TRANSISTOR		V651	X-0040E94004	LED DISPLAY,HR-A591U/U(C)
		Q1008	X-0000100380	PHOTO TRANSISTOR		BT601	X-1412004008	BATTERY,MANGAN,HR-A590UC
				PNA2604M010R				R03(AB)E_20_T
		Q4001	X-TCATC31980	TRANSISTOR				
				KTC3198-AT(Y,GR)				
		Q4002	X-TCATC31980	TRANSISTOR				
				KTC3198-AT(Y,GR)				
		Q4003	X-TPAAC05002	TRANSISTOR				
				KRA103SR TK				
		Q4005	X-TAATA12660	TRANSISTOR				
				KTA1266-AT(Y,GR)				
		Q4006	X-TCAT032034	TRANSISTOR				
				KTC3203_Y-AT				
		Q4010	2SA1037AK/RS/-X	TRANSISTOR				
		Q4011	2SC2412K/RS/-X	TRANSISTOR				
		Q4012	2SC2412K/RS/-X	TRANSISTOR				
		Q4201	X-TAATA12660	TRANSISTOR				
				KTA1266-AT(Y,GR)				
		Q4202	X-TPAAC05002	TRANSISTOR				
				KRA103SR TK				
		Q4203	2SC2412K/RS/-X	TRANSISTOR				
		Q4204	2SC2412K/RS/-X	TRANSISTOR				
		Q6001	KRC103S-X	TRANSISTOR				
		B501	X-024HT03564	CORE,BEADS				
				W4BRH3.5X6X1				
		B502	X-024HT03564	CORE,BEADS				
				W4BRH3.5X6X1				
△	L501	X-029T000083	COIL,LINE FILTER					
	L504	X-021W7A220K	COIL					22μH
	L505	X-021W7A220K	COIL					22μH
	L1001	X-0216A6150K	COIL					15μH
	L1002	X-021W7A220K	COIL					22μH
	L4001	QQL29BJ-220Z	COIL					22μH
	L4003	QQL29BJ-101Z	COIL					100μH
	L4004	X-0216A6220K	COIL					22μH
	L4005	X-0216A6470K	COIL					47μH
	L4006	X-0216A6470K	COIL					47μH
	L5501	QQL071J-101Y	COIL					100μH
	L5502	QQL071J-101Y	COIL					100μH
	L5504	X-0216A6220K	COIL					22μH
	L6002	QQL29BJ-220Z	COIL					22μH
	T4001	X-031626009R	COIL,BIAS OSC					
△	T501	X-0481220094	SW TRANSF					
	J4201	X-060J411018	RCA JACK					
	J4203	X-060J401087	RCA JACK					
	J4204	X-060J401087	RCA JACK					
	J4205	X-060J421025	RCA JACK					
	SW651	QSW0456-001Z	TACT SWITCH					
	SW652	QSW0456-001Z	TACT SWITCH					
	SW653	QSW0456-001Z	TACT SWITCH					
	SW654	QSW0456-001Z	TACT SWITCH					
	SW655	QSW0456-001Z	TACT SWITCH					
	SW656	QSW0456-001Z	TACT SWITCH					
	SW657	QSW0456-001Z	TACT SWITCH					
	SW658	QSW0456-001Z	TACT SWITCH					
	SW1001	X-0508A11001	SWITCH(LEAF)					
	SW6001	X-0510S21041	SWITCH SLIDE,HR-A590U(C)					
	VR1001	QVP0039-103Z	TRIM RESISTOR					
	CP1001	X-06972C0010	CONNECTOR PCB SIDE					
	CP4001	X-0697290620	CONNECTOR PCB SIDE					
	CP4002	X-069J760019	CONNECTOR PCB SIDE					
	CP4003	X-0697120320	CONNECTOR PCB SIDE					
	X1001	X-1002T01003	CERAMIC OSCILLATOR					CSTS1000MG96004-T2
	X4001	NAX0102-001X	CRYSTAL					3.57954MHz
△	TU6001	X-0162K00027	RF UNIT					

HR-A591U/U(C),590U(C) (VP)-V15D0

SECTION 2
CHARTS AND DIAGRAMS

INTERCONNECTION DIAGRAM

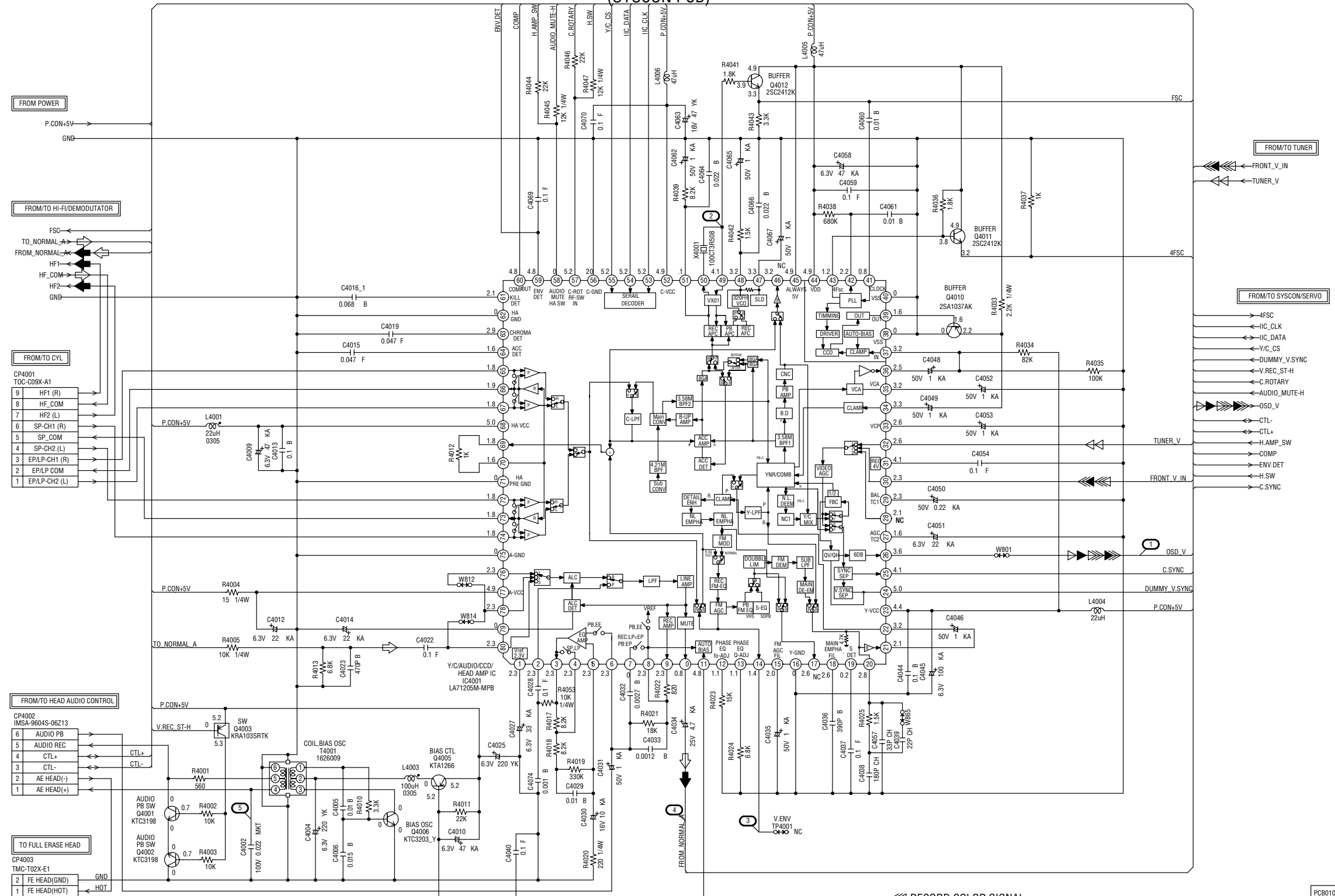


CAUTION: SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY USE ONES DESCRIBED IN PARTS LIST ONLY .

ATTENTION: LES PIECES REPARÉES PAR UN ÉTANT DANGEREUSES AN POINT DE VUE SÉCURITÉ N'UTILISER QUE CELLS DÉCRITES DANS LA NOMENCLATURE DES PIÉCES.

NOTE: THIS INTERCONNECTION DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE .

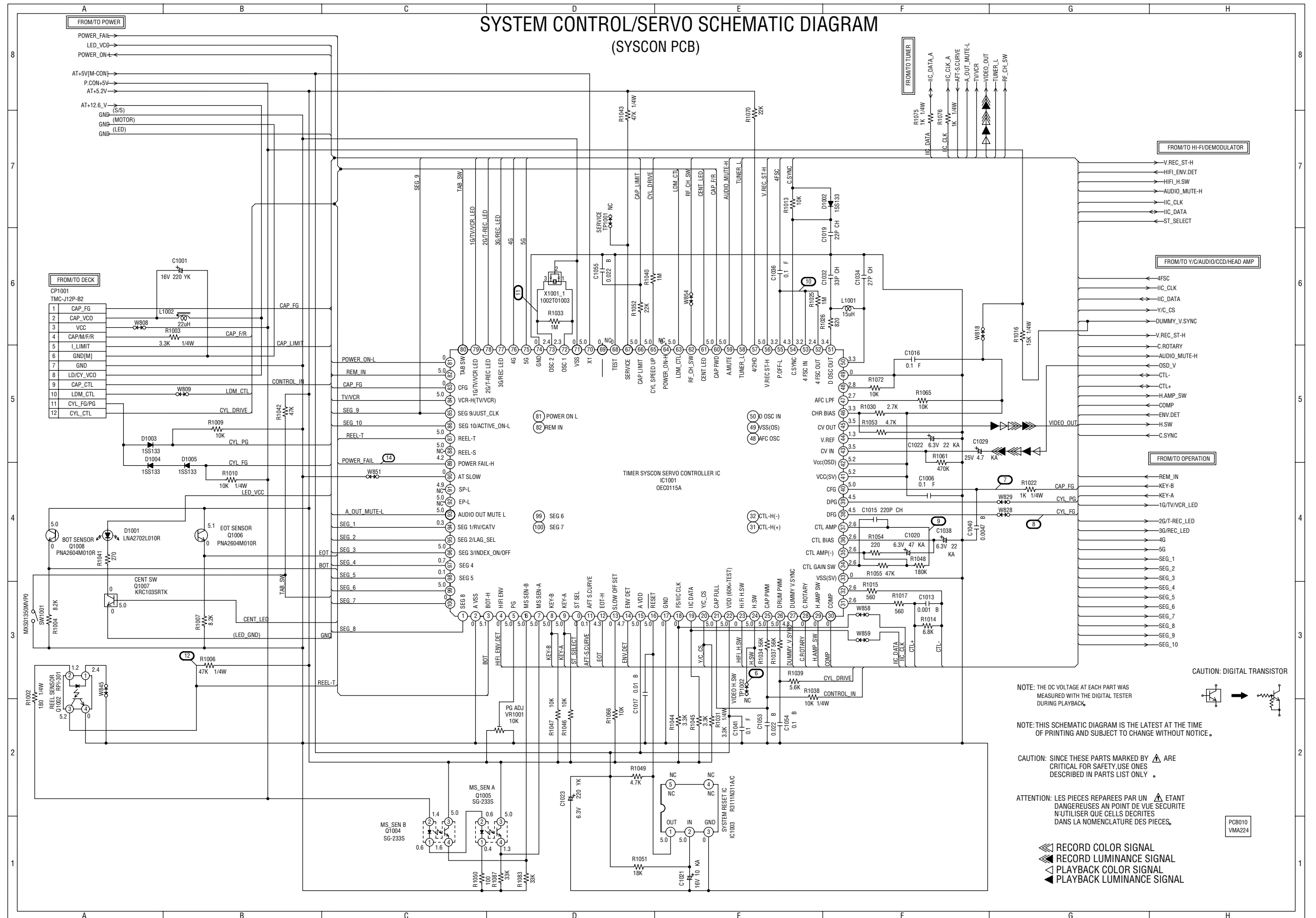
Y/C/AUDIO/CCD/HEAD AMP SCHEMATIC DIAGRAM (SYSCON PCB)



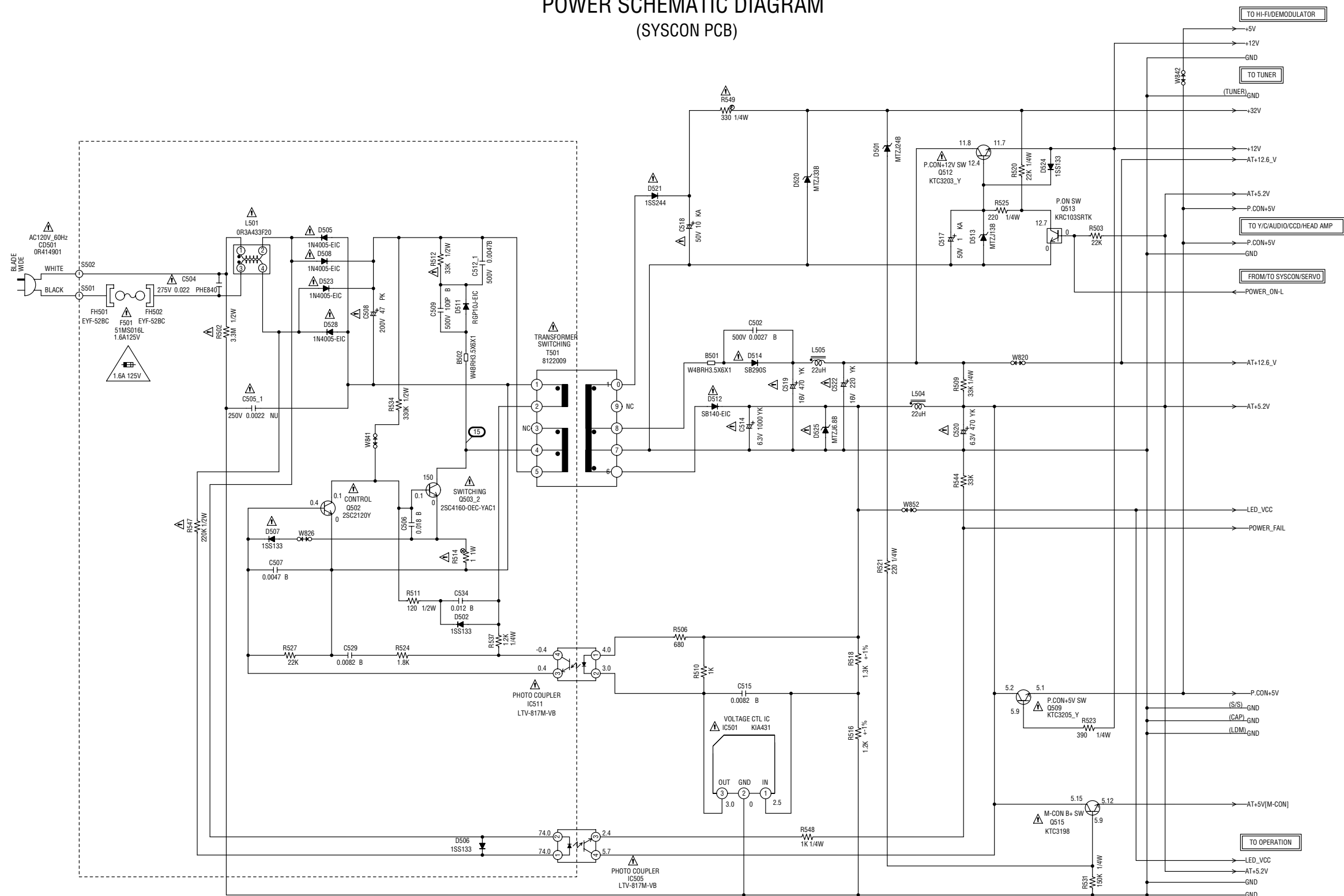
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

SYSTEM CONTROL/SERVO SCHEMATIC DIAGRAM (SYSCON PCB)



POWER SCHEMATIC DIAGRAM (SYSCON PCB)



CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD,
REPLACE ONLY WITH THE SAME TYPE FUSE
1.6A 125V (F501)
ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES D'INCEIE
N'UTILISER QUE DES FUSIBLE DE MEME TYPE
1.6A 125V (F501)

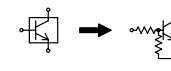
NOTE: THE DC VOLTAGE AT EACH PART WAS
MEASURED WITH THE DIGITAL TESTER
DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

ATTENTION: LES PIECES REPARÉES PAR UN ETANT
DANGEREUSES AU POINT DE VUE SECURITE
N'UTILISER QUE CELLS DECRITES
DANS LA NOMENCLATURE DES PIECES.

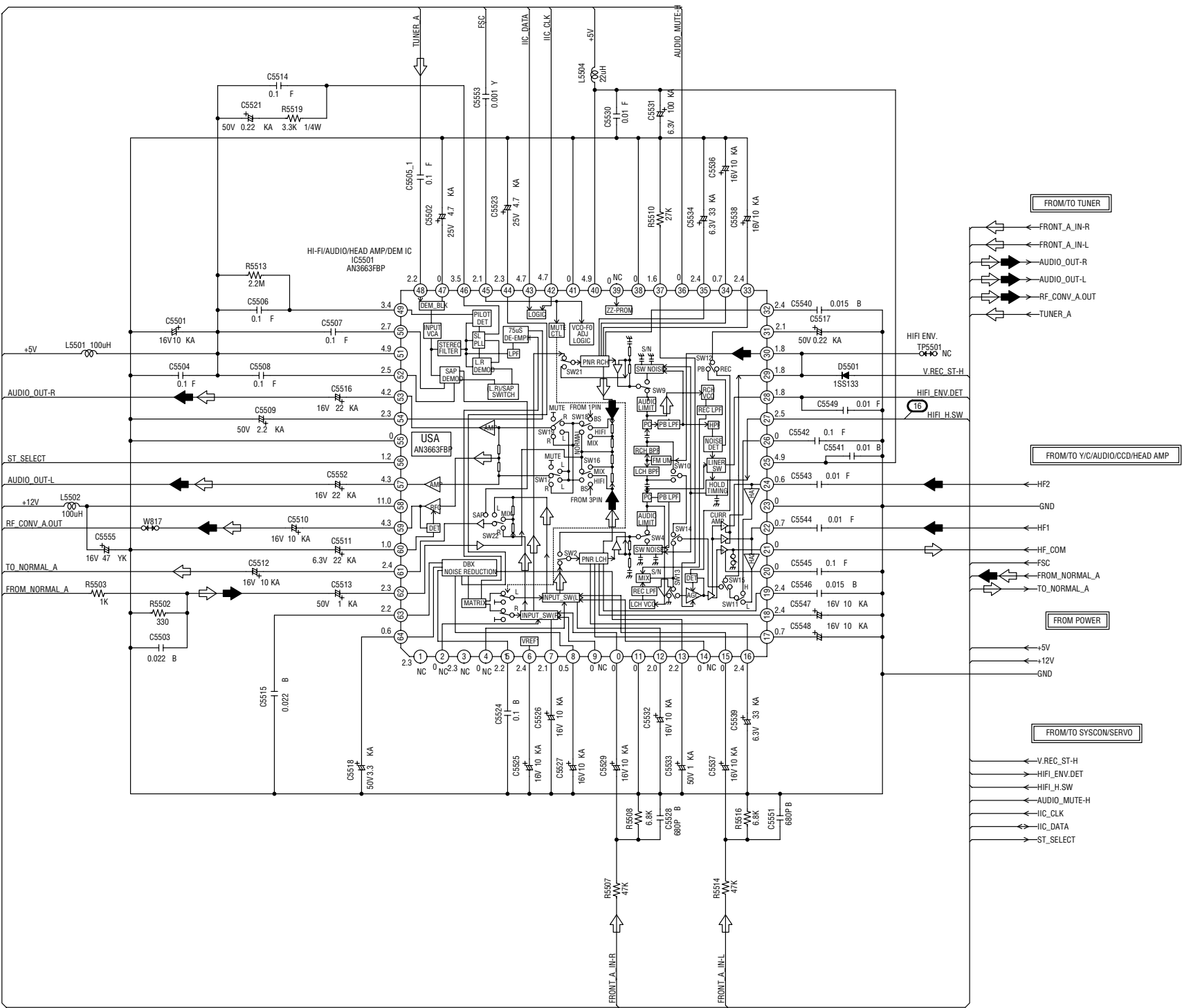
CAUTION: SINCE THESE PARTS MARKED BY ARE
CRITICAL FOR SAFETY, USE ONES
DESCRIBED IN PARTS LIST ONLY.

CAUTION: DIGITAL TRANSISTOR



PCB010
VMA224

HI-FI/DEMODULATOR SCHEMATIC DIAGRAM
(SYSCON PCB)



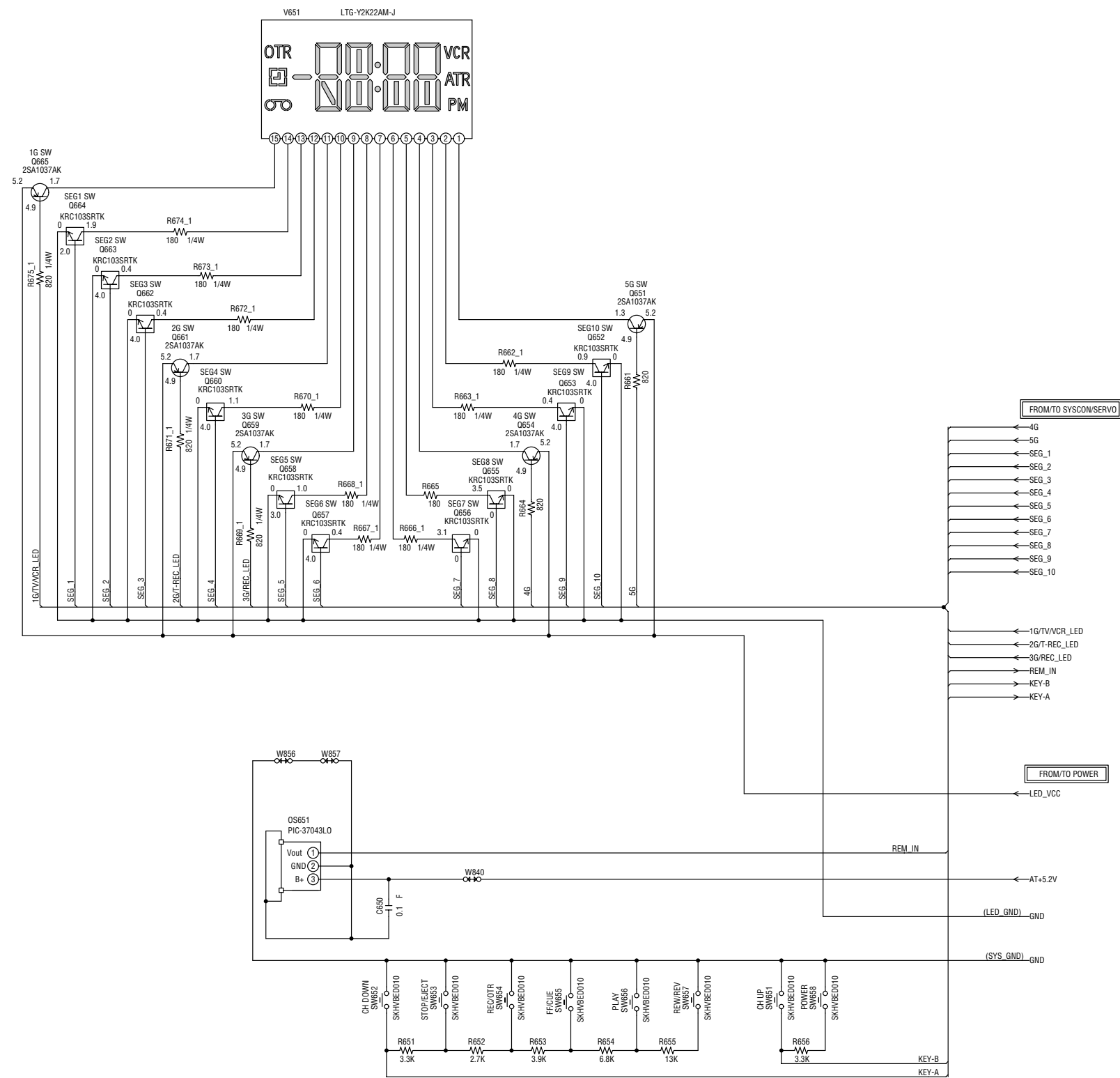
NOTE: THE DC VOLTAGE AT EACH PART WAS
MEASURED WITH THE DIGITAL TESTER
DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

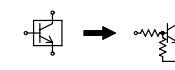
◁ AUDIO SIGNAL(REC)
◀ AUDIO SIGNAL(PB)

PC8010
VMA224

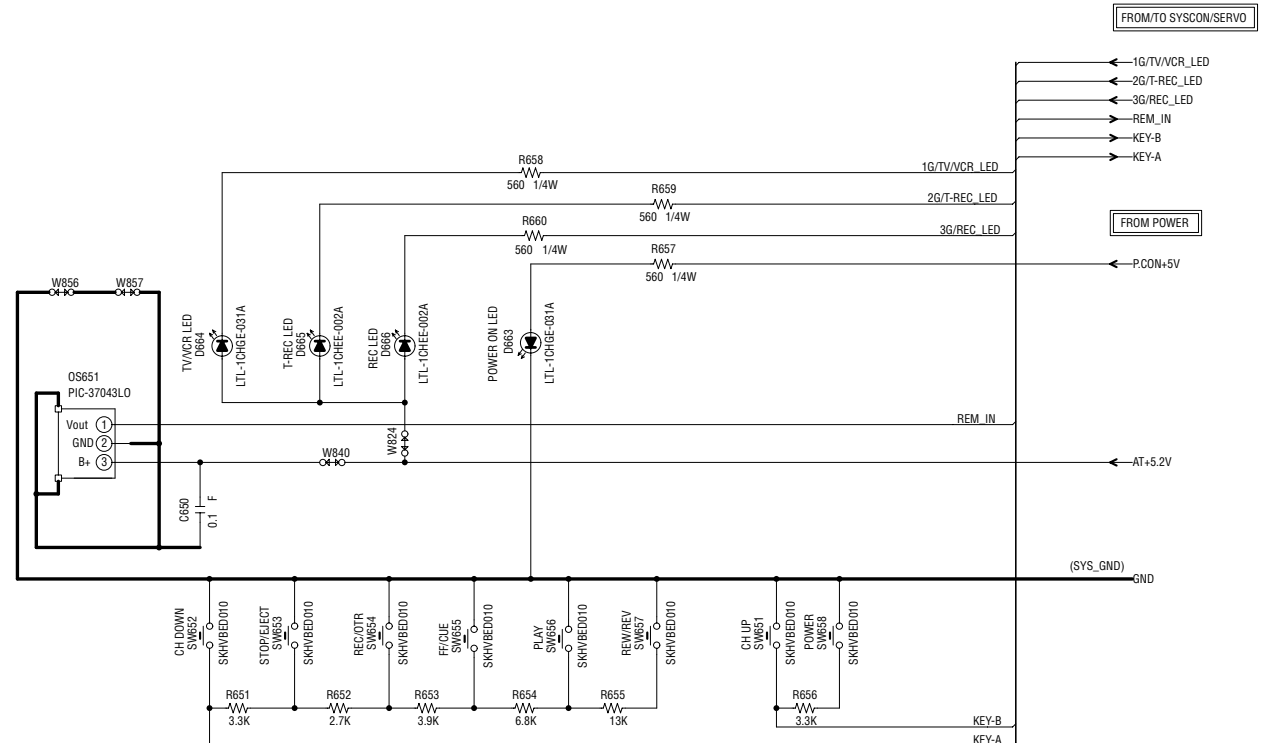
OPERATION SCHEMATIC DIAGRAM [HR-A591U/A591U(C)] (SYSCON PCB)



CAUTION: DIGITAL TRANSISTOR



OPERATION SCHEMATIC DIAGRAM [HR-A590U(C)]
(SYSCON PCB)

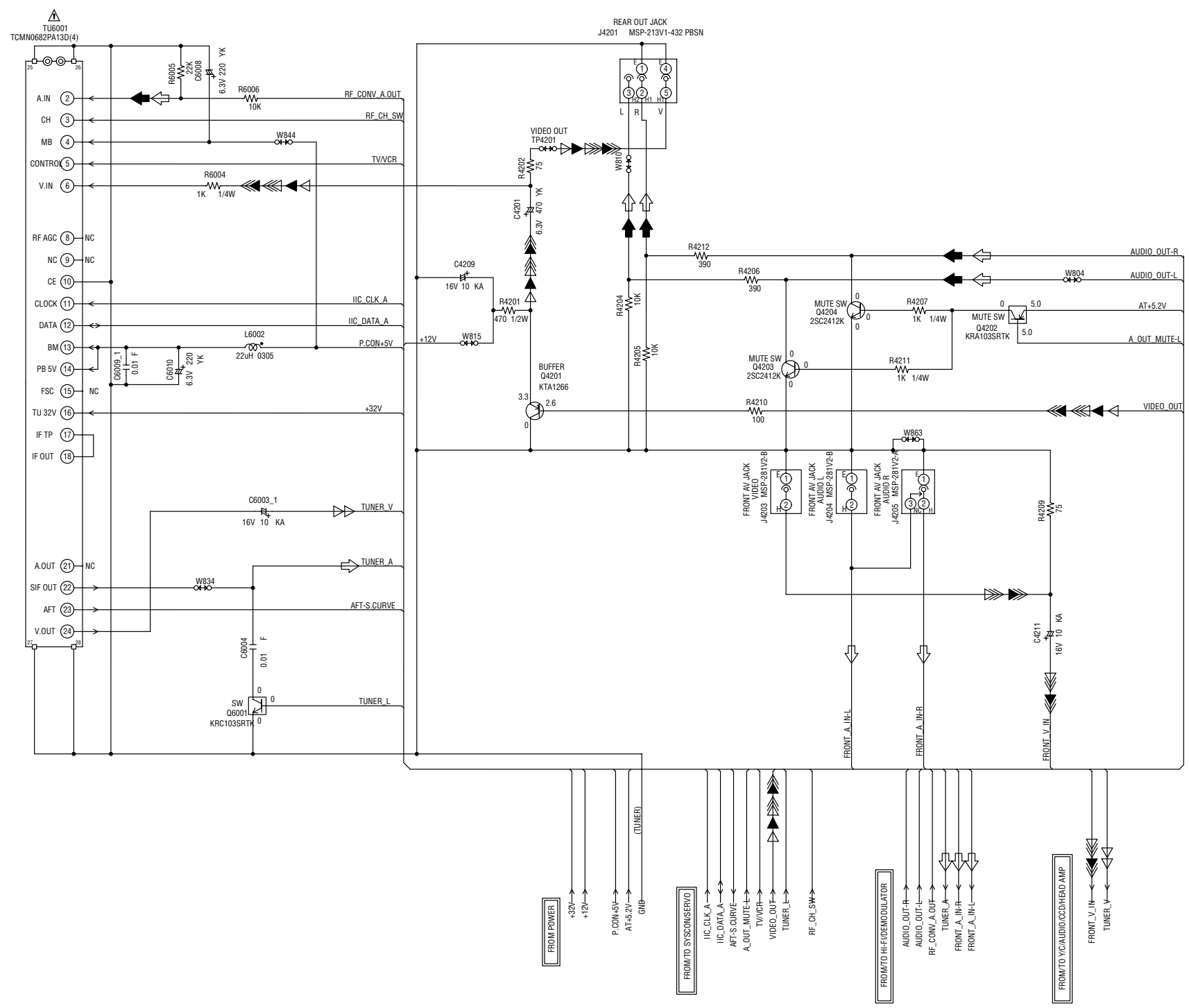


NOTE: THE DC VOLTAGE AT EACH PART WAS
MEASURED WITH THE DIGITAL TESTER
DURING PLAYBACK .

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE .

PC8010
VMA224

TUNER SCHEMATIC DIAGRAM [HR-A591U/A591U(C)]
(SYSCON PCB)



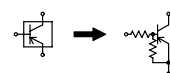
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

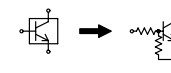
CAUTION: SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

ATTENTION: LES PIÈCES RÉPARÉES PAR UN ÉTANT DANGEREUSES AU POINT DE VUE SÉCURITÉ, N'UTILISER QUE CELLES DÉCRITES DANS LA NOMENCLATURE DES PIÈCES.

CAUTION: DIGITAL TRANSISTOR



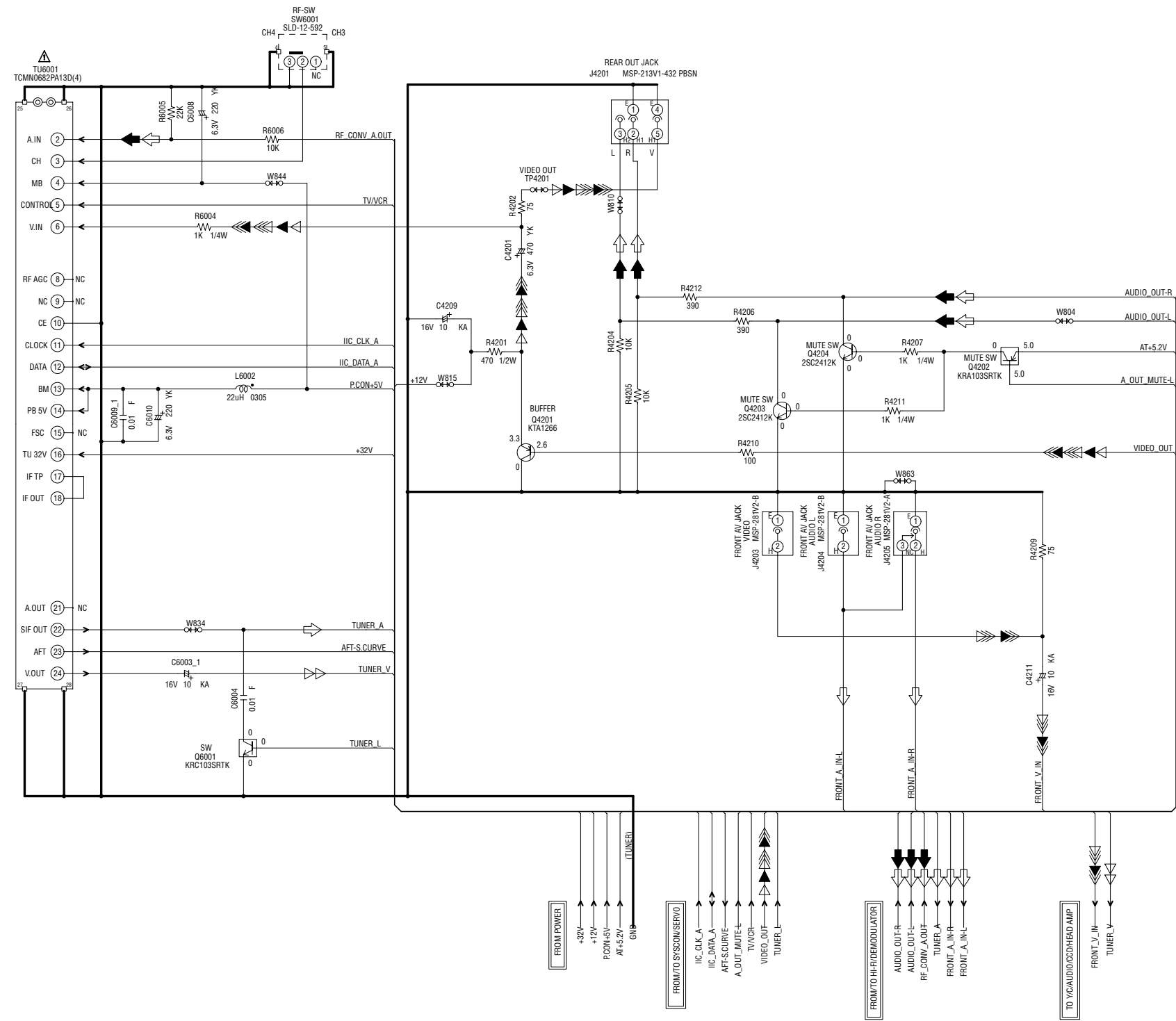
CAUTION: DIGITAL TRANSISTOR



- RECORD LUMINANCE SIGNAL
- RECORD COLOR SIGNAL
- AUDIO SIGNAL(REC)
- AUDIO SIGNAL(PB)
- TUNER VIDEO SIGNAL
- PLAYBACK LUMINANCE SIGNAL
- PLAYBACK COLOR SIGNAL

PC8010
VMA224

TUNER SCHEMATIC DIAGRAM [HR-A590U(C)]
(SYS CON PCB)



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

CAUTION: SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

ATTENTION: LES PIECES REPARÉES PAR UN ÉTANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

CAUTION: DIGITAL TRANSISTOR

CAUTION: DIGITAL TRANSISTOR

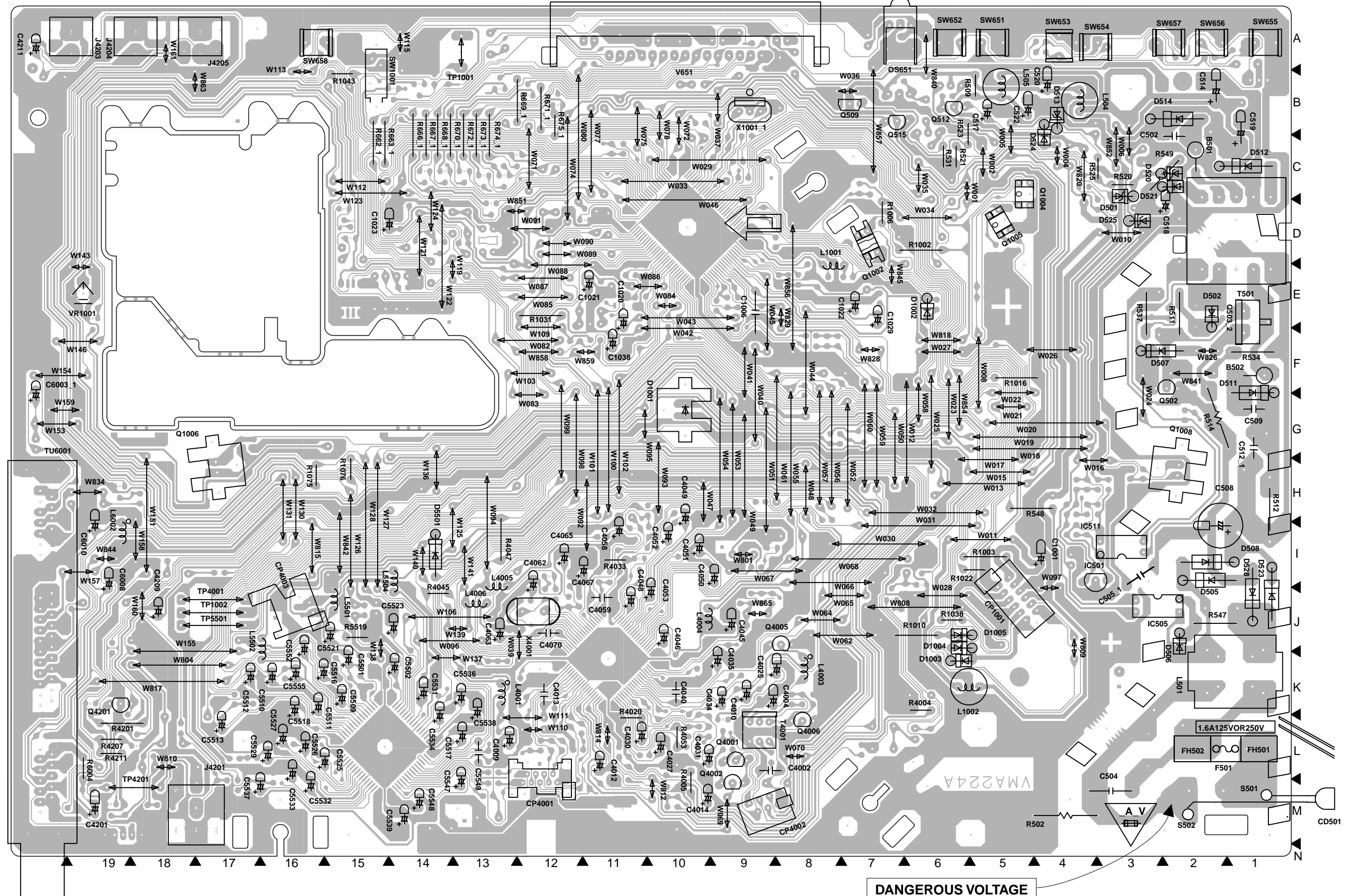
- RECORD LUMINANCE SIGNAL
- RECORD COLOR SIGNAL
- AUDIO SIGNAL (REC)
- AUDIO SIGNAL (PB)
- TUNER VIDEO SIGNAL
- PLAYBACK LUMINANCE SIGNAL
- PLAYBACK COLOR SIGNAL

PCB010
VMA224

SYSCON CIRCUIT BOARD **(INSERTED PARTS)** **SOLDER SIDE**



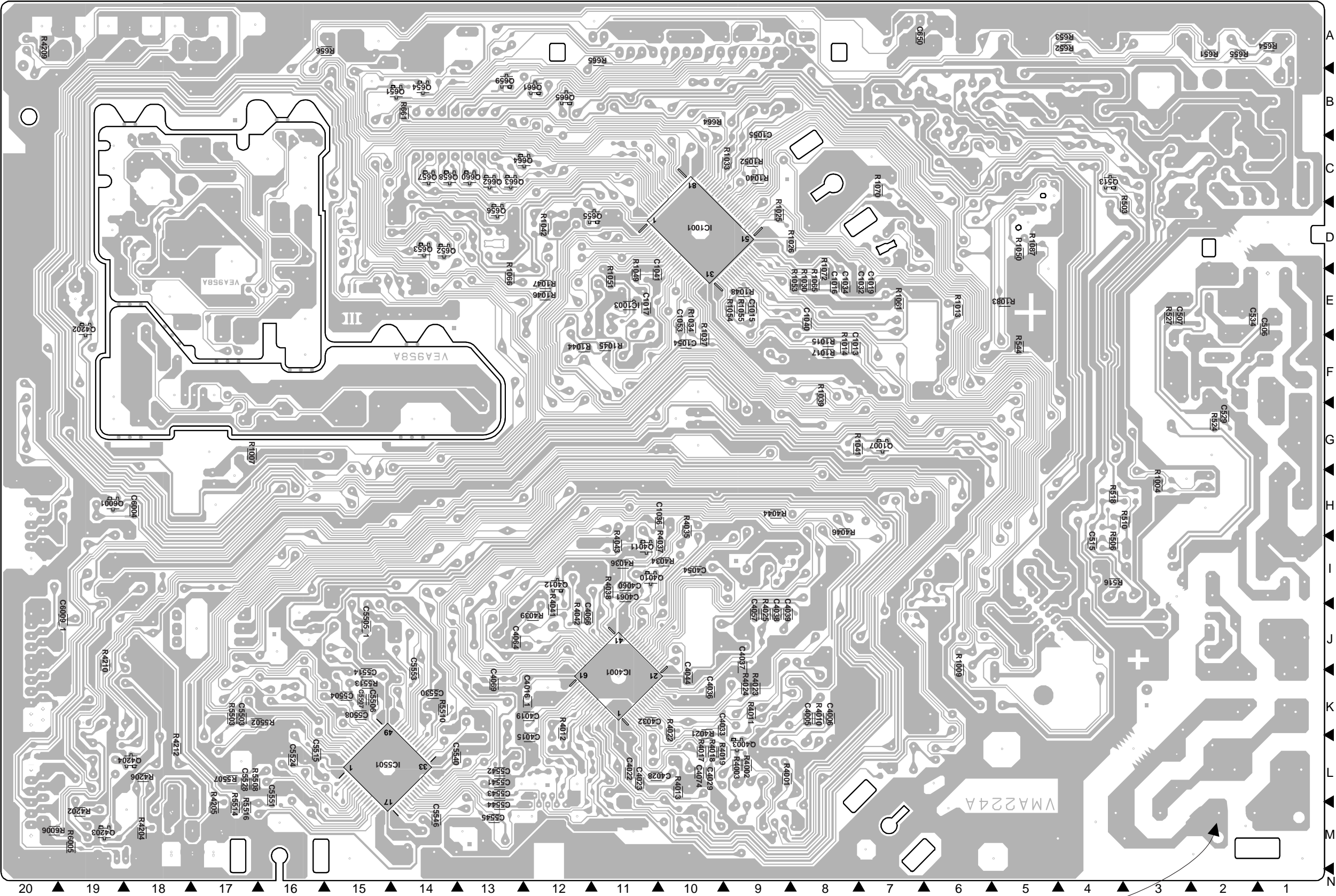
CAUTION :
 FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH SAME TYPE AND RATED FUSE(S).
 FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH SAME TYPE CP(S) MANUFACTURED BY ROHM.
 ATTENTION :
 REPLACER PAR DES FUSIBLE DE MEME TYPE.



SYSCON CIRCUIT BOARD
(CHIP MOUNTED PARTS)
SOLDER SIDE



CAUTION :
FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH SAME TYPE AND RATED FUSE(S).
ATTENTION :
REPLACER PAR DES FUSIBLE DE MEME TYPE.

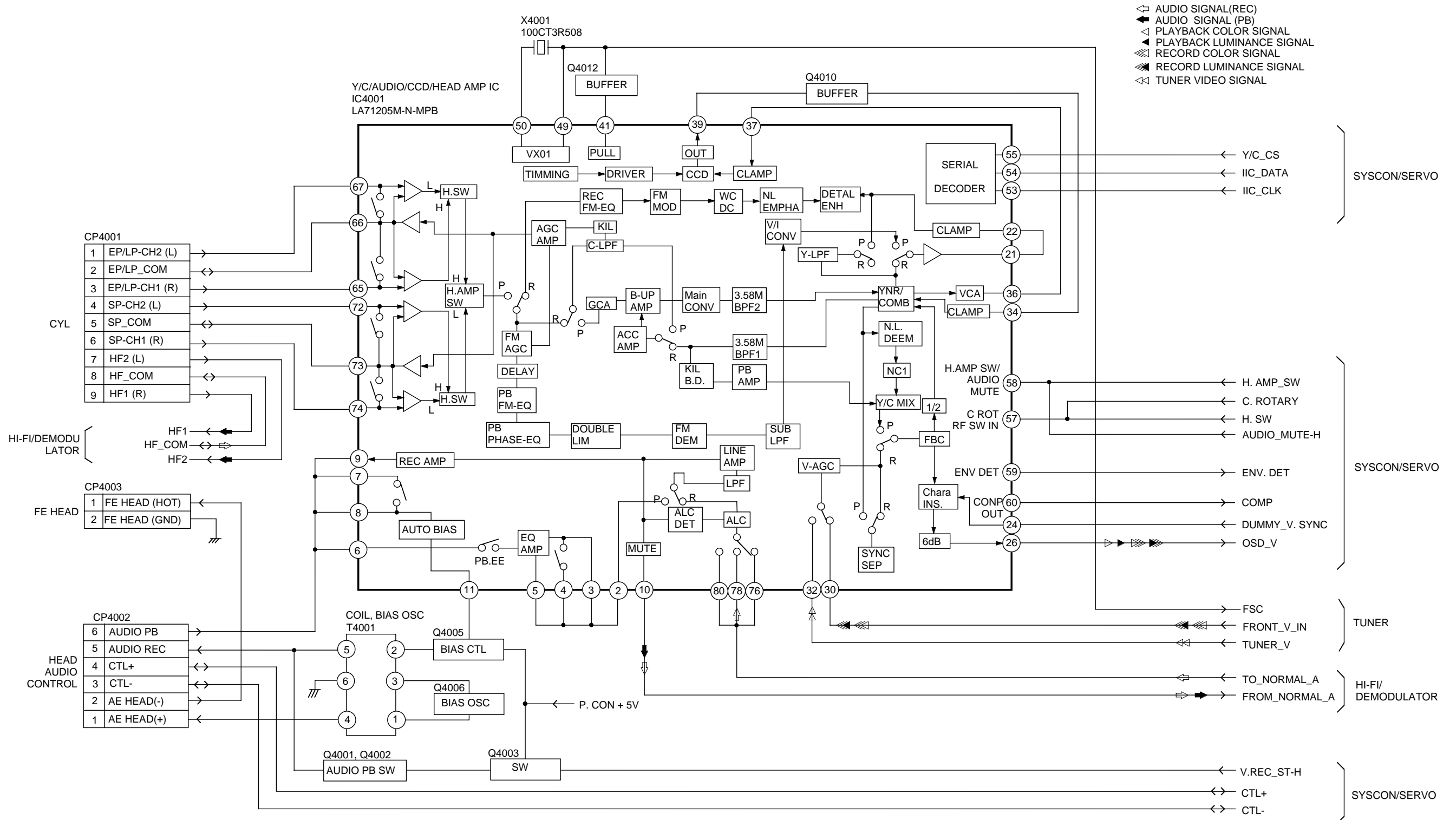


DANGEROUS VOLTAGE

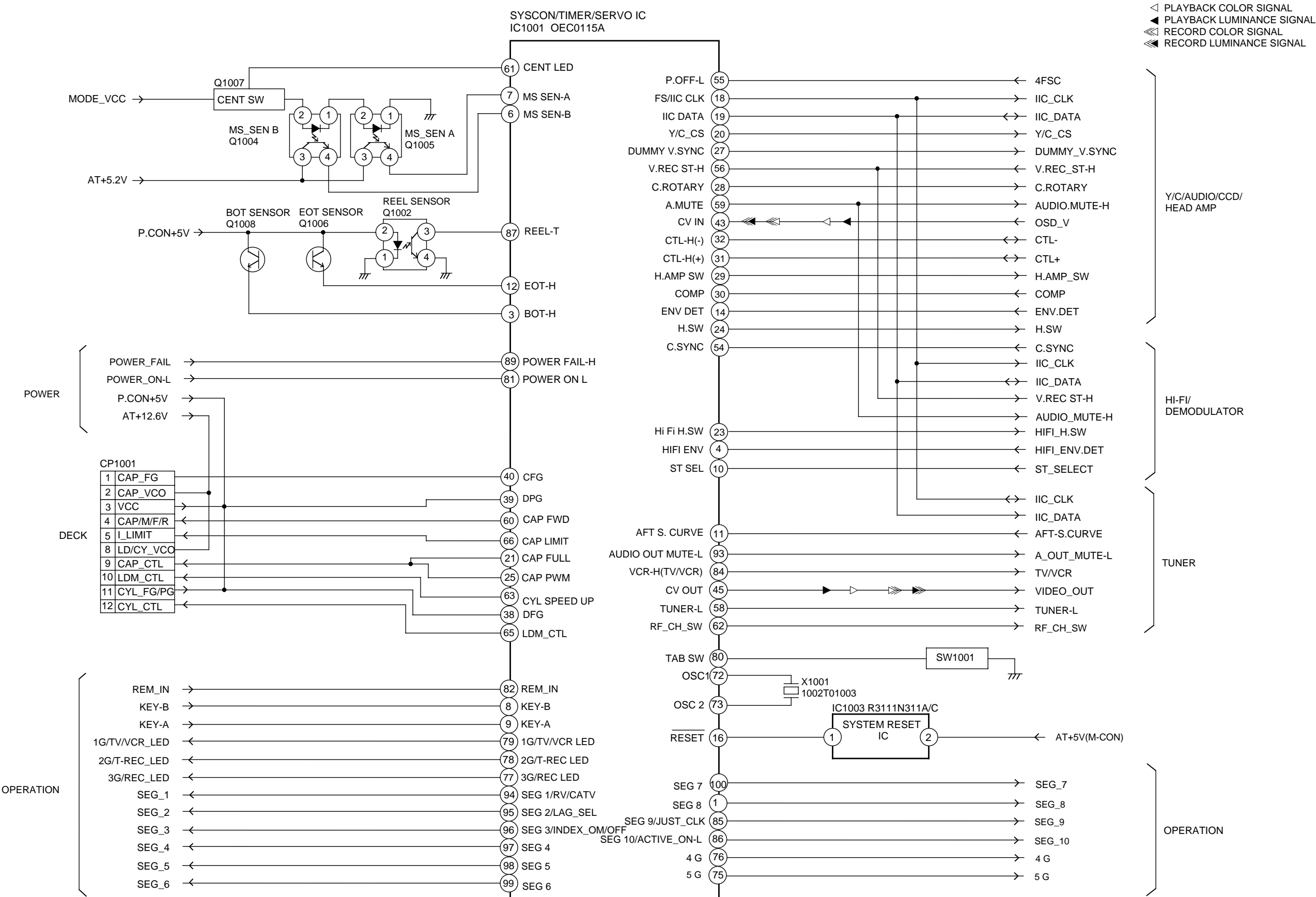
COMPONENT PARTS LOCATION GUIDE <SYSCON> VMA224

REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION	REF.NO.	LOCATION
CAPASITOR													
C502	2C	C4056	13K	D663	8A	R511	2E	R1057	13D	SW606_4	16D		
C503	4B	C4057	9J	D664	11A	R512	1H	R1058	14D	SW607	17F		
C504	3M	C4058	11I	D665	10A	R513	2E	R1059	11C	SW607_1	16D		
C505	3I	C4059	11J	D666	9A	R514	2F	R1060	12C	SW607_2	16D		
C506	1E	C4060	11I	D1001	10G	R515	4H	R1061	7E	SW608	16C		
C507	3E	C4061	11I	D1002	6E	R516	4I	R1062	13C	SW608_1	18G		
C508	1I	C4062	12J	D1003	6K	R517	3H	R1063	12C	SW608_2	18C		
C509	1G	C4063	13J	D1004	5J	R518	4H	R1064	12C	SW651	5A		
C510	2E	C4064	13J	D1005	5J	R519	7B	R1065	8E	SW652	6A		
C511	4H	C4065	12I	D1006	15B	R520	3C	R1066	13E	SW653	4A		
C512	1G	C4066	12J	D1009	12E	R521	6C	R1067	11E	SW654	4A		
C514	2B	C4067	11I	D4202	20B	R523	6B	R1068	7F	SW655	1A		
C515	4I	C4068	13K	D5501	14I	R524	2G	R1069	15C	SW656	2A		
C516	4H	C4069	13K			R525	4C	R1070	7C	SW657	2A		
C517	5B	C4070	12J			R526	4I	R1071	7D	SW658	16A		
C518	2D	C4073	13K	FUSE		R527	3E	R1072	8E	SW659	2A		
C519	1C	C4074	10L	F501	2L	R530	6B	R1073	12F	SW660	4A		
C520	4B	C4075	11I			R531	6C	R1074	11F	SW1001	15B		
C521	3C	C4201	19M	IC		R532	6C	R1075	16H	SW6001	19M		
C522	5B	C4202	18M	IC501	4I	R533	1F	R1076	15H	S101X	1B		
C524	1J	C4203	18M	IC505	2J	R534	4H	R1077	5E	S101Y	3C		
C529	2G	C4204	17M	IC511	3I	R535	3E	R1083	5D				
C534	2E	C4205	19L	IC1001	10D	R537	5F	R1087	9L	TEST POINT			
C650	7A	C4206	19L	IC1003	11E	R544	4H	R4001	9L	TP1001	1G		
C651	7A	C4207	19M	IC1003	12E	R546	1J	R4002	9L	TP1002	10A		
C1001	4I	C4208	18J	IC1099	14E	R547	4H	R4003	9L	TP4001	10A		
C1002	4I	C4209	18J	IC1099	15E	R548	2C	R4004	10L	TP4201	13A		
C1003	5J	C4211	20A	IC4001	11K	R549	17E	R4006	10M	TP5501	10A		
C1004	3H	C504_1	3L	IC5501	15L	R601	18D	R4007	7L				
C1005	17G	C512_1	1G			R602	18D	R4008	12L	OTHER			
C1006	9E	C5501	15K	COIL		R603	18D	R4008	12L	CP501	2M		
C1013	8F	C5502	14K	L501	2K	R604	18C	R4009	8K	CP601	18F		
C1014	14D	C5503	17K	L504	4B	R605	16C	R4010	8K	CP601_1	19D		
C1015	9E	C5504	15K	L505	5B	R606	9A	R4011	9K	CP651	1B		
C1016	8E	C5505	15J	L1001	7E	R607	17E	R4012	12K	CP1001	5J		
C1017	11E	C5505_1	15J	L1002	5K	R608	9A	R4013	10L	CP4001	12M		
C1018	7E	C5506	15K	L4001	13K	R609	14B	R4014	10M	CP4001	12M		
C1019	7E	C5507	15K	L4002	9J	R610	9A	R4016	11M	CP4001	12M		
C1020	11F	C5508	15K	L4003	8K	R651	2A	R4017	10L	CP4002	8M		
C1021	11E	C5509	15K	L4004	10J	R652	4A	R4018	10L	CP4003	16J		
C1022	7E	C5510	16K	L4004_1	10J	R653	4A	R4019	10L	FH501	1L		
C1023	15D	C5511	16K	L4005	13J	R654	1A	R4020	11L	FH502	2L		
C1023_1	15D	C5512	17K	L4005_1	13J	R655	2A	R4021	10L	J4201	17M		
C1026	6J	C5513	17L	L4006	13J	R656	15A	R4022	10L	J4201_1	17M		
C1027	9E	C5514	15K	L4006_1	13J	R657	8A	R4023	9K	J4201_2	17M		
C1028	13E	C5515	16L	L501_1	2K	R658	13A	R4024	9K	J4201_3	17M		
C1029	7E	C5516	16K	L5501	15J	R659	10A	R4025	9J	J4203	19A		
C1030	14E	C5517	13L	L5501_1	15J	R660	9A	R4032	9J	J4204	18A		
C1031	9E	C5518	16L	L5502	16J	R661	14B	R4033	11I	J4205	17A		
C1032	7E	C5519	16K	L5504	14I	R662	15B	R4034	10I	J4205_1	17A		
C1033	7E	C5520	15J	L5504_1	14I	R663	15B	R4035	10H	OS651	7A		
C1034	8E	C5521	15J	L6001	19I	R664	10B	R4036	11I	T501	2E		
C1035	6L	C5522	15K	L6002	19I	R665	11A	R4037	10I	T4001	9L		
C1036	10H	C5523	14J	L6003	18I	R666	14B	R4038	11I	TU6001	20M		
C1038	11F	C5524	16L			R667	14B	R4039	12J	TU6001	20M		
C1040	8E	C5525	16L	TRANSISTOR		R668	14B	R4040	12J	V651	11A		
C1041	11E	C5526	16L	Q502	3F	R669	13B	R4041	12J	VR1001	19E		
C1042	5E	C5527	16L	Q503	1E	R670	14B	R4042	12J	X1001	9B		
C1043	5D	C5528	17L	Q506	6B	R671	12B	R4043	11I	X1001_1	9B		
C1044	11F	C5529	16L	Q508	6B	R672	13B	R4044	9H	X4001	12J		
C1046	11E	C5530	14K	Q509	7B	R673	13B	R4045	14J				
C1051	9C	C5531	14K	Q512	6B	R674	13B	R4046	8H				
C1052	9C	C5532	16M	Q513	4C	R675	12B	R4047	13H				
C1053	10E	C5533	16M	Q514	6B	R677	6A	R4048	8I				
C1054	10F	C5534	14L	Q515	6B	R678	14B	R4049	12I				
C1055	6G	C5535	13K	Q651	14B	R1001	8G	R4050	9J				
C1056	9C	C5536	17M	Q652	14D	R1002	6D	R4051	13K				
C4001	12L	C5537	13L	Q653	14D	R1003	5I	R4052	14J				
C4002	8L	C5538	14M	Q654	14B	R1004	3H	R4053	10L				
C4003	9K	C5540	14L	Q655	11D	R1005	6J	R4201	18L				
C4004	12L	C5541	13L	Q656	13D	R1006	7D	R4202	19M				
C4005	8K	C5542	13L	Q657	14C	R1007	17G	R4204	18M				
C4006	8K	C5543	13L	Q658	14C	R1008	15D	R4205	17M				
C4007	11M	C5544	13M	Q659	13B	R1009	6K	R4206	18L				
C4008	12L	C5545	14M	Q660	13C	R1010	6J	R4207	19L				
C4009	13L	C5546	14M	Q661	12B	R1012	15C	R4208	19E				
C4010	9K	C5547	13M	Q662	13C	R1013	6E	R4209	20A				
C4011	11K	C5548	14M	Q663	13C	R1014	8F	R4210	19J				
C4012	11L	C5549	13L	Q664	13C	R1015	8F	R4211	19L				
C4013	12K	C5550	16K	Q665	12B	R1016	4F	R4212	18L				
C4014	10M	C5551	16K	Q1001	13D	R1017	8F	R4213	18L				
C4015	12L	C5552	14K	Q1002	7D	R1018	6I	R512_1	1H				
C4016	12K	C5553	16K	Q1003	5C	R1019	13D	R5502	17K				
C4017	12L	C5554	20L	Q1004	5D	R1020	12D	R5503	17K				
C4018	12L	C5555	20I	Q1005	17H	R1021	6J	R5507	17L				
C4019	12K	C5556	20G	Q1006	7G	R1022	5I	R5508	17L				
C4020	11M	C5557	20G	Q1007	2H	R1023	7F	R5509	14K				
C4021	10M	C5558	18H	Q1008	6I	R1024	8E	R5510	14K				
C4022	11L	C5559	20L	Q1009	15D	R1025	9D	R5513	15K				
C4023	11L	C5560	20K	Q1010	15D	R1026	9D	R5514	17M				
C4024	9K	C5561	19J	Q1011	7J	R1027	6F	R5516	17M				
C4025	8K	C5562	19J	Q1012	9L	R1029	12D	R5519	15J				
C4026	9K	C5563	19I	Q4001	9M	R1030	8E	R5520	14K				
C4027	10L	C5564	20L	Q4002	9L	R1031	12E	R6004	19L				
C4028	11L	C5565	18I	Q4003	9J	R1032	6D	R6005	19M				
C4029	10L	C5566	19H	Q4004	8L	R1033	9C	R6006	20M				
C4030	11L	C5567	17I	Q4005	9I	R1034	10E	R6010	19J				
C4031	10L	C5568		Q4006	11I	R1035	6K						
C4032	11K	C5569		Q4007	11I	R1036	6L						
C4033	10K	C5570		Q4008	12I	R1037	10F						
C4034	9K	C5571		Q4009	19K	R1038	6J						
C4035	9K	C5572		Q4010	19E	R1039	8F						
C4036	10K	C5573		Q4011	19M	R1040	9C						
C4037	9K	C5574		Q4012	18L	R1041	8G						
C4038	9J	C5575		Q4013	19K	R1042	12D						
C4039	9J	C5576		Q4014	1E	R1043	15B						
C4040	10K	C5577		Q4015	19H	R1044	12F						
C4041	10K	C5578		Q4016		R1045	11F						
C4042	10K	C5579		Q4017		R1046	12E						
C4043	10K	C5580		Q4018		R1047	12E						
C4044	10J	C5581		Q4019		R1048	9E						
C4045	11J	C5582		Q4020		R1049	11E						
C4046	10I	C5583		Q4021		R1050	5D						
C4047	9I	C5584		Q4022		R1051	11E						
C4048	10I	C5585		Q4023		R1052	9C						
C4049	10I	C55											

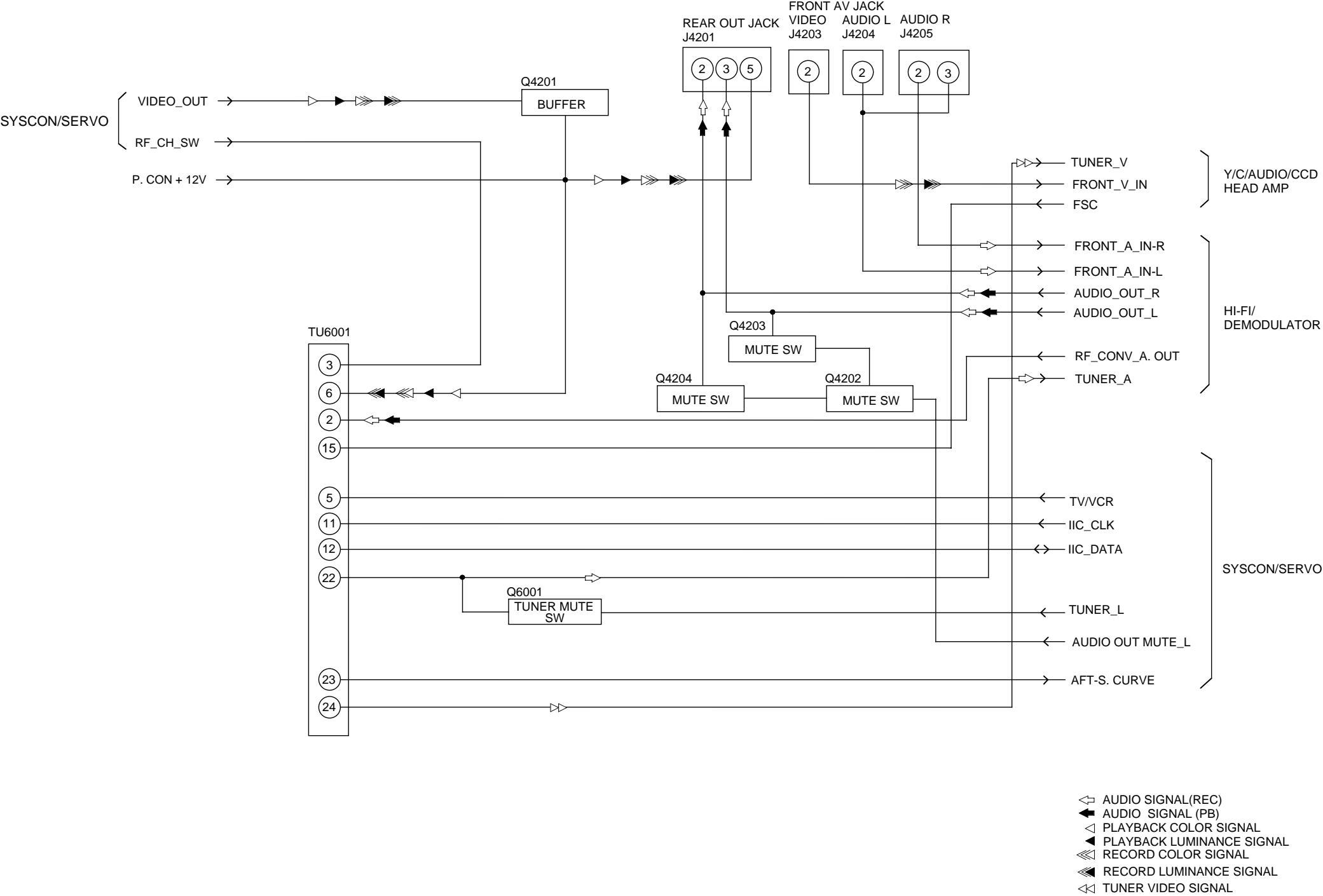
Y/C/AUDIO/CCD/HEAD AMP BLOCK DIAGRAM



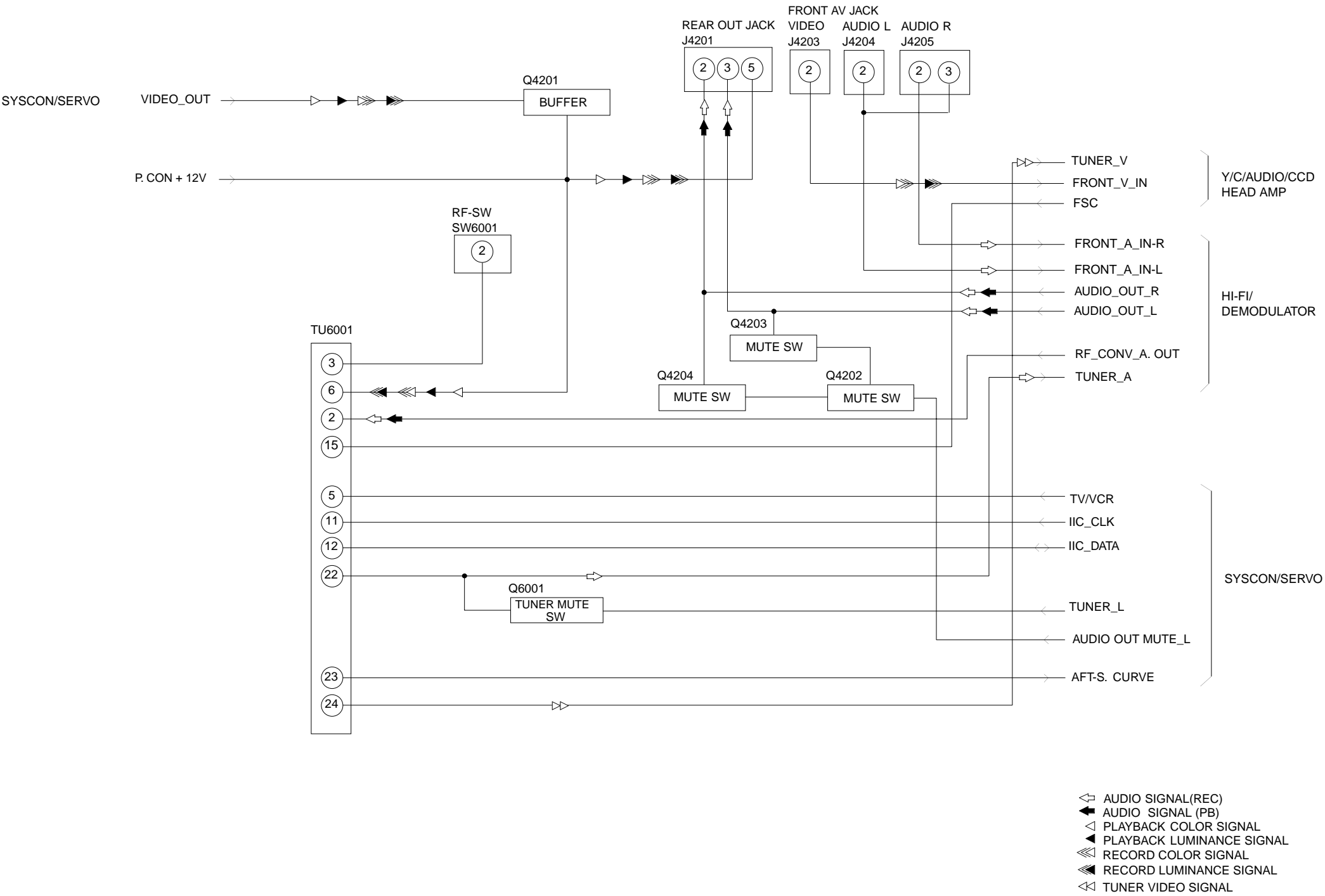
SYSTEM CONTROL/SERVO BLOCK DIAGRAM



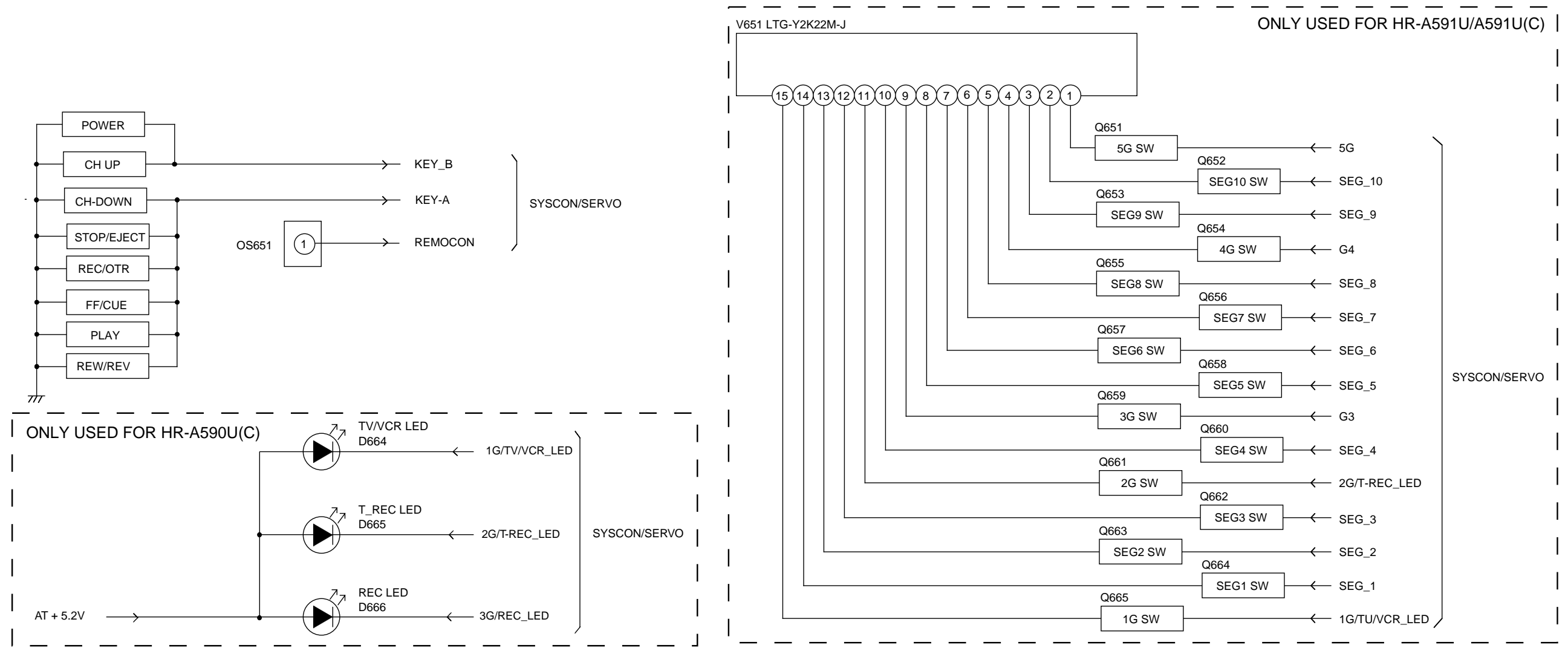
TUNER BLOCK DIAGRAM [HR-A591U/A591U(C)]



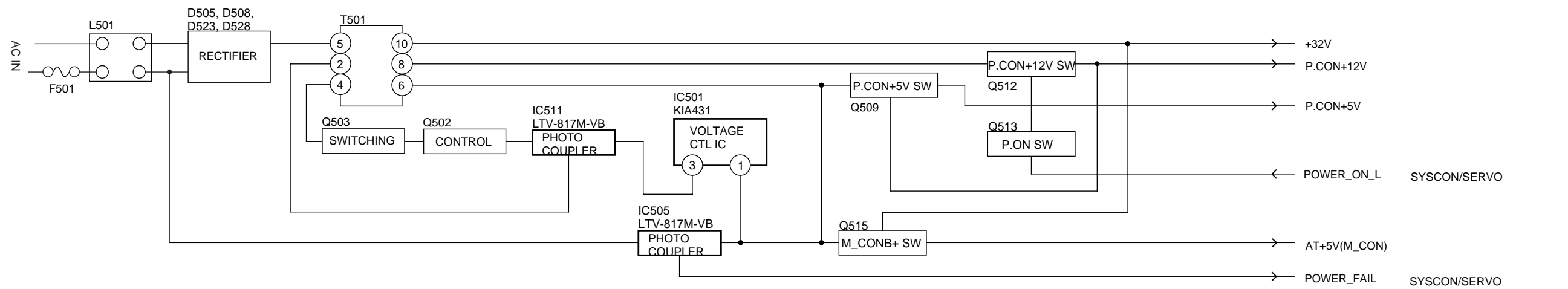
TUNER BLOCK DIAGRAM [HR-A590U(C)]



OPERATION BLOCK DIAGRAM



POWER BLOCK DIAGRAM



HI-FI/DEMODULATOR BLOCK DIAGRAM

