

SERVICE MANUAL

INTEGRATED COLOR TV / STEREO VIDEO
CASSETTE RECORDER

BASIC TAPE MECHANISM : OVD-6

SPECIFICATIONS

GENERAL

POWER REQUIREMENTS	120V AC, 60Hz
POWER CONSUMPTION	119W
	TYP 4W (power save mode)
WEIGHT	26.5 kg (58.5 lbs.)
DIMENSIONS	574 mm (W) x 489 mm (D) x
	502 mm (H)
	(22 5/8 x 19 3/8 x 19 7/8 in.)

TV SECTION

PICTURE TUBE	406 mm (W) x 305 mm (H)
	(16 x 12 1/8 in.)
	508 mm (diagonal) (20 in.)
TUNER SYSTEM	Frequency synthesized tuner
CHANNEL COVERAGE	VHF: 2 to 13
	UHF: 14 to 69
	CATV: 4A, A-1 to A-5, A to W,
	W+1 to W+84

PROGRAM MEMORY	181
TV SYSTEM	M
HORIZONTAL RESOLUTION	230 lines
ANTENNA INPUT	75 ohms, unbalanced

VCR SECTION

OPERATING TEMPERATURE	5°C to 40°C
VIDEO RECORDING SYSTEM	Rotary 2 head helical scanning system

VIDEO SIGNAL SYSTEM	NTSC color system, 525 lines, 60 fields
VIDEO HEAD	Azimuth 2 head
USABLE CASSETTES	VHS video cassette
	S-VHS video cassette (play back only)
TAPE SPEED	SP: 33.35 mm/sec
	LP: 16.67 mm/sec
	SLP: 11.12 mm/sec
RECORDING/PLAYBACK TIME	SP: 3 hours with T-180 tape
	LP: 6 hours with T-180 tape
	SLP: 9 hours with T-180 tape
VIDEO INPUT	1.0Vp-p, 75 ohm, unbalanced
VIDEO OUTPUT	1.0Vp-p, 75 ohm, unbalanced
VIDEO S/N	53dB (nominal)
AUDIO INPUT	-8dBs, 50K ohm
AUDIO OUTPUT	-8dBs, less than 1K ohm
AUDIO TRACK	3 tracks (Hi-Fi sound 2 tracks, Normal sound 1 track)
FAST-FORWARD TIME	Approx. 2 minutes 15 seconds with T-120 tape
REWIND TIME	Approx. 1 minutes 48 seconds with T-120 tape
HI-FI DYNAMIC RANGE	More than 90dB
HI-FI FREQUENCY RESPONSE	20Hz-20kHz
HI-FI WOW AND FLUTTER	Less than 0.01%

● Design and specifications are subject to change without notice.

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SERVICING NOTICES ON CHECKING

1. KEEP THE NOTICES

As for the places which need special attentions, they are indicated with the labels or seals on the cabinet, chassis and parts. Make sure to keep the indications and notices in the operation manual.

2. AVOID AN ELECTRIC SHOCK

There is a high voltage part inside. Avoid an electric shock while the electric current is flowing.

3. USE THE DESIGNATED PARTS

The parts in this equipment have the specific characters of incombustibility and withstand voltage for safety. Therefore, the part which is replaced should be used the part which has the same character. Especially as to the important parts for safety which is indicated in the circuit diagram or the table of parts as a \triangle mark, the designated parts must be used.

4. PUT PARTS AND WIRES IN THE ORIGINAL POSITION AFTER ASSEMBLING OR WIRING

There are parts which use the insulation material such as a tube or tape for safety, or which are assembled in the condition that these do not contact with the printed board. The inside wiring is designed not to get closer to the pyrogenic parts and high voltage parts. Therefore, put these parts in the original positions.

5. TAKE CARE TO DEAL WITH THE CATHODE-RAY TUBE

In the condition that an explosion-proof cathode-ray tube is set in this equipment, safety is secured against implosion. However, when removing it or serving from backward, it is dangerous to give a shock. Take enough care to deal with it.

6. AVOID AN X-RAY

Safety is secured against an X-ray by considering about the cathode-ray tube and the high voltage peripheral circuit, etc.

Therefore, when repairing the high voltage peripheral circuit, use the designated parts and make sure not modify the circuit.

Repairing except indicates causes rising of high voltage, and it emits an X-ray from the cathode-ray tube.

7. PERFORM A SAFETY CHECK AFTER SERVICING

Confirm that the screws, parts and wiring which were removed in order to service are put in the original positions, or whether there are the portions which are deteriorated around the serviced places serviced or not. Check the insulation between the antenna terminal or external metal and the AC cord plug blades. And be sure the safety of that.

(INSULATION CHECK PROCEDURE)

1. Unplug the plug from the AC outlet.
2. Remove the antenna terminal on TV and turn on the TV.
3. Insulation resistance between the cord plug terminals and the external exposure metal **[Note 2]** should be more than 1M ohm by using the 500V insulation resistance meter **[Note 1]**.
4. If the insulation resistance is less than 1M ohm, the inspection repair should be required.

[Note 1]

If you have not the 500V insulation resistance meter, use a Tester.

[Note 2]

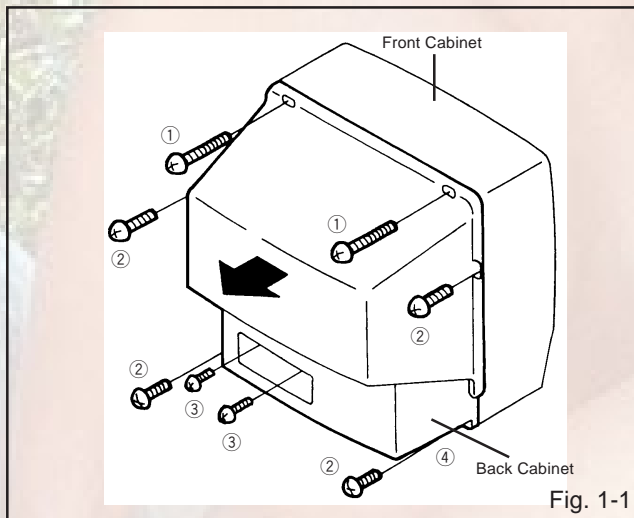
External exposure metal: Antenna terminal
Earphone jack

DISASSEMBLY INSTRUCTIONS

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

1-1: BACK CABINET (Refer to Fig. 1-1)

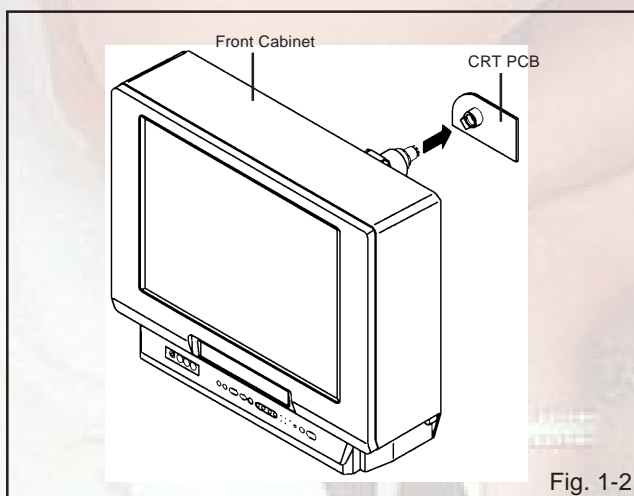
1. Remove the 2 screws ①.
2. Remove the 4 screws ②.
3. Remove the 2 screws ③ which are used for holding the Back Cabinet.
4. Remove the AC cord from the AC cord hook ④.
5. Remove the Back Cabinet in the direction of arrow.



1-2: CRT PCB (Refer to Fig. 1-2)

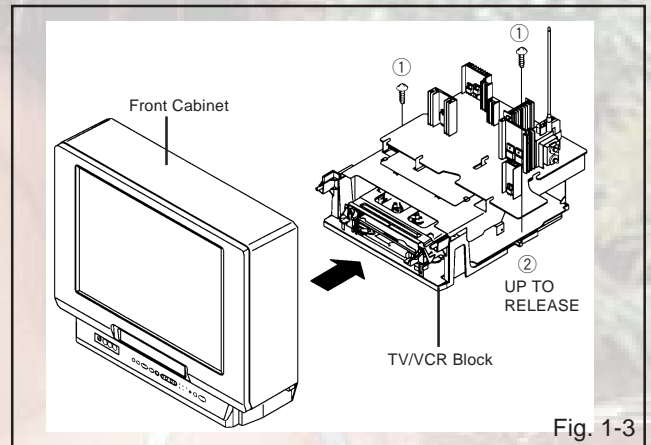
CAUTION: BEFORE REMOVING THE ANODE CAP, DISCHARGE ELECTRICITY BECAUSE IT CONTAINS HIGH VOLTAGE. BEFORE ATTEMPTING TO REMOVE OR REPAIR ANY PCB, UNPLUG THE POWER CORD FROM THE AC SOURCE.

1. Remove the Anode Cap.
(Refer to REMOVAL OF ANODE CAP)
2. Disconnect the following connectors:
(CP802 and CP805).
3. Remove the CRT PCB in the direction of arrow.



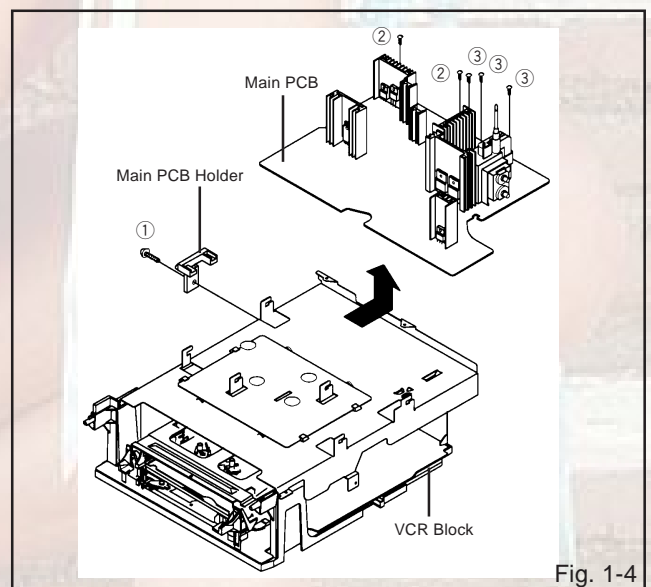
1-3: TV/VCR BLOCK (Refer to Fig. 1-3)

1. Remove the 2 screws ①.
2. Disconnect the following connectors:
(CP303, CP401, CP502, CP4201 and CP4202).
3. Unlock the support ②.
4. Remove the TV/VCR Block in the direction of arrow.



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

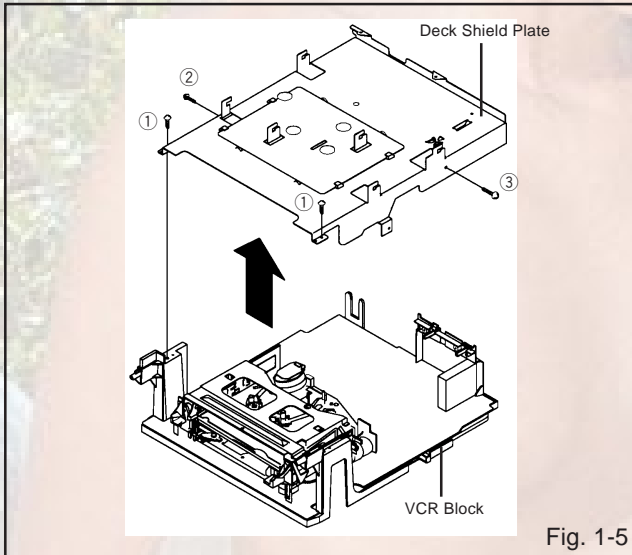
1. Remove the screw ①.
2. Remove the Main PCB Holder.
3. Remove the 2 screws ②.
4. Remove the 3 screws ③.
5. Disconnect the following connectors:
(CP810, CP820, CP811, CP804 and CP806).
6. Remove the Main PCB in the direction of arrow.



DISASSEMBLY INSTRUCTIONS

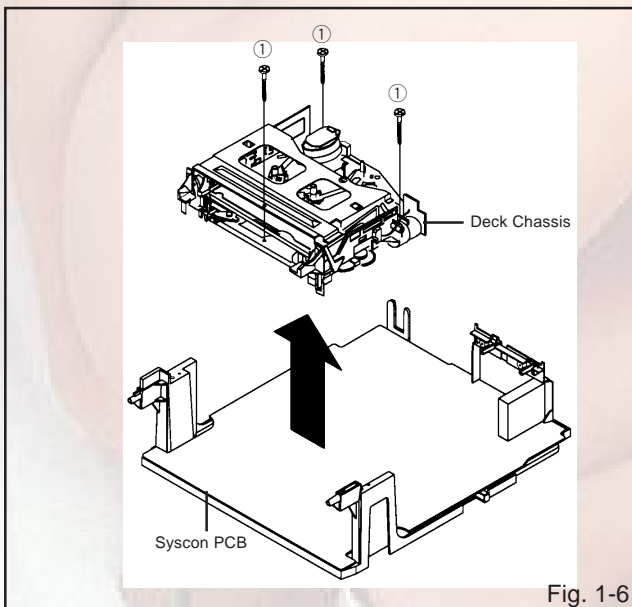
1-5: DECK SHIELD PLATE (Refer to Fig. 1-5)

1. Remove the 2 screws ①.
2. Remove the screw ②.
3. Remove the screw ③.
4. Remove the Deck Shield Plate in the direction of arrow.



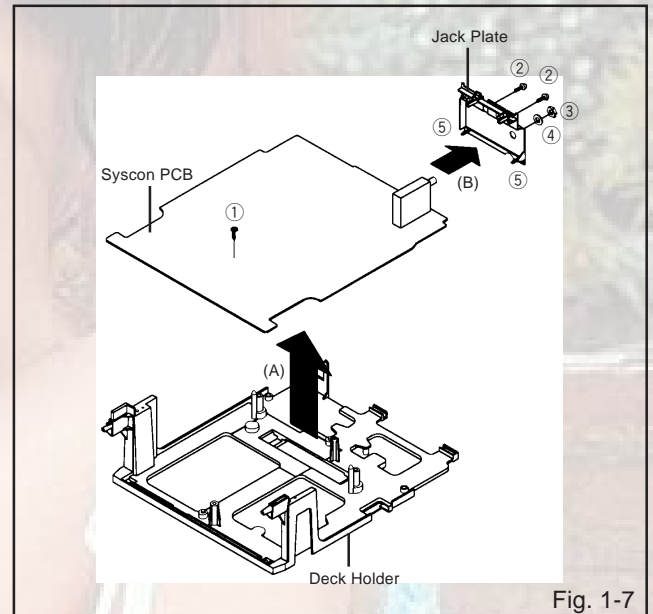
1-6: DECK CHASSIS (Refer to Fig. 1-6)

1. Remove the 3 screws ①.
2. Disconnect the following connectors: (CP1002, CP1005, CP1006, CP4001, CP4004 and CP4005).
3. Remove the Deck Chassis in the direction of arrow.



1-7: JACK PLATE AND SYSCON PCB (Refer to Fig. 1-7)

1. Remove the screw ①.
2. Remove the Syscon PCB in the direction of arrow (A).
3. Remove the 2 screws ②.
4. Remove the nut ③.
5. Remove the washer ④.
6. Unlock the 2 supports ⑤.
7. Remove the Jack Plate in the direction of arrow (B).



DISASSEMBLY INSTRUCTIONS

2. REMOVAL OF DECK PARTS

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

1. Remove the 2 screws ①.
2. Slide the 2 supports ② and remove the Top Bracket.

NOTE

When you install the Top Bracket, install the screw (1) first, then install the screw (2).

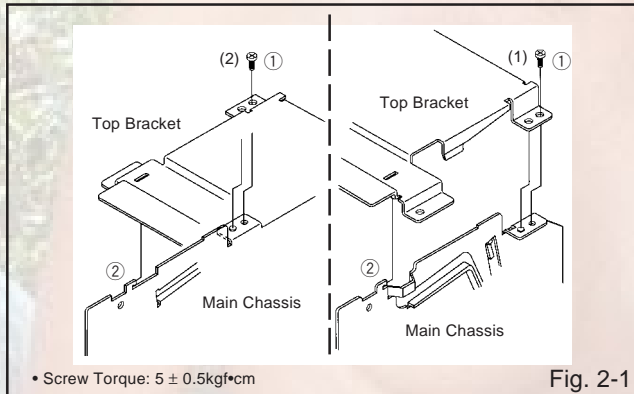


Fig. 2-1

2-2: FLAP LEVER/TAPE GUIDE R (Refer to Fig. 2-2)

1. Move the Cassette Holder Ass'y to the back side.
2. Remove the Polyslider Washer ①.
3. Remove the Flap Lever.
4. Unlock the 3 supports ② and remove the Tape Guide R.

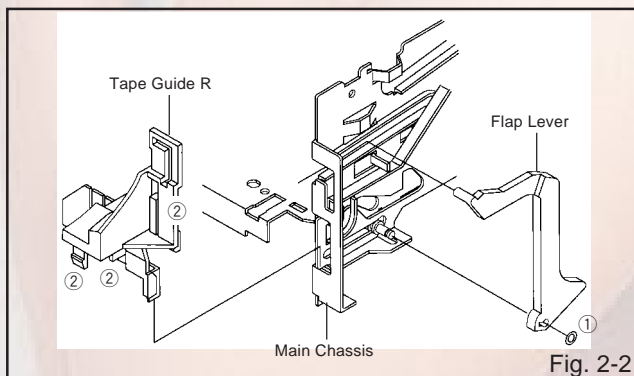


Fig. 2-2

2-3: TAPE GUIDE L (Refer to Fig. 2-3-A)

1. Move the Cassette Holder Ass'y to the back side.
2. Unlock the 2 supports ① and remove the Tape Guide L.
3. Remove the REC Lever. (Recorder only)

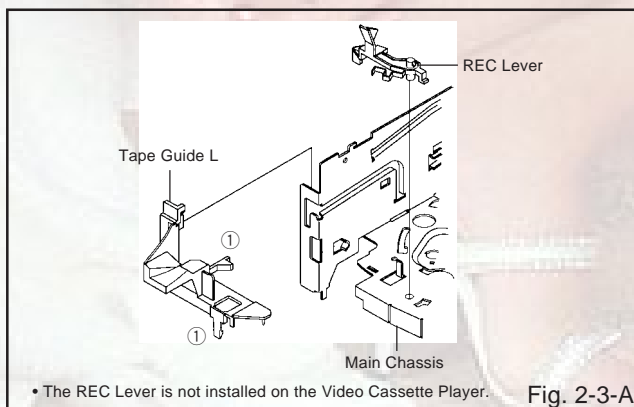


Fig. 2-3-A

NOTE

When you install the Tape Guide L, install as shown in the circle of Fig. 2-3-B. (Refer to Fig. 2-3-B)

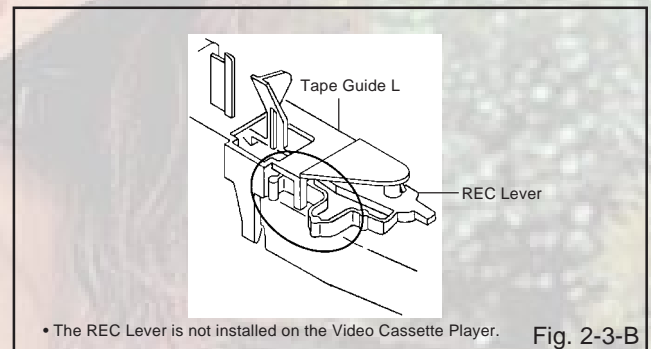


Fig. 2-3-B

2-4: CASSETTE HOLDER ASS'Y (Refer to Fig. 2-4)

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.

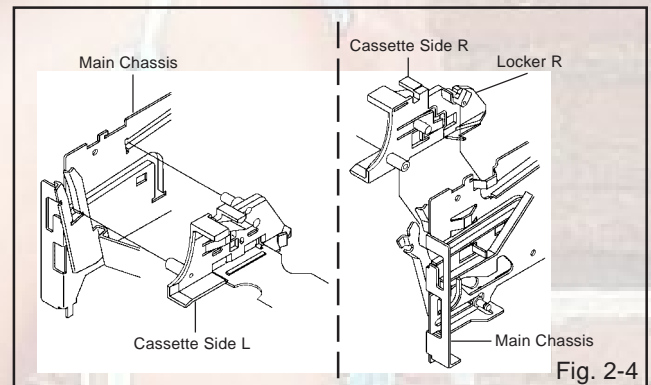


Fig. 2-4

2-5: CASSETTE SIDE L/R (Refer to Fig. 2-5)

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

NOTE

When you install the Cassette Side L/R, be sure to move the Locker L/R after installing.

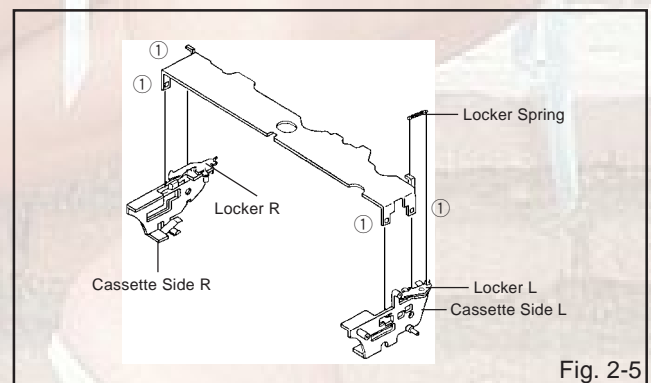


Fig. 2-5

DISASSEMBLY INSTRUCTIONS

2-6: LINK ASS'Y (Refer to Fig. 2-6)

1. Set the Link Ass'y to the Eject position.
2. Remove the (A) side of the Link Ass'y first, then remove the (B) side.

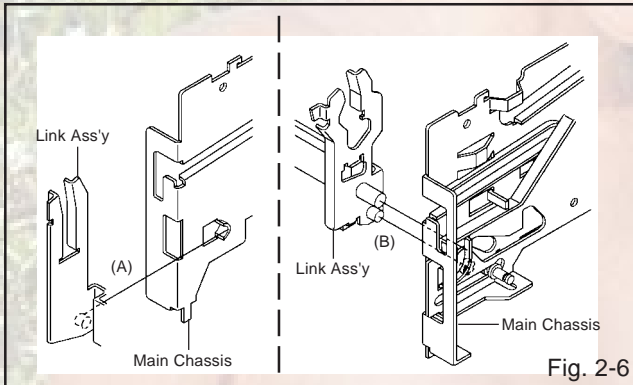


Fig. 2-6

2-7: LOADING MOTOR ASS'Y (Refer to Fig. 2-7)

1. Remove the Link Lever.
2. Remove the Dumper Spring.
3. Remove the 2 screws ①.
4. Unlock the support ② and remove the Loading Motor Ass'y.
5. Unlock the 2 supports ③ and remove the Deck PCB (BOT).

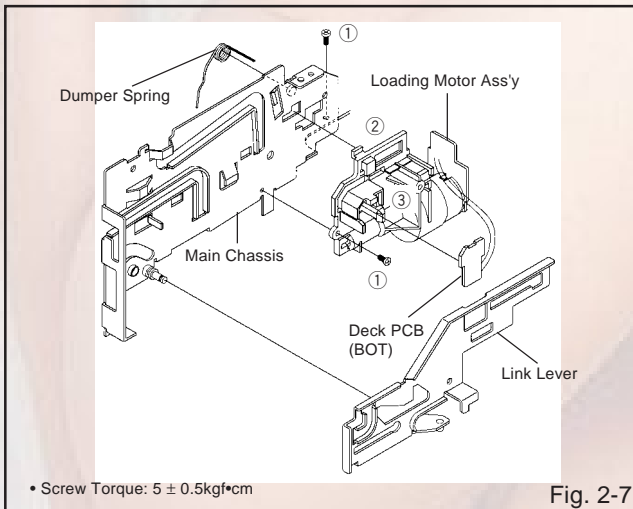


Fig. 2-7

2-8: SENSOR COVER L (Refer to Fig. 2-8)

1. Unlock the support ① and remove the Sensor Cover L.
2. Unlock the 2 supports ② and remove the Deck PCB (EOT).

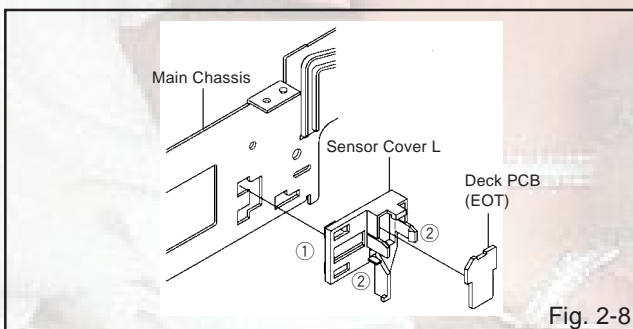


Fig. 2-8

2-9: TENSION ASS'Y (Refer to Fig. 2-9-A)

1. Move the Inclined S Ass'y to the back side.
2. Unlock the support ① and remove the S Reel Stopper.
3. Remove the Tension Spring.
4. Unlock the support ② and remove the Tension Arm Ass'y.
5. Remove the Tension Adjust.
6. Unlock the 2 supports ③ and remove the Tension Band Ass'y.
7. Unlock the support ④ and remove the Tension Holder.

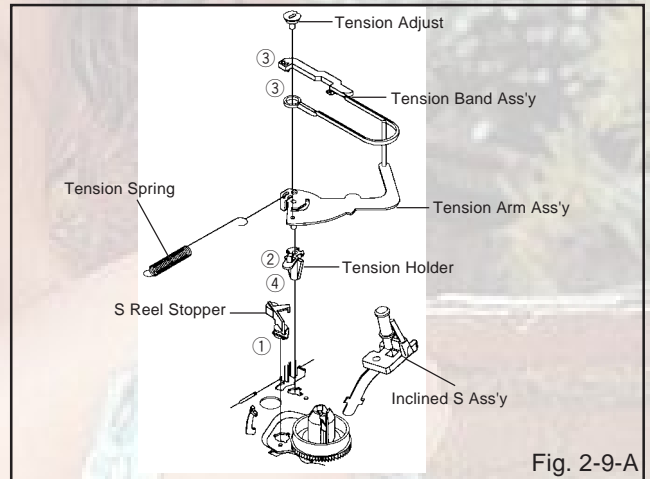


Fig. 2-9-A

NOTE

When you install the Tension Adjust, install as shown in Fig. 2-9-B. (Refer to Fig. 2-9-B)

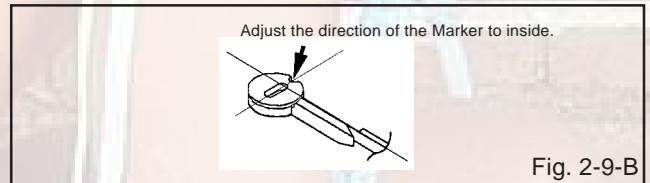


Fig. 2-9-B

2-10: T BRAKE ASS'Y (Refer to Fig. 2-10)

1. Remove the T Brake Spring.
2. Remove the T Brake Ass'y.

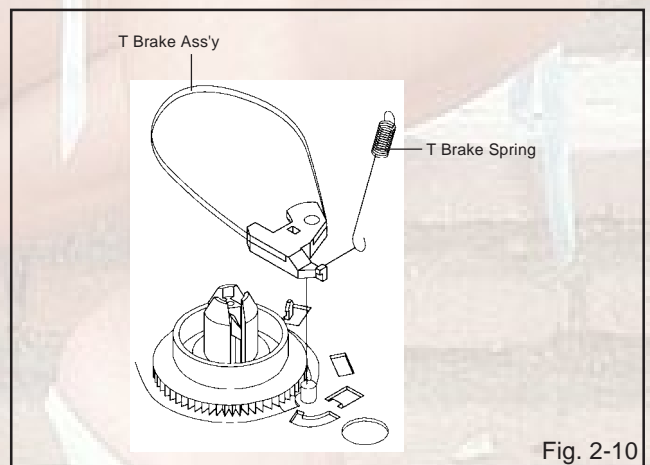


Fig. 2-10

DISASSEMBLY INSTRUCTIONS

2-11: S REEL/T REEL ASS'Y (Refer to Fig. 2-11)

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

NOTE

1. Take care not to damage the gears of the S Reel, T Reel Ass'y and Idler Ass'y.
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 Ass'y. (Use gloves.) **(Refer to Fig. 2-11)** Do not adhere the stains on it.
5. When you install the reel, clean the shaft and oil it (KYODO OIL Slidas #150). (If you do not oil, noise may be heard in FF/REW mode.)
6. After installing the reel, adjust the height of the reel. **(Refer to MECHANICAL ADJUSTMENT)**

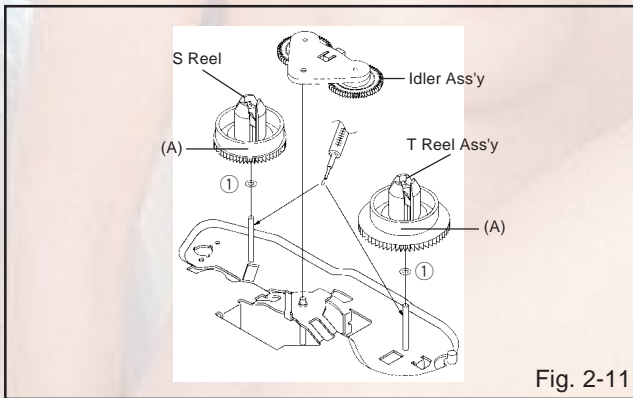


Fig. 2-11

2-12: PINCH ROLLER ASS'Y/P5 ARM ASS'Y (Refer to Fig. 2-12-A)

1. Remove the P5 Spring.
2. Remove the screw ①.
3. Unlock the 2 supports ② and remove the Cassette Opener.
4. Remove the Pinch Roller Ass'y, Pinch Roller Lever and P5 Arm Ass'y.

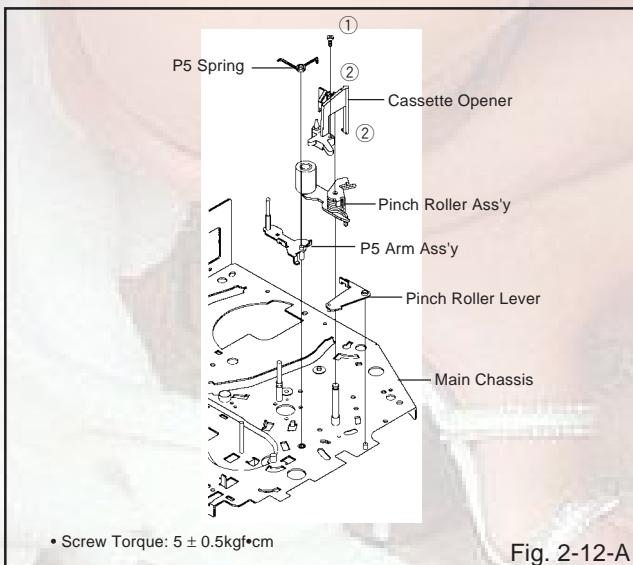


Fig. 2-12-A

NOTE

1. Do not touch the Pinch Roller. (Use gloves.)
2. When you install the Pinch Roller Ass'y, install as shown in the circle. **(Refer to Fig. 2-12-B)**

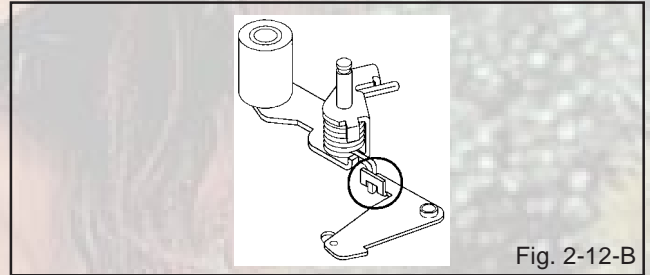


Fig. 2-12-B

2-13: A/C HEAD (Refer to Fig. 2-13-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. 2-13-B. **(Refer to Fig. 2-13-B)**
3. When you install the A/C Head, tighten the screw (1) first, then tighten the screw (2), finally tighten the screw (3).

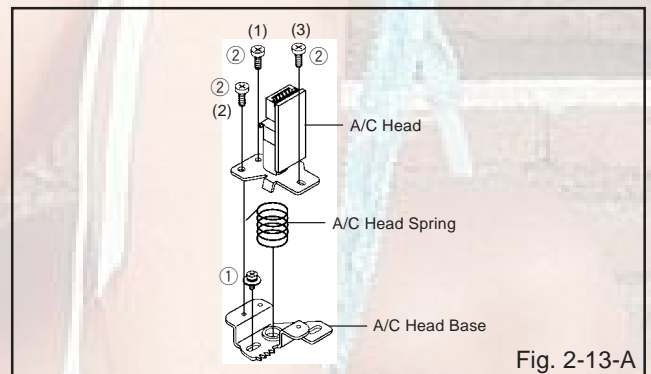


Fig. 2-13-A

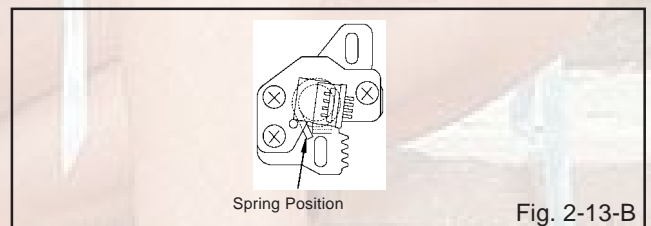


Fig. 2-13-B

2-14: FE HEAD (RECORDER ONLY) (Refer to Fig. 2-14)

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

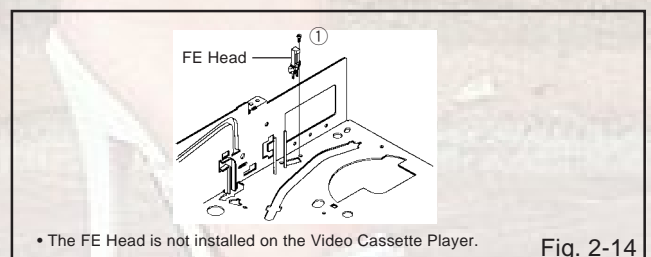


Fig. 2-14

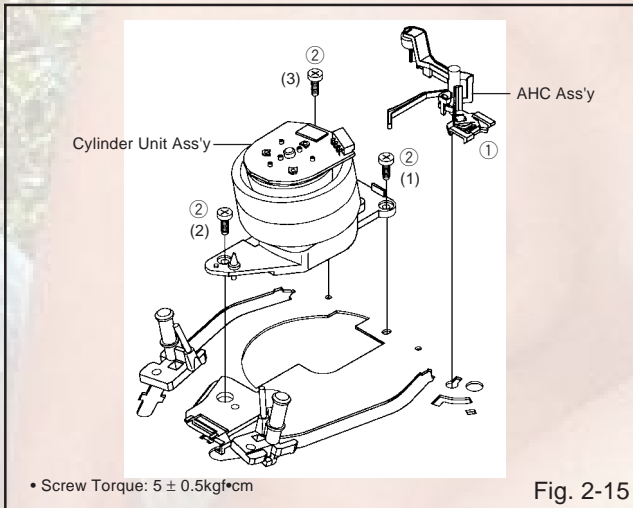
DISASSEMBLY INSTRUCTIONS

2-15: AHC ASS'Y/CYLINDER UNIT ASS'Y (Refer to Fig. 2-15)

1. Unlock the support ① and remove the AHC Ass'y.
2. Remove the 3 screws ②.
3. Remove the Cylinder Unit Ass'y.

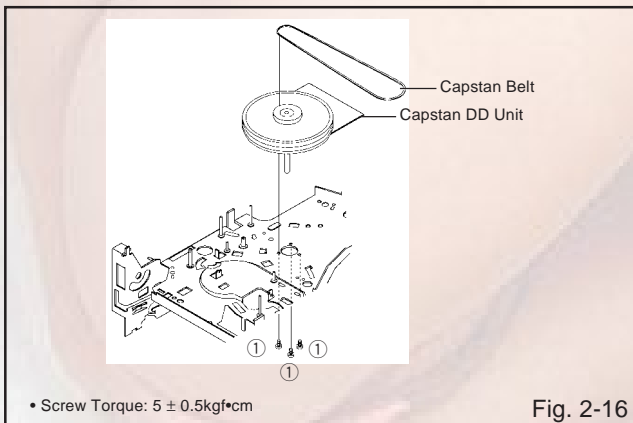
NOTE

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.



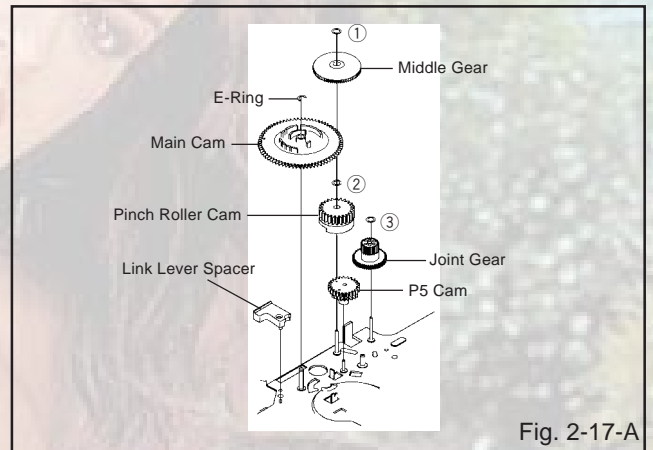
2-16: CAPSTAN DD UNIT (Refer to Fig. 2-16)

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



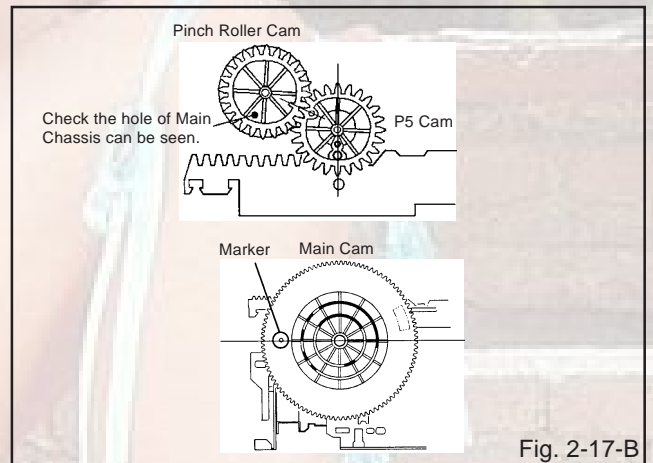
2-17: MIDDLE GEAR/MAIN CAM (Refer to Fig. 2-17-A)

1. Remove the Polyslider Washer ①, then remove the Middle Gear.
2. Remove the E-Ring, then remove the Main Cam, Link Lever Spacer and P5 Cam.
3. Remove the Polyslider Washer ②, then remove the Pinch Roller Cam.
4. Remove the Polyslider Washer ③, then remove the Joint Gear.



NOTE

When you install the Pinch Roller Cam, P5 Cam and Main Cam, align each marker. (Refer to Fig. 2-17-B)

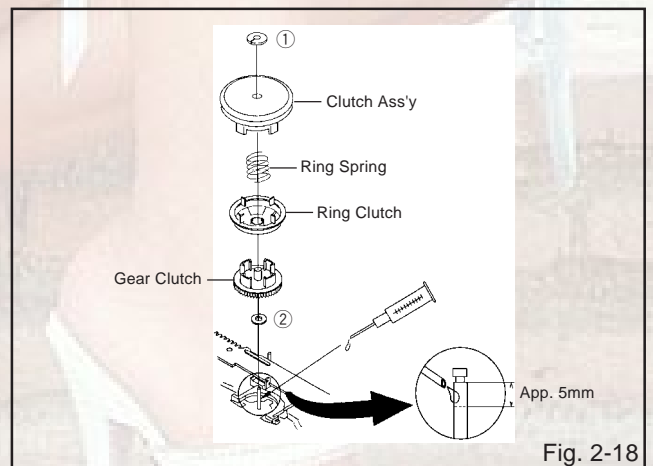


2-18: CLUTCH ASS'Y (Refer to Fig. 2-18)

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

NOTE

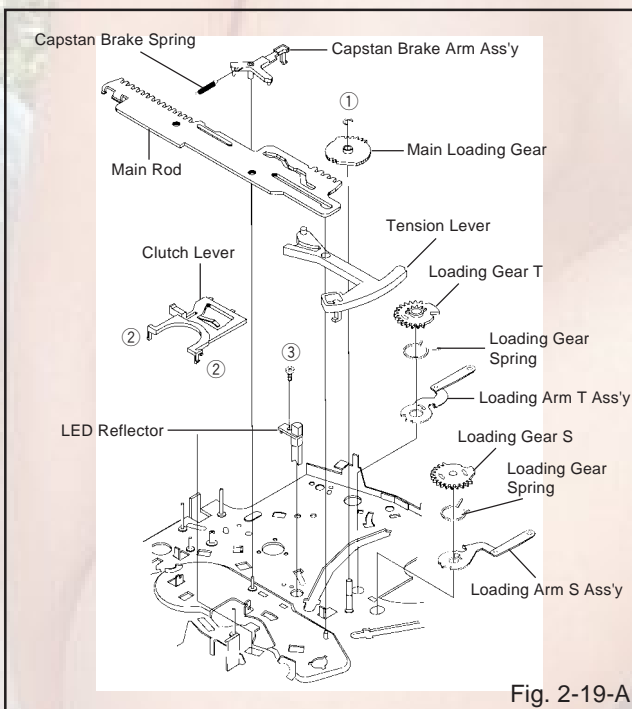
When you install the Clutch Ass'y, oil the shaft (KYODO OIL Slidas #150).



DISASSEMBLY INSTRUCTIONS

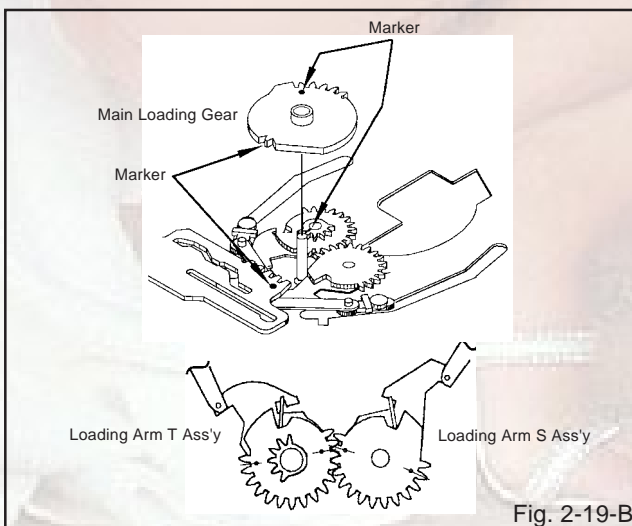
2-19: LOADING GEAR S/T ASS'Y (Refer to Fig. 2-19-A)

1. Remove the E-Ring ① and remove the Main Loading Gear.
2. Remove the Capstan Brake Spring.
3. Slide the Main Rod and remove the Capstan Brake Arm Ass'y.
4. Remove the Main Rod.
5. Remove the Tension Lever.
6. Unlock the 2 supports ② and remove the Clutch Lever.
7. Remove the screw ③.
8. Remove the LED Reflector.
9. Remove the Loading Arm S Ass'y and Loading Arm T Ass'y.
10. Remove the Loading Gear S and Loading Gear T.
11. Remove the Loading Gear Spring.



NOTE

When you install the Loading Arm S Ass'y, Loading Arm T Ass'y and Main Loading Gear, align each marker. (Refer to Fig. 2-19-B)

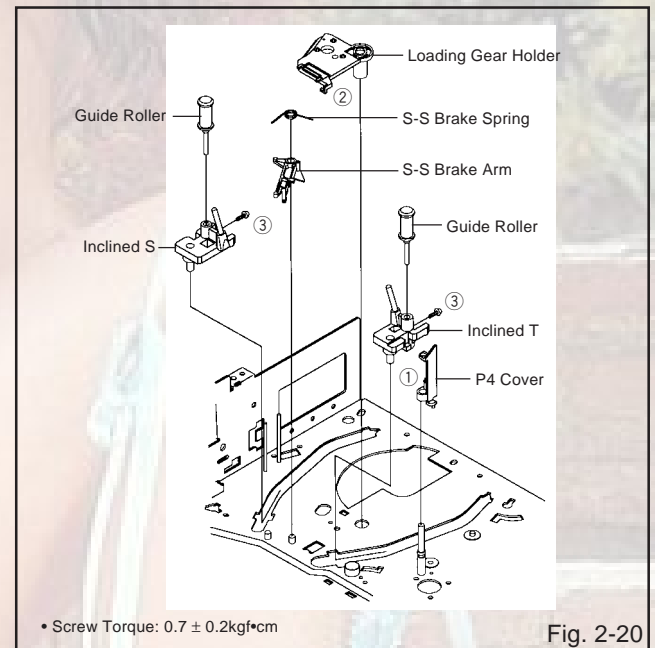


2-20: INCLINED S/T ASS'Y (Refer to Fig. 2-20)

1. Unlock the support ① and remove the P4 Cover.
2. Remove the S-S Brake Spring.
3. Unlock the support ② and remove the Loading Gear Holder.
4. Remove the S-S Brake Arm.
5. Remove the Inclined S.
6. Remove the Inclined T.
7. Remove the 2 screws ③, then remove the Guide Roller.

NOTE

Do not touch the roller of Guide Roller.



DISASSEMBLY INSTRUCTIONS

3. REMOVAL OF ANODE CAP

Read the following **NOTED** items before starting work.

- * After turning the power off there might still be a potential voltage that is very dangerous. When removing the Anode Cap, make sure to discharge the Anode Cap's potential voltage.
- * Do not use pliers to loosen or tighten the Anode Cap terminal, this may cause the spring to be damaged.

REMOVAL

1. Follow the steps as follows to discharge the Anode Cap. (Refer to Fig. 3-1.)

Connect one end of an Alligator Clip to the metal part of a flat-blade screwdriver and the other end to ground. While holding the plastic part of the insulated Screwdriver, touch the support of the Anode with the tip of the Screwdriver.

A cracking noise will be heard as the voltage is discharged.

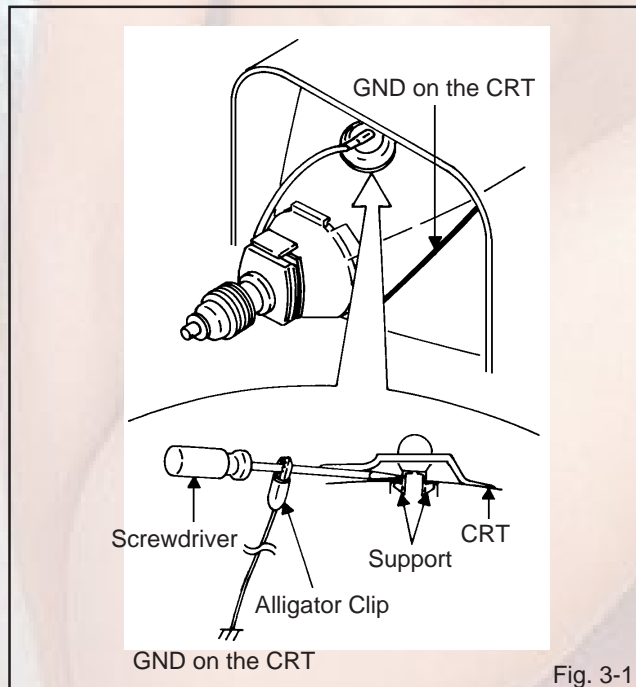


Fig. 3-1

2. Flip up the sides of the Rubber Cap in the direction of the arrow and remove one side of the support. (Refer to Fig. 3-2.)

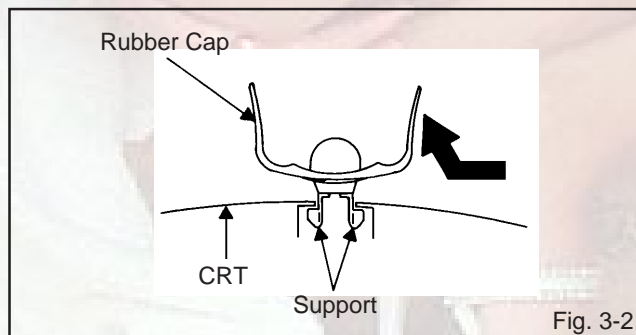


Fig. 3-2

3. After one side is removed, pull in the opposite direction to remove the other.

NOTE

Take care not to damage the Rubber Cap.

INSTALLATION

1. Clean the spot where the cap was located with a small amount of alcohol. (Refer to Fig. 3-3.)

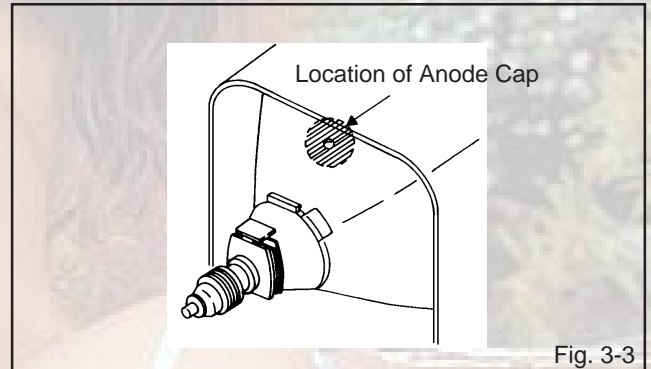


Fig. 3-3

NOTE

Confirm that there is no dirt, dust, etc. at the spot where the cap was located.

2. Arrange the wire of the Anode Cap and make sure the wire is not twisted.
3. Turn over the Rubber Cap. (Refer to Fig. 3-4.)

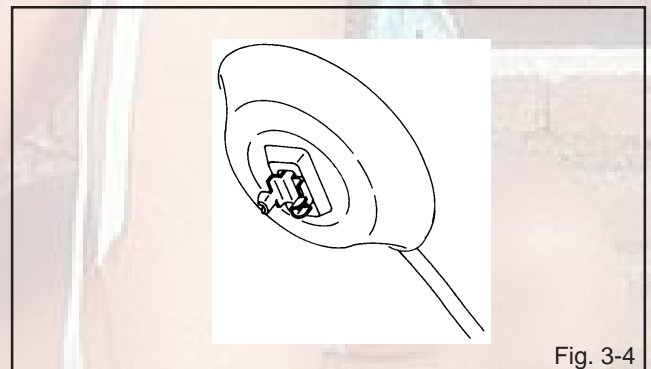


Fig. 3-4

4. Insert one end of the Anode Support into the anode button, then the other as shown in Fig. 3-5.

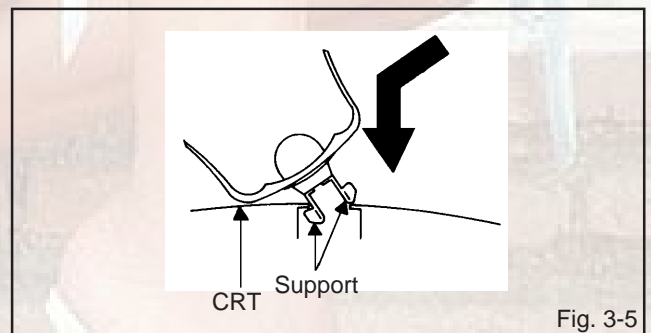


Fig. 3-5

5. Confirm that the Support is securely connected.
6. Put on the Rubber Cap without moving any parts.

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
	DEMODO	: 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

SERVICE MODE LIST

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

To enter SERVICE MODE, Unplug AC cord till lost actual clock time. Then press and hold Vol (-) button of main unit and remocon key simultaneously.

The both pressing of set key and remote control key will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 5 seconds before Power On.

Set Key	Remocon Key	Operations
VOL. (-) MIN	0	Releasing of V-CHIP PASSWORD.
VOL. (-) MIN	1	Initialization of the factory. NOTE: Do not use this for the normal servicing.
VOL. (-) MIN	2	Horizontal position adjustment of OSD. NOTE: Also can be adjusted by using the Adjustment MENU. Refer to the "ELECTRICAL ADJUSTMENT" (OSD HORIZONTAL).
VOL. (-) MIN	3	Adjust the PG SHIFTER automatically. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
VOL. (-) MIN	4	Adjust the PG SHIFTER manually. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
VOL. (-) MIN	5	Adjusting of the Tracking to the center position. NOTE: Also can be adjusted by pressing the ATR button for more tan 2 seconds during PLAY.
VOL. (-) MIN	6	POWER ON total hours and PLAY/REC total hours are displayed on the screen. Refer to the "PREVENTIVE CHECKS AND SERVICE INTERVALS" (CONFIRMATION OF USING HOURS). Can be checked of the INITIAL DATA of MEMORY IC. Refer to the "NOTE FOR THE REPLACING OF MEMORY IC".
VOL. (-) MIN	8	Writing of EEPROM initial data. NOTE: Do not use this for the normal servicing.
VOL. (-) MIN	9	Display of the Adjustment MENU on the screen. Refer to the "ELECTRICAL ADJUSTMENT" (On-Screen Display Adjustment).

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" (PG SHIFTER).
Make the short circuit between the test point of SERVICE and the GND.	The EOT/BOT/Reel sensor do not work at this moment. Refer to the "PREPARATION FOR SERVICING"

PREVENTIVE CHECKS AND SERVICE INTERVALS

The following standard table depends on environmental conditions and usage. Unless maintenance is properly carried out, the following service intervals may be quite shortened as harmful effects may be had on other parts. Also, long term storage or misuse may cause transformation and aging of rubber parts.

Parts Name \ Time	500 hours	1,000 hours	1,500 hours	2,000 hours	3,000 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					●	
Capstan Shaft	■	■	■	■	■	
Tape Running Guide Post	■	■	■	■	■	Replace when rolling becomes abnormal.
Cylinder Unit	■	■	■	■	●	Clean the Head

- : Clean
- : Replace

CONFIRMATION OF USING HOURS

POWER ON total hours and PLAY/REC total hours can be checked on the screen. Total hours are displayed in 16 system of notation.

NOTE: The confirmation of using hours will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 5 seconds before Power On.

1. Set the VOLUME to minimum.
2. While holding down VOLUME button on front cabinet, press key 6 on remote control simultaneously.
3. After the confirmation of using hours, turn off the power.

INIT 00 83	Initial setting content of MEMORY IC.
POWER ON 0010	POWER ON total hours.
PLAY/REC 0003	PLAY/REC total hours.

(16 x 16 x 16 x thousands digit value) + (16 x 16 x hundreds digit value) + (16 x tens digit value) + (ones digit value)

PREVENTIVE CHECKS AND SERVICE INTERVALS

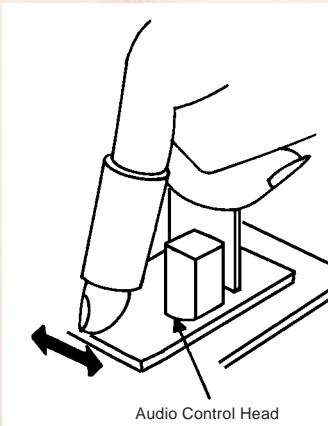
CLEANING

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

Wrap a piece of chamois around your finger. Dip it in isopropyl alcohol and clean the audio control head by wiping it horizontally. Clean the full erase head in the same manner. **(Refer to the figure below.)**



2. TAPE RUNNING SYSTEM

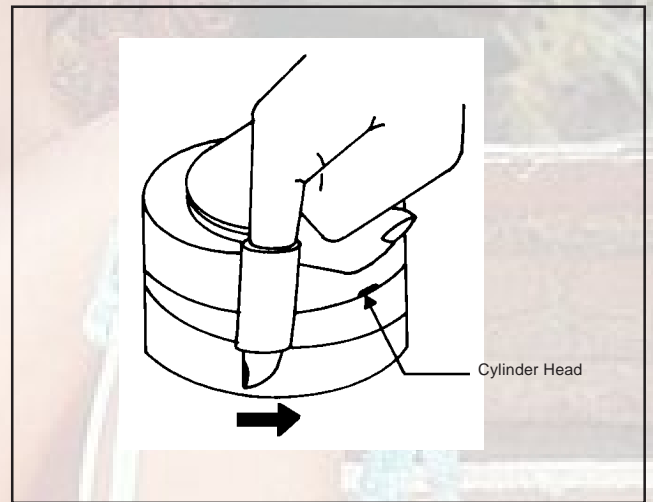
When cleaning the tape transport system, use the gauze moistened with isopropyl alcohol.

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.



NOTE FOR THE REPLACING OF MEMORY IC

If a service repair is undertaken where it has been required to change the MEMORY IC, the following steps should be taken to ensure correct data settings while making reference to TABLE 1.

NOTE: Initial Data setting will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 5 seconds before Power On.

ADDRESS	DATA	ADDRESS	DATA	ADDRESS	DATA	ADDRESS	DATA	ADDRESS	DATA
00	80	0A	1B	14	90	1E	42	28	19
01	6D	0B	B7	15	A0	1F	15	29	00
02	21	0C	CB	16	7F	20	8D		
03	00	0D	01	17	66	21	05		
04	00	0E	00	18	18	22	11		
05	00	0F	06	19	07	23	00		
06	A4	10	6C	1A	44	24	39		
07	EB	11	2B	1B	86	25	04		
08	39	12	21	1C	8F	26	00		
09	90	13	15	1D	FC	27	1A		

Table 1

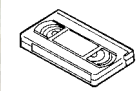
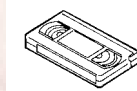
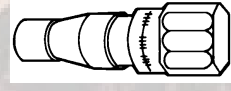
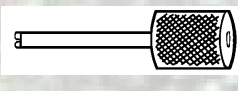
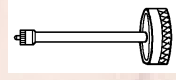
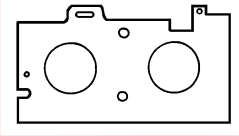

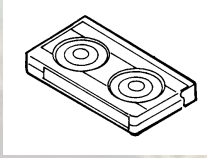
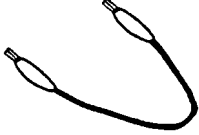
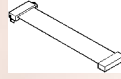
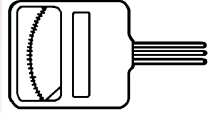
1. Enter DATA SET mode by setting VOLUME to minimum.
2. While holding down VOLUME button on front cabinet, press key 6 on remote control simultaneously.
3. ADDRESS and DATA should appear as FIG 1.

	ADDRESS	DATA
INIT	00	83
POWER ON	0010	
PLAY/REC	0003	

Fig. 1

4. ADDRESS is now selected and should "blink". Using the SET + or - keys on the remote, step through the ADDRESS until required ADDRESS to be changed is reached.
5. Press ENTER to select DATA. When DATA is selected, it will "blink".
6. Again, step through the DATA using SET + or - until required DATA value has been selected.
7. Pressing ENTER will take you back to ADDRESS for further selection if necessary.
8. Repeat steps 4 to 7 until all data has been checked.
9. When satisfied correct DATA has been entered, turn POWER off (return to STANDBY MODE) to finish DATA input. The unit will now have the correct DATA for the new MEMORY IC.

SERVICING FIXTURES AND TOOLS

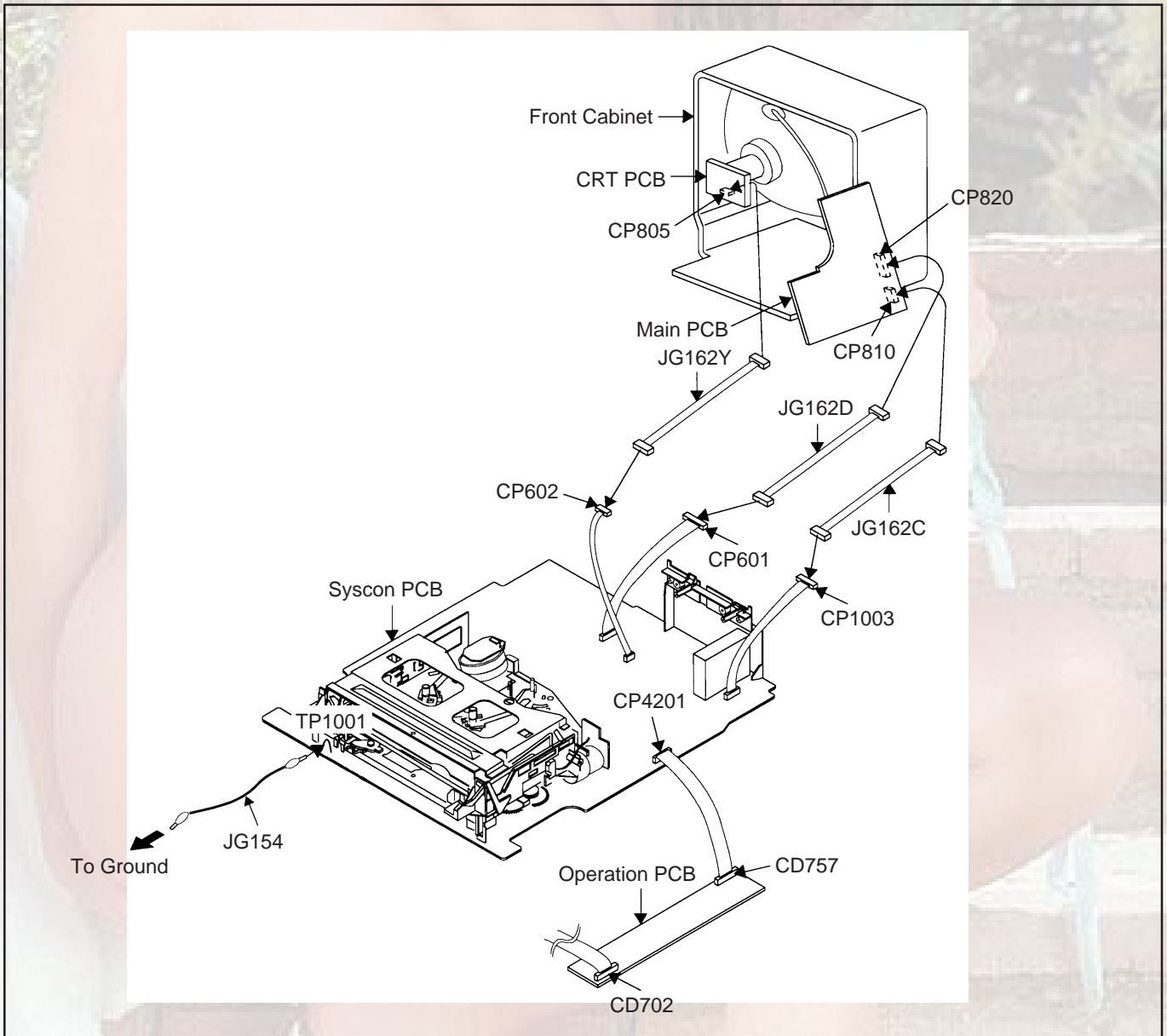
<p>(For 2 heads model) VHS Alignment Tape JG001 (TTV-N2) JG001A (TTV-N12) JG001T (VN₂S-X6³)</p> 	<p>(For 4 heads model) VHS Alignment Tape JG001B (TTV-N2) JG001I (TTV-N12) JG001S (VN₁S-X6³)</p> 	<p>JG002B Adapter JG002E Dial Torque Gauge (10~90gf•cm) JG002F (60~600gf•cm)</p> 	<p>JG005 Post Adjustment Screwdriver Part No. SV-TG0-030-000 (small)</p> 
<p>JG153 X Value Adjustment Screwdriver</p> 	<p>JG022 Master Plane</p> 	<p>JG024A Reel Disk Height Adjustment Jig</p> 	<p>JG100A Torque Tape (VHT-063)</p> 
<p>JG154 Cable Parts No. SJ-G15-400-000</p> 	<p>JG162C Cable (10 Pins) Parts No. SJ-G16-2C0-000 JG162D Cable (11 Pins) Parts No. SJ-G16-2D0-000 JG162Y Cable (5 Pins) Parts No. SJ-G16-2Y0-000</p> 	<p>Tentelometer</p> 	

Part No.	Remarks
JG001	Stair Steps, 7KHz (For 2 heads model)
JG001A	Color Bar, 1KHz (For 2 heads model)
JG001T	X Value Adjustment (For 2 heads model)
JG001B	Stair Steps, 7KHz (For 4 heads model)
JG001I	Color Bar, 1KHz (For 4 heads model)
JG001S	X Value Adjustment (For 4 heads model)
JG002B	VSR Torque, Brake Torque (S Reel/T Reel Ass'y)
JG002E	Brake Torque (T Reel Ass'y)
JG002F	VSR Torque, Brake Torque (S Reel)
JG005	Guide Roller Adjustment
JG153	X Value Adjustment
JG022/JG024A	Reel Disk Height Adjustment
JG100A	Playback Torque, Back Tension Torque During Playback
JG154	Used to connect the test point of SERVICE and GROUND
JG162C/JG162D	Used to connect the Syscon PCB and Main PCB
JG162Y	Used to connect the Syscon PCB and CRT PCB

PREPARATION FOR SERVICING

Basic Servicing Position (In case of needing to check on all blocks)

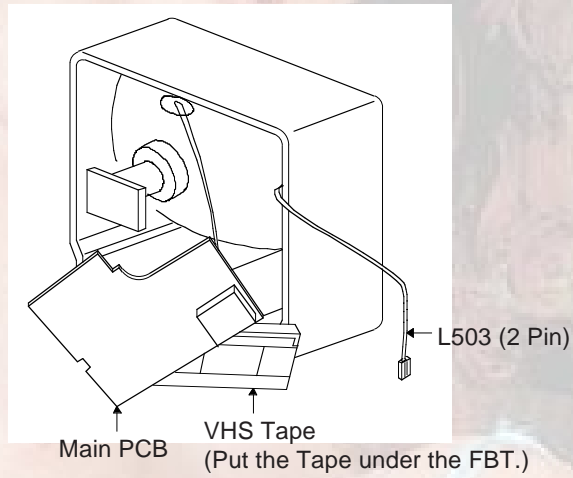
1. Unplug the connector CP4201, CP4202 and CP303, then remove the TV/VCR Block from the set.
2. Unplug the connector CP810, CP820 and CP805, then remove the Main PCB from the VCR Block.
3. Connect as shown in the below figure using the Service Fixture.
 - Connect the Syscon PCB to the Main PCB with the cable JG162C and JG162D.
 - Connect the Syscon PCB to the CRT PCB with the cable JG162Y.
4. Remove the Operation PCB from the set, then connect it with the Syscon PCB.
If necessary, connect CP4202. (Front A/V Jack Input Terminal)
5. Short circuit between **TP1001** and **GND** with the cable JG154.
(The EOT, BOT and Reel Sensor do not work at this moment.)
6. At that time, the STOP/EJECT button is available to insert and eject the Cassette Tape.



PREPARATION FOR SERVICING

Servicing Position for Main PCB (In case of needing to check on Main PCB)

- It's possible to get the Servicing Position without the extension Jig if you arrange the unit as shown below.
(But L503 connection can not be done, Degauss circuit will not operate.)



- Be careful for the short circuit.

VCR TEST TAPE INTERCHANGEABILITY TABLE

There are two types of the new alignment tape CH-1B (for NTSC) and CH-2 (for PAL). On each tape four signals (1) - (4) are recorded for the times and in the order shown below.

(1) : 8min. ---> (2) : 2min. ---> (3) : 5min. ---> (4) : 5min.

The TTV-MP1 (for M-PAL), TTV-MS1 (for MESECAM) and TTV-S1 (for SECAM) alignment tapes have the same contents as the previous tapes.

Method	Now in use TYPE		New TYPE		Application
	Model	Contents*1	Model	Contents*1	
NTSC	TTV-N1	NTSC, Color, 1kHz, SP	CH-1B(2)	NTSC, Stairsteps, 1kHz, SP	PB-Y Level/General electrical ADJ. Head ACE Height/Tilt ADJ.
	TTV-N1E	NTSC, Color, 1kHz, EP	CH-1B(4) *2	NTSC, Color, 1kHz, EP	Switching position ADJ.
	TTV-N2	NTSC, Stairsteps, 7kHz, SP	CH-1B(1)	NTSC, Stairsteps, 7kHz, SP	Head ACE Azimuth ADJ.
	TTV-N12 (SCV-1998)	NTSC, Color, 1kHz, SP	CH-1B(4)	NTSC, Color, 1kHz, EP	FM envelope ADJ. X-Value ADJ.
	TTV-N7A	NTSC, Stairsteps, 1kHz, SP, HiFi 400Hz	CH-1B(3)	NTSC, Color, No sound SP, HiFi 400Hz	HiFi Audio PB Level ADJ.
PAL	TTV-P1	PAL, Color, 1kHz, SP	CH-2(2) *3	PAL, Stairsteps, 1kHz, SP	Switching position ADJ. PB-Y Level/General electrical ADJ. Head ACE Height/Tilt ADJ.
	TTV-P1L	PAL, Color, 1kHz, LP	CH-2(4)	PAL, Color, 1kHz, LP	Switching position. (LP Model) FM Envelope ADJ. (LP Model) X-Value ADJ. (LP Model)
	TTV-P2	PAL, Stairsteps, 6kHz, SP	CH-2(1)	PAL, Stairsteps, 6kHz, SP	Head ACE Azimuth ADJ. FM Envelope ADJ. (SP Model) X-Value ADJ. (SP Model)
	TTV-P7	PAL, Stairsteps, 1kHz, SP, HiFi, 1kHz	CH-2(3)	PAL, Color, No sound SP, HiFi 400Hz	HiFi Audio PB Level ADJ.
	TTV-P16	PAL, Color, 400Hz, SP, HiFi 1kHz	No Changed.		FM Filter ADJ.

*1. Described in the order of color format. Video signal. Linear audio. Tape speed and Hi-Fi audio.

*2. Use CH-1B (1) - (3) with models used exclusively in the SP mode.

*3. Use CH-2 (3) and (4) when it is necessary to observe the chroma signal.

MECHANICAL ADJUSTMENTS

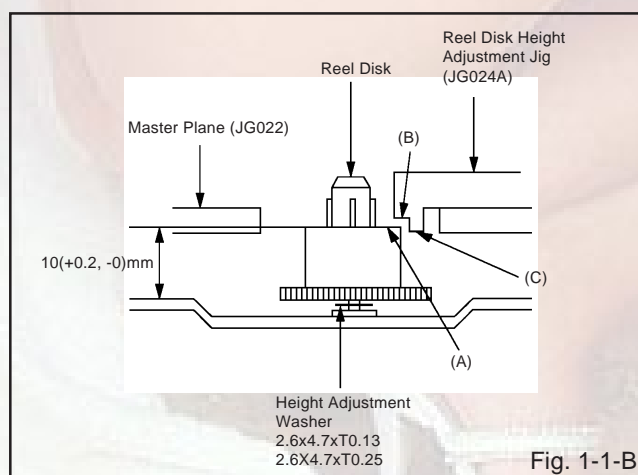
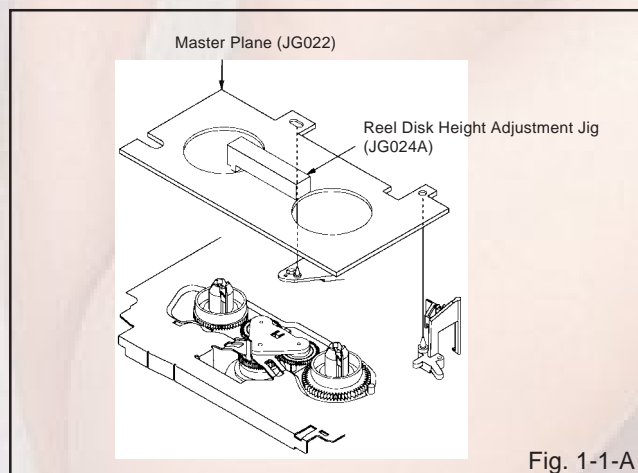
1. CONFIRMATION AND ADJUSTMENT

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.)
- When you activate the deck without the Cassette Holder, short circuit between **TP1001** and **GND**. (Refer to **ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE**) In this condition the BOT/EOT/Reel Sensor will not function.

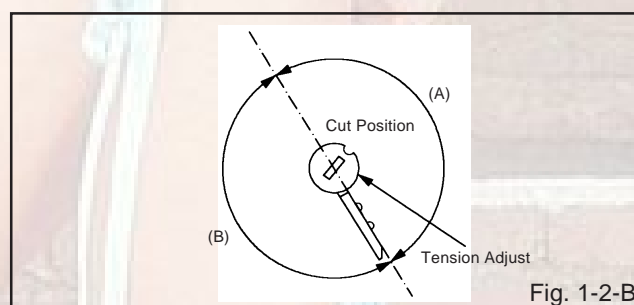
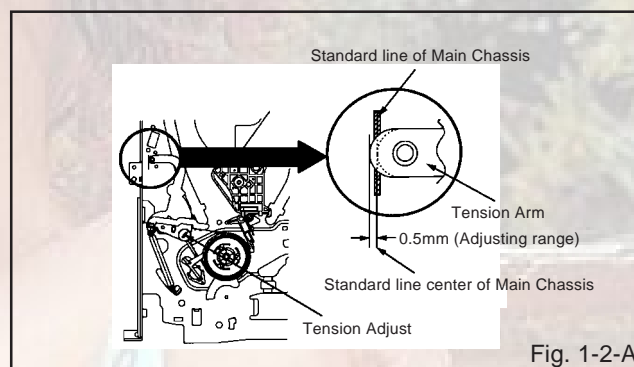
1-1: CONFIRMATION AND ADJUSTMENT OF REEL DISK HEIGHT

1. Turn on the power and set to the STOP mode.
2. Set the master plane (**JG022**) and reel disk height adjustment jig (**JG024A**) on the mechanism framework, taking care not to scratch the drum, as shown in **Fig. 1-1-A**.
3. Confirm that "A" of the reel disk is lower than "B" of the reel disk height adjustment jig (**JG024A**), and is higher than "C". If it is not enough height, adjust to $10(+0.2, -0)$ mm with the height adjustment washer.
4. Adjust the other reel in the same way.



1-2: CONFIRMATION AND ADJUSTMENT OF TENSION POST POSITION

1. Set to the PLAY mode.
2. Adjust the Tension Adjust until the edge of the Tension Arm is positioning within 0.5mm range from the standard line center of Main Chassis. After this adjustment, confirm that the cut position is located in "A" area as shown in **Fig. 1-2-B**. If it is located in "B" area, adjust again.
3. While turning the S Reel clockwise, confirm that the edge of the Tension Arm is located in the position described above.

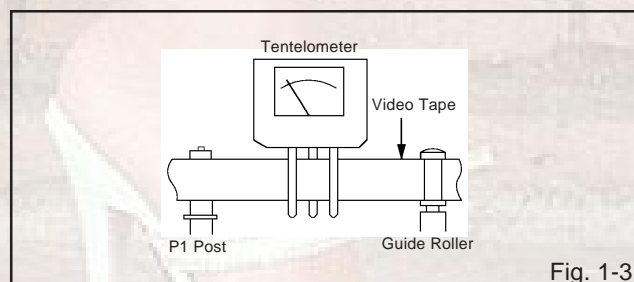


1-3: CONFIRMATION OF PLAYBACK TORQUE AND BACK TENSION TORQUE DURING PLAYBACK

1. Load a video tape (T-120) recorded in standard speed mode. Set the unit to the PLAY mode.
2. Install the tentelometer as shown in **Fig. 1-3**. Confirm that the meter indicates 20 ± 2 gf in the beginning of playback.

• USING A CASSETTE TYPE TORQUE TAPE (**JG100A**)

1. After confirmation and adjustment of Tension Post position (Refer to item 1-2), load the cassette type torque tape (**JG100A**) and set to the PLAY mode.
2. Confirm that the right meter of the torque tape indicates $70 \sim 110$ gf•cm during playback in SP mode.
3. Confirm that the left meter of the torque tape indicates $25 \sim 40$ gf•cm during playback in SP mode.



MECHANICAL ADJUSTMENTS

1-4: CONFIRMATION OF VSR TORQUE

1. Operate within 4~5 seconds after the reel disk begins to turn.
2. Install the Torque Gauge (JG002F) and Adapter (JG002B) on the S Reel. Set to the Rewind mode. (Refer to Fig.1-4)
3. 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.

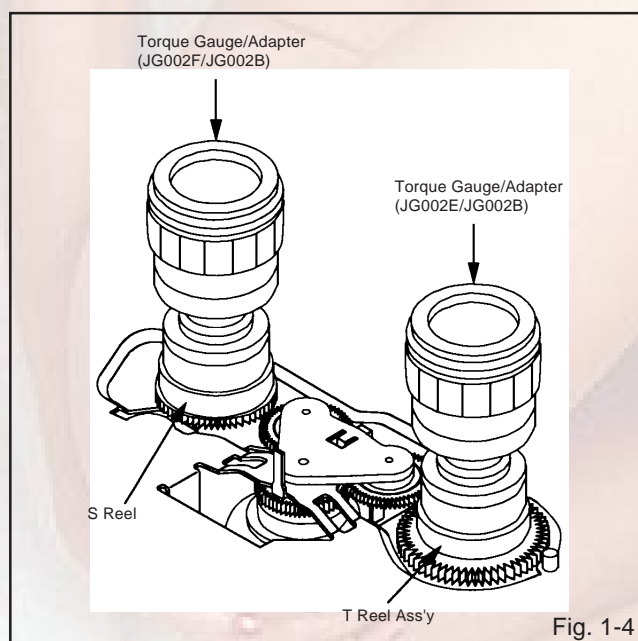
1-5: CONFIRMATION OF REEL BRAKE TORQUE

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

1. Set to the STOP mode.
2. Move the Idler Ass'y from the S Reel.
3. Install the Torque Gauge (JG002F) and Adapter (JG002B) on the S Reel. Turn the Torque Gauge (JG002F) clockwise.
4. Then, confirm that it indicates 70~100gf•cm.

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

1. Set to the STOP mode.
2. Move the Idler Ass'y from the T Reel Ass'y.
3. Install the Torque Gauge (JG002E) and Adapter (JG002B) on the T reel. Turn the Torque Gauge (JG002E) counterclockwise.
4. Then, confirm that it indicates 35~60gf•cm.



NOTE

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

Check item	Replacement Part
1-4	Idler Ass'y/Clutch Ass'y
1-5	T Brake Spring/Tension Spring

2. CONFIRMATION AND ADJUSTMENT OF TAPE RUNNING MECHANISM

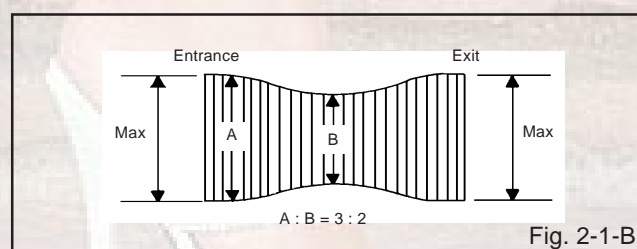
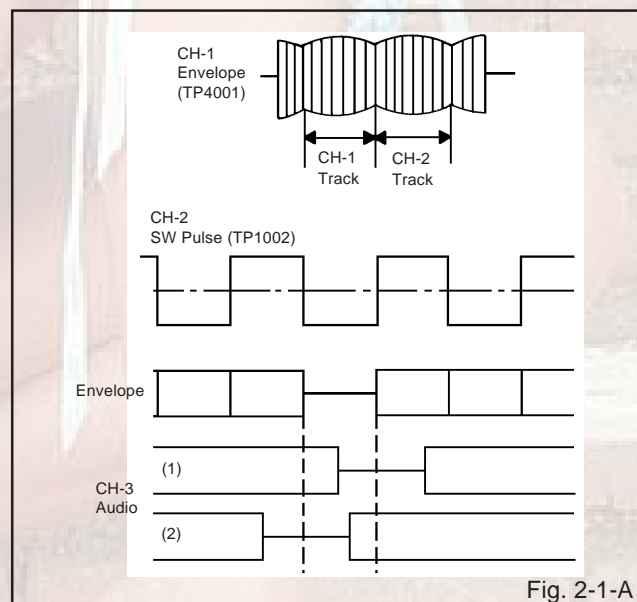
Tape Running Mechanism is adjusted precisely at the factory. Adjustment is not necessary as usual. When you replace the parts of the tape running mechanism because of long term usage or failure, the confirmation and adjustment are necessary.

2-1: GUIDE ROLLER

1. Playback the VHS Alignment Tape (JG001 or JG001B). (Refer to SERVICING FIXTURE AND TOOLS)
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 Adjusting Driver (JG005) slightly until the envelope will be flat. Even if you press the Tracking Button, adjust so that flatness is not moved so much.
6. Adjust so that the A : B ratio is better than 3 : 2 as shown in Fig. 2-1-B, even if you press the Tracking Button to move the envelope (The envelope waveform will begins to decrease when you press the Tracking Button).
7. Adjust the PG shifter during playback. (Refer to the ELECTRICAL ADJUSTMENTS)

NOTE

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

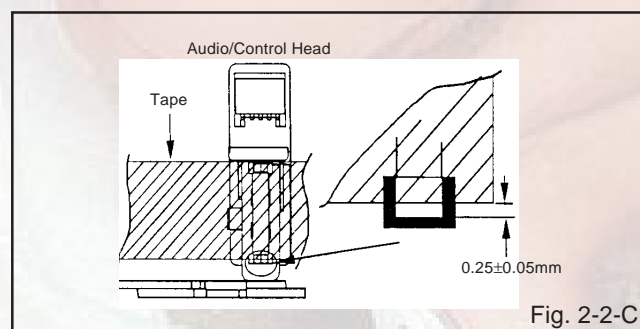
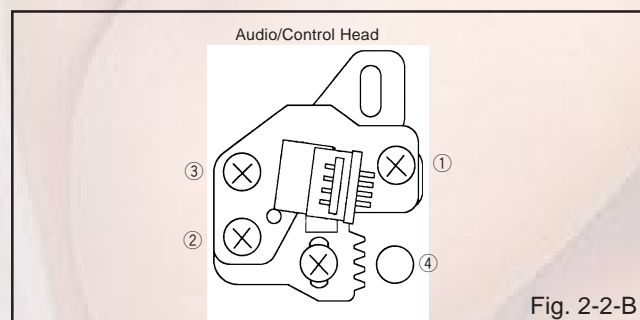
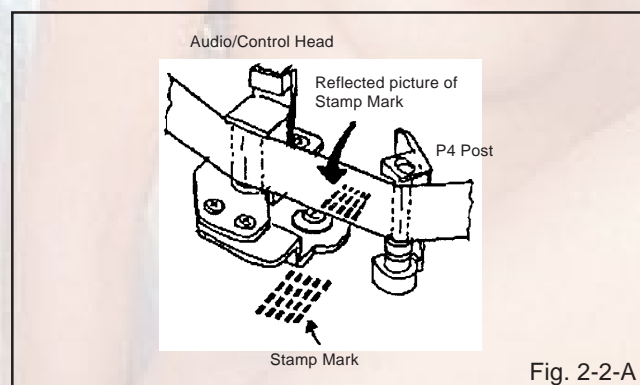


MECHANICAL ADJUSTMENTS

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 (JG001 or JG001B). (Refer to **SERVICING FIXTURE AND TOOLS**)
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.

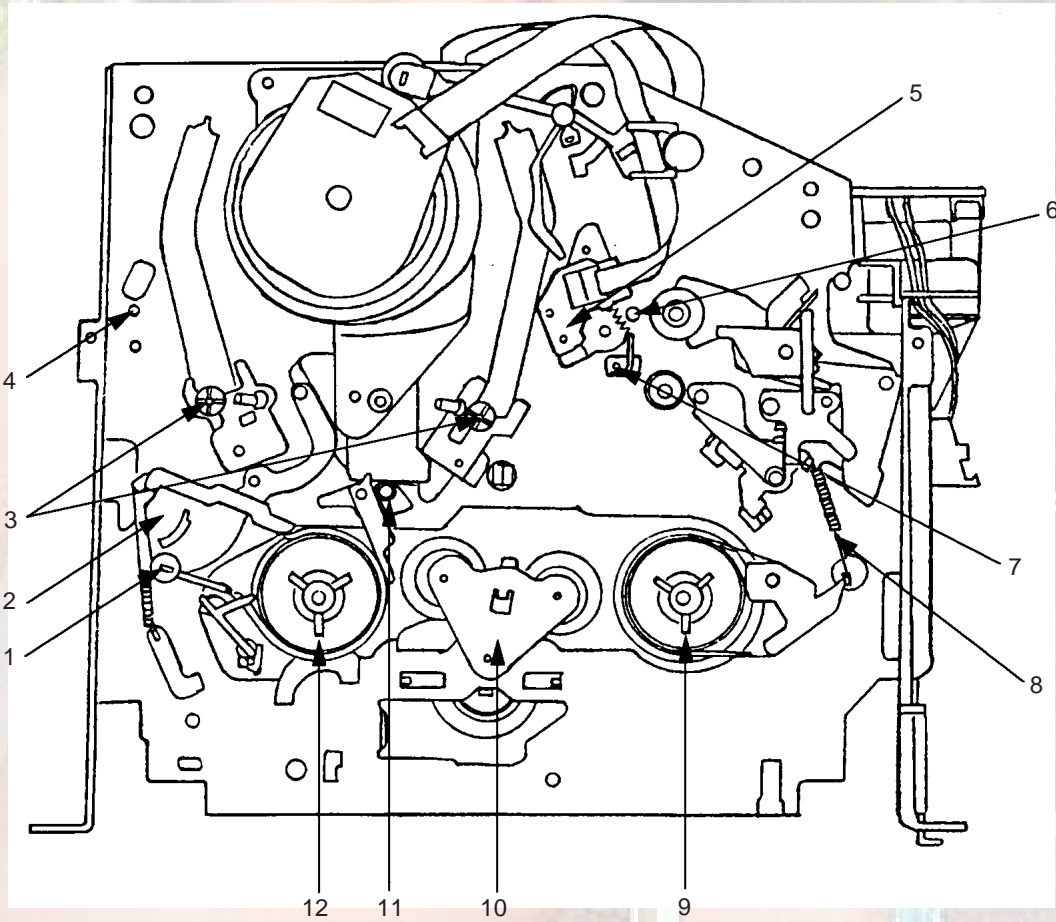


2-3: TAPE RUNNING ADJUSTMENT (X VALUE ADJUSTMENT)

1. Confirm and adjust the height of the Reel Disk. (Refer to item 1-1)
2. Confirm and adjust the position of the Tension Post. (Refer to item 1-2)
3. Adjust the Guide Roller. (Refer to item 2-1)
4. Confirm and adjust the Audio/Control Head. (Refer to item 2-2)
5. Connect CH-1 of the oscilloscope to TP4001, CH-2 to TP1002 and CH-3 to HOT side of Audio Out Jack.
6. Playback the VHS Alignment Tape (JG001S or JG001T). (Refer to **SERVICING FIXTURE AND TOOLS**)
7. Press and hold the TRACKING-AUTO button on the remote control more than 2 seconds to set tracking to center.
8. Set the X Value adjustment driver (JG153) to the ④ of **Fig. 2-2-B**. Adjust X value so that the envelope waveform output becomes maximum. Check if the relation between Audio and Envelope waveform becomes (1) or (2) of **Fig. 2-1-A**.

MECHANICAL ADJUSTMENTS

3. MECHANISM ADJUSTMENT PARTS LOCATION GUIDE



- | | |
|-----------------------------------|----------------------|
| 1. Tension Adjust | 7. P4 Post |
| 2. Tension Arm | 8. T Brake Spring |
| 3. Guide Roller | 9. T Reel Ass'y |
| 4. P1 Post | 10. Idler Ass'y |
| 5. Audio/Control Head | 11. S-S Brake Spring |
| 6. X value adjustment driver hole | 12. S Reel |

ELECTRICAL ADJUSTMENTS

1. ADJUSTMENT PROCEDURE

Read and perform these adjustments when repairing the circuits or replacing electrical parts or PCB assemblies.

CAUTION

When replacing IC's or transistors, use only specified silicon grease (**G746**).
(To prevent the damage to IC's and transistors.)

On-Screen Display Adjustment

1. Unplug the AC plug for more than 5 seconds to set the clock to the non-setting state. Then, set the volume level to minimum.
2. Press the VOL. DOWN button on the set and the channel button (**9**) on the remote control simultaneously to display adjustment mode on the screen as shown in **Fig. 1-1**.

NOTE

Use the channel buttons (**1-8**) on the remote control to select the options shown in **Fig. 1-1**.
Press the channel button (**0**) on the remote control to end the adjustments.

1. H/V
2. AKB
3. COLOR TEMP
4. PICTURE
5. OTHERS
6. TEST PATTERN
7. STEREO/SAP
8. (VOL TEST) 0. END

"The adjustment items 3, 7 and 8 are not used for this model."

Fig. 1-1

2. BASIC ADJUSTMENTS

(VCR SECTION)

2-1: PG SHIFTER

1. Connect CH-1 on the oscilloscope to **TP1002** and CH-2 to **TP4201**.
2. Playback the alignment tape. (**JG001A**)
3. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
4. Press the VOL. DOWN button on the set and the channel button (**3**) on the remote control simultaneously until the indicator REC disappears. If the indicator REC disappears, adjustment is completed.

(If the above adjustments doesn't work well:)

5. Press the VOL. DOWN button on the set and the channel button (**3**) on the remote control simultaneously until the indicator REC disappears.
6. When the REC indicator is blinking, press both VOL. DOWN button on the set and the channel button (**4**) on the remote control simultaneously and adjust the Tracking +/- button until the arising to the down of Head Switching Pulse becomes $6.5 \pm 0.5H$.
(Refer to **Fig. 2-1-A, B**)
7. Press the Tracking Auto button.

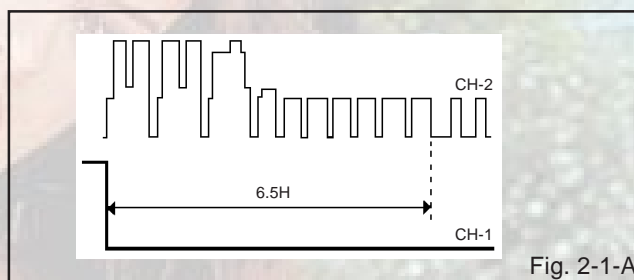


Fig. 2-1-A

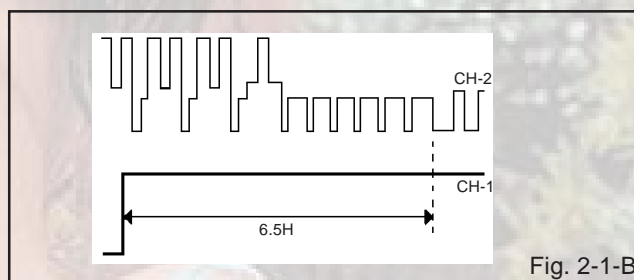


Fig. 2-1-B

2-2: VCO FREERUN

1. Place the set with Aging Test for more than 15 minutes.
2. Receive the VHF HIGH.
3. Disconnect the Antenna while receiving the VHF HIGH and set to the Noise screen.
4. Once turn off the Power and turn on the Power again.
5. Approx. 3 seconds later, input the Antenna again.
6. Connect the digital voltmeter to **TP601**.
7. Adjust the **L610** until the digital voltmeter is $3.1 \pm 0.05V$.

2-3: RF AGC

1. Receive the VHF HIGH (70dB).
2. Connect the digital voltmeter between the **pin 5 of CP603** and the **pin 1 (GND) of CP603**.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button (**5**) on the remote control. The **Fig. 2-2** appears on the display.
4. Press the channel button (**1**) on the remote control.
5. Press the VOL. UP/DOWN button on the remote control until the digital voltmeter is $2.25 \pm 0.05V$.

1. RF AGC DELAY
2. VIDEO LEVEL
3. FM LEVEL
4. OSD H
5. CUT OFF
- 6.
- 7.
8. 0. RETURN

"The adjustment item 2 is not used for this model."

Fig. 2-2

2-4: TUNER AUDIO LEVEL

1. Receive the VHF HIGH (70dB).
2. Connect the AC voltmeter to **AUDIO OUT L/R**.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button (**5**) on the remote control. The **Fig. 2-2** appears on the display.
4. Press the channel button (**3**) on the remote control.
5. Press the VOL. UP/DOWN button on the remote control until the AC voltmeter is $310 \pm 10mVrms$.

ELECTRICAL ADJUSTMENTS

2-5: STEREO SEPARATION

NOTE: Adjust after performing adjustments in section 2-4.

1. Receive the stereo signal. (L=2KHz, R=400Hz)
2. Connect the AC voltmeter to **AUDIO OUT L/R** through stereo filter (L=400Hz, R=2KHz).
3. Check if the difference between with the stereo filter and without the stereo filter is more than 23dB.

(TV SECTION)

2-6: CONSTANT VOLTAGE

1. Connect the digital voltmeter to **TP501**.
2. Set condition is AV MODE without signal.
3. Adjust the **VR502** until the DC voltage is $111 \pm 0.5V$.

2-7: OSD HORIZONTAL

1. Using the remote control, set the brightness and contrast to normal position.
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(5)** on the remote control. The **Fig. 2-2** appears on the display.
3. Press the channel button **(4)** on the remote control.
4. Press the VOL. UP/DOWN button on the remote control until the difference of A and B becomes minimum. (Refer to **Fig. 2-3**)

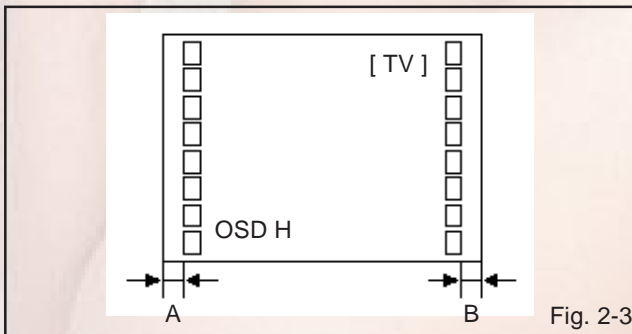


Fig. 2-3

2-8: HORIZONTAL PHASE

1. Receive the center cross signal from the Pattern Generator.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(1)** on the remote control. The **Fig. 2-4** appears on the display.
4. Press the channel button **(1)** on the remote control.
5. Press the VOL. UP/DOWN button on the remote control until the right and left screen size of the vertical line becomes the same.

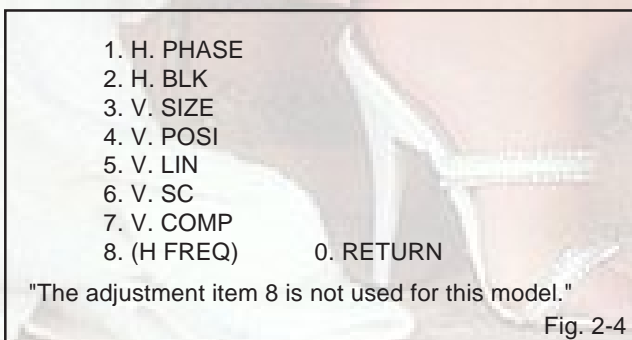


Fig. 2-4

2-9: HORIZONTAL SIZE

NOTE: Adjust after performing adjustments in section 2-8.

Measurement Equipment Maker: SHIBASOKU Co. Limited
Measurement Equipment Model No.: DIGITAL TEST PATTERN GENERATOR 588

1. Receive the monoscope pattern.
2. Adjust the **VR401** until the SHIFT quantity of the OVER SCAN on right and left becomes $10 \pm 2\%$.

(Simple Adjustments)

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(6)** on the remote control. The **Fig. 2-5** appears on the display.
2. Press the channel button **(6)** on the remote control.
3. Adjust the **VR401** until the right vertical line of the pattern becomes fit to the right end.

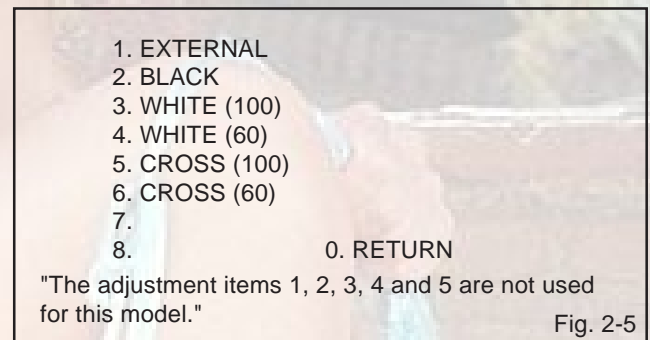


Fig. 2-5

2-10: VERTICAL SIZE

NOTE: Adjust after performing adjustments in section 2-9.

1. Receive the cross hatch signal from the Pattern Generator.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(1)** on the remote control. The **Fig. 2-4** appears on the display.
4. Press the channel button **(3)** on the remote control.
5. Press the VOL. UP/DOWN button on the remote control until the rectangle on the center of the screen becomes square.
6. Receive a broadcast and check if the picture is normal.

2-11: VERTICAL LINEARITY

NOTE: Adjust after performing adjustments in section 2-10.

1. Receive the cross hatch signal from the Pattern Generator.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(1)** on the remote control. The **Fig. 2-4** appears on the display.
4. Press the channel button **(5)** on the remote control.
5. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on upside and downside becomes minimum.

ELECTRICAL ADJUSTMENTS

2-12: VERTICAL POSITION

NOTE: Adjust after performing adjustments in section 2-11.

1. Receive the center cross signal from the Pattern Generator.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(1)** on the remote control. The **Fig. 2-4** appears on the display.
4. Press the channel button **(4)** on the remote control.
5. Press the VOL. UP/DOWN button on the remote control until the horizontal line becomes fit to the notch of the shadow mask.

2-13: FOCUS

1. Receive a broadcast.
2. Turn the Focus Volume fully counterclockwise once.
3. Adjust the **Focus Volume** until picture is distinct.

2-14: CUT OFF

1. Place the set with Aging Test for more than 15 minutes.
2. Set condition is AV MODE without signal.
3. Using the remote control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(5)** on the remote control. The **Fig. 2-2** appears on the display.
5. Press the channel button **(5)** on the remote control.
6. Adjust the **Screen Volume** until a dim raster is obtained.

2-15: SUB BRIGHTNESS

1. Receive the black pattern*. (RF Input)
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(4)** on the remote control. The **Fig. 2-6** appears on the display.
4. Press the channel button **(1)** on the remote control.
5. Press the VOL. UP/DOWN button on the remote control until the screen begin to shine.
6. Receive the black pattern*. (Audio Video Input)
7. Press the TV/VCR button on the remote control to set to the AV mode. Then perform the above adjustments 2~5.

*The Black Pattern means the whole black raster signal. Select the "RASTER" of the pattern generator, set to the OFF position for each R, G and B.

1. BRIGHT
2. CONTRAST
3. COLOR
4. TINT
5. SHARPNESS
6. OSD CONT
- 7.
8. 0. RETURN

Fig. 2-6

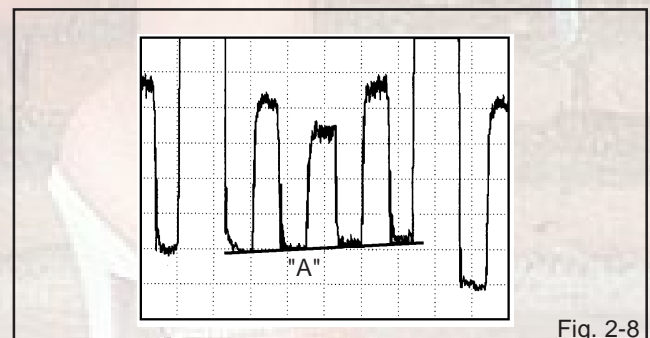
2-16: SUB COLOR

1. Receive the color bar pattern. (RF Input)
2. Using the remote control, set the brightness, contrast, color and tint to normal position.
3. Connect the synchro scope to **TP804**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(4)** on the remote control. The **Fig. 2-6** appears on the display.
5. Press the channel button **(3)** on the remote control.
6. Adjust the VOLTS RANGE VARIABLE knob of the oscilloscope until the range between white 100% and 0% is set to 4 scales on the screen of the oscilloscope.
7. Press the VOL. UP/DOWN button on the remote control until the red color level is adjusted to $100 \pm 5\%$ of the white level. (**Refer to Fig. 2-7**)
8. Receive the color bar pattern. (Audio Video Input)
9. Press the TV/VCR button on the remote control to set to the AV mode. Then perform the above adjustments 2~7.



2-17: SUB TINT

1. Receive the color bar pattern. (RF Input)
2. Using the remote control, set the brightness, contrast, color and tint to normal position.
3. Connect the synchro scope to **TP806**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(4)** on the remote control. The **Fig. 2-6** appears on the display.
5. Press the channel button **(4)** on the remote control.
6. Press the VOL. UP/DOWN button on the remote control until the section "A" becomes a straight line. (**Refer to Fig. 2-8**)
7. Receive the color bar pattern. (Audio Video Input)
8. Press the TV/VCR button on the remote control to set to the AV mode. Then perform the above adjustments 2~6.



ELECTRICAL ADJUSTMENTS

2-18: SUB CONTRAST

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(4)** on the remote control. The **Fig. 2-6** appears on the display.
2. Press the channel button **(2)** on the remote control.
3. Press the VOL. UP/DOWN button on the remote control until the contrast step No. becomes "67"
4. Press the TV/VCR button on the remote control to set to the AV mode. Then perform the above adjustments 1~3.

2-19: SUB SHARPNESS

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(4)** on the remote control. The **Fig. 2-6** appears on the display.
2. Press the channel button **(5)** on the remote control.
3. Check if the step No. of SHARPNESS is "40".
4. Press the TV/VCR button on the remote control to set to the AV mode. Then perform the above adjustments 1~3.

2-20: OSD CONTRAST

1. Using the remote control, set the brightness and contrast to normal position.
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(4)** on the remote control. The **Fig. 2-6** appears on the display.
3. Press the channel button **(6)** on the remote control.
4. Check if the step No. of OSD CONT. is "0".

2-21: PIN CUSHION (PCC)

1. Receive the color bar pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Adjust the **VR402** until the right and left vertical line becomes straight.

2-22: WHITE BALANCE

NOTE: Adjust after performing adjustments in section 2-14.

1. Place the set with Aging Test for more than 15 minutes.
2. Receive the white 100% signal from the Pattern Generator.
3. Using the remote control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(2)** on the remote control. The **Fig. 2-9** appears on the display.
5. Perform channel button 2 through 7 on the remote control until the screen becomes white.

1. AKB AUTO
2. R.BIAS
3. G.BIAS
4. B.BIAS
5. R.DRIVE
6. G.DRIVE
7. B.DRIVE
8. AGC AUTO
0. RETURN

"The adjustment items 1 and 8 are not used for this model."

Fig. 2-9

2-23: H. BLK

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(1)** on the remote control. The **Fig. 2-4** appears on the display.
2. Press the channel button **(2)** on the remote control.
3. Switch the R/L by using the ENTER button on the remote control and check if the H. BLK step No. becomes "R0, L4".

2-24: V. S-CORRECTION (V. SC)

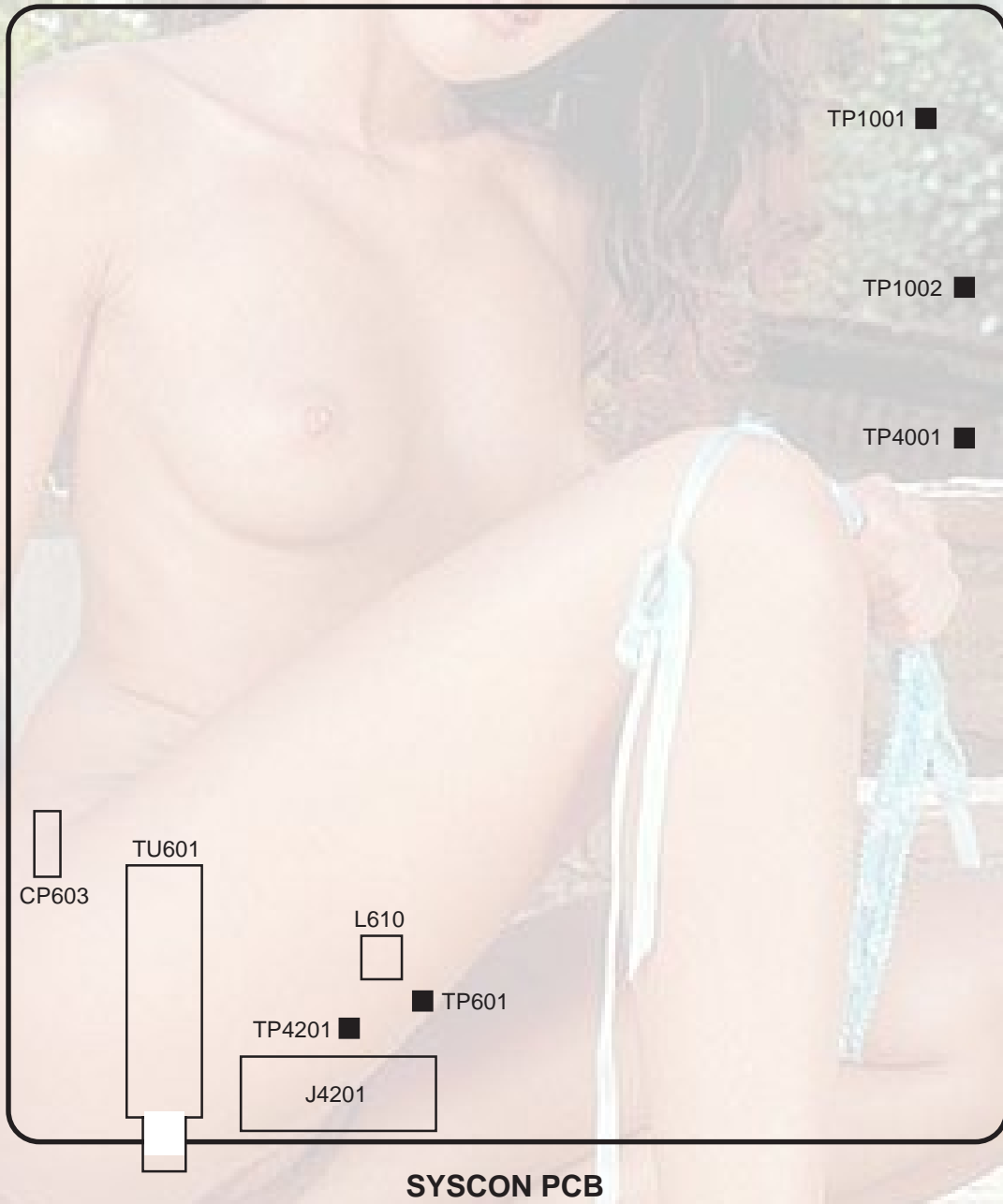
1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(1)** on the remote control. The **Fig. 2-4** appears on the display.
2. Press the channel button **(6)** on the remote control.
3. Check if the step No. of V. SC is "0".

2-25: V. COMP

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(1)** on the remote control. The **Fig. 2-4** appears on the display.
2. Press the channel button **(7)** on the remote control.
3. Check if the step No. of V. COMP is "7".

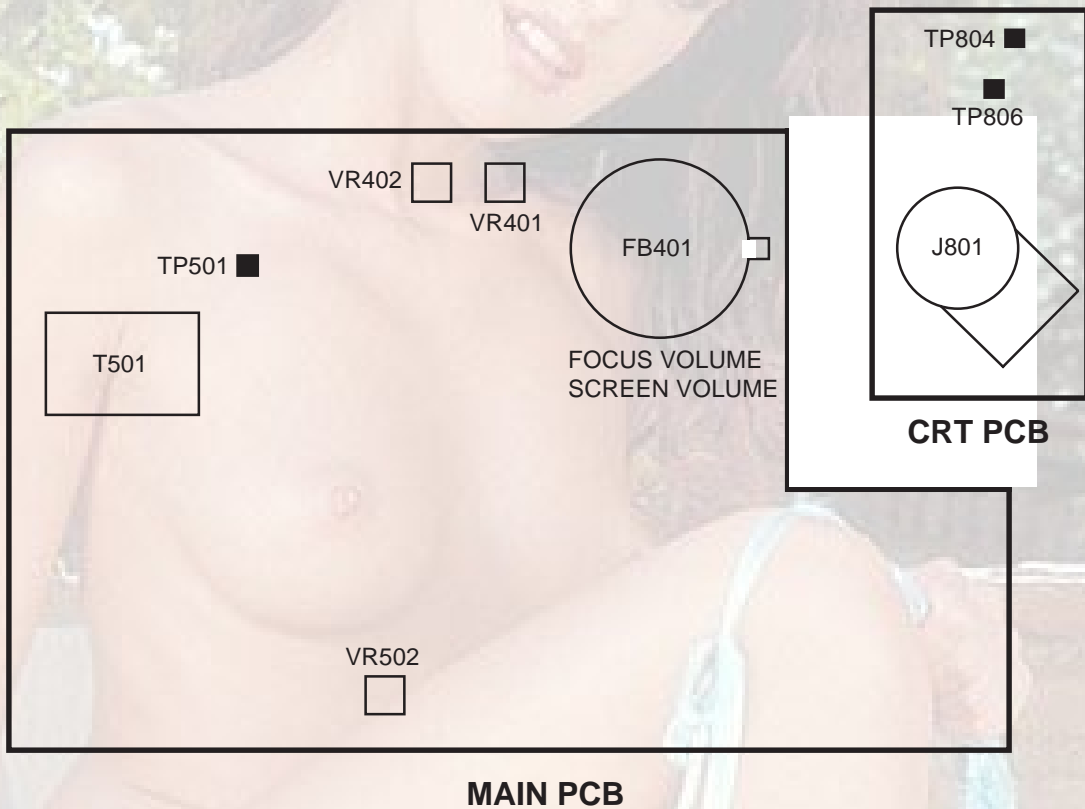
ELECTRICAL ADJUSTMENTS

3. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE (VCR SECTION)



ELECTRICAL ADJUSTMENTS

(TV SECTION)



ELECTRICAL ADJUSTMENTS

4. PURITY AND CONVERGENCE ADJUSTMENTS

NOTE

1. Turn the unit on and let it warm up for at least 30 minutes before performing the following adjustments.
2. Place the CRT surface facing east or west to reduce the terrestrial magnetism.
3. Turn ON the unit and demagnetize with a Degauss Coil.

4-1: STATIC CONVERGENCE (ROUGH ADJUSTMENT)

1. Tighten the screw for the magnet. Refer to the adjusted CRT for the position. **(Refer to Fig. 4-1)**
If the deflection yoke and magnet are in one body, untighten the screw for the body.
2. Receive the green raster pattern from the color bar generator.
3. Slide the deflection yoke until it touches the funnel side of the CRT.
4. Adjust center of screen to green, with red and blue on the sides, using the pair of purity magnets.
5. Switch the color bar generator from the green raster pattern to the crosshatch pattern.
6. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
7. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.
8. Adjust the crosshatch pattern to change to white by repeating steps 6 and 7.

4-2: PURITY

NOTE

Adjust after performing adjustments in section 4-1.

1. Receive the green raster pattern from color bar generator.
2. Adjust the pair of purity magnets to center the color on the screen.
Adjust the pair of purity magnets so the color at the ends are equally wide.
3. Move the deflection yoke backward (to neck side) slowly, and stop it at the position when the whole screen is green.
4. Confirm red and blue colors.
5. Adjust the slant of the deflection yoke while watching the screen, then tighten the fixing screw.

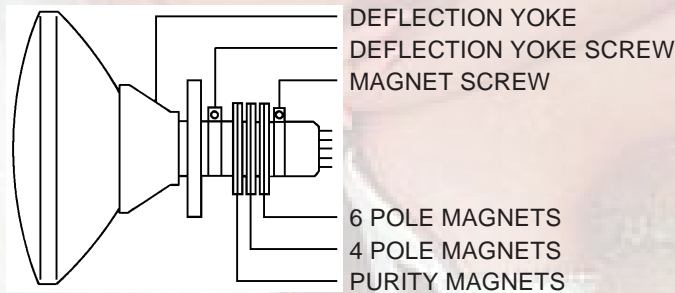


Fig. 4-1

4-3: STATIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 4-2.

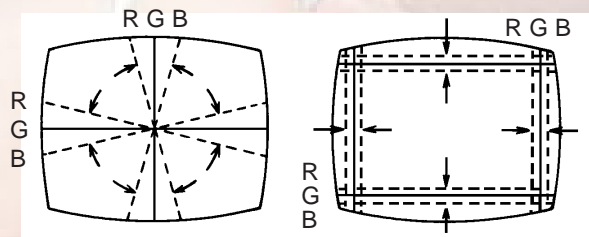
1. Receive the crosshatch pattern from the color bar generator.
2. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
3. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.

4-4: DYNAMIC CONVERGENCE

NOTE

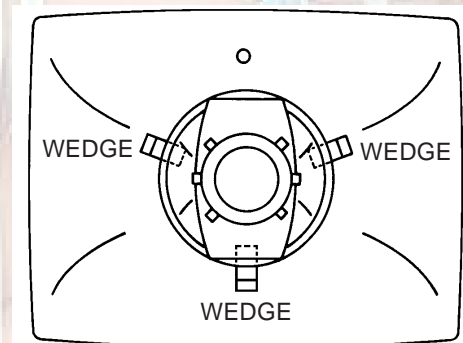
Adjust after performing adjustments in section 4-3.

1. Adjust the differences around the screen by moving the deflection yoke upward/downward and right/left. **(Refer to Fig. 4-2-a)**
2. Insert three wedges between the deflection yoke and CRT funnel to fix the deflection yoke. **(Refer to Fig. 4-2-b)**



UPWARD/DOWNWARD SLANT RIGHT/LEFT SLANT

Fig. 4-2-a



WEDGE POSITION

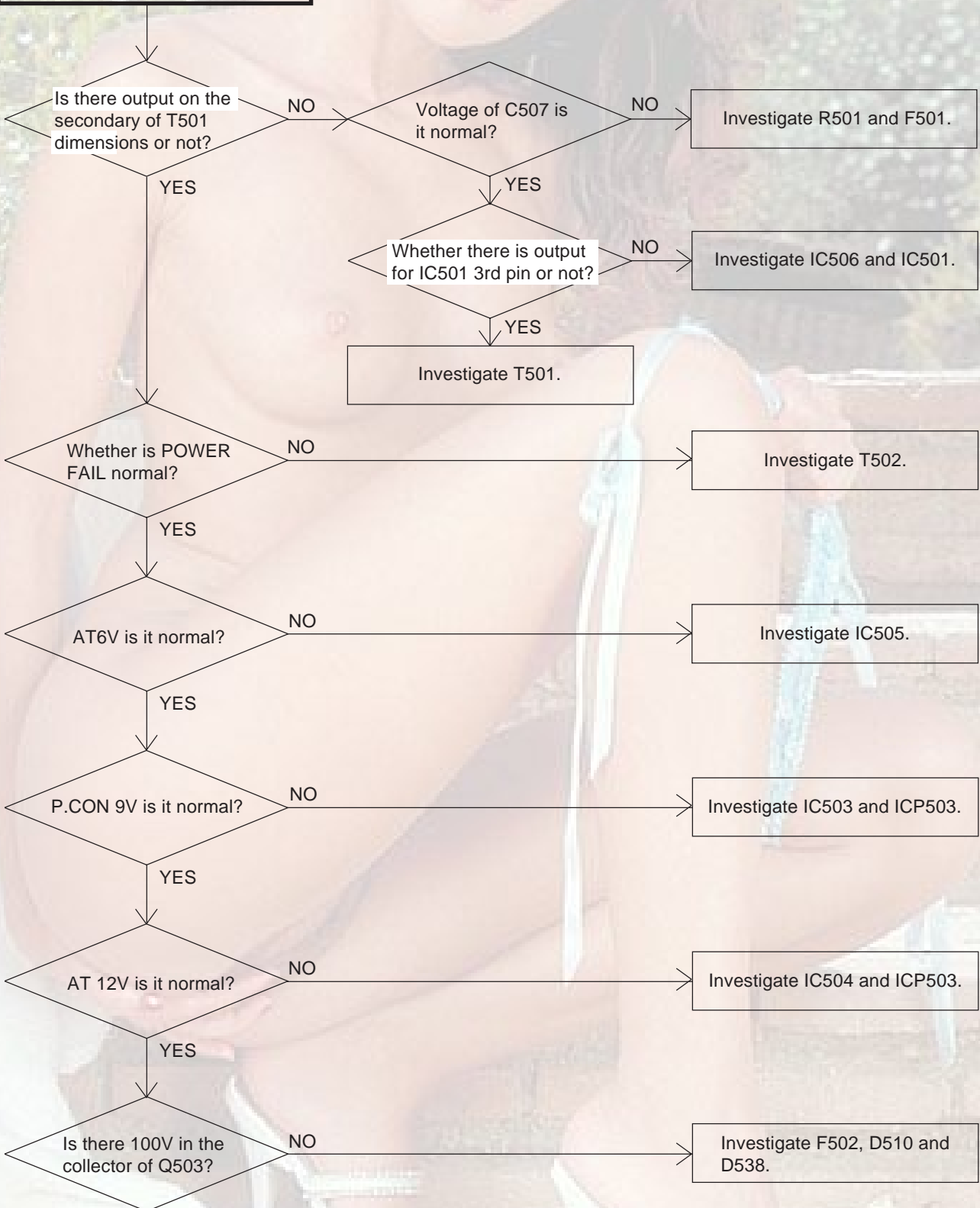
Fig. 4-2-b

TROUBLESHOOTING GUIDE

(Television division)

(1) that a power supply doesn't enter

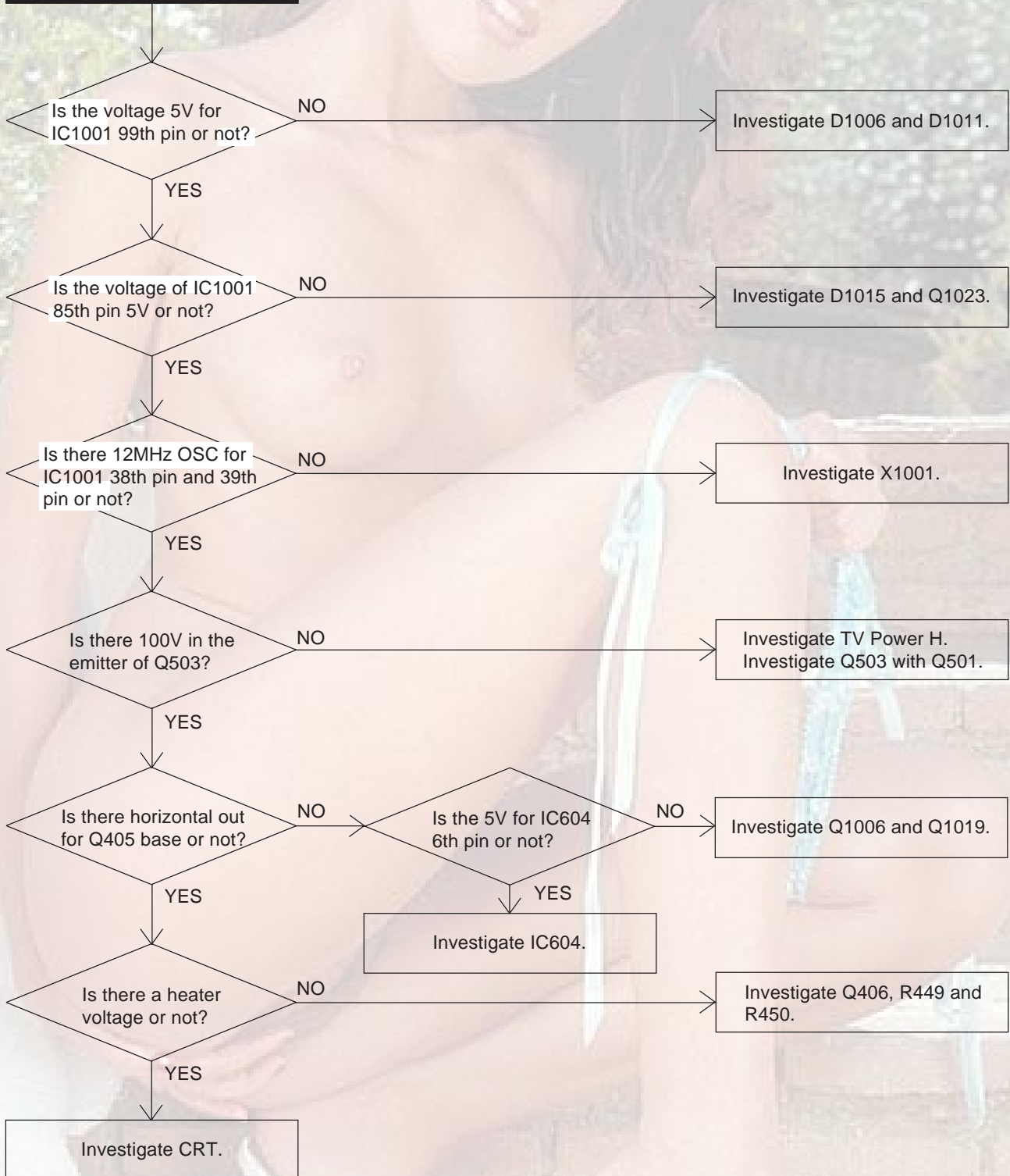
(In case that there isn't a normal tension for time to do stanby CD810 every terminal)



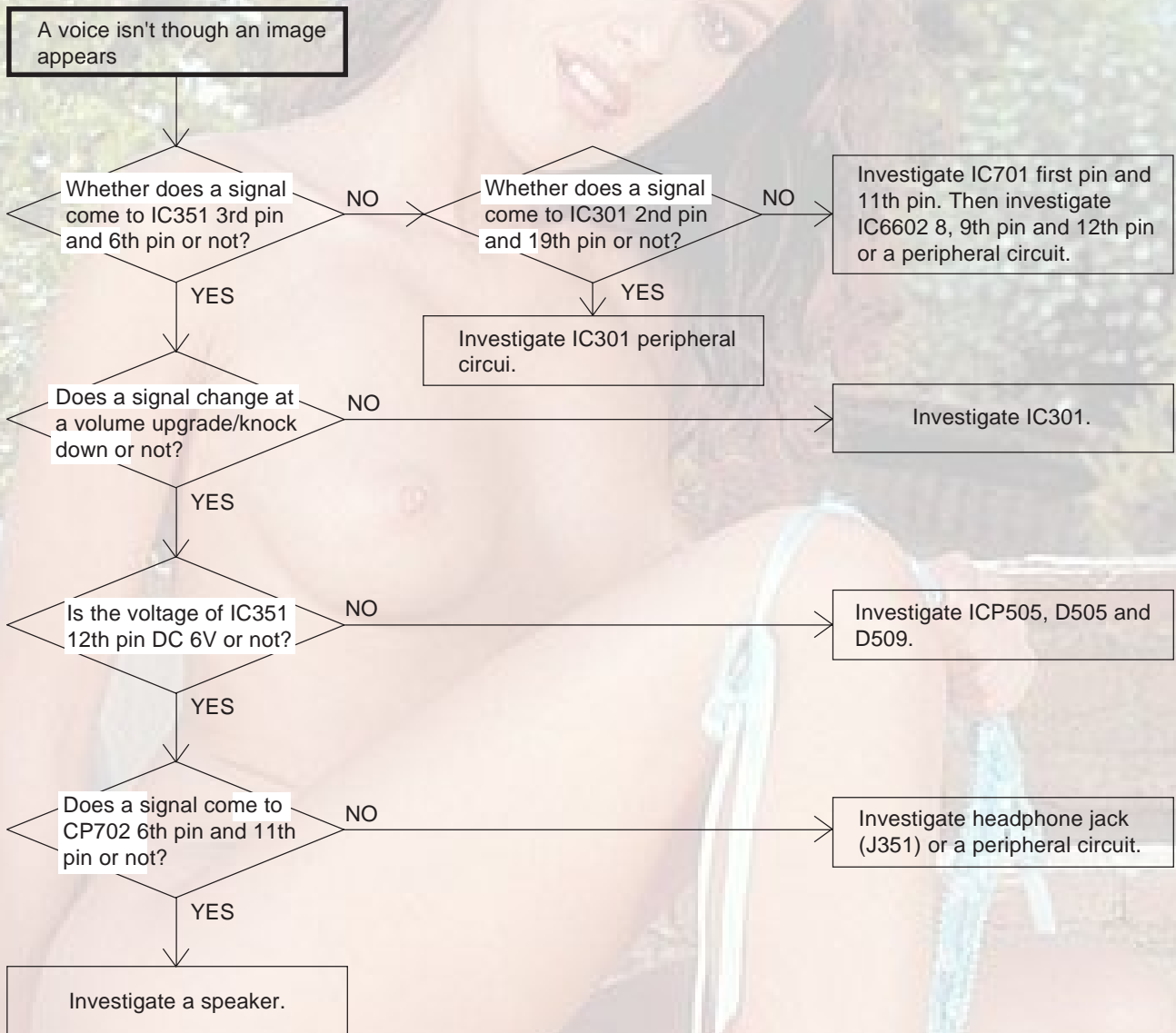
TROUBLESHOOTING GUIDE

(2) that a power supply doesn't enter

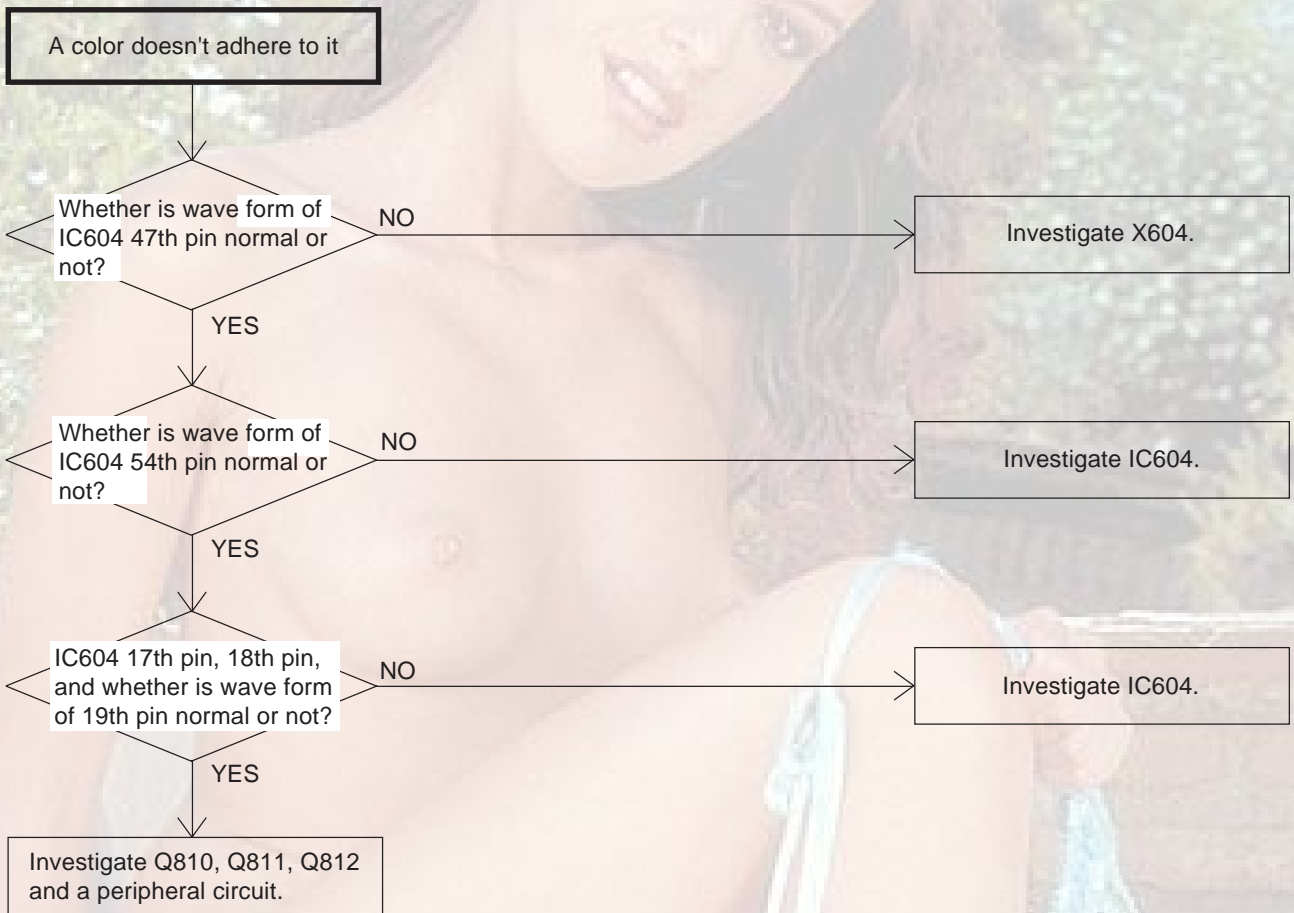
(in case that there is a normal tension for time to do stanby CD810 every terminal)



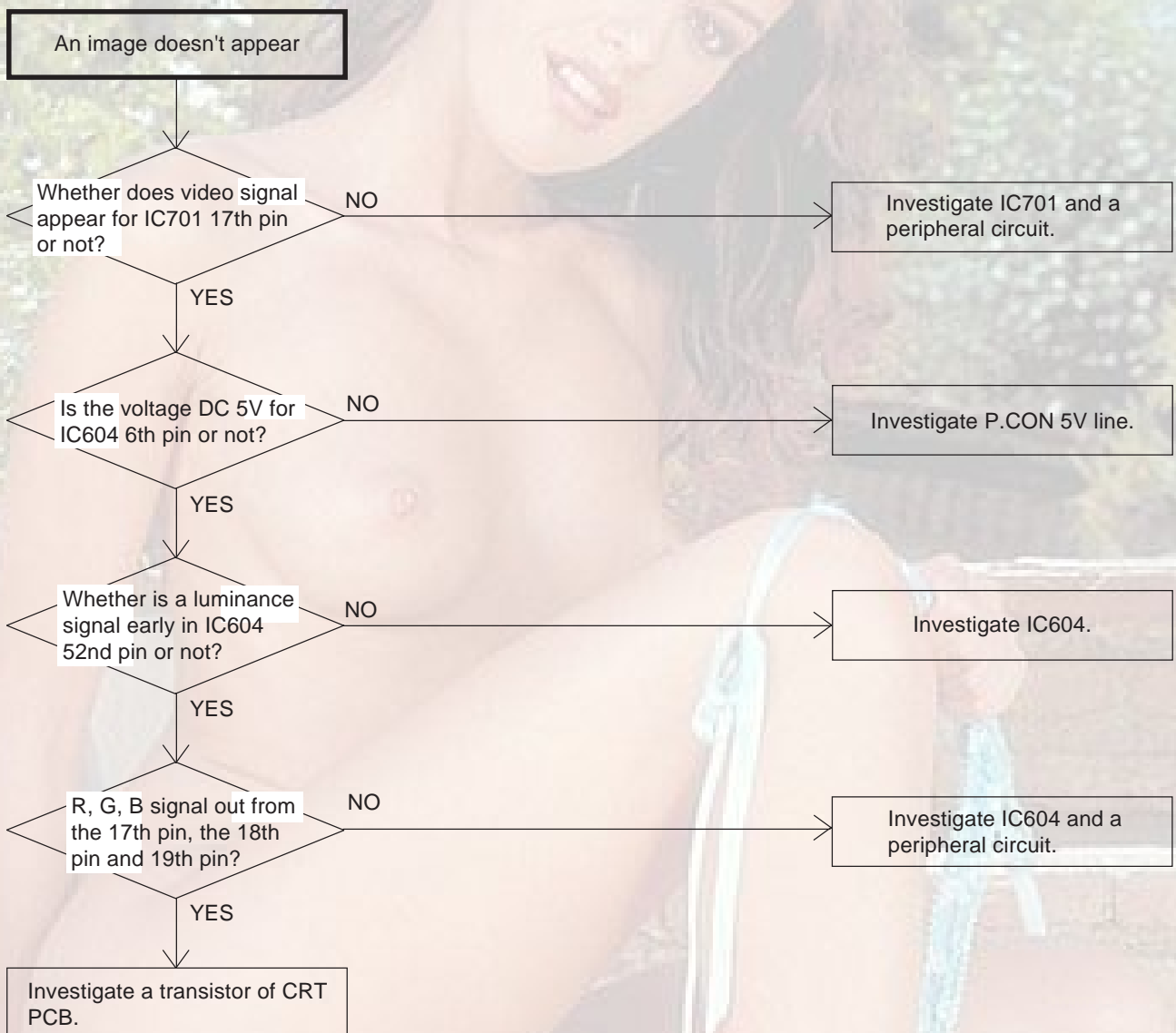
TROUBLESHOOTING GUIDE



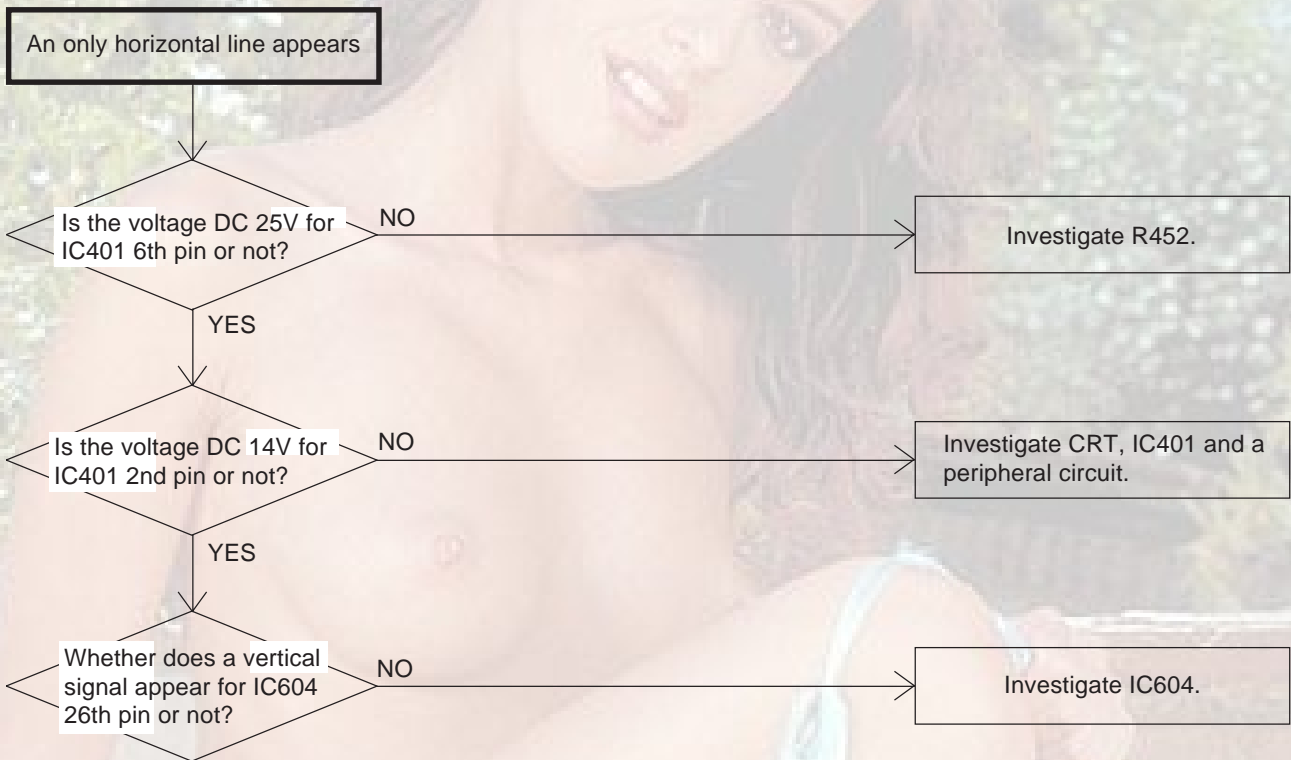
TROUBLESHOOTING GUIDE



TROUBLESHOOTING GUIDE

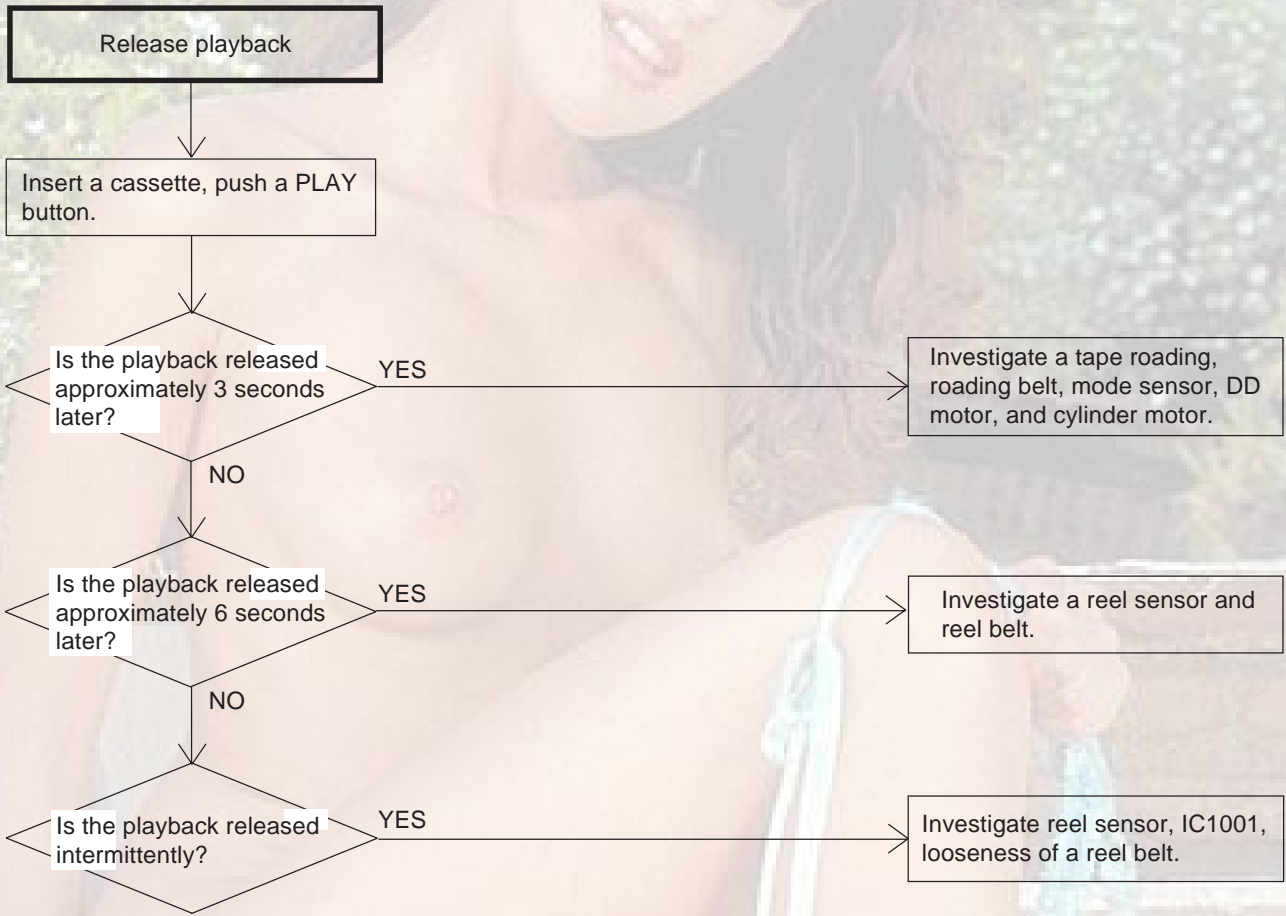


TROUBLESHOOTING GUIDE

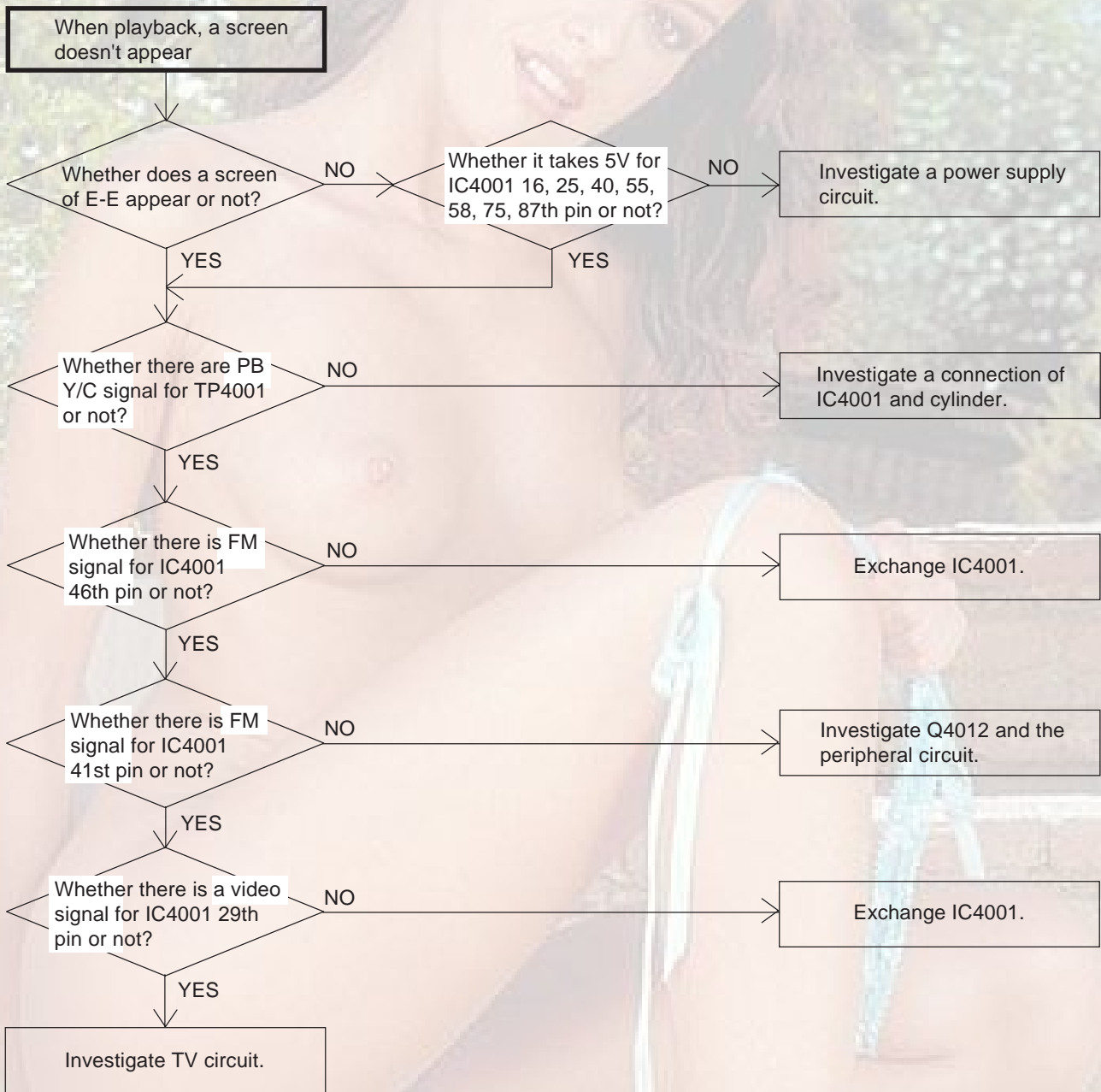


TROUBLESHOOTING GUIDE

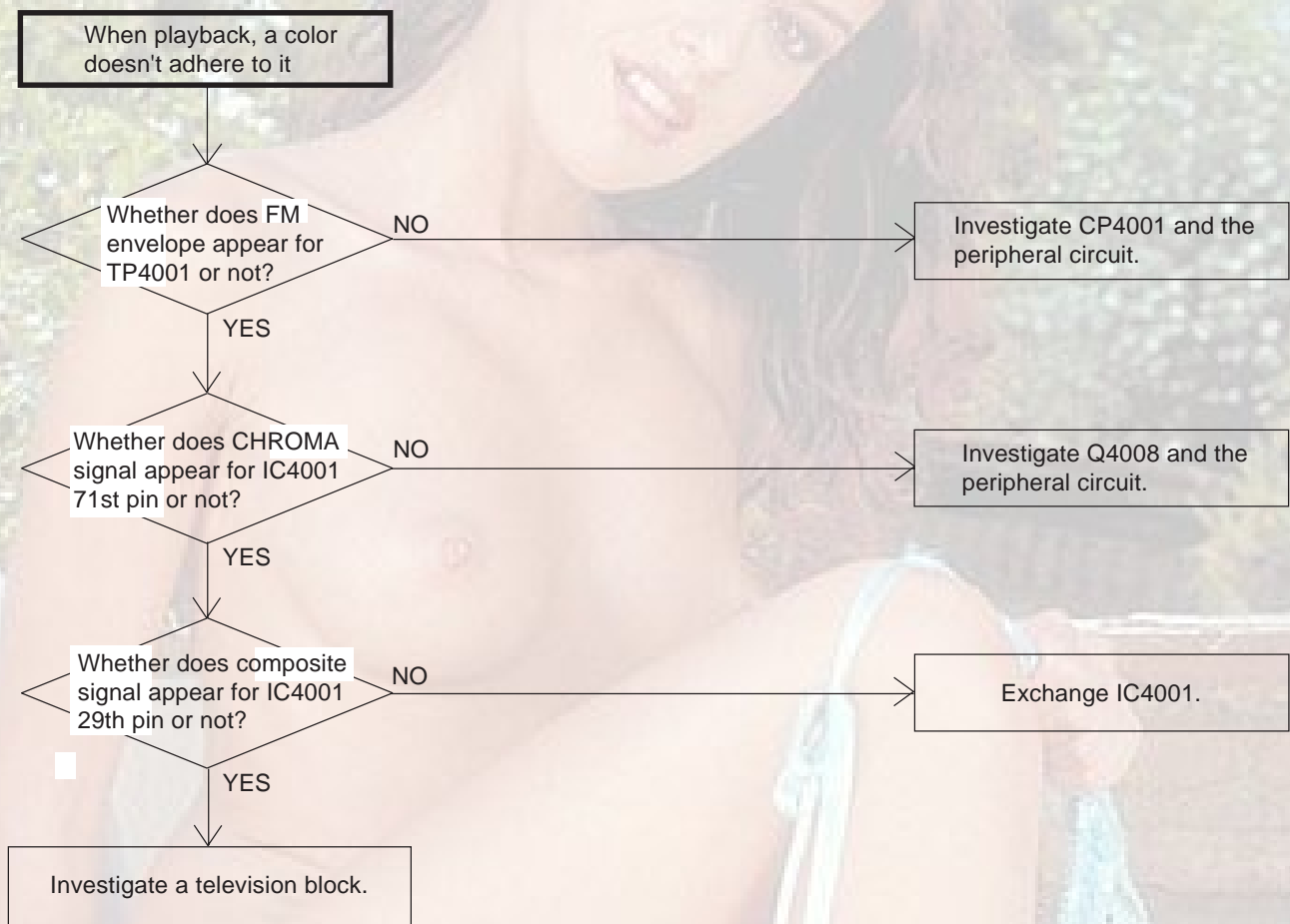
(Video division)



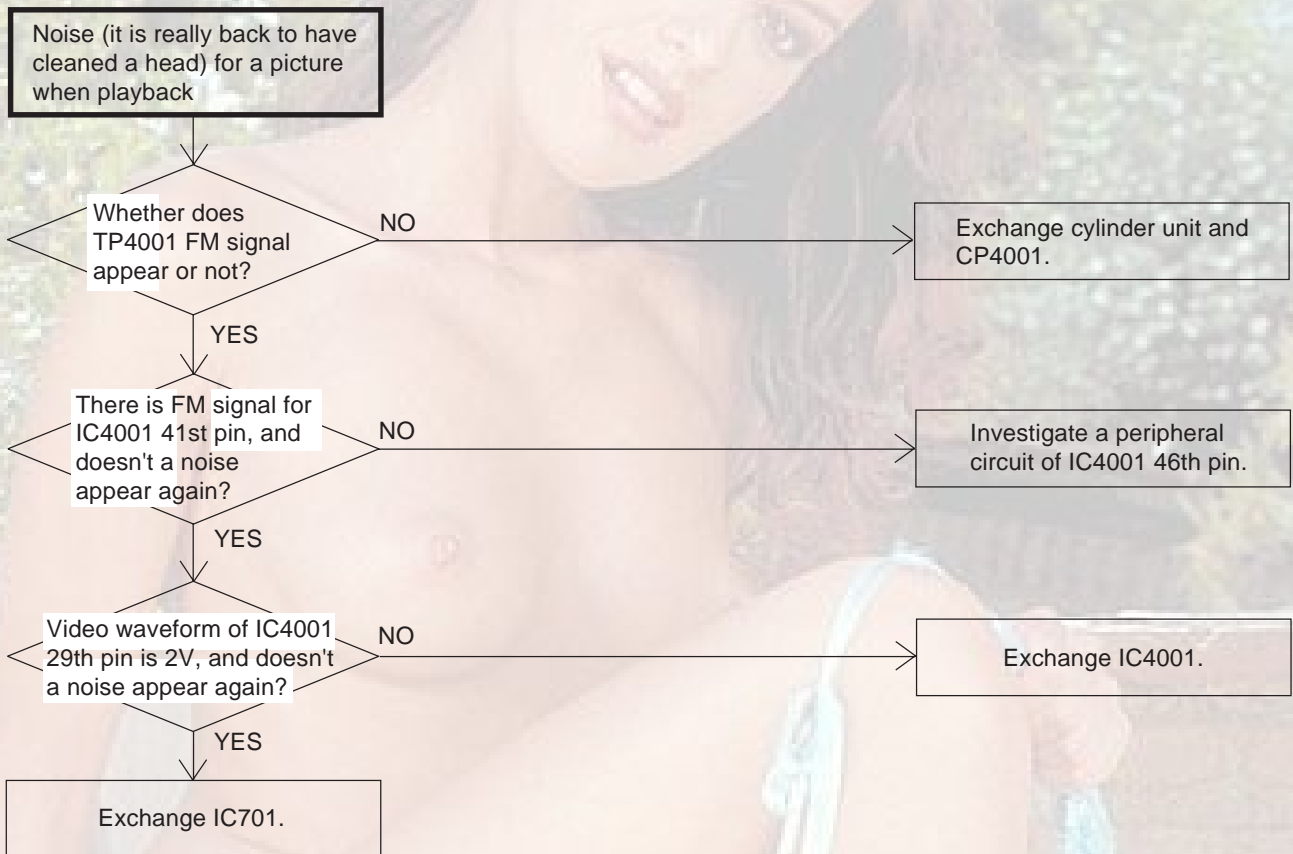
TROUBLESHOOTING GUIDE



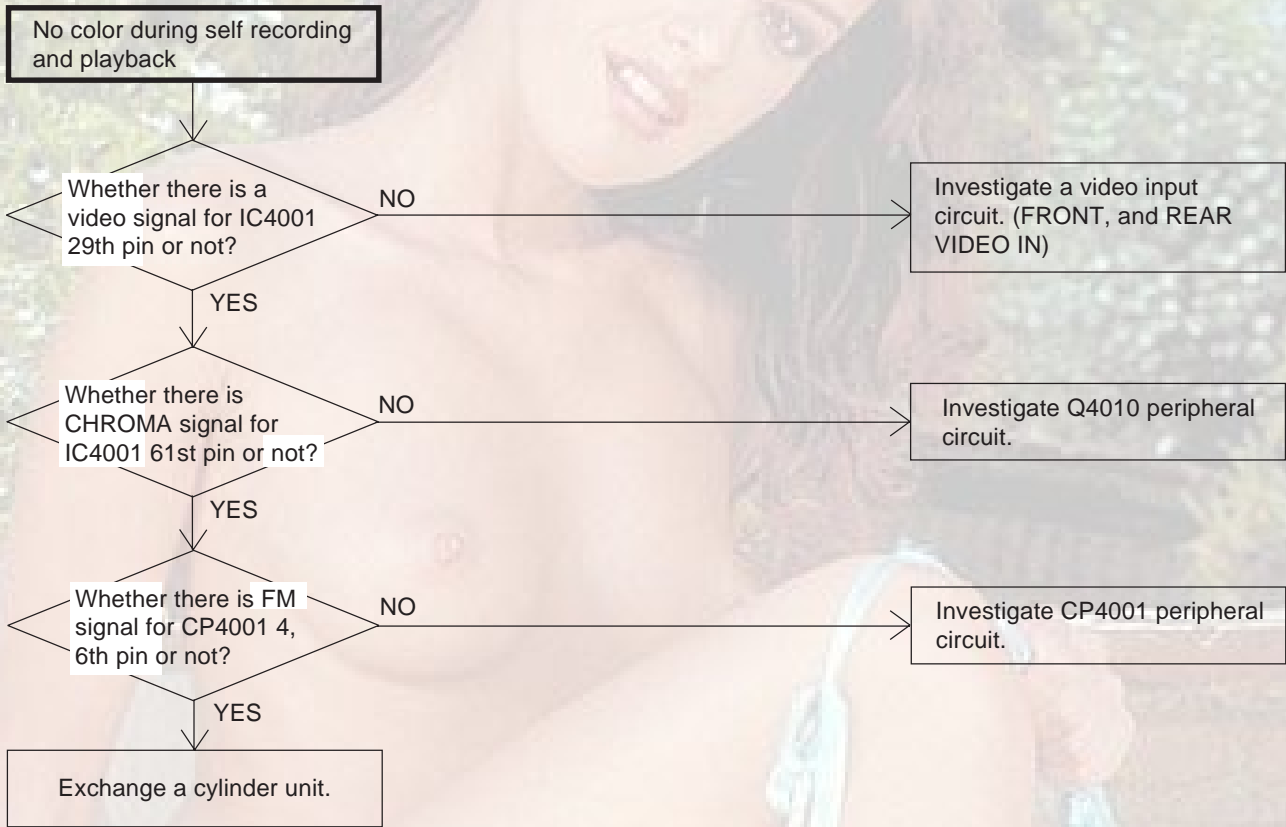
TROUBLESHOOTING GUIDE



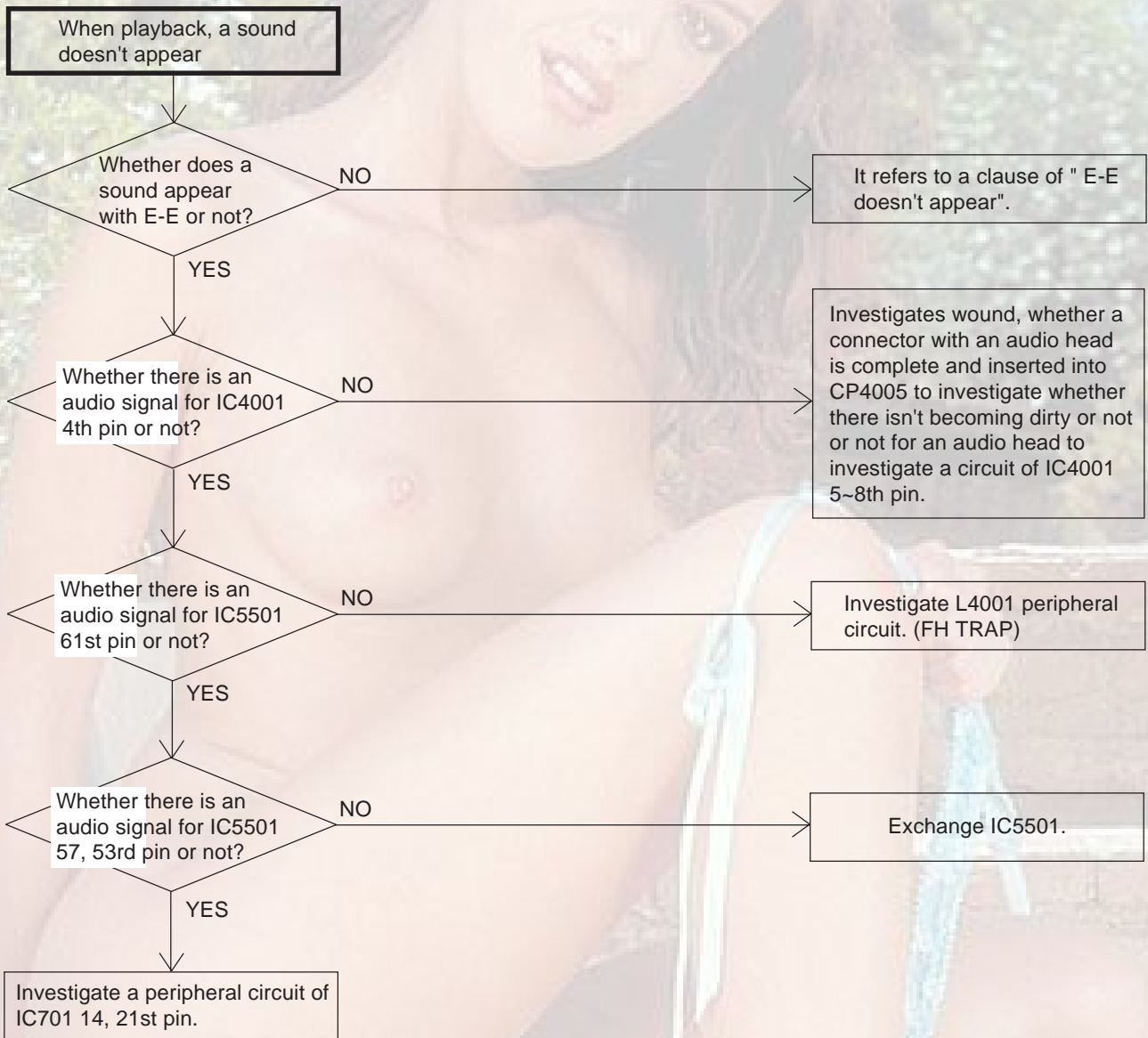
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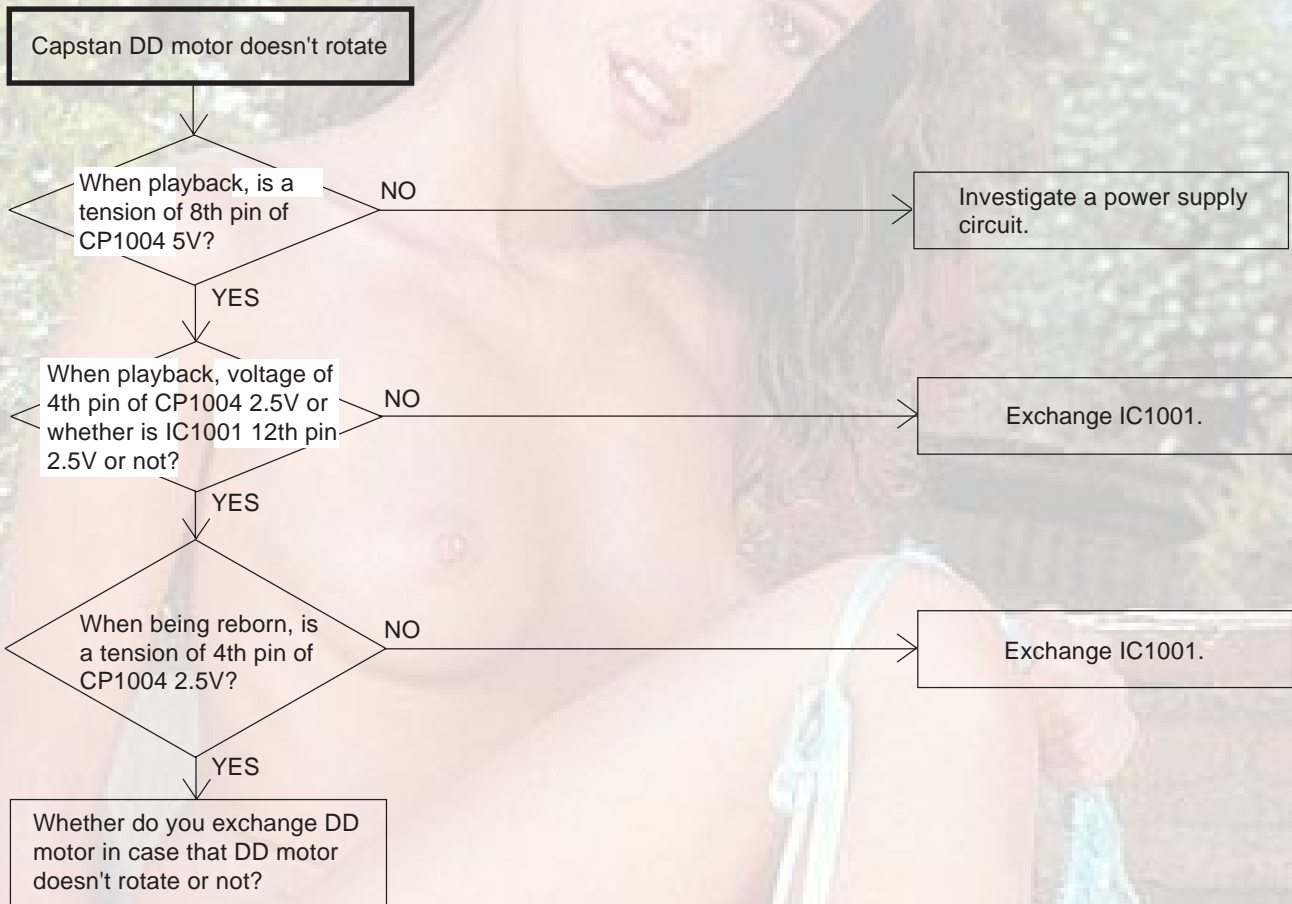
TROUBLESHOOTING GUIDE



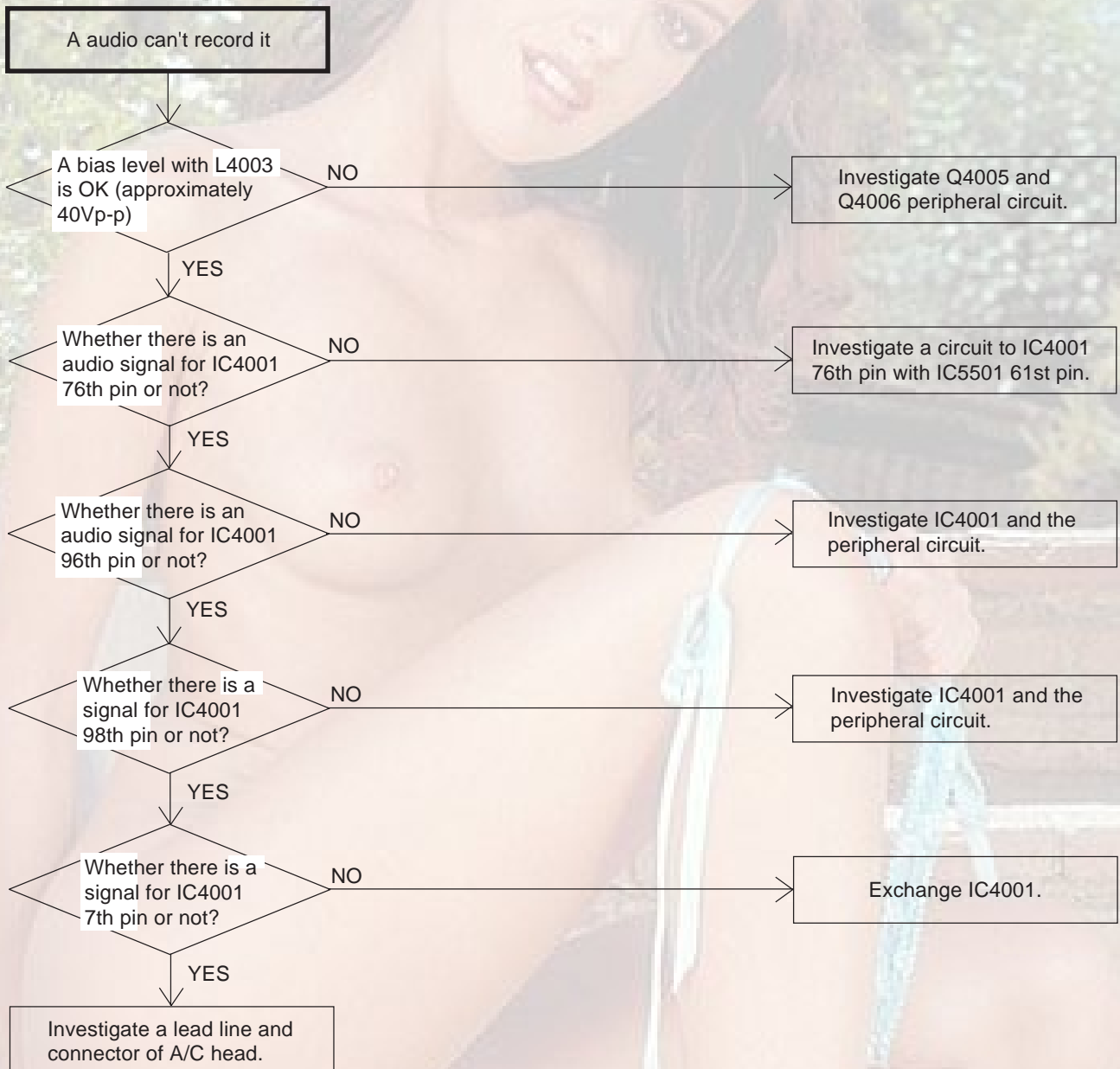
TROUBLESHOOTING GUIDE



TROUBLESHOOTING GUIDE

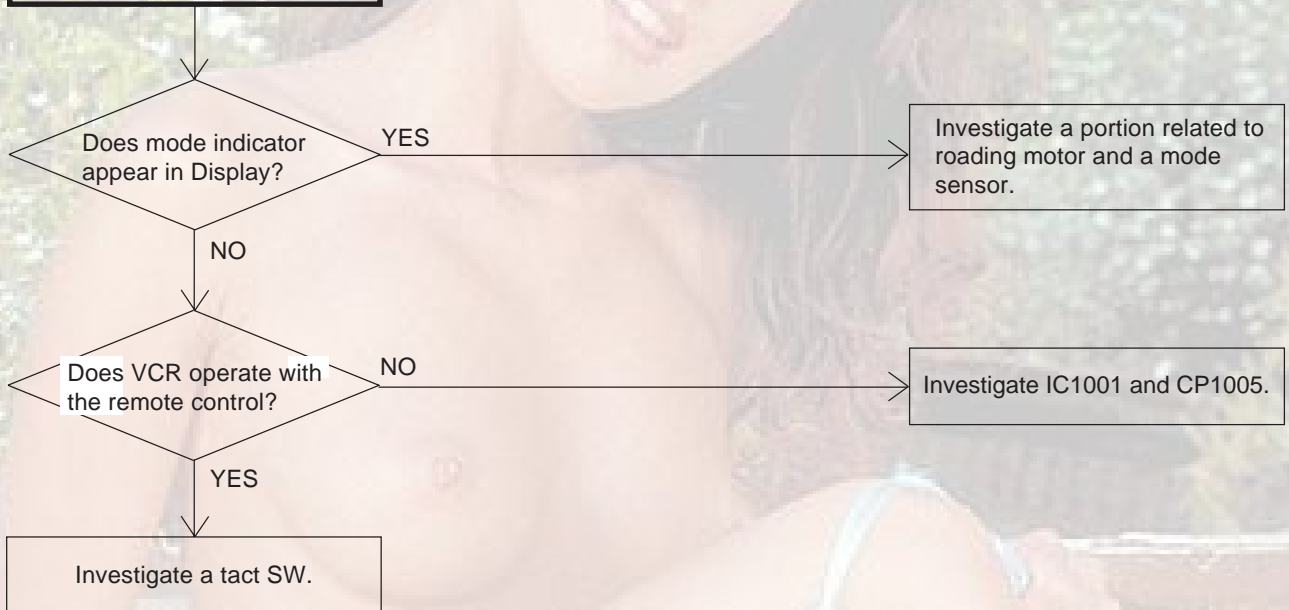


TROUBLESHOOTING GUIDE

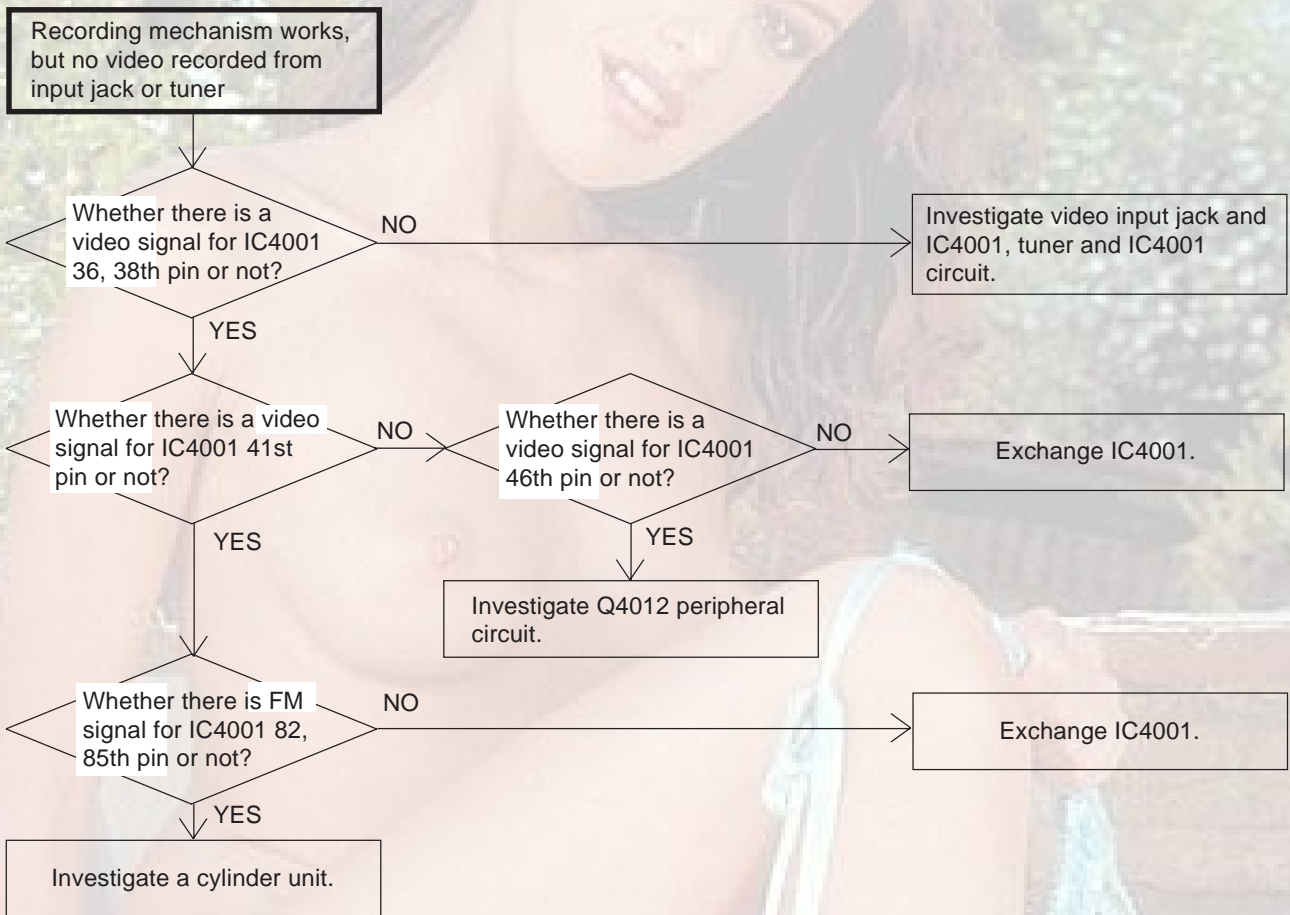


TROUBLESHOOTING GUIDE

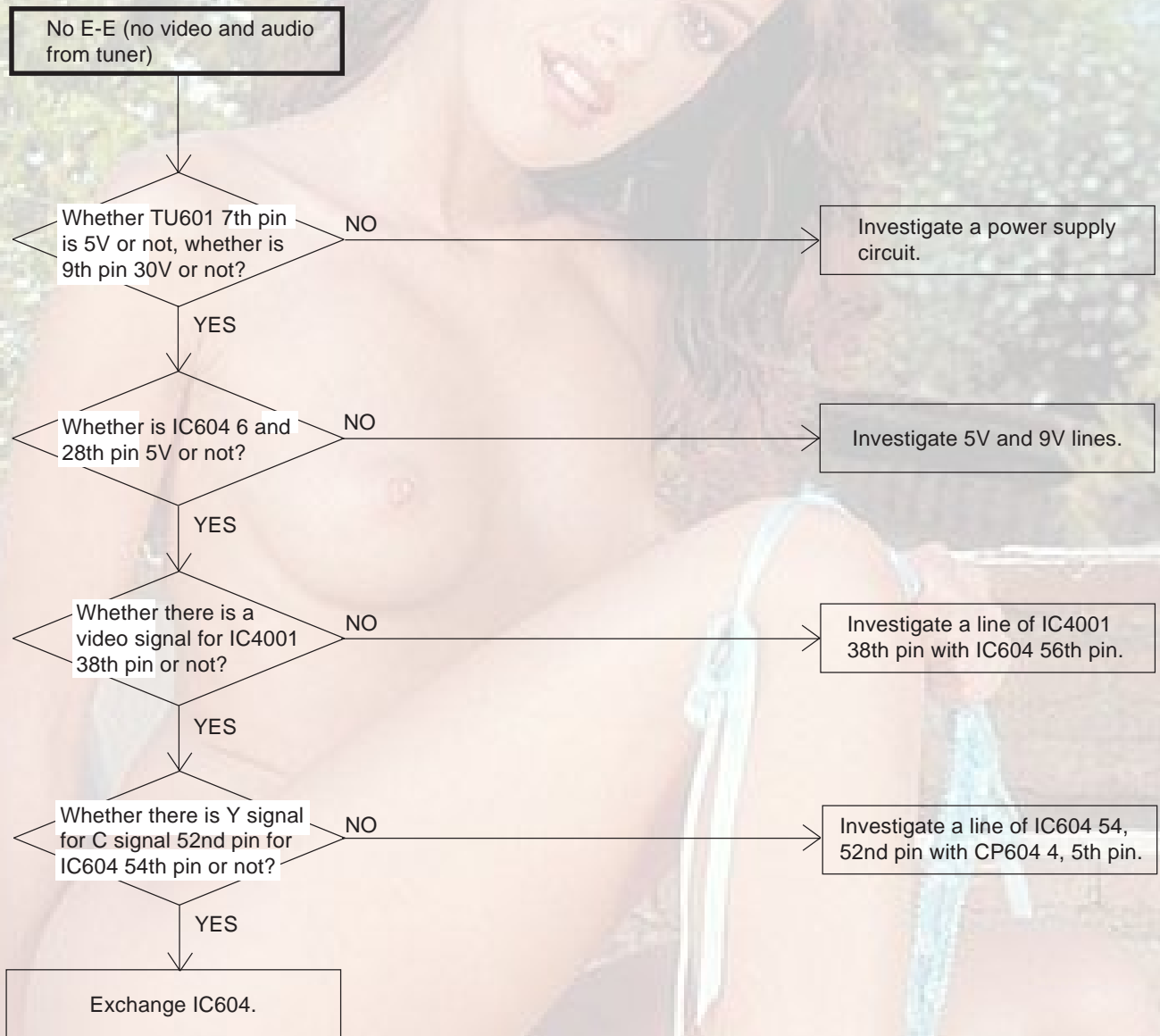
Though a cassette can insert it,
a tape doesn't move



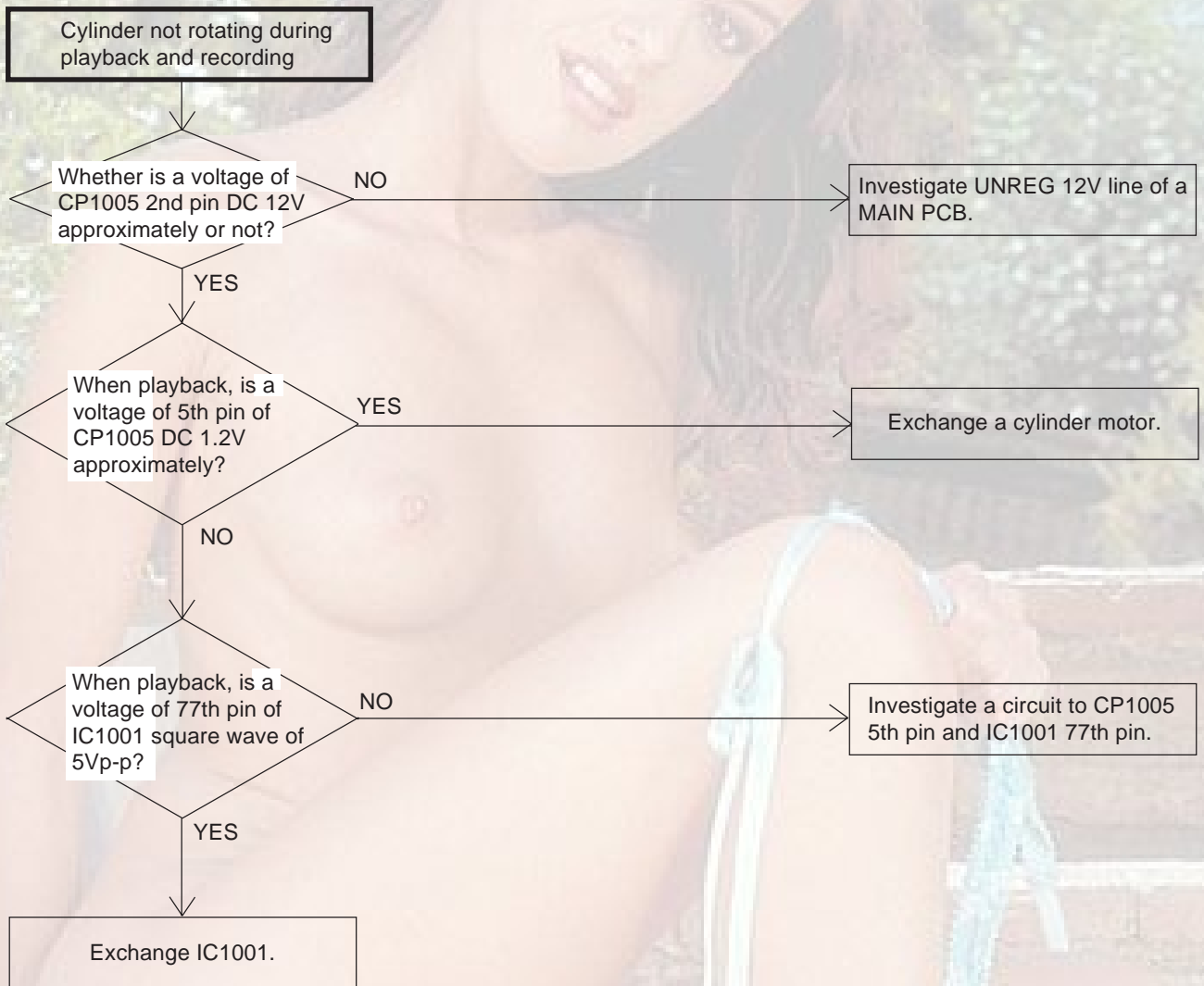
TROUBLESHOOTING GUIDE



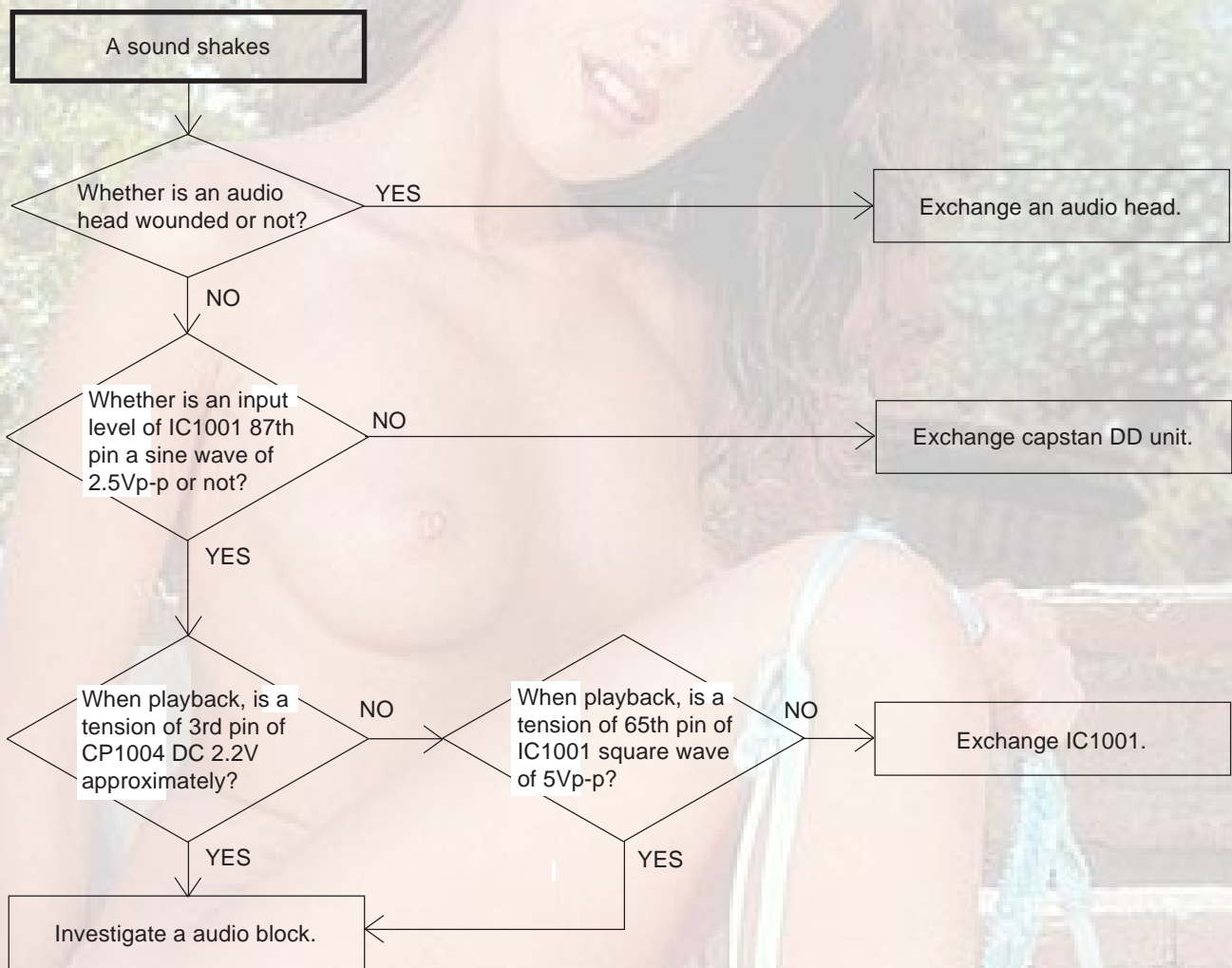
TROUBLESHOOTING GUIDE



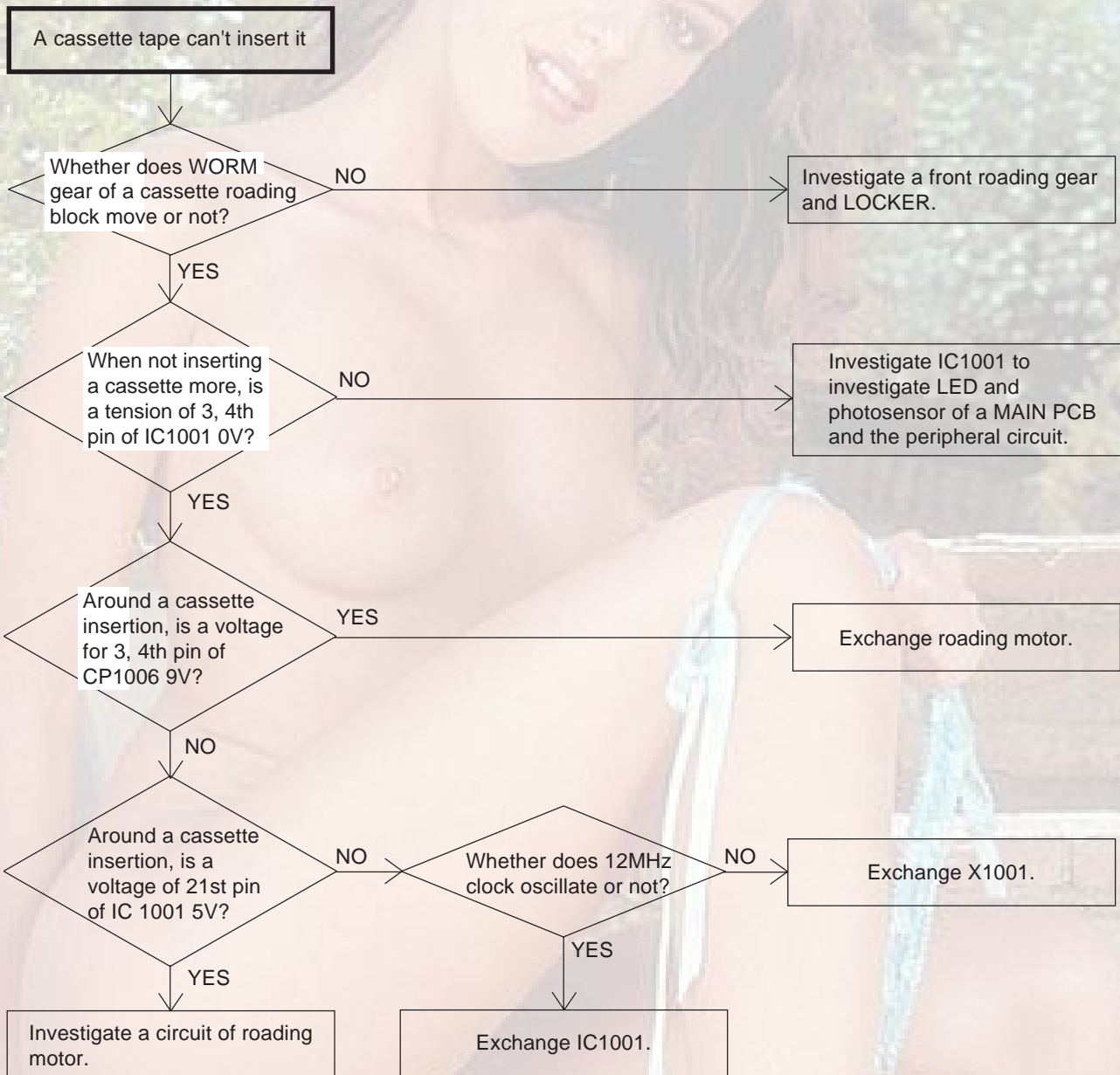
TROUBLESHOOTING GUIDE



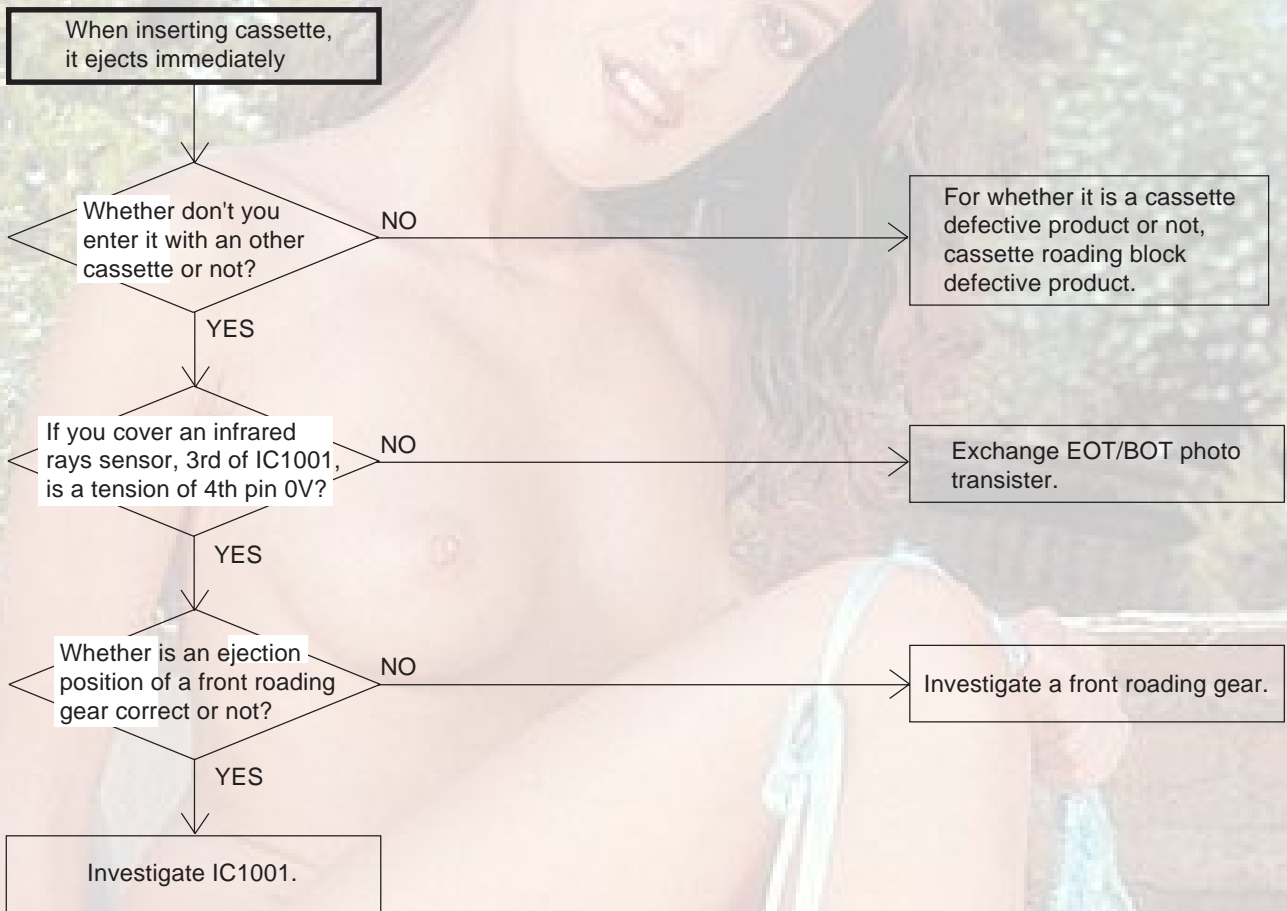
TROUBLESHOOTING GUIDE



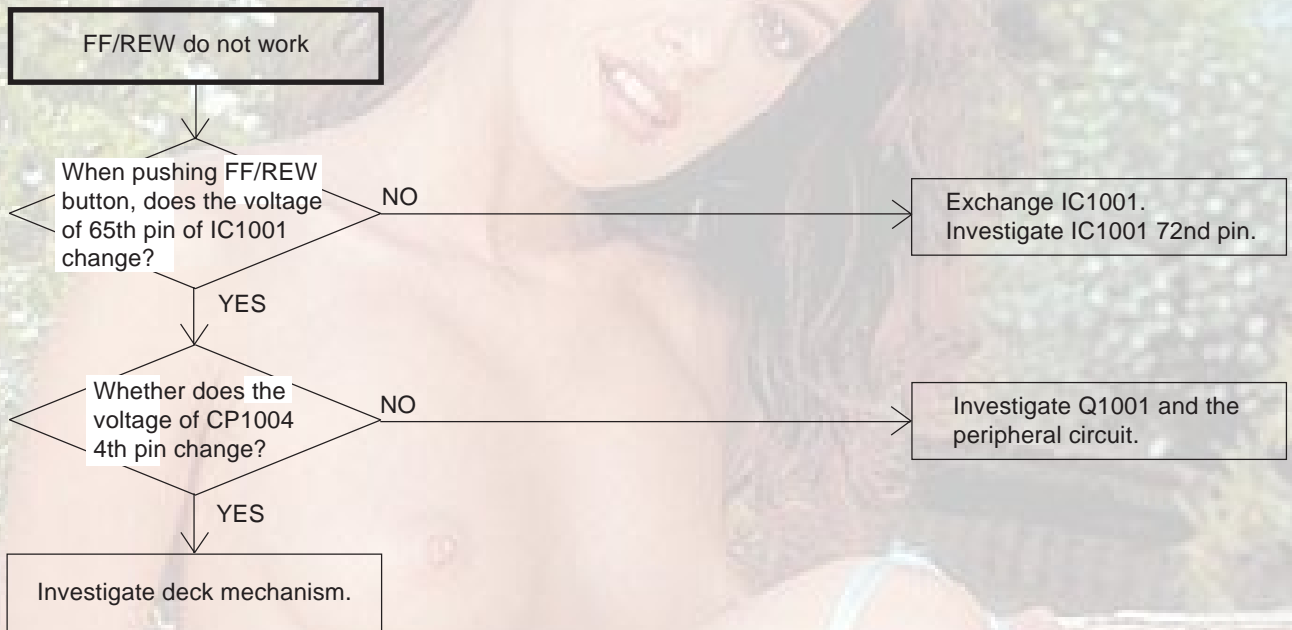
TROUBLESHOOTING GUIDE



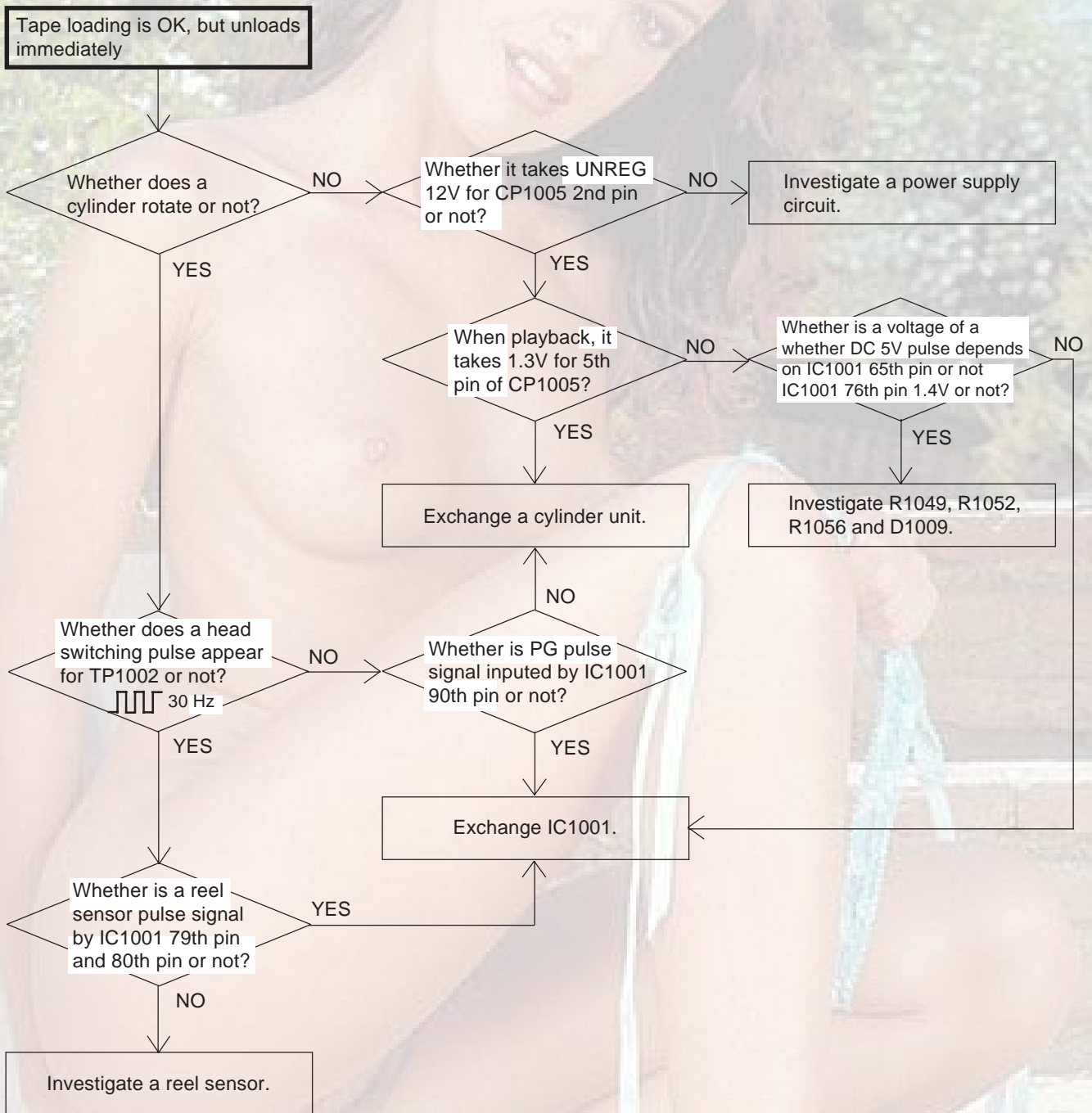
TROUBLESHOOTING GUIDE



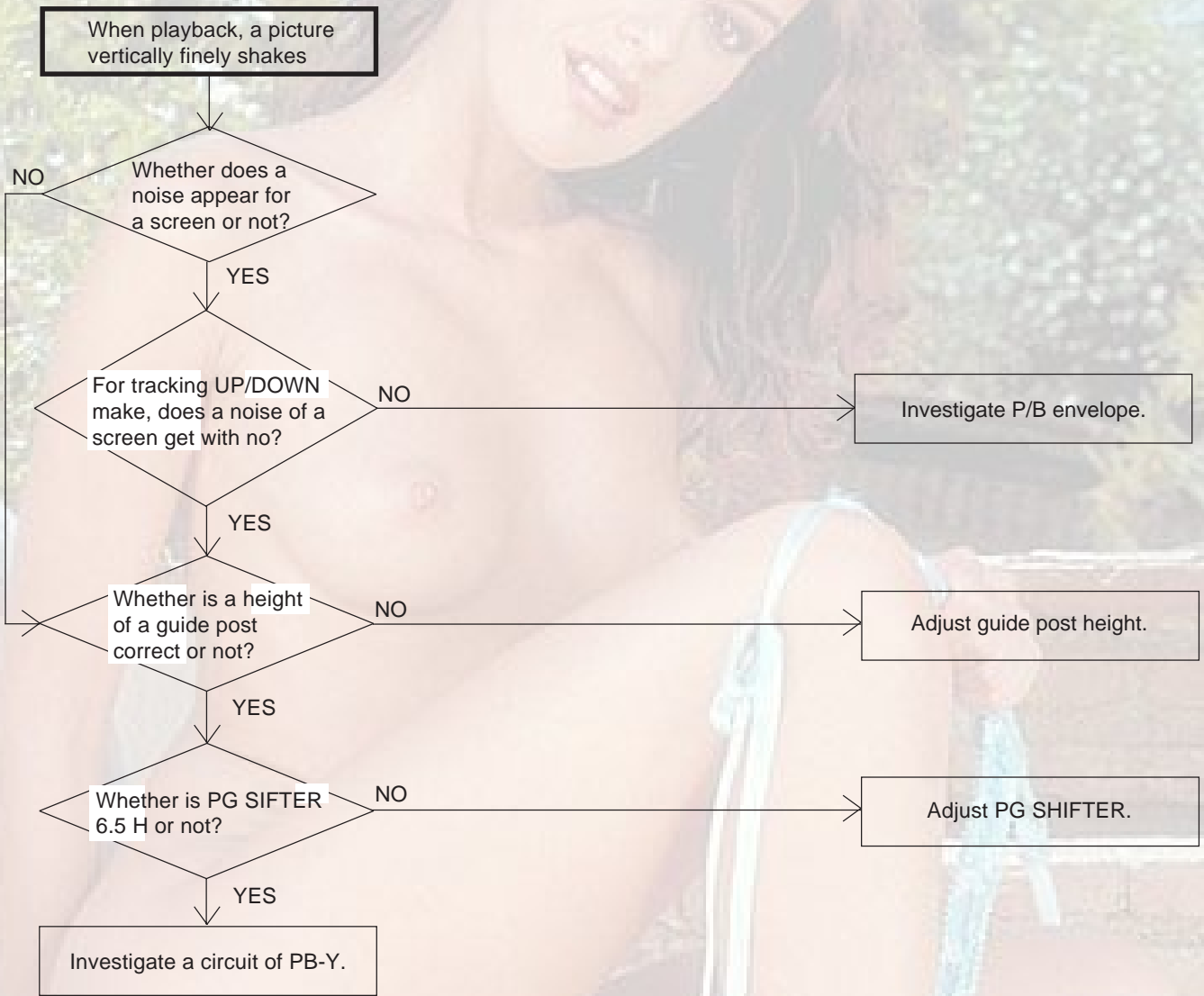
TROUBLESHOOTING GUIDE



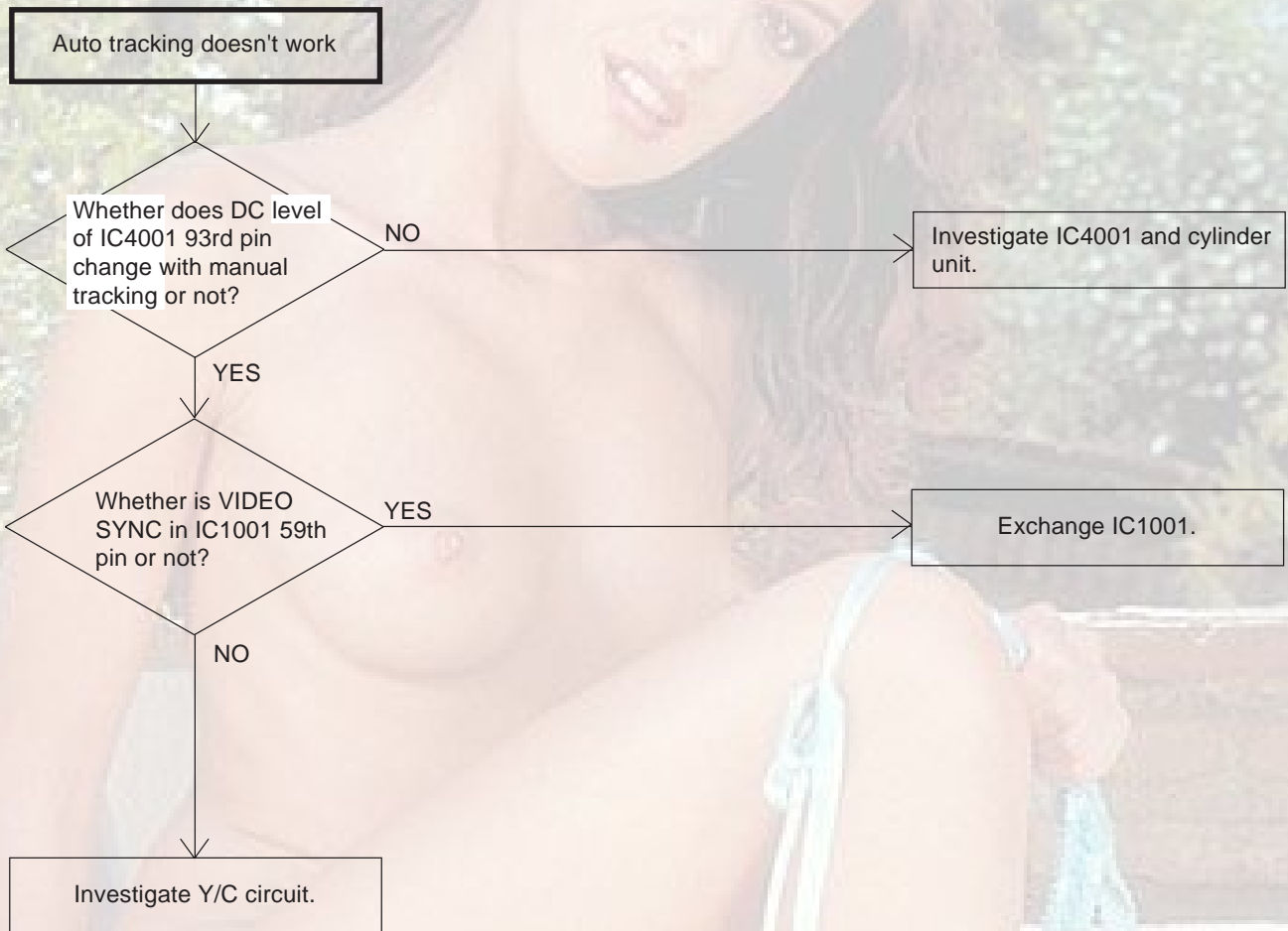
TROUBLESHOOTING GUIDE



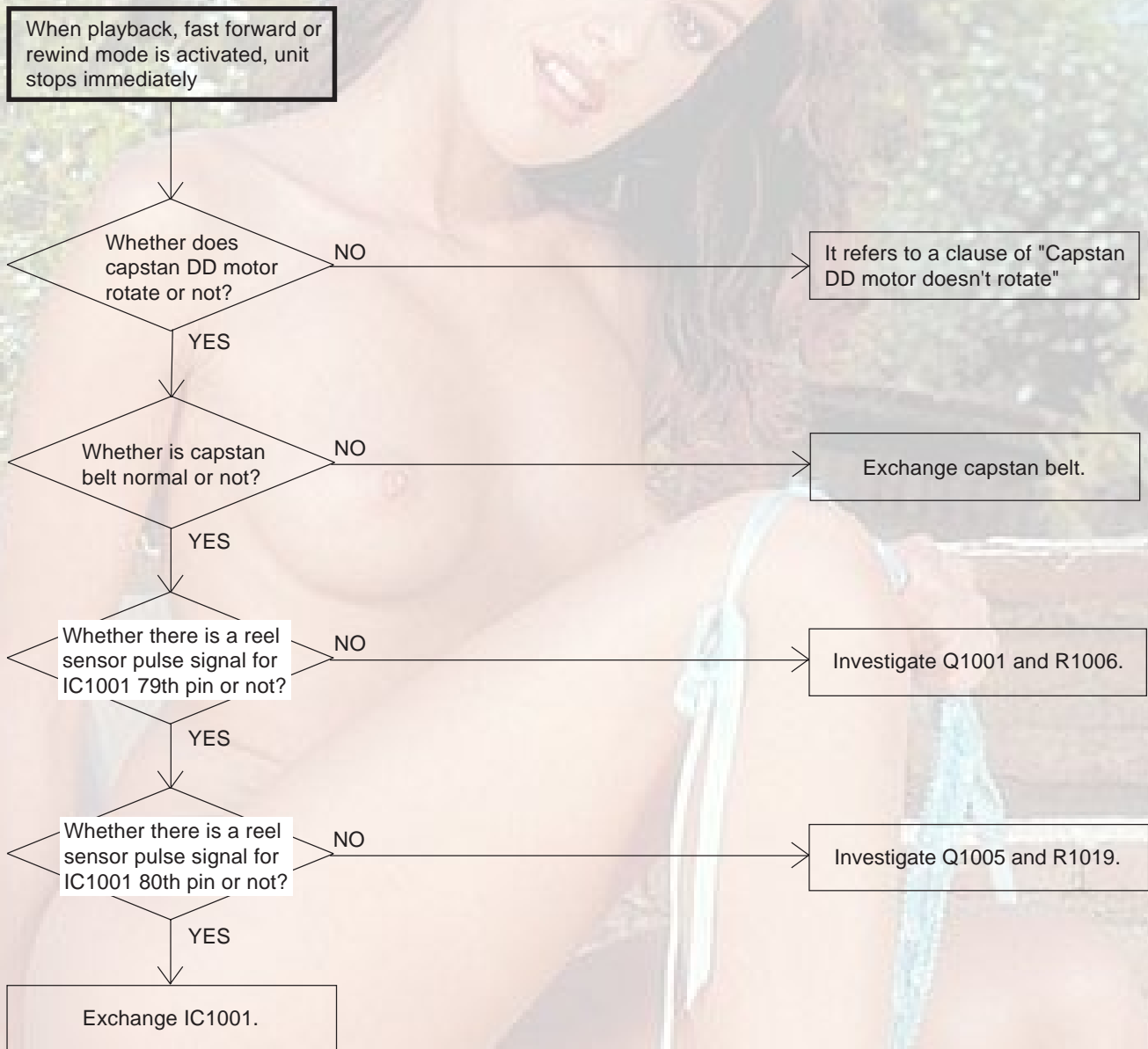
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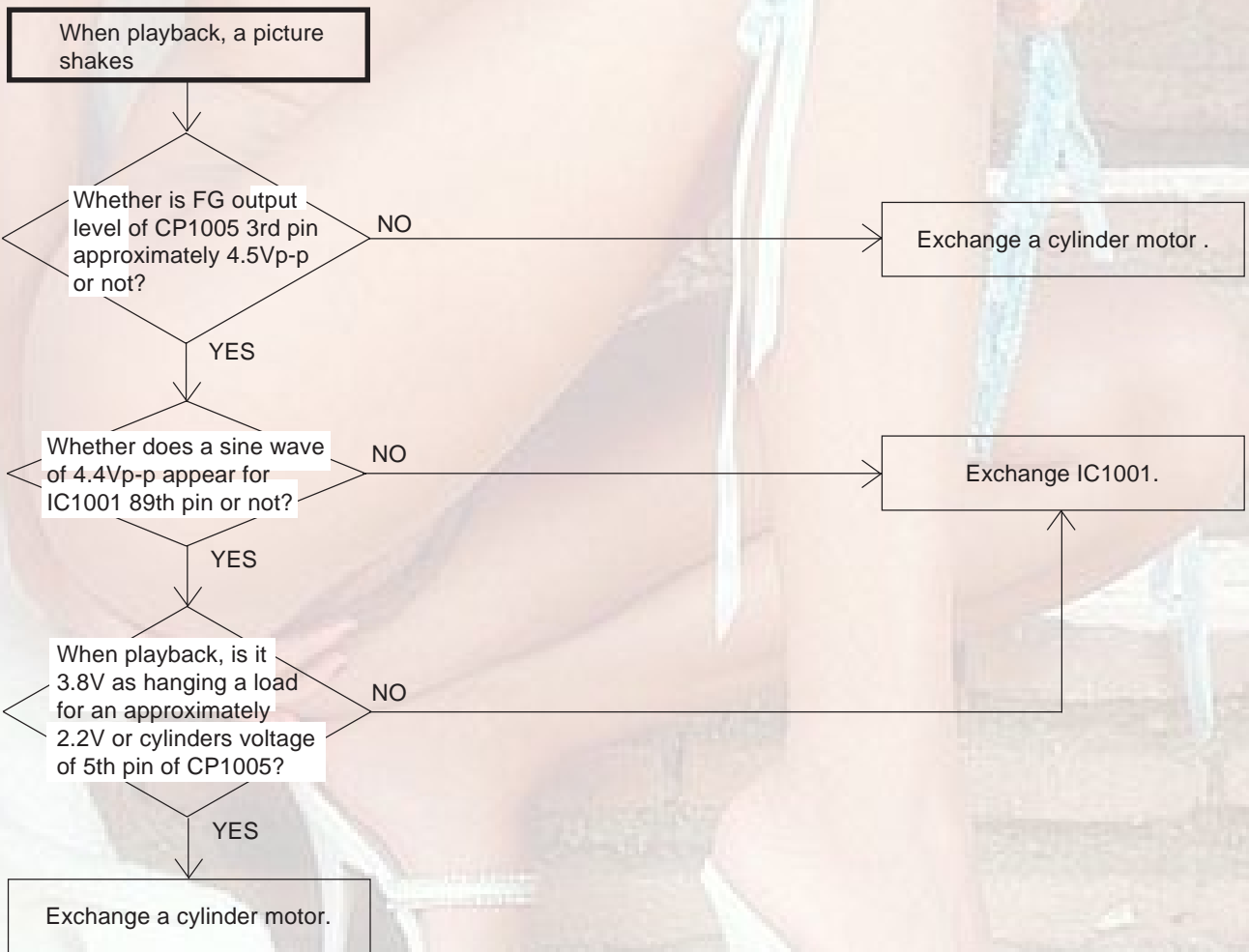
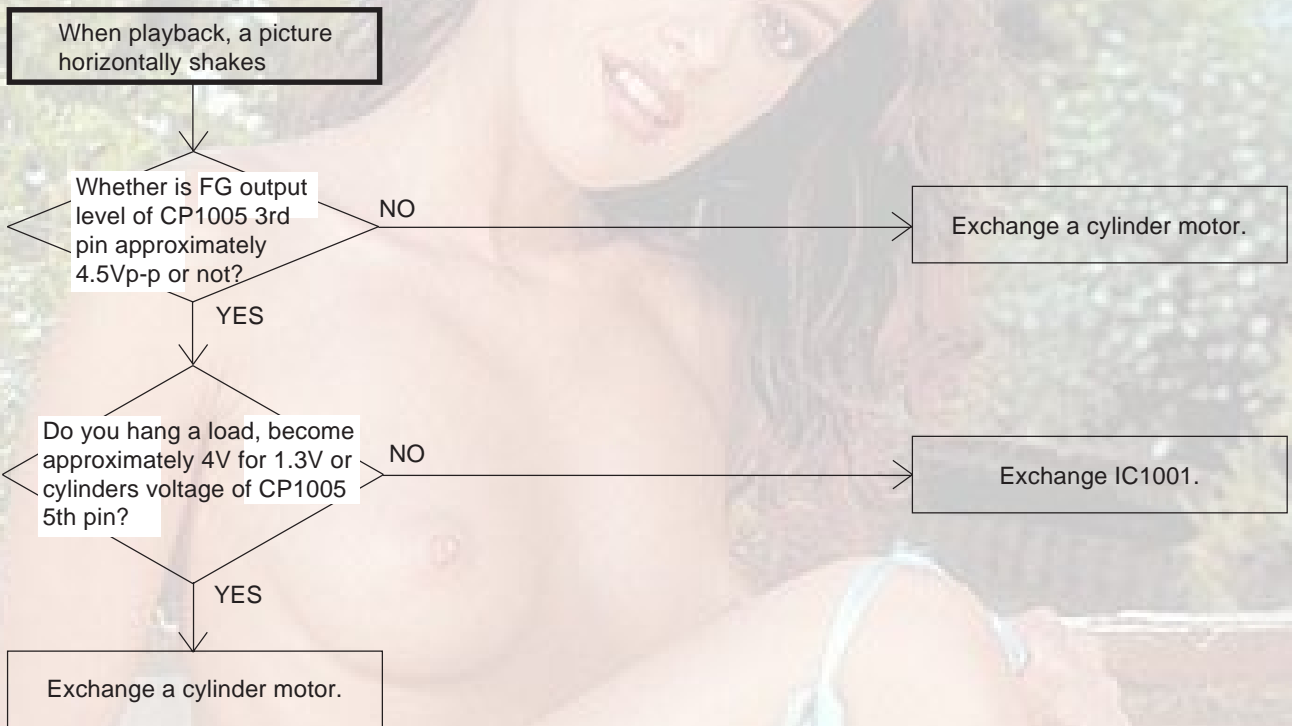
TROUBLESHOOTING GUIDE



TROUBLESHOOTING GUIDE



TROUBLESHOOTING GUIDE



SERVO TIMING CHART

IC1001 (OEC7041A)

DPG 90 PIN

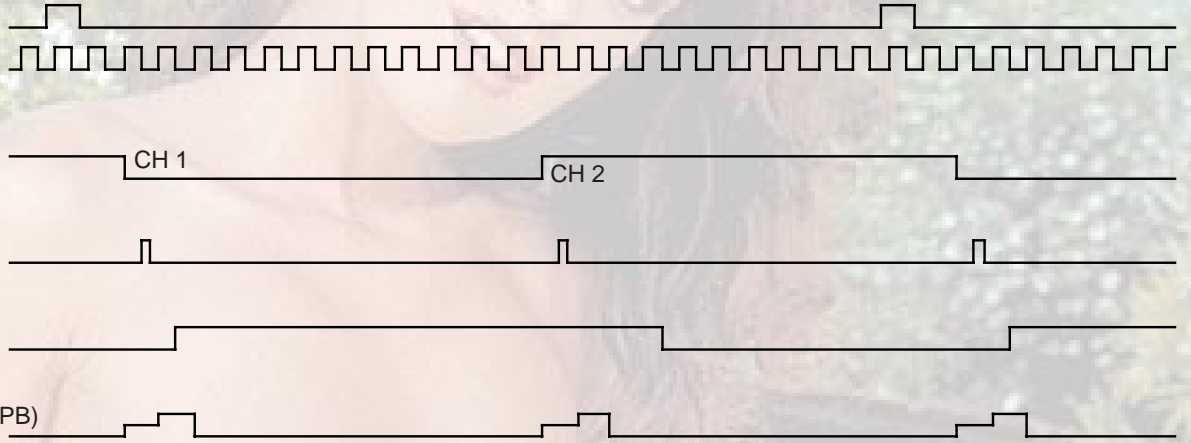
DFG 89 PIN

H. SW. P
18 PIN

V-SYNC (E-E)
59 PIN

REC CTL (REC)
97 PIN

V-SYNC (TRICK PB)
13 PIN



• WAVEFORM CHANGES DEPENDED ON THE TAPE SPEED

IC DESCRIPTION

OEC7041A (IC1001)

Pin No.	Pin Name	I/O	DESCRIPTION
1	MSEN-A	I	Input terminal of mecha state sensor.
2	MSEN-B	I	
3	EOT	I	Tape end sensor input signal.
4	BOT	I	Tape start sensor input signal.
5	HI-FI-ENV	I	Input terminal of HiFi RF envelope.
6	VIDEO-ENV	I	Input terminal of video RF envelope.
7	AFT(MONI)	I	Input terminal of AFT.
8	AFT(REC)	I	Not used.
9	KEY A	I	Main unit key input.
10	KEY B	I	
11	CAP-FWD	O	Capstan forward and backward command.(forward "L" output)
12	CAP-LIMIT	O	Switch the maximum output current of the Capstan Motor.
13	DUMMY-V.SYNC	O	Virtual V Pulse output.
14	REMOCON-IN	I	Receive the remote control signal.
15	COLOR ROTARY	O	Color Rotary Control output.
16	HEAD.AMP.SW	O	Switching output of Head Amp SW on 4 heads.
17	ENV-CMP-IN	I	Comparison results input of Playback Envelope level ON SP/LP heads(4heads).
18	VIDEO-H.SW	O	Output terminal of Head SW to Y/C/A and Head Amp.
19	HI-FI-H.SW	O	Output terminal of audio Head SW to Y/C/A and Head Amp.
20	LDM-RVS	O	Output signal to control the rotation direction of the loading motor.
21	LDM-FWD	O	
22	TRICK-PB-H	O	Special effect playback.(CUE/REVIEW/STILL/SLOW etc)
23	MSENS-CTL	O	MSEN sensor LED.
24	CAP-HI H	O	Power of Capstan Motor select.
25	PLAY LED	O	PLAY indication LED output.
26	EXT-MUTE	O	Mute signal of external video mute.
27	VCR-POWER	O	VCR power output.
28	TV-POWER	O	TV power output.
29	T-REC LED	O	T-REC indication LED output.
30	REC LED	O	REC indication LED output.
31	ON-TIMER LED	O	ON-TIMER indication LED output.
32	OTP LED	O	OTP indication LED output.
33	AKB CTL	O	"H" is output at the time of AKB white adjustment.
34	RESET-L	I	RESET will be done when the voltage goes to HIGH after the reset signal.
35	XC_IN(32kHz)	I	Subclock pulse.(32kHz)
36	XC_OUT(32kHz)	O	
37	VCC	-	5V
38	X-IN(12MHz)	I	Connect the main crystal.(10MHz)
39	X-OUT(12MHz)	O	
40	VSS	-	Ground.
41	AV1	O	Not used.
42	AV2	O	Not used.
43	CLKSEL	I	5V
44	OSC-IN2	I	Condenser connection for OSC-IN2.

IC DESCRIPTION

OEC7041A (IC1001)

Pin No.	Pin Name	I/O	DESCRIPTION
45	OSC-OUT2	O	Condenser connection for OSC-OUT2.
46	NUB	-	Ground.
47	CM_ADV_VIDEO	I/O	Not used.
48	CM_ADV_AUDIO	I	Not used.
49	OSD-VSS	-	Ground.
50	TAB SW	I	Input terminal for judge the tape if it has TAB or not.
51	SERVICE	I	Input terminal for Service Mode.
52	SD-IN(MONI)	I	Not used.
53	OSD-VCC	-	5V
54	HLF	-	Condenser connection for HLF.
55	VHOLD	-	Condenser connection for VHOLD.
56	CVIN	I	Composite Video input terminal.
57	NUA	-	Ground.
58	H/C-SYNC	I	Input terminal for H-SYNC.
59	V-SYNC	I	Input terminal for V-SYNC.
60	OSD OUT1	O	Blanking output terminal of OSD.
61	CENTER LED	O	Tape end sensor LED.
62	B	O	Color signal blue output.
63	G	O	Color signal green output.
64	R	O	Color signal red output.
65	CAP FULL	O	Output the HIGH during the acceleration force of capstan motor at SLOW mode.
66	V-REC-ST-H	O	On control of A/V recording (Whole width erase) circuit.
67	IIC-CLK3	O	Not used.
68	IIC-DATA3	I/O	Not used.
69	SP-H	O	Output "H" terminal of Playback/Recording SP mode.
70	IIC-DATA2	I/O	Terminal for I2C BUS communication.
71	IIC-CLK1	O	CLOCK terminal for I2C BUS communication.
72	IIC-DATA1	I/O	DATA terminal for I2C BUS communication.
73	IIC-OFF	I	When input "L" the I2CBUS communication is stopped.
74	JUST CLOCK	I	Not used.
75	AGC(REC)	O	Not used.
76	CAP-PWM	O	PWM putput of Capstan control.
77	DRUM-PWM	O	PWM putput of Cylinder control.
78	E/V_MASK	I	Not used.
79	REEL-S	I	Input terminal of reel sensor supply.
80	REEL-T	I	Input terminal of reel sensor take up.
81	VCR_A_MUTE	O	Mute signal of audio mute.(VCR)
82	TV_A_MUTE	O	Mute signal of audio mute.(TV)
83	FF/REW-L	O	The output terminal of to that switches the frequency characteristic of CTL by the circuit bill outside.
84	CA/MA_SEL	O	Not used.
85	POWER_FAIL_L	I	Input for the detection of power interruption.
86	CFG AMP-OUT	O	Not used.
87	CAP-FG	I	Input terminal for capstan rotation signal detection.

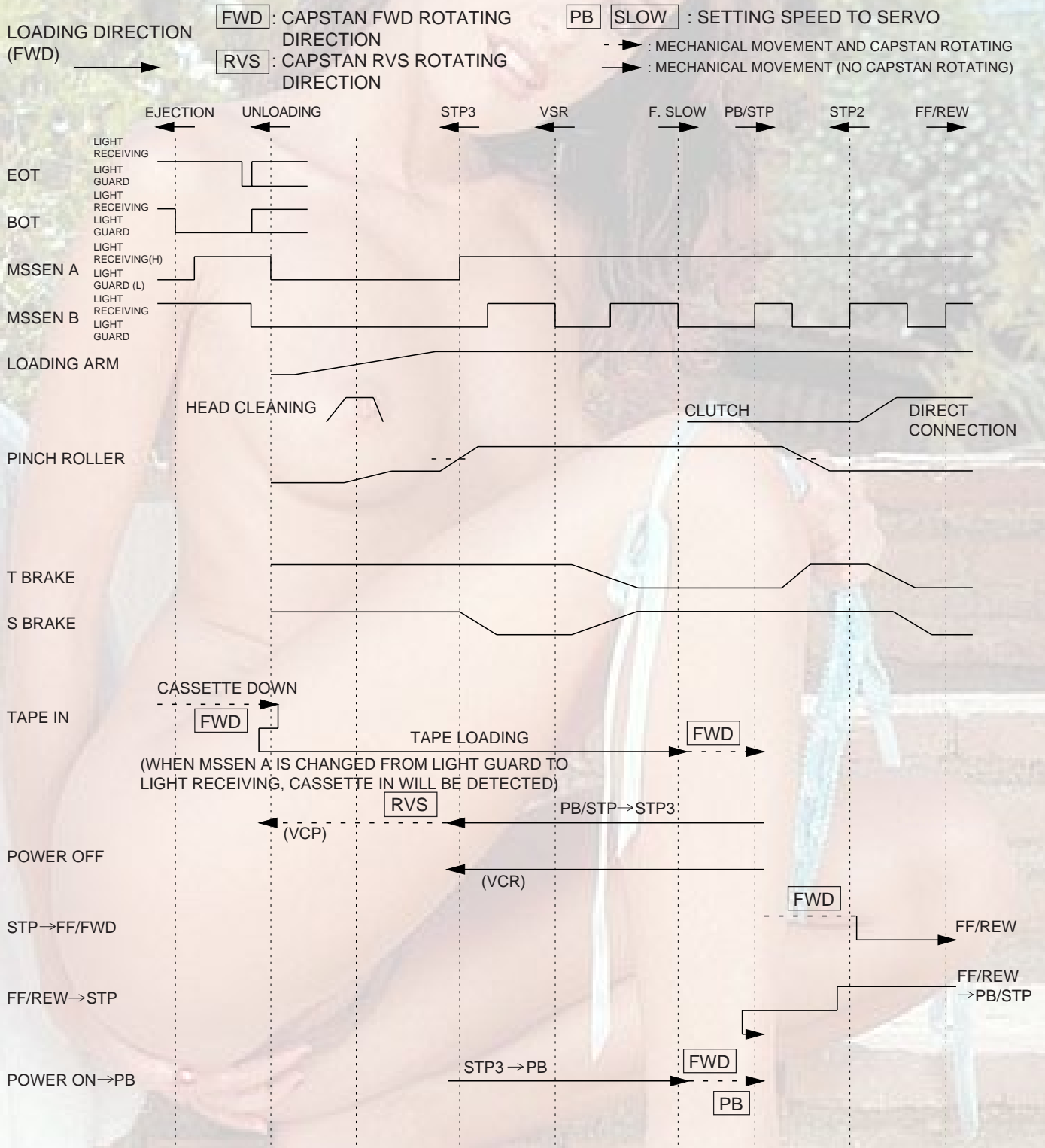
IC DESCRIPTION

OEC7041A (IC1001)

Pin No.	Pin Name	I/O	DESCRIPTION
88	AMP-VSS	-	Ground.
89	DRUM-FG	I	Input terminal for drum rotation signal detection.
90	DRUM-PG	I	Input terminal for DRUM PG signal detection.
91	AMP-VREFOUT	O	Condenser connection for AMP-VREFOUT.
92	AMP-VREFIN	I	Condenser connection for AMP-VREFIN.
93	C	I	Condenser connection for C.
94	CTL-	I/O	Input and output terminal of Control Head.
95	CTL+	I/O	Input terminal of Control Head.
96	AMP C	-	Condenser connection for AMP C.
97	CTL AMP-OUT	O	Output terminal for amp out.
98	AMP-VCC	-	5V
99	ANALOG VCC	-	5V
100	DEW(mono)	I	Input terminal for the detection with the dew of the cylinder.
100	STEREO SEL(HiFi)	I	Input terminal for the judgement of voice reception condition.

- The assignment for Pin 100 is varies according to the SET which is MONO or Hi-Fi.
It is used for DEW terminal in MONO and STEREO SEL terminal in Hi-Fi.

SYSTEM SWITCH MODE

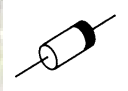


SEMICONDUCTOR BASE CONNECTIONS

DIODE



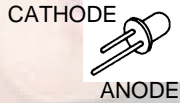
1SS133T-77
HZ11B3L TD
HZ27-1L TD
HZ30-1L TD
MTZJ30B T-77
MTZJ5.1B T-77
MTZJ5.6B T-77
MTZJ6.2B T-77
MTZJ6.8B T-77
MTZJ9.1B T-77
SB10-03A3



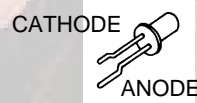
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11EQS04N-TA1B2
11ES1N-TA1B2
1N4005E-G23
RD12FB-T7
RMFG06J



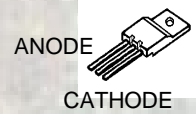
10ELS6TA1B2
21DQ09N-TA2B1
RM11C
RM11C-LF-B1
RU2AM V1



SID1050CM
SLR-342VCT32

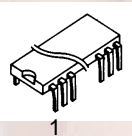


SLZ-345B-02-T1

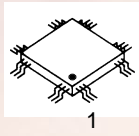


FMV-3FULF027-102

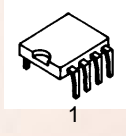
IC



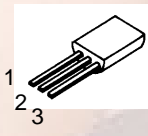
20PIN
M62420SP



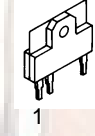
64PIN
AN3662FBP
80PIN
LA71170M-MPB



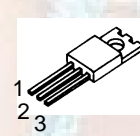
8PIN
M24C04-BN6



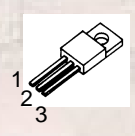
3PIN
PST600H



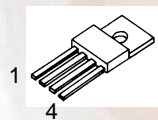
7PIN
LA7840



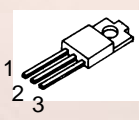
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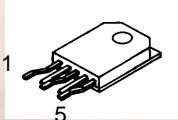
3PIN
KIA7806PI
KIA7812PI



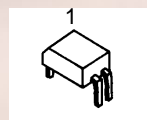
4PIN
PQ09RD08



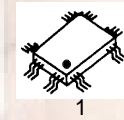
3PIN
UPC2406AHF



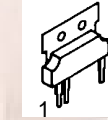
5PIN
STR-F6626



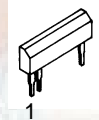
4PIN
TLP621(D4-GR-LF2)



100PIN
LA76814BM-MPB
OEC7041A



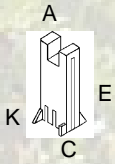
12PIN
AN7522



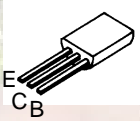
8PIN
BA6955AN

SEMICONDUCTOR BASE CONNECTIONS

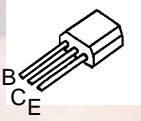
TRANSISTOR



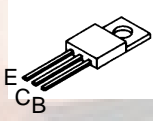
SG-260



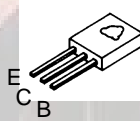
2SA1318(S,T)-AA
2SA1371(D,E)-AE
2SA733(C)-T_Q
2SB892(S,T)-AE
2SC1317(Q,R,S)-T
2SC1815Y(TPE2)
2SC2909(S,T)-AA
2SC3331(S,T,U)-A



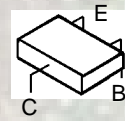
2SC1740SP TP



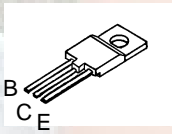
2SD2396(J,K)



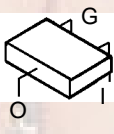
2SC2621(D,E)-RAC



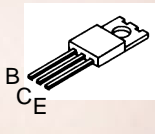
2SA1037AKT146R,S RPI-352Q01R
2SC2412KT146 R,S
DTC114TKAT146



2SD2499(LBOEC1)



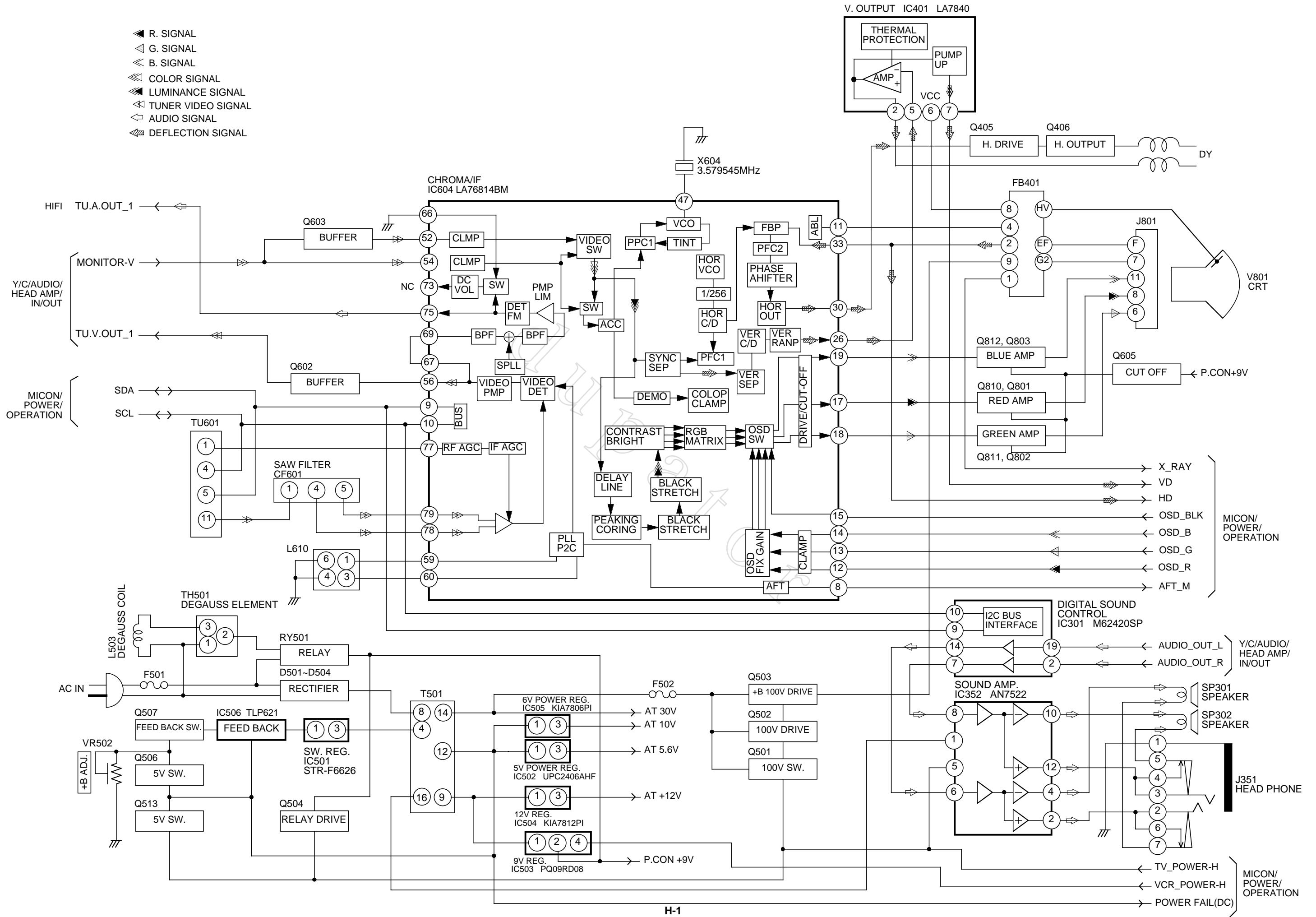
DTA124EKAT146
DTC114EKAT146
DTC124EKAT146
DTC143EKAT146



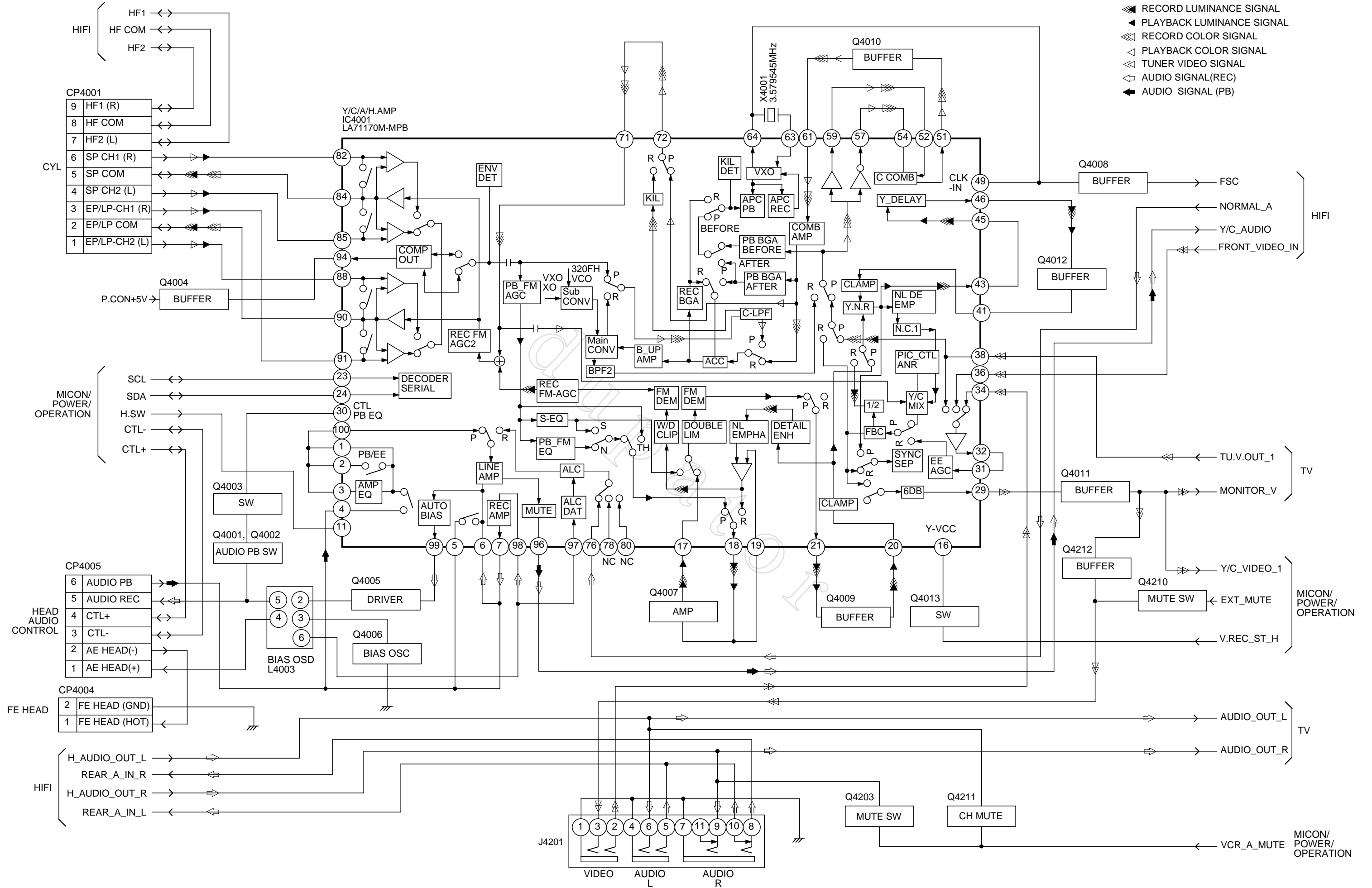
2SC4160-OEC-YAC1
2SD1667(R,S)

TV BLOCK DIAGRAM

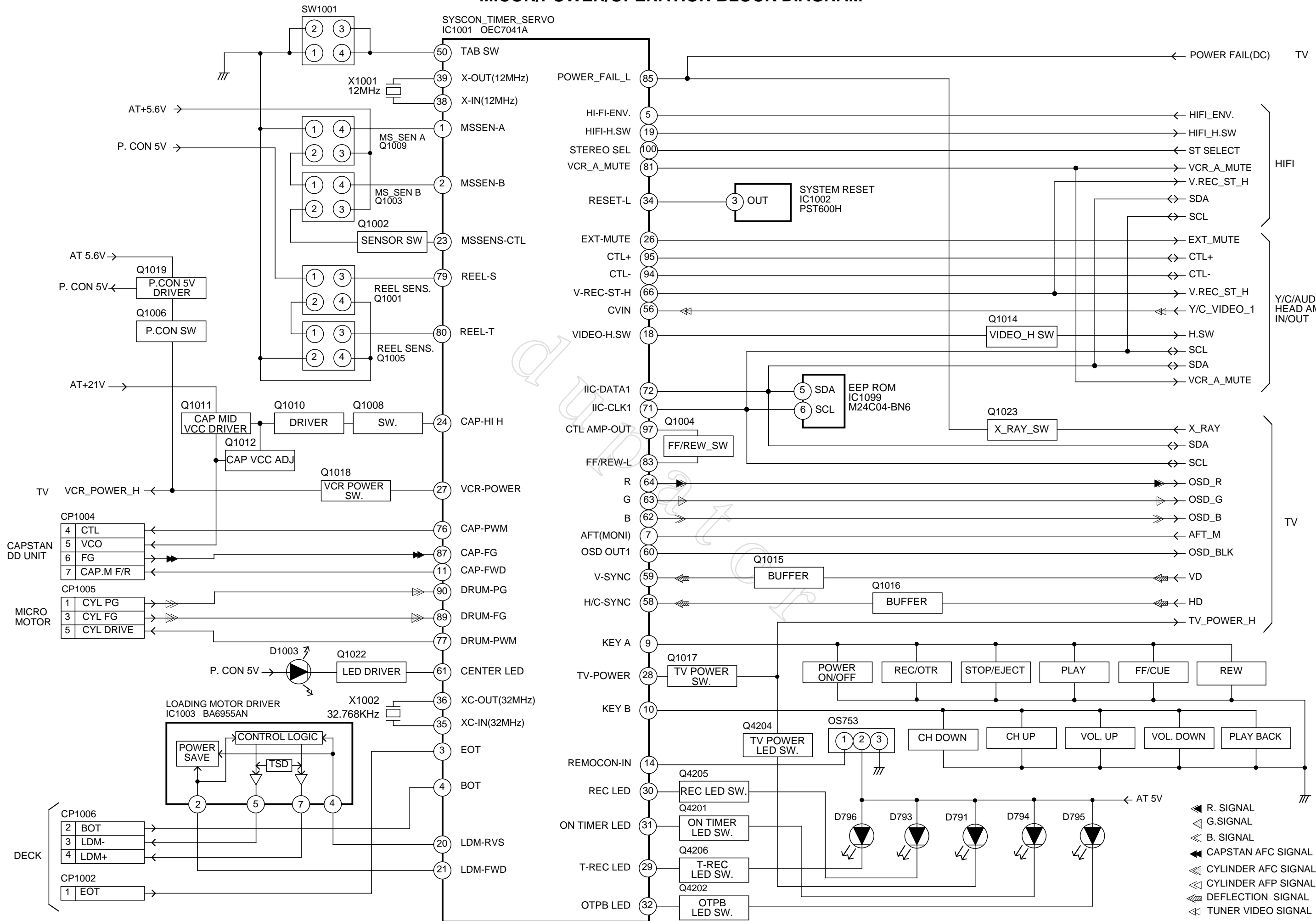
- ◀ R. SIGNAL
- ◀ G. SIGNAL
- ◀ B. SIGNAL
- ◀ COLOR SIGNAL
- ◀ LUMINANCE SIGNAL
- ◀ TUNER VIDEO SIGNAL
- ◀ AUDIO SIGNAL
- ◀ DEFLECTION SIGNAL



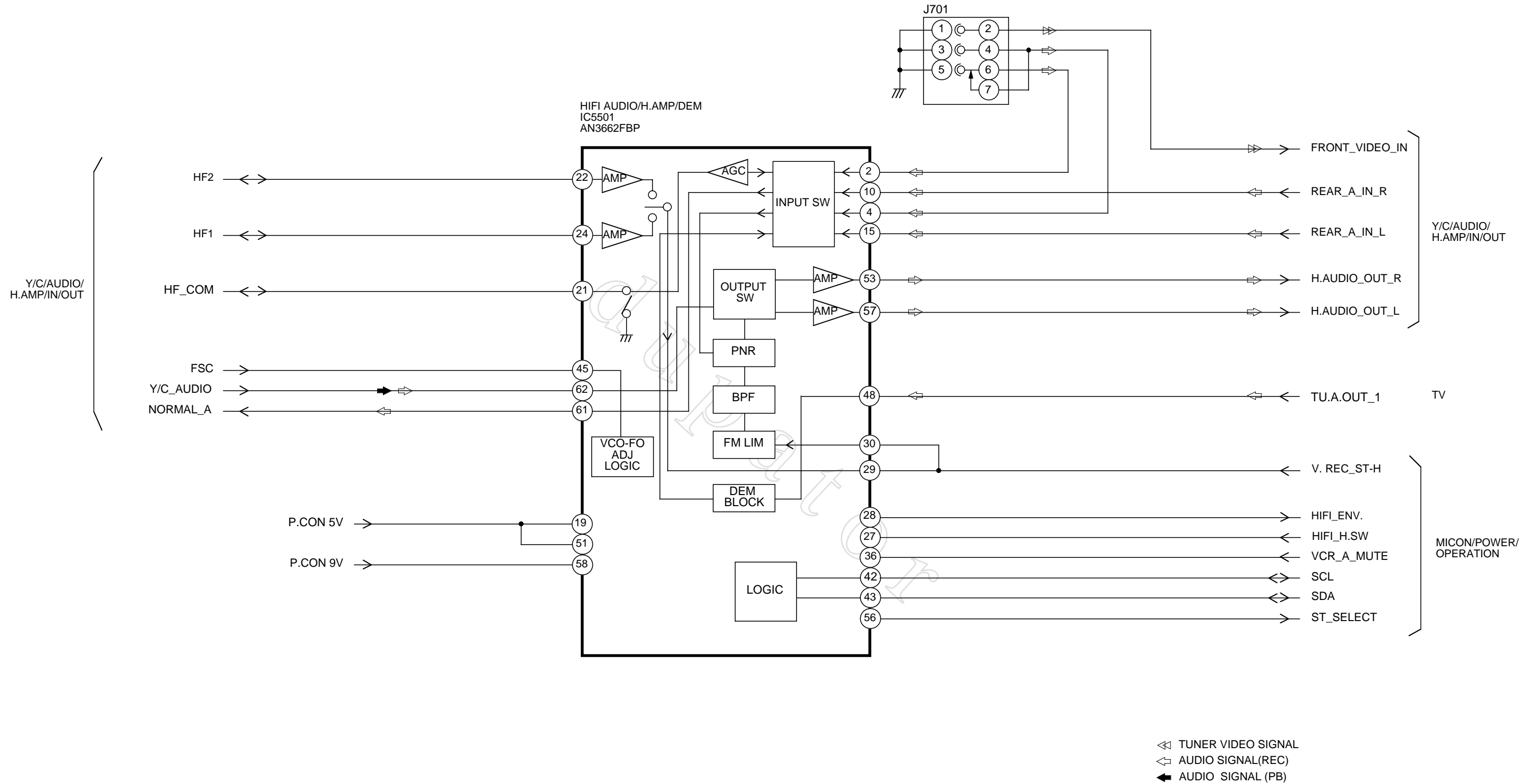
Y/C/AUDIO/HEAD AMP/IN/OUT BLOCK DIAGRAM



MICON/POWER/OPERATION BLOCK DIAGRAM

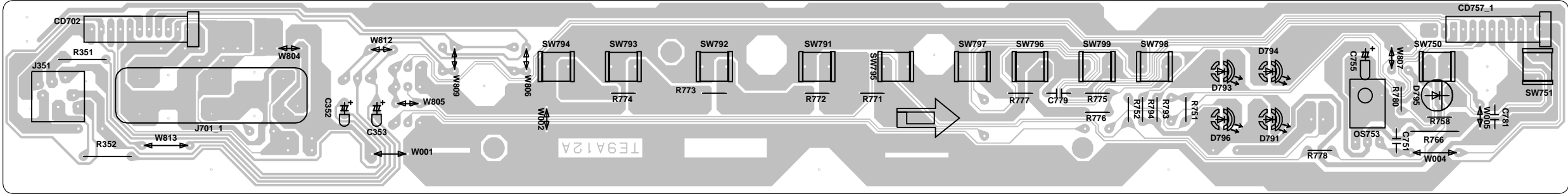


HIFI BLOCK DIAGRAM

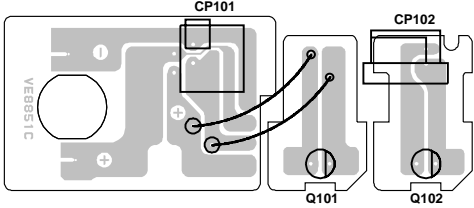


PRINTED CIRCUIT BOARDS

OPERATION
SOLDER SIDE

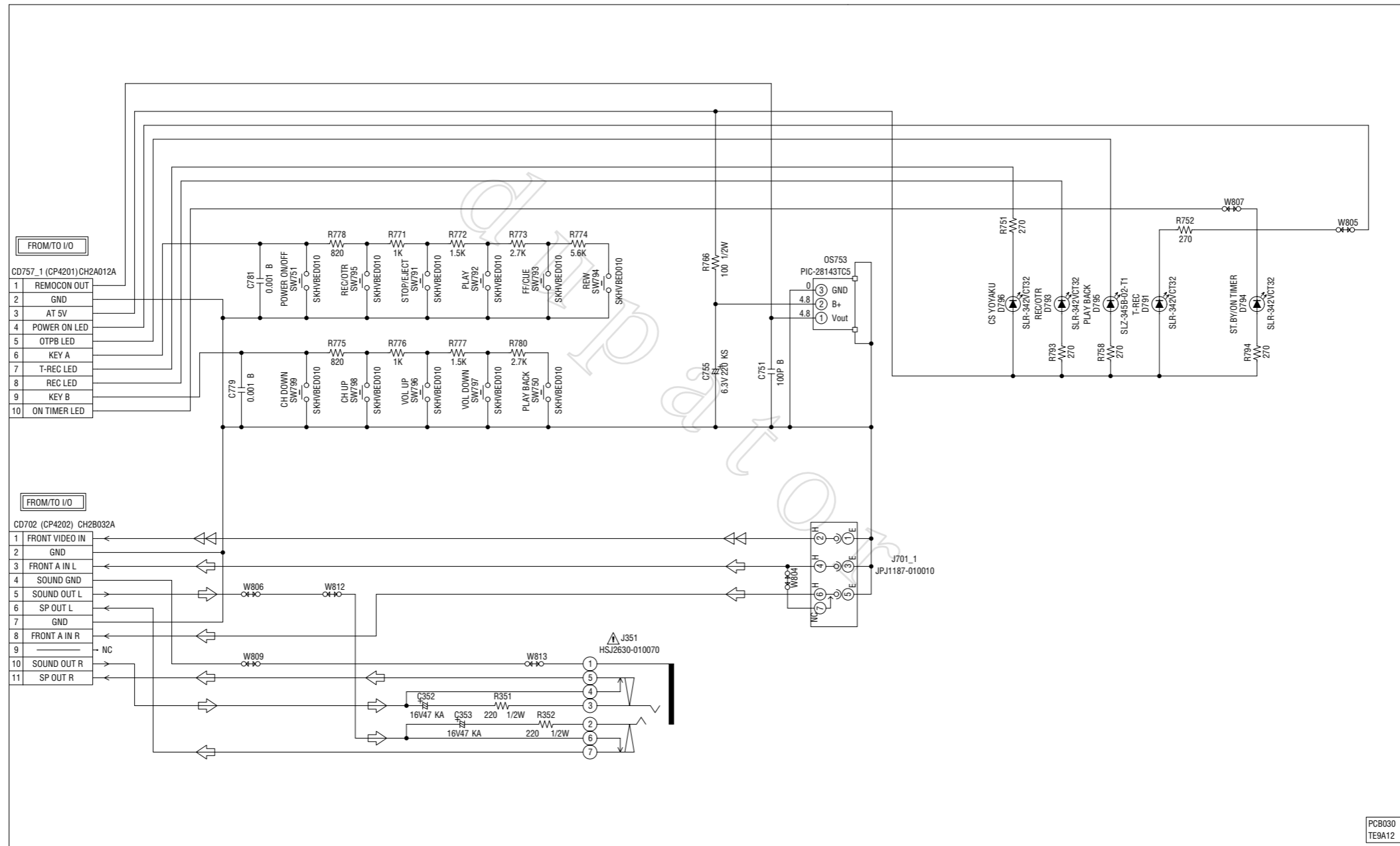


DECK
SOLDER SIDE



OPERATION SCHEMATIC DIAGRAM

(OPERATION PCB)



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

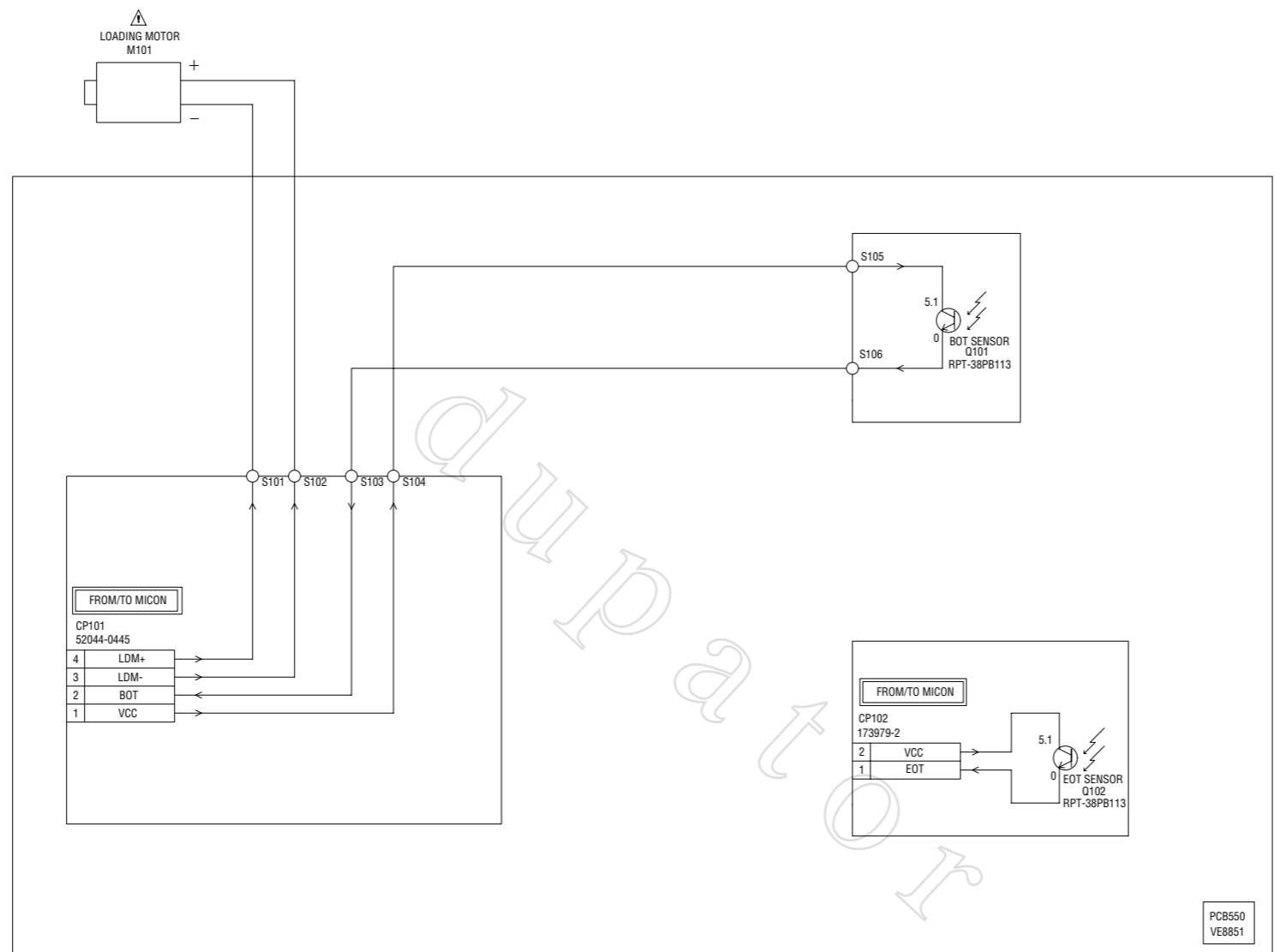
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.


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.

TUNER VIDEO SIGNAL
 AUDIO SIGNAL

DECK SCHEMATIC DIAGRAM



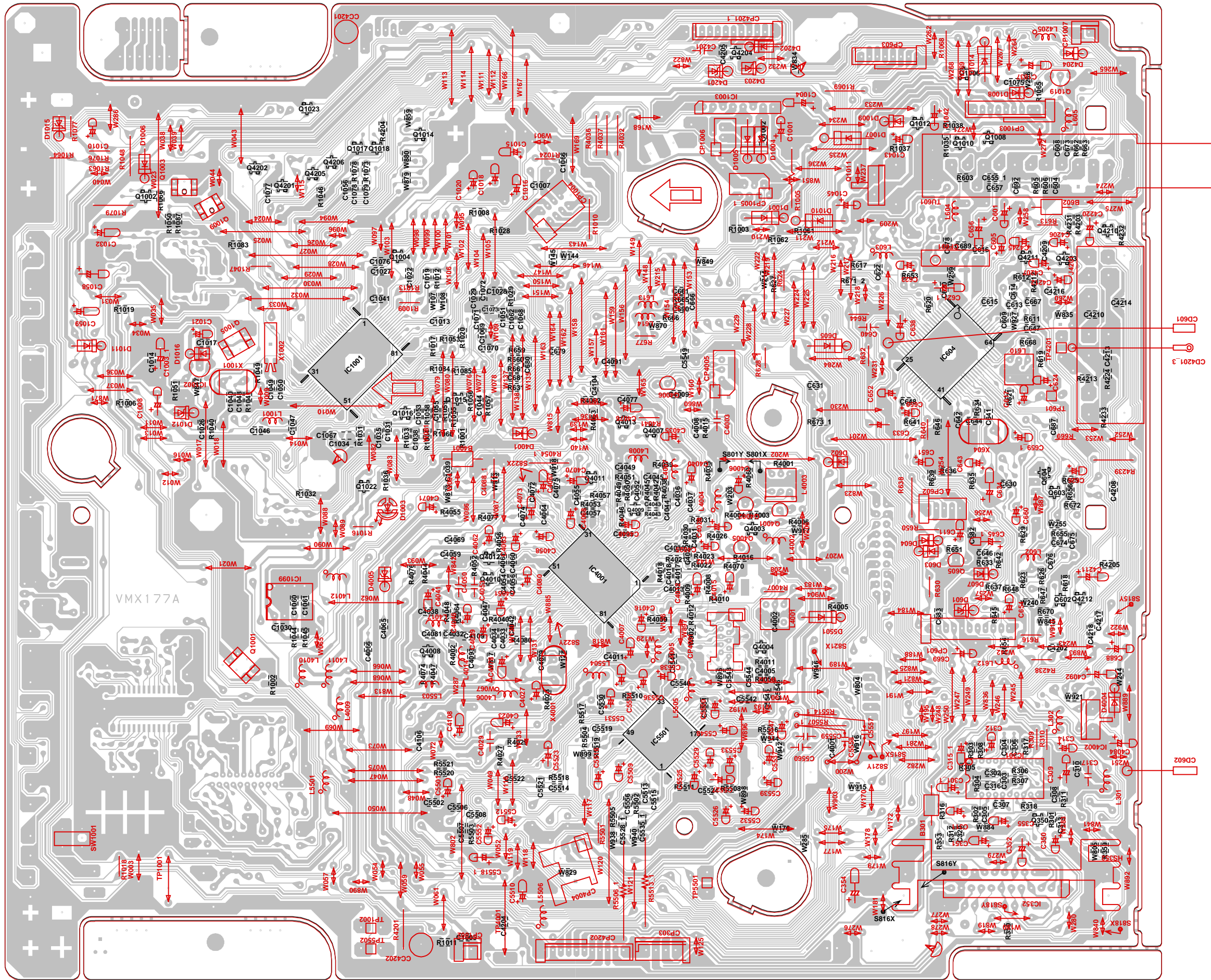
CAUTION: SINCE THESE PARTS MARKED BY  ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY .

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

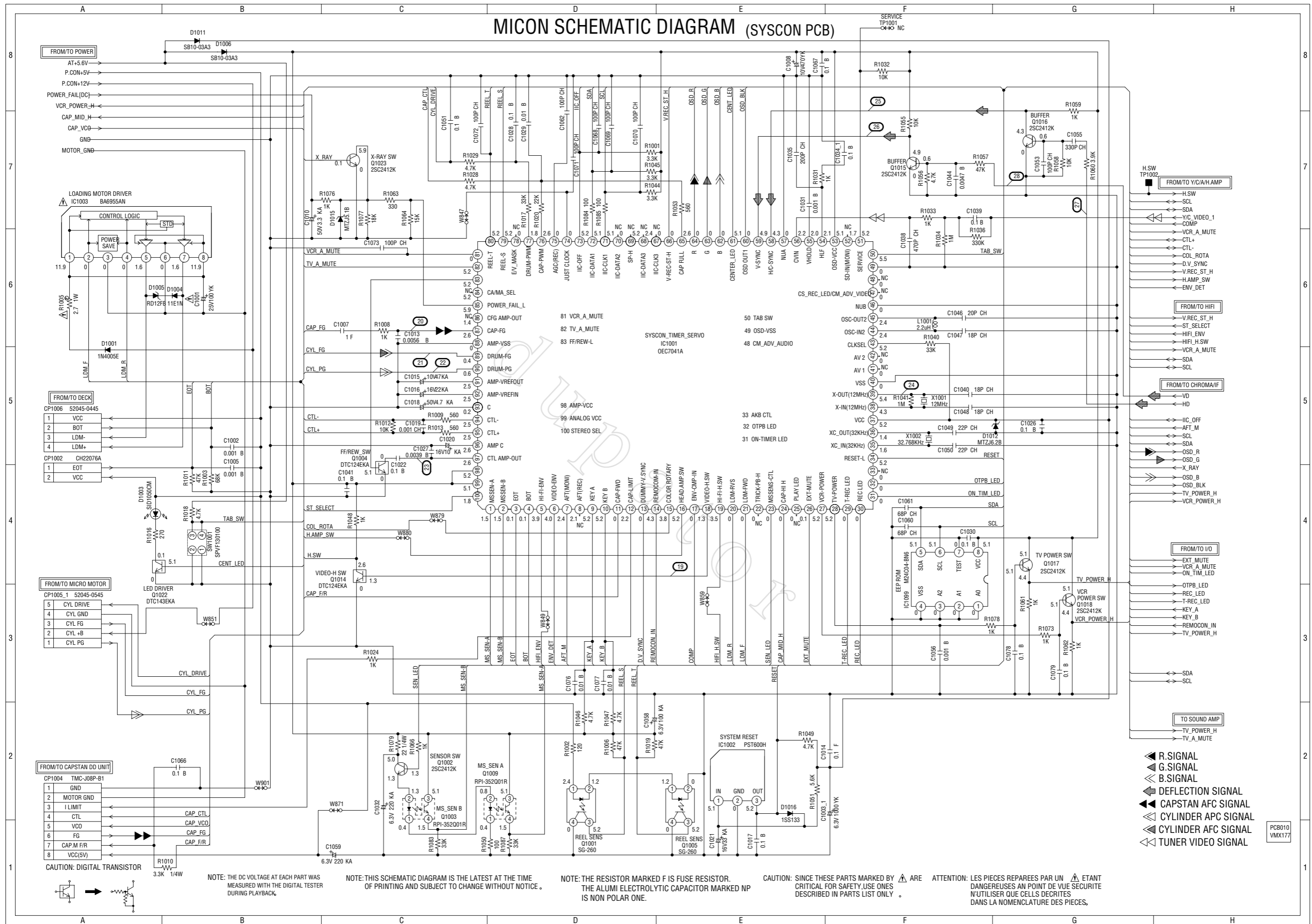
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

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

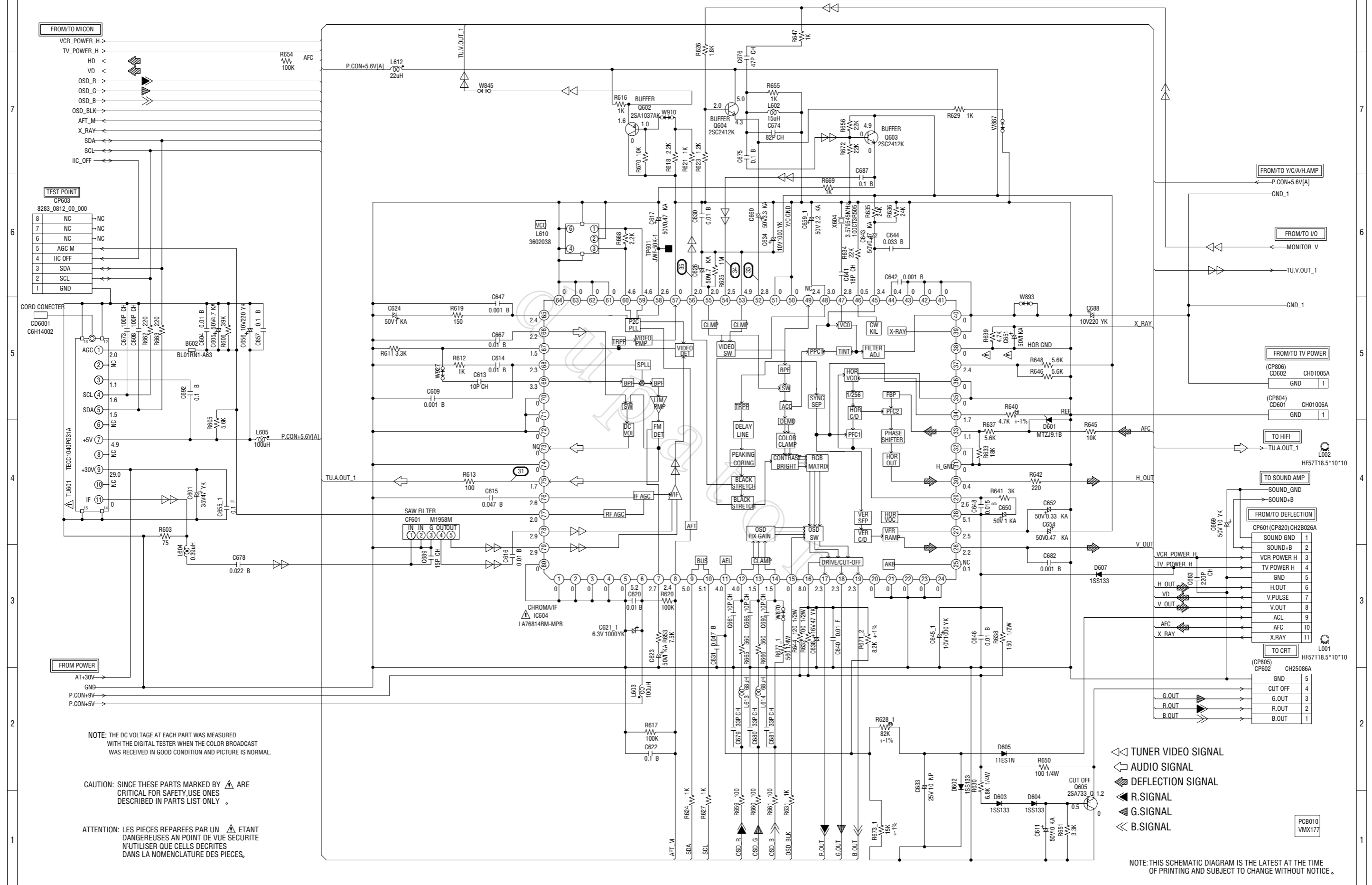
PRINTED CIRCUIT BOARDS
SYSICON



MICON SCHEMATIC DIAGRAM (SYSCON PCB)



CHROMA/IF SCHEMATIC DIAGRAM (SYSCON PCB)



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

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

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

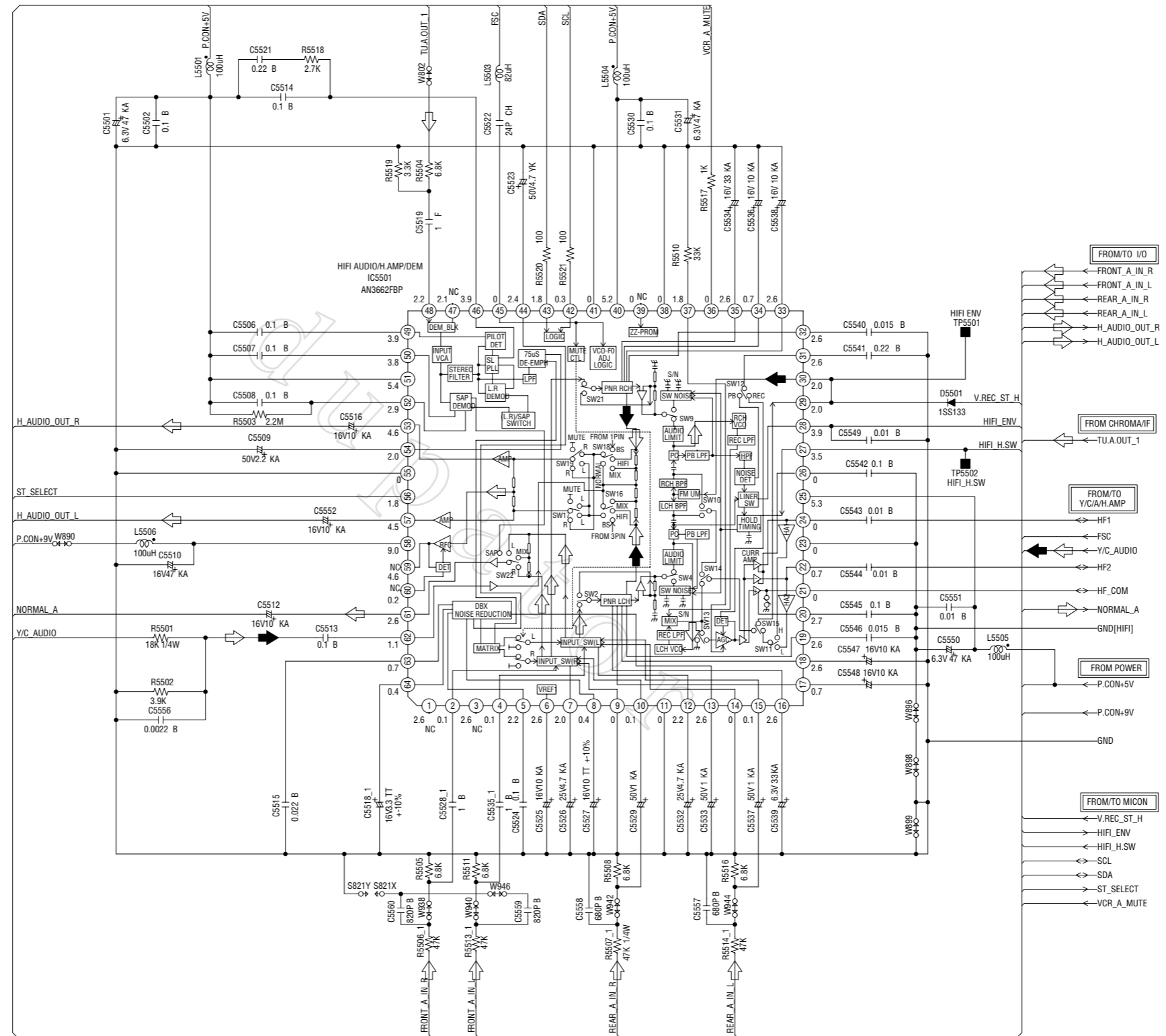
- \triangleleft TUNER VIDEO SIGNAL
- \triangleleft AUDIO SIGNAL
- \triangleleft DEFLECTION SIGNAL
- \triangleleft R.SIGNAL
- \triangleleft G.SIGNAL
- \triangleleft B.SIGNAL

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

PCB010
VMX177

HIFI SCHEMATIC DIAGRAM

(SYSCON PCB)



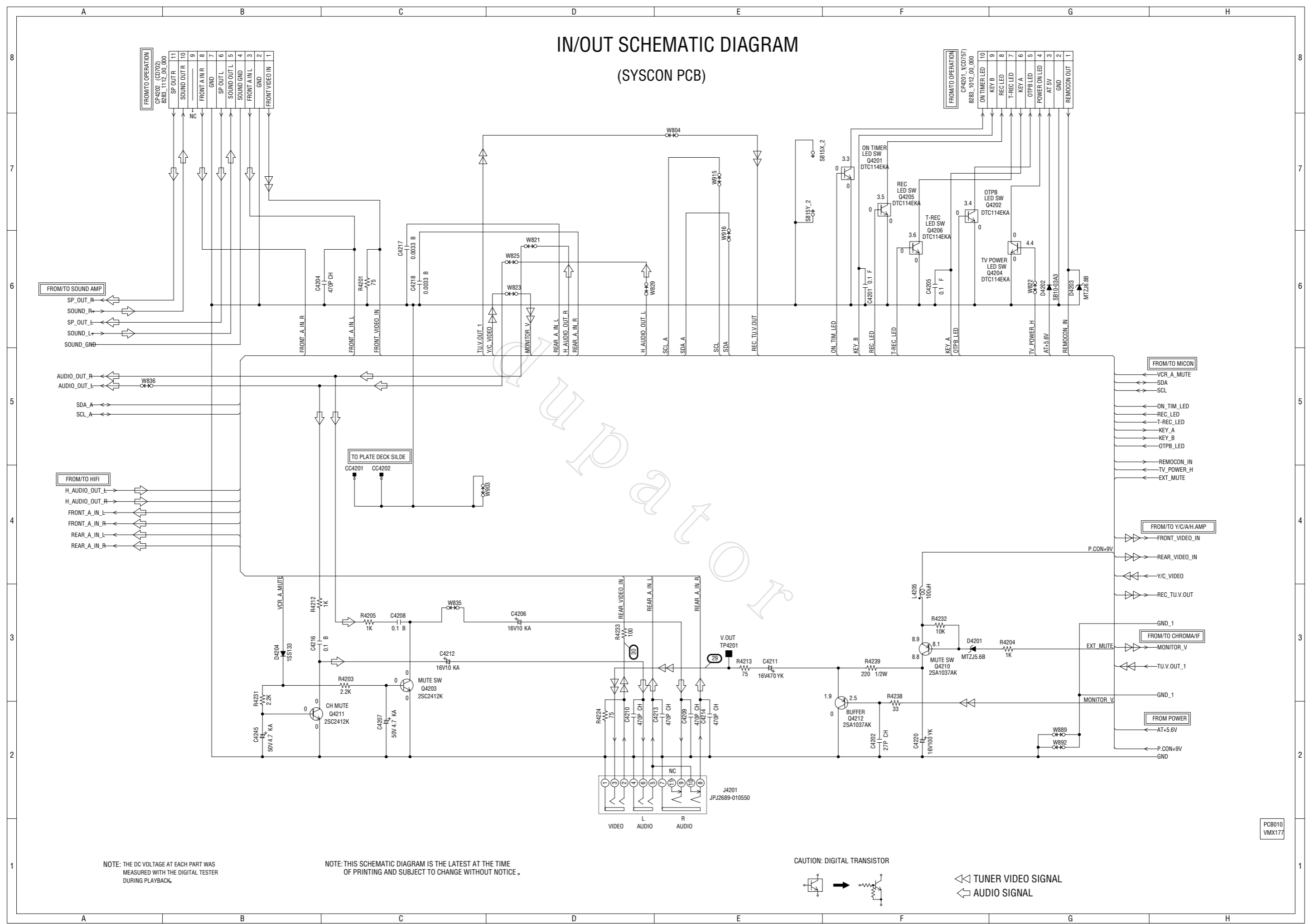
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

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

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

PC8010
 VMX177

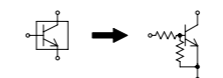
IN/OUT SCHEMATIC DIAGRAM (SYSCON PCB)



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.

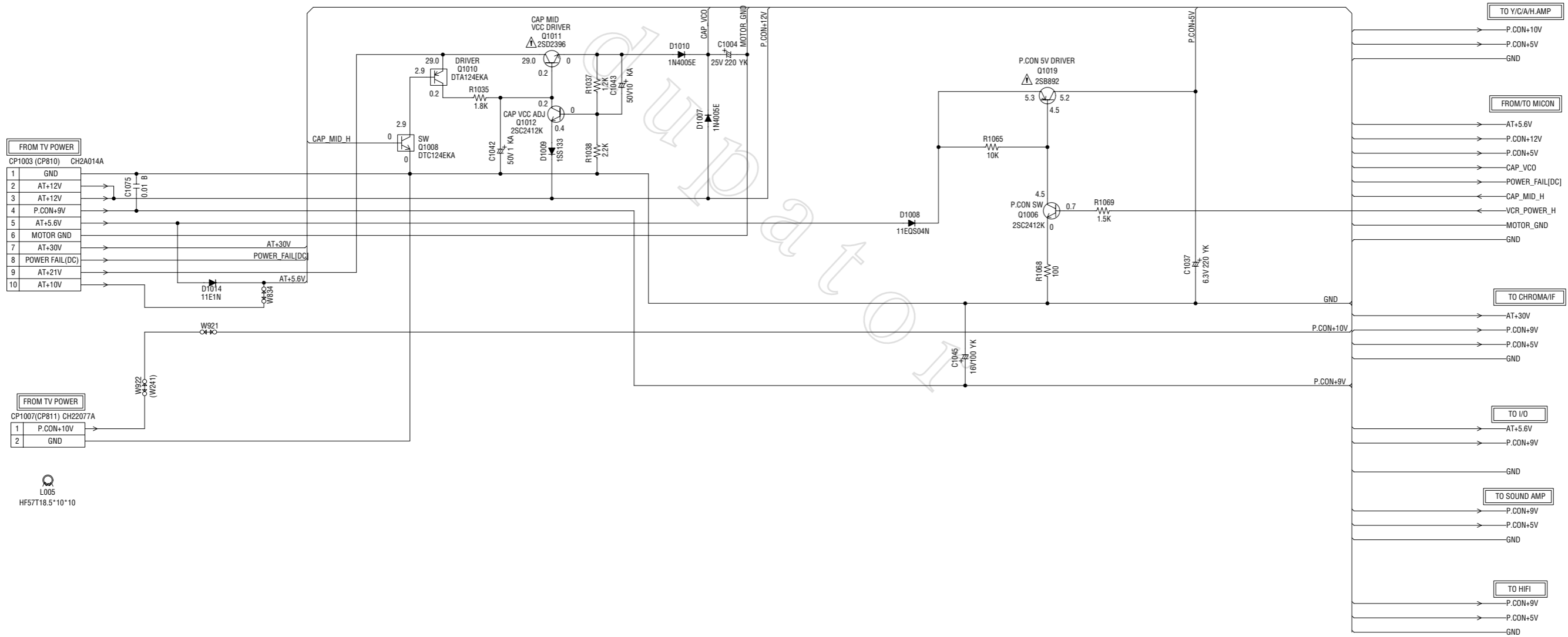
CAUTION: DIGITAL TRANSISTOR



TUNER VIDEO SIGNAL
 AUDIO SIGNAL

PCB010
VMX177

POWER SCHEMATIC DIAGRAM (SYSCON PCB)



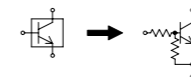
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

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

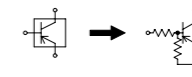
CAUTION: SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

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



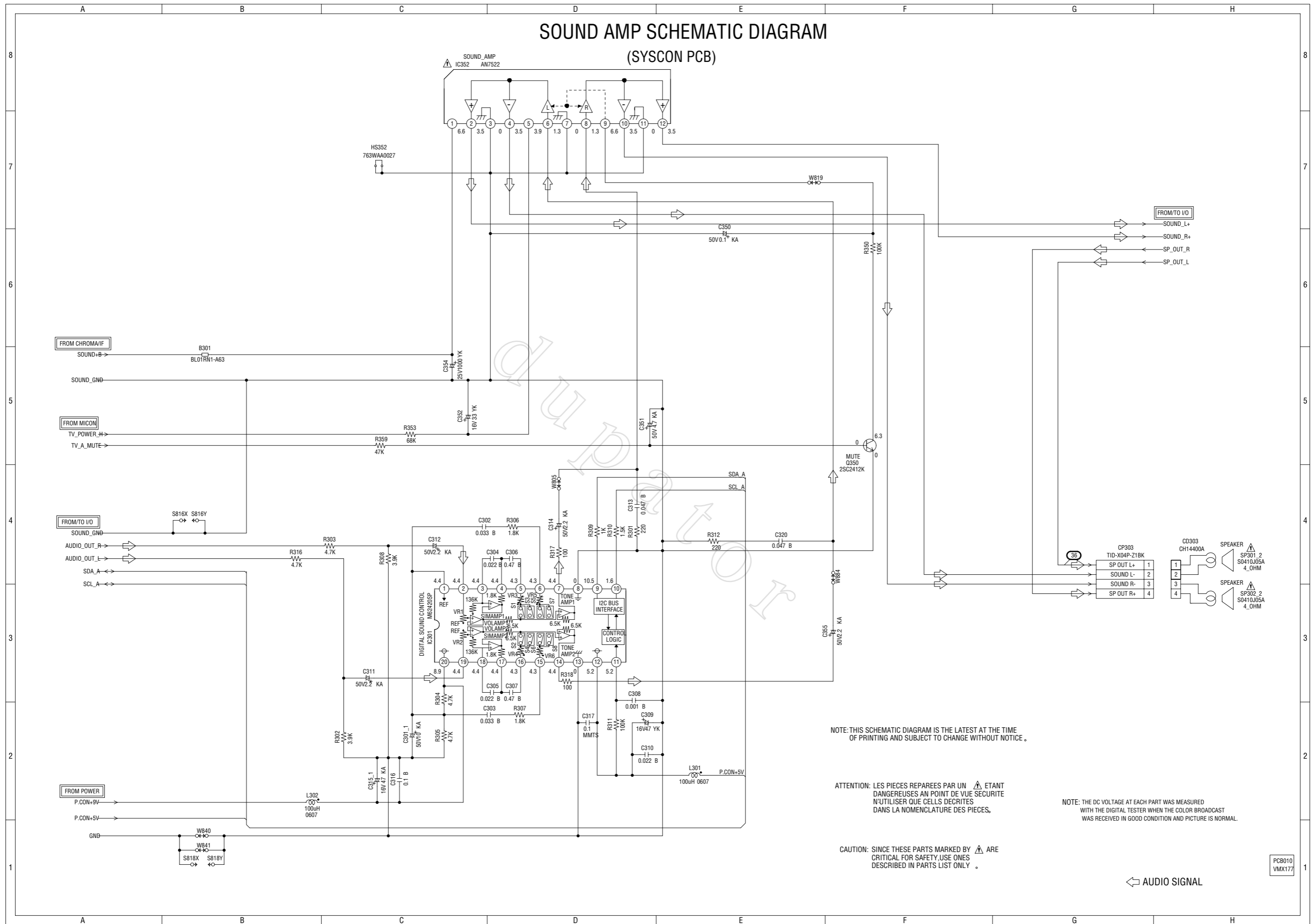
CAUTION: DIGITAL TRANSISTOR



PCB010
VMX177

SOUND AMP SCHEMATIC DIAGRAM

(SYSCON PCB)



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 AN POINT DE VUE SECURITE N'UTILISER QUE CELLES DECRITES DANS LA NOMENCLATURE DES PIECES.

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

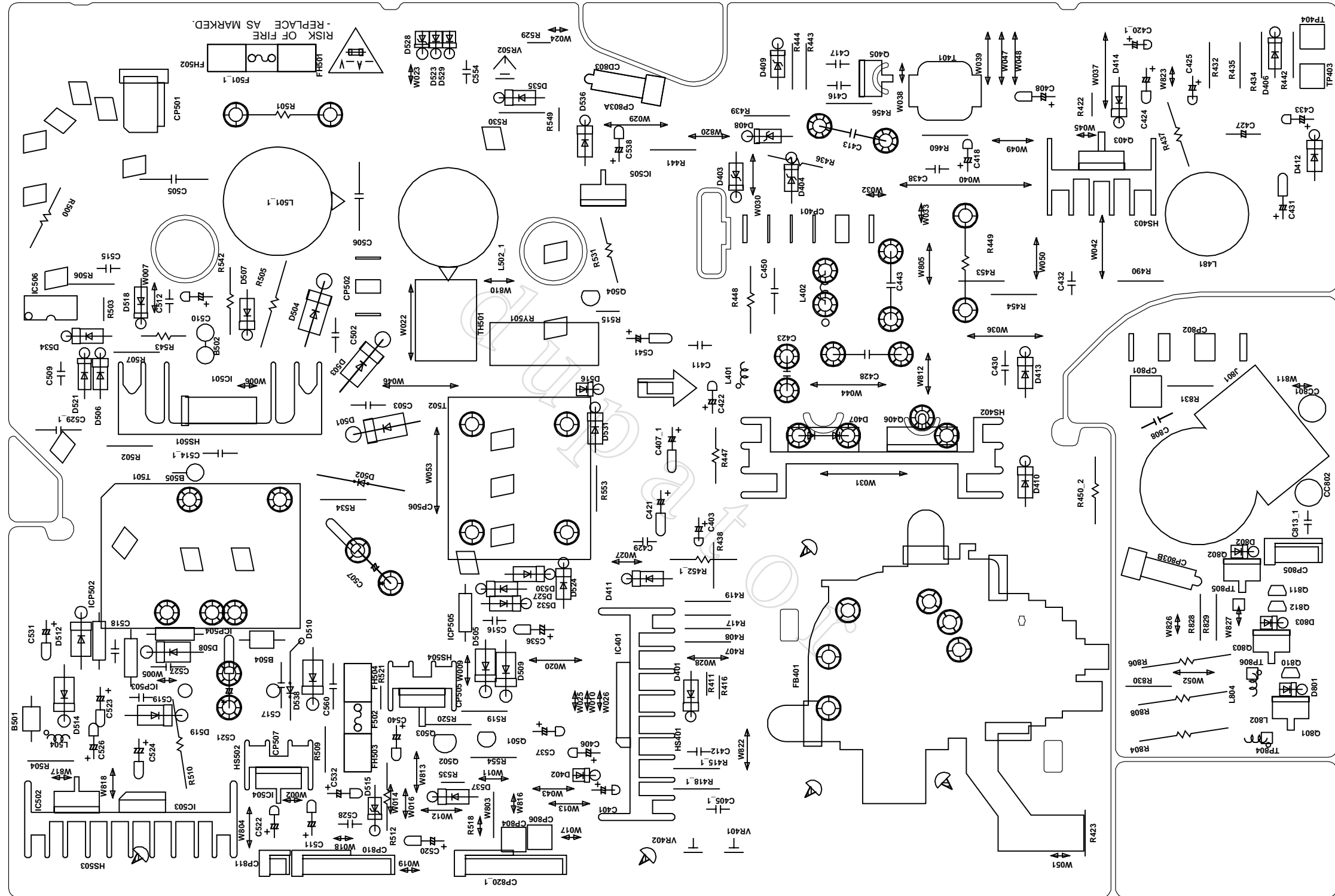
CAUTION: SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

AUDIO SIGNAL

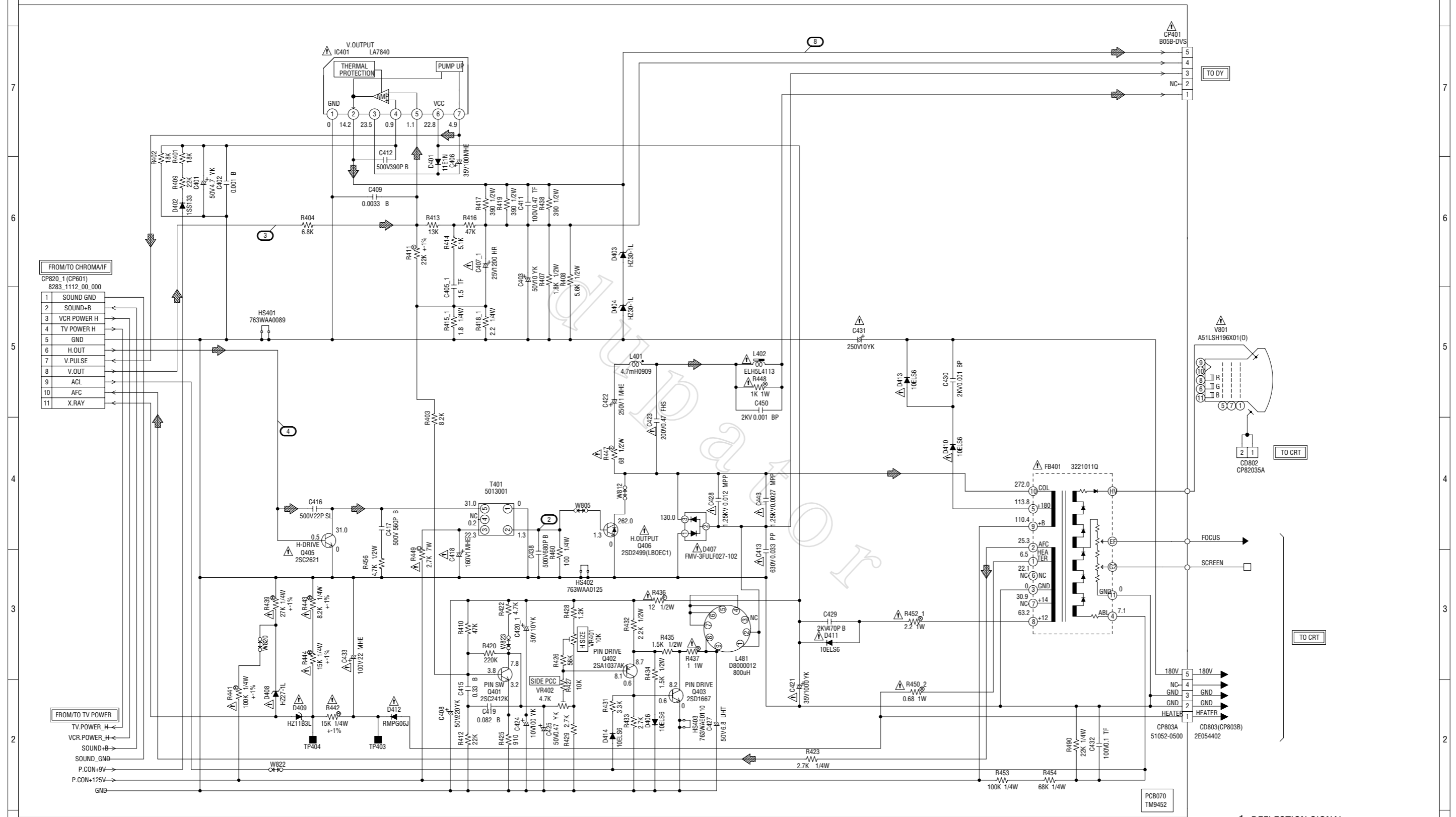
PCB010
VMX177

PRINTED CIRCUIT BOARDS

MAIN/CRT



DEFLECTION SCHEMATIC DIAGRAM (MAIN PCB)



FROM/TO CHROMA/IF
CP820_1 (CP601)
8263_1112_00_000

1	SOUND GND
2	SOUND+B
3	VCR POWER H
4	TV POWER H
5	GND
6	H.OUT
7	V.PULSE
8	V.OUT
9	ACL
10	AFC
11	X.RAY

FROM/TO TV POWER

TV POWER_H
VCR_POWER_H
SOUND+B
SOUND_GND
P.CON+9V
P.CON+125V
GND

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR. THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP IS NON POLAR ONE.

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

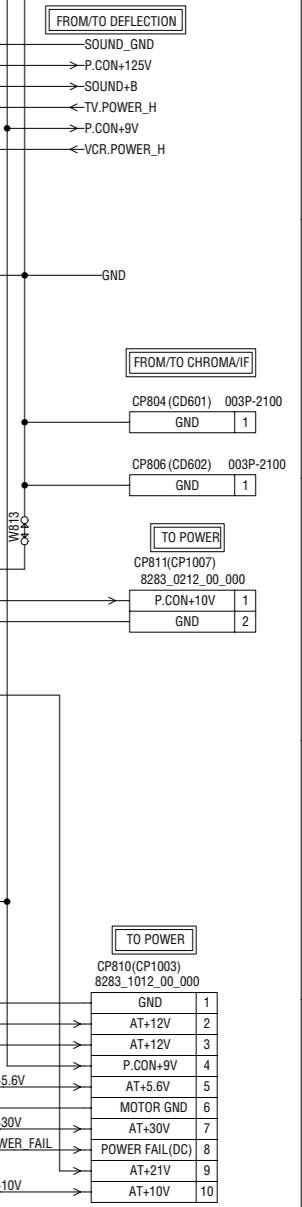
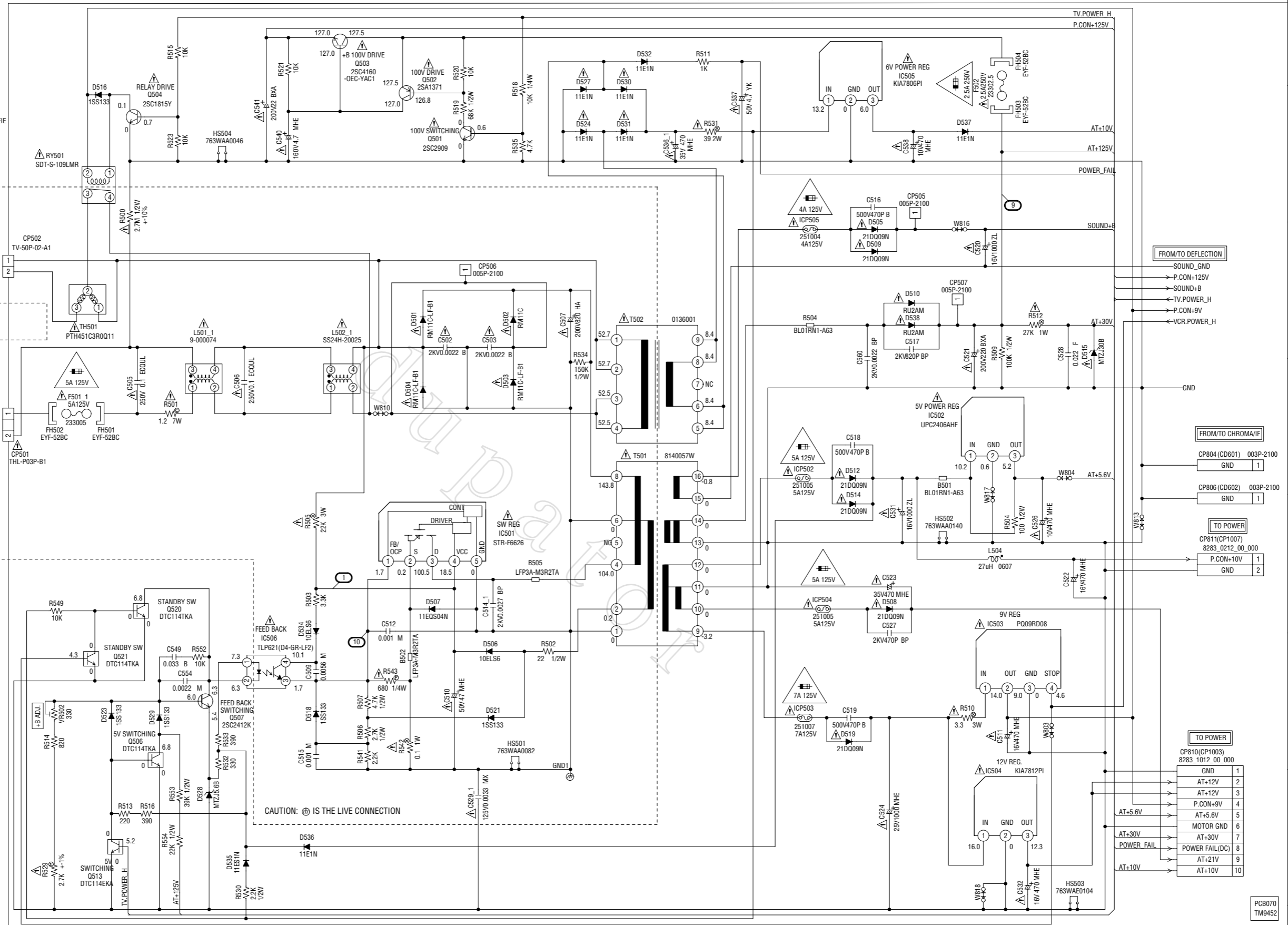
CAUTION: SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

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

TV POWER SCHEMATIC DIAGRAM (MAIN PCB)



CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE FUSE
 5A 125V(F501) , 2.5A 250V(F502) , 5A 125V(ICP502, ICP504) AND 7A 125V(ICP503) , 4A 125V(ICP505).
 ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES D'INCEINDE N'UTILISER QUE DES FUSIBLE DE MEME TYPE
 5A 125V(F501) , 2.5A 250V(F502) , 5A 125V(ICP502, ICP504) AND 7A 125V(ICP503) , 4A 125V(ICP505).



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

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

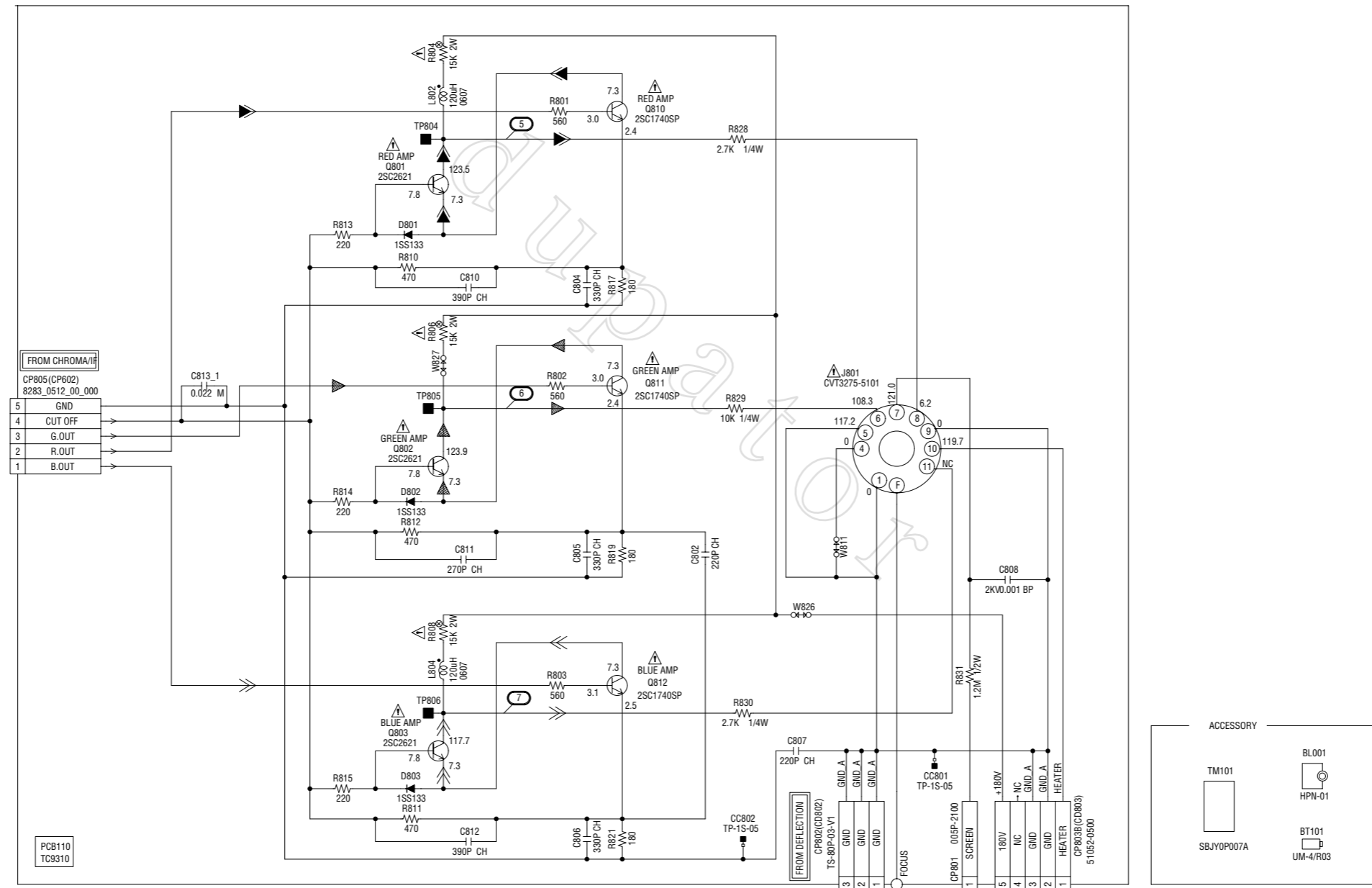
CAUTION: SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

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

CAUTION: DIGITAL TRANSISTOR

CRT SCHEMATIC DIAGRAM

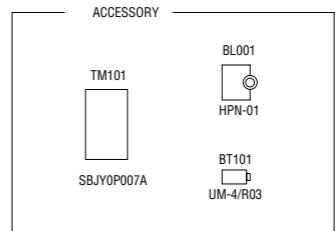
(CRT PCB)



FROM CHROMA/IF

5	GND
4	CUT OFF
3	G.OUT
2	R.OUT
1	B.OUT

PCB110
TC9310



◀ R.SIGNAL
◀ G.SIGNAL
◀ B.SIGNAL

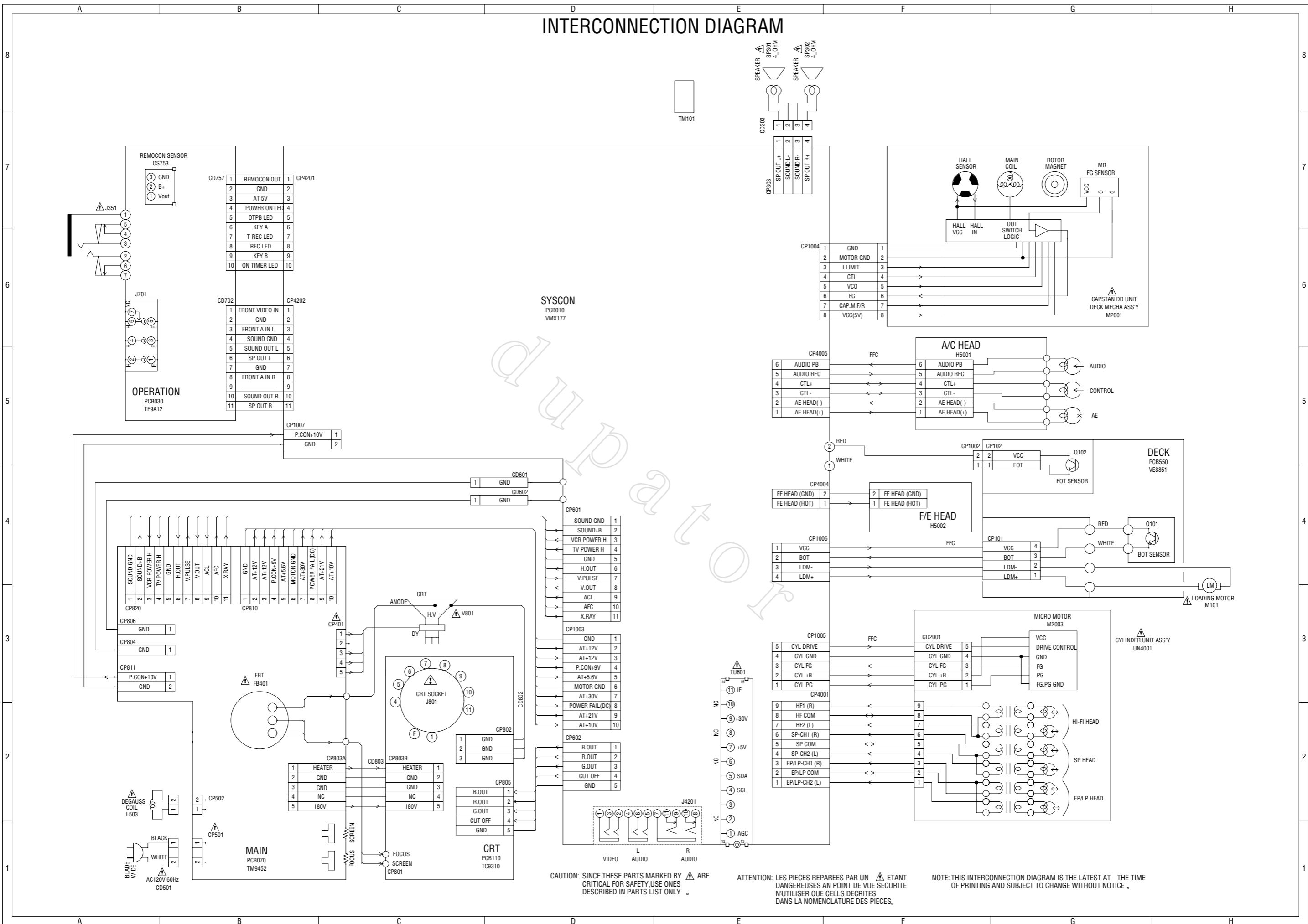
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

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

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

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

INTERCONNECTION DIAGRAM



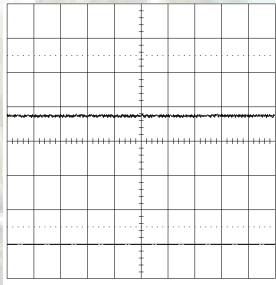
CAUTION: SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

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

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

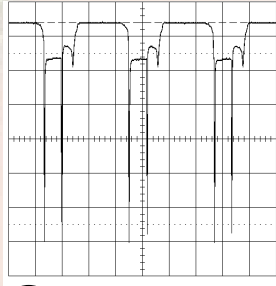
WAVEFORMS

TV POWER

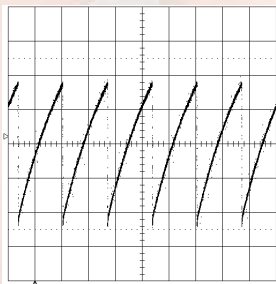


① 5.0V 0.1ms/div

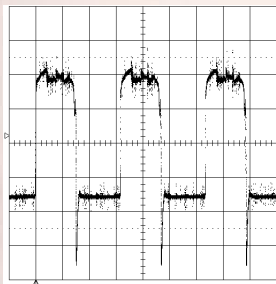
DEFLECTION



② 2.0V 20μs/div

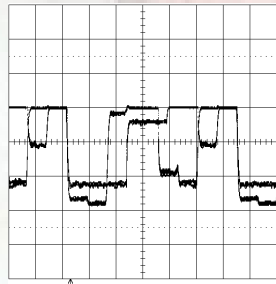


③ 200mV 10ms/div

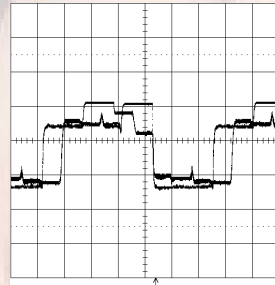


④ 200mV 20μs/div

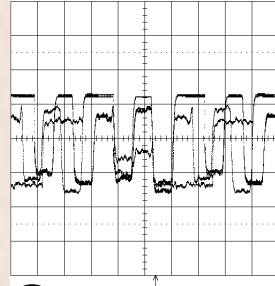
CRT



⑤ 50V 10μs/div

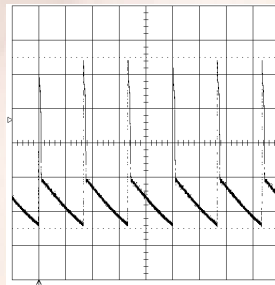


⑥ 50V 10μs/div



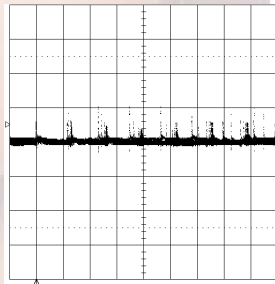
⑦ 50V 10μs/div

DEFLECTION

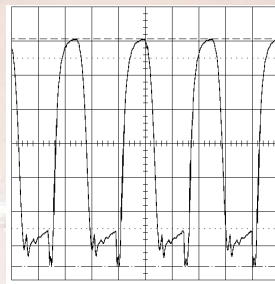


⑧ 10V 10ms/div

TV POWER

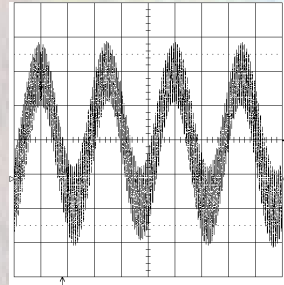


⑨ 2V 10μs/div

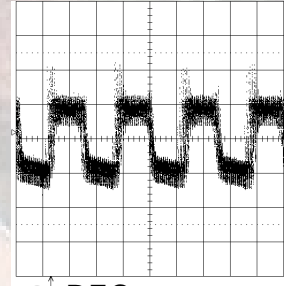


⑩ 0.5V 5μs/div

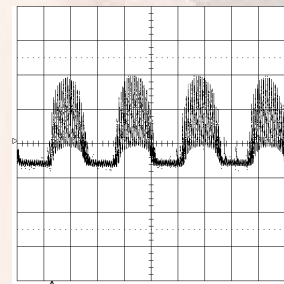
Y/C/AUDIO/HEAD AMP



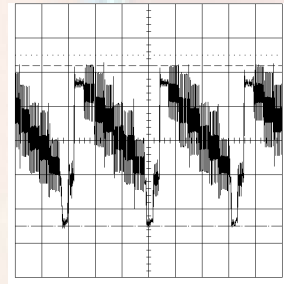
⑪ REC
0.5V 0.2ms/div



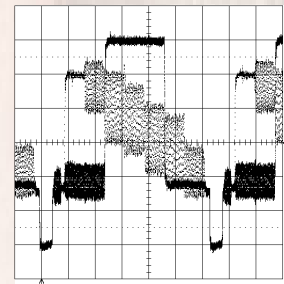
⑫ REC
100mV 0.2ms/div



⑬ REC
200mV 0.2ms/div



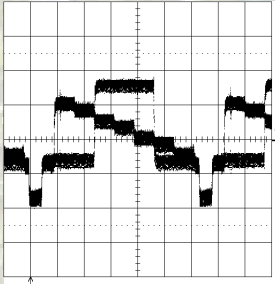
⑭ PB
0.5V 20μs/div



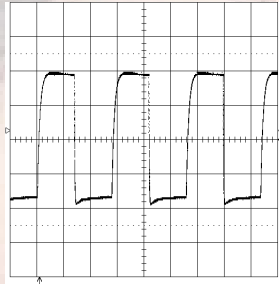
⑮ REC
200mV 10μs/div

NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

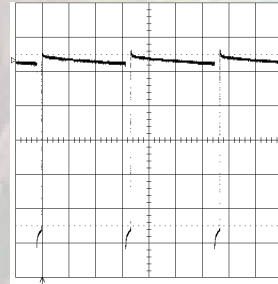
WAVEFORMS



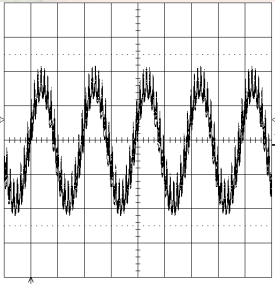
①⑥ PB
100mV. 10 μ s/div



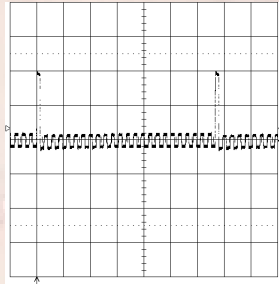
②① PB
1V. 0.5ms/div



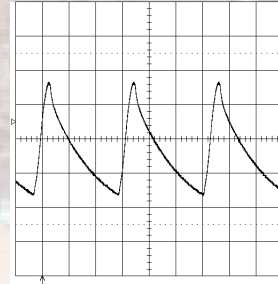
②⑥ REC
1V. 5ms/div



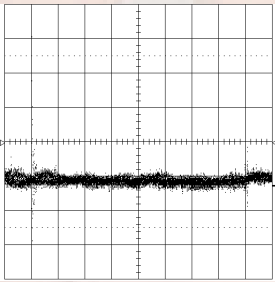
①⑦ REC
0.5V. 0.5ms/div



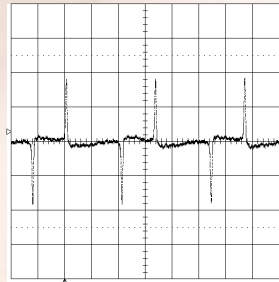
②② PB
2V. 5ms/div



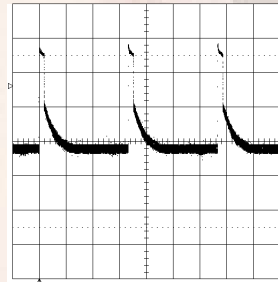
②⑦ REC
5V. 20 μ s/div



①⑧ REC
20mV. 5 μ s/div

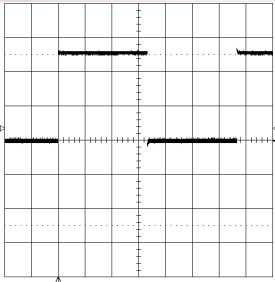


②③ PB
1V. 10ms/div

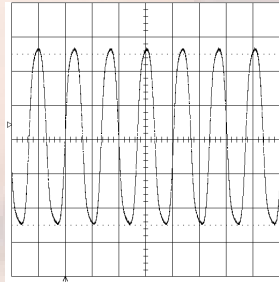


②⑧ REC
200mV. 5ms/div

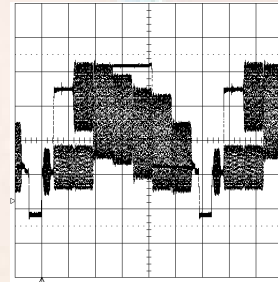
MICON



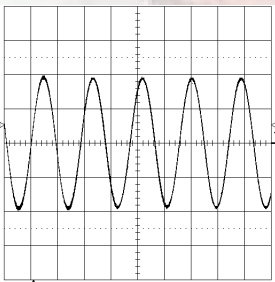
①⑨ PB
2V. 5ms/div



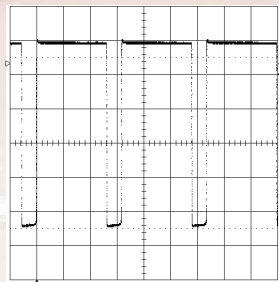
②④ REC
1V. 2ms/div



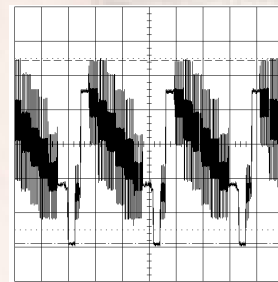
②⑨ REC
0.5V. 10 μ s/div



②⑩ PB
0.5V. 0.5ms/div



②⑤ REC
1V. 20 μ s/div

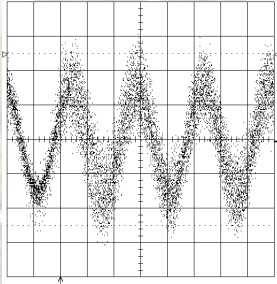


③⑩ POWER ON
200mV 20 μ s/div

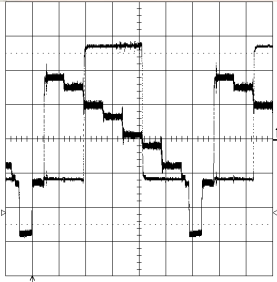
NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

WAVEFORMS

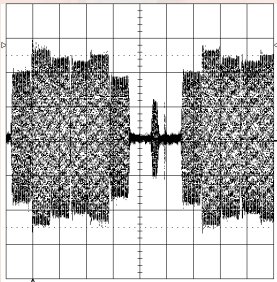
CHROMA/IF



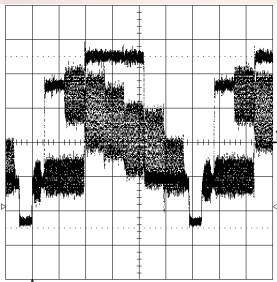
31) 200mV. 1ms/div



33) 200mV. 10μs/div

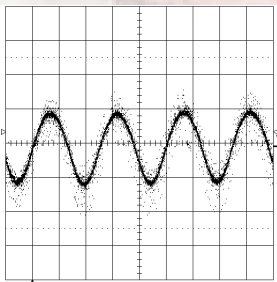


34) 50mV. 10μs/div



35) 200mV. 10μs/div

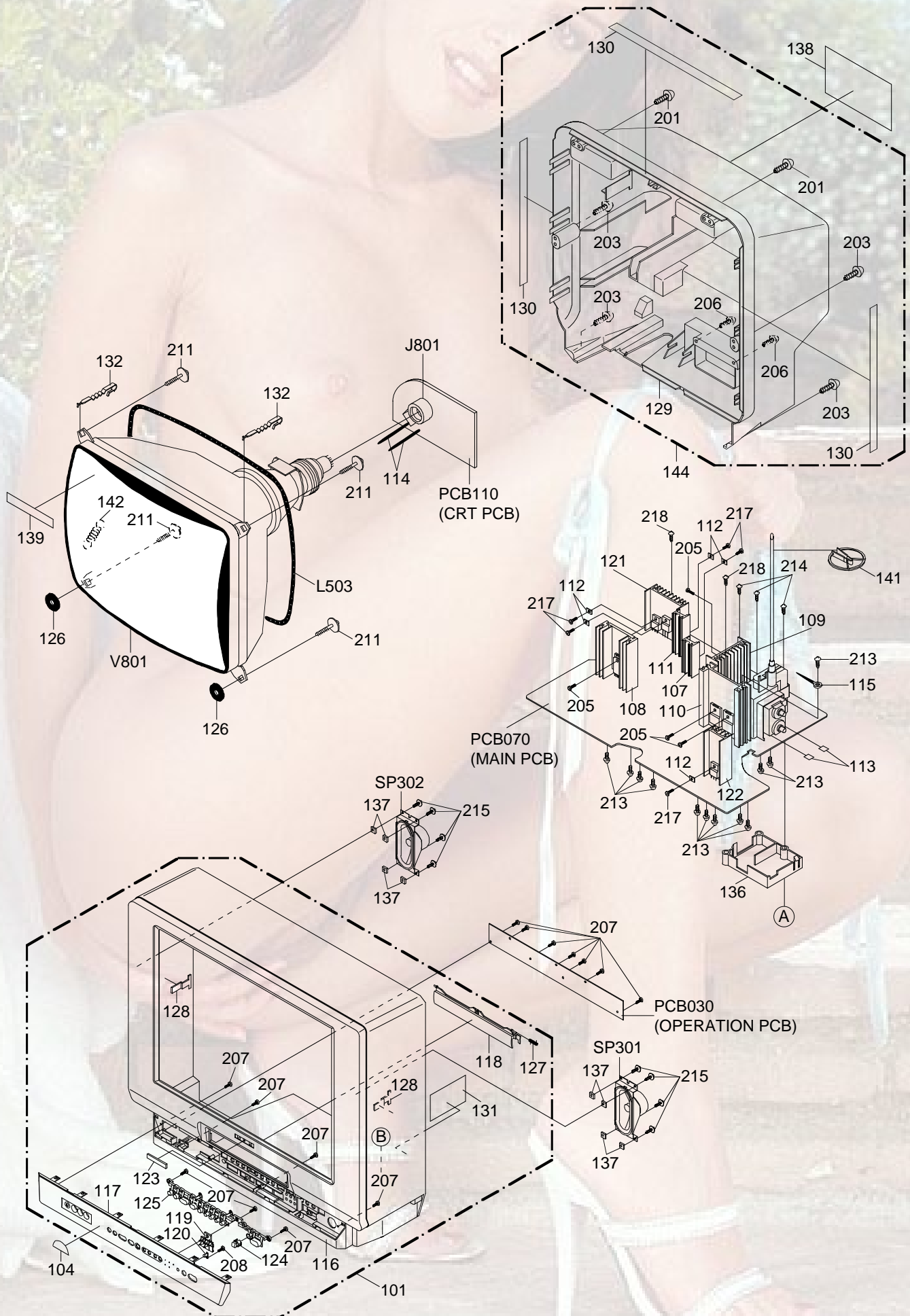
SOUND AMP



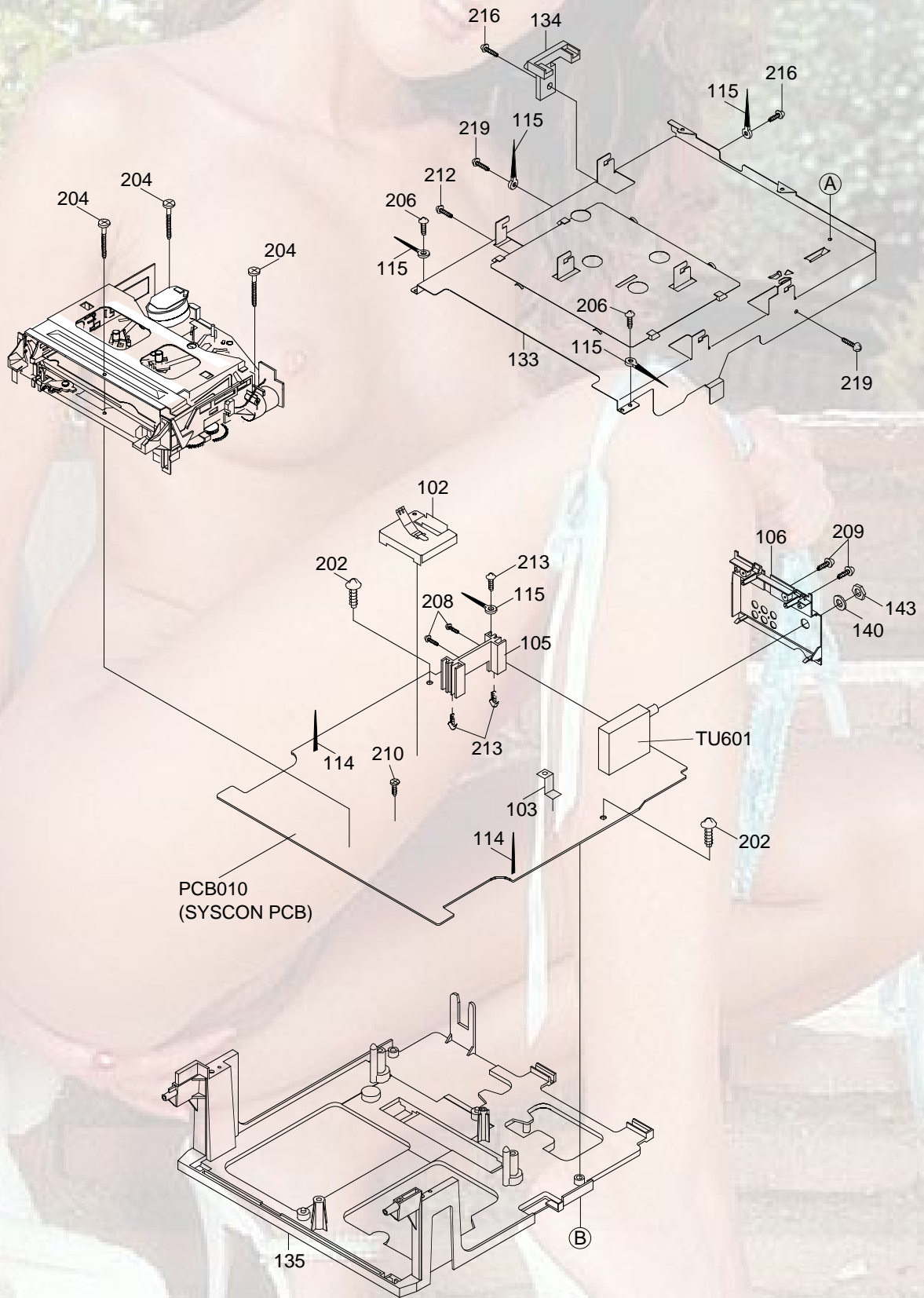
36) 100mV. 1ms/div

NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

MECHANICAL EXPLODED VIEW



MECHANICAL EXPLODED VIEW



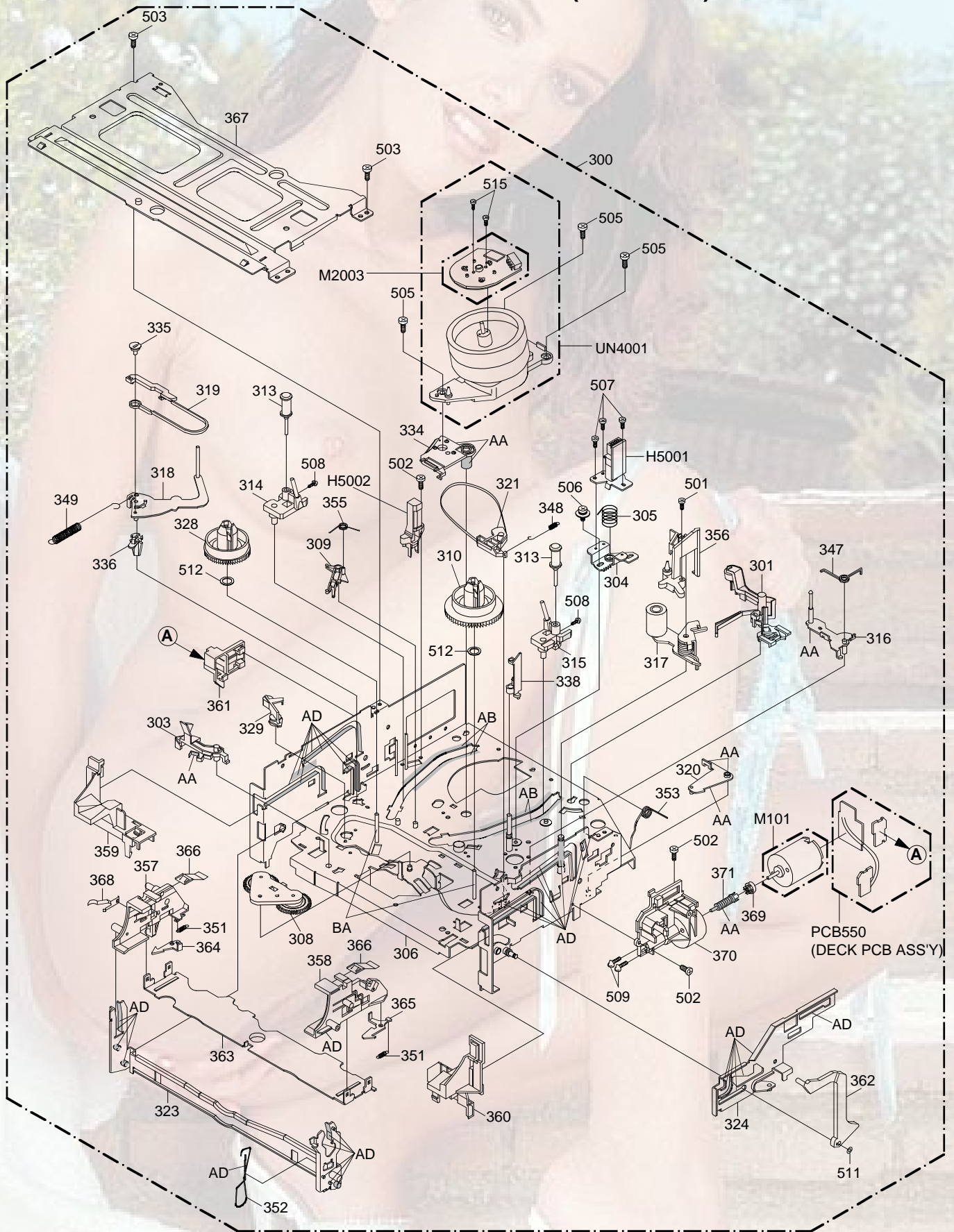
MECHANICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	Q'TY	REF. NO.	PART NO.	DESCRIPTION	Q'TY
101	S5-620-1Q7-200	CABI,FRONT ASS'Y	1	140	S2-A97-A40-770	W,9.7-14-T0.7	1
102	----	SHIELD,CASE HEAD AMP ASS'Y	1	141	S9-9HV-3T0-000	HOLDER,ANODE WIRE	1
103	----	PLATE,EARTH-SYSCON	1	142	S4-1WU-A00-010	SPR,EARTH	1
104	----	LABEL,ENEGY STAR	1	143	S3-004-952-070	NUT,(VOLUME NUT 3/8 INCH)	1
105	----	HEAT SINK	1	144	S5-620-1Q7-400	CABI,BACK ASS'Y	1
106	S7-1WP-A02-310	PLATE,JACK	1	201	S1-172-40C-540	SCREW,TAP(B0)BIND 4-35	2
107	----	HEAT SINK	1	202	S1-175-40B-040	SCREW,TAP(B0)TRUSS 4-20	2
108	----	HEAT SINK	1	203	S1-175-40A-640	TAP(B0)4-16	4
109	----	HEAT SINK	1	204	S1-171-40A-240	TAP(B0)V+4-12	3
110	----	HEAT SINK	1	205	S1-0A1-30A-040	SCREW/WASHER(B)M3-10	4
111	----	HEAT SINK	1	206	S1-106-30A-240	SCREW,TAP(P)3-12	4
112	----	METAL SPACER	5	207	S1-106-30A-040	UIT+3-10	14
113	----	RUBBER,SILCON	2	208	S1-106-308-040	TAP(P)3-8	3
114	----	COATING CLIP	4	209	S1-102-30A-020	VT2+3-10	2
115	----	CORD CLIP UL CO.	6	210	87-741-095-410	SCREW,TAP TITE(P) FLAT 3-8	1
116	----	CABI,FRONT	1	211	S1-11J-50D-040	SCREW TAP(A)5-40	4
117	S1-2WP-J06-670	PLATE,FRONT	1	212	87-743-073-010	VT2+2.6-6	1
118	S1-2WP-J06-680	FLAP	1	213	87-753-095-410	SCREW,TAP 3-8	15
119	----	GLASS,LED	1	214	S1-0A1-30B-040	SCREW,WASHER(A) M3x20	3
120	S1-3WP-A01-000	GUIDE,REMOCON	1	215	S1-461-26A-040	SCREW,TAP M2.6x10	8
121	----	HEAT SINK	1	216	S1-076-308-040	SCREW,TAP	2
122	----	HEAT SINK	1	217	S1-0A1-308-040	WASHER(A)M3-8	5
123	S2-344-900-990	BADGE,BRAND	1	218	S1-0A1-306-040	SCREW,WASHER(A)M3-6	2
124	S3-5WP-D06-700	BUTTON,OTPB	1	219	S1-076-306-040	BVTT+3-6	2
125	S3-5WP-J01-410	BUTTON,FRAME	1				
126	----	SHEET,CRT SUPPORT	2				
127	S4-3WK-A00-320	SPR,FLAP	1				
128	S0-9WP-A00-220	STOPPER,PCB	2				
129	----	CABI,BACK	1				
130	----	FELT SHEET	3				
131	----	SHEET,CRT SERVICEMAN	1				
132	S6-2WP-A00-110	HOLDER,CRT WIRE	2				
133	----	PLATE,DECK SHIELD	1				
134	S6-1WP-A01-510	HOLDER,M/PCB	1				
135	S6-1WP-A01-570	HOLDER,DECK	1				
136	S6-1WP-A01-450	HOLDER,FBT	1				
137	----	RUBBER,SPEAKER	8				
138	----	SHEET,RATING	1				
139	----	LABEL,POP	1				

ACCESSORY REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	Q'TY
1	S2-3C0-002-2A0	COIL,BALUN HPN-1	1
2	S7-660-DB0-100	TRANSMITTER	1
3	S5-620-101-000	INSTRUCUTION BOOK	1

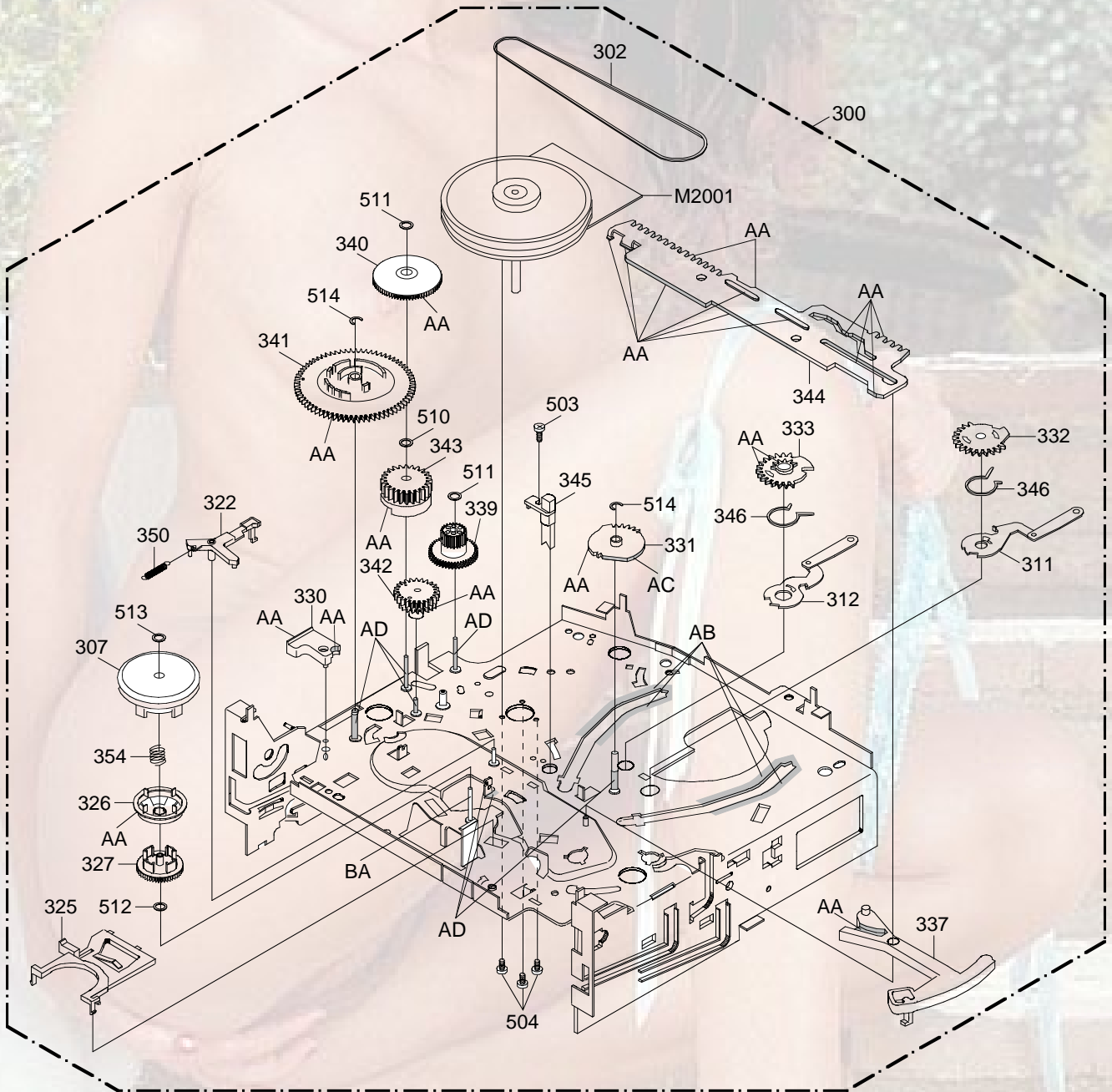
CHASSIS EXPLODED VIEW (TOP VIEW)



CLASS	PART NO.	MARK
GREASE	G-555G	AA
	G-488M	AB
	FL-721	AC
	MG-33	AD
OIL	KYODO OIL SLIDAS No. 150	BA

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

CHASSIS EXPLODED VIEW (BOTTOM VIEW)



CLASS	PART NO.	MARK
GREASE	G-555G	AA
	G-488M	AB
	FL-721	AC
	MG-33	AD
OIL	KYODO OIL SLIDAS No. 150	BA

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

CHASSIS REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	QTY	REF. NO.	PART NO.	DESCRIPTION	QTY
300	----	DECK ASSY A55901B420A	1	360	S5-OP9-006-860	TAPE GUIDE R	1
301	S5-OA5-000-220	AHC ASS'Y	1	361	S5-OP9-007-070	COVER,SENSOR L	1
302	S5-OP2-002-700	BELT,CAPSTAN	1	362	S5-OP9-006-880	LEVER,FLAP	1
303	S5-OP9-007-100	LEVER,REC	1	363	S5-OP9-006-900	CASS HOLDER	1
304	S5-OP5-000-830	BASE,AC HEAD	1	364	S5-OP9-006-910	LOCKER,L	1
305	S5-OP8-003-240	SPR,AC HEAD	1	365	S5-OP9-006-920	LOCKER,R	1
306	----	MAIN CHASSIS ASS'Y	1	366	S5-OP9-006-940	SPR,PACK	2
307	S5-OA2-000-810	CLUTCH ASS'Y X	1	367	S5-OP9-006-950	BRACKET,TOP	1
308	S5-OA2-000-730	ARM,IDLER ASS'Y	1	368	----	SPR,CASS EARTH	1
309	S5-OP6-005-530	ARM,S-S BRAKE	1	369	S5-OP6-005-400	DRIVER,WORM	1
310	S5-OA2-000-760	T REEL ASS'Y	1	370	S5-OP6-005-630	BRACKET,MOTOR	1
311	S5-OA3-000-610	LOAD ARM S ASS'Y	1	371	S5-OP6-005-410	WORM	1
312	S5-OA3-000-620	LOAD ARM T ASS'Y	1	501	87-654-075-410	SCREW,TAP 2.6-10	1
313	S5-OA4-001-870	G-ROLLER ASS'Y	2	502	S1-072-268-040	VT2+2.6-8	3
314	S5-OA4-001-880	BASE,INCL S ASS'Y	1	503	87-743-073-010	VT2+2.6-6	3
315	S5-OA4-001-960	BASE,INCL T(S) ASS'Y	1	504	87-743-073-410	SCREW,TAP 2.6-6	3
316	S5-OA4-001-970	P5-3 ARM ASS'Y	1	505	S1-0A1-268-040	SCREW,WASHER(A)M2.6-8	3
317	S5-OA4-001-740	PINCH ROLLER BLOCK	1	506	S1-0B1-264-040	SCREW,WASHER(B)M2.6-4	1
318	S5-OA4-001-750	TENSION ARM ASS'Y	1	507	87-261-035-410	SCREW,PAN M2-6	3
319	S5-OA4-001-760	TENSION BAND ASS'Y	1	508	87-261-032-410	SCREW,PAN M2-3	2
320	S5-OA4-001-780	PINCH ROLLER LEVER ASS'Y	1	509	87-258-091-010	U+M3-3	2
321	S5-OA6-001-820	BRAKE T ASS'Y	1	510	S2-Q31-54C-5N0	PW,3.1-5.4-0.25	1
322	S5-OA6-001-830	CAP BRAKE ARM ASS'Y	1	511	S2-P26-600-5N0	PW(CUT)2.6-6-0.5	3
323	S5-OA9-002-130	LINK ASS'Y	1	512	S2-Q26-471-3N0	PW 2.6-4.7-0.13	3
324	S5-OA9-002-160	LINK LEVER ASS'Y	1	513	S2-P18-450-5N0	PW(CUT)1.8-4.5-0.5	1
325	S5-OP2-002-610	LEVER,CLUTCH	1	514	S3-ETW-300-000	E-RING 3	2
326	S5-OP2-002-620	RING,CLUTCH	1	515	S1-0A1-235-040	SEMS A M2.3-5	2
327	S5-OP2-002-630	GEAR,CLUTCH	1	CP101	----	CONN,PWB SIDE	1
328	S5-OP2-002-710	REEL,S	1	CP102	----	CONN,PWB SIDE 173979-2	1
329	S5-OP2-002-730	STOPPER,REEL S	1	H5001	S5-23D-910-340	HEAD,AC	1
330	S5-OP2-002-740	SPACER,LINK LEVER	1	H5002	S5-43D-020-130	HEAD,FE	1
331	S5-OP3-001-780	GEAR,MAIN LOADING	1	M101	S5-96P-780-010	MOTOR(LOADING)	1
332	S5-OP3-001-790	GEAR,LOADING S	1	M2001	S5-94J-980-080	CAPSTAN DD UNIT EP15BC	1
333	S5-OP3-001-800	GEAR,LOADING T	1	M2003	S5-89V-110-070	MICRO MOTOR	1
334	S5-OP3-001-860	HOLDER,LOADING GEAR	1	PCB550	----	DECK PCB ASS'Y VE8851	1
335	S5-OP4-004-720	ADJUST,TENSION	1	Q101	S0-007-003-200	PHOTO,TR RPT-38PB113	1
336	S5-OP4-004-920	HOLDER,TENSION	1	Q102	S0-007-003-200	PHOTO,TR RPT-38PB113	1
337	S5-OP4-004-900	LEVER,TENSION	1	UN4001	S5-590-1B5-000	CYLINDER UNIT ASS'Y A55901B50C	1
338	S5-OP4-004-750	COVER,P4	1				
339	S5-OP6-005-430	GEAR,JOINT	1				
340	S5-OP6-005-440	GEAR,MIDDLE	1				
341	S5-OP6-005-450	CAM,MAIN	1				
342	S5-OP6-005-460	CAM,P5	1				
343	S5-OP6-005-650	CAM,PINCH ROLLER	1				
344	S5-OP6-005-480	ROD,MAIN	1				
345	S5-OP7-000-350	REFLECTOR,LED	1				
346	S5-OP8-003-180	SPR,LOADING GEAR	2				
347	S5-OP8-003-190	SPR,P5	1				
348	S5-OP8-003-210	SPR,BRAKE T	1				
349	S5-OP8-003-220	SPR,TENSION	1				
350	S5-OP8-003-230	SPR,CAP BRAKE	1				
351	S5-OP8-003-420	SPRING,LOCKER (S)	2				
352	S5-OP8-003-260	SPR,LINK	1				
353	S5-OP8-003-280	SPR,DAMPER	1				
354	S5-OP8-003-300	SPR,RING	1				
355	S5-OP8-003-320	SPR,S-S BRAKE	1				
356	S5-OP9-006-800	OPENER,CASS	1				
357	S5-OP9-006-830	CASS SIDE L	1				
358	S5-OP9-006-840	CASS SIDE R	1				
359	S5-OP9-007-090	TAPE GUIDE L (P,R)	1				

ELECTRICAL REPLACEMENT PARTS LIST

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
SYSCON PCB ASS'Y			*** CAPACITORS ***		
		*** RESISTORS ***	C4058	87-015-695-080	CAP,E 1-50V
R628	S4-X5T-682-3F0	RES,MF 82K-1/6W	C4062	87-015-075-040	CAP,E 10-16V
R640	S4-X5T-647-2F0	RES,M 4.7K-1/6W	C4063	87-015-695-080	CAP,E 1-50V
△ R1005	S6-150-12R-7J0	RES,FUSE 2.7-1W	C4067	87-015-683-080	CAP,E 33-16V
		*** CAPACITORS ***	C4068	87-010-403-080	CAP,E 3.3-50V
			C4070	87-015-677-010	CAP,E 100-6.3V
C301	87-010-560-080	CAP,E 10-50V	C4071	87-015-695-080	CAP,E 1-50V
C309	87-010-553-040	CAP,E 47-16V	C4073	87-010-380-080	CAP,E 47-16V
C311	87-010-402-080	CAP,E 2.2-50V	C4076	87-015-677-010	CAP,E 100-6.3V
C312	87-010-402-080	CAP,E 2.2-50V	C4078	87-010-549-010	CAP,E 47-6.3V
C314	87-010-402-080	CAP,E 2.2-50V	C4080	87-010-549-010	CAP,E 47-6.3V
C315	87-010-380-080	CAP,E 47-16V	C4084	87-A10-189-040	CAP,E 220-10V
C350	87-010-067-010	CAP,E 0.1-50V	C4092	87-010-685-080	CAP,E 330-16V
C351	87-010-404-080	CAP,E 4.7-50V	C4108	87-015-677-010	CAP,E 100-6.3V
C352	87-016-245-090	CAP,E 33-16V	C4206	87-015-075-040	CAP,E 10-16V
C354	87-010-388-090	CAP,E 1000-25V	C4207	87-010-404-080	CAP,E 4.7-50V
C355	87-010-402-080	CAP,E 2.2-50V	C4211	87-010-235-080	CAP,E 470-16V
C601	S0-2LT-447-0M0	CAP,E 47-35V	C4211	87-010-235-080	CAP,E 470-16V
C605	87-010-404-080	CAP,E 4.7-50V	C4212	87-015-075-040	CAP,E 10-16V
C611	87-010-553-080	CAP,E 10-50V	C4220	87-010-112-080	CAP,E 100-16V
C617	87-010-400-080	CAP,E 0.47-50V	C4245	87-010-404-080	CAP,E 4.7-50V
C621	87-010-550-080	CAP,E 1000-6.3V	C5501	87-010-549-010	CAP,E 47-6.3V
C623	87-015-695-080	CAP,E 1-50V	C5509	87-010-402-080	CAP,E 2.2-50V
C624	87-015-695-080	CAP,E 1-50V	C5510	87-010-380-080	CAP,E 47-16V
C626	87-010-404-080	CAP,E 4.7-50V	C5512	87-015-075-040	CAP,E 10-16V
C633	S0-2ET-310-0M0	CAP,E 10-25V	C5516	87-015-075-040	CAP,E 10-16V
C634	87-010-236-080	CAP,E 1000-10V	C5518	87-016-301-080	CAP,TAN 3.3-16V
C638	87-010-553-040	CAP,E 47-16V	C5523	87-016-636-080	CAP,E 4.7-50V
C643	87-010-400-080	CAP,E 0.47-50V	C5525	87-015-075-040	CAP,E 10-16V
C645	87-010-236-080	CAP,E 1000-10V	C5526	87-016-334-080	CAP,E 4.7-25V
C650	87-015-695-080	CAP,E 1-50V	C5527	87-016-302-080	CAP,TAN 10-16V
△ C651	87-015-695-080	CAP,E 1-50V	C5529	87-015-695-080	CAP,E 1-50V
C652	87-015-693-080	CAP,E 0.33-50V	C5531	87-010-549-010	CAP,E 47-6.3V
C654	87-010-400-080	CAP,E 0.47-50V	C5532	87-016-334-080	CAP,E 4.7-25V
C656	87-A10-189-040	CAP,E 220-10V	C5533	87-015-695-080	CAP,E 1-50V
C659	87-010-402-080	CAP,E 2.2-50V	C5534	87-015-683-080	CAP,E 33-16V
C660	87-010-403-080	CAP,E 3.3-50V	C5536	87-015-075-040	CAP,E 10-16V
C669	87-010-560-080	CAP,E 10-50V	C5537	87-015-695-080	CAP,E 1-50V
C688	87-A10-189-040	CAP,E 220-10V	C5538	87-015-075-040	CAP,E 10-16V
△ C1001	87-010-135-010	CAP,E 100-25V	C5539	S0-E7T-033-0M0	CAP,E 33-6.3V
C1003	87-010-550-080	CAP,E 1000-6.3V	C5547	87-015-075-040	CAP,E 10-16V
C1004	87-016-584-080	CAP,E 220-25V	C5548	87-015-075-040	CAP,E 10-16V
C1008	87-010-221-080	CAP,E 470-10V	C5550	87-010-549-010	CAP,E 47-6.3V
C1010	87-010-403-080	CAP,E 3.3-50V	C5552	87-015-075-040	CAP,E 10-16V
C1015	87-015-680-010	CAP,E 47-10V			*** DIODES ***
C1016	87-016-053-080	CAP,E 22-16V	D601	S9-7U0-9R1-1B0	ZENER,MTZJ9.1B
C1018	87-010-404-080	CAP,E 4.7-50V	D602	87-020-465-010	DIODE,1SS133T
C1020	87-015-075-040	CAP,E 10-16V	D603	87-020-465-010	DIODE,1SS133T
C1021	87-015-683-080	CAP,E 33-16V	D604	87-020-465-010	DIODE,1SS133T
C1032	87-016-088-040	CAP,E 220-6.3V	D605	S2-8T1-1ES-N10	DIODE,11ES1N-TA1B2
C1037	87-016-088-040	CAP,E 220-6.3V	D607	87-020-465-010	DIODE,1SS133T
C1042	87-010-071-080	CAP,E 1-50V	D1001	S2-LXE-658-000	DIODE,1N4005E-G23
C1043	87-010-560-080	CAP,E 10-50V	D1003	S0-106-000-600	LED,SID1050CM
C1045	87-010-112-080	CAP,E 100-16V	D1004	S2-8T1-1E1-N10	DIODE,11E1N-TA1B2
C1058	87-010-079-080	CAP,E 100-6.3V	D1005	S9-2T1-120-B00	ZENER,RD12FB-T7
C1059	87-016-088-040	CAP,E 220-6.3V	D1006	S2-3U1-003-A30	DIODE,SB10-03A3
C4006	S5-0HU-210-1M0	CAP,E 100-16 V	D1007	S2-LXE-658-000	DIODE,1N4005E-G23
C4007	87-015-677-010	CAP,E 100-6.3	D1008	S2-8TE-QS0-400	DIODE,11EQS04N-TA
C4012	87-010-404-080	CAP,E 4.7-50V	D1009	87-020-465-010	DIODE,1SS133T
C4015	87-010-380-080	CAP,E 47-16V	D1010	S2-LXE-658-000	DIODE,1N4005E-G23
C4016	87-015-695-080	CAP,E 1-50V	D1011	S2-3U1-003-A30	DIODE,SB10-03A3
C4023	87-015-683-080	CAP,E 33-16V	D1012	S9-7U0-6R2-1B0	ZENER,MTZJ6.2B
C4025	87-015-075-040	CAP,E 10-16V	D1014	S2-8T1-1E1-N10	DIODE,11E1N-TA1B2
C4027	87-016-053-080	CAP,E 22-16V	D1015	S9-7U0-5R1-1B0	ZENER,MTZJ5.1B
C4028	87-015-697-080	CAP,E 3.3-50V	D1016	87-020-465-010	DIODE,1SS133T
C4035	87-010-402-080	CAP,E 2.2-50V	D4001	87-020-465-010	DIODE,1SS133T
C4039	87-015-695-080	CAP,E 1-50V	D4004	S2-8TE-QS0-400	DIODE,11EQS04N-TA
C4040	87-015-695-080	CAP,E 1-50V	D4005	87-017-931-010	ZENER,MTZJ5.6B
C4041	87-015-677-010	CAP,E 100-6.3V	D4201	87-017-931-010	ZENER,MTZJ5.6B
C4046	87-015-695-080	CAP,E 1-50V	D4202	S2-3U1-003-A30	DIODE,SB10-03A3
C4048	87-010-403-080	CAP,E 3.3-50V	D4203	S3-Z68-V10-000	ZENER,MTZJ6.8B
C4051	87-015-695-080	CAP,E 1-50V	D4204	87-020-465-010	DIODE,1SS133T
			D5501	87-020-465-010	DIODE,1SS133T

ELECTRICAL REPLACEMENT PARTS LIST

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
*** ICS ***			*** COILS ***		
IC301	87-A20-312-010	IC,M62420SP	L610	S3-360-203-880	COIL,V IFT
IC352	S0-FSP-752-200	IC,AN7522	L612	87-005-688-080	COIL,22UH
△ IC604	S0-3FE-814-B00	IC,LA76814BM-MPB	L613	S2-1LA-668-0K0	COIL,68UH
IC1001	S5-6F5-704-1A0	IC,OEC7041A	L614	S2-1LA-668-0K0	COIL,68UH
IC1002	S9-UJ0-T60-OH0	IC,PST600H	L1001	87-A50-040-010	COIL,2.2UH
△ IC1003	S0-7SQ-955-AN0	IC,BA6955AN	L4001	S3-262-300-380	COIL,TRAP 2623003
IC1099	S5-620-1Q0-150	IC,M24C04-BN6	L4002	S2-167-D10-1K0	COIL,100UH
IC4001	S0-3F3-711-700	IC,LA71170M-MPB	L4003	S3-162-600-7S0	COIL,BIAS OSC
IC4002	S0-Q09-780-500	IC,NJM7805FD	L4004	S2-167-D10-1K0	COIL,100UH
IC5501	S0-1F6-2FB-P00	IC,AN3662FBP	L4005	87-005-096-010	COIL,100UH
*** TRANSISTORS ***			L4006	87-005-096-010	COIL,100UH
Q350	89-324-122-080	TR,2SC2412KT	L4007	87-003-286-010	COIL,56UH
Q602	89-110-372-080	TR,2SA1037AK	L4008	S2-1LA-612-1K0	COIL,120UH
Q603	89-324-122-080	TR,2SC2412KT	L4009	87-005-096-010	COIL,100UH
Q604	89-324-122-080	TR,2SC2412KT	L4010	87-005-096-010	COIL,100UH
Q605	84-LB2-698-080	TR,2SA733(C)-T	L4011	87-003-112-010	COIL,1MH
Q1001	S0-02M-005-700	PHOTO,COUPLER SG-260	L4012	87-003-152-010	COIL,100UH
Q1002	89-324-122-080	TR,2SC2412KT	L4014	87-003-286-010	COIL,56UH
Q1003	S0-027-005-300	PHOTO COUPLER RPI-352Q01	L4017	87-003-150-010	COIL,68UH
Q1004	87-026-236-080	TR,DTC124EK	L4205	87-003-152-010	COIL,100UH
Q1005	S0-02M-005-700	PHOTO,COUPLER SG-260	L5501	87-003-152-010	COIL,100UH
Q1006	89-324-122-080	TR,2SC2412KT	L5503	87-003-151-010	COIL,82UH
Q1008	87-026-236-080	TR,DTC124EK	L5504	87-003-152-010	COIL,100UH
Q1009	S0-027-005-300	PHOTO COUPLER RPI-352Q01	L5505	87-003-152-010	COIL,100UH
Q1010	87-026-228-080	TR,DTA124EK	L5506	87-003-152-010	COIL,100UH
△ Q1011	SD-70D-239-600	TR,2SD2396(J,K)	*** SWITCH ***		
Q1012	89-324-122-080	TR,2SC2412KT	SW1001	S5-082-210-010	SW,LEAF
Q1014	87-026-236-080	TR,DTC124EK	*** CONNECTORS ***		
Q1015	89-324-122-080	TR,2SC2412KT	CP303	S6-9W1-4T2-900	CONN,PWB SIDE TID-X04P-Z1B
Q1016	89-324-122-080	TR,2SC2412KT	CP1004	S6-972-805-900	CONN PWB SIDE
Q1017	89-324-122-080	TR,2SC2412KT	CP1005	S6-9R7-500-280	CONN,PWB SIDE 52045-0545
Q1018	89-324-122-080	TR,2SC2412KT	CP1006	S6-9R7-400-280	CONN,52045-0445
△ Q1019	SB-3T0-089-200	TR,2SB892(CP4001	S6-972-906-200	CONN PWB SIDE
Q1022	87-026-287-080	TR,DTC143EKAT146	CP4004	S6-971-203-200	CONN PWB SIDE TMC-T02X-E1
Q1023	89-324-122-080	TR,2SC2412KT	CP4201	S6-9E2-A01-290	CONN,PWB SIDE
Q4001	SC-3T0-333-100	TR,2SC3331(S,T,U)-A	CP4202	S6-9E2-B01-290	CONN,PWB SIDE
Q4002	SC-3T0-333-100	TR,2SC3331(S,T,U)-A	*** FILTER ***		
Q4003	87-026-228-080	TR,DTA124EK	CF601	S0-2E2-45R-710	FLTR,SAW M1958M
Q4004	89-324-122-080	TR,2SC2412KT	*** CRYSTAL & CERAMIC OSCILLATORS ***		
Q4005	89-113-187-080	TR,2SA1318(S,T)	X604	S0-OCT-3R5-050	X'TAL,HC-49/C
Q4006	89-313-172-010	TR,2SC1317	X1001	S0-OCT-012-070	X'TAL,HC-49/U-S
Q4007	89-324-122-080	TR,2SC2412KT	X1002	S0-0D3-2R8-010	X'TAL,32.768K
Q4008	89-324-122-080	TR,2SC2412KT	X4001	S0-OCT-3R5-040	X'TAL,HC-49/C
Q4009	89-324-122-080	TR,2SC2412KT	*** TUNER ***		
Q4010	89-324-122-080	TR,2SC2412KT	△ TU601	S1-45K-000-500	TUNER,UHF-VHF TECC1040PG31
Q4011	89-110-372-080	TR,2SA1037AK	*** OTHERS ***		
Q4012	89-110-372-080	TR,2SA1037AK	CD601	S6-CH0-100-6A0	CORD CONN CH01006A
Q4013	87-026-239-080	DTC114TKAT14	CD602	S6-CH0-100-5A0	CORD CONN CH01005A
Q4201	87-026-235-010	TR,DTC114EK	CP601	S6-CH2-B02-6A0	CORD CONN CH2B026A
Q4202	87-026-235-010	TR,DTC114EK	CP602	S6-CH2-508-6A0	CORD CONN CH25086A
Q4203	89-324-122-080	TR,2SC2412KT	CD6001	S6-C6H-140-020	CORD,COAXIAL C6H14002
Q4204	87-026-235-010	TR,DTC114EK	CP1002	S6-CH2-207-6A0	CORD CONN CH22076A
Q4205	87-026-235-010	TR,DTC114EK	CP1003	S6-CH2-A01-4A0	CORD CONN CH2A014A
Q4206	87-026-235-010	TR,DTC114EK	CP1007	S6-CH2-207-7A0	CORD CONN CH22077A
Q4210	89-110-372-080	TR,2SA1037AK	*** CAPACITORS ***		
Q4211	89-324-122-080	TR,2SC2412KT	C352	87-010-380-080	CAP,E 47-16V
Q4212	89-110-372-080	TR,2SA1037AK	C353	87-010-380-080	CAP,E 47-16V
*** COILS ***			C755	87-015-975-080	CAP,E 220-6.3V
B301	S2-4AT-036-550	CORE,BEADS BL01RN1-A63T6	OPERATION PCB ASS'Y		
B602	S2-4AT-036-550	CORE,BEADS BL01RN1-A63T6	*** CAPACITORS ***		
B4001	S2-4AT-036-550	CORE,BEADS BL01RN1-A63T6	*** CAPACITORS ***		
L001	S2-A6A-8A0-A10	CORE,FERRITE HF57T18.5*10*10	*** CAPACITORS ***		
L002	S2-A6A-8A0-A10	CORE,FERRITE HF57T18.5*10*10	*** CAPACITORS ***		
L301	S2-167-D10-1K0	COIL,100UH	*** CAPACITORS ***		
L302	S2-167-D10-1K0	COIL,100UH	*** CAPACITORS ***		
L602	87-003-146-010	COIL,15UH	*** CAPACITORS ***		
L603	87-005-096-010	COIL,100UH	*** CAPACITORS ***		
L604	S2-1LA-6R3-9M0	COIL,0.39UH	*** CAPACITORS ***		
L605	87-003-152-010	COIL,100UH	*** CAPACITORS ***		

ELECTRICAL REPLACEMENT PARTS LIST

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
*** DIODES ***			*** CAPACITORS ***		
D791	S0-217-211-500	LED,SLR-342VCT32	C425	87-015-694-080	CAP,E 0.47-50V
D793	S0-217-211-500	LED,SLR-342VCT32	C427	S5-3FF-56R-8K0	CAP,E 6.8-50V NP
D794	S0-217-211-500	LED,SLR-342VCT32	▲ C428	S4-N8F-J12-3H0	CAP,MPP 0.012-1.25KV
D795	S0-213-5Q1-600	LED,SLZ-345B-02	C429	87-012-386-080	CAP,CER 470PF-2KV
D796	S0-217-211-500	LED,SLR-342VCT32	C430	S0-34B-N71-3K0	CAP,CER 0.001-2KV
*** JACKS ***			▲ C431	87-016-373-010	CAP,E 10-250V
▲ J351	S6-021-310-120	JACK,RCA 3.5 HSJ2630-0100	▲ C433	S5-EZT-822-0M0	CAP,E 22-100V
J701	S6-024-310-130	JACK,RCA	C438	87-010-977-010	CAP,CER 680PF-500V
*** SWITCHES ***			C443	S4-N8F-J27-2H0	CAP,MPP 0.0027-1.25KV
SW750	S5-042-01T-310	SW,TACT SKHVBED010	C450	S0-34B-N71-3K0	CAP,CER 0.001-2KV
SW751	S5-042-01T-310	SW,TACT SKHVBED010	▲ C505	S2-122-B10-4M0	CAP,MP 0.1-250V
SW791	S5-042-01T-310	SW,TACT SKHVBED010	▲ C506	S2-122-B10-4M0	CAP,MP 0.1-250V
SW792	S5-042-01T-310	SW,TACT SKHVBED010	▲ C507	S5-1SF-C82-1M0	CAP,E 820-200V
SW793	S5-042-01T-310	SW,TACT SKHVBED010	▲ C510	S5-EZT-547-0M0	CAP,E 47-50V
SW794	S5-042-01T-310	SW,TACT SKHVBED010	▲ C511	S5-EZT-247-1M0	CAP,E 470-16V
SW795	S5-042-01T-310	SW,TACT SKHVBED010	C514	S0-1BB-P7K-3K0	CAP,0.0027-2KV
SW796	S5-042-01T-310	SW,TACT SKHVBED010	C516	87-012-376-010	CAP,CER 470PF-500V
SW797	S5-042-01T-310	SW,TACT SKHVBED010	C517	S0-34B-N7W-2K0	CAP,CER 820P-2KV BP
SW798	S5-042-01T-310	SW,TACT SKHVBED010	C518	87-012-376-010	CAP,CER 470PF-500V
SW799	S5-042-01T-310	SW,TACT SKHVBED010	C519	87-012-376-010	CAP,CER 470PF-500V
*** OTHERS ***			C520	S6-2FF-210-2M0	CAP,E 1000-16V
CD702	S6-CH2-B03-2A0	CORD CONN CH2B032A	C521	S6-2D0-C22-1M0	CAP,E 220-200V
CD757	S6-CH2-A01-2A0	CORD CONN CH2A012A	C522	S5-EZT-247-1M0	CAP,E 470-16V
OS753	S7-7Q0-000-190	REMOTE RECEIVER PIC-28143TCS	▲ C523	S5-EZT-447-1M0	CAP,E 470-35V
MAIN PCB ASS'Y			▲ C524	S5-EZF-310-2M0	CAP,E 1000-25V
*** RESISTORS ***			▲ C526	S5-EZT-147-1M0	CAP,E 470-10V
R411	S4-X5T-622-3F0	RES,MF 22K-1/6W	C527	S0-34B-N7Q-2K0	CAP,CER 470P-2KV BP
R436	S6-558-212-0J0	RES,FUSE 12-1/2W RNF50R120J	▲ C529	SA-3PF-0KL-3M0	CAP,CER 0.0033U-125V
▲ R437	S3-X18-101-0J0	RES,M MOR1W010JB/B 1	C531	S6-2FF-210-2M0	CAP,E 1000-16V
▲ R439	87-025-525-080	RES,M 27K-1/4W	▲ C532	S5-EZT-247-1M0	CAP,E 470-16V
▲ R441	87-025-571-080	RES,M 100K-1/4W	▲ C536	S5-EZT-447-1M0	CAP,E 470-35V
▲ R442	87-025-459-080	RES,M 15K-1/4W	▲ C537	87-016-636-080	CAP,E 4.7-50V
▲ R443	S4-X5T-482-2F0	RES,M 8.2K-1/4	C538	S5-EZT-147-1M0	CAP,E 470-10V
▲ R444	87-025-459-080	RES,M 15K-1/4W	C540	S5-EZT-B4R-7M0	CAP,E 4.7-160V
▲ R447	87-A00-100-060	RES,FUSE 68-1/2W	▲ C541	87-016-294-080	CAP,E 22-200V
▲ R448	SF-F01-02J-B10	RES,M 1K-1W	C560	S0-JBB-07H-3K0	CAP,CER 0.0022-2KV
▲ R449	S5-X2C-E27-2J0	RES,CEMENT 2.7K-7W	D401	S2-8T1-1E1-N10	DIODE,11E1N-TA1B2
▲ R450	S3-X18-1R6-8J0	RES,M 0.68	D402	87-020-465-010	DIODE,1SS133T
▲ R452	S3-X18-12R-2J0	RES,M/O 2.2-1W	D403	87-027-661-010	ZENER,HZ30-1L TD
▲ R501	S5-X2A-E1R-2J0	RES,CEMENT 1.2-7W	D404	87-027-661-010	ZENER,HZ30-1L TD
▲ R505	87-022-448-090	RES,M/O 22K-3W	D406	S2-8T1-0EL-S60	DIODE,10ELS6TA1
▲ R510	S3-X28-B3R-3J0	RES,M 3.3-3W	▲ D407	SC-BFM-V3F-U00	DIODE,FMV-3FULF027-102
▲ R512	S3-X18-127-3J0	RES,M 27K	▲ D408	87-020-407-010	ZENER,HZ27-1L TD
R529	S4-X5T-627-2F0	RES,M 2.7K-1/6W	▲ D409	87-027-556-080	ZENER,HZ11B3L TD
▲ R531	S3-X18-A39-0J0	RES,M/F 39-2W	D410	S2-8T1-0EL-S60	DIODE,10ELS6TA1
▲ R542	87-022-604-080	RES,M 0.1-1W	▲ D411	S2-8T1-0EL-S60	DIODE,10ELS6TA1
R543	S6-358-468-1J0	RES,FUSE 680-1/4W	▲ D412	S2-LTP-G06-J00	DIODE,RMPG06J
*** CAPACITORS ***			▲ D413	S2-8T1-0EL-S60	DIODE,10ELS6TA1
C401	87-016-636-080	CAP,E 4.7-50V	D414	S2-8T1-0EL-S60	DIODE,10ELS6TA1
C403	87-010-560-080	CAP,E 10-50V	▲ D501	S2-BFR-M11-C00	DIODE,RM11C-LF-B1
C406	S5-EZT-410-1M0	CAP,E 100-35V	▲ D502	S2-BTR-M11-C00	DIODE,RM11C
▲ C407	S6-210-312-2M0	CAP,E 1200-25V	▲ D503	S2-BFR-M11-C00	DIODE,RM11C-LF-B1
C408	S0-2LT-522-1M0	CAP,E 220-50V	▲ D504	S2-BFR-M11-C00	DIODE,RM11C-LF-B1
C411	S6-13T-147-4J0	CAP,MPL 0.47-100V	▲ D505	S2-8T2-1DQ-N90	DIODE,21DQ09N-TA2B
C412	S0-JTB-05N-2K0	CAP,390P-500V B	D506	S2-8T1-0EL-S60	DIODE,10ELS6TA1
▲ C413	S3-N1F-533-3J0	CAP,PP 0.033-630V	D507	S2-8TE-QS0-400	DIODE,11EQS04N-TA
C417	S0-JTB-05S-2K0	CAP,CER 560PF-500V	▲ D508	S2-8T2-1DQ-N90	DIODE,21DQ09N-TA2B
C418	S5-EZT-B01-0M0	CAP,E 1-160V	▲ D509	S2-8T2-1DQ-N90	DIODE,21DQ09N-TA2B
C420	87-010-560-080	CAP,E 10-50V	D510	S2-BTR-U2A-M00	DIODE,RU2AM V1
C421	S0-2L0-410-2M0	CAP,E 1000-35V	▲ D512	S2-8T2-1DQ-N90	DIODE,21DQ09N-TA2B
C422	S5-EZT-D01-0M0	CAP,E 1-250V	D514	S2-8T2-1DQ-N90	DIODE,21DQ09N-TA2B
▲ C423	S4-41F-247-4J0	CAP,MPP 0.47-200V	▲ D515	87-A40-500-080	ZENER,MTZJ30B T-77
C424	87-010-263-010	CAP,E 100-10V	D516	87-020-465-010	DIODE,1SS133T
			D518	87-020-465-010	DIODE,1SS133T
			▲ D519	S2-8T2-1DQ-N90	DIODE,21DQ09N-TA2B
			D521	87-020-465-010	DIODE,1SS133T
			D523	87-020-465-010	DIODE,1SS133T
			D524	S2-8T1-1E1-N10	DIODE,11E1N-TA1B2
			D527	S2-8T1-1E1-N10	DIODE,11E1N-TA1B2
			D528	87-017-931-010	ZENER,MTZJ5.6B
			D529	87-020-465-010	DIODE,1SS133T
			D530	S2-8T1-1E1-N10	DIODE,11E1N-TA1B2

ELECTRICAL REPLACEMENT PARTS LIST

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
*** DIODES ***			*** FUSES ***		
D531	S2-8T1-1E1-N10	DIODE,11E1N-TA1B2	CP803A	S6-7R1-050-190	HOLDER,WIRE 51052-0500
D532	S2-8T1-1E1-N10	DIODE,11E1N-TA1B2	△ F501	S8-1PA-050-030	FUSE,233005-MB000
D534	S2-8T1-0EL-S60	DIODE,10ELS6TA1	△ F502	S8-0PA-2R5-010	FUSE,23302.5-MB00
D535	S2-8T1-1ES-N10	DIODE,11ES1N-TA1B2	FH501	S6-710-T00-060	HOLDER,FUSE EYF-52B
D536	S2-8T1-1E1-N10	DIODE,11E1N-TA1B2	FH502	S6-710-T00-060	HOLDER,FUSE EYF-52B
D537	S2-8T1-1E1-N10	DIODE,11E1N-TA1B2	FH503	S6-710-T00-060	HOLDER,FUSE EYF-52B
D538	S2-BTR-U2A-M00	DIODE,RU2AM V1	FH504	S6-710-T00-060	HOLDER,FUSE EYF-52B
△ IC506	S0-025-004-800	PHOTO,COUPLER TLP621	*** RELAY ***		
△ TH501	SF-20C-3R0-Q00	DEGAUSS ELEMENT PTH451C3R0Q11	△ RY501	S5-60Q-102-010	RELAY,SDT-S-109LMR
*** ICS ***			*** OTHER ***		
△ IC401	87-A20-128-010	IC,LA7840	EL002	S2-412-030-1A0	EYE LET XRY20X30BD
△ IC501	S2-BT0-662-600	IC,STR-F6626	△ ICP502	S8-3PC-050-020	MICRO FUSE,251005
△ IC502	S0-2K9-240-600	IC,UPC2406AHF	△ ICP503	S8-3PC-070-020	MICRO FUSE 251007
△ IC503	S0-GA9-09R-D00	IC,PQ09RD08	△ ICP504	S8-3PC-050-020	MICRO FUSE,251005
△ IC504	87-A20-525-010	IC,KIA7812PI	△ ICP505	S8-3PC-040-020	MICRO FUSE 251004
IC505	87-A20-790-010	IC,KIA7806P	CRT PCB ASS'Y		
*** TRANSISTORS ***			*** RESISTORS ***		
Q401	89-324-122-080	TR,2SC2412KT	△ R804	87-025-590-060	RES,M 15K-2W
Q402	89-110-372-080	TR,2SA1037AK	△ R806	87-025-590-060	RES,M 15K-2W
Q403	SD-300-166-700	TR,2SD1667(R,S)	△ R808	87-025-590-060	RES,M 15K-2W
△ Q405	S2-SC2-621-D00	TR,2SC2621(D,E)	*** CAPACITORS ***		
△ Q406	SD-UU0-249-900	TR,2SD2499(LBOEC1)	C808	S0-34B-N71-3K0	CAP,CER 0.001-2KV
△ Q501	SC-3T0-290-900	TR,2SC2909	*** DIODES ***		
△ Q502	SA-3T1-371-A00	TR,2SA1371	D801	87-020-465-010	DIODE,1SS133T
△ Q503	SC-300-416-000	TR,2SC4160-OEC	D802	87-020-465-010	DIODE,1SS133T
Q504	89-318-154-080	TR,2SC1815Y	D803	87-020-465-010	DIODE,1SS133T
Q506	87-026-239-080	DTC114TKAT14	*** TRANSISTORS ***		
Q507	89-324-122-080	TR,2SC2412KT	△ Q801	S2-SC2-621-D00	TR,2SC2621(D,E)
Q513	87-026-235-010	TR,DTC114EK	△ Q802	S2-SC2-621-D00	TR,2SC2621(D,E)
Q520	87-026-239-080	DTC114TKAT14	△ Q803	S2-SC2-621-D00	TR,2SC2621(D,E)
Q521	87-026-239-080	DTC114TKAT14	Q810	SC-7T1-740-S00	TR,2SC1740SP(R,S)
*** COILS ***			Q811	SC-7T1-740-S00	TR,2SC1740SP(R,S)
B501	S2-4AT-036-550	CORE,BEADS BL01RN1-A63T6	Q812	SC-7T1-740-S00	TR,2SC1740SP(R,S)
B502	S2-4DT-035-810	CORE,BEADS LFP3A-M3R2TA	*** COILS ***		
B504	S2-4AT-036-550	CORE,BEADS BL01RN1-A63T6	L802	S2-167-D12-1K0	COIL,120UH EL0607RA-121K
B505	S2-4DT-035-810	CORE,BEADS LFP3A-M3R2TA	L804	S2-167-D12-1K0	COIL,120UH EL0607RA-121K
L401	87-003-143-010	COIL,4.7MH	*** CONNECTOR ***		
△ L402	S2-210-002-7A0	COIL,LINEARITY ELH5L4113	CP805	S6-9E2-501-290	CONN,PWB SIDE
L481	S2-D80-000-120	TIB PIN PHASE COIL D8000012	*** FUSE ***		
△ L501	S2-9K0-000-740	COIL,LINE,FILTER 9-000074	CP803B	S6-7R1-050-190	HOLDER,WIRE 51052-0500
△ L502	S2-9X0-000-740	COIL,LINE FILTER SS24H-20025	*** CRT SOCKET ***		
L504	S2-167-D27-0K0	COIL,27UH EL0607RA-270K	△ J801	S6-6C1-300-170	SOCKET,CRT CVT3275-5101
*** TRANSFORMERS ***			AND OTHERS		
△ FB401	S4-322-101-1Q0	TRANS,FLYBACK 3221011Q	*** OTHERS ***		
T401	S4-501-300-1J0	TRANS,H DRIVE	CD802	S6-CP8-203-5A0	CORD CONN CP82035A
△ T501	S4-814-005-7W0	TRANS,SWITCHING 8140057W	*** CONNECTORS ***		
T502	S4-013-600-160	TRANS,POWER AC 0136001	CD803	S6-9X4-500-290	CONN PWB SIDE B05B-DVS
*** VARIABLE RESISTORS ***			CP501	S6-973-200-390	CORD UX CONNECTOR
VR401	S1-263-14B-TC0	SFR,RH063MC14R07A	CP810	S6-9E2-A01-290	CONN,PWB SIDE
VR402	S1-263-Q3B-TC0	SFR,RH063MC	CP820	S6-9E2-B01-290	CONN,PWB SIDE
VR502	S1-263-L2B-TC0	SFR,RH063MCN2R07	*** OTHERS ***		

ELECTRICAL REPLACEMENT PARTS LIST

REF.NO.	PART NO.	DESCRIPTION
		*** COILS ***
L005	S2-A6A-8A0-A10	CORE,FERRITE HF57T18.5*10*10
▲ L503	S2-8R2-000-240	COIL,DEGAUSS 8R200024
		*** AC CORD ***
▲ CD501	S2-0R6-149-180	CORD,AC 0R614918
		*** OTHERS ***
CD303	S6-CH1-440-0A0	CORD CONN CH14400A
SP301	S7-0V0-420-010	SPKR S0410J05A
SP302	S7-0V0-420-010	SPKR S0410J05A
▲ V801	S9-8W2-104-190	CRT,W/DY A51LSH196X01(O)

