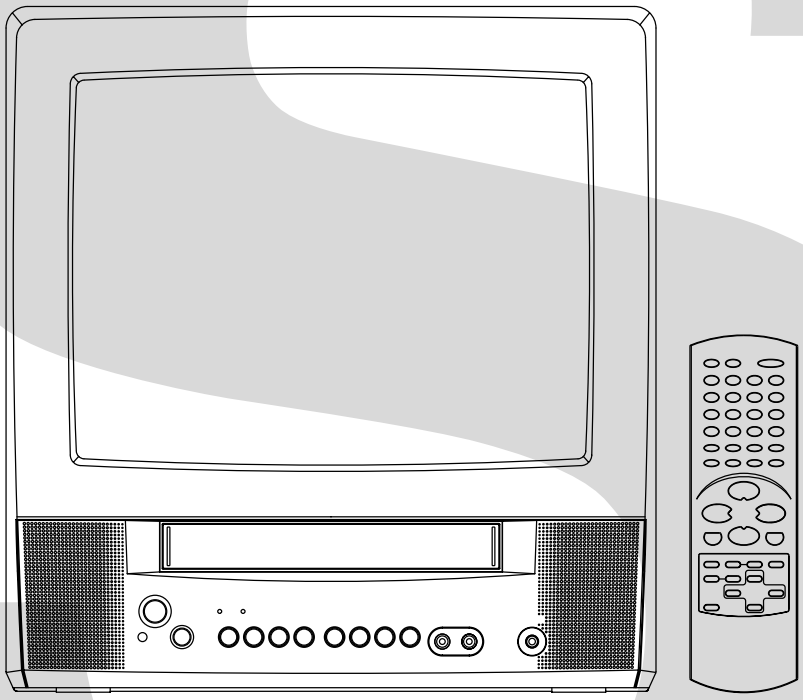
TOSHIBA

FILE NO. 140-200335

SERVICE MANUAL

COLOR TELEVISION/ VIDEO CASSETTE RECORDER

MV13P2



DOCUMENT CREATED IN JAPAN, Dec., 2003

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 ⚠ 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 eternal 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

HOW TO ORDER PARTS

Please include the following informations when you order parts. (Particularly the VERSION LETTER.)

1. MODEL NUMBER and VERSION LETTER
   The MODEL NUMBER can be found on the back of each product and the VERSION LETTER can be found at the end of the SERIAL NUMBER.
2. PART NO. and DESCRIPTION
   You can find it in your SERVICE MANUAL.

TAPE REMOVAL METHOD AT NO POWER SUPPLY

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

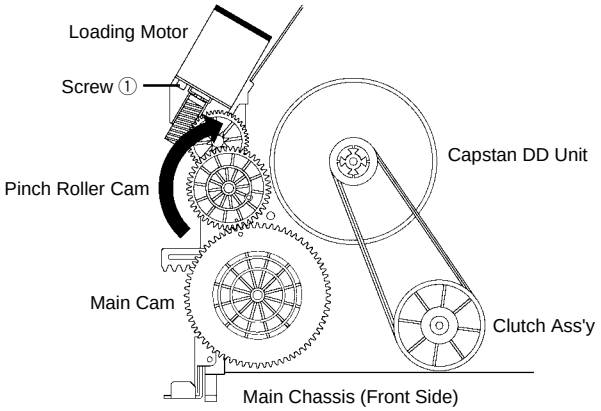


TABLE OF CONTENTS

GENERAL SPECIFICATIONS

G-1	**TV System**	CRT		CRT Size / Visual Size	13 inch / 335.4mmV
				CRT Type	Normal
				Deflection	90 degree
				Magnetic Field BV/BH	+0.45G / 0.18G
		Color System			NTSC
		Speaker			1Speaker
				Position	Front
				Size	1.5 x 2.7 Inch
				Impedance	8 ohm
		Sound Output		MAX	1.5 W
				10%(Typical)	1.0 W
G-2	**VCR System**	System			VHS Player / Recorder
		Video System			NTSC
		Hi-Fi STEREO			No
		NTSC PB			-
		Deck		DECK	OVD-7
				Loading System	Front
				Motor	3
		Heads	Video Head		2 Head
			FM Audio Head		No
			Audio /Control		Mono/Yes
			Erase(Full Track Erase)		Yes
		Tape Speed	Rec	PAL	-
				NTSC	SP/SLP
			Play	PAL	-
				NTSC	SP/SLP
		Fast Forward / Rewind Time (Approx.) at 25oC			FF:4'50"/REW:2'30"
				with Cassette	T-120
		Forward/Reverse Picture Search		NTSC or PAL-M	SP/SLP=3x,5x/9x,15x
				PAL or SECAM	-
		Frame Advance			-
		Slow Speed			-
G-3	**Tuning System**	Broadcasting System			US System M
		Tuner and Receive CH		System	1Tuner
				Destination	US(w/CATV)
				Tuning System	F-Synth
				Input Impedance	VHF/UHF 75 ohm
				CH Coverage	2~69, 4A,A-5~A-1, A~I, J~W,W+1~W+84
		Intermediate Frequency		Picture(FP)	45.75MHz
				Sound(FS)	41.25MHz
				FP-FS	4.5MHz
		Preset CH			No
		Stereo/Dual TV Sound			No
		Tuner Sound Muting			Yes
G-4	**Signal**	Video Signal		Input Level	1 V p-p/75 ohm
				Output Level	-
				S/N Ratio (Weighted)	50dB
				Horizontal Resolution at SP Mode	220Lines
		Audio Signal		Input Level	-8dBm/50k ohm
				Output Level	-
				S/N Ratio at SP (Weighted)	38dB
				Harmonic Distortion at SP(1KHz) Typical	1.5 %
				Frequency Response at SP	100Hz - 10kHz
				at LP	-
				at SLP	100Hz - 4kHz
		Hi-Fi Audio Signal		Dynamic Range : More than	-
				Frequency Response	-
				Wow And Flutter : Less than	-
				Channel Separation : More than	-
				Harmonic Distortion : Less than	-

GENERAL SPECIFICATIONS

G-5	**Power**	Power Source		AC	120V 60Hz	
				DC	-	
		Power Consumption		at AC	65 W at 120V 60Hz	
				at DC	-	
				Stand by (at AC)	5 W at 120V 60 Hz	
				Per Year	-	
		Protector		Power Fuse	Yes	
				Safety Circuit	Yes	
				IC Protector(Micro Fuse)	No	
				Dew Sensor	No	
G-6	**Regulation**			Safety	UL	
				Radiation	FCC	
				X-Radiation	DHHS	
G-7	**Temperature**			Operation	+5oC ~ +40oC	
				Storage	-20oC ~ +60oC	
G-8	**Operating Humidity**				Less than 80% RH	
G-9	**On Screen**	Menu			Yes	
	Display		Menu	Type	Icon	
			System Setup		Yes	
				Clock Set	Yes	
				On/Off Timer Set	Yes	
				Auto Clock On/Off	Yes	
				Standard Time	Yes	
				Daylight Saving Time	Yes	
			TV Setup		Yes	
				Language	Yes	
				Picture	Yes	
				Audio	No	
				Picture Preference	Yes	
			Channel Setup		Yes	
				TV/CATV	Yes	
				Auto CH Memory	Yes	
				Add/ Delete	Yes	
			V-chip Setup		Yes	
			Tape Setup		Yes	
				Timer Rec Set	Yes	
				Auto Repeat On/Off	Yes	
		G-CODE(or SHOWVIEW or PLUSCODE)No. Entry			No	
		Clock			Yes	
		CH/AV(Line)			Yes	
		Tape Counter(Linear Counter)			Yes	
		Tape Speed			Yes	
		Sleep Time			Yes	
		Stereo/Audio Output			No	
				Bilingual	No	
				SAP	No	
		Control	Volume		Yes	
		Level	Bright / Contrast / Sharpness / Color		Yes	
			Tint		Yes	
			Bass/Treble/Balance		No	
			Manual Tracking		Yes	
		Play/Stop/FF/Rew/Rec/OTR/T-Rec/Pause/Eject/Tape In (Symbol Mark)			Yes	
		Auto Tracking/Manual Tracking			Yes	
		Caption / Text			Yes	
		Index			Yes	
		Mute			Yes	
		Hi-Fi			No	
		Repeat			Yes	
		Zero Return			Yes	
		DEW			No	
G-10	**OSD Language**				English French Spanish	
G-11	**Clock,Timer**	Calendar			1990/1/1 ~ 2081/12/31	
	and Timer	Timer Events			8 prog/ 1 month	
	Back-up	One Touch Recording Max Time			6 Hours	
		OTPB Valid Time			No	
		Sleep Timer		Max Time	120	min.
				Step	10	min.
		On/Off Timer		Program(On Timer / Off Timer)	1	prog.
		Auto Shut Off		No Signal	15	min.
				No Operation	-	
		Timer Back-up (at Power Off Mode)			5	sec.

GENERAL SPECIFICATIONS

G-12	**Remote Control**	Unit		RC-JG
		Glow in Dark Remocon		Yes
		Format		NEC
		Custom Code		40-BFh , 44-BBh
		Power Source	Voltage(D.C)	3V
			UM size x pcs	UM-4 x 2 pcs
		Total Keys		44 Keys
		Keys	Power	Yes
			1	Yes
			2	Yes
			3	Yes
			4	Yes
			5	Yes
			6	Yes
			7	Yes
			8	Yes
			9	Yes
			0	Yes
			CH Up	Yes
			CH Down	Yes
			Volume Up	Yes
			Volume Down	Yes
			Input Select	Yes
			Play	Yes
			F.Fwd	Yes
			Rew	Yes
			Pause/Still	Yes
			Stop	Yes
			Index+	Yes
			Index-	Yes
			T-REC	Yes
			Rec(T-Rec/OTR)	Yes
			Rec/OTR	Yes
			Eject	Yes
			Counter Reset	Yes
			Speed	Yes
			TV Monitor	Yes
			Quick View(Channel Return)	Yes
			Program	Yes
			Slow	No
			Auto Tracking(Digital Tracking)	Yes
			Tracking+	Yes
			Tracking -	Yes
			Menu	Yes
			Enter	Yes
			Cancel	Yes
			Call	Yes
			Closed Caption(TV/Caption/Text)	Yes
			Sleep Timer	Yes
			Mute	Yes
			Zero Return	Yes
			CM Skip(Skip Search)	Yes
			Audio Select	No

GENERAL SPECIFICATIONS

G-13	**Features**	Auto Head Cleaning		No
		Auto Tracking		Yes
		HQ (VHS Standard High Quality)		Yes
		Auto Power On, Auto Play, Auto Rewind, Auto Eject		Yes
		VIDEO PLUS+(SHOWVIEW,G-CODE)		No
		Auto Clock		Yes
		Forward / Reverse Picture Search		Yes
		One Touch Playback		No
		Auto CH Memory		Yes
		Closed Caption		Yes
		TV Auto Shut off Function		Yes
		End Call		No
		Index Search		Yes
		SQPB		No
		CATV		Yes
		CM Skip(30sec x 6 Times)		Yes
		Comb Filter		No
		TV Monitor		Yes
		Program Extend		No
		Choke Coil		No
		Energy Star		Yes
		Dirty Head		No
		V-chip USA V-chip		Yes
		CANADA V-chip		No
		CM Advance		No
		Movie Advance		No
		Zero Return		Yes
		Power On Memory		No
		Picture Preference		Yes
		Auto Setup		Yes
		Protect of FBT Leak Circuit		Yes
G-14	**Accessories**	Owner's Manual	Language	English
			w/Guarantee Card	Yes
		Remote Control Unit		Yes
		Battery		Yes
			UM size x pcs	UM-4 x 2 pcs
			OEM Brand	No
		Rod Antenna		No
			Poles	-
			Terminal	-
			W/300 ohm to 75 ohm antenna adapter	-
		Loop Antenna		No
			Terminal	-
		U/V Mixer		No
		300 ohm to 75 ohm Antenna Adapter		Yes
		Antenna Change Plug		No
		DC Car Cord (Center+)		No
		AC Plug Adapter		No
		AC Cord		No
		AV Cord (2Pin-1Pin)		No
		Guarantee Card		No
		Registration Card		Yes
		ESP Card		Yes
		Warning Sheet		No
		Dew/AHC Caution Sheet		No
		Quick Set-up Sheet		No
		Circuit Diagram		No
		Service Facility List		No
		Important Safeguard		No
		Sheet Information (Return)		Yes

GENERAL SPECIFICATIONS

G-15	**Interface**	Switch		Power	Yes
				Play	Yes
				Pause/Still	No
				One Touch Playback	No
				Channel Up	Yes
				Channel Down	Yes
				F.FWD/Cue	Yes
				Eject/Stop	Yes
				Main Power SW	No
				Volume Up	Yes
				Volume Down	Yes
				Rew/Rev	Yes
				Rec/OTR	Yes
				Input Select	No
		Indicator		Power	No
				Rec/OTR	Yes (Red)
				T-Rec	Yes (Red)
				On Timer	No
				CS	No
		Key Light up		Rec/OTR	No
				One Touch Playback	No
				Play	No
		Terminals	Front	Video Input	RCA x 1
				Audio Input	RCA x 1
				Other Terminal	Head Phone(Stereo & Mono, 3.5mm)
			Rear	Video Input	No
				Audio Input	No
				Video Output	No
				Audio Output	No
				Euro Scart	No
				Diversity	No
				Ext Speaker	No
				DC Jack 12V(Center +)	No
				VHF/UHF Antenna Input	F Type
				AC Inlet	No
G-16	**Set Size**			Approx. W x D x H (mm)	362 x 365 x 382
G-17	**Weight**			Net (Approx.)	11.0 kg(24.3 lbs)
				Gross (Approx.)	12.5 kg(27.6 lbs)
G-18	**Carton**		Master Carton		No
				Content	-
				Material	-
				Dimensions W x D x H(mm)	-
				Description of Origin	-
			Gift Box		Yes
				Material	Double/White
				Dimensions W x D x H(mm)	423 x 447 x 443
				Design	As per Buyer's
				Description of Origin	Yes
			Drop Test	Natural Dropping At	1 Corner / 3 Edges / 6 Surfaces
				Height (cm)	62
			Container Stuffing(40' container)		700 Sets
G-19	**Material**		Cabinet	Front	PS 94V0 DECABROM
				Rear	PS 94V0 DECABROM
				Jack Panel	-
			PCB	Non-Halogen Demand	No
				Eyelet Demand	Yes
G-20	**Environment**		Pb Free	Lead-free Solder	No
				Other	No
			Cd Free		No

DISASSEMBLY INSTRUCTIONS

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

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

1. Remove the 4 screws ①.
2. Remove the AC cord from the AC cord hook ②.
3. Remove the Back Cabinet in the direction of arrow.

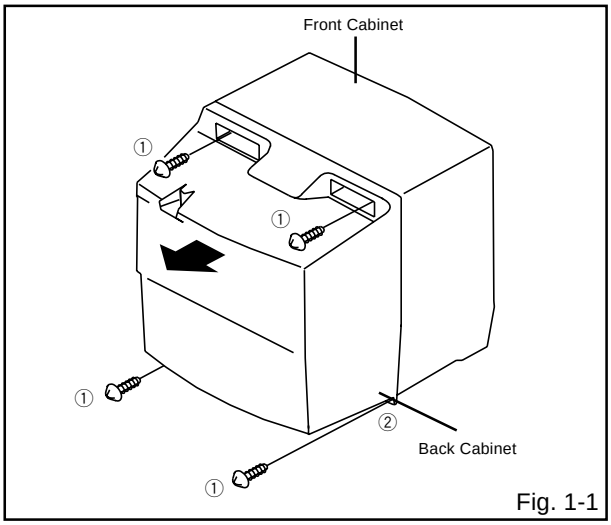


Fig. 1-1

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:
   (CP801 and CP851B).
3. Remove the CRT PCB in the direction of arrow.

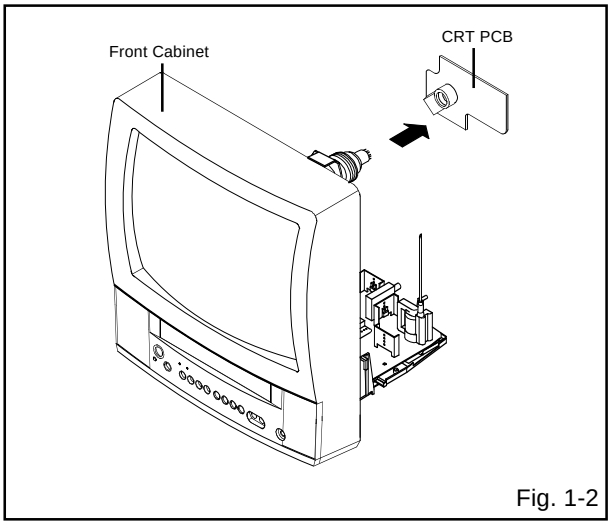


Fig. 1-2

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

1. Remove the 2 screws ①.
2. Disconnect the following connectors:
   (CP352, CP401 and CP502).
3. Unlock the support ②.
4. Remove the TV/VCR Block in the direction of arrow.

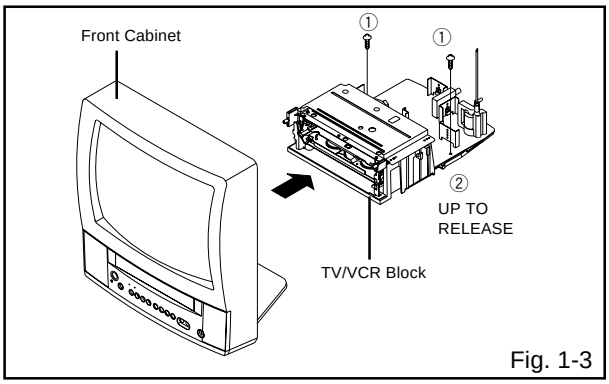


Fig. 1-3

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

1. Remove the 2 screws ①.
2. Remove the screw ②.
3. Remove the Deck Shield Plate in direction of arrow (A).
4. Remove the 3 screws ③.
5. Disconnect the following connectors:
   (CP1001, CP4001, CP4002 and CP4003).
6. Remove the Deck Chassis in the direction of arrow (B).
7. Remove the screw ④.
8. Remove the Syscon PCB in the direction of arrow (C).

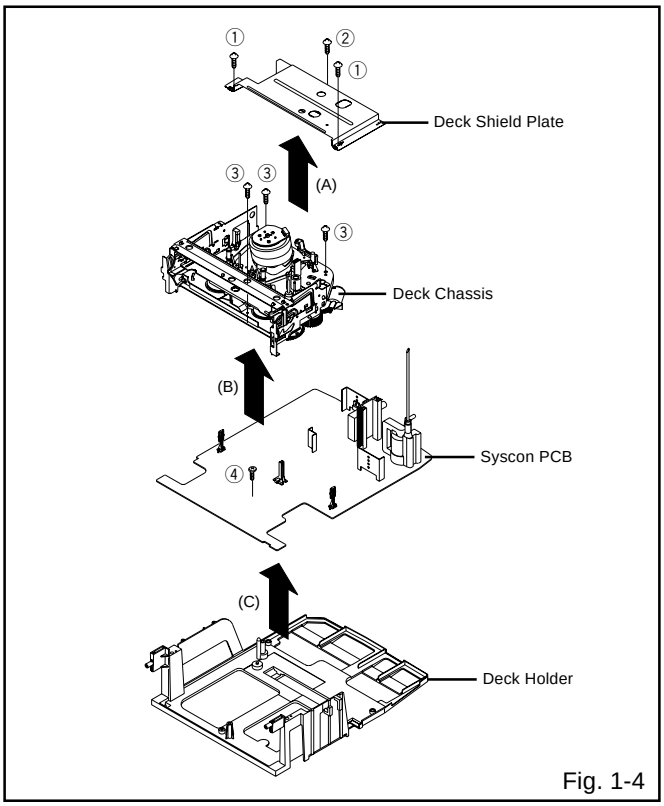


Fig. 1-4

DISASSEMBLY INSTRUCTIONS

2. REMOVAL OF VCR DECK PARTS

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

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

NOTE

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

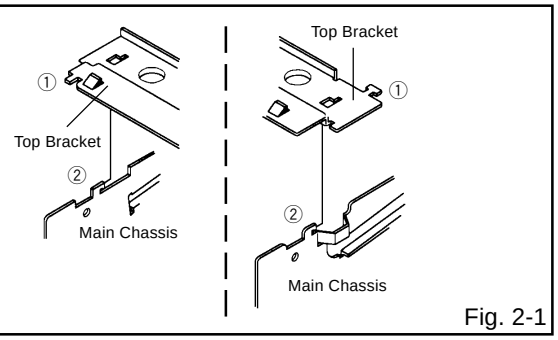


Fig. 2-1

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

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

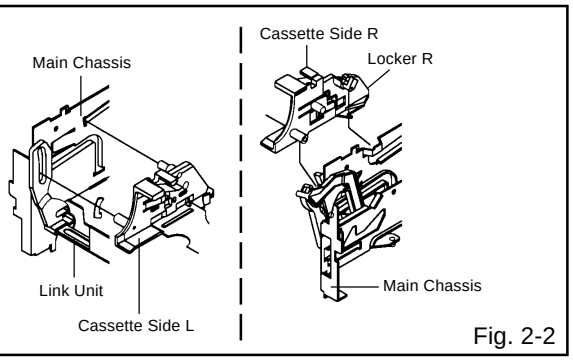


Fig. 2-2

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

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

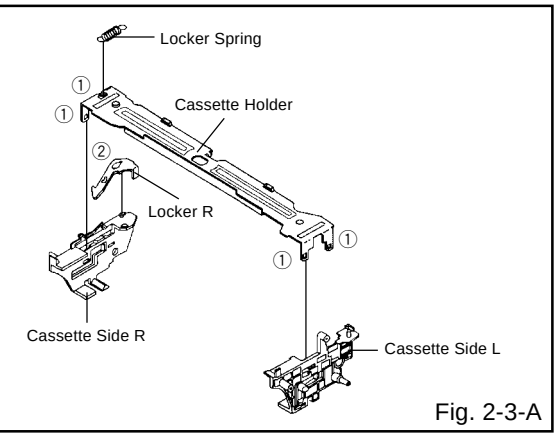


Fig. 2-3-A

NOTE

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

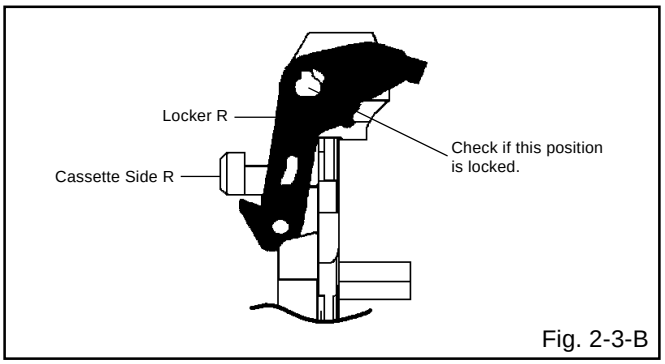


Fig. 2-3-B

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

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

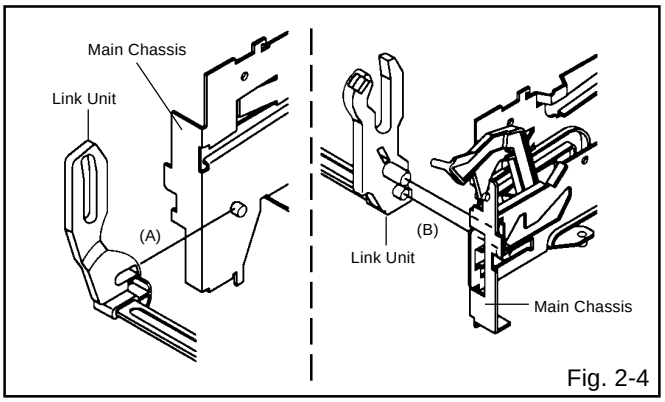


Fig. 2-4

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

1. Unlock the support ①.
2. Remove the BOT Cover.
3. Extend the support ②.
4. Remove the Link Lever.
5. Remove the Flap Lever.

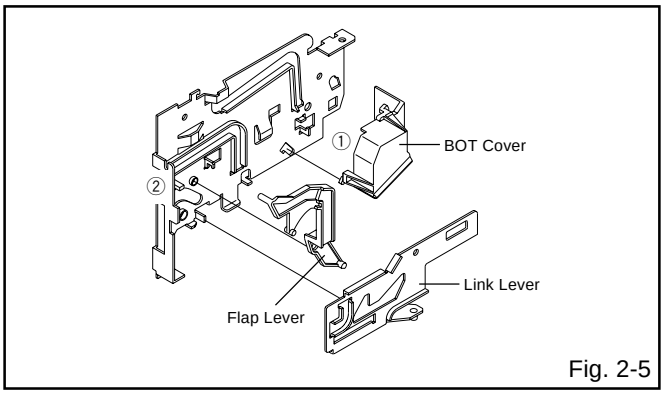


Fig. 2-5

DISASSEMBLY INSTRUCTIONS

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

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

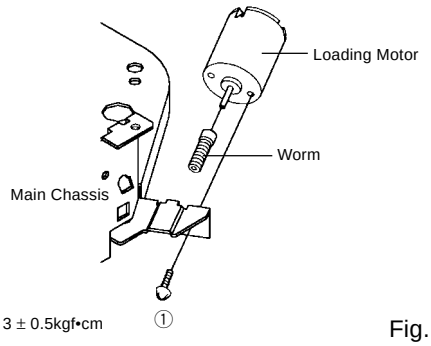


Fig. 2-6-A

NOTE

1. In case of the Worm installation, check if the value of the Fig. 2-6-B is correct.
2. In case of the Loading Motor installation, hook the wire on the Cassette Opener as shown Fig. 2-6-C.
3. When installing the wires between Capstan DD Unit and Loading Motor, connect them correctly as shown Fig. 2-6-D.

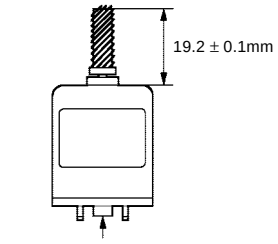


Fig. 2-6-B

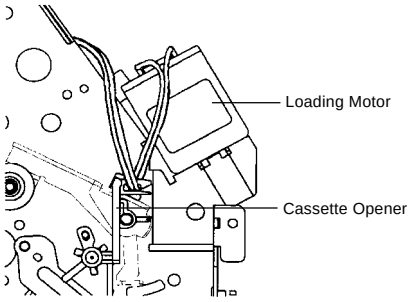


Fig. 2-6-C

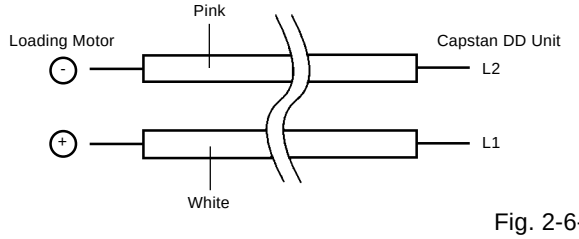


Fig. 2-6-D

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

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

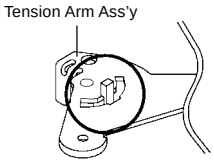


Fig. 2-7-A

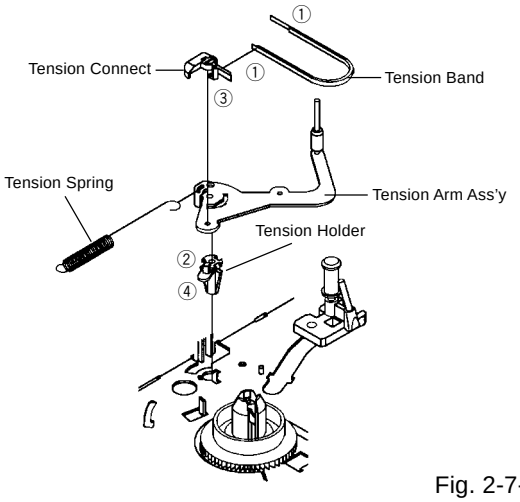


Fig. 2-7-B

NOTE

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

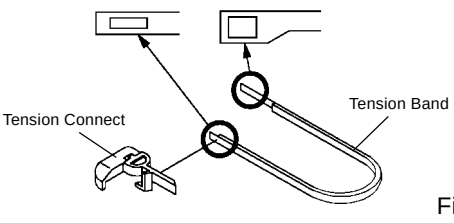


Fig. 2-7-C

DISASSEMBLY INSTRUCTIONS

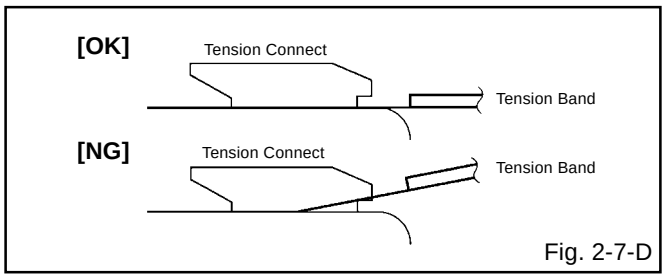


Fig. 2-7-D

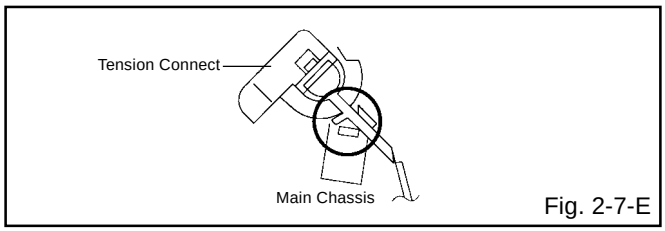


Fig. 2-7-E

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

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

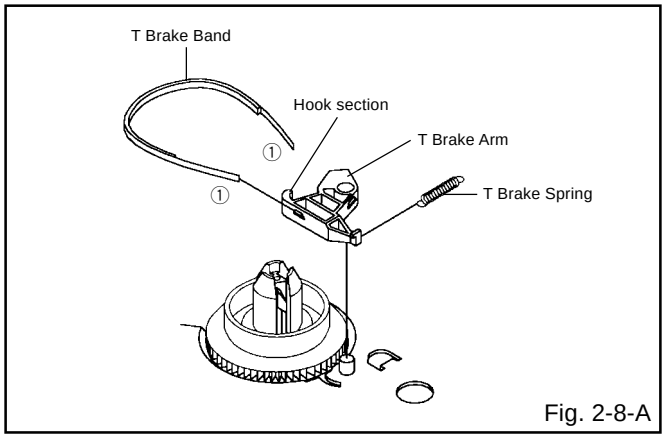


Fig. 2-8-A

NOTE

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

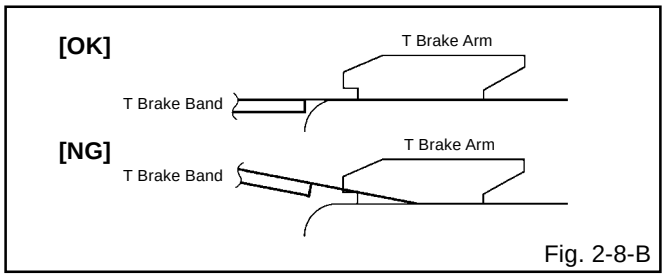


Fig. 2-8-B

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

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

NOTE

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

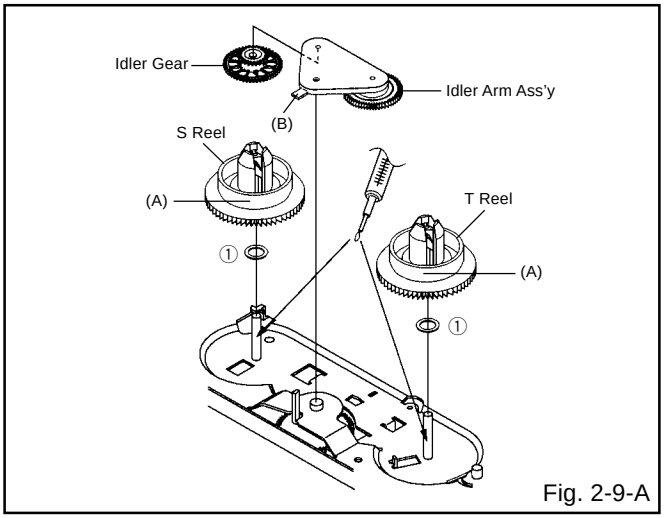


Fig. 2-9-A

NOTE

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

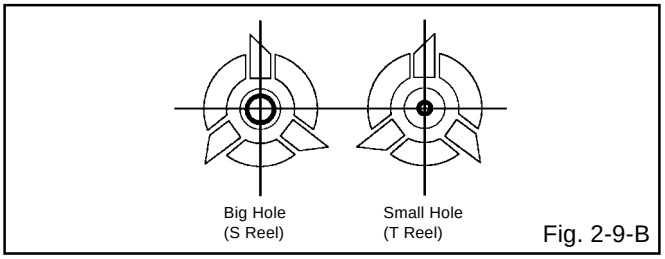


Fig. 2-9-B

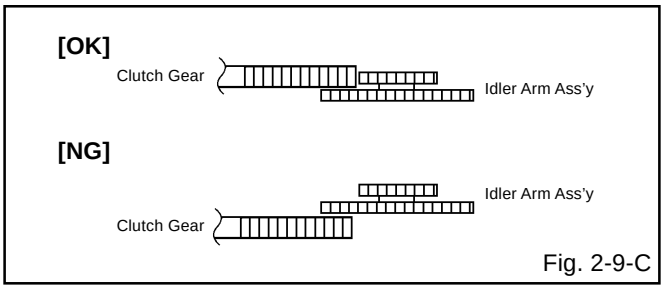


Fig. 2-9-C

DISASSEMBLY INSTRUCTIONS

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

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

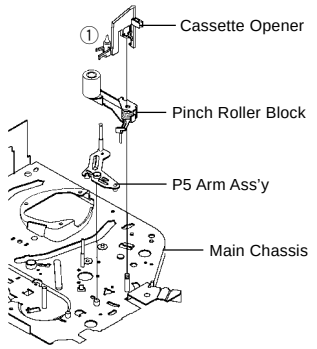


Fig. 2-10-A

NOTE

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

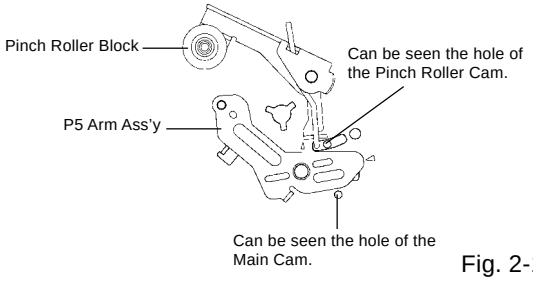


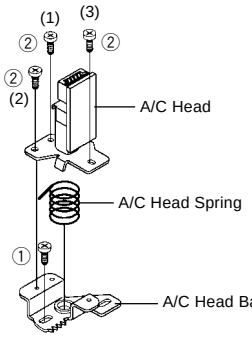
Fig. 2-10-B

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

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

NOTE

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



• Screw Torque: 5 ± 0.5kgf•cm (Screw ①)

Fig. 2-11-A

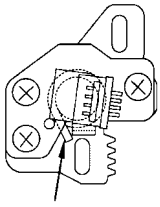
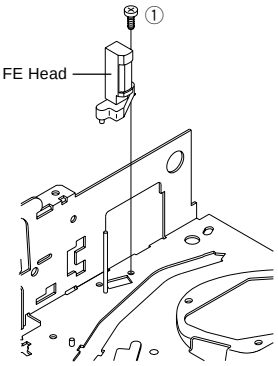


Fig. 2-11-B

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

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



• Screw Torque: 5 ± 0.5kgf•cm
• The FE Head is not installed on the Video Cassette Player.

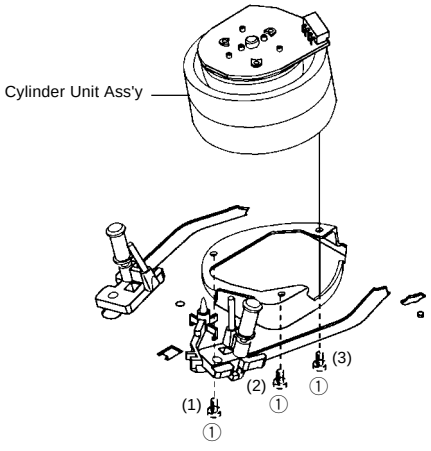
Fig. 2-12

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

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

NOTE

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



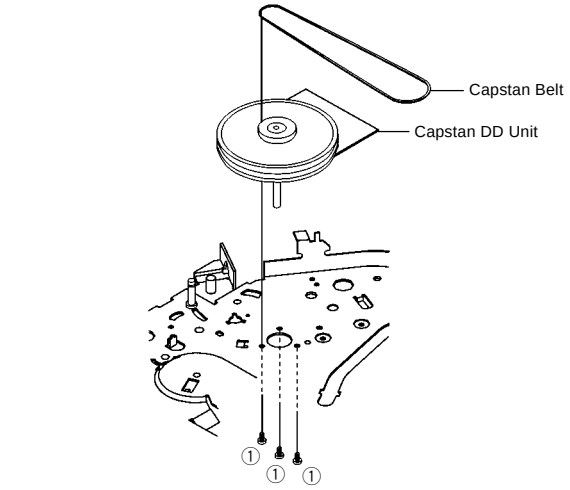
• Screw Torque: 3 ± 0.5kgf•cm

Fig. 2-13

DISASSEMBLY INSTRUCTIONS

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

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



• Screw Torque: 4 ± 0.5kgf•cm

Fig. 2-14-A

NOTE

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

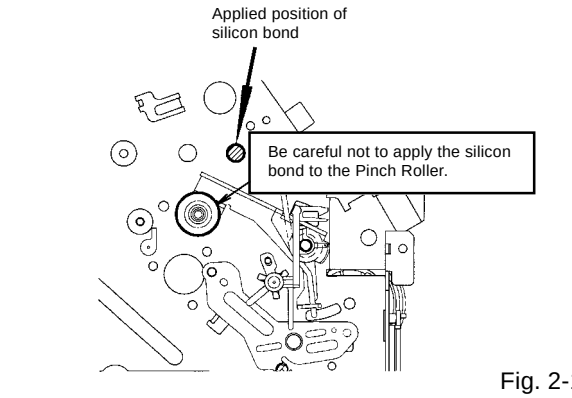


Fig. 2-14-B

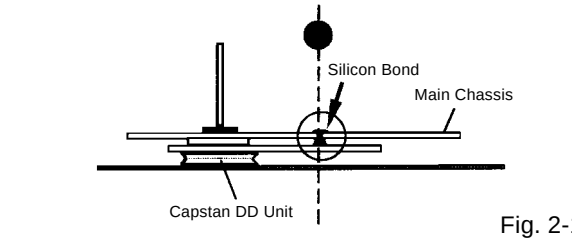


Fig. 2-14-C

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

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

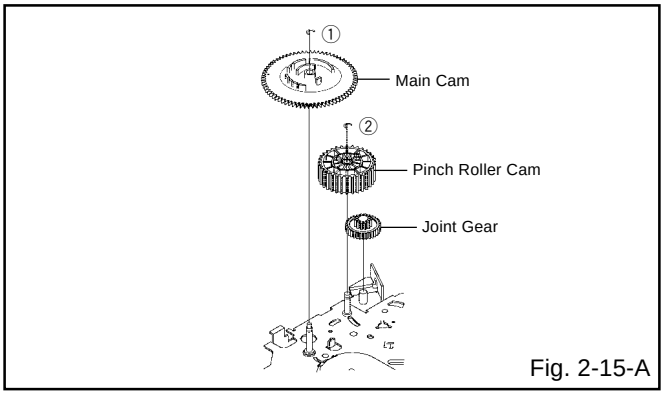


Fig. 2-15-A

NOTE

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

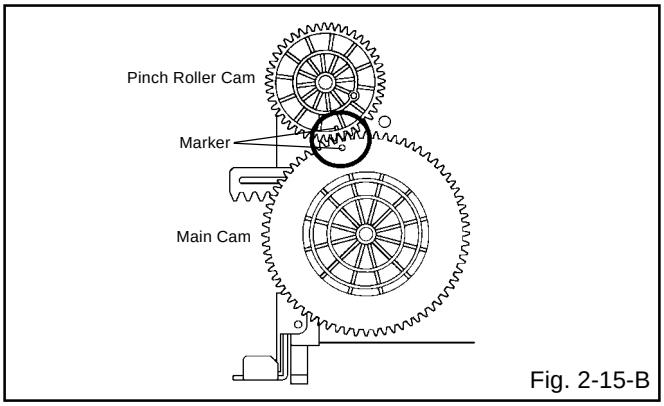


Fig. 2-15-B

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

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

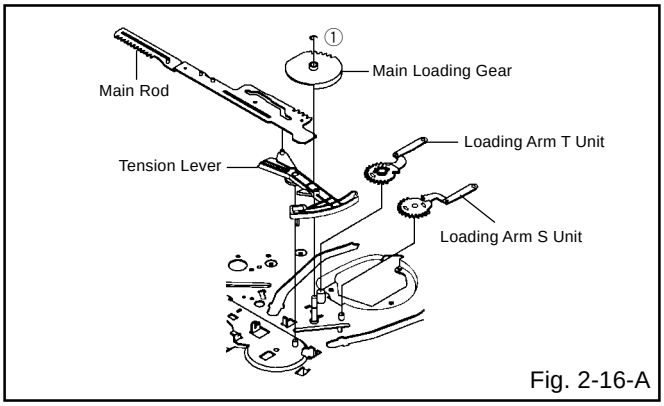


Fig. 2-16-A

DISASSEMBLY INSTRUCTIONS

NOTE

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

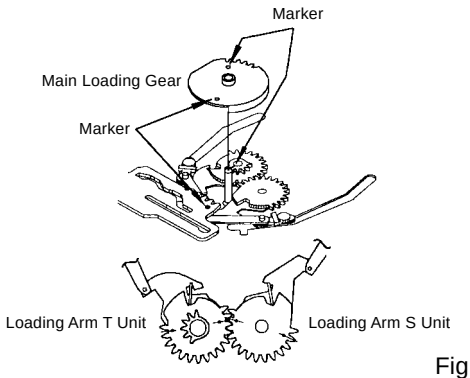


Fig. 2-16-B

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

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

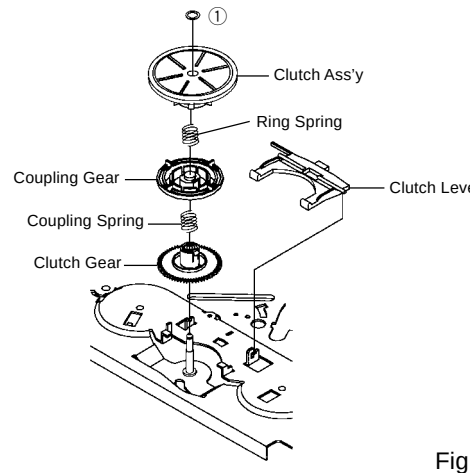


Fig. 2-17-A

NOTE

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

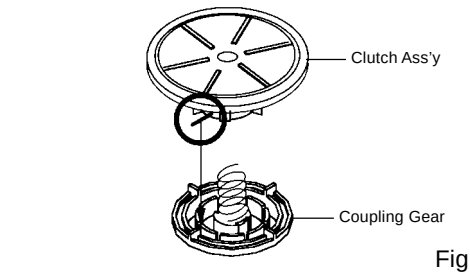


Fig. 2-17-B

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

1. Remove the P4 Cap.
2. Unlock the support ① and remove the Cassette Guide Post.
3. Remove the Inclined Base S/T Unit.
4. Remove the screw ②.
5. Remove the LED Reflector.

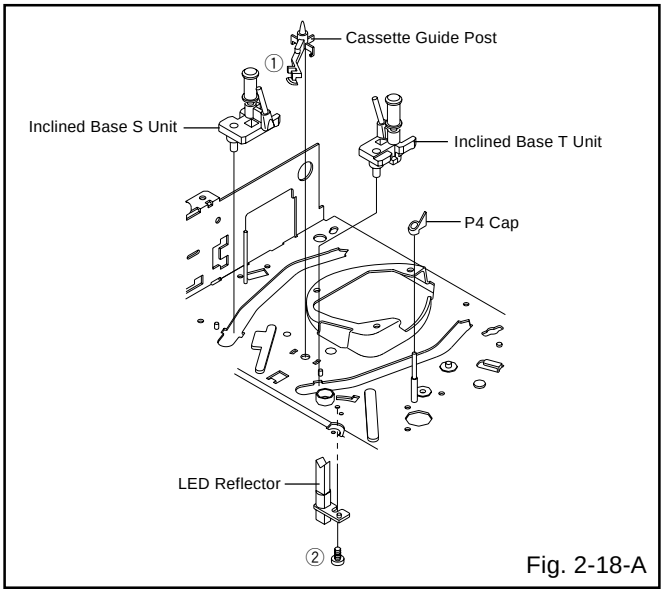


Fig. 2-18-A

NOTE

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

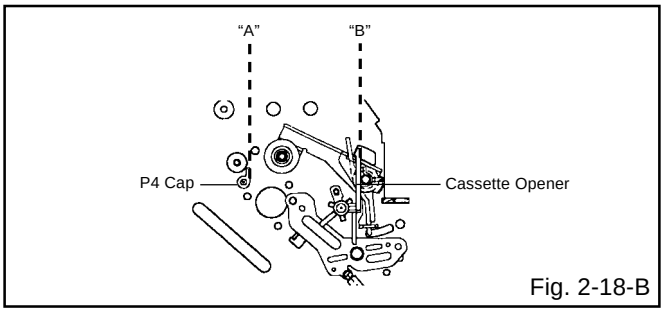


Fig. 2-18-B

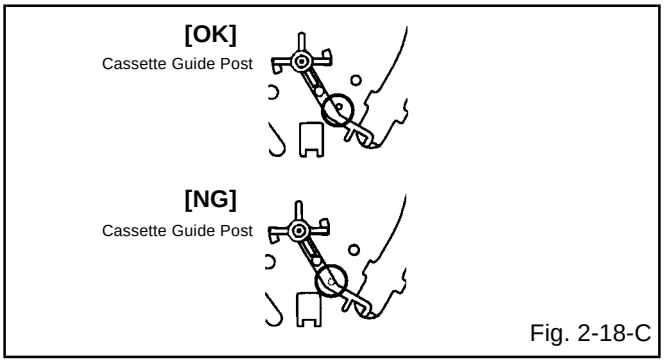


Fig. 2-18-C

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.

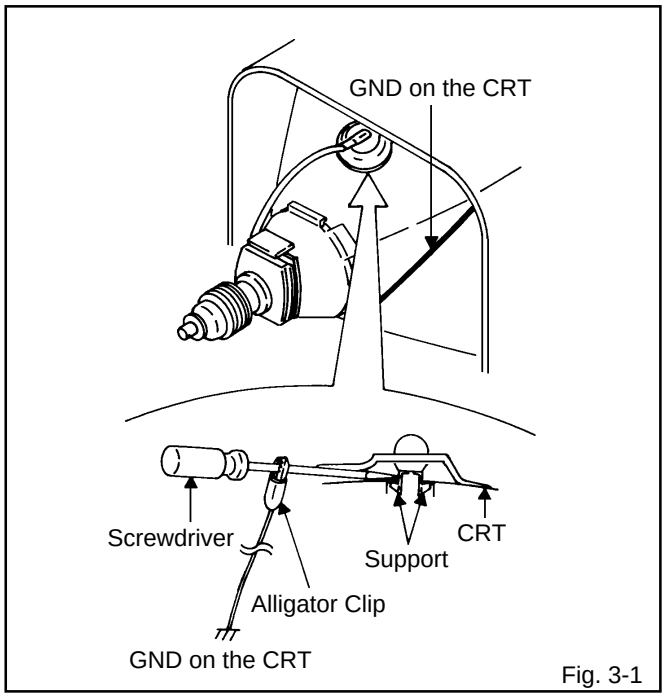


Fig. 3-1

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.)**

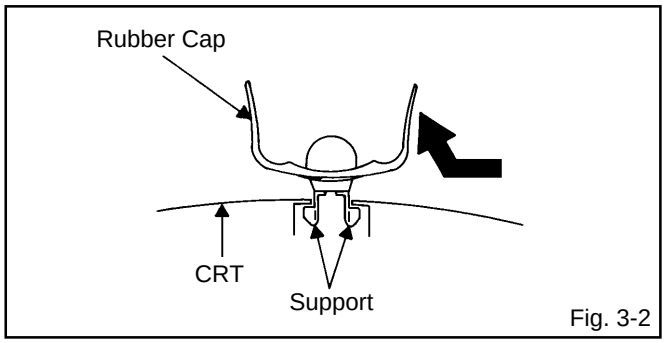


Fig. 3-2

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.)**

NOTE

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

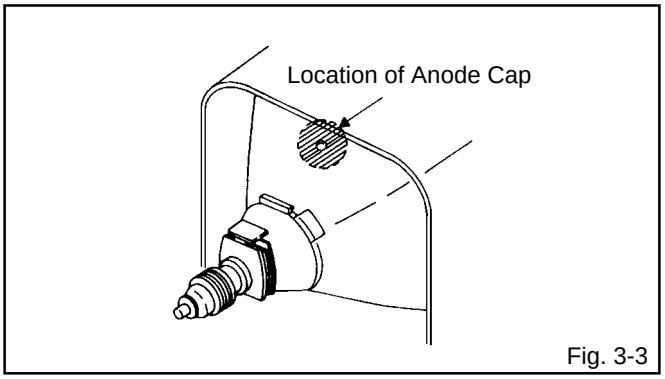


Fig. 3-3

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.)**

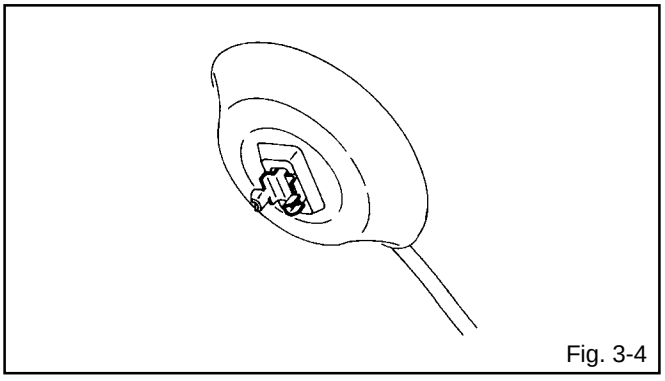


Fig. 3-4

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

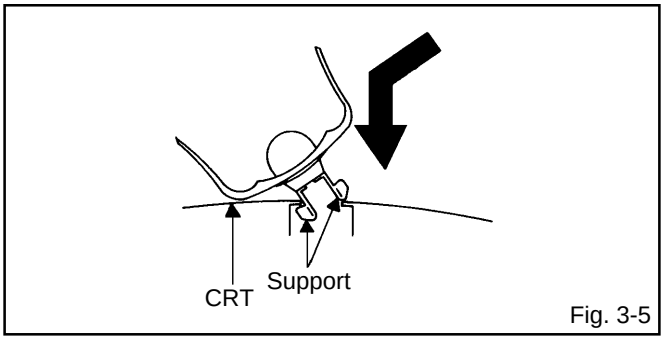


Fig. 3-5

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

DISASSEMBLY INSTRUCTIONS

4. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC

REMOVAL

1. Put the Masking Tape (cotton tape) around the Flat Package IC to protect other parts from any damage. **(Refer to Fig. 4-1.)**

   NOTE

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

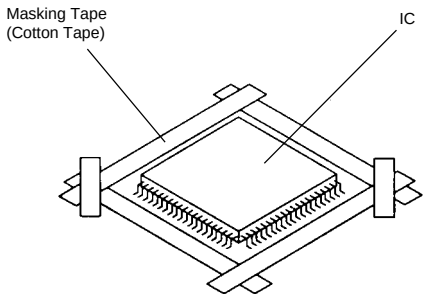


Fig. 4-1

2. Heat the IC leads using a blower type IC desoldering machine. **(Refer to Fig. 4-2.)**

   NOTE

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

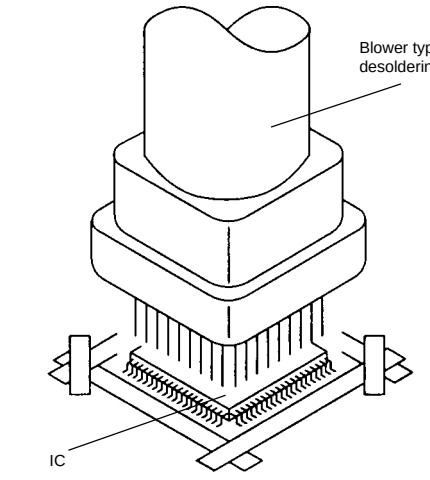


Fig. 4-2

3. When IC starts moving back and forth easily after desoldering completely, pickup the corner of the IC using a tweezers and remove the IC by moving with the IC desoldering machine. **(Refer to Fig. 4-3.)**

   NOTE

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

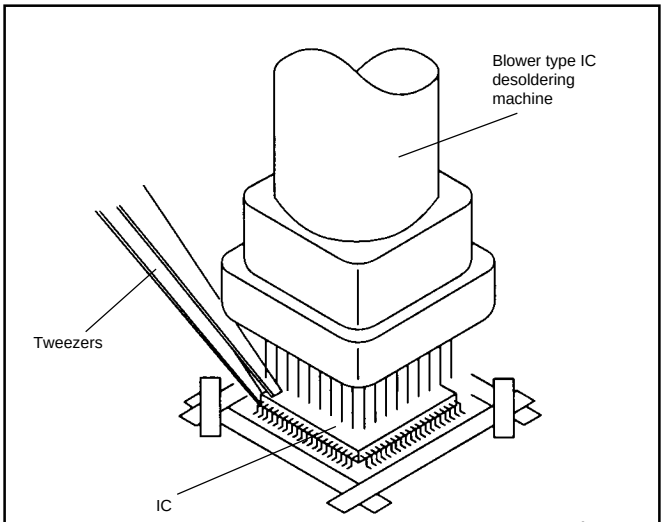


Fig. 4-3

4. Peel off the Masking Tape.

5. Absorb the solder left on the pattern using the Braided Shield Wire. **(Refer to Fig. 4-4.)**

   NOTE

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

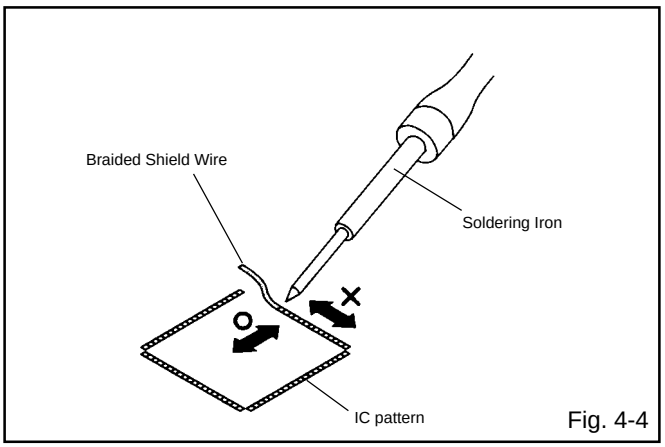


Fig. 4-4

DISASSEMBLY INSTRUCTIONS

INSTALLATION

1. Take care of the polarity of new IC and then install the new IC fitting on the printed circuit pattern. Then solder each lead on the diagonal positions of IC temporarily. **(Refer to Fig. 4-5.)**

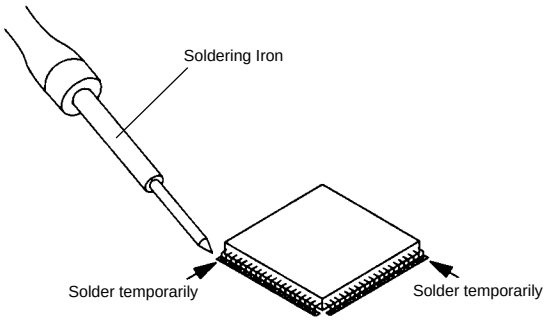


Fig. 4-5

2. Supply the solder from the upper position of IC leads sliding to the lower position of the IC leads. **(Refer to Fig. 4-6.)**

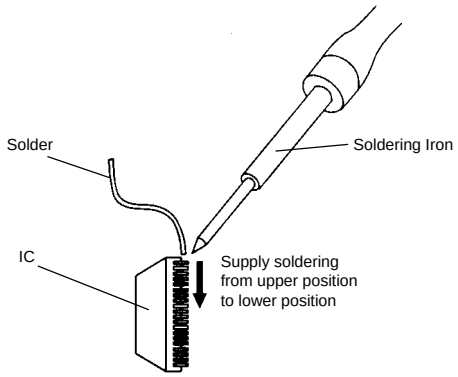


Fig. 4-6

3. Absorb the solder left on the lead using the Braided Shield Wire. **(Refer to Fig. 4-7.)**

   NOTE

   Do not absorb the solder to excess.

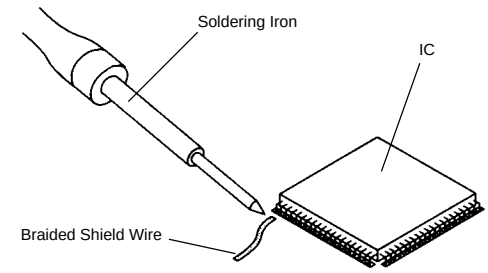


Fig. 4-7

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

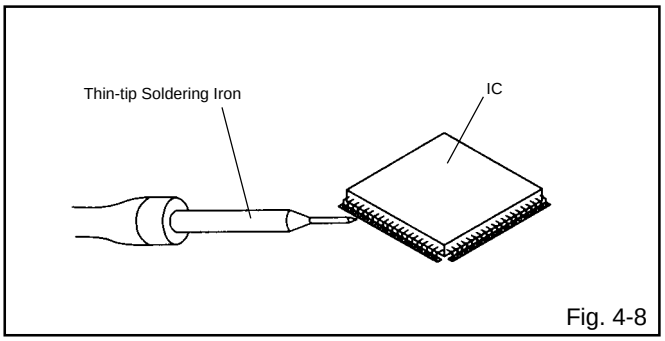


Fig. 4-8

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

   NOTE

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

KEY TO ABBREVIATIONS

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

KEY TO ABBREVIATIONS

S	**STB**	:	Serial Strobe
	SW	:	Switch
	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. If you set a factory initialization, the memories are reset such as the clock setting, the channel setting, the POWER ON total hours, and PLAY/REC total hours.
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.
VOL. (-) MIN	5	Adjusting of the Tracking to the center position.
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 HOURS USED). Can be checked of the INITIAL DATA of MEMORY IC. Refer to the "WHEN REPLACING EEPROM (MEMORY) IC".
VOL. (-) MIN	9	Display of the Adjustment MENU on the screen. Refer to the "ELECTRICAL ADJUSTMENT" (On-Screen Display Adjustment).

Method	Operations
Make the short circuit between the test point of SERVICE and the GND.	The BOT, EOT, and the Reel Sensor do not work and the deck can be operated without a cassette tape. Refer to the "PREPARATION FOR SERVICING"

PREVENTIVE CHECKS AND SERVICE INTERVALS

The following standard table depends on environmental conditions and usage.
Parts replacing time does not mean the life span for individual parts.
Also, long term storage or misuse may cause transformation and aging of rubber parts.
The following list means standard hours, so the checking hours depends on the conditions.

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

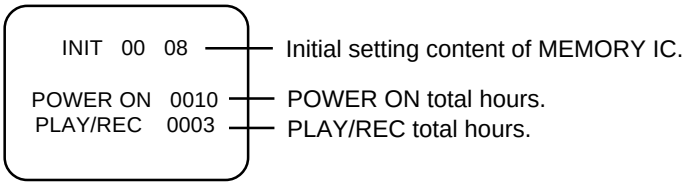
■ : Clean
● : Check it and if necessary, replace it.

CONFIRMATION OF HOURS USED

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: If you set a factory initialization, the total hours is reset to "0".
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. Press both VOL. DOWN button on the set and Channel button **(6)** on the remote control for more than 2 seconds.
3. After the confirmation of using hours, turn off the power.



(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

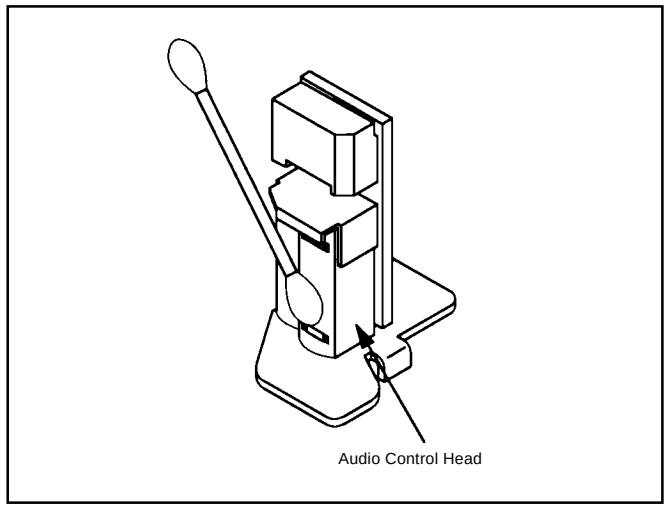
CLEANING

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

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



2. TAPE RUNNING SYSTEM

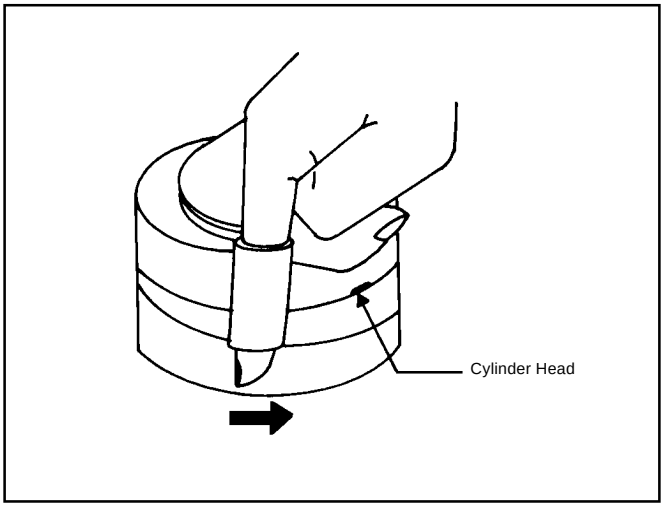
When cleaning the tape transport system, use the gauze moistened with isopropyl alcohol.

3. CYLINDER

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

NOTE

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



WHEN REPLACING EEPROM (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: No need setting for after INI 3F due to the adjustment value.

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
00	08	0A	70	6B	C2	B3	24	A9	51	2C	40	A6	00	40	00	10
10	B2	9A	92	93	00	11	30	25	08	82	A9	0F	94	45	06	14
20	06	3A	01	25	54	60	23	3B	DA	D7	00	00	00	00	00	38
30	88	08	88	98	88	06	00	00	00	00	00	00	00	00	00	00

Table 1

1. Enter DATA SET mode by setting VOLUME to minimum.
2. Press both VOL. DOWN button on the set and Channel button **(6)** on the remote control for more than 2 seconds. ADDRESS and DATA should appear as FIG 1.

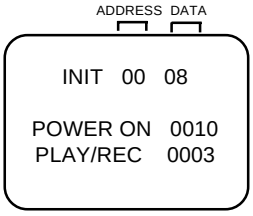


Fig. 1

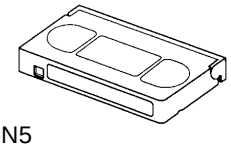
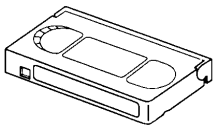
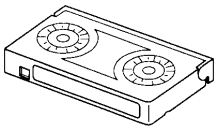
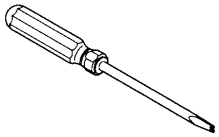
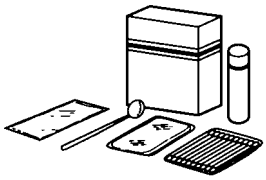
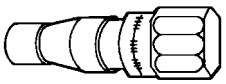
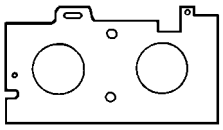
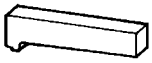
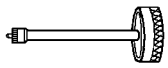
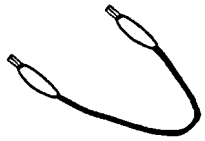
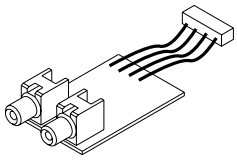
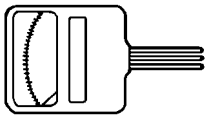
3. ADDRESS is now selected and should "blink". Using the VOL. +/- button on the remote, step through the ADDRESS until required ADDRESS to be changed is reached.
4. Press ENTER to select DATA. When DATA is selected, it will "blink".
5. Again, step through the DATA using VOL. +/- button until required DATA value has been selected.
6. Pressing ENTER will take you back to ADDRESS for further selection if necessary.
7. Repeat steps 3 to 6 until all data has been checked.
8. When satisfied correct DATA has been entered, turn POWER off (return to STANDBY MODE) to finish DATA input.

After the data input, set to the initializing of shipping.

9. Turn POWER on.
10. Press both VOL. DOWN button on the set and Channel button **(1)** on the remote control for more than 2 seconds.
11. After the finishing of the initializing of shipping, the unit will turn off automatically.

The unit will now have the correct DATA for the new MEMORY IC.

SERVICING FIXTURES AND TOOLS

Alignment Tape  ST-N5 ST-NF	Back tension cassette gauge  70909103	Torque cassette gauge (KT-300NR)  70909199	Taper nut driver  70909228
VTR cleaning kit 	VTR lubrication kit 	Grease 	JG002B Adapter JG002E Dial Torque Gauge (10~90gf•cm) JG002F (60~600gf•cm) 
JG022 Master Plane 	JG024A Reel Disk Height Adjustment Jig 	JG153 X Value Adjustment Screwdriver 	JG154 Cable 
JG180 AV Jack Jig 	JG185 Tentelometer 		

Ref. No.	Part No.	Parts Name	Remarks
JG002B	APJG002B00	Adapter	VSR Torque, Brake Torque (S Reel/T Reel Ass'y)
JG002E	APJG002E00	Dial Torque Gauge (10~90gf•cm)	Brake Torque (T Reel Ass'y)
JG002F	APJG002F00	Dial Torque Gauge (60~600gf•cm)	VSR Torque, Brake Torque (S Reel)
JG022	APJG022000	Master Plane	Reel Disk Height Adjustment
JG024A	APJG024A00	Reel Disk Height Adjustment Jig	Reel Disk Height Adjustment
JG153	APJG153000	X Value Adjustment Screwdriver	X Value Adjustment
JG154	APJG154000	Cable	Used to connect the test point of SERVICE and GROUND
JG180	APJG180000	AV Jack Jig	PG Shifter Adjustment
JG185	APJG185000	Tentelometer	Confirmation of Tape Tension on Playback

PREPARATION FOR SERVICING

How to use the Servicing Fixture

1. Remove the Syscon PCB from the set.
   Be sure to place the parts on a paper so that they have no short-circuit each other.
2. Short circuit between **TP1001** and **Ground** with the cable JG154.
   (The BOT, EOT, and the Reel Sensor do not work and the deck can be operated without a cassette tape.)
3. In case of using a cassette tape, press the STOP/EJECT button to insert or eject a cassette tape.
   Turn on the power and re-check the cable before checking the trouble points.

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.)

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. While turning the reel and confirm the following points. Check if the surface "A" of reel disk is lower than the surface "B" of reel disk height adjustment jig **(JG024A)** and is higher than the surface "C". If it is not passed, place the height adjustment washers and adjust to 10(+2, -0)mm.
4. Adjust the other reel in the same way.

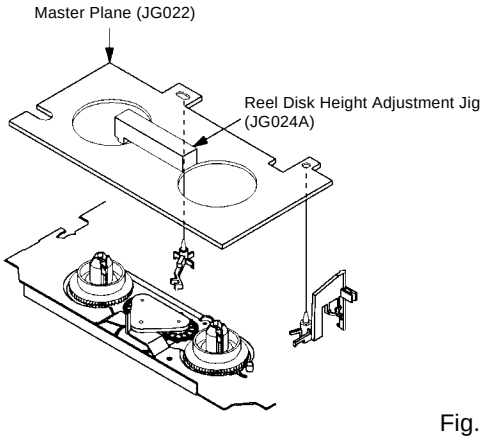


Fig. 1-1-A

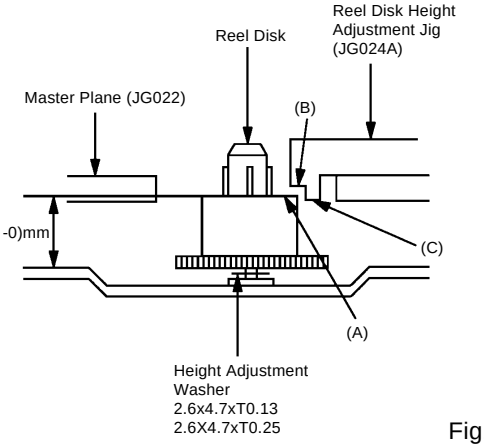


Fig. 1-1-B

1-2: CONFIRMATION AND ADJUSTMENT OF TENSION POST POSITION

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

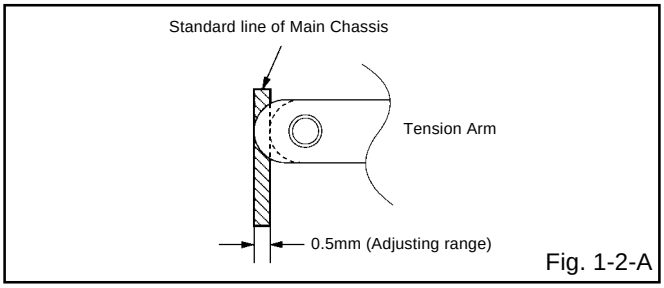


Fig. 1-2-A

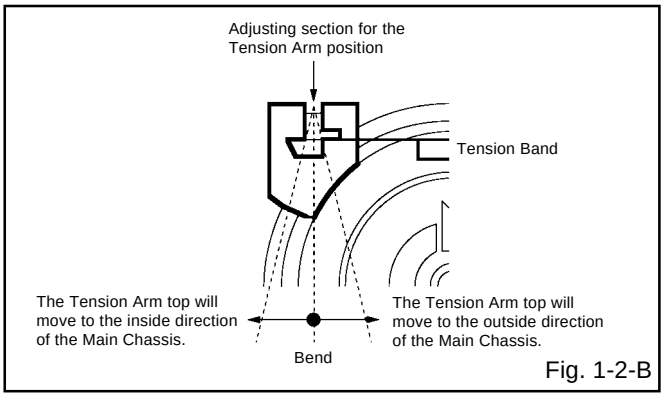


Fig. 1-2-B

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 (JG185) as shown in **Fig. 1-3**. Confirm that the meter indicates 20 ± 2gf in the beginning of playback.

• USING A CASSETTE TYPE TORQUE TAPE **(KT-300NR)**

1. After confirmation and adjustment of Tension Post position **(Refer to item 1-2)**, load the cassette type torque tape **(KT-300NR)** and set to the PLAY mode.
2. Confirm that the right meter of the torque tape indicates 50~90gf•cm during playback in SP mode.
3. Confirm that the left meter of the torque tape indicates 25~40gf•cm during playback in SP mode.

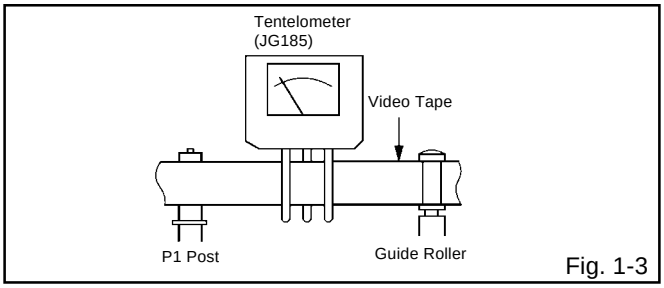


Fig. 1-3

MECHANICAL ADJUSTMENTS

1-4: CONFIRMATION OF VSR TORQUE

1. Install the Torque Gauge **(JG002F)** and Adapter **(JG002B)** on the S Reel. Set to the Picture Search (Rewind) mode. **(Refer to Fig.1-4-B)**
2. Then, confirm that it indicates 120~180gf•cm.

NOTE

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

1-5: CONFIRMATION OF REEL BRAKE TORQUE

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

1. Once set to the Fast Forward mode then set to the Stop mode. While, unplug the AC cord when the Pinch Roller Block is on the position of **Fig. 1-4-A**.
2. Move the Idler Ass'y from the S Reel.
3. Install the Torque Gauge **(JG002F)** and Adapter **(JG002B)** on the S Reel. Turn the Torque Gauge **(JG002F)** clockwise.
4. Then, confirm that it indicates 60~100gf•cm.

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

1. Once set to the Fast Forward mode then set to the Stop mode. While, unplug the AC cord when the Pinch Roller Block is on the position of **Fig. 1-4-A**.
2. Move the Idler Ass'y from the T Reel.
3. Install the Torque Gauge **(JG002E)** and Adapter **(JG002B)** on the T reel. Turn the Torque Gauge **(JG002E)** counterclockwise.
4. Then, confirm that it indicates 30~50gf•cm.

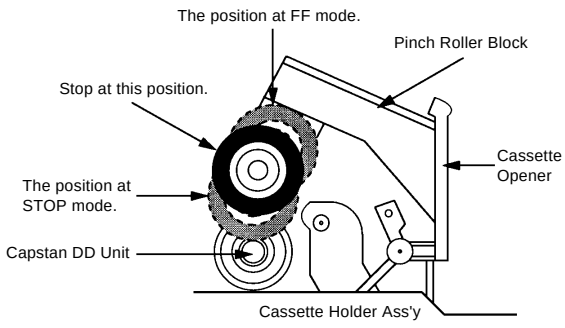


Fig. 1-4-A

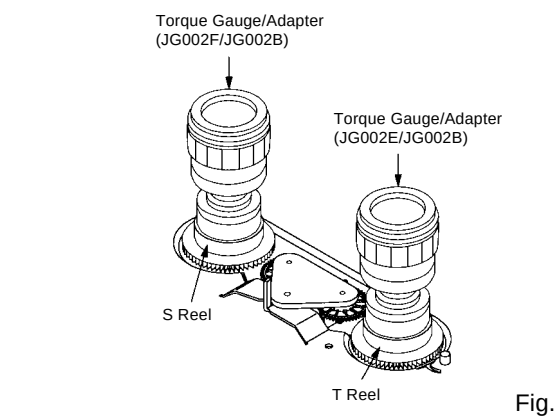


Fig. 1-4-B

NOTE

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

Check item	Replacement Part
1-4	Idler Ass'y/Clutch Ass'y
1-5	S Reel side: S Reel/Tension Band/Tension Connect/Tension Arm Ass'y T Reel side: T Reel/T Brake Band//T Brake Spring/T Brake Arm

2. CONFIRMATION AND ADJUSTMENT OF TAPE RUNNING MECHANISM

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

2-1: GUIDE ROLLER

1. Playback the VHS Alignment Tape.
2. Connect CH-1 of the oscilloscope to **TP4001 (Envelope)** and CH-2 to **TP1002 (SW Pulse)**.
3. Press both VOL. DOWN button on the set and the Channel button **(5)** on the remote control simultaneously.
4. Trigger with SW Pulse and observe the envelope. **(Refer to Fig. 2-1-A)**
5. When observing the envelope, adjust the Taper Nut Driver 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 begin 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)

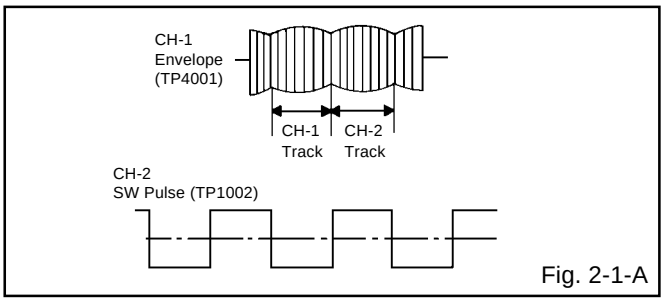


Fig. 2-1-A

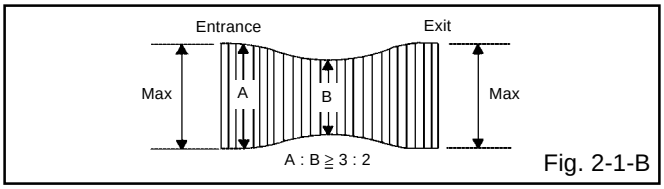


Fig. 2-1-B

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.
2. Confirm that the reflected picture of stamp mark is appeared on the tape prior to P4 Cap 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.

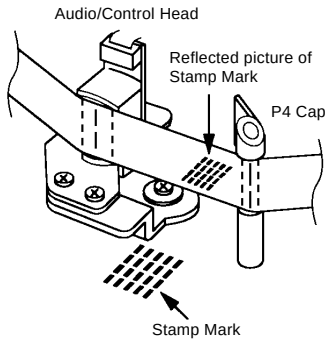


Fig. 2-2-A

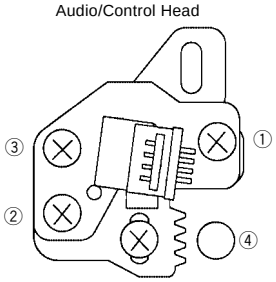


Fig. 2-2-B

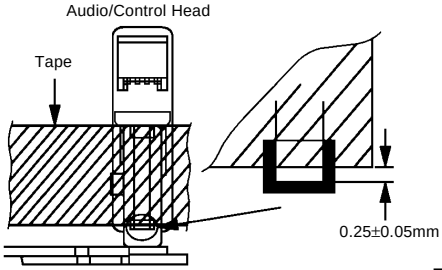


Fig. 2-2-C

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 the connector of AV Jack Jig **(JG180)** to **CP1003**.
6. Connect CH-1 of the oscilloscope to **TP1002**, CH-2 to **TP4001** and CH-3 to **Hot side of JG180 Audio out Jack**.
7. Playback the VHS Alignment Tape.
8. Press both VOL. DOWN button on the set and the Channel button **(5)** on the remote control simultaneously.
9. 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. 2-3**.

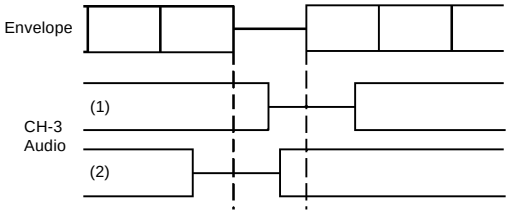
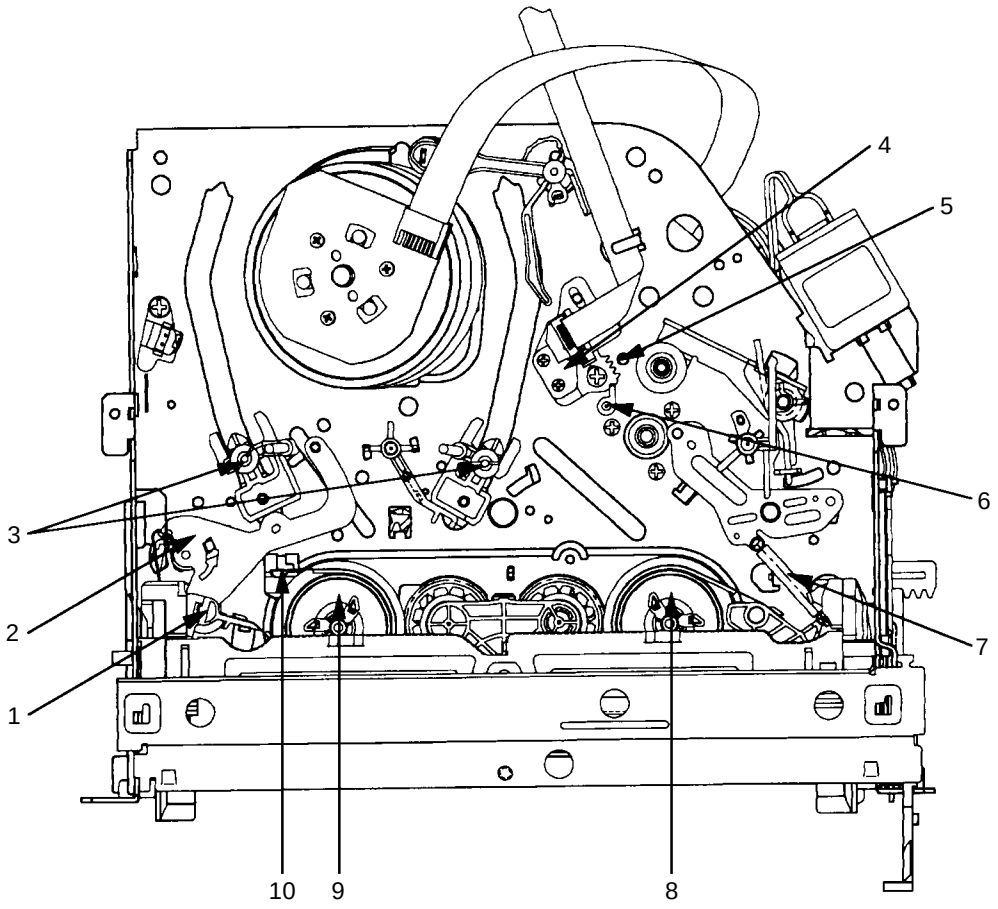


Fig. 2-3

MECHANICAL ADJUSTMENTS

3. MECHANISM ADJUSTMENT PARTS LOCATION GUIDE



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

ELECTRICAL ADJUSTMENTS

1. BEFORE MAKING ELECTRICAL ADJUSTMENTS

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

CAUTION

- Use an isolation transformer when performing any service on this chassis.
- Before removing the anode cap, discharge electricity because it contains high voltage.
- When removing a PCB or related component, after unfastening or changing a wire, be sure to put the wire back in its original position.
- When you exchange IC and Transistor for a heat sink, apply the silicon grease on the contact section of the heat sink. Before applying new silicon grease, remove all the old silicon grease. (Old grease may cause damages to the IC and Transistor.)

Prepare the following measurement tools for electrical adjustments.

1. Oscilloscope
2. Digital Voltmeter

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 both VOL. DOWN button on the set and the Channel button **(9)** on the remote control for more than 2 seconds to appear the adjustment mode on the screen as shown in **Fig. 1-1.**

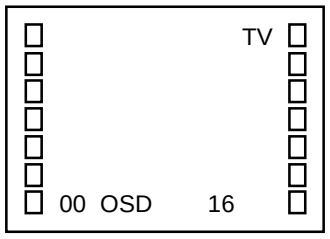


Fig. 1-1

3. Use the Channel UP/DOWN button or Channel button **(0-9)** on the remote control to select the options shown in **Fig. 1-2**.
4. Press the MENU button on the remote control to end the adjustments.

NO.	FUNCTION	NO.	FUNCTION
00	OSD H	16	CONT.CENT
01	CUT OFF	17	CONT.MAX
02	RF AGC	18	CONT.MIN
03	V.VCO	19	COL.CENT
04	H.VCO	20	COL.MAX
05	H.PHAS	21	COL.MIN
06	V.SIZE	22	TINT
07	V.SFT	23	SHARP
08	R.DRV	24	FM.LVL
09	B.DRV	25	LVL
10	R CUT OFF	26	SEP1
11	G CUT OFF	27	SEP2
12	B CUT OFF	28	T.MONO
13	BRI.CENT	29	T.STE
14	BRI.MAX		
15	BRI.MIN		

Fig. 1-2

2. BASIC ADJUSTMENTS (VCR SECTION)

2-1: PG SHIFTER

1. Connect the connector of AV Jack Jig **(JG180)** to **CP1003**.
2. Connect CH-1 on the oscilloscope to **TP1002** and CH-2 to **Hot side of JG180 Video out Jack**.
3. Playback the alignment tape.
4. Press both VOL.DOWN button on the set and the Channel button **(5)** on the remote control simultaneously to set tracking to center.
5. 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:)

6. Press the VOL. DOWN button on the set and the channel button **(3)** on the remote control simultaneously until the indicator REC disappears.
7. 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
8. Tracking +/- button until the arising to the down of Head Switching Pulse becomes 6.5 ± 0.5H. **(Refer to Fig. 2-1-A, B)**
9. Press the Tracking Auto button.

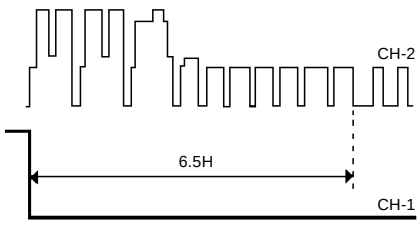


Fig. 2-1-A

ELECTRICAL ADJUSTMENTS

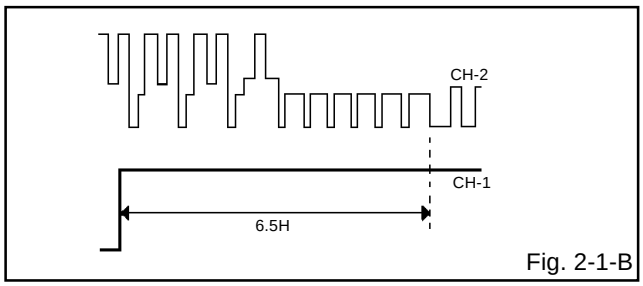


Fig. 2-1-B

2-2: VCO FREERUN

1. Receive the VHF HIGH (63dB).
2. Place the set with Aging Test for more than 10 minutes.
3. Connect the digital voltmeter between the **pin 5 of CP351** and the **pin 1 (GND) of CP351**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(03)** on the remote control to select "V.VCO".
5. Press the VOL. UP/DOWN button on the remote control until the digital voltmeter is 2.5V.
6. After the 2.5V adjustment, countdown the VIF VCO step No. by 1 step with the VOL. DOWN button.

2-3: RF AGC

1. Receive the VHF HIGH (63 ± 1dB).
2. Connect the digital voltmeter between the **pin 5 of CP351** and the **pin 1 (GND) of CP351**.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(02)** on the remote control to select "RF AGC".
4. Press the VOL. UP/DOWN button on the remote control until the digital voltmeter is 2.7 ± 0.05V.

(TV SECTION)

2-4: CONSTANT VOLTAGE

1. Using the remote control, set the brightness and contrast to normal position.
2. Connect the digital voltmeter to **TP601** (R520).
3. Set condition is AV MODE without signal.
4. Adjust the **VR502** until the digital voltage is 135 ± 0.5V.

2-5: CUT OFF

1. Adjust the unit to the following settings.
   R CUT OFF=127, G CUT OFF=127, B CUT OFF=127, SUB BRI.CENT=127, SUB CONT.MAX=70
2. Place the set with Aging Test for more than 15 minutes.
3. Set condition is AV MODE without signal.
4. Using the remote control, set the brightness and contrast to normal position.
5. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(01)** on the remote control to select "CUT OFF".
6. Adjust the **Screen Volume** until a dim raster is obtained.

2-6: WHITE BALANCE

NOTE: Adjust after performing CUT OFF adjustment.

1. Place the set with Aging Test for more than 15 minutes.
2. Receive the gray scale pattern.
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 **(10)** on the remote control to select "R CUT OFF".
5. Using the VOL. UP/DOWN button on the remote control, adjust the R CUT OFF.
6. Press the CH. UP/DOWN button on the remote control to select the "R DRIVE", "B DRIVE", "G CUT OFF" or "B CUT OFF".
7. Adjust the VOL. UP/DOWN button on the remote control, adjust the R DRIVE, B DRIVE, G CUT OFF or B CUT OFF at each step tone sections equally.
8. Perform the above adjustments 6 and 7 until the white color is looked like a white.

2-7: FOCUS

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Turn the Focus Volume fully counterclockwise once.
4. Adjust the **Focus Volume** until picture is distinct.

2-8: HORIZONTAL PHASE

1. Receive the monoscope pattern.
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 **(05)** on the remote control to select "H PHAS".
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on right and left becomes minimum.

2-9: VERTICAL SHIFT

1. Receive the monoscope pattern.
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 **(07)** on the remote control to select "V SFT".
4. Check if the step No. V. SHIFT is "03".
5. Adjust the **VR401** until the horizontal line becomes fit to the notch of the shadow mask.

2-10: VERTICAL SIZE

1. Receive the monoscope pattern.
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 **(06)** on the remote control to select "V SIZE".
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on upside and downside becomes 10 ± 2%.

ELECTRICAL ADJUSTMENTS

2-11: SUB BRIGHTNESS

1. Receive the monoscope 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 **(13)** on the remote control to select "BRI.CENT".
4. Press the VOL. UP/DOWN button on the remote control until the white 10% is starting to be visible.
5. Receive the monoscope pattern. (Audio Video Input)
6. Press the INPUT SELECT button on the remote control to set to the AV mode. Then perform the above adjustments 2~4.

2-12: SUB CONTRAST MAX

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(17)** on the remote control to select "CONT.MAX".
2. Press the VOL. UP/DOWN button on the remote control until the contrast step No. becomes "70".
3. Receive a broadcast and check if the picture is normal.
4. Press the INPUT SELECT button on the remote control to set to the AV mode. Then perform the above adjustments 1~3.

2-13: 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 oscilloscope to **TP801**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(22)** on the remote control to select "TINT".
5. Press the VOL. UP/DOWN button on the remote control until the section "A" becomes a straight line. **(Refer to Fig. 2-2)**
6. Receive the color bar pattern. (Audio Video Input)
7. Press the INPUT SELECT button on the remote control to set to the AV mode. Then perform the above adjustments 2~5.

Fig. 2-2

2-14: 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 oscilloscope to **TP803**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(19)** on the remote control to select "COL.CENT".
5. 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.
6. Press the VOL. UP/DOWN button on the remote control until the red color level is adjusted to 110 ± 10% of the white level. **(Refer to Fig. 2-3)**
7. Receive the color bar pattern. (Audio Video Input)
8. Press the INPUT SELECT button on the remote control to set to the AV mode. Then perform the above adjustments 2~6.

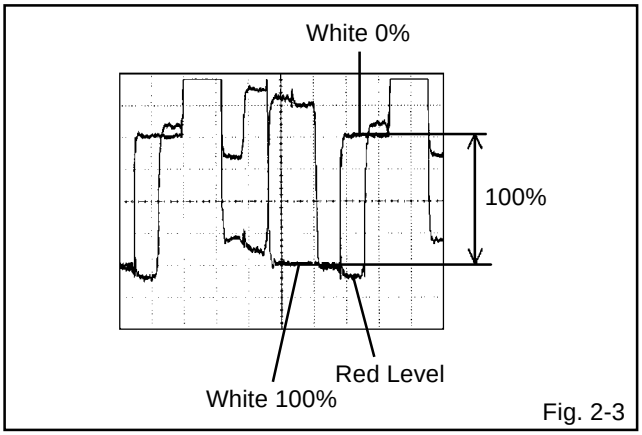


Fig. 2-3

2-15: OSD HORIZONTAL

1. Activate the adjustment mode display of **Fig. 1-1**.
2. Press the VOL. UP/DOWN button on the remote control until the difference of A and B becomes minimum. **(Refer to Fig. 2-4)**

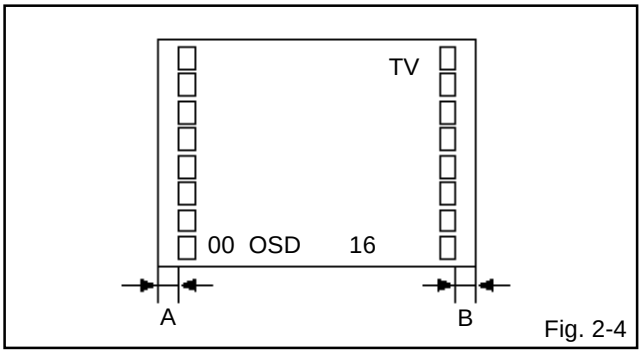


Fig. 2-4

ELECTRICAL ADJUSTMENTS

2-16: SUB SHARPNESS

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(23)** on the remote control to select "SHARP".
2. Check if the step No. of SHARPNESS is "37".
3. Press the INPUT SELECT button on the remote control to set to the AV mode. Then perform the above adjustments 1~2.

2-17: H VCO

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(04)** on the remote control to select "H VCO".
2. Check if the step No. of H VCO is "04".

ELECTRICAL ADJUSTMENTS

3. 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.

3-1: STATIC CONVERGENCE (ROUGH ADJUSTMENT)

1. Tighten the screw for the magnet. Refer to the adjusted CRT for the position. **(Refer to Fig. 3-1)**
   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.

3-2: PURITY

NOTE

Adjust after performing adjustments in section 3-1.

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.

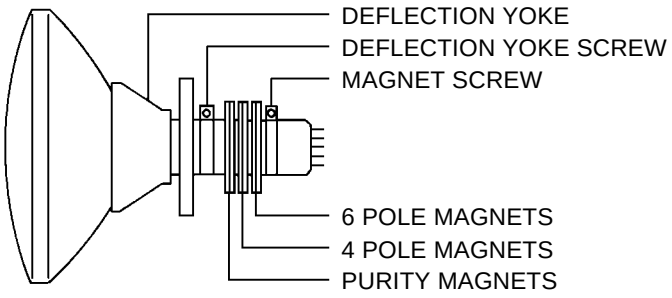


Fig. 3-1

3-3: STATIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-2.

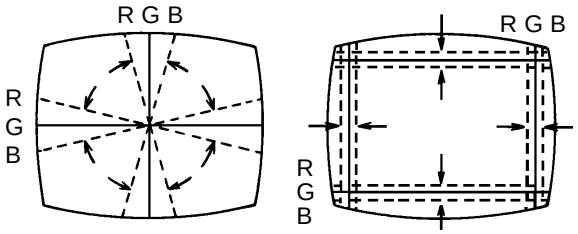
1. Receive the crosshatch pattern from the color bar generator.
2. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
3. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.

3-4: DYNAMIC CONVERGENCE

NOTE

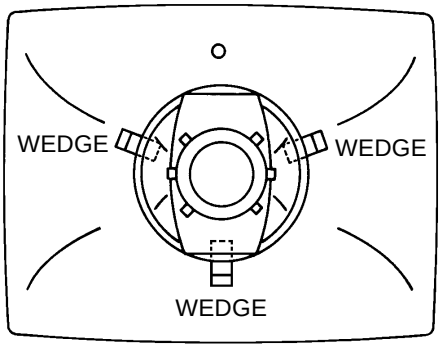
Adjust after performing adjustments in section 3-3.

1. Adjust the differences around the screen by moving the deflection yoke upward/downward and right/left. **(Refer to Fig. 3-2-a)**
2. Insert three wedges between the deflection yoke and CRT funnel to fix the deflection yoke. **(Refer to Fig. 3-2-b)**



UPWARD/DOWNWARD SLANT RIGHT/LEFT SLANT

Fig. 3-2-a

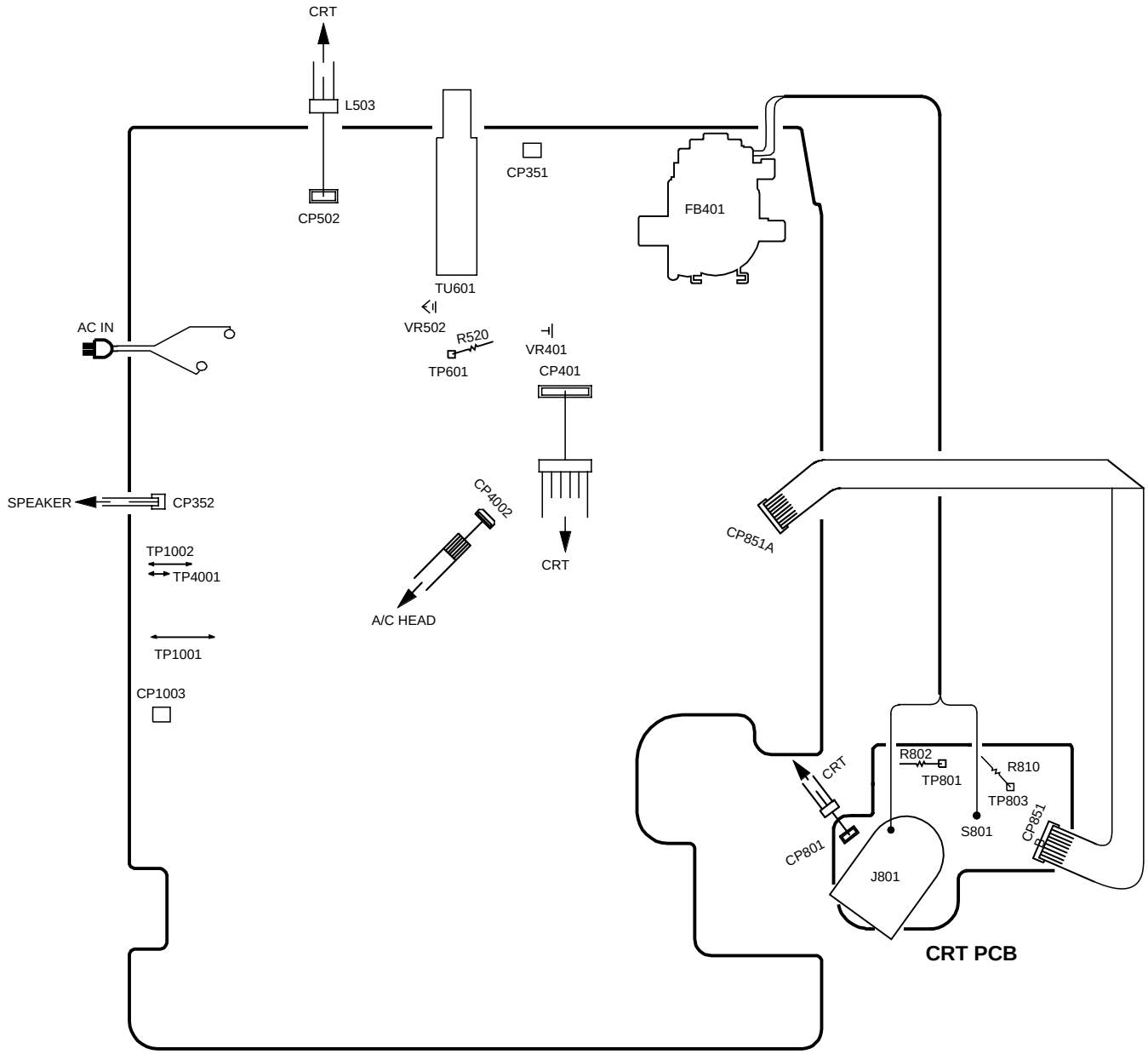


WEDGE POSITION

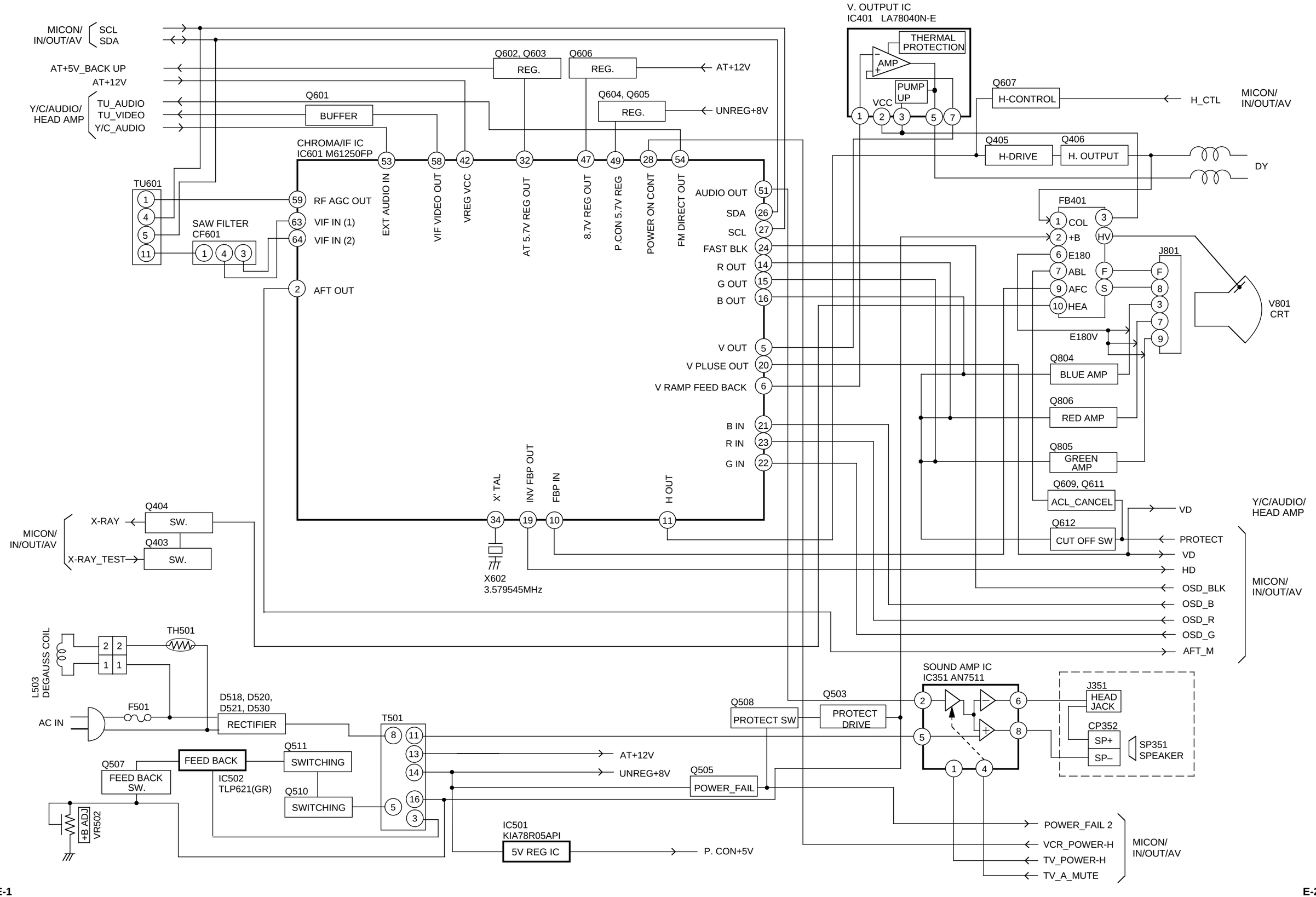
Fig. 3-2-b

ELECTRICAL ADJUSTMENTS

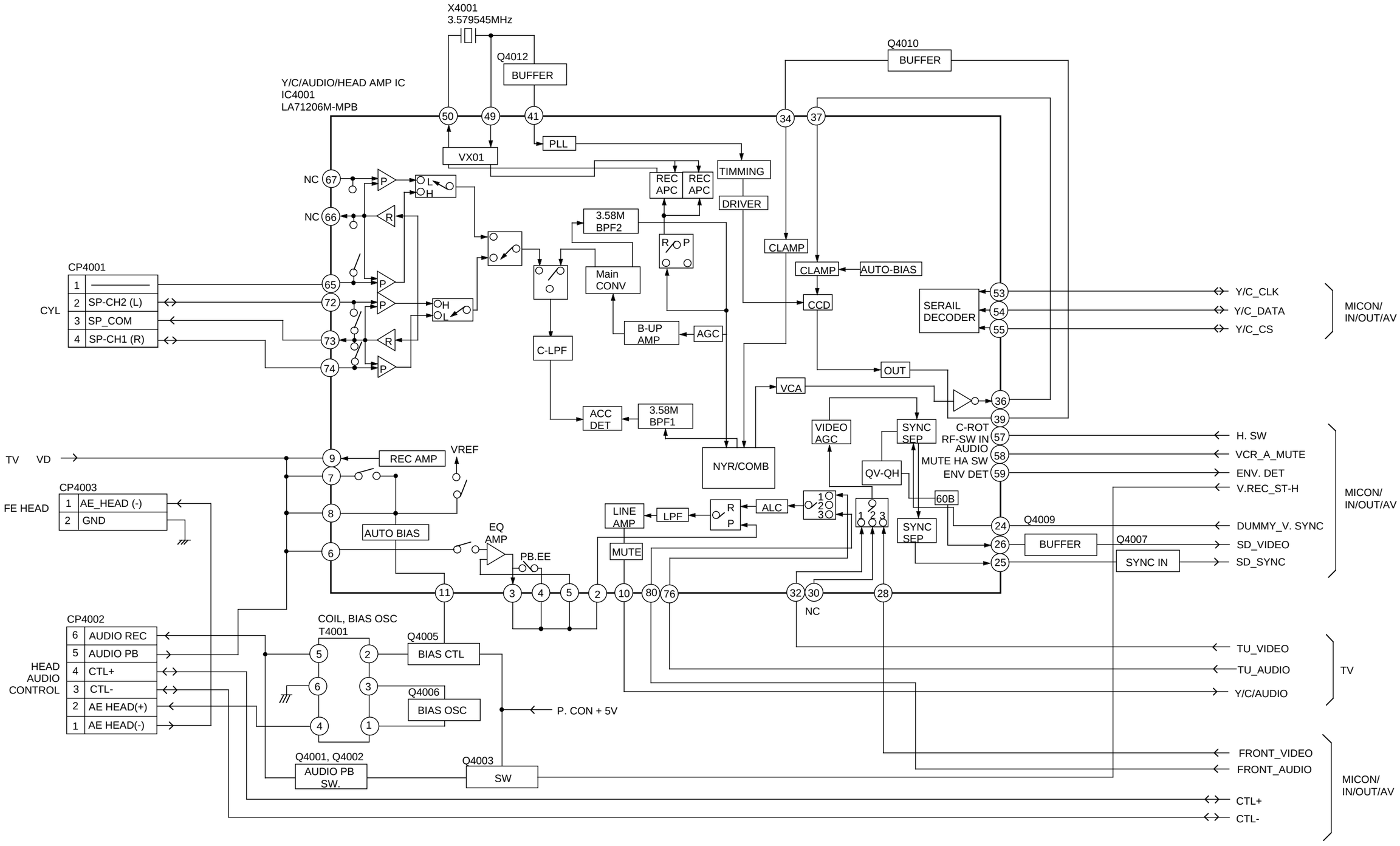
4. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE (WIRING CONNECTION)



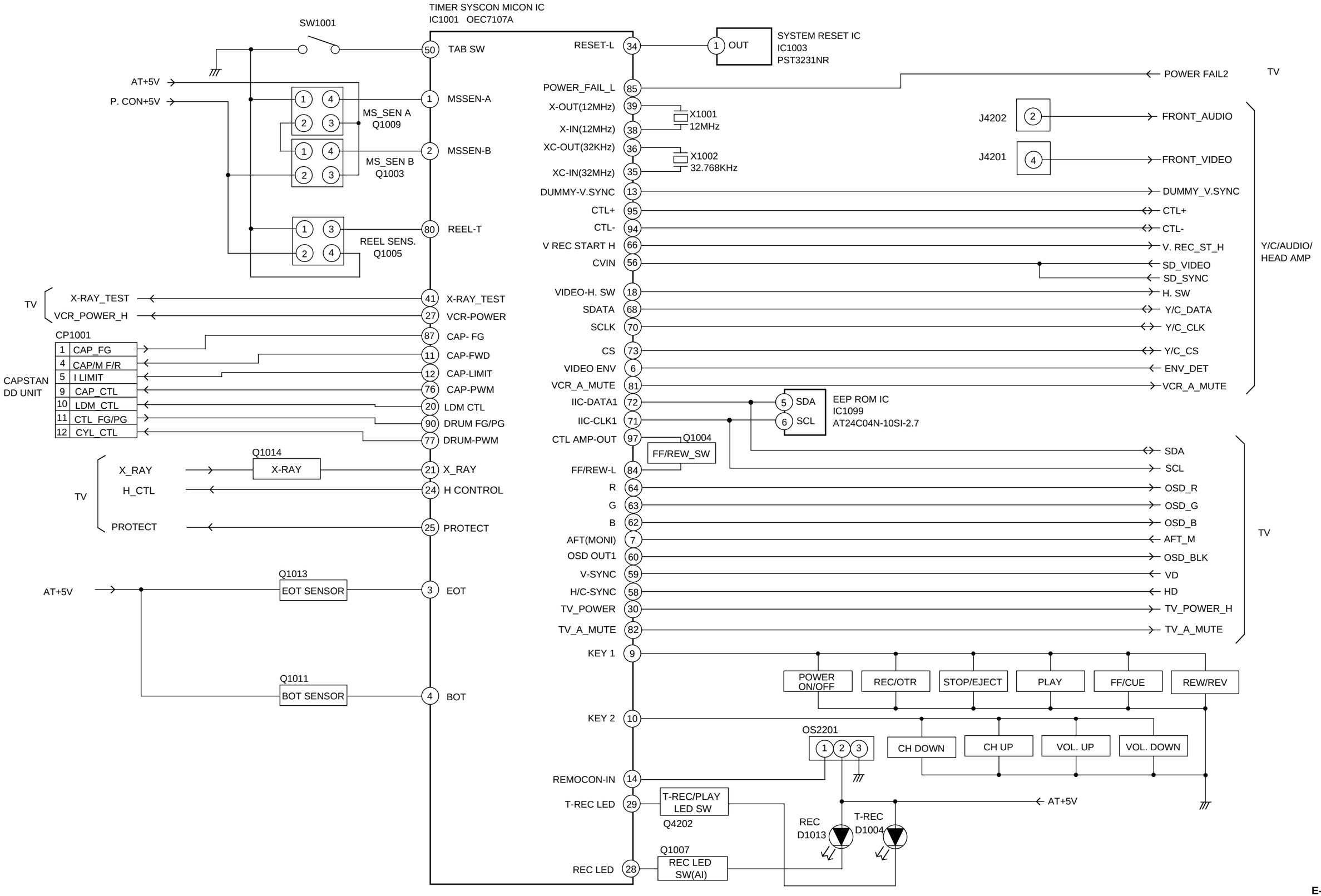
TV BLOCK DIAGRAM



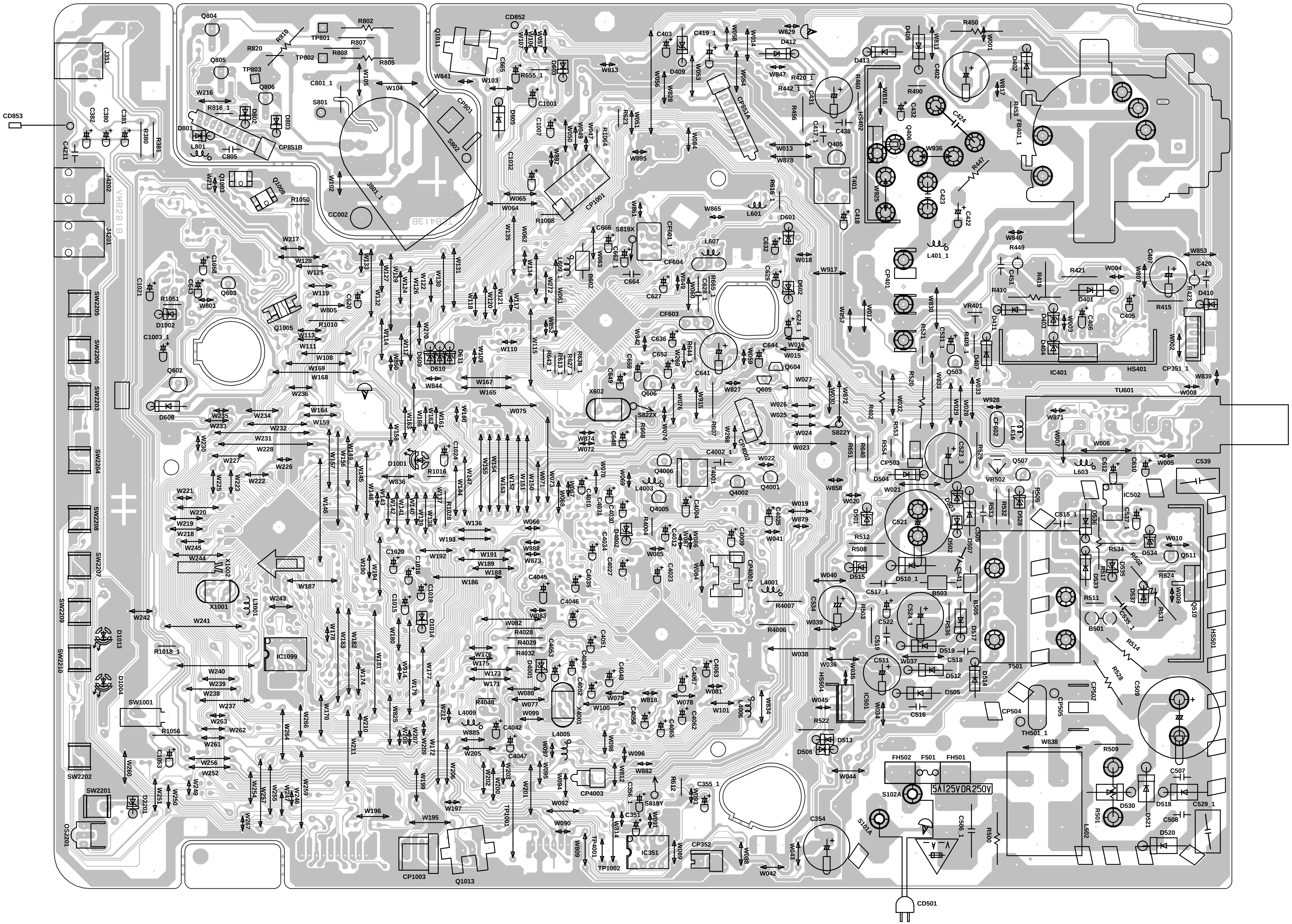
Y/C/AUDIO/HEAD AMP BLOCK DIAGRAM



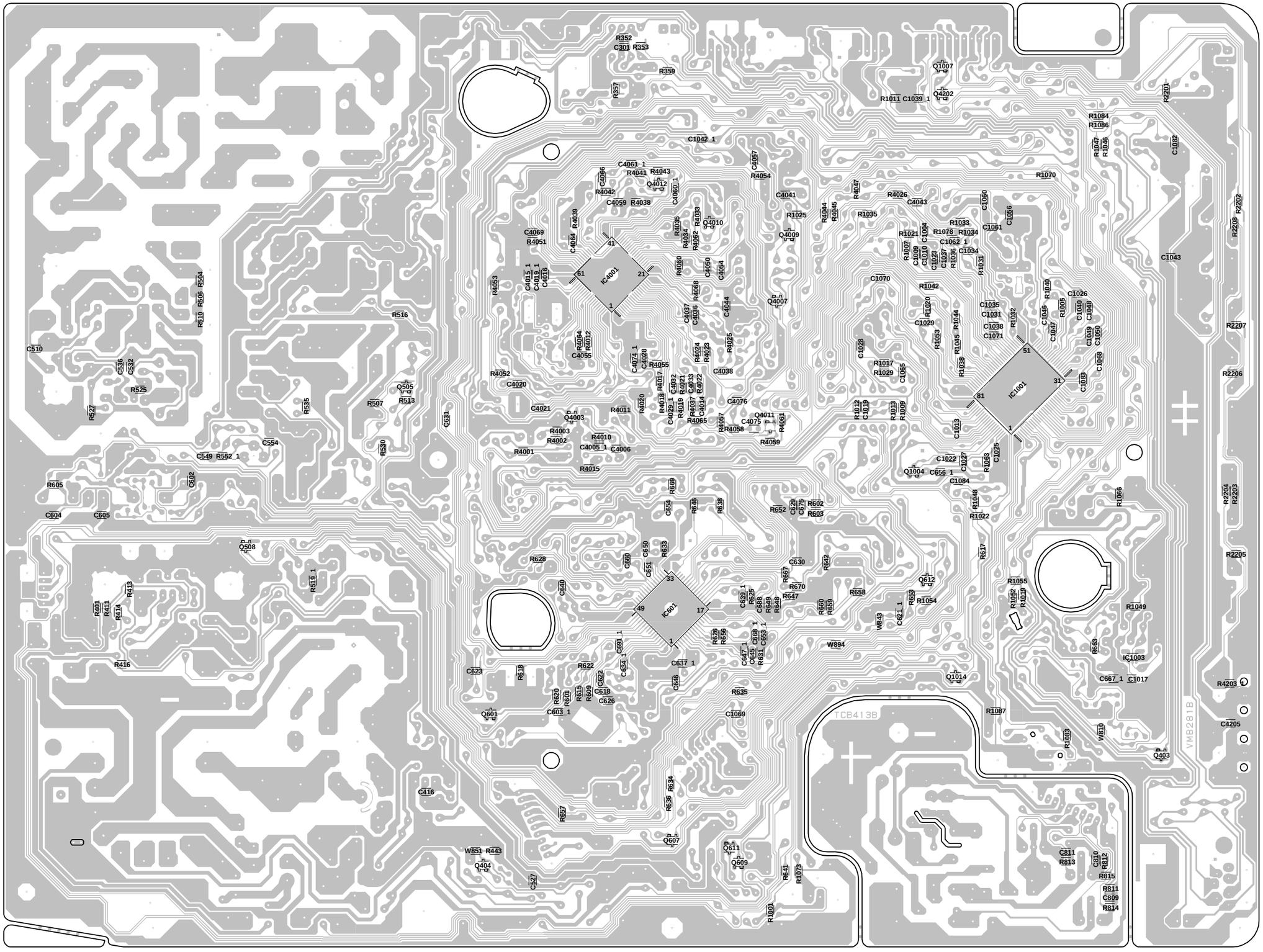
MICON/IN/OUT/AV BLOCK DIAGRAM



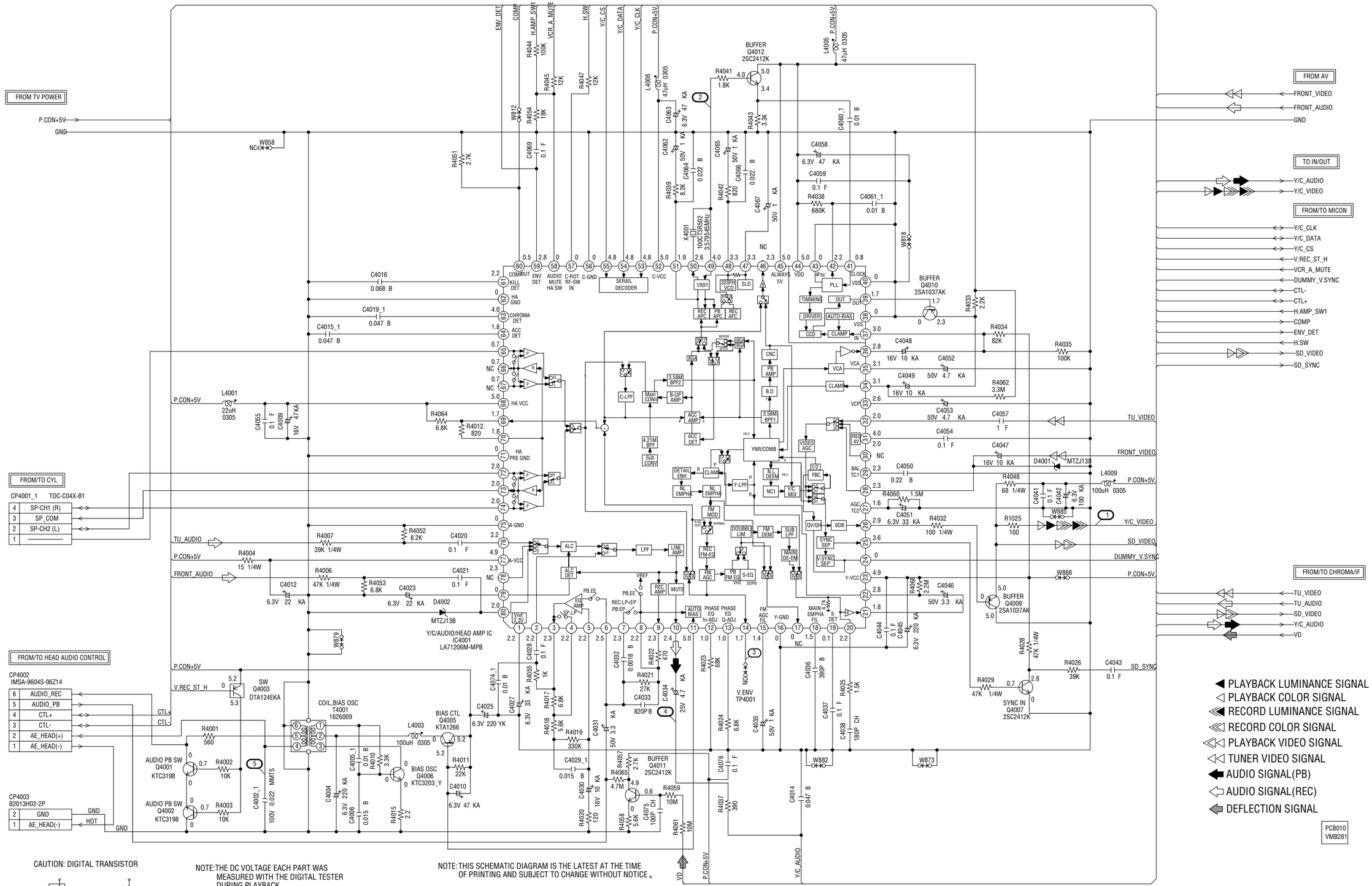
PRINTED CIRCUIT BOARDS
SYSCON/CRT (INSERTED PARTS)
SOLDER SIDE



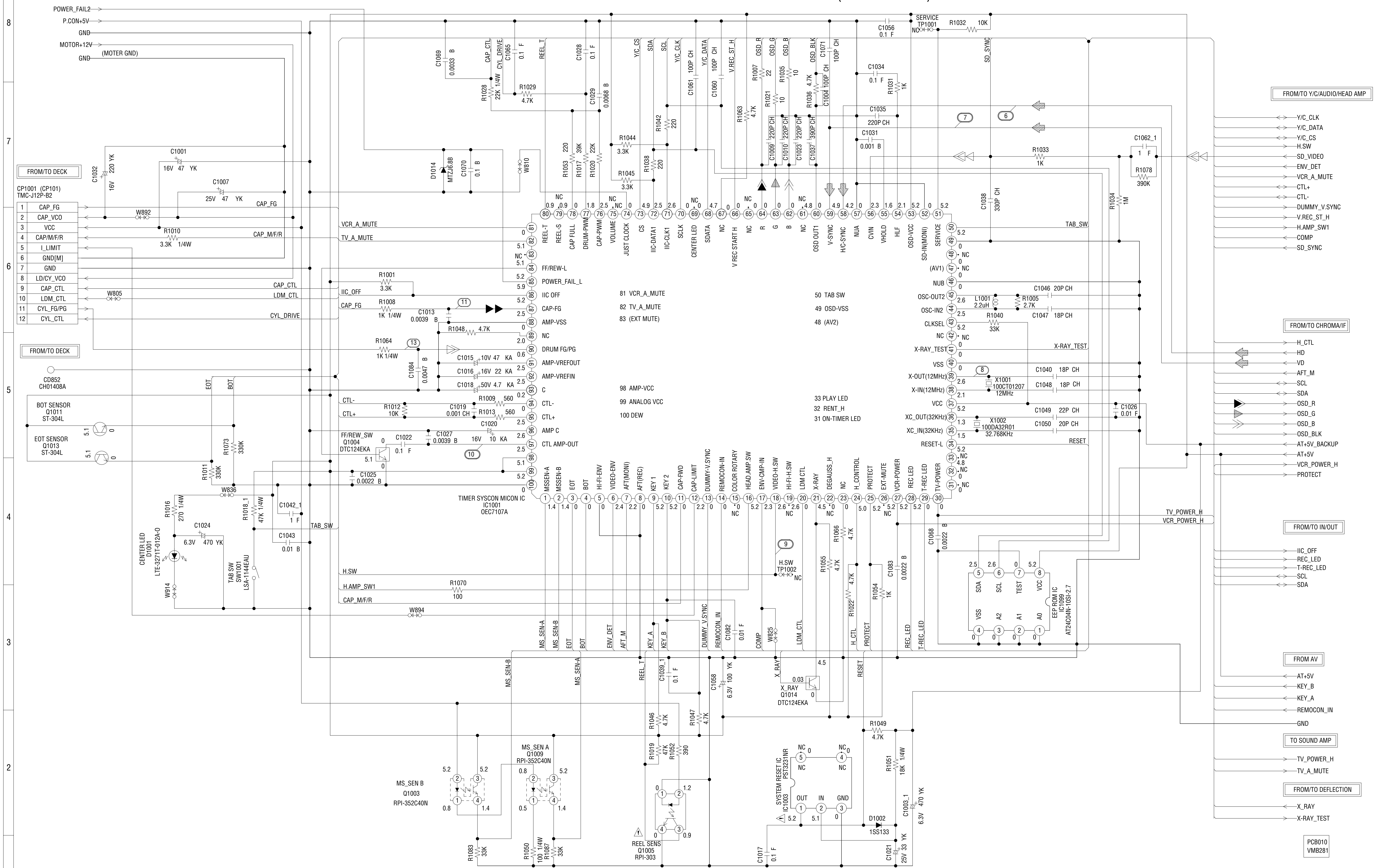
PRINTED CIRCUIT BOARDS
SYSCON/CRT (CHIP MOUNTED PARTS)
SOLDER SIDE



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



MICON 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 EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

CAUTION: DIGITAL TRANSISTOR

- R.SIGNAL
- G.SIGNAL
- B.SIGNAL
- AUDIO SIGNAL(REC)
- DEFLECTION SIGNAL
- PLAYBACK VIDEO SIGNAL
- CAPSTAN AFC SIGNAL
- TUNER VIDEO SIGNAL
- CYLINDER APC SIGNAL

IN/OUT SCHEMATIC DIAGRAM
(SYSCON PCB)

TEST POINT
CP351_1
00_8283_0611_00

6	5	4	3	2	1
B.OUT	INT-MONI	IIC OFF	SDA	SCL	GND

TEST POINT
CP1003
1739Y9-4

1	2	3	4
Y/C_AUDIO	AT+5V	GND	Y/C_VIDEO

FROM/TO MICON
IIC_OFF
SDA
SCL
REC_LED

3.6
0
REC LED SW(AI)
Q1007
DTC114EKA
0

T-REC/PLAY LED SW
Q4202
DTC114EKA
4.8
3.5
0

T-REC_LED

FROM Y/C/AUDIO/HEAD AMP
Y/C_AUDIO
Y/C_VIDEO

R1086
VVC
270

R1084
VVC
270

T-REC
D1004
SLR-342/VGT32

REC
D1013
SLR-342/VGT32

FROM CHROMA/IF
AT+5V
INT-MONI
B.OUT

FROM AV
AT+5V
GND

FROM/TO TV POWER
GND

PCB010
VMB281

NOTE:THE DC VOLTAGE 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。

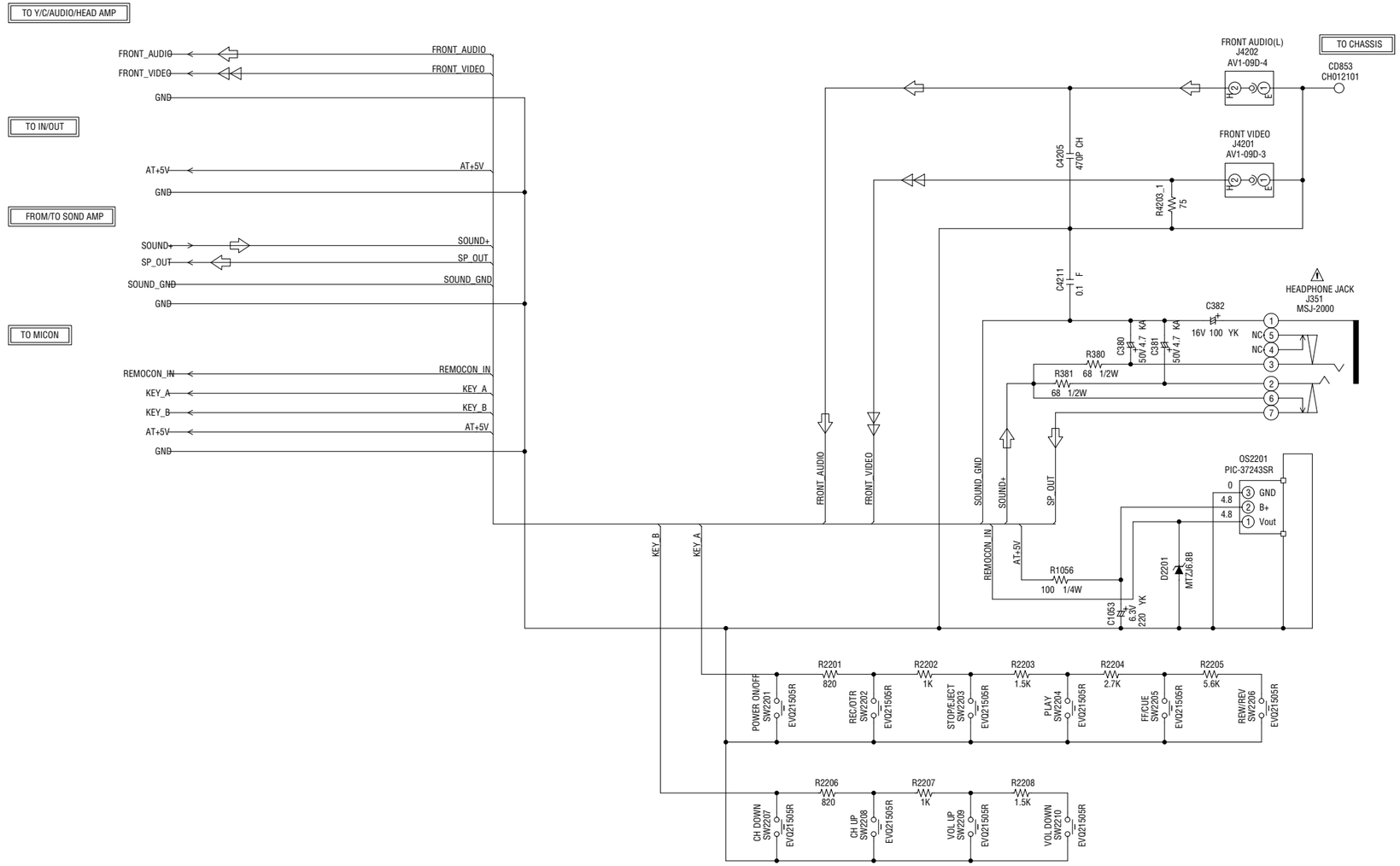
CAUTION: DIGITAL TRANSISTOR

≪ B.SIGNAL
≪≪ TUNER VIDEO SIGNAL
⇦ AUDIO SIGNAL(REC)
⬅ AUDIO SIGNAL(PB)

⋘◀ RECORD LUMINANCE SIGNAL
⋘◁ RECORD COLOR SIGNAL
◀ PLAYBACK LUMINANCE SIGNAL
◁ PLAYBACK COLOR SIGNAL

AV SCHEMATIC DIAGRAM

(AV PCB)



PCB010
VMB281

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

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

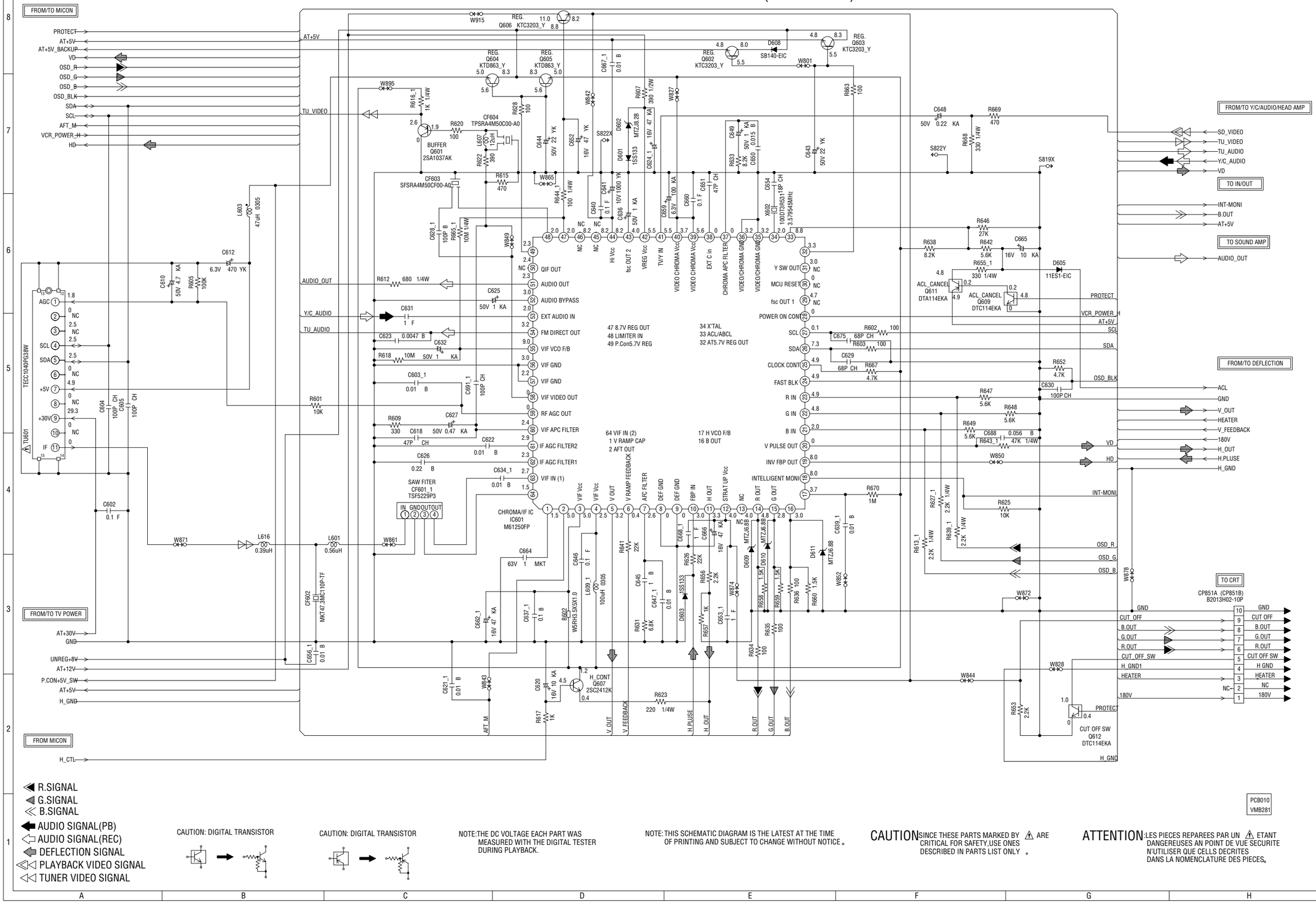
NOTE:THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

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

◁◁ TUNER VIDEO SIGNAL

◁ AUDIO SIGNAL(REC)

CHROMA/IF SCHEMATIC DIAGRAM (SYSCON PCB)



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

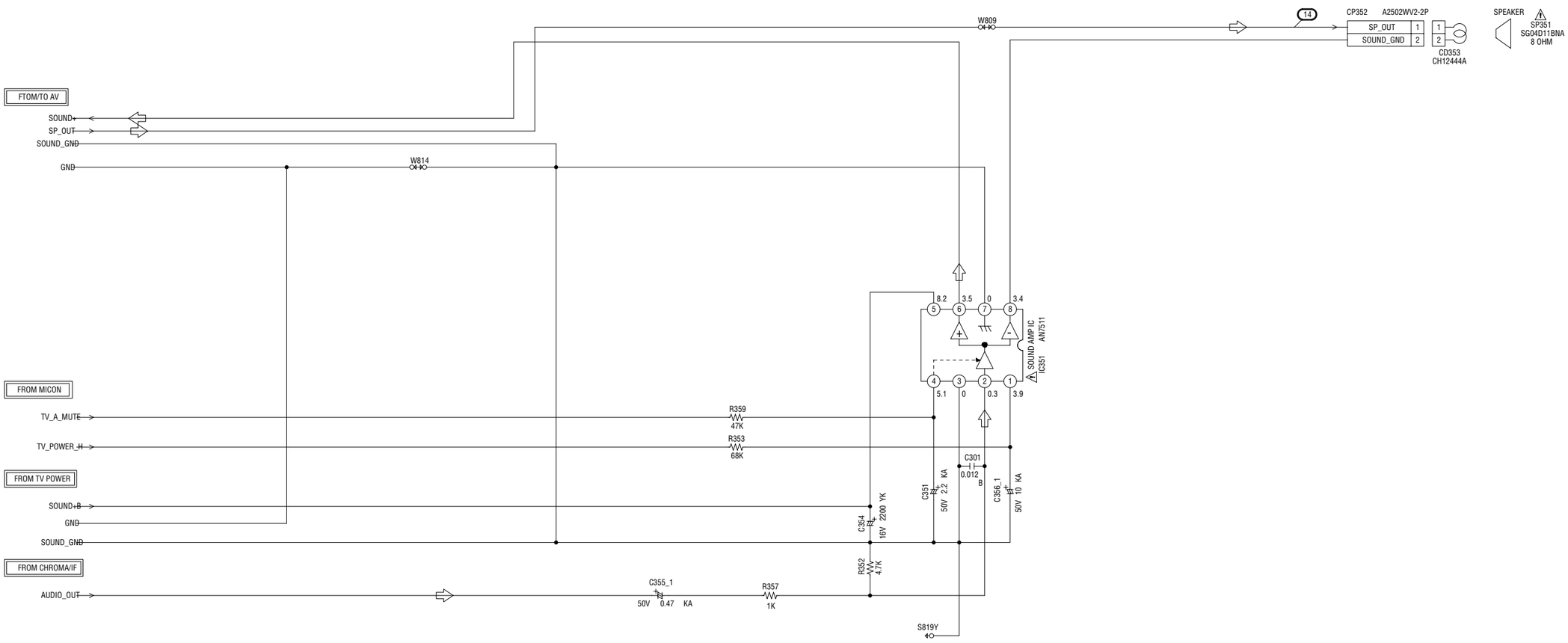
NOTE:THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

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

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

SOUND AMP SCHEMATIC DIAGRAM

(SYSCON PCB)



PCB010
VMB281

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

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

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

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

⇦ AUDIO SIGNAL(REC)

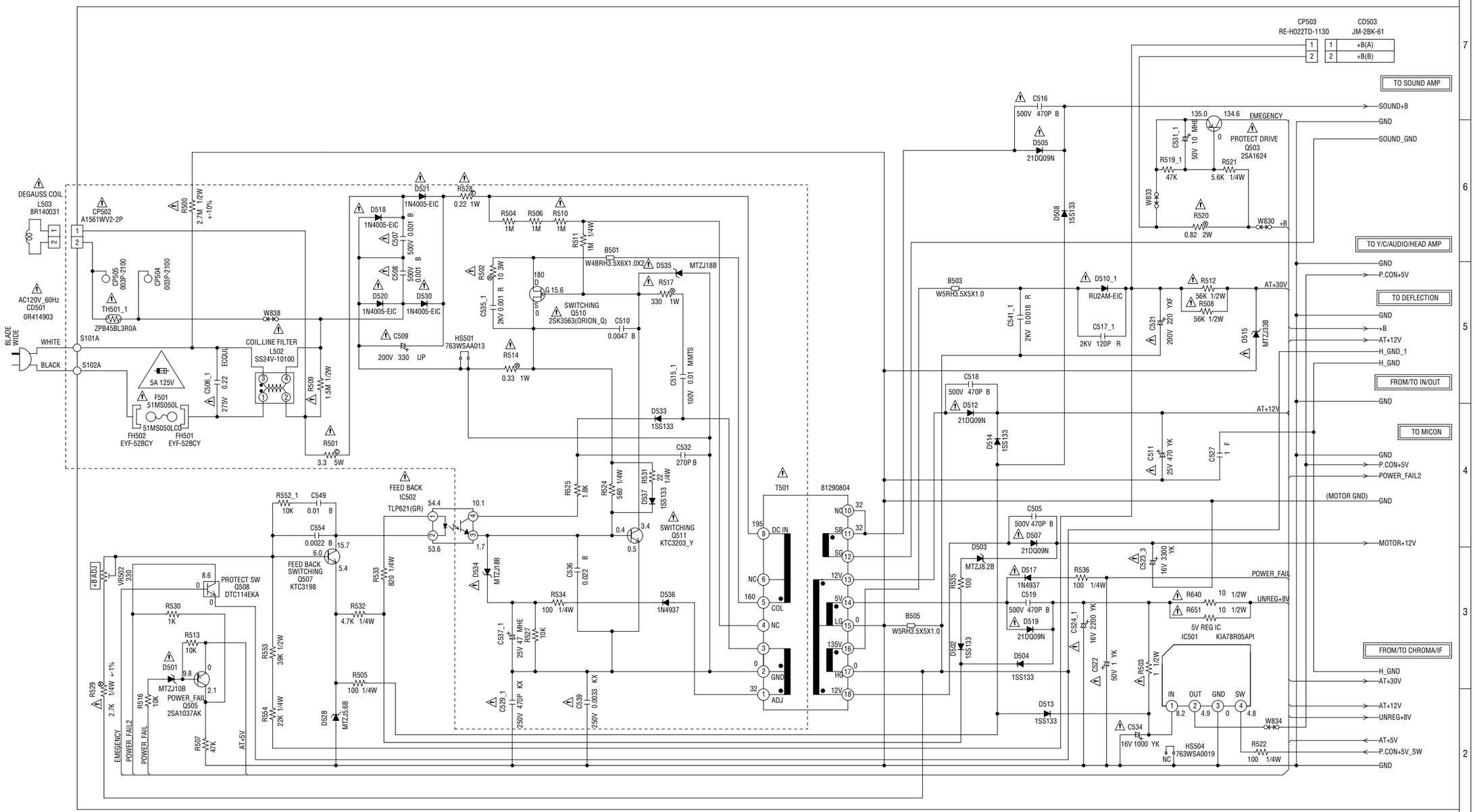
POWER SCHEMATIC DIAGRAM

(SYSCON PCB)

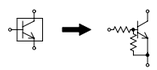
5A 125V

CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE FUSE 5A 125V (F501).

ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES D'INCEIE N'UTILISER QUE DES FUSIBLE DE MEME TYPE 5A 125V (F501).



CAUTION: DIGITAL TRANSISTOR



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

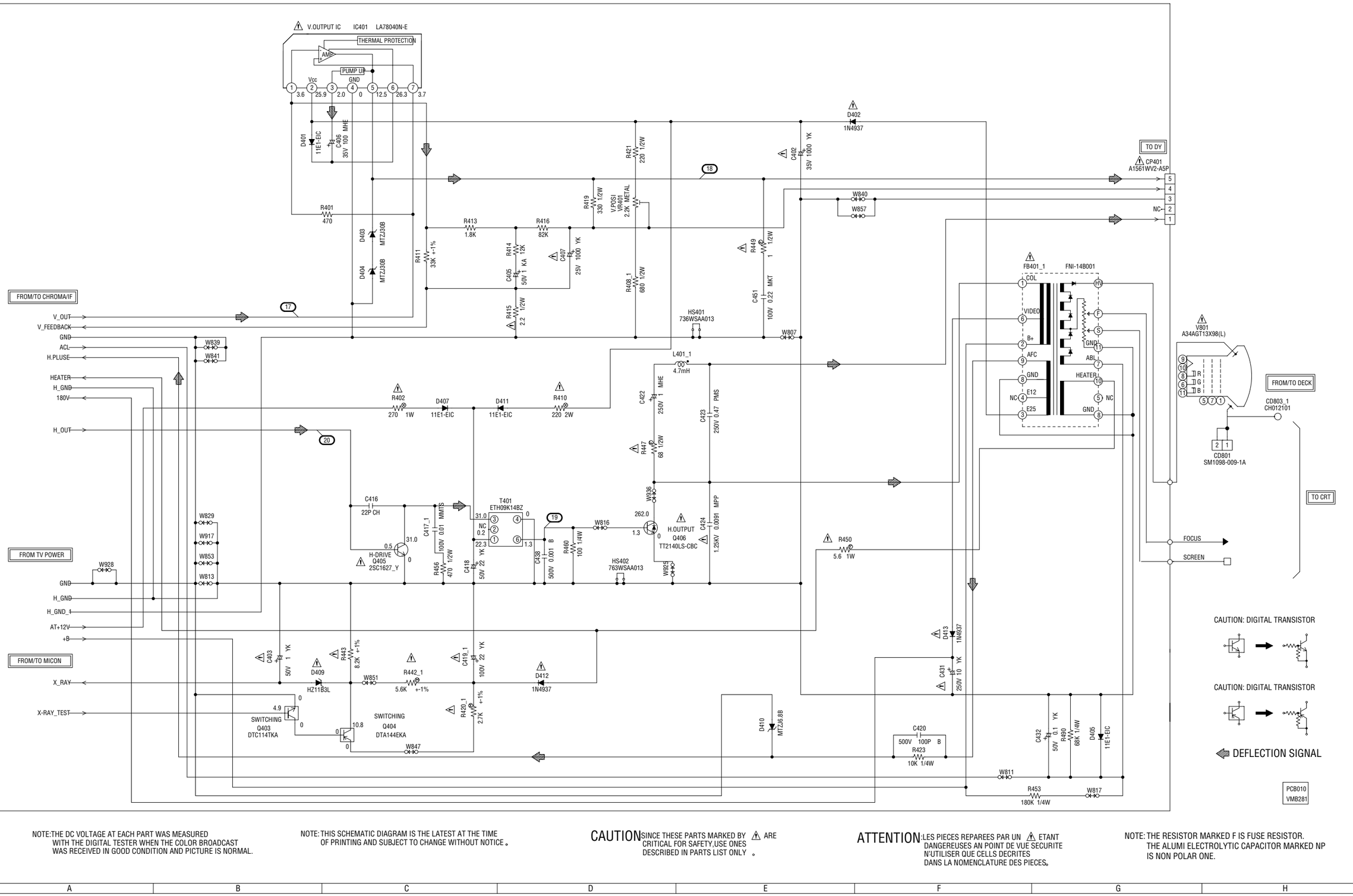
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

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 REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

DEFLECTION 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.

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

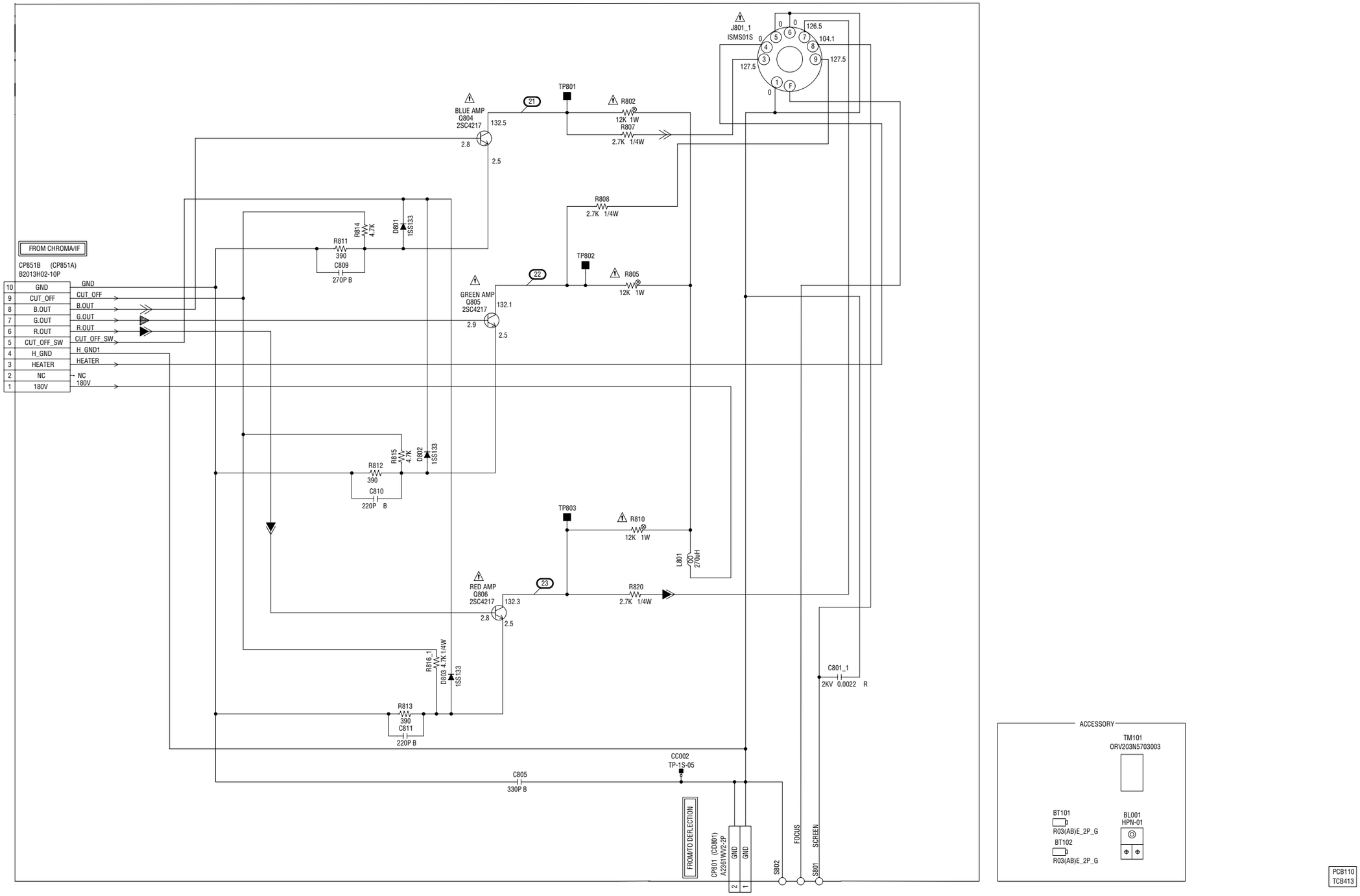
CAUTION SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY 。

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

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

CRT SCHEMATIC DIAGRAM

(CRT 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.

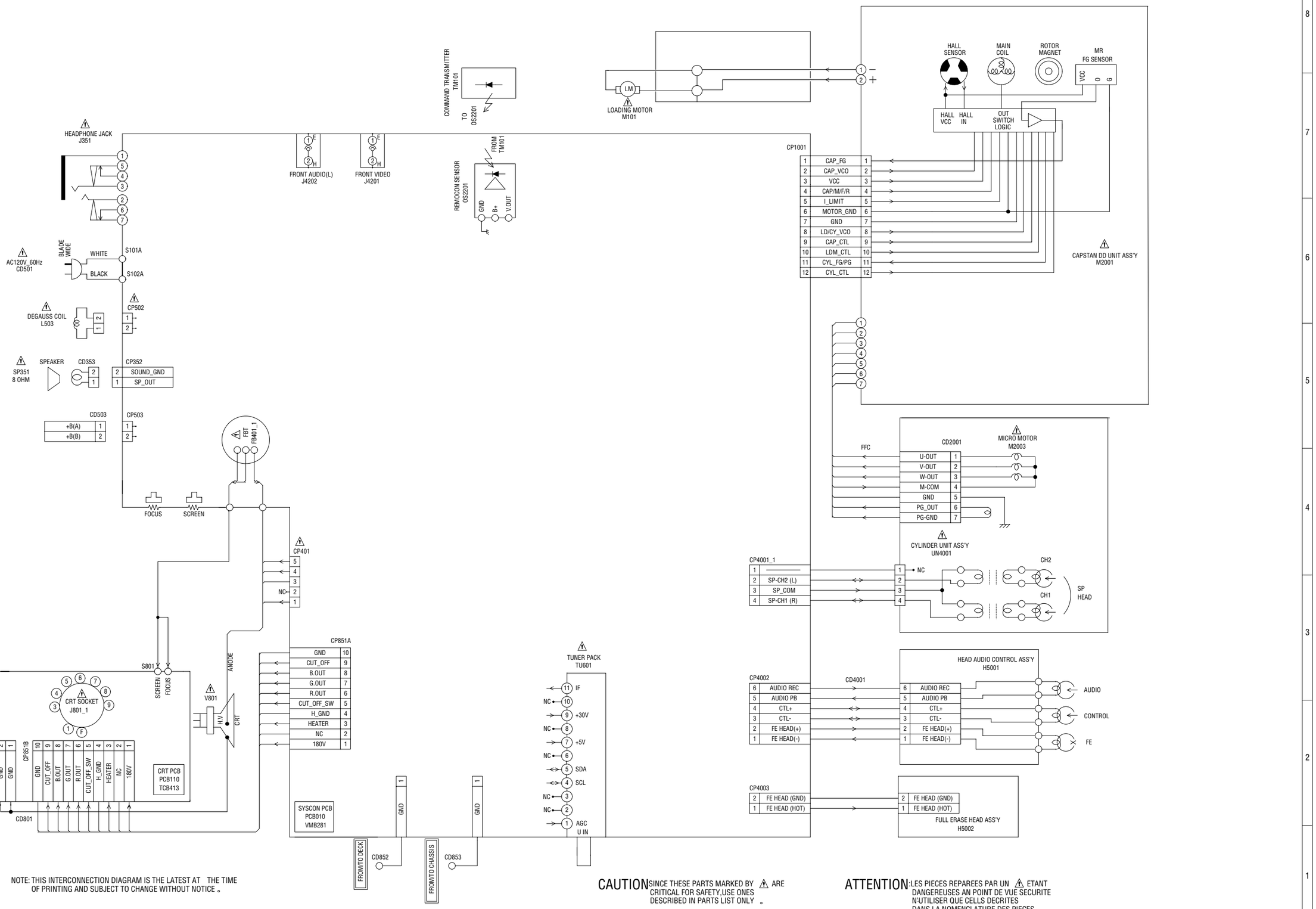
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

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

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

◀ R.SIGNAL
◀ G.SIGNAL
≪ B.SIGNAL

INTERCONNECTION DIAGRAM



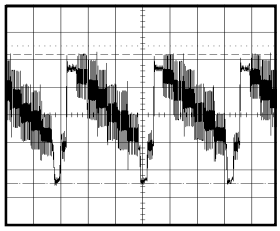
NOTE: THIS INTERCONNECTION DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

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

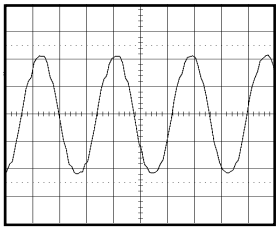
ATTENTION LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

WAVEFORMS

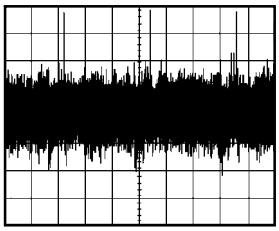
Y/C/AUDIO/HEAD AMP



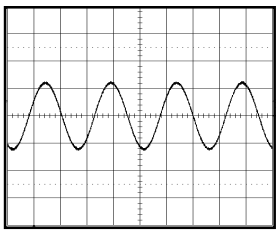
① PB
0.5V 20µs/div



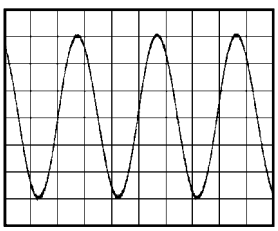
② POWER ON
100mV 0.1µs/div



③ PB
10mV 20µs/div

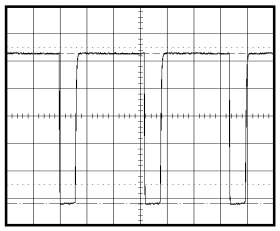


④ PB
0.5V 1ms/div

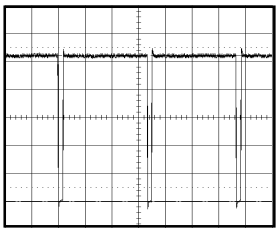


⑤ REC
10.0V 5µs/div

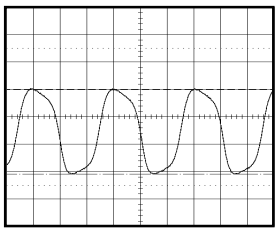
MICON



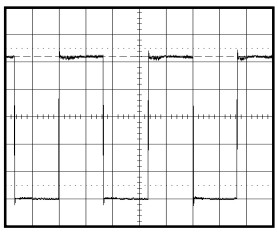
⑥ POWER ON
1.0V 20µs/div



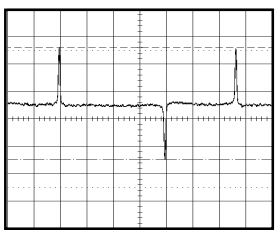
⑦ POWER ON
0.5V 10ms/div



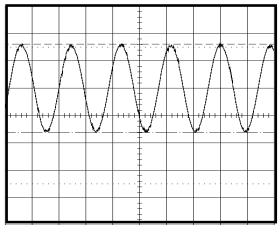
⑧ POWER ON
1.0V 10µs/div



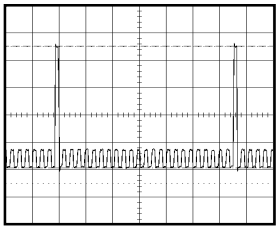
⑨ PB
1.0V 10ms/div



⑩ PB
1.0V 5ms/div

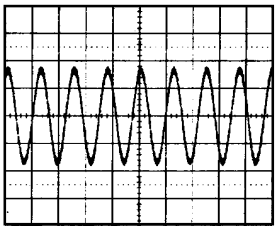


⑪ PB
0.5V 0.5ms/div



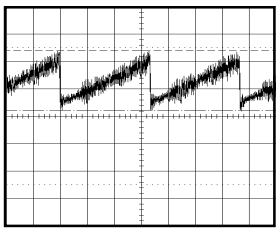
⑬ PB
1.0V 5ms/div

SOUND AMP

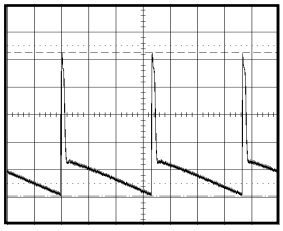


⑭ POWER ON
200mV 2ms/div

DEFLECTION



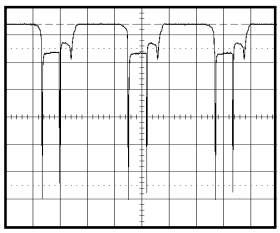
⑰ POWER ON
0.5V 5ms/div



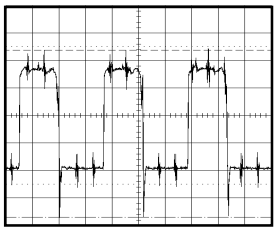
⑱ POWER ON
10.0V 5ms/div

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

WAVEFORMS

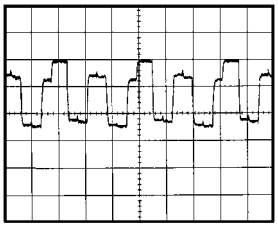


⑲ POWER ON
2.0V 20µs/div

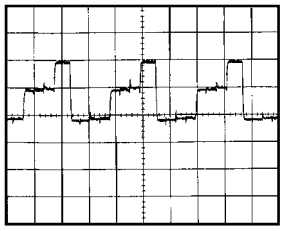


⑳ POWER ON
200mV 20µs/div

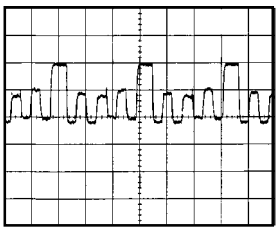
CRT



㉑ POWER ON
50.0V 20µs/div



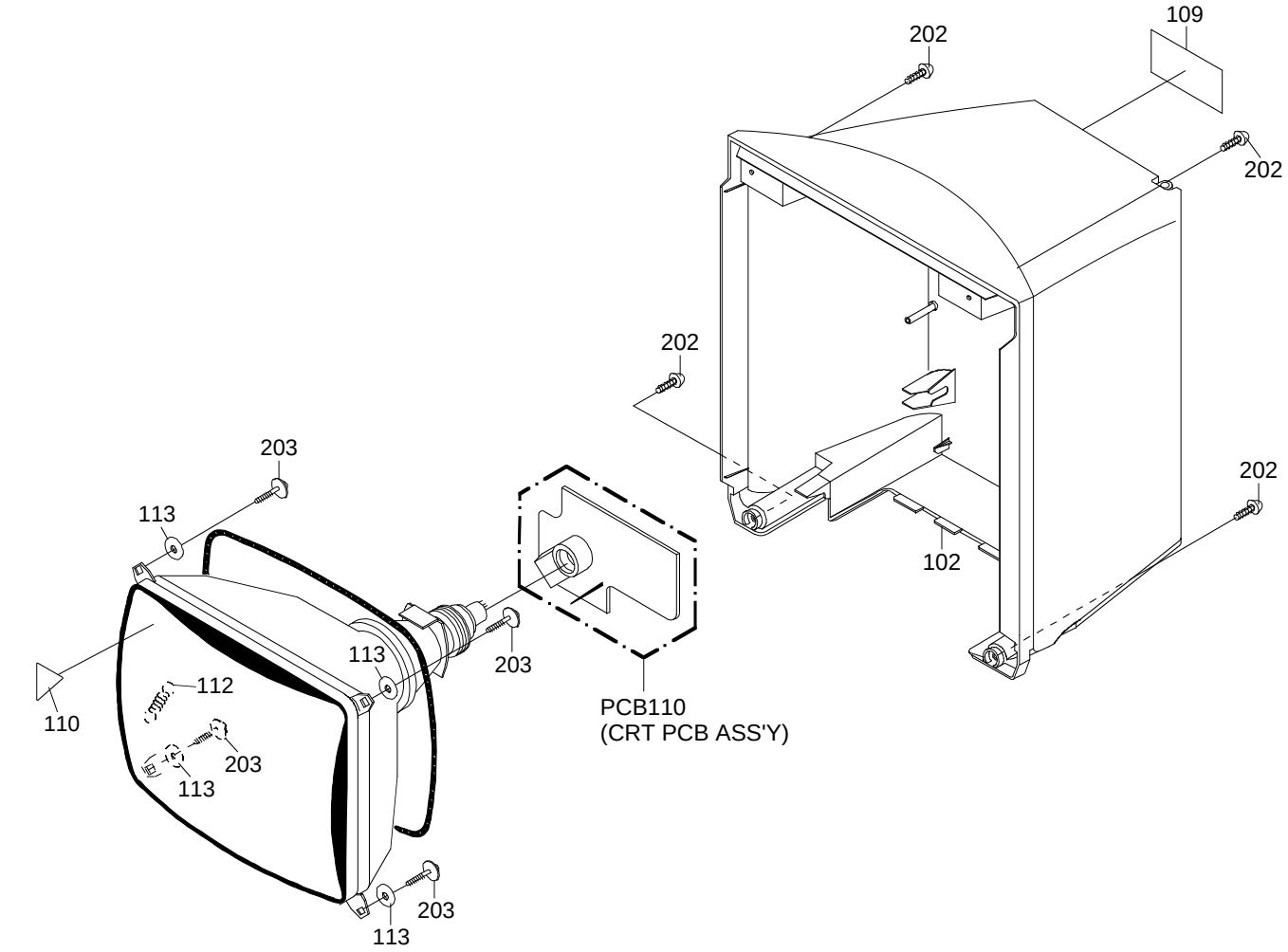
㉒ POWER ON
50.0V 20µs/div

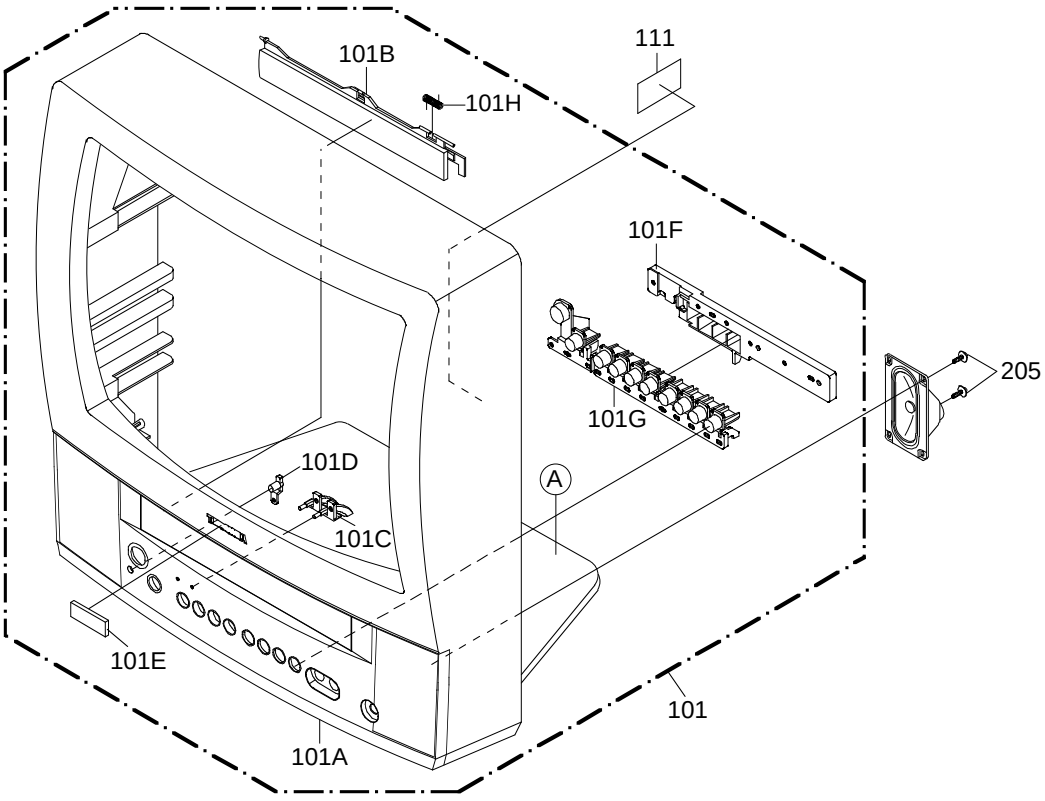


㉓ POWER ON
50.0V 20µs/div

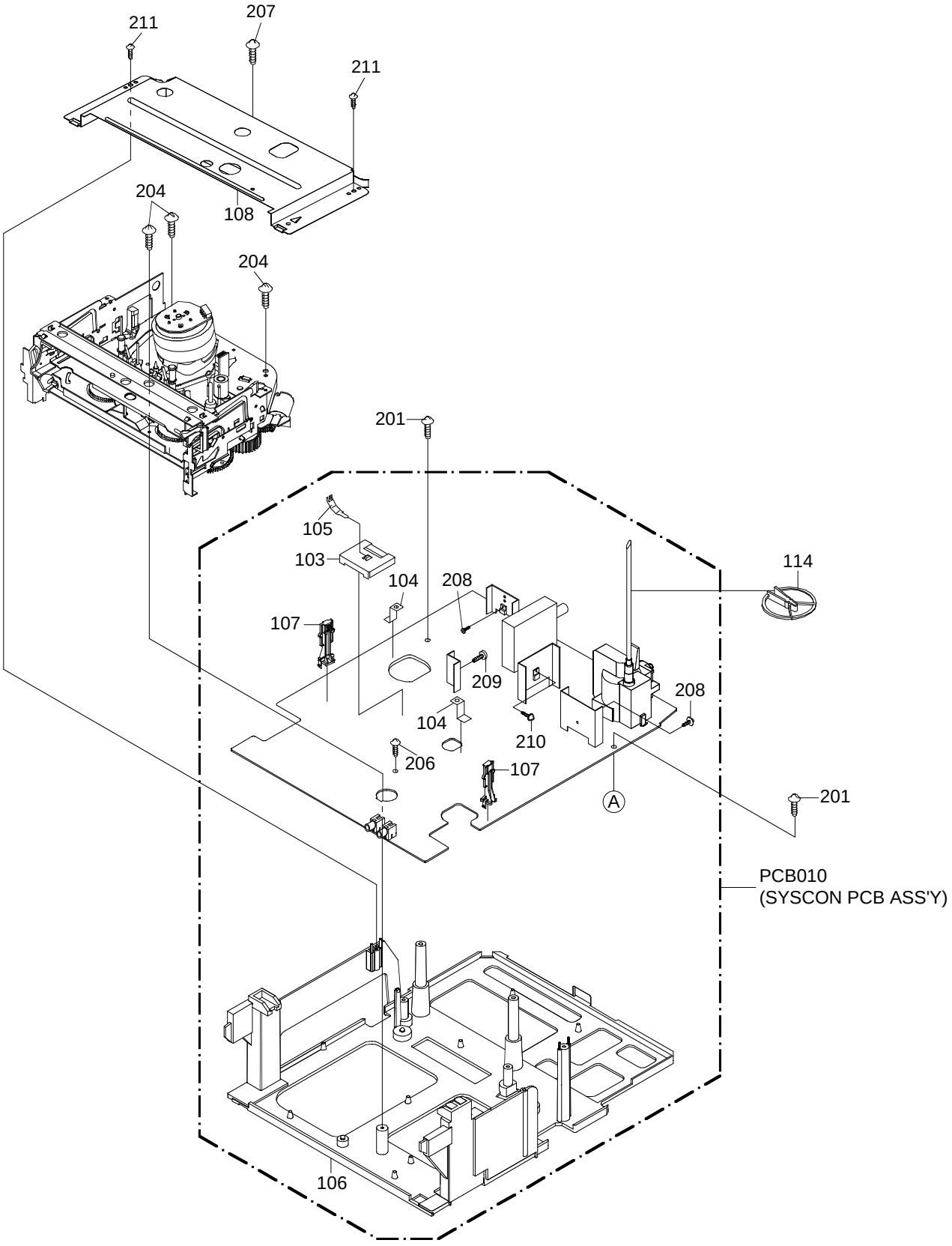
NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

MECHANICAL EXPLODED VIEW

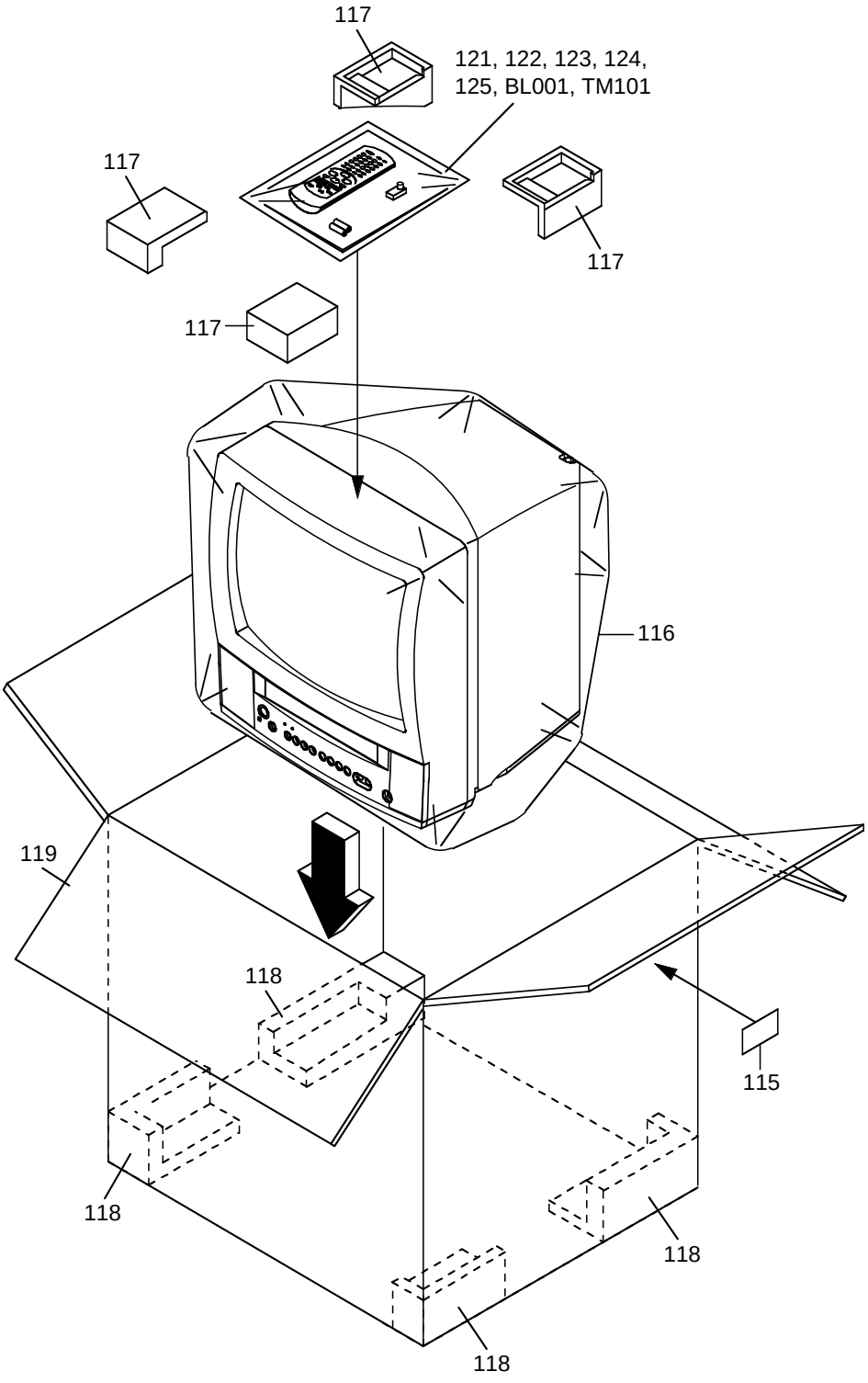




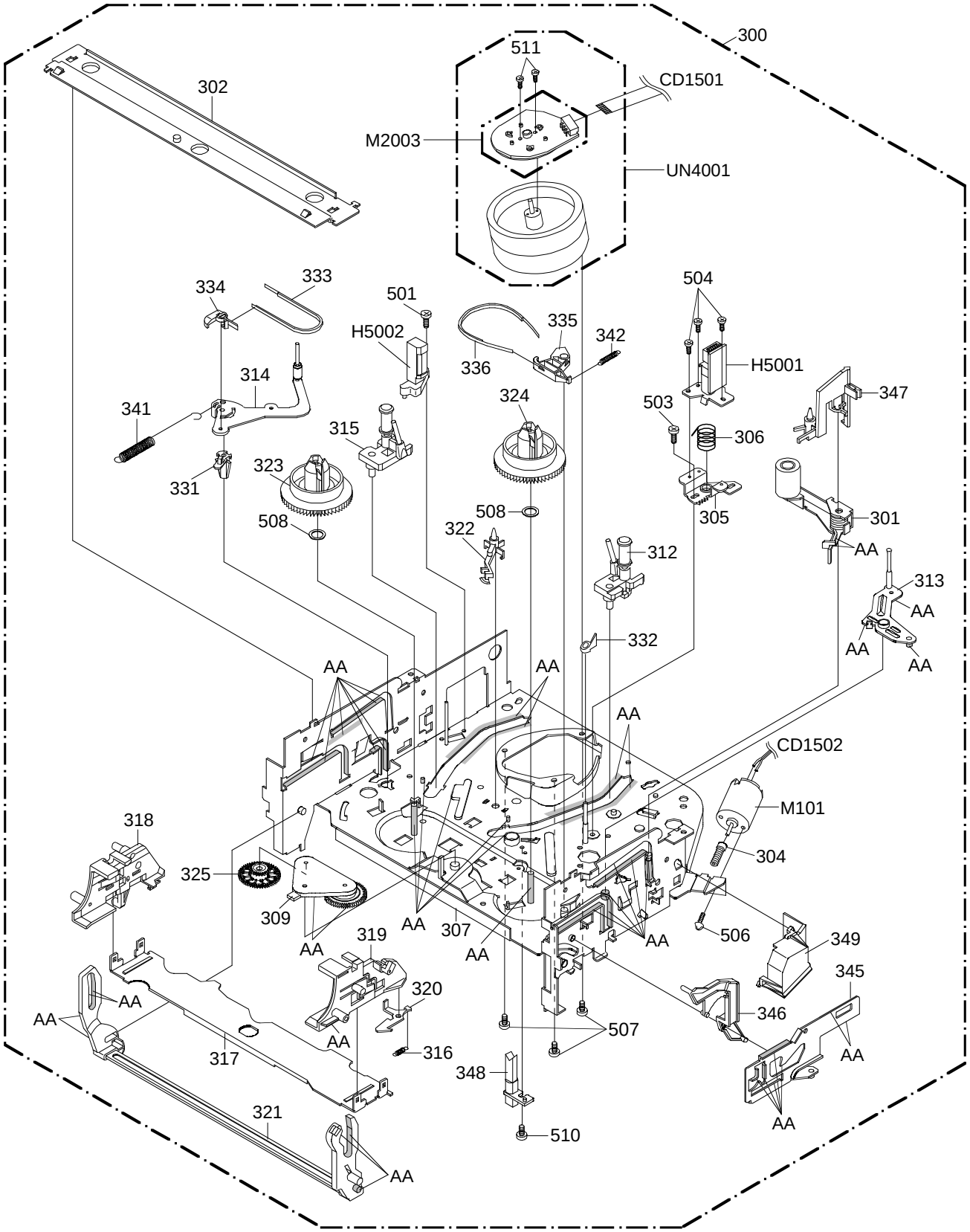
MECHANICAL EXPLODED VIEW



MECHANICAL EXPLODED VIEW
(PACKING DIAGRAM)



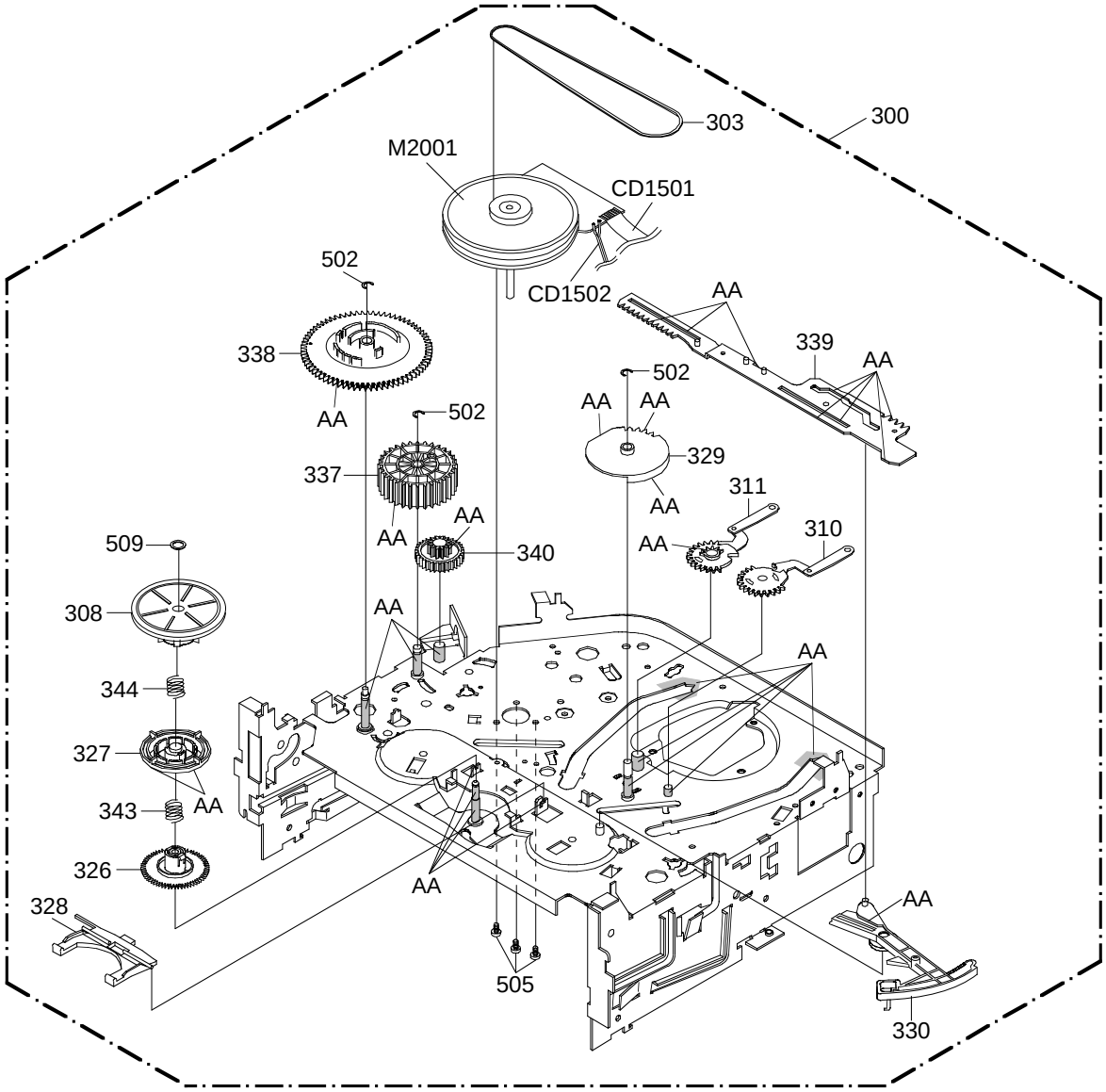
CHASSIS EXPLODED VIEW (TOP VIEW)



CLASS	MARK
GREASE	AA

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

CHASSIS EXPLODED VIEW (BOTTOM VIEW)



CLASS	MARK
GREASE	AA

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

MECHANICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
101	AE002770	7A701A018A	FRONT CABI ASS'Y	
101A	AE002771	701WPJC487	CABINET,FRONT	
101B	AE002772	712WPJB964	FLAP	
101C	AD301664	713WPA0248	GLASS,LED	
101D	AD301663	713WPA0249	GUIDE,REMOCON	
101E	AD301657	723549A011	BADGE,BRAND	
101F	AD301661	735WPAA493	STOPPER,BUTTON	
101G	AE002773	735WPBA957	BUTTON,FRAME	
101H	AD301686	743WKA0037	SPRING,FLAP	
102	AE002774	A5L801V740	CABINET,BACK ASSY	
103	BZ710466	752WSA0230	SHIELD,CASE HEAD AMP	
104	AE000049	753WSA0118	PLATE,EARTH-SYSCON	
105	BZ710331	753WUAA006	SPRING,EARTH HEAD AMP	
106	AD301656	761WPA0236	HOLDER,DECK	
107	BZ710498	85OP700038	HOLDER,END SENSOR	
108	AD301750	752WSAA051	PLATE,DECK SHIELD	
109	AE001655	722549A299	SHEET,RATING	
110	AE002775	723000C462	POP LABEL	
111	AD300007	7230006755	SHEET,CAUTION	
112	AD300759	741WUA0021	SPRING,EARTH	
113	AE000053	800WR0A011	SHEET,CRT SUPPORT (D)	
114	BZ710260	899HV3T000	HOLDER,ANODE WIRE	
115	AE002776	723000C445	SHEET,BAR CODE	
116	AD302402	791WHA0061	LAMIFILM BAG	
117	AD301669	792WHA0412	PACKAGE,TOP	
118	AE001366	792WHA0478	PACKAGE,BOTTOM	
119	AE002777	793WCDC038	GIFT BOX	
120	AE002778	A5L801V975	INSTRUCTION BOOK KIT	
121	AE002779	J5L80101A	INSTRUCTION BOOK	
122	AD302404	J5500817	REGISTRATION CARD	
123	AE001396	J5500836	ESP CARD	
124	AE001184	J5F10129A	INFORMATION SHEET	
125	AD300812	JB5UD400	POLYBAG,INSTRUCTION(RED CAUTION)	
201	BZ710036	8117540B04	SCREW,TAPPING(B0) TRUSS	4x20
202	BZ710035	8117540A64	SCREW,TAPPING(B0) TRUSS	4x16
203	BZ710321	8121F50B84	SCREW,TAP TITE(P) FAI20 FLAT	5x28
204	BZ710032	8110630A24	SCREW,TAP TITE(P) BRAZIER	3x12
205	BZ710030	8110630804	SCREW,TAP TITE(P) BRAZIER	3x8
206	BZ710028	8110330804	SCREW,TAP TITE(P) FLAT	3x8
207	AD301667	8110E30804	SCREW,TAP TITE(P) WH10	3x8
208	BZ710239	8109I30A04	SCREW,TAP TITE(B) WH7	3x10
209	BZ710562	8109I30804	SCREW,TAP TITE(B) WH7	3x8
210	BZ710018	8107630804	SCREW,TAP TITE(S) BRAZIER	3x8
211	BZ710147	8107630604	SCREW,TAP TITE(S) BRAZIER	3x6

CHASSIS REPLACEMENT PARTS LIST

	Location No.	TSB P/N	Reference No.	Description	
	300	AD301674	A5E201A420K	DECK ASS'Y	A5E201A420K
	301	AE002754	85OA400240	PINCH ROLLER BLOCK (VA)	
	302	BZ710514	85OP900746	BRACKET,TOP 3V	
	303	BZ710193	85OP200290	BELT,CAPSTAN (S)	
	304	BZ710515	85OP600581	WORM	
	305	BZ710094	85OP500083	BASE,AC HEAD	
	306	BZ710112	85OP800324	SPRING,AC HEAD	
	307	BZ710516	85OA000459	MAIN CHASSIS ASS'Y	
	308	BZ710517	85OA200089	CLUTCH ASS'Y	
	309	BZ710518	85OA200090	ARM IDLER ASS'Y	
	310	BZ710519	85OA300065	LOADING ARM S UNIT	
	311	BZ710520	85OA300066	LOADING ARM T UNIT	
	312	BZ710521	85OA400223	INCLINED BASE T UINT 3S	
	313	BZ710522	85OA400232	P5 ARM ASS'Y 2	
	314	BZ710650	85OA400235	TENSION ARM ASS'Y 2	
	315	BZ710524	85OA400231	INCLINED BASE S UNIT	
	316	AE000442	85OP800367	SPRING,LOCKER	
	317	BZ710526	85OP900736	CASS,HOLDER	
	318	BZ710527	85OP900748	CASS,SIDE L	
	319	BZ710528	85OP900749	CASS,SIDE R	
	320	BZ710529	85OP900739	LOCKER,R	
	321	BZ710530	85OA900228	LINK UNIT	
	322	BZ710531	85OP000496	POST,CASS GUIDE	
	323	BZ710532	85OP200316	REEL,S (S)	
	324	BZ710533	85OP200317	REEL,T (S)	
	325	BZ710534	85OP200308	GEAR,IDLER	
	326	BZ710535	85OP200311	GEAR,CLUTCH	
	327	BZ710536	85OP200312	GEAR,COUPLING	
	328	BZ710537	85OP200313	LEVER,CLUTCH	
	329	BZ710538	85OP300194	GEAR,MAIN LOADING	
	330	BZ710092	85OP400490	LEVER,TENSION	
	331	BZ710093	85OP400492	HOLDER,TENSION	
	332	BZ710366	85OP400520	CAP.P4	
	333	BZ710762	85OP400542	BAND,TENSION	
	334	BZ710540	85OP400533	CONNECT,TENSION	
	335	BZ710541	85OP600573	ARM,BRAKE T	
	336	BZ710763	85OP600584	BAND,BRAKE T	
	337	BZ710543	85OP600577	CAM,PINCH ROLLER	
	338	BZ710544	85OP600578	CAM,MAIN	
	339	BZ710545	85OP600579	ROD,MAIN	
	340	BZ710546	85OP600582	GEAR,JOINT	
	341	BZ710110	85OP800322	SPRING,TENSION	
	342	BZ710547	85OP800360	SPRING,BRAKE T	
	343	BZ710548	85OP800355	SPRING,COUPLING	
	344	BZ710549	85OP800356	SPRING,RING	
	345	BZ710565	85OP900750	LEVER,LINK 2	
	346	BZ710551	85OP900744	LEVER,FLAP	
	347	BZ710552	85OP900745	CASS,OPENER	
	348	BZ710106	85OP700035	REFLECTOR,LED	
	349	BZ710796	85OP700039	COVER,BOT	
	501	BZ710049	8107226804	SCREW,TAP TITE(S) BIND	2.6x8
	502	BZ710058	83ETW30000	E-RING	3.0
	503	BZ710371	8107226404	SCREW,TAP TITE(S) BIND	2.6x4
	504	BZ710046	8102120604	SCREW,PAN	M2x6
	505	BZ710050	8109126604	SCREW,TAP TITE(B) PAN	2.6x6
	506	BZ710553	810A130404	SCREW/WASHER(A)	M3x4
	507	BZ710219	810A126504	SCREW/WASHER(A)	M2.6x5
	508	BZ710056	82Q264713N	POLYSLIDER WASHER	2.6x4.7xT0.13
	509	BZ710054	82P184505N	POLYSLIDER WASHER(CUT)	1.8x4.5xT0.5
	510	BZ710017	8107226604	SCREW,TAP TITE(S) BIND	2.6x6
	511	BZ710051	810A123504	SEMS A	M2.3x5.0
	CD1501	BZ614292	122H071704	CORD JUMPER	2H071704
	CD1502	BZ614339	122Y021902	CORD JUMPER	2Y021902
	H5001	AD301675	1523Q91003	HEAD (AUDIO CONTROL)	VTR-1X2RPE22-756
	H5002	AD301676	1543Q02014	HEAD (FULL ERASE)	VTR-1X2ERS11-154
⚠	M101	BZ710566	1596P98001	MOTOR (LOADING)	MXN13FB12K3
⚠	M2001	AE002696	1510S98040	CAPSTAN DD UNIT	F2QVB33B
⚠	M2003	BZ710373	1589S11014	MICRO MOTOR	I2OAL03
⚠	UN4001	BZ610290	A5A305A500	CYLINDER UNIT ASS'Y	A5A305A500

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.		Description
			RESISTORS	
⚠R402	BZ210225	R3X181271J	R,METAL OXIDE	270 OHM 1W
⚠R410	AD301140	R3X28A221J	R,METAL OXIDE	220 OHM 2W
⚠R415	BZ210053	R002T22R2J	RC	2.2 OHM 1/2W
⚠R420	BZ210233	R4X5T6272F	R,METAL	2.7K OHM 1/6W
⚠R442	AD300036	R4X5T6562F	R,METAL	5.6K OHM 1/6W
⚠R443	AE002992	R803R9822F	RC	8.2K OHM 1/16W
⚠R447	BZ210021	R65582680J	R,FUSE	68 OHM 1/2W
⚠R449	BZ210241	R655U2010J	R,FUSE	1 OHM 1/2W
⚠R450	AD301631	R655815R6J	R,FUSE	5.6 OHM 1W
⚠R500	BZ210080	R0G3K2275K	RC	2.7M OHM 1/2W
⚠R501	AD301632	R5Y2CD3R3J	R,CEMENT	3.3 OHM 5W
⚠R502	BZ210215	R3X28B100J	R,METAL OXIDE	10 OHM 3W
⚠R508	BZ210158	R002T2563J	RC	56K OHM 1/2W
⚠R509	BZ210206	R002T2155J	RC	1.5M OHM 1/2W
⚠R510	AE001887	R803R9105J	RC	1M OHM 1/16W
⚠R512	BZ210158	R002T2563J	RC	56K OHM 1/2W
⚠R514	BZ210048	R3X181R33J	R,METAL OXIDE	0.33 OHM 1W
⚠R517	BZ210217	R3X181331J	R,METAL OXIDE	330 OHM 1W
⚠R520	BZ210009	R3X28AR82J	R.METAL OXIDE	0.82 OHM 2W
⚠R528	BZ210190	R63581R22J	R,FUSE	0.22 OHM 1W
⚠R529	BZ210084	R4X5T4272F	R,METAL	2.7K OHM 1/4W
⚠R802	BZ210089	R3X181123J	R,METAL OXIDE	12K OHM 1W
⚠R805	BZ210089	R3X181123J	R,METAL OXIDE	12K OHM 1W
⚠R810	BZ210089	R3X181123J	R,METAL OXIDE	12K OHM 1W
			CAPACITORS	
C354	BZ110135	E02L02222M	CE	2200 UF 16V
⚠C402	BZ110077	E02L04102M	CE	1000 UF 35V
⚠C407	BZ110078	E02L03102M	CE	1000 UF 25V
⚠C419	AD300064	E02LT8220M	CE	22 UF 100V
C423	BZ210173	P4J7F3474J	CMPP	0.47 UF 250V PMS
⚠C424	AD302292	P4N8FJ912H	CMPP	0.0091UF 1.25KV
⚠C431	BZ110103	E02LTD100M	CE	10 UF 250V
⚠C506	BZ110025	P2122B224M	CMP	0.22 UF 275V ECQUL
⚠C507	BZ110061	C0JTB0513K	CC	0.001 UF 500V B
⚠C509	AD301635	E51CGC331M	CE	330 UF 200V
⚠C511	BZ110041	E02LT3471M	CE	470 UF 25V
⚠C516	BZ110206	C0JTB05Q2K	CC	470 PF 500V B
C517	AD301636	C0PLRR7B2K	CC	120 PF 2KV R
⚠C521	BZ110130	E62NFC221M	CE	220 UF 200V
⚠C522	AD300788	E02LU5010M	CE	1 UF 50V
C523	BZ110104	E0EL02332M	CE	3300 UF 16V
⚠C524	BZ110135	E02L02222M	CE	2200 UF 16V
⚠C529	AE000308	CD39B0MQ2K	CC	470 PF 250V
C535	BZ110202	C0PLRR713K	CC	0.001 UF 2KV R
⚠C539	BZ110227	CD39E0ML3M	CC	0.0033UF 250V
C541	AD301702	C0PLRR7G3K	CC	0.0018 UF 2KV R
C801	BZ110201	C0PLRR7H3K	CC	0.0022 UF 2KV R
			DIODES	
D401	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
⚠D402	AD300731	D2WXN49370	DIODE,SILICON	1N4937
D403	BZ410019	D97U03001B	DIODE,ZENER	MTZJ30B T-77
D404	BZ410019	D97U03001B	DIODE,ZENER	MTZJ30B T-77
D405	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
D407	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
⚠D409	BZ410017	D94TA11B13	DIODE,ZENER	HZ11B3L TD
D410	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D411	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
⚠D412	AD300731	D2WXN49370	DIODE,SILICON	1N4937
⚠D413	AD300731	D2WXN49370	DIODE,SILICON	1N4937
⚠D501	BZ410061	D97U01001B	DIODE,ZENER	MTZJ10B T-77
D502	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D503	BZ410058	D97U08R21B	DIODE,ZENER	MTZJ8.2B T-77
D504	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
⚠D505	BZ410010	D28T21DQN9	DIODE,SCHOTTKY	21DQ09N-TA2B1
⚠D507	BZ410010	D28T21DQN9	DIODE,SCHOTTKY	21DQ09N-TA2B1
D508	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
⚠D510	BZ410080	D2WXRU2AM0	DIODE,SILICON	RU2AM-EIC
⚠D512	BZ410010	D28T21DQN9	DIODE,SCHOTTKY	21DQ09N-TA2B1
D513	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D514	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
⚠D515	BZ410037	D97U03301B	DIODE,ZENER	MTZJ33B T-77

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.		Description
			DIODES	
⚠D517	AD300731	D2WXN49370	DIODE,SILICON	1N4937
⚠D518	BZ410085	D2WXN40050	DIODE,SILICON	1N4005-EIC
⚠D519	BZ410010	D28T21DQN9	DIODE,SCHOTTKY	21DQ09N-TA2B1
⚠D520	BZ410085	D2WXN40050	DIODE,SILICON	1N4005-EIC
⚠D521	BZ410085	D2WXN40050	DIODE,SILICON	1N4005-EIC
D528	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
⚠D530	BZ410085	D2WXN40050	DIODE,SILICON	1N4005-EIC
D533	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
⚠D534	AD300671	D97U01801B	DIODE,ZENER	MTZJ18B T-77
⚠D535	AD300671	D97U01801B	DIODE,ZENER	MTZJ18B T-77
D536	AD300731	D2WXN49370	DIODE,SILICON	1N4937
D537	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D601	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D602	BZ410058	D97U08R21B	DIODE,ZENER	MTZJ8.2B T-77
D603	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D605	BZ410059	D2WT11ES10	DIODE,SILICON	11ES1-EIC
D608	BZ410077	D2WXSB1400	DIODE,SCHOTTKY	SB140-EIC
D609	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D610	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D611	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D801	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D802	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D803	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D1001	AD301638	0010E00330	INFRARED LED	LTE-3271T-012A-O
D1002	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D1004	BZ410054	0021721150	LED	SLR-342VCT32
D1013	BZ410054	0021721150	LED	SLR-342VCT32
D1014	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D2201	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D4001	BZ410034	D97U01301B	DIODE,ZENER	MTZJ13B T-77
D4002	BZ410034	D97U01301B	DIODE,ZENER	MTZJ13B T-77
			ICS	
⚠IC351	BZ611001	I01DP75110	IC	AN7511
⚠IC401	AE002783	I03TD804N0	IC	LA78040N-E
⚠IC501	AE000560	I1KA9R05A0	IC	KIA78R05API
⚠IC502	BZ410055	0002500450	PHOTO COUPLER	TLP621(GR)
IC601	AD301639	I06FC61250	IC	M61250FP
IC1001	AE002784	I56F57107A	IC	OEC7107A
⚠IC1003	AD301641	I9UF032310	IC	PST3231NR
IC1099	AE002785	A5L801V015	IC	AT24C04N-10SI-2.7
IC4001	AD301643	I03F3206M0	IC	LA71206M-MPB
			TRANSISTORS	
Q403	BZ510022	TNYJJ05001	COMPOUND TRANSISTOR	DTC114TKAT146
Q404	BZ510049	TPYJD05001	COMPOUND TRANSISTOR	DTA144EKAT146
⚠Q405	BZ510089	TC5T01627Y	TRANSISTOR,SILICON	2SC1627_Y(TPE2)
⚠Q406	BZ510120	TD3U021400	TRANSISTOR,SILICON	TT2140LS-CBC
⚠Q503	BZ510004	TA3T016240	TRANSISTOR,SILICON	2SA1624-AA
Q505	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q507	BZ510069	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
Q508	BZ510020	TNYJB05001	COMPOUND TRANSISTOR	DTC114EKAT146
⚠Q510	AE002251	T25F035630	FET	2SK3563(ORION_Q)
⚠Q511	BZ510070	TCAT032034	TRANSISTOR,SILICON	KTC3203_Y-AT
Q601	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q602	BZ510070	TCAT032034	TRANSISTOR,SILICON	KTC3203_Y-AT
Q603	BZ510070	TCAT032034	TRANSISTOR,SILICON	KTC3203_Y-AT
Q604	BZ510074	TDAT00863Y	TRANSISTOR,SILICON	KTD863_Y-AT
Q605	BZ510074	TDAT00863Y	TRANSISTOR,SILICON	KTD863_Y-AT
Q606	BZ510070	TCAT032034	TRANSISTOR,SILICON	KTC3203_Y-AT
Q607	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q609	BZ510020	TNYJB05001	COMPOUND TRANSISTOR	DTC114EKAT146
Q611	BZ510025	TPYJB05001	COMPOUND TRANSISTOR	DTA114EKAT146
Q612	BZ510020	TNYJB05001	COMPOUND TRANSISTOR	DTC114EKAT146
⚠Q804	BZ510009	TC3F042170	TRANSISTOR,SILICON	2SC4217(D,E)-RAC
⚠Q805	BZ510009	TC3F042170	TRANSISTOR,SILICON	2SC4217(D,E)-RAC
⚠Q806	BZ510009	TC3F042170	TRANSISTOR,SILICON	2SC4217(D,E)-RAC
Q1003	BZ410106	0002700680	PHOTO COUPLER	RPI-352C40N
Q1004	BZ510021	TNYJC05001	COMPOUND TRANSISTOR	DTC124EKAT146
⚠Q1005	BZ410107	0002700690	PHOTO COUPLER	RPI-303
Q1007	BZ510020	TNYJB05001	COMPOUND TRANSISTOR	DTC114EKAT146
Q1009	BZ410106	0002700680	PHOTO COUPLER	RPI-352C40N
Q1011	BZ410097	0000M00390	PHOTO TRANSISTOR	ST-304L

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.		Description
			TRANSISTORS	
Q1013	BZ410097	0000M00390	PHOTO TRANSISTOR	ST-304L
Q1014	BZ510021	TNYJC05001	COMPOUND TRANSISTOR	DTC124EKAT146
Q4001	BZ510069	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
Q4002	BZ510069	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
Q4003	BZ510026	TPYJC05001	COMPOUND TRANSISTOR	DTA124EKAT146
Q4005	BZ510073	TAATA12660	TRANSISTOR,SILICON	KTA1266-AT(Y,GR)
Q4006	BZ510070	TCAT032034	TRANSISTOR,SILICON	KTC3203_Y-AT
Q4007	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q4009	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q4010	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q4011	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q4012	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q4202	BZ510020	TNYJB05001	COMPOUND TRANSISTOR	DTC114EKAT146
			COILS &TRANSFORMERS	
L401	AD301644	021L75472J	COIL	4.7 MH
⚠L502	BZ310075	029X000087	COIL,LINE FILTER	SS24V-10100
⚠L503	BZ310076	028R140031	COIL,DEGAUSS	8R140031
L601	BZ310012	021LA6R56M	COIL	0.56 UH
L603	BZ310040	02167F470J	COIL	47 UH
L607	BZ310038	021LA6120K	COIL	12 UH
L609	BZ310041	02167F101J	COIL	100 UH
L616	BZ310169	021LA6R39M	COIL	0.39 UH
L801	AD301757	021673271K	COIL	270 UH
L1001	BZ310009	021LA62R2K	COIL	2.2 UH
L4001	BZ310039	02167F220J	COIL	22 UH
L4003	BZ310041	02167F101J	COIL	100 UH
L4005	BZ310040	02167F470J	COIL	47 UH
L4006	BZ310040	02167F470J	COIL	47 UH
L4009	BZ310041	02167F101J	COIL	100 UH
T401	BZ310157	045009003J	TRANS,HORIZONTAL DRIVE	ETH09K14BZ
⚠T501	BZ310160	0481290804	TRANSFORMER,SWITCHING	81290804
T4001	BZ310114	031626009R	COIL,BIAS OSC	1626009
			JACKS	
⚠J351	BZ614361	060J131015	HEADPHONE JACK	MSJ-2000
⚠J801	AD301147	066F120018	SOCKET,CATHODE RAY TUBE	ISMS01S
J4201	AD300680	060Q401077	RCA JACK	AV1-09D-3
J4202	AD300681	060Q401076	RCA JACK	AV1-09D-4
			SWITCHES	
SW1001	BZ612016	0508S11001	SWITCH (LEAF)	LSA-1144EAU
SW2201	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW2202	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW2203	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW2204	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW2205	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW2206	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW2207	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW2208	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW2209	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
SW2210	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R
			VARIABLE RESISTORS	
VR401	BZ210218	V1K63H3BTE	VOLUME,SEMI FIXED	NVG6TLTAB222
VR502	BZ210024	V1163L2BTC	VOLUME,SEMI FIXED	EVNCYAA03BY2
			P.C.BOARD ASSEMBLIES	
PCB010	AE002786	A5L801V010	PCB ASS'Y	VMB281B
PCB110	AE002787	A5L801V110	PCB ASS'Y	TCB413B
			MISCELLANEOUS	
B501	BZ310122	024HT03563	CORE,BEADS	W4BRH3.5X6X1.0X2
B503	BZ310121	024HT03553	CORE,BEADS	W5RH3.5X5X1.0
B505	BZ310121	024HT03553	CORE,BEADS	W5RH3.5X5X1.0
B602	BZ310121	024HT03553	CORE,BEADS	W5RH3.5X5X1.0
BL001	BZ310014	023C00022A	COIL,BALUN	HPN-01
BT101	AE000012	1412004008	BATTERY,MANGAN	R03(AB)E_2P_G
BT102	AE000012	1412004008	BATTERY,MANGAN	R03(AB)E_2P_G
CD353	BZ614150	06CH12444A	CORD,CONNECTOR	CH12444A
⚠CD501	AD300685	120R414903	CORD,AC BUSH	0R414903
CD503	BZ614133	069X620040	CONNECTOR	JM-2BK-61
CD801	BZ614175	06CU82039A	CORD,CONNECTOR	SM1098-009-1A
CD803	BZ614317	06CH012101	CORD,CONNECTOR	CH012101
CD851	AD300889	WHL6032038	FLAT CABLE	AWM2468 AWG26 10C BLACK 320MM
CD852	BZ614100	06CH01408A	CORD,EIS CONNECTOR	CH01408A
CD853	BZ614317	06CH012101	CORD,CONNECTOR	CH012101

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.		Description
			MISCELLANEOUS	
CF601	BZ613031	1029045R7G	FILTER,SAW	TSF5229P3
CF602	AD300513	1012T04702	FILTER,CERAMIC TRAP	MKT47.3MC110P-TF
CF603	AD301647	1012T4R520	FILTER,CERAMIC	SFSRA4M50CF00-A0
CF604	AD301648	1012T4R519	FILTER,CERAMIC TRAP	TPSRA4M50C00-A0
CP351	AD301329	069E260659	CONNECTOR PCB SIDE	00_8283_0611_00_000
CP352	BZ614365	069S120419	CONNECTOR PCB SIDE	A2502WV2-2P
CP401	BZ614303	069S450089	CONNECTOR PCB SIDE	A1561WV2-A5P
⚠CP502	AD300687	069S420110	CONNECTOR PCB SIDE	A1561WV2-2P
CP503	BZ614137	069X620030	CONNECTOR PCB SIDE	RE-H022TD-1130
CP504	BZ614016	069W01001A	CONNECTOR PCB SIDE	003P-2100
CP505	BZ614016	069W01001A	CONNECTOR PCB SIDE	003P-2100
CP801	BZ614269	069S320010	CONNECTOR PCB SIDE	A2361WV2-2P
CD4001	BZ614373	122F061502	CORD,JUMPER	2F061502
CP1001	BZ614289	06972C0010	CONNECTOR PCB SIDE	TMC-J12P-B2
CP1003	BZ614138	0694240139	CONNECTOR PCB SIDE	173979-4
CP4001	BZ614054	0697240600	CONNECTOR PCB SIDE	TOC-C04X-B1
CP4002	BZ614050	069J760029	CONNECTOR PCB SIDE	IMSA-9604S-06Z14
CP4003	AD301649	067U002019	WIRE HOLDER	B2013H02-2P
CP851A	BZ614273	067U010049	WIRE HOLDER	B2013H02-10P
CP851B	BZ614273	067U010049	WIRE HOLDER	B2013H02-10P
CUS013	BZ710149	800WFAA008	CUSHION C	
EL001	BZ614044	124120301A	EYE LET	XRY20X30BD
EL002	BZ614043	124116281A	EYE LET	XRY16X28BD
⚠F501	BZ614504	081PC05005	FUSE	51MS050L
⚠FB401	AD301650	043214037F	TRANSFORMER,FLYBACK	FNI-14B001
FH501	AE002634	06710T0009	HOLDER,FUSE	EYF-52BCY
FH502	AE002634	06710T0009	HOLDER,FUSE	EYF-52BCY
OS2201	BZ614199	077Q004017	REMOTE RECEIVER	PIC-37243SR
⚠SP351	BZ614200	070C533019	SPEAKER	SG04D11BNA
⚠TH501	BZ410079	DF5EL3R0A0	DEGAUSS ELEMENT	ZPB45BL3R0A
TM101	AE002788	076D0JG010	TRANSMITTER	ORV203N5703003
⚠TU601	AD301652	0145K00062	TUNER,VHF-UHF	TECC1040PG38W
⚠V801	BZ614141	098Q1404B2	CRT W/DY	A34AGT13X98(L)
X602	AD301653	100DT3R531	CRYSTAL	HC-49/U
X1001	AE000107	100CT01207	CRYSTAL	HC-49/U-S
X1002	BZ613006	100DA32R01	CRYSTAL	DT-26
X4001	BZ613017	100CT3R502	CRYSTAL	HC-49/U

RESISTOR

RC..... CARBON RESISTOR

CAPACITORS

CC..... CERAMIC CAPACITOR
CE..... ALUMI ELECTROLYTIC CAPACITOR
CP..... POLYESTER CAPACITOR
CPP..... POLYPROPYLENE CAPACITOR
CPL..... PLASTIC CAPACITOR
CMP..... METAL POLYESTER CAPACITOR
CMPL..... METAL PLASTIC CAPACITOR
CMPP..... METAL POLYPROPYLENE CAPACITOR

TOSHIBA CORPORATION
1-1, SHIBAURA 1-CHOME, MINATO-KU, TOKYO 105-8001, JAPAN