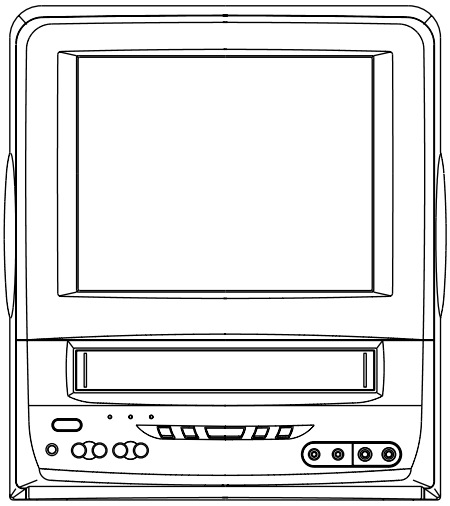
Memorex®

MVT2090 Series A

SERVICE MANUAL

COLOR TELEVISION/VIDEO CASSETTE RECORDER



VHS

ORIGINAL
MFR'S VERSION A

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
Earphone jack

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.

CONTENTS

GENERAL SPECIFICATIONS

G-1	TV System	CRT		CRT Size / Visual Size	9 inch / 222.8mmV
				CRT Type	Normal
				Deflection	90 degree
				Magnetic Field BV/BH	+0.45G / 0.18G
		Color System			NTSC
		Speaker			1Speaker
				Position	Side
				Size	3 Inch
				Impedance	8 ohm
		Sound Output		MAX	1.2 W
				10%(Typical)	0.8 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
			Erase(Full Track Erase)		Yes
		Tape Speed	Rec	PAL	-
				NTSC	SP/SLP
			Play	PAL	-
				NTSC	SP/LP/SLP
		Fast Forward / Rewind Time (Approx.)			FF:4'50"/REW:2'30"
				Cassette	at T-120
		Forward/Reverse Picture Search		NTSC or PAL-M	SP/LP/SLP=3x,5x/7x,9x/9x,15x
		Frame Advance		Slow	-
		Slow Speed		Variable Slow	-
G-3	Tuning System	Broadcasting System			US Sysytem M
		Tuner and Receive CH		System	1Tuner
				Destination	USA/CANADA+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
G-4	Signal	Video Signal		Input Level	1 V p-p/75 ohm
				Output Level	1 V p-p/75 ohm
				S/N Ratio (Weighted)	50 dB
				Horizontal Resolution at SP Mode	230Lines
		Audio Signal		Input Level	RCA-8dB/50Kohm
				Output Level	RCA-8dB/ 1Kohm
				S/N Ratio at SP	38dB
				Harmonic Distortion (1KHz)	0.015
				Frequency Response at SP	100Hz ~10kHz
				at LP	-
				at SLP	100Hz ~4kHz
		Hi-Fi Audio Signal		Dynamic Range : More than	-
				Wow And Flutter : Less than	-
				Channel Separation : More than	-
				Harmonic Distortion : Less than	-
G-5	Power	Power Source		AC	120V 60Hz
				DC	12V
		Power Consumption			at AC 48 W at 120V 60Hz
					at DC 48 W at 12 V
				Stand by (at AC)	3 W at 120V 60 Hz
				Per Year	-
		Protector		Power Fuse	Yes
				Dew Sensor	Yes
G-6	Regulation			Safety	UL
				Radiation	FCC
				X-Radiation	DHHS
G-7	Temperature			Operation	+5ºC ~ +40ºC
				Storage	-20ºC ~ +60ºC
G-8	Operating Humidity				Less then 80% RH
G-9	On Screen Display	Menu			Yes
			Menu	Type	Character

GENERAL SPECIFICATIONS

			Timer Rec Set	Yes	
			Channel Setup	Yes	
			TV/CATV	Yes	
			Auto ch Memory	Yes	
			Add/Delete	Yes	
			Guide ch Set	No	
			TV Setup	Yes	
			V-chip Set	Yes	
			On/Off Timer Set	Yes	
			Picture	Yes	
			Audio	No	
			Sap On/Off	No	
			Auto Repeat On/Off	Yes	
			On/Off Timer Set	No	
			System Setup	Yes	
			Clock Set	Yes	
			Language	Yes	
			Auto Clock On/Off	Yes	
			Standard Time	Yes	
			Daylight Saving Time	Yes	
			Commercial Advance	No	
			Marking On/Off	No	
			Blueback On/Off	No	
			Playback Auto/Manual	No	
			Unmarked Tape	No	
			Movie Advance	No	
			Go To Movie	No	
			Go To Preview	No	
		G-CODE(or SHOWVIEW or PLUSCODE)No. Entry		No	
		Clock		Yes	
		CH/AV		Yes	
		Tape Counter(Linear Counter)		Yes	
		Tape Speed		Yes	
		Sleep Time		Yes	
		Stereo/Audio Output		No	
			Bilingal	No	
			SAP	No	
		Control Level	Volume	Yes	
			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		No	
		Muting		Yes	
		Hi-Fi		No	
		Repeat		Yes	
		Zero Return		No	
		DEW		Yes	
G-10	**OSD Language**			English French Spanish	
			OSD Language Setting	English	
G-11	**Clock,Timer and Timer Back-up**	Calendar		1990/1/1 ~ 2081/12/31	
		Timer Events		8 prog/ 1 month	
		One Touch Recording Max Time		5 Hours	
		OTPB Valid Time		No	
		Sleep Timer	Max Time	120	min.
			Step	10	min.
		On/Off Timer	Program(On Tim / Off Tim)	1	prog.
		Auto Shut Off	No Signal	15	min.
			No Operation	-	
		Timer Back-up (at Power Off Mode)		30	sec.
G-12	**Remote Control**	Unit		RC-CG	
		Glow in Dark Remocon		Yes	
		Power Source	Voltage(D.C)	3V	
			UM size x pcs	UM-4 x 2 pcs	
		Total Keys		41 Keys	
		Keys	Power	Yes	
			1	Yes	
			2	Yes	
			3	Yes	
			4	Yes	
			5	Yes	
			6	Yes	
			7	Yes	
			8	Yes	

GENERAL SPECIFICATIONS

			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
			Rec/OTR	Yes
			Eject	Yes
			Counter Reset	Yes
			Speed	Yes
			Timer Rec	Yes
			TV Monitor	Yes
			Quick View	Yes
			Program	Yes
			Slow	No
			Auto Tracking	Yes
			Set/Tracking+	Yes
			Set/ Tracking -	Yes
			Menu	Yes
			Enter	Yes
			Cancel	Yes
			Call	Yes
			TV/Caption/Text	Yes
			Sleep Timer	Yes
			Muting	Yes
			Zero Return	Yes
			CM Skip	Yes
			Audio Select	No
G-13	**Features**	Auto Head Cleaning		Yes
		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		No
		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
G-14	**Accessories**	Owner's Manual	Language	English/Spanish
			w/Guarantee Card	No
		Remote Control Unit		Yes
		Rod Antenna		Yes
			Poles	2pole
			Terminal	F type
			w/300 ohm to 75 ohm Antenna Adapter	Yes
		Loop Antenna		No
			Terminal	-
		U/V Mixer		No
		DC Car Cord (Center+)		Yes
		Guarantee Card		Yes
		Warning Sheet		No
		Circuit Diagram		No
		Antenna Change Plug		No
		Service Facility List		No
		Columbia Offer Sheet		No

GENERAL SPECIFICATIONS

		Tent Card			No
		Important Safeguard			No
		Dew/AHC Caution Sheet			No
		AC Plug Adapter			No
		Quick Set-up Sheet			No
		Battery			No
			UM size x pcs	UM4 x 2 pcs	
		AC Cord			No
		AV Cord (2Pin-1Pin)			No
		Registration Card			No
		ESP Card			No
		300 ohm to 75 ohm Antenna Adapter			No
G-15	Interface	Switch	Power	Yes	
			Play	Yes	
			Pause/Still		No
			System Select		No
			One Touch Playback		No
			Channel Up	Yes	
			Channel Down	Yes	
			F.FWD/Cue	Yes	
			Eject/Stop	Yes	
			Main Power SW		No
			Volume Up	Yes	
			Volume Down	Yes	
			Rew/Rev	Yes	
			Rec/OTR	Yes	
			Input Select		No
		Indicator	Power	Red	
			Rec/OTR	Red	
			T-Rec	Red	
			On Timer		No
			CS		No
		Key Light up	Rec/OTR		No
			One Touch Playback		No
			Play		No
		Terminals	Front	Video Input	RCAx1
				Audio Input	RCAx1
				Other Terminal	Head Phone(Stereo & Mono, 3.5mm) x 2
			Rear	Video Input	RCAx1
				Audio Input	RCAx1
				Video Output	RCAx1
				Audio Output	RCAx1
				Euro Scart	No
				Diversity	No
				Ext Speaker	No
				DC Jack 12V(Center +)	Yes
				VHF/UHF Antenna Input	F Type
				AC Inlet	No
G-16	Set Size			Approx. W x D x H (mm)	278 x 312.5 x 311.5
G-17	Weight			Net (Approx.)	8.8 kg (19.4 lbs)
				Gross (Approx.)	10.5 kg (23.1 lbs)
G-18	Carton	Master Carton			No
				Content	-
				Material	-
				Dimensions W x D x H(mm)	-
				Description of Origin	-
			Gift Box		Yes
				Material	Double/Brown CORRUGATED
				Dimensions W x D x H(mm)	338 x 381 x 386
				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)			1260 Sets
G-19	Cabinet Material			Cabinet Front	PS 94V0 DECABROM
				Cabinet Rear	PS 94V0 DECABROM
				Jack Panel	PS 94V0 DECABROM

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

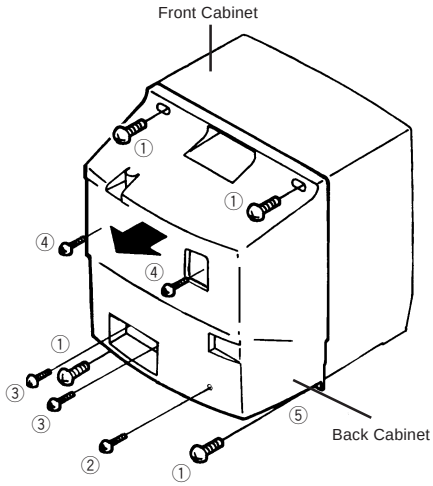


Fig. 1-1

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 CP850).
3. Remove the CRT PCB in the direction of arrow.

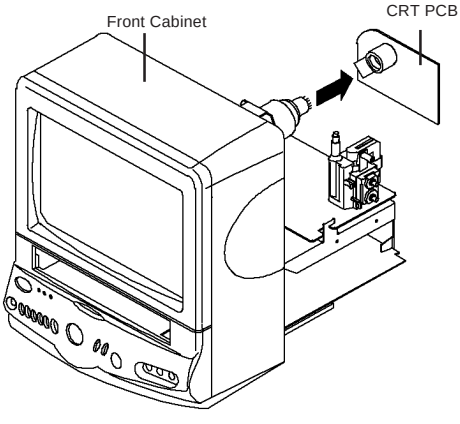


Fig. 1-2

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

1. Remove the 2 screws ①.
2. Disconnect the following connectors:
   (CP353, CP401 and CP403).
3. Unlock the support ②.
4. Remove the TV/VCR Block in the direction of arrow.

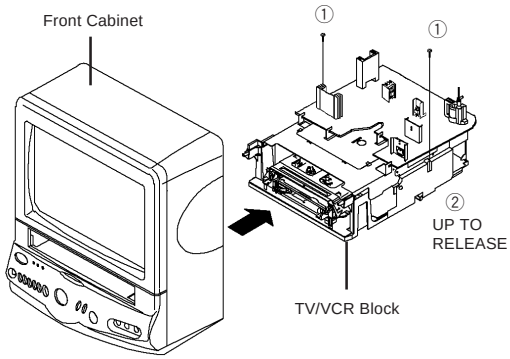


Fig. 1-3

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

1. Remove the screw ①.
2. Remove the Main PCB Holder.
3. Remove the 2 screws ②.
4. Remove the screw ③.
5. Remove the 2 screws ④.
6. Disconnect the following connectors:
   (CP502 and CP820).
7. Remove the Main PCB in the direction of arrow.

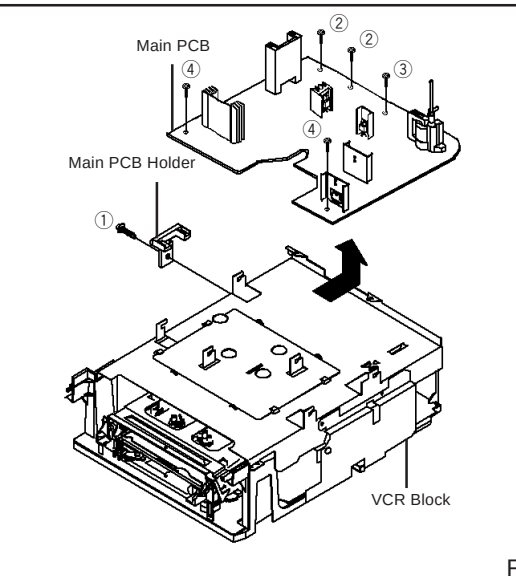


Fig. 1-4

DISASSEMBLY INSTRUCTIONS

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

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

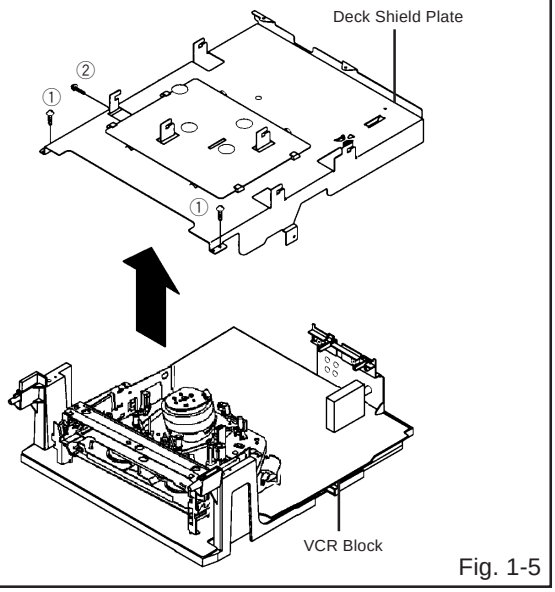


Fig. 1-5

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

1. Remove the 3 screws ①.
2. Disconnect the following connectors:
   (CP1001, CP1002, CP4001, CP4002 and CP4003).
3. Remove the Deck Chassis and Shield Cover Deck in the direction of arrow.

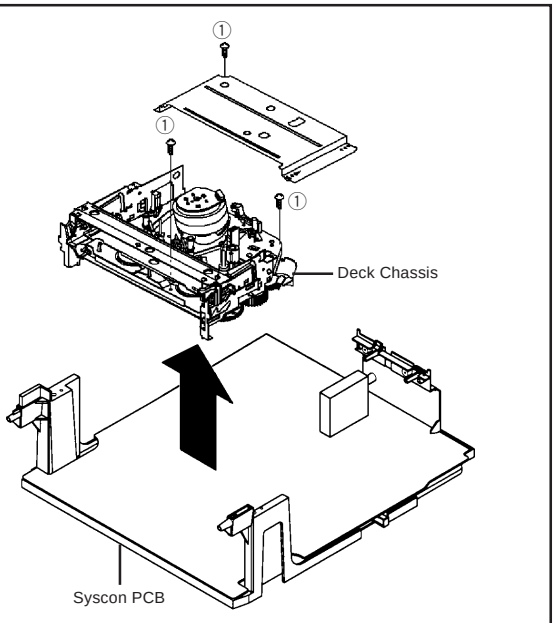


Fig. 1-6

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

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

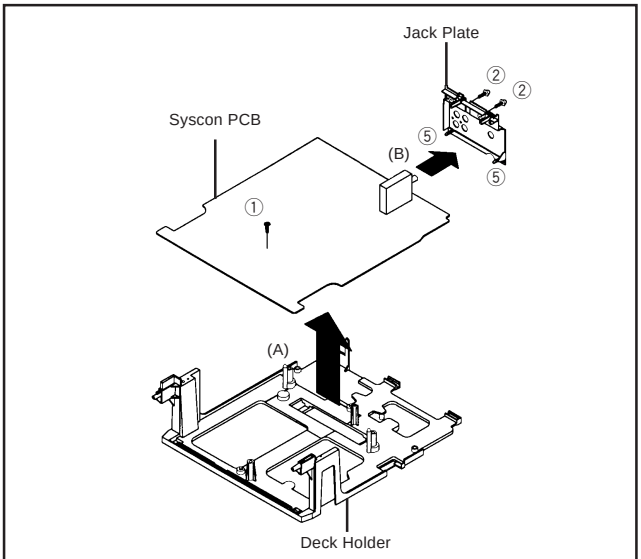


Fig. 1-7

DISASSEMBLY INSTRUCTIONS

2. REMOVAL OF DECK PARTS

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

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

NOTE

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

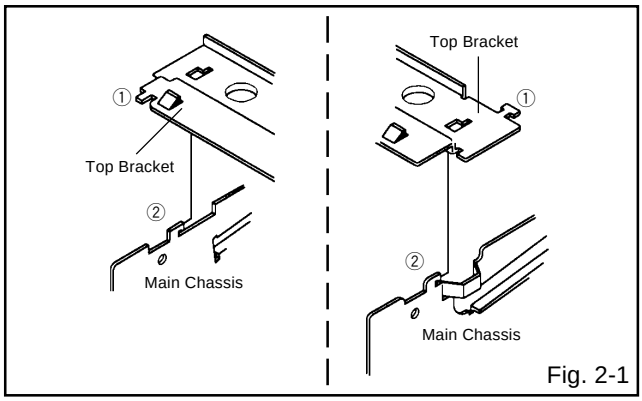


Fig. 2-1

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.

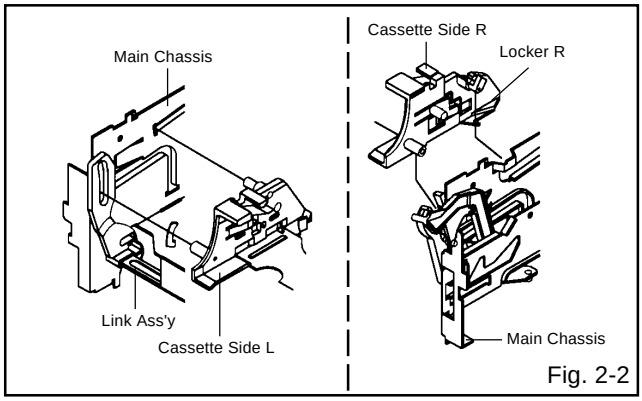


Fig. 2-2

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.

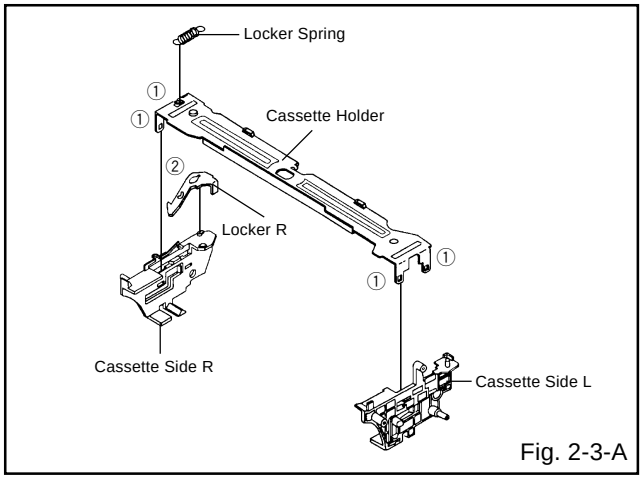


Fig. 2-3-A

NOTE

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

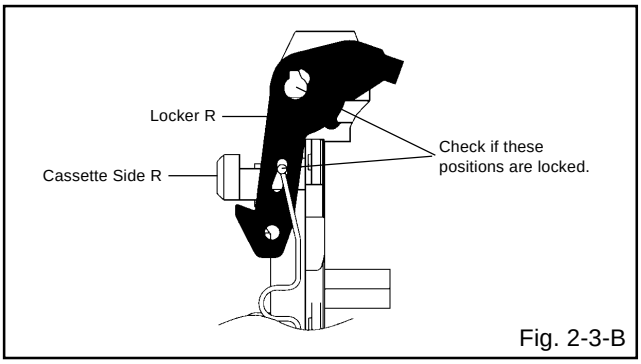


Fig. 2-3-B

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.

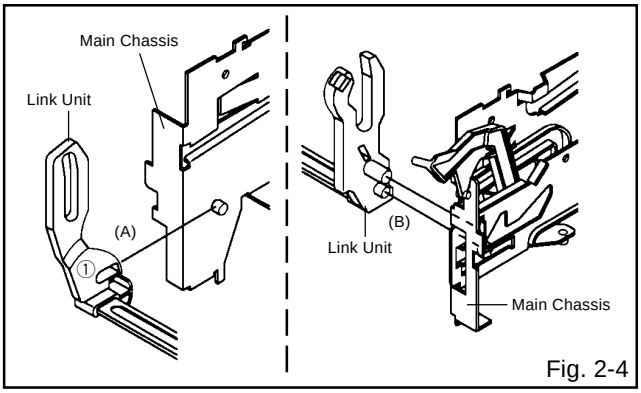


Fig. 2-4

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

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

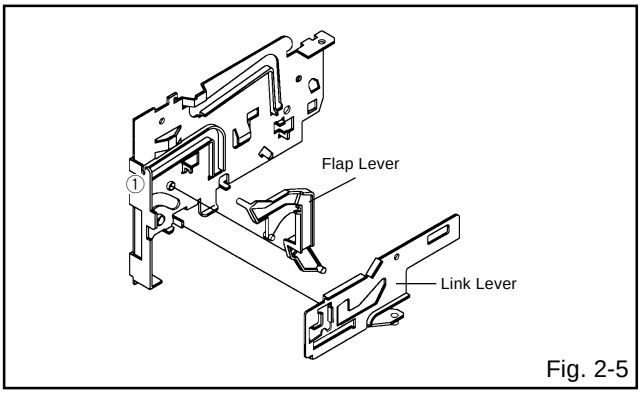


Fig. 2-5

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.

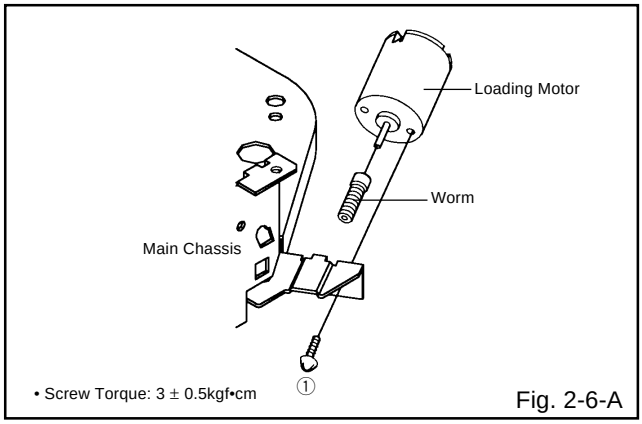


Fig. 2-6-A

NOTE

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

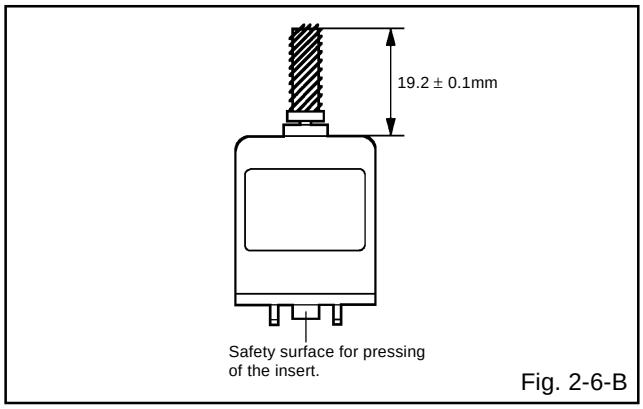


Fig. 2-6-B

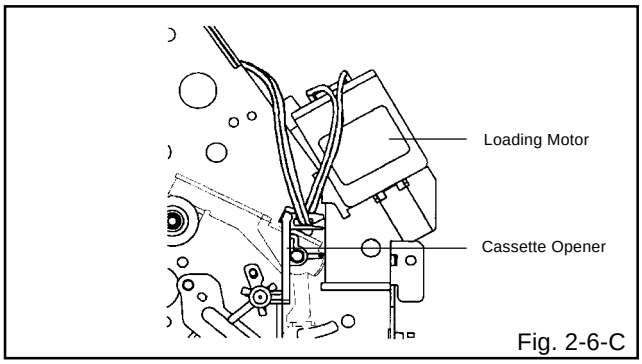


Fig. 2-6-C

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

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

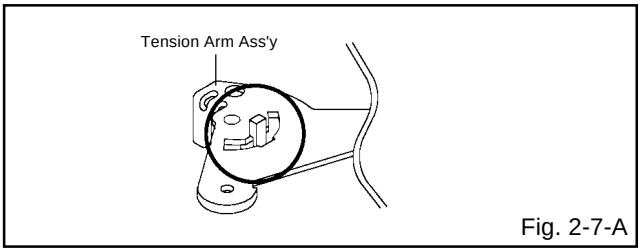


Fig. 2-7-A

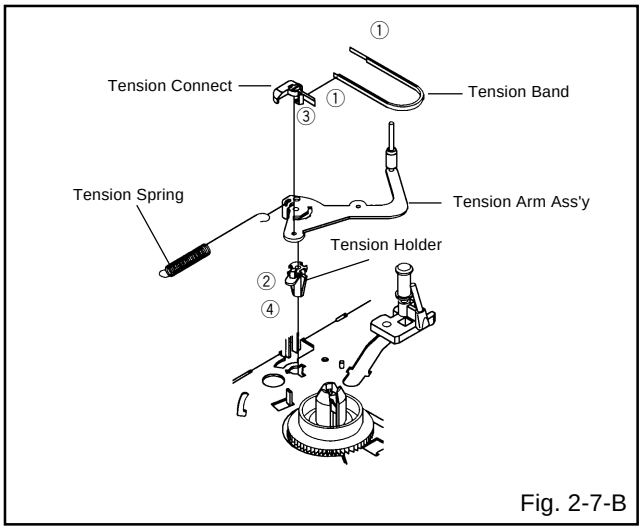


Fig. 2-7-B

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.

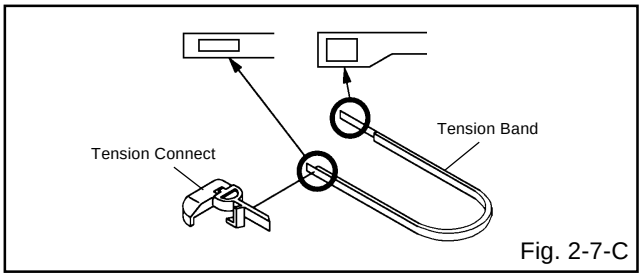


Fig. 2-7-C

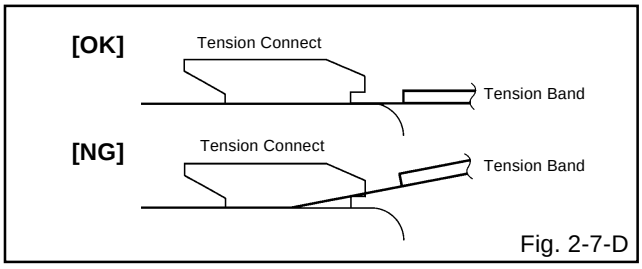


Fig. 2-7-D

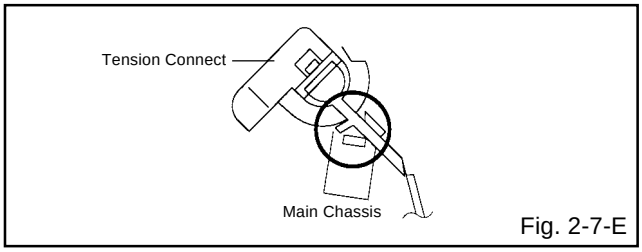


Fig. 2-7-E

DISASSEMBLY INSTRUCTIONS

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

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

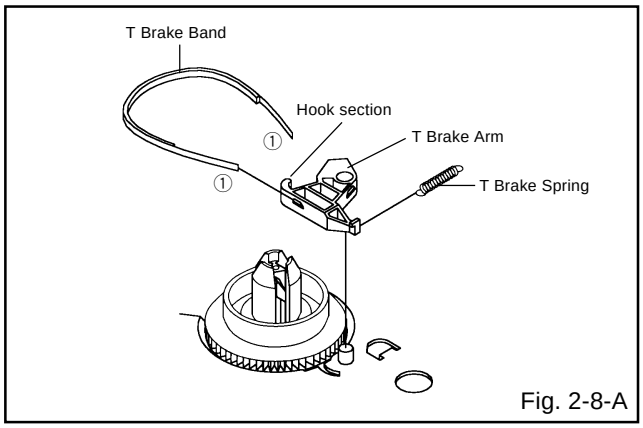


Fig. 2-8-A

NOTE

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

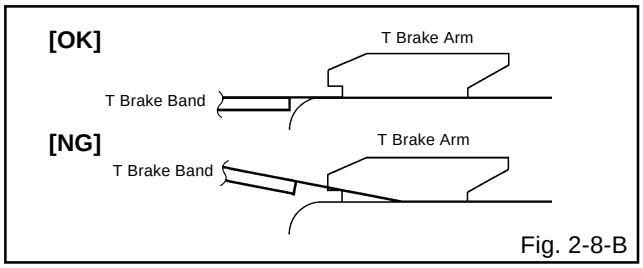


Fig. 2-8-B

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 (FG-84M). (If you do not grease, noise may be heard in FF/REW mode.)
6. After installing the reel, adjust the height of the reel. **(Refer to MECHANICAL ADJUSTMENT)**

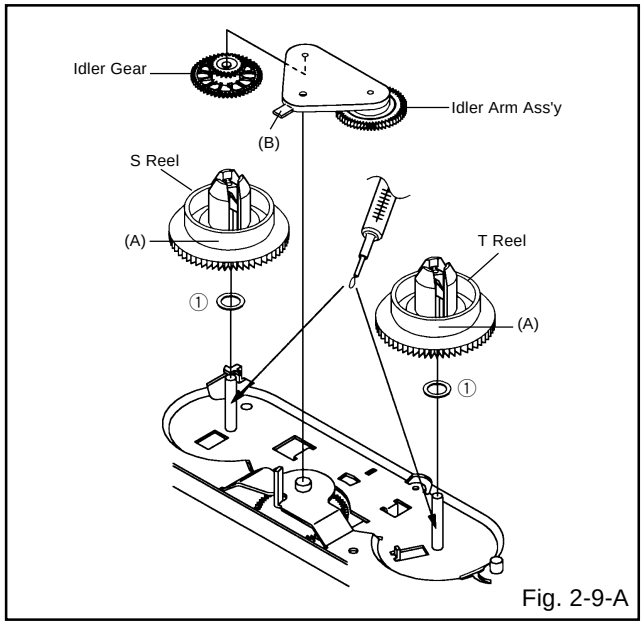


Fig. 2-9-A

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.

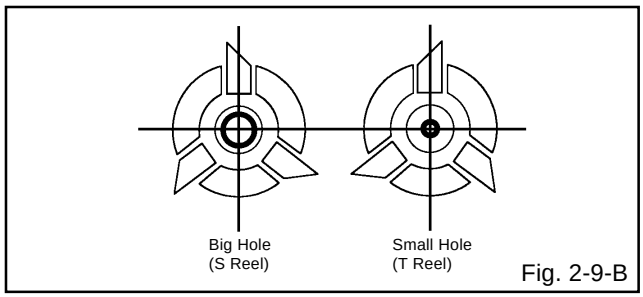


Fig. 2-9-B

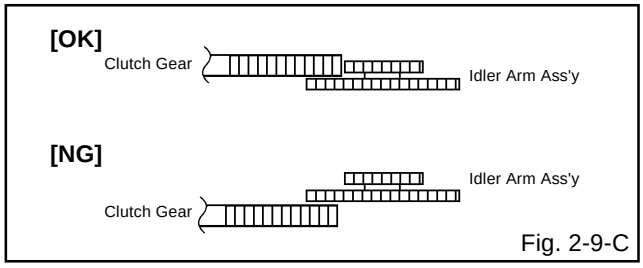


Fig. 2-9-C

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.

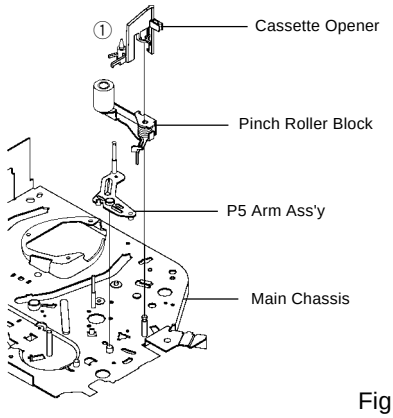


Fig. 2-10-A

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.

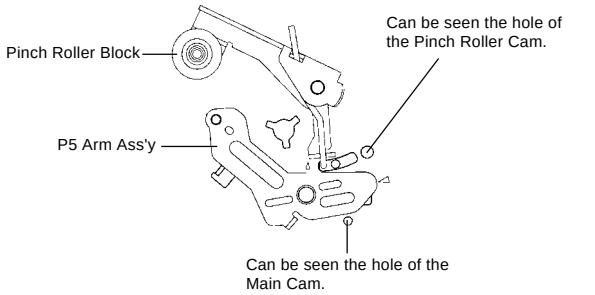


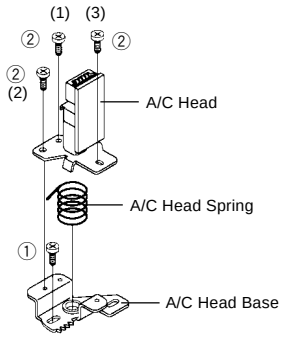
Fig. 2-10-B

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

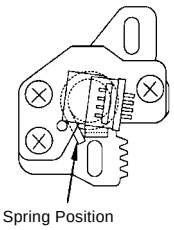
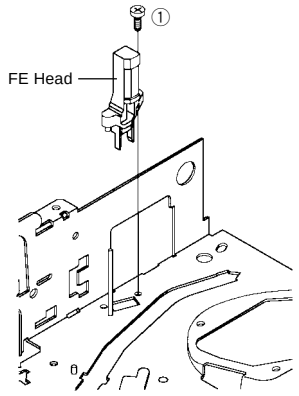


Fig. 2-11-B

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.

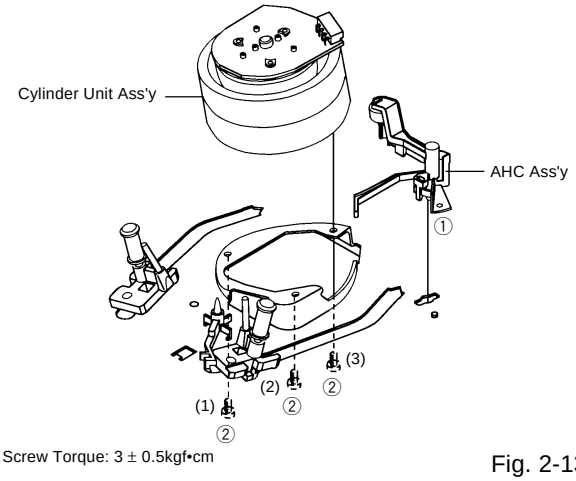
Fig. 2-12

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

1. Unlock the support ① and remove the AHC Ass'y.
2. Disconnect the following connector: (CD2001)
3. Remove the 3 screws ②.
4. 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)

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

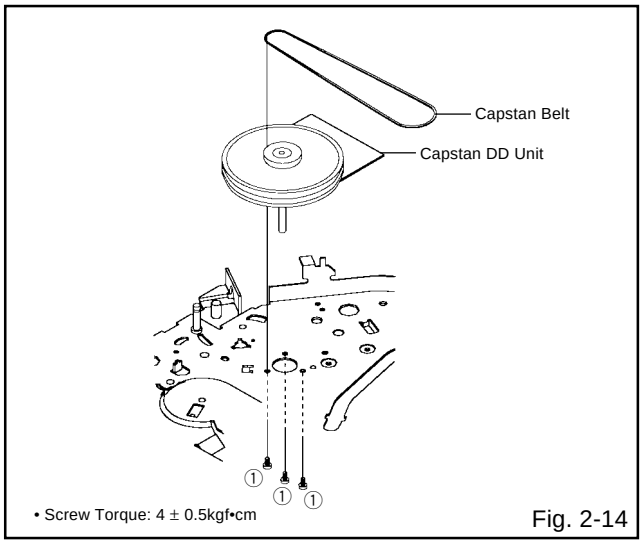


Fig. 2-14

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)**

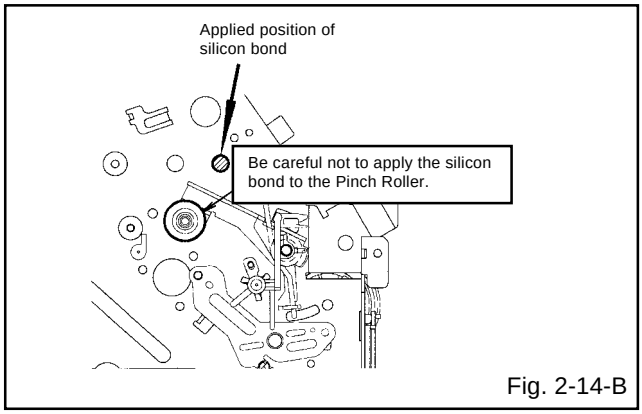


Fig. 2-14-B

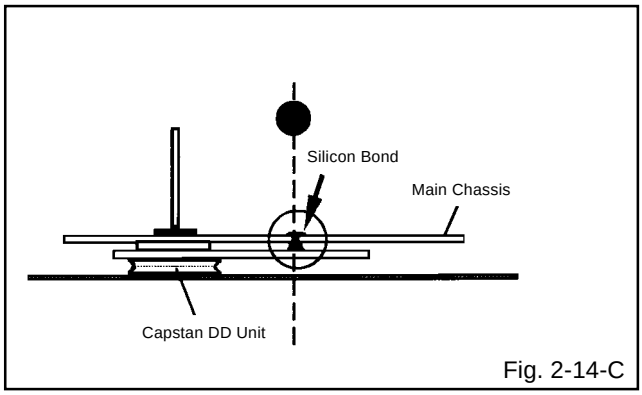


Fig. 2-14-C

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.

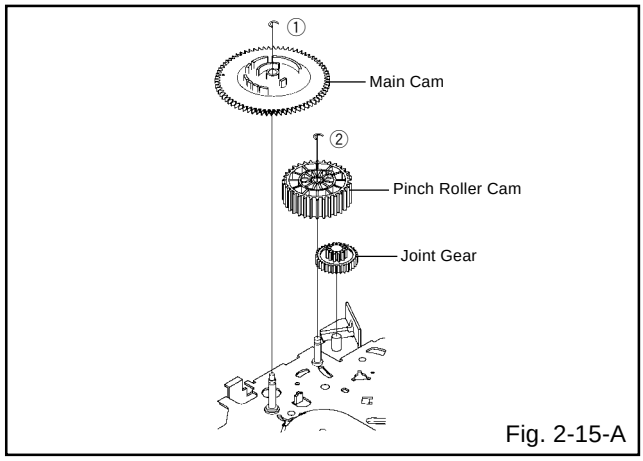


Fig. 2-15-A

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)**

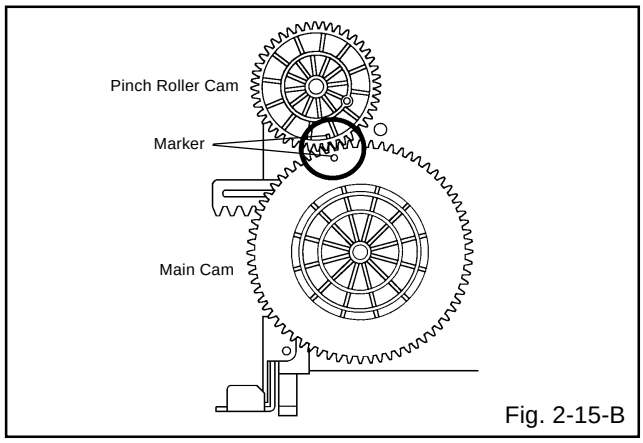


Fig. 2-15-B

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.

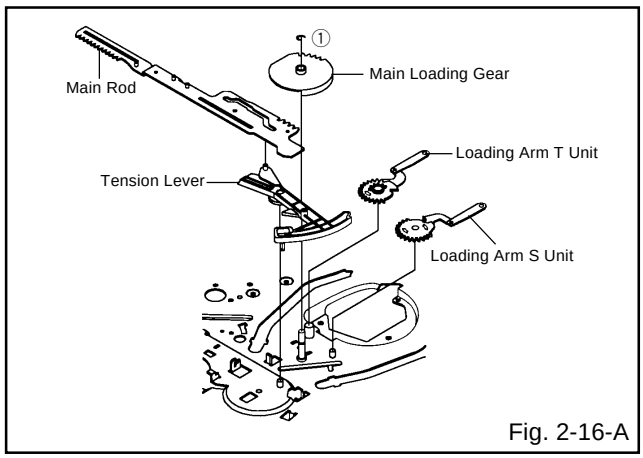


Fig. 2-16-A

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)**

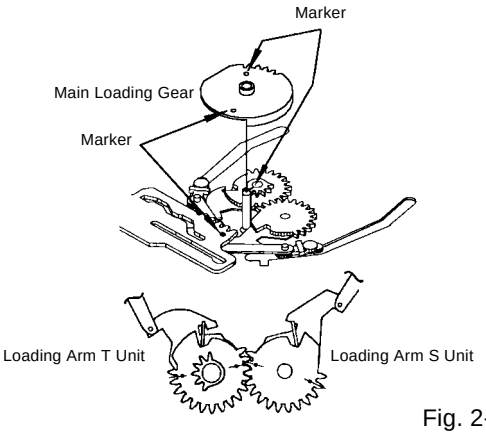


Fig. 2-16-B

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.

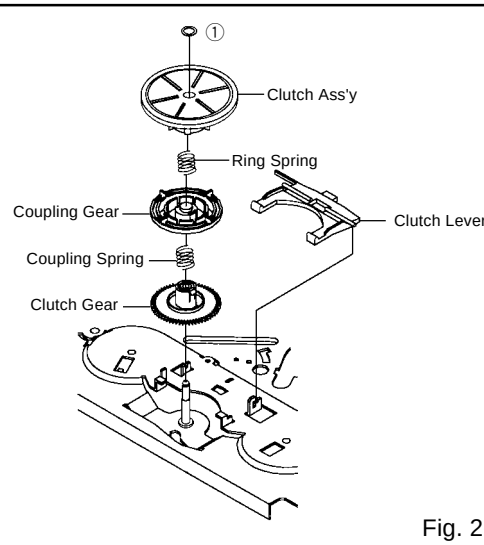


Fig. 2-17-A

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)**

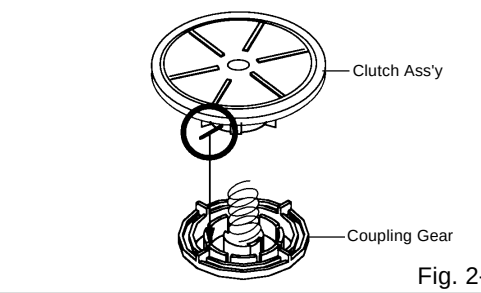


Fig. 2-17-B

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

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

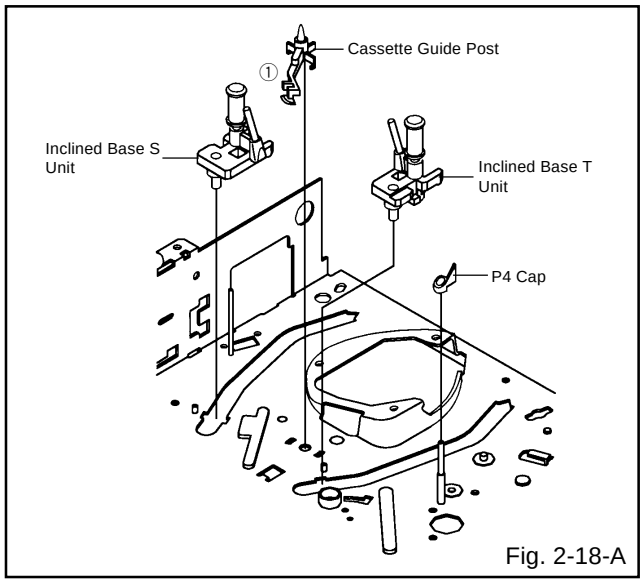


Fig. 2-18-A

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.

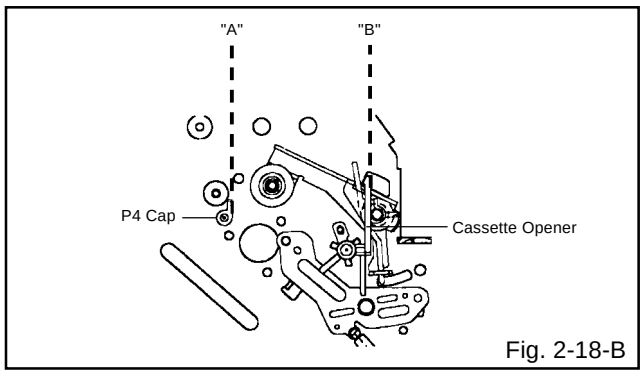


Fig. 2-18-B

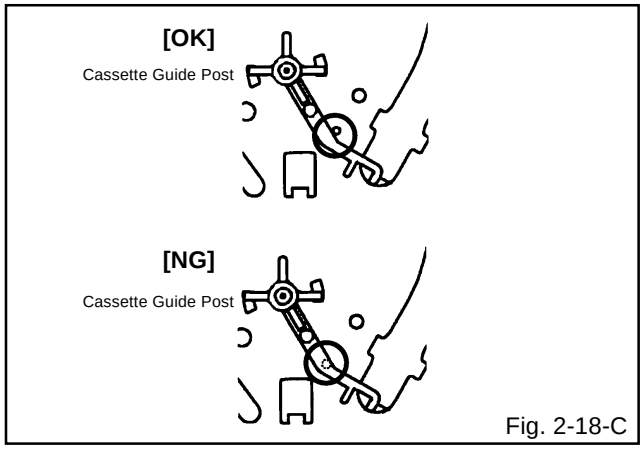


Fig. 2-18-C

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.

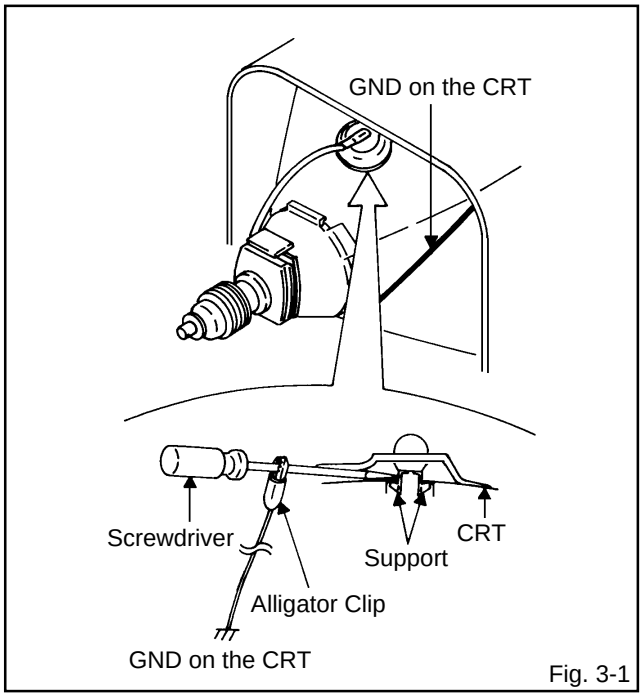


Fig. 3-1

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.)**

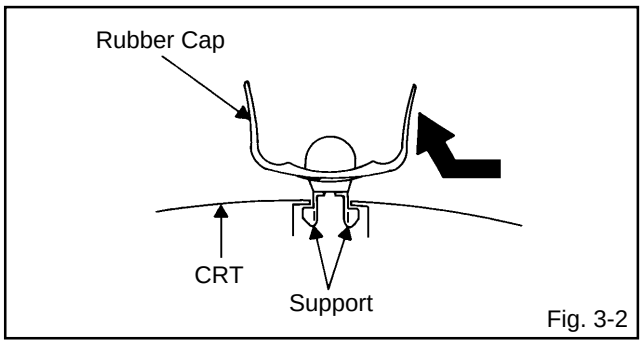


Fig. 3-2

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.)**

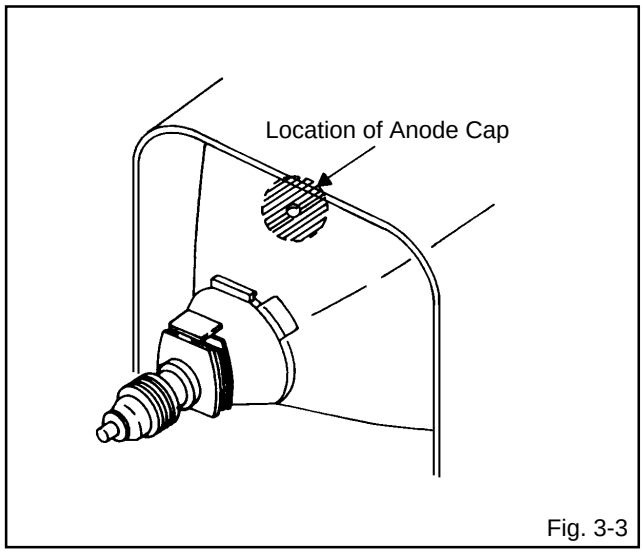


Fig. 3-3

NOTE

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

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

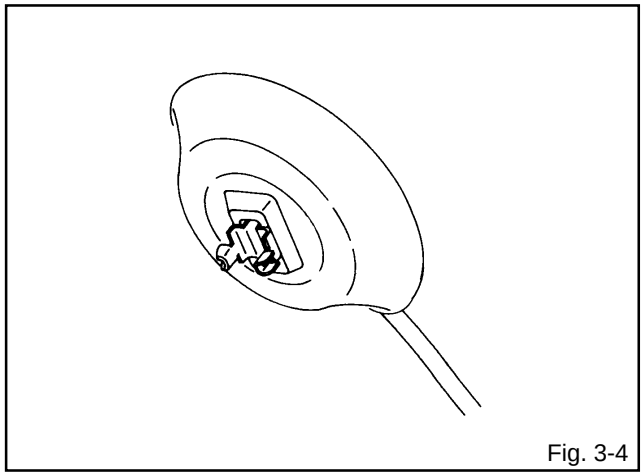


Fig. 3-4

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

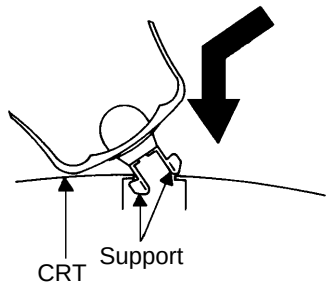


Fig. 3-5

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

4. REMOVAL OF DEFLECTION YOKE

(Refer to Fig. 4-1)

1. Loosen the screw ①.
2. Remove the Convergence • Purity Magnet in the direction of arrow (A).
3. Remove the 3 Wedges.
4. Remove the Deflection Yoke in the direction of arrow.

INSTALLATION

Install new Deflection Yoke in reverse steps of REMOVAL.

NOTE

After adjusting the purity and the convergence, fix the screw ② and lock the wedges.

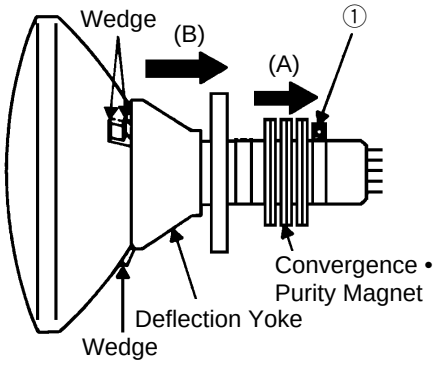


Fig. 4-1

DISASSEMBLY INSTRUCTIONS

5. 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. 5-1.)**

   NOTE

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

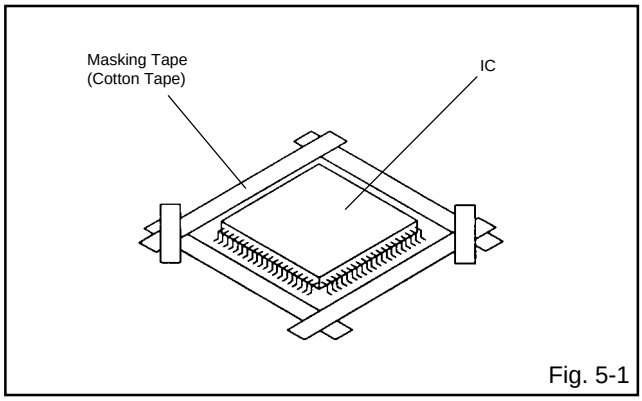


Fig. 5-1

2. Heat the IC leads using a blower type IC desoldering machine. **(Refer to Fig. 5-2.)**

   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.

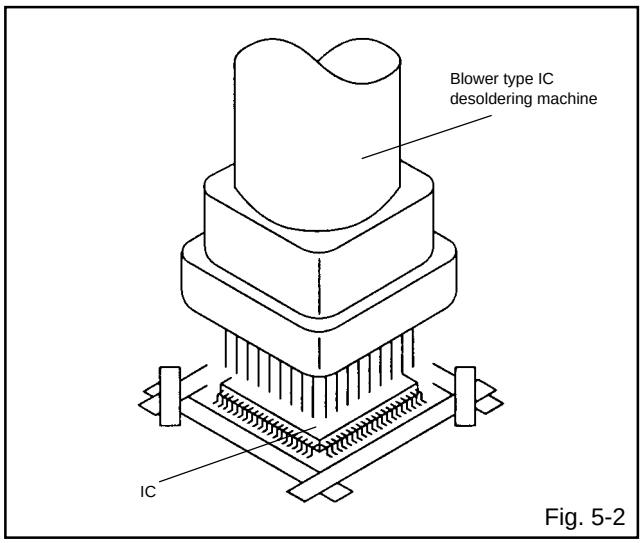


Fig. 5-2

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. 5-3.)**

   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.

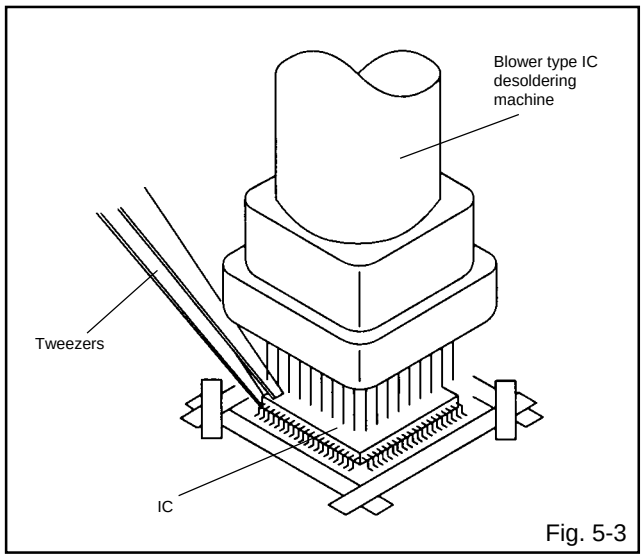


Fig. 5-3

4. Peel off the Masking Tape.

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

   NOTE

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

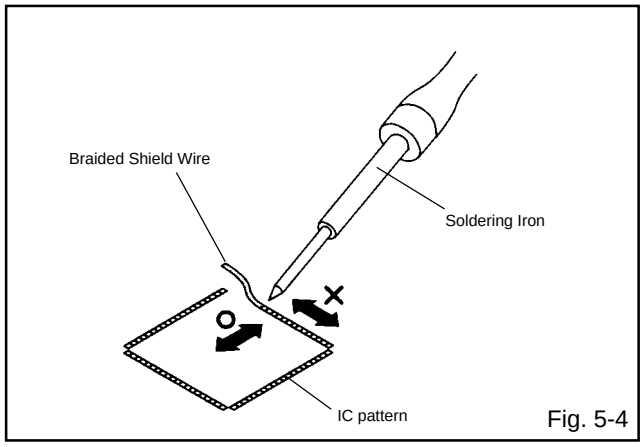


Fig. 5-4

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. 5-5.)**

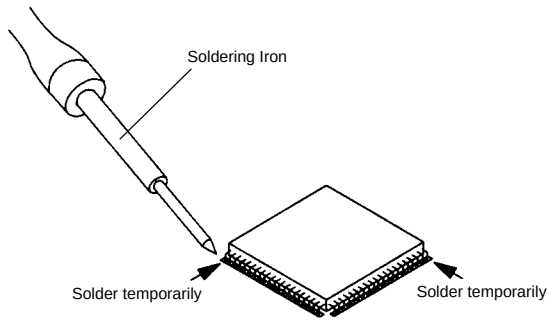


Fig. 5-5

2. Supply the solder from the upper position of IC leads sliding to the lower position of the IC leads. **(Refer to Fig. 5-6.)**

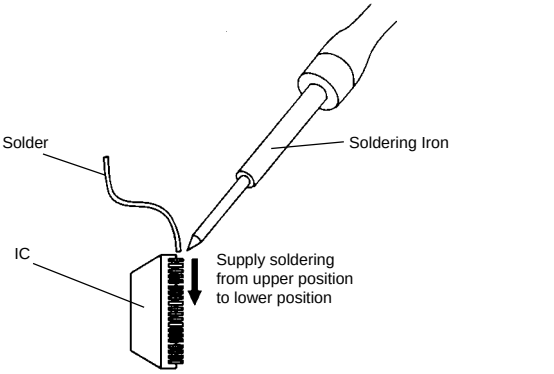


Fig. 5-6

3. Absorb the solder left on the lead using the Braided Shield Wire. **(Refer to Fig. 5-7.)**

   NOTE

   Do not absorb the solder to excess.

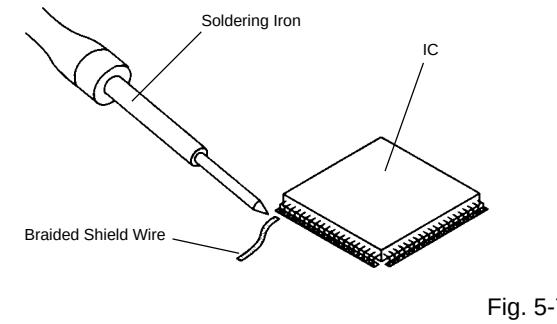


Fig. 5-7

4. When bridge-soldering between terminals and/or the soldering amount are not enough, resolder using a Thin-tip Soldering Iron. **(Refer to Fig. 5-8.)**

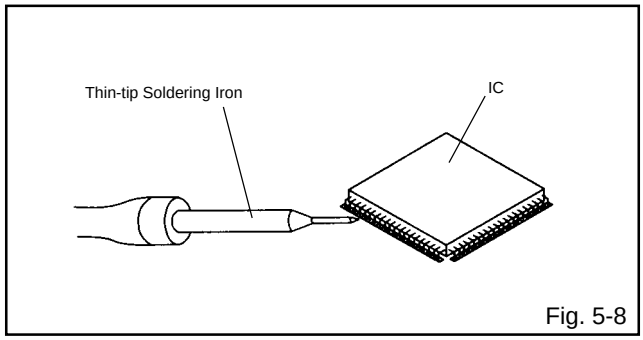


Fig. 5-8

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, Flipflop
	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
	STB	:	Serial Strobe
	SW	:	Switch

KEY TO ABBREVIATIONS

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

SERVICE MODE LIST

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

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

The both pressing of set key and remote control key will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 30 minutes 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. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
VOL. (-) MIN	5	Adjusting of the Tracking to the center position. NOTE: Also can be adjusted by pressing the ATR button for more than 2 seconds during PLAY.
VOL. (-) MIN	6	POWER ON total hours and PLAY/REC total hours are displayed on the screen. Refer to the "PREVENTIVE CHECKS AND SERVICE INTERVALS" (CONFIRMATION OF HOURS USED). Can be checked of the INITIAL DATA of MEMORY IC. Refer to the "WHEN REPLACING EEPROM (MEMORY) IC".
VOL. (-) MIN	8	Writing of EEPROM initial data. NOTE: Do not use this for the normal servicing.
VOL. (-) MIN	9	Display of the Adjustment MENU on the screen. Refer to the "ELECTRICAL ADJUSTMENT" (On-Screen Display Adjustment).

Method	Operations
Press the ATR button on the remote control for more than 2 seconds during PLAY.	Adjusting of the Tracking to the center position. Refer to the "MECHANICAL ADJUSTMENT" (GUIDE ROLLER) and "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
Make the short circuit between the test point of SERVICE and the GND.	The 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

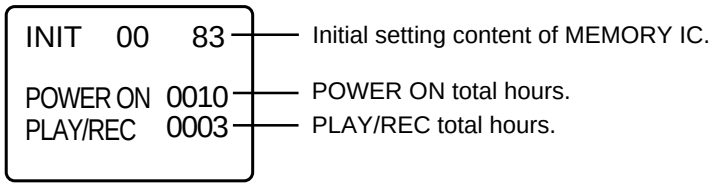
■ : Clean
● : Check it and if necessary, replace it.

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 30 minutes before Power On.

1. Set the VOLUME to minimum.
2. Press both VOL. DOWN button on the set and the Channel button **(6)** on the remote control simultaneously.
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

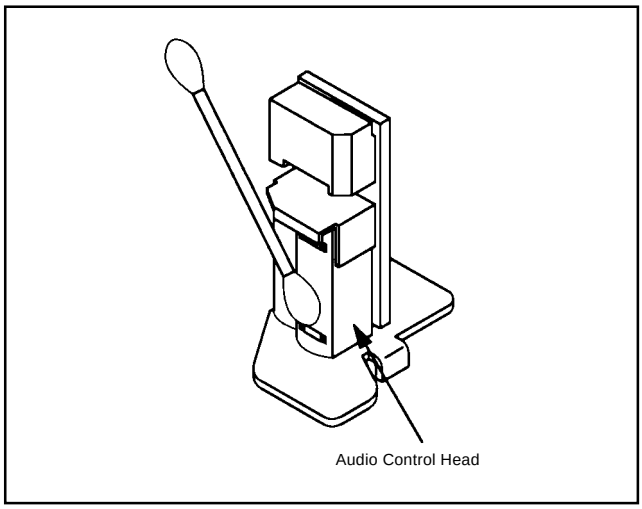
CLEANING

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

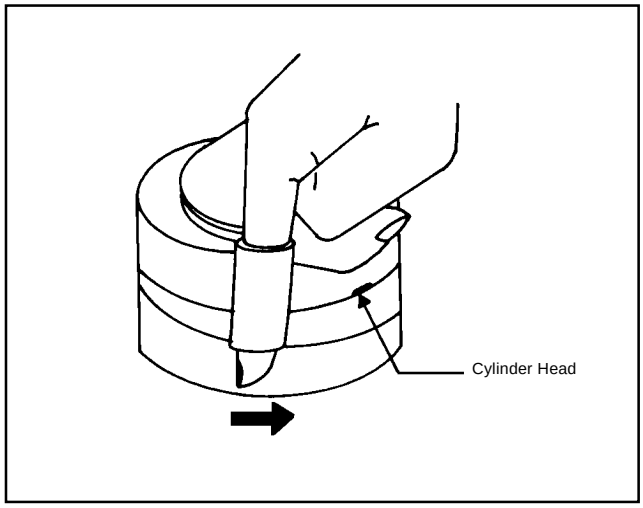
When cleaning the tape transport system, use the gauze moistened with isopropyl alcohol.

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: Initial Data setting will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 30 minutes before Power On or alternatively, discharge backup capacitor.

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
00	88	0A	E2	63	43	14	34	0B	51	3A	10	66	00	40	00	29
10	AB	94	91	86	00	00	00	05	08	00	AC	0F	A5	3E	0A	0C
20	06	2A	01	17	10	60	32	3A	BA	D7	18	1D	28	2D	2E	2F
30	30	31	33	35	37	39	3B	3D	3F	40	41	42	43	44	45	46
40	47	48	49	4A	4B	4C	4D	4E	4F	50	51	52	53	54	55	56
50	57	58	59	5A	5B	5C	5D	5E	5F	60	61	62	63	64	65	66
60	67	67	68	68	69	69	6A	6A	6B	6B						

Table 1

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

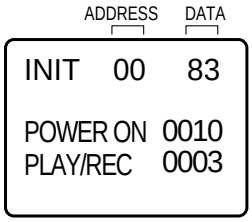
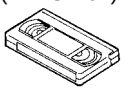
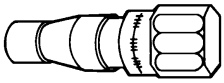
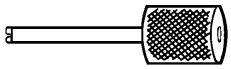
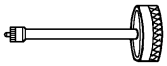
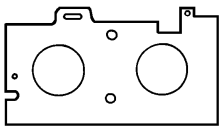
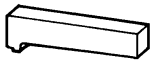
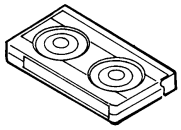
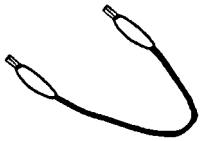
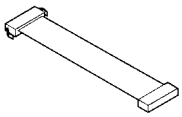
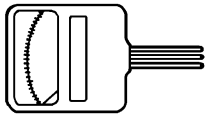


Fig. 1

3. ADDRESS is now selected and should "blink". Using the PLAY or STOP 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 PLAY or STOP 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.

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

SERVICING FIXTURES AND TOOLS

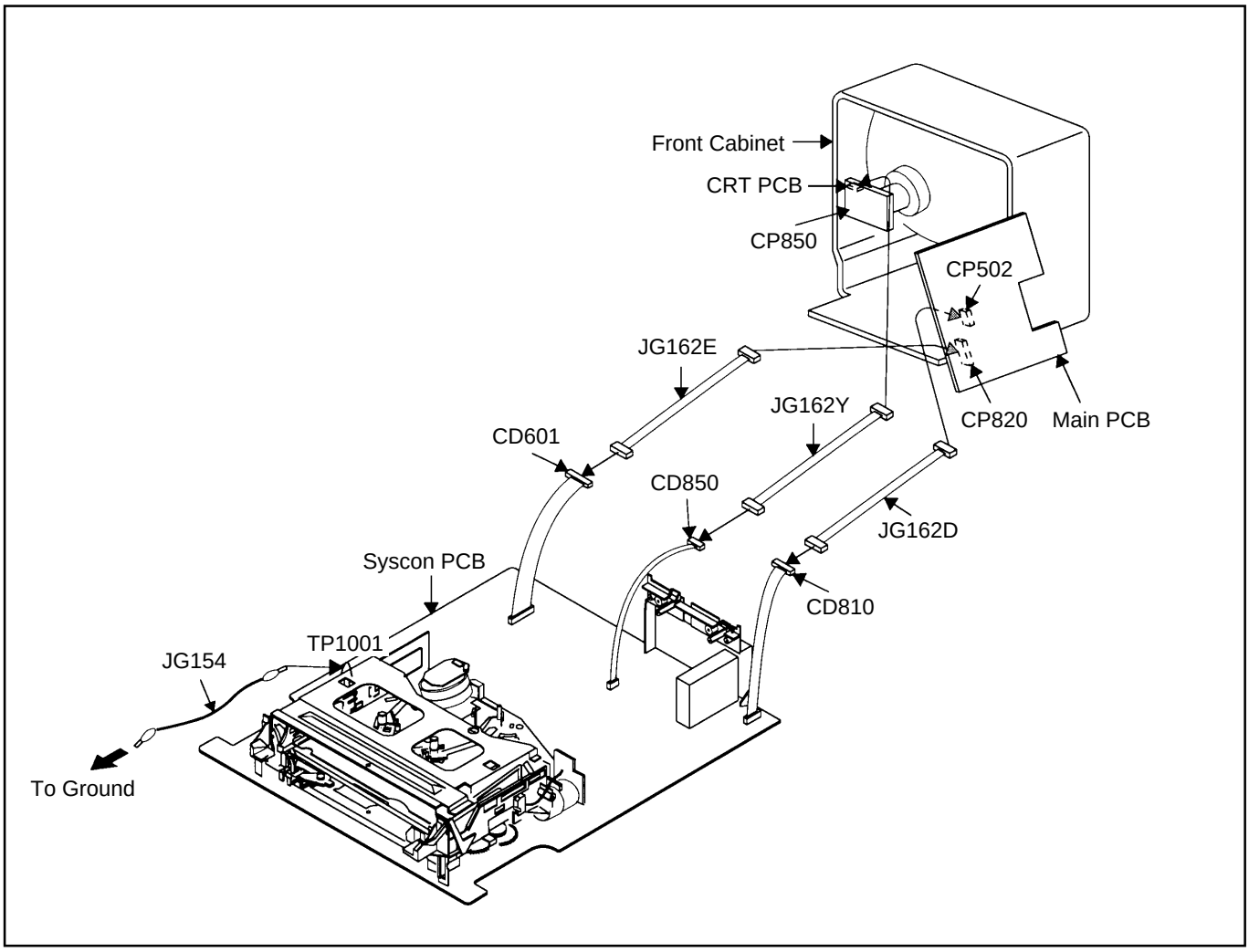
(For 2 heads model) VHS Alignment Tape JG001 (VN_2S-$LI6^3$) JG001A (VN_2S-$CO1^3$) JG001Q (VN_2S-$LI6^3H$) JG001T (VN_2S-$X6^3$) 	**(For 4 heads model)** VHS Alignment Tape JG001B (VN_1S-$LI6^3$) JG001I (VN_1S-$CO1^3$) JG001P (VN_1S-$LI6^3H$) JG001S (VN_1S-$X6^3$) 	JG002B Adapter JG002E Dial Torque Gauge (10~90gf•cm) JG002F (60~600gf•cm) 	JG005 Post Adjustment Screwdriver Part No. SV-TG0-030-000 (small) 
JG153 X Value Adjustment Screwdriver 	JG022 Master Plane 	JG024A Reel Disk Height Adjustment Jig 	JG100A Torque Tape (VHT-063) 
JG154 Cable 	JG162D Cable (11 Pins) JG162E Cable (12 Pins) JG162Y Cable (5 Pins) 	Tentelometer 	

Ref. No.	Part No.	Parts Name	Remarks
JG001	APJG001000	VHS Alignment Tape **(For 2 heads model)**	Monoscope, 6KHz
JG001A	APJG001A00	VHS Alignment Tape **(For 2 heads model)**	Color Bar, 1KHz
JG001Q	APJG001Q00	VHS Alignment Tape **(For 2 heads model)**	Hi-Fi Audio
JG001T	APJG001T00	VHS Alignment Tape **(For 2 heads model)**	X Value Adjustment
JG001B	APJG001B00	VHS Alignment Tape **(For 4 heads model)**	Monoscope, 6KHz
JG001I	APJG001I00	VHS Alignment Tape **(For 4 heads model)**	Color Bar, 1KHz
JG001P	APJG001P00	VHS Alignment Tape **(For 4 heads model)**	Hi-Fi Audio
JG001S	APJG001S00	VHS Alignment Tape **(For 4 heads model)**	X Value Adjustment
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)
JG005	APJG005000	Post Adjustment Screwdriver	Guide Roller Adjustment
JG153	APJG153000	X Value Adjustment Screwdriver	X Value Adjustment
JG022	APJG022000	Master Plane	Reel Disk Height Adjustment
JG024A	APJG024A00	Reel Disk Height Adjustment Jig	Reel Disk Height Adjustment
JG100A	APJG100A00	Torque Tape (VHT-063)	Playback Torque, Back Tension Torque During Playback
JG154	APJG154000	Cable	Used to connect the test point of SERVICE and GROUND
JG162D	APJG162D00	Cable (11 Pins)	Used to connect the Syscon PCB and Main PCB
JG162E	APJG162E00	Cable (12 Pins)	Used to connect the Syscon PCB and Main PCB
JG162Y	APJG162Y00	Cable (5 Pins)	Used to connect the Syscon PCB and CRT PCB

PREPARATION FOR SERVICING

How to use the Servicing Fixture

1. Unplug the connector CP353, CP502, CP820 and CP850, then remove the VCR Block from the set.
2. Connect as shown in the below figure using the Service Fixture.
   • Connect the Syscon PCB to the Main PCB with the cable JG162D and JG162E.
   • Connect the Syscon PCB to the CRT PCB with the cable JG162Y.
3. Short circuit between **TP1001** and **Ground** with the cable JG154.
   (Refer to MAJOR COMPONENTS LOCATION GUIDE)
   (The BOT, EOT, and the Reel Sensor do not work and the deck can be operated without a cassette tape.)
4. 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.

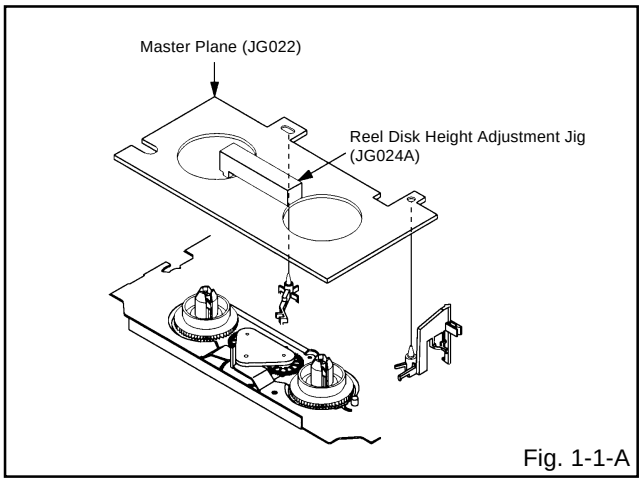


Fig. 1-1-A

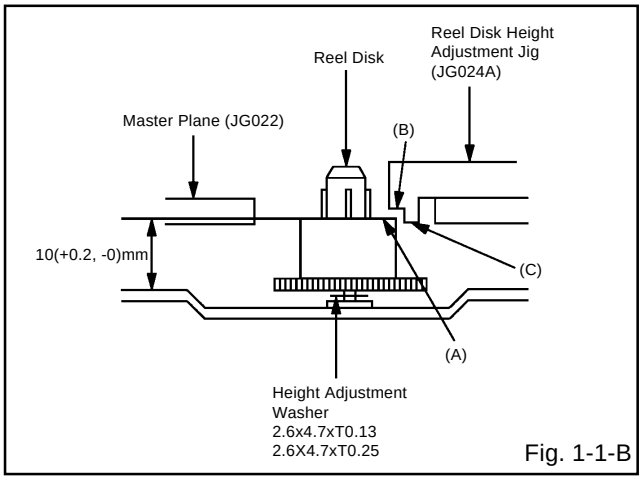


Fig. 1-1-B

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.

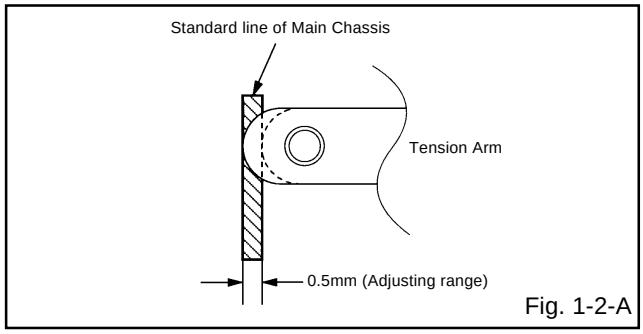


Fig. 1-2-A

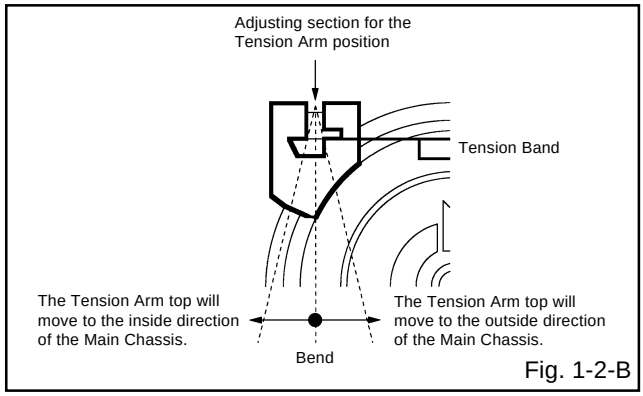


Fig. 1-2-B

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

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

1. After confirmation and adjustment of Tension Post position **(Refer to item 1-2)**, load the cassette type torque tape **(JG100A)** and set to the PLAY mode.
2. Confirm that the right meter of the torque tape indicates 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.

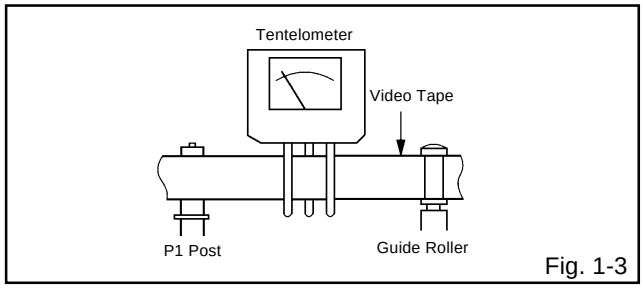


Fig. 1-3

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.

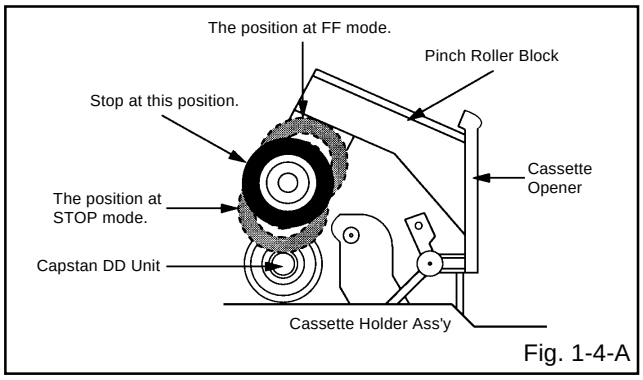


Fig. 1-4-A

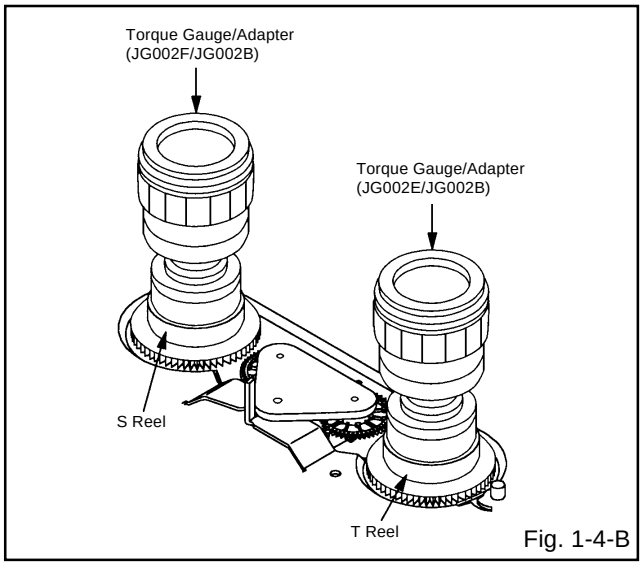


Fig. 1-4-B

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 **(JG001 or JG001B)**. **(Refer to SERVICING FIXTURE AND TOOLS)**
2. Connect CH-1 of the oscilloscope to **TP4001 (Envelope)** and CH-2 to **TP1002 (SW Pulse)**.
3. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
4. Trigger with SW Pulse and observe the envelope. **(Refer to Fig. 2-1-A)**
5. When observing the envelope, adjust the Adjusting Driver **(JG005)** slightly until the envelope will be flat. Even if you press the Tracking Button, adjust so that flatness is not moved so much.
6. Adjust so that the A : B ratio is better than 3 : 2 as shown in **Fig. 2-1-B**, even if you press the Tracking Button to move the envelope (The envelope waveform will 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)**

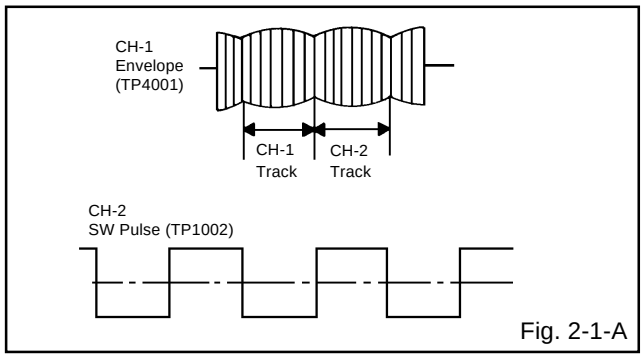


Fig. 2-1-A

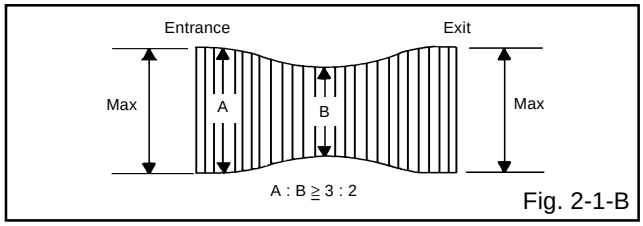


Fig. 2-1-B

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 **(JG001 or JG001B)** . **(Refer to SERVICING FIXTURE AND TOOLS)**
2. Confirm that the reflected picture of stamp mark is appeared on the tape prior to P4 Post as shown in **Fig. 2-2-A**.
   a) When the reflected picture is distorted, turn the screw ① clockwise until the distortion is disappeared.
   b) When the reflected picture is not distorted, turn the screw ① counterclockwise until little distortion is appeared, then adjust the a).
3. Turn the screw ② to set the audio level to maximum.
4. Confirm that the bottom of the Audio/ Control Head and the bottom of the tape is shown in **Fig. 2-2-C**.
   c) When the height is not correct, turn the screw ③ to adjust the height. Then, adjust the 1~3 again.

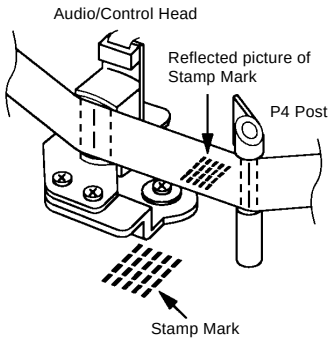


Fig. 2-2-A

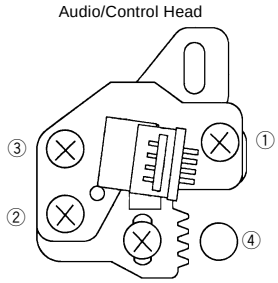


Fig. 2-2-B

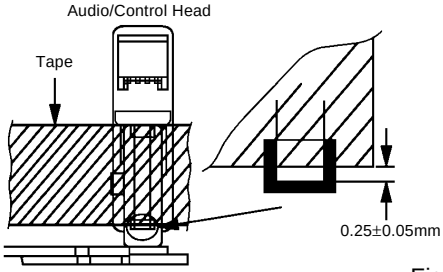


Fig. 2-2-C

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 CH-1 of the oscilloscope to **TP4001**, CH-2 to **TP1002** and CH-3 to **HOT side of Audio Out Jack**.
6. Playback the VHS Alignment Tape **(JG001S or JG001T)**. **(Refer to SERVICING FIXTURE AND TOOLS)**
7. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
8. Set the X Value adjustment driver **(JG153)** to the ④ of **Fig. 2-2-B**. Adjust X value so that the envelope waveform output becomes maximum. Check if the relation between Audio and Envelope waveform becomes (1) or (2) of **Fig. 2-3**.

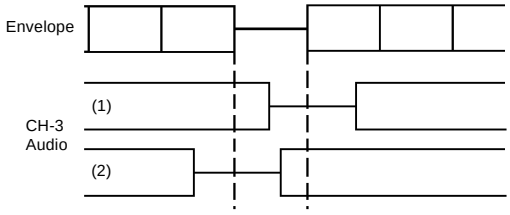


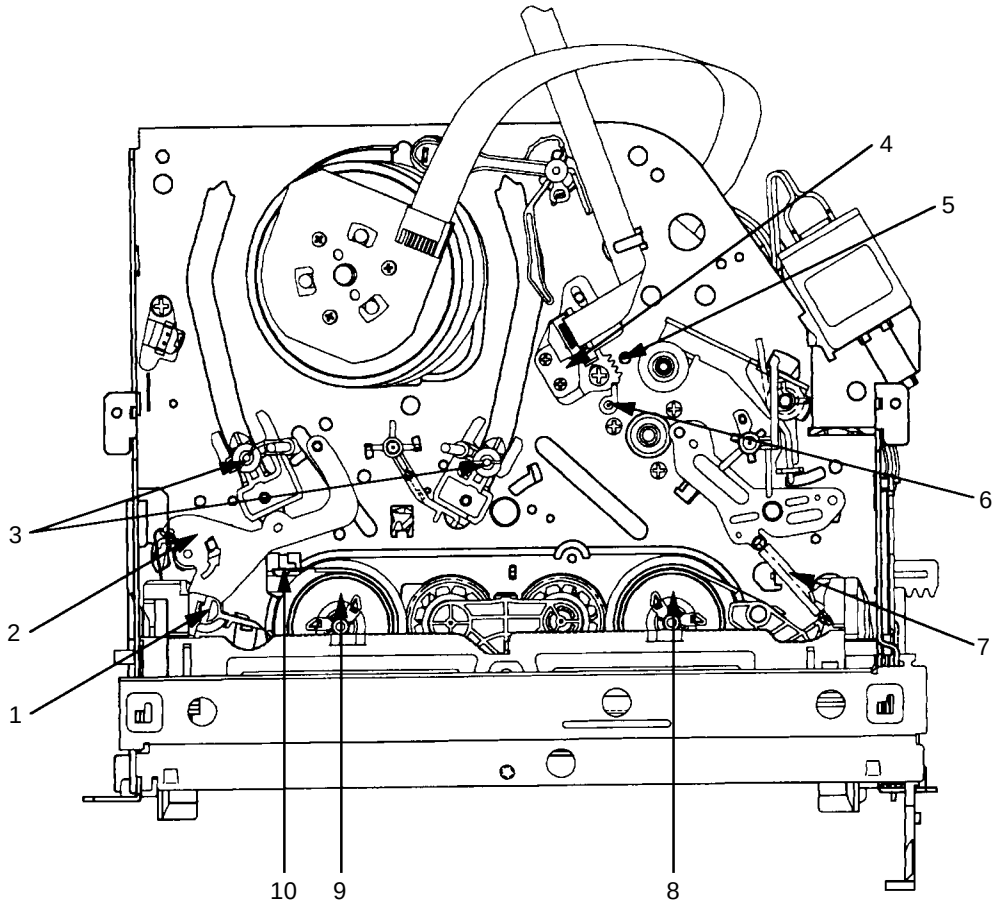
Fig. 2-3

2-4: CONFIRM HI-FI AUDIO (Hi-Fi model only)

1. Connect CH-1 of the oscilloscope to **TP1002** and CH-2 to the **Hi-Fi Audio Out Jack**.
2. Playback the VHS Alignment Tape **(JG001P or JG001Q)**. **(Refer to SERVICING FIXTURE AND TOOLS)**
3. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
4. Press the Tracking Up button and count number of steps which the audio output is changed from Hi-Fi (10KHz) to MONO (6KHz).
5. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
6. Press the Tracking Down button and count number of steps which the audio output is changed from Hi-Fi (10KHz) to MONO (6KHz).
7. If the difference are more than 3 steps, set the X Value adjustment driver **(JG153)** to ④ of **Fig. 2-2-B**. Change the X Value and adjust it so that the value becomes within 2 steps.

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 **(YG6260M)** 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.)

On-Screen Display Adjustment

1. Unplug the AC plug for more than 30 minutes to set the clock to the non-setting state.Then, set the volume level to minimum.
2. Press the VOL. DOWN button on the set and the Channel button **(9)** on the remote control for more than 2 seconds to display adjustment mode on the screen as shown in **Fig. 1-1.**

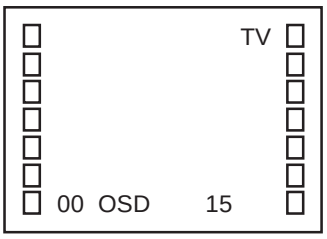


Fig. 1-1

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	13	BRIGHTNESS
01	CUT OFF	14	CONTRAST
02	RF AGC	15	COLOR
03	VIF VCO	16	TINT
04	H VCO	17	SHARPNESS
05	H PHASE	18	FM LEVEL
06	V SIZE	19	LEVEL
07	V SHIFT	20	SEPARATION 1
08	R DRIVE	21	SEPARATION 2
09	B DRIVE	22	TEST MONO
10	R CUT OFF	23	TEST STEREO
11	G CUT OFF	24	X-RAY TEST
12	B CUT OFF		

Fig. 1-2

2. BASIC ADJUSTMENTS (VCR SECTION)

2-1: PG SHIFTER

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

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

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

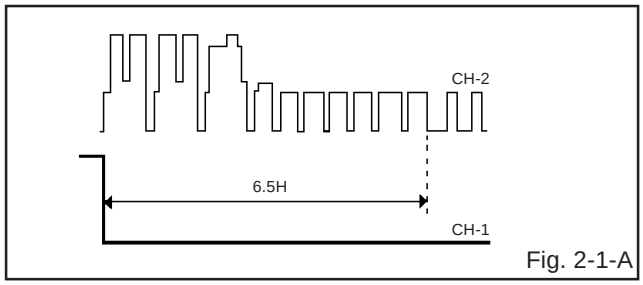


Fig. 2-1-A

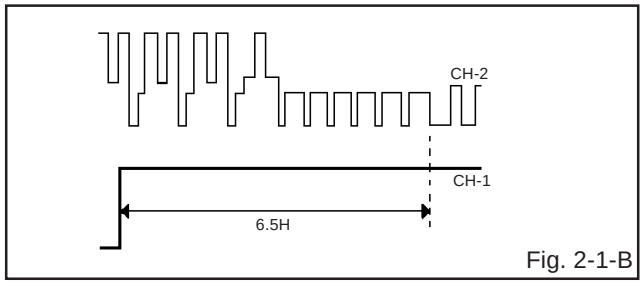


Fig. 2-1-B

2-2: RF AGC

1. Receive the monoscope pattern.
2. Connect the digital voltmeter between the **pin 5 of CP602** and the **pin 1 (GND) of CP602.**
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 2.9 ± 0.05V.

ELECTRICAL ADJUSTMENTS

2-3: VCO FREERUN

1. Place the set with Aging Test for more than 10 minutes.
2. Connect the digital voltmeter between the **pin 7 and pin 1 of CP602.**
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(03)** on the remote control to select "VIF VCO".
4. Press the VOL. UP/DOWN button on the remote control until the digital voltmeter is 2.5 ± 0.5V.

(TV SECTION)

2-4: CONSTANT VOLTAGE

1. Input DC12V to DC Jack and turn the Power ON.
2. Connect the digital voltmeter to the **F502** and **GND.**
3. Set condition is AV MODE without signal.
4. Adjust the **VR501** until the DC voltage is 101 ± 0.5V.
5. Input AC120V to AC cord and remove the DC Jack cord. Check if the Power is ON before doing the above procedure.
6. Adjust the **VR502** until the AC voltage is 102 ± 0.5V.

2-5: CUT OFF

1. Adjust the unit to the following settings. R.DRIVE=64, B.DRIVE=64, R.CUT OFF=128, G.CUT OFF=128, B.CUT OFF=128, SUB BRIGHT=128, SUB CONTRAST=96.
2. Place the set with Aging Test for more than 15 minutes.
3. Set condition is AV MODE without signal.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(01)** on the remote control to select "CUT OFF".
5. Adjust the **Screen Volume** until a dim raster is obtained.

2-6: FOCUS

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

2-7: WHITE BALANCE

NOTE: Adjust after performing CUT OFF adjustment.

1. Place the set with Aging Test for more than 15 minutes.
2. Receive the white 100% signal from the Pattern Generator.
3. Using the remote control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(10)** on the remote control to select "R.BIAS".
5. Using the VOL. UP/DOWN button on the remote control, adjust the R.BIAS.
6. Press the CH. UP/DOWN button on the remote control to select the "R.DRIVE", "B.DRIVE", "G.BIAS" or "B.BIAS".
7. Using the VOL. UP/DOWN button on the remote control, adjust the R.DRIVE, B.DRIVE, G.BIAS or B.BIAS.
8. Perform the above adjustments 6 and 7 until the white color is looked like a white.

2-8: SUB BRIGHTNESS

1. Receive the black pattern. (RF Input)
2. Using the remote control, set the brightness, contranst, color and tint 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 "BRIGHTNESS".
4. Press the VOL. UP/DOWN button on the remote control until the screen begin to shine.
5. Receive the black pattern. (Audio Video Input)
6. Press the INPUT SELECT button on the remote control to set to the AV mode. Then perform the above adjustment 2~4.

2-9: SUB TINT

1. Receive the color bar pattern. (RF Input)
2. Connect the oscilloscope to **TP803.**
3. Using the remote control, set the brightness, contranst, color and tint to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(16)** 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.

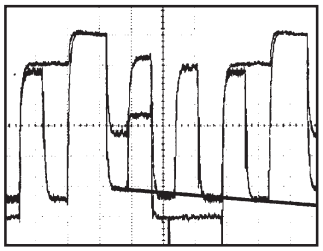


Fig. 2-2

ELECTRICAL ADJUSTMENTS

2-10: SUB COLOR

1. Receive the color bar pattern. (RF Input)
2. Connect the oscilloscope to **TP801.**
3. Using the remote control, set the brightness, contranst, color and tint to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(15)** on the remote control to select "COLOR".
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 120 ± 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.

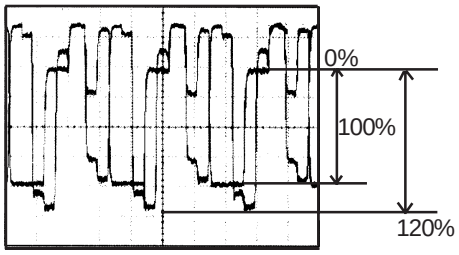


Fig. 2-3

2-11: SUB CONTRAST

1. Receive the color bar pattern. (RF Input)
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(14)** on the remote control to select "CONTRAST".
3. Press the VOL. UP/DOWN button on the remote control until the contrast step No. becomes "96".
4. Receive the color bar pattern. (Audio Video Input)
5. Press the INPUT SELECT button on the remote control to set to the AV mode. Then perform the above adjustments 2,3.

2-12: HORIZONTAL PHASE

1. Receive the monoscope pattern.
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(05)** on the remote control to select "H PHASE".
3. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on right and left becomes minimum.

2-13: 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)**

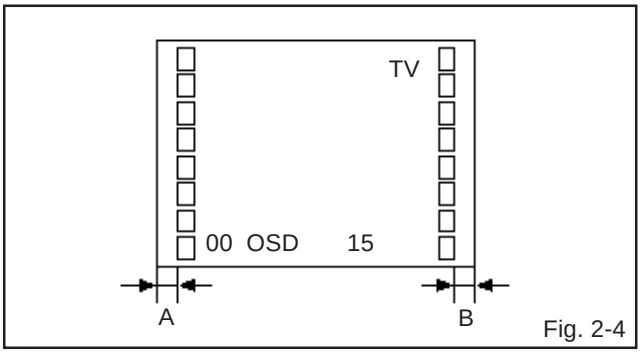


Fig. 2-4

2-14: SUB SHARPNESS

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(17)** on the remote control to select "SHARPNESS".
2. Check if the step No. of SHARPNESS is "40".
3. Press the AV button on the remote control to set to the AV mode. Then perform the above adjustments 1, 2.

2-15: 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 "4".

2-16: VERTICAL SHIFT

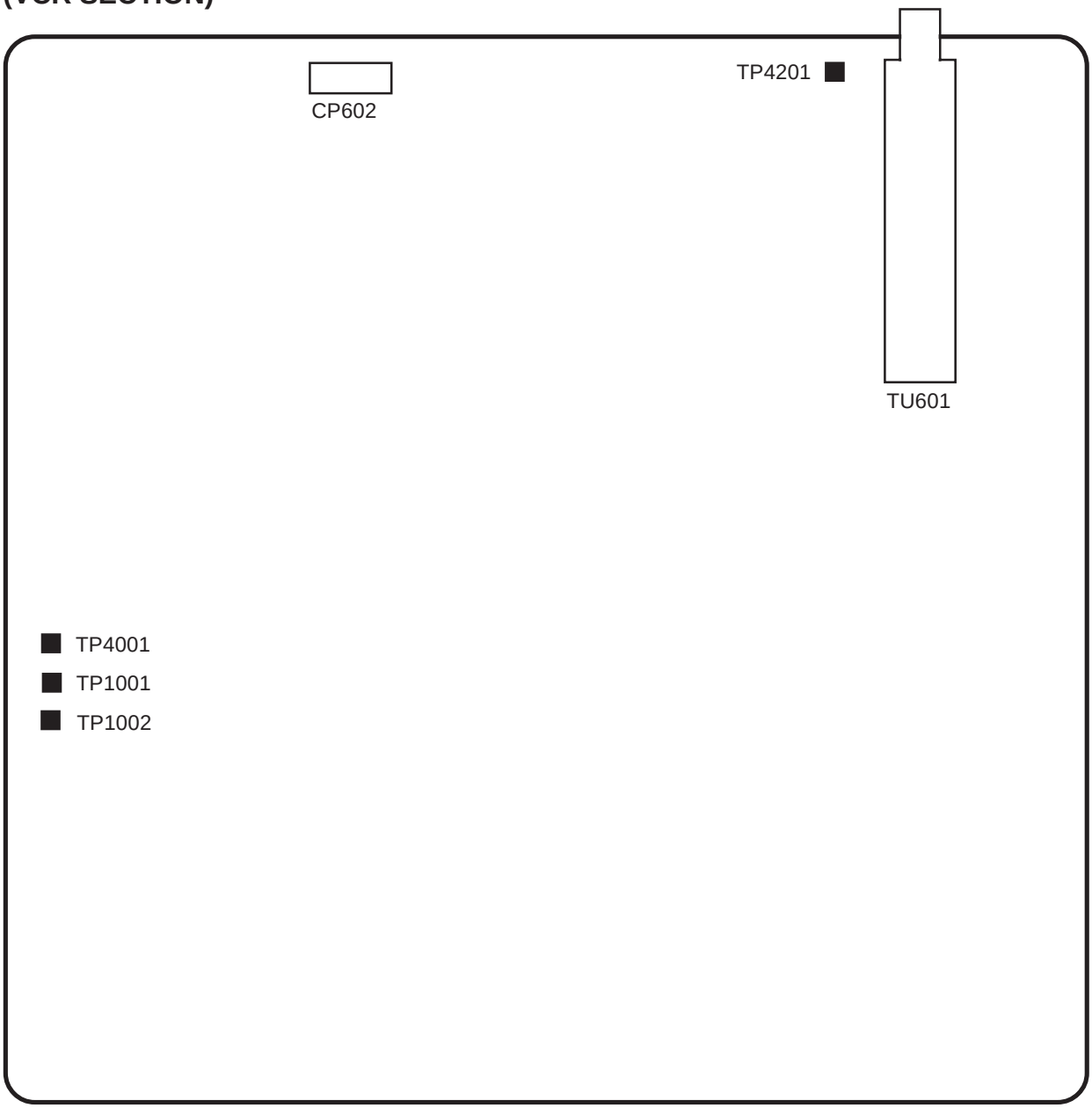
1. Receive the monoscope pattern.
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(07)** on the remote control to select "V SHIFT".
3. Adjust the **VR402** until the horizontal line becomes fit to notch of the shadow mask.

2-17: VERTICAL SIZE

1. Receive the monoscope pattern.
2. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(06)** on the remote control to select "V SIZE".
3. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on upside and downside becomes minimum.
4. Receive a broadcast and check if the pictrue is mormal.

ELECTRICAL ADJUSTMENTS

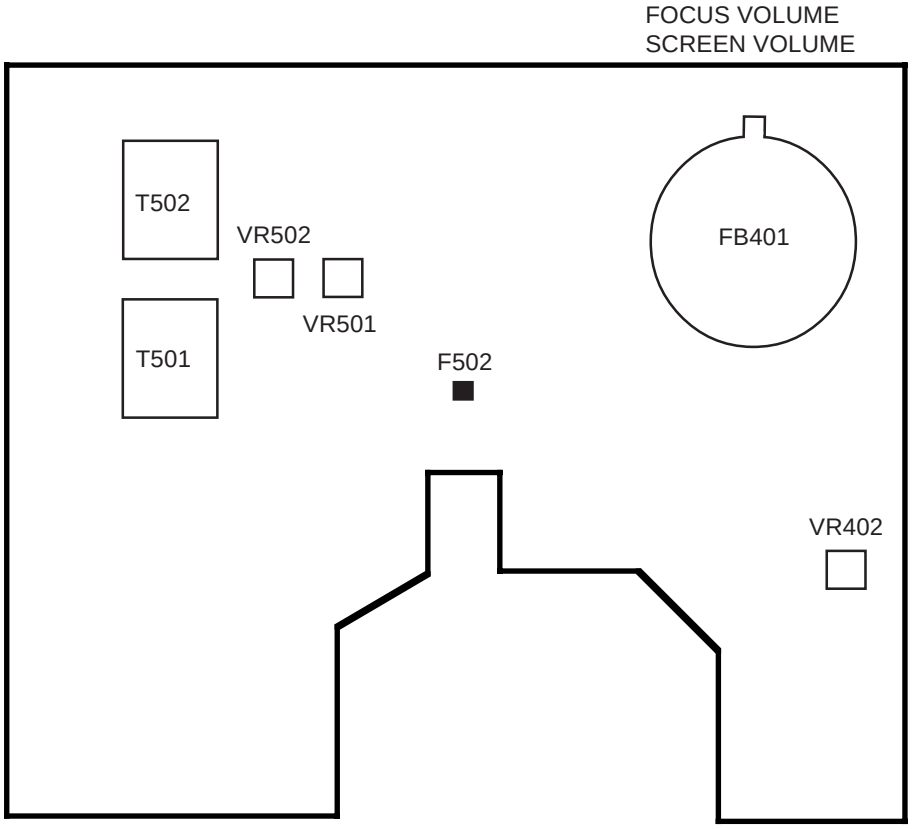
3. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE (VCR SECTION)



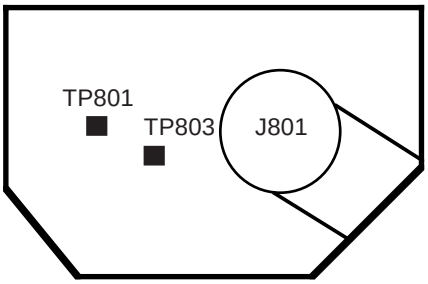
SYSCON PCB

ELECTRICAL ADJUSTMENTS

(TV SECTION)



MAIN PCB



CRT PCB

ELECTRICAL ADJUSTMENTS

4. PURITY AND CONVERGENCE ADJUSTMENTS

NOTE

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

4-1: STATIC CONVERGENCE (ROUGH ADJUSTMENT)

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

4-2: PURITY

NOTE

Adjust after performing adjustments in section 4-1.

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

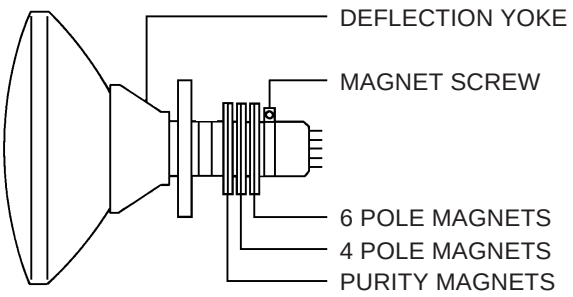


Fig. 4-1

4-3: STATIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 4-2.

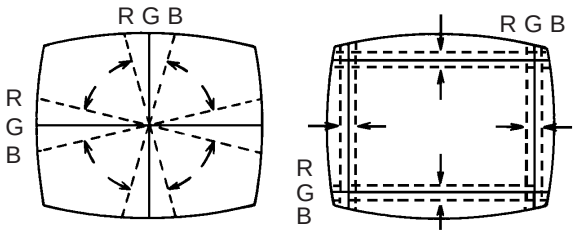
1. Receive the crosshatch pattern from the color bar generator.
2. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
3. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.

4-4: DYNAMIC CONVERGENCE

NOTE

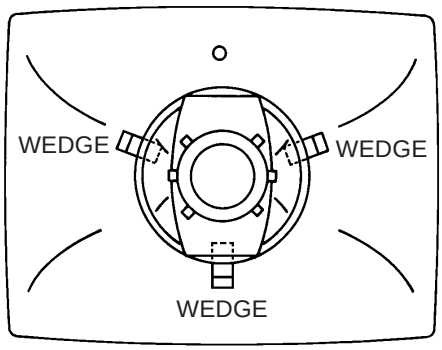
Adjust after performing adjustments in section 4-3.

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



UPWARD/DOWNWARD SLANT RIGHT/LEFT SLANT

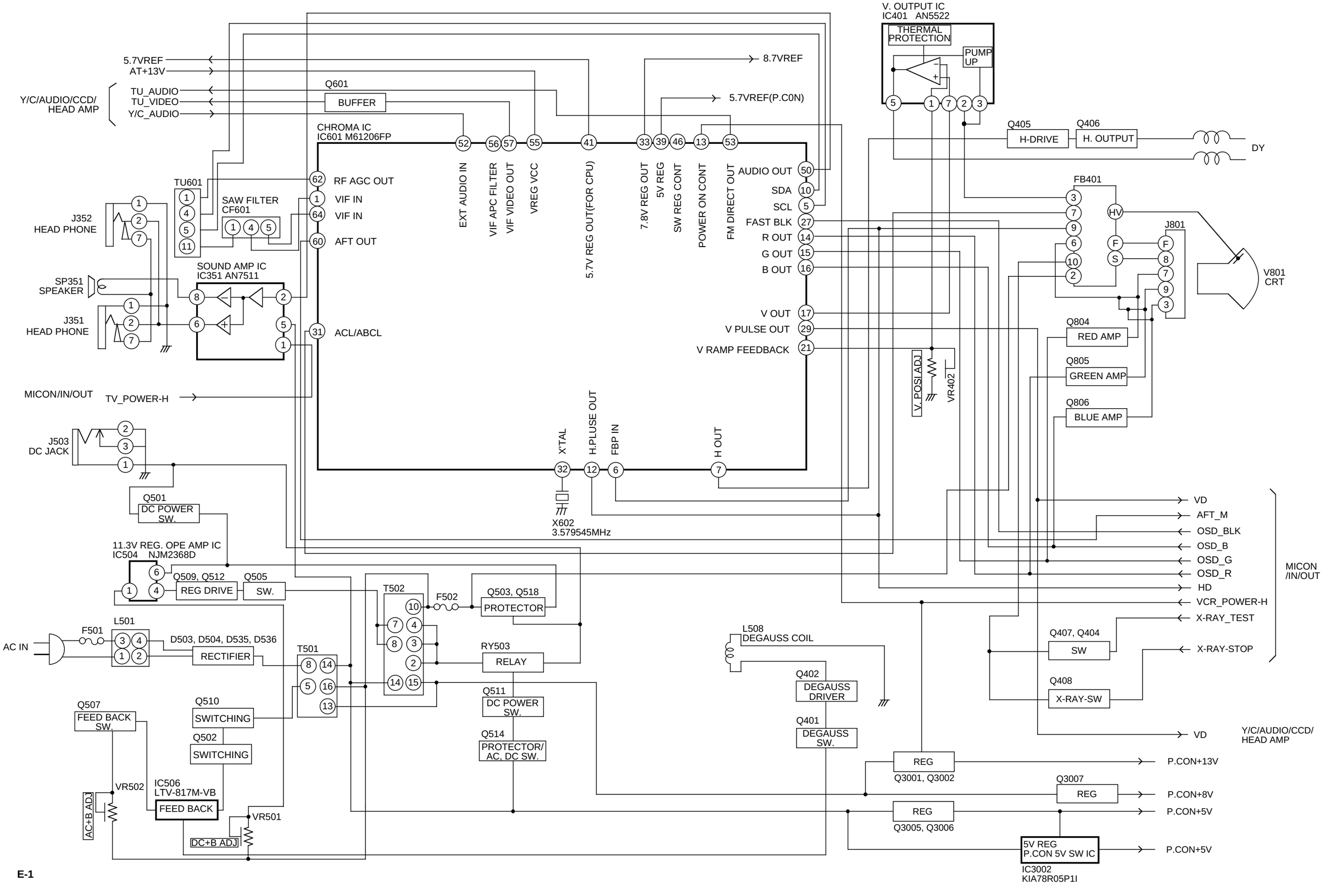
Fig. 4-2-a



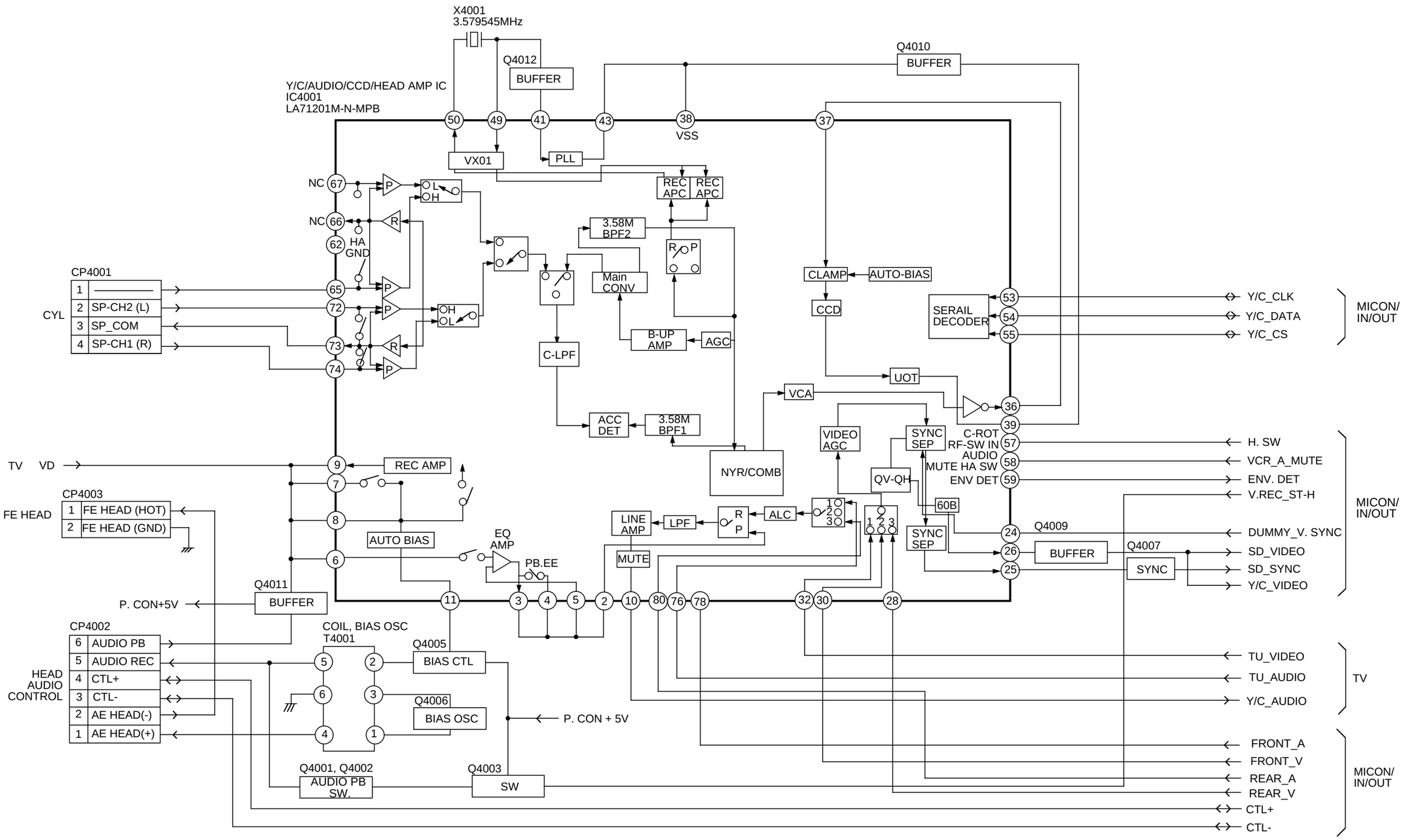
WEDGE POSITION

Fig. 4-2-b

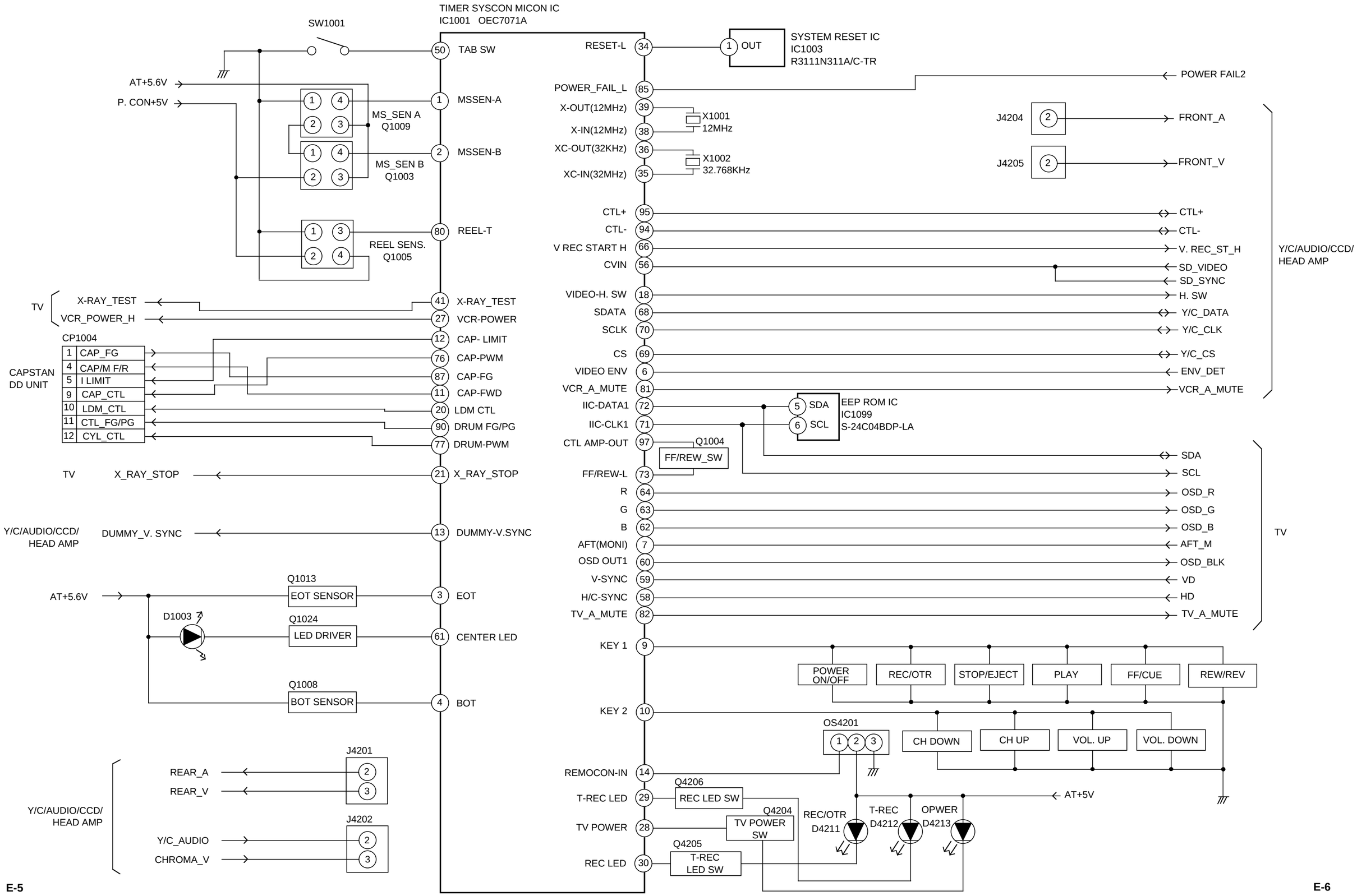
TV BLOCK DIAGRAM



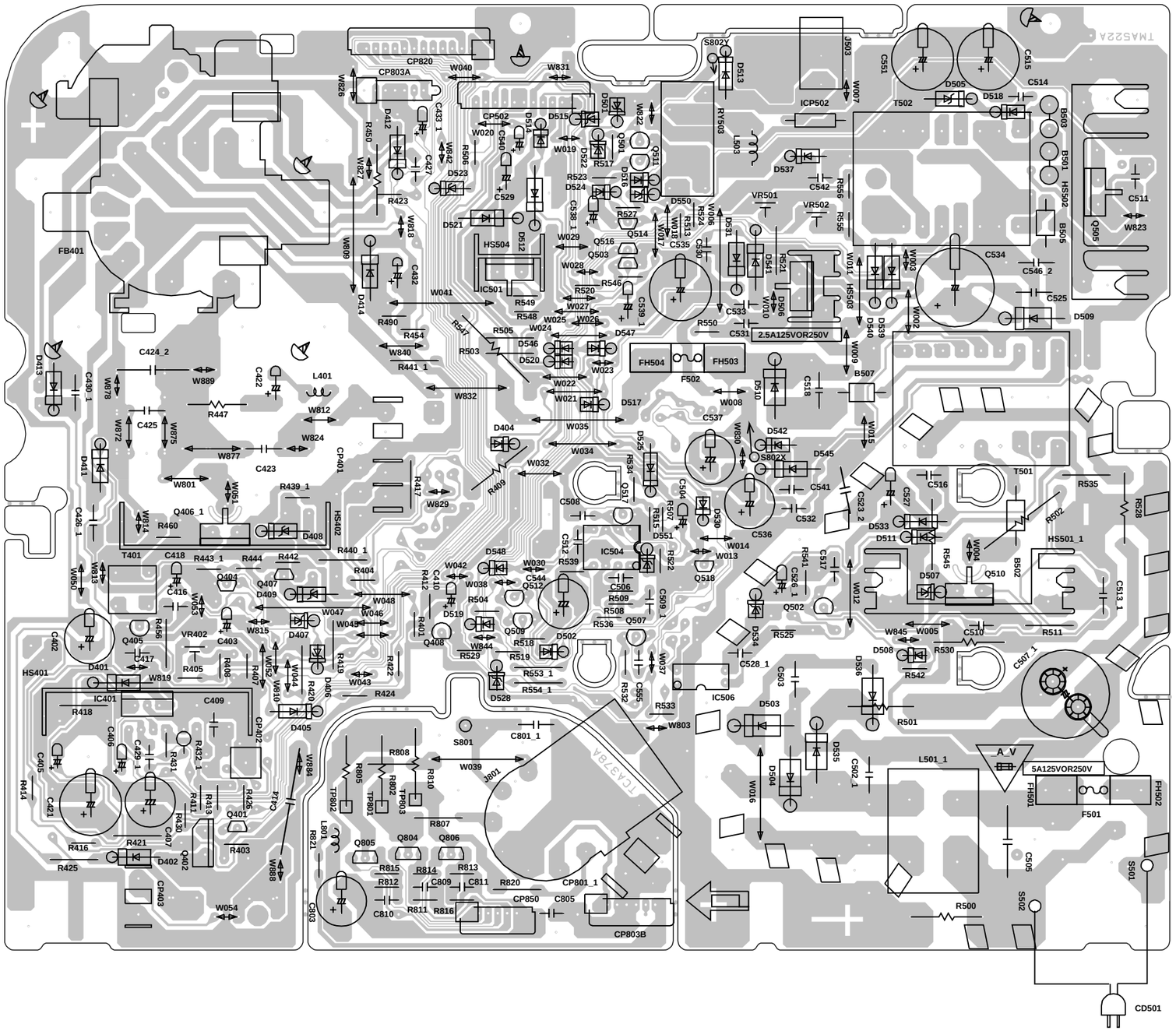
Y/C/AUDIO/CCD/HEAD AMP BLOCK DIAGRAM



MICON/IN/OUT BLOCK DIAGRAM



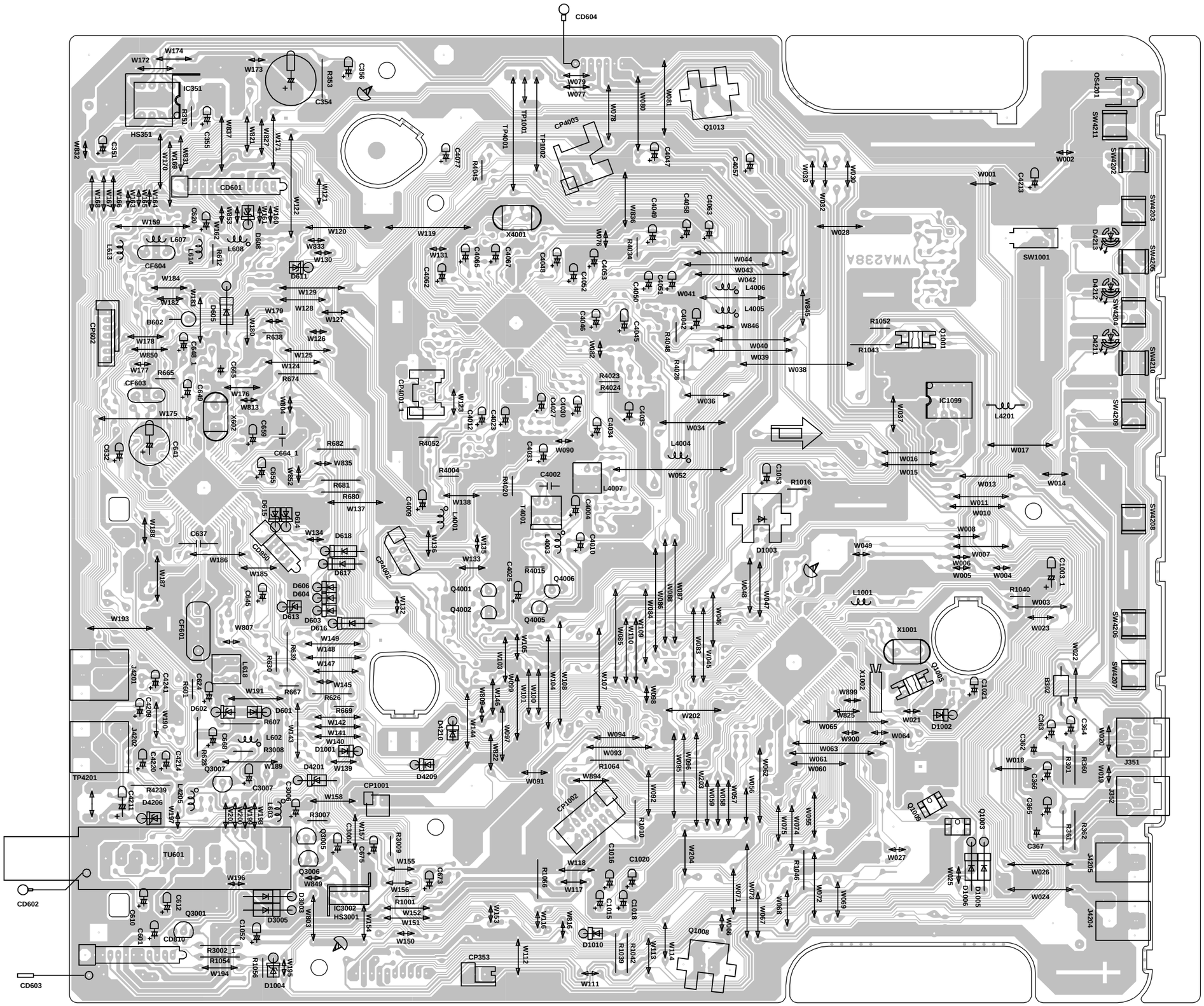
PRINTED CIRCUIT BOARDS
MAIN/CRT
SOLDER SIDE



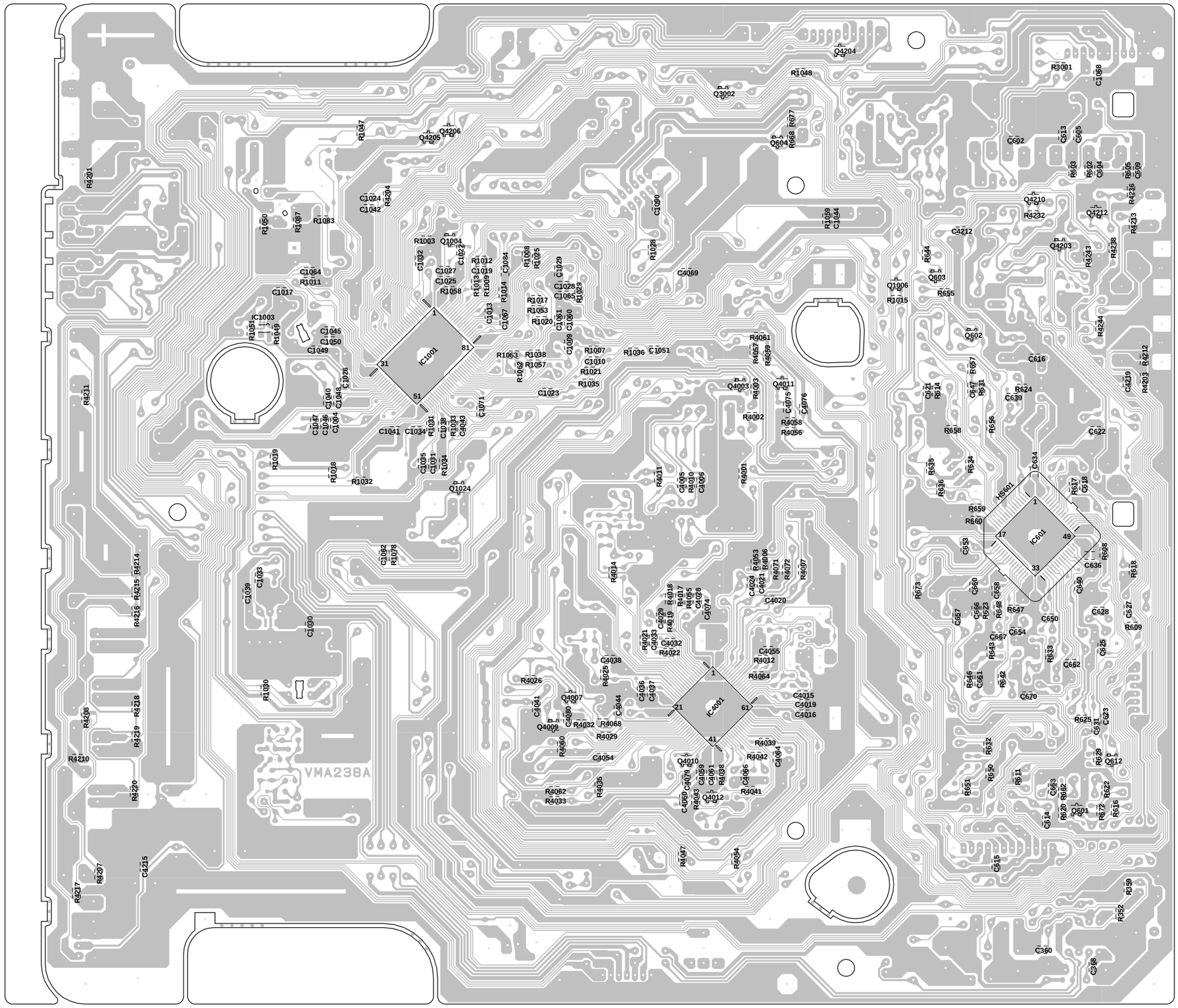
F-1

F-2

PRINTED CIRCUIT BOARDS
SYSCON (INSERTED PARTS)
SOLDER SIDE

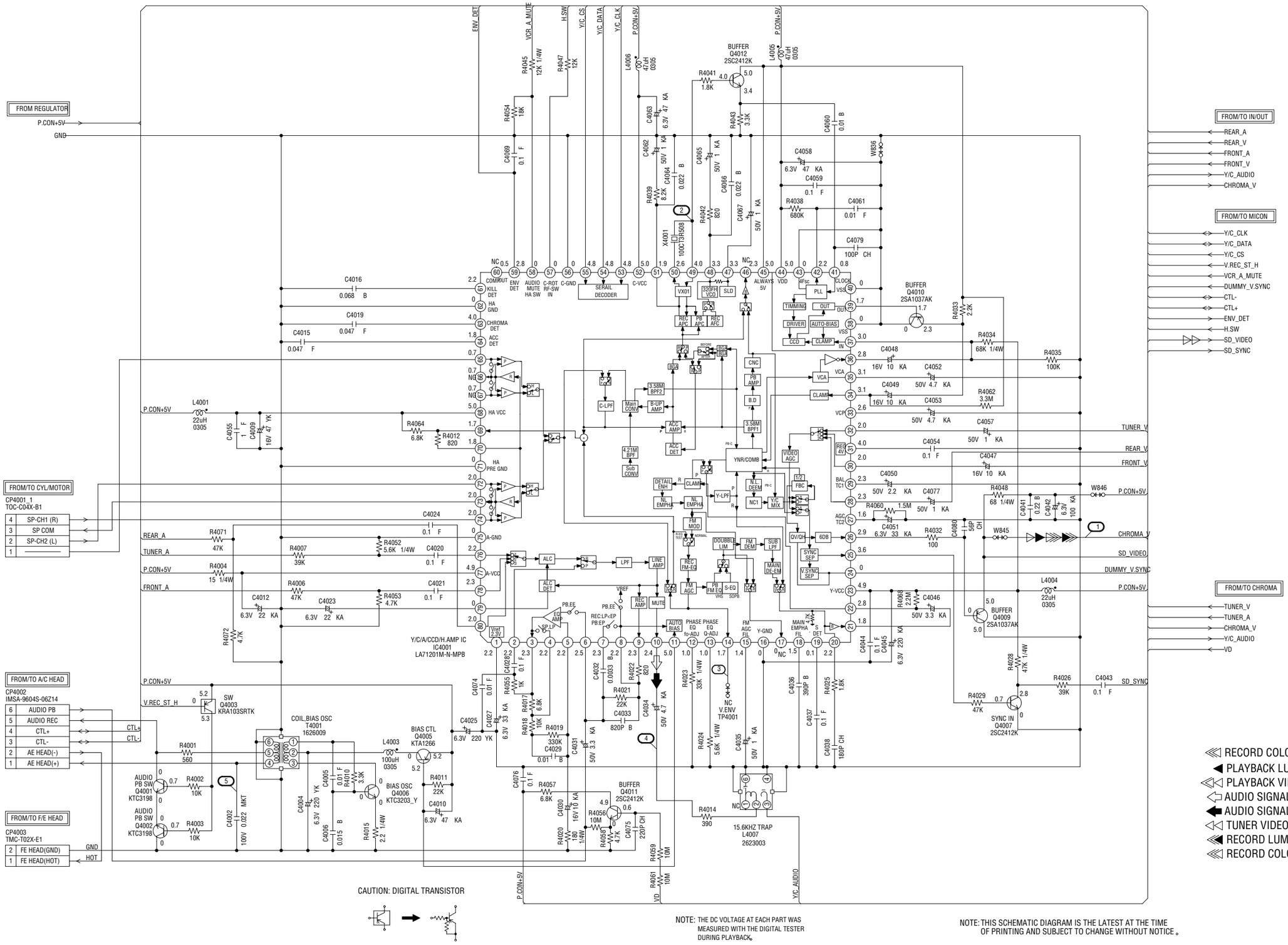


PRINTED CIRCUIT BOARDS
SYSCON (CHIP MOUNTED PARTS)
SOLDER SIDE



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

(SYSCON PCB)



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

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

MICON SCHEMATIC DIAGRAM
(SYSCON PCB)

FROM/TO REGULATOR

AT+5.6V
GND
MOTOR_GND
P.CON+5V
AT+12V
X-RAY_STOP
POWER_FAIL[DC]

D1006 SB140-EIC
D1005 SB140-EIC
AT+5V
D1004 MTZJ5.6C
POWER_FAIL[DC]
R1056 10K 1/4W
R1054 5.6K 1/4W
D1001 1SS133
R1015 10K
POWER_FAIL 4.2
POWER FAIL Q1006 2SA1037AK 3.6 5.2
R1025 4.7K
C1067 0.1 F

C1028 0.1 F
C1065 0.1 F
REEL_T
REEL_S
R1028 22K
CAP_CTL
R1029 4.7K
CYL_DRIVE
C1029 0.0068 B
R1053 220
R1017 39K
R1020 22K
C1061 100P CH
SDA
SCL
R1062 3.3K
R1038 100
R1057 100
Y/C_CLK
Y/C_CS
Y/C_DATA
C1060 100P CH
H_CTL
V.REC_ST_H
R1063 33K
R1007 4.7K
OSD_R
R1021 680
OSD_G
R1035 680
OSD_B
CENT_LED
R1038 3.3K
OSD_BLK
C1071 100P CH
C1009 100P CH
C1010 100P CH
C1023 100P CH
C1051 220P CH
C1041 0.1 F
C1034 0.1 F
C1035 220P CH
R1031 1K
R1032 4.7K
SD_SYNC
SERVICE TP1001 NC
C1031 0.001 B
R1033 1K
C1062 1 B
R1078 390K
C1038 680P CH
R1034 560K

FROM/TO Y/C/AUDIO/CCD/HEAD AMP
Y/C_CLK
Y/C_DATA
Y/C_CS
H.SW
SD_VIDEO
ENV_DET
VCR_A_MUTE
CTL+
CTL-
DUMMY_V.SYNC
V.REC_ST_H
SD_SYNC

VCR_A_MUTE
TV_A_MUTE
EXT_A_MUTE
SDA
SCL
IIC_OFF
CAP_FG
CYL_FG/PG
CTL-
CTL+
FF/REW_SW Q1004 KRC103SRTK
C1022 0.1 F
C1027 0.0039 B 16V 10 KA
CTL AMP-OUT
R1058 560K
R1059 150K
C1025 0.1 F
EOT
BOT
CENT_LED
TAB_SW

R1001 3.3K 1/4W
R1008 1K
C1013 0.0039 B
R1014 47K
R1064 1K 1/4W
C1084 0.0022 B
C1015 6.3V 47 KA
C1016 16V 22 KA
C1018 50V 4.7 KA
R1009 560
R1013 560
R1012 10K
C1019 0.001 CH
C1020 2.5
C1053 6.3V 100 KA

EEP ROM IC IC1099 S-24C04BDP-1A
SDA SCL TEST VCC
VSS A2 A1 A0
C1030 0.1 F
C1033 100P CH
C1039 100P CH

EOT SENSOR Q1013 ST-304L
D1003 LNA2702L010R
BOT SENSOR Q1008 ST-304L
R1016 270 1/4W
R1011 330K C1064 0.001 B
R1003 330K C1032 0.001 B
LED DRIVER Q1024 KRC103SRTK 0.12 5.17
SW1001 MXS01380MPP0
R1018 4.7K

FROM DEW SENSOR
CP1001 52287-0211
1 DEW-
2 DEW+
C1044 0.01 F

FROM/TO CAP MOTOR
CP1002 TMC-J12P-B2
1 CAP FG
2 CAP VCO
3 VCC(5V)
4 CAP.M F/R
5 I LIMIT
6 MOTOR GND
7 GND
8 CYL/LAD VCO
9 CAP CTL
10 LDM CTL
11 CYL FG/PG
12 CYL CTL
C1052 16V 47 YK
C1068 0.1 F
C1090 0.0033 B

TIMER SYSCON MICON IC IC1001 OEC7071A

80 POWER_FAIL_L
81 IIC OFF
82 CAP-FG
83 AMP-VSS
84 NC
85 DRUM FG/PG
86 AMP-VREFOUT
87 AMP-VREFIN
88 C
89 CTL-
90 CTL+
91 AMP C
92 CTL AMP-OUT
93 MSSEN-A
94 MSSEN-B
95 EOT
96 BOT
97 5 HI-FI-ENV
98 6 VIDEO-ENV
99 7 AFT(MONI)
100 8 AFT(REC)
1 9 KEY A
2 10 KEY B
3 11 CAP-FWD
4 12 CAP-LIMIT
5 13 DUMMY-V.SYNC
6 14 REMOCON-IN
7 15 COLOR ROTARY
8 16 HEAD AMP SW
9 17 ENV-CMP-IN
10 18 VIDEO-H.SW
11 19 HI-FI-H.SW
12 20 LDM CTL
13 21 X-RAY STOP
14 22 DEGAUSS_H
15 23 STAND BY H
16 24 H CTL
17 25 PROTECT
18 26 EXT-MUTE
19 27 VCR-POWER
20 28 TV-POWER
21 29 T-REC LED
22 30 REC LED
23 31 NC
24 32 NC
25 33 NC
26 34 RESET-L
27 35 XC_IN(32KHz)
28 36 XC_OUT(32KHz)
29 37 VCC
30 38 X-IN(12MHz)
31 39 X-OUT(12MHz)
32 40 VSS
33 41 X-RAY_TEST
34 42 TUNER_CONTROL
35 43 CLKSEL
36 44 OSC-IN2
37 45 OSC-OUT2
38 46 NUB
39 47 CM_ADV_VIDEO/AV2
40 48 CM_ADV_AUDIO/AV2
41 49 OSD-VSS
42 50 TAB SW
43 51 SERVICE
44 52 SD-IN(MONI)
45 53 OSD-VCC
46 54 H/F
47 55 V/HOLD
48 56 CV/IN
49 57 NUA
50 58 H/C-SYNC
51 59 V-SYNC
52 60 OSD OUT1
53 61 CENTER LED
54 62 B
55 63 G
56 64 R
57 65 NC
58 66 V.REC START H
59 67 NC
60 68 SDATA
61 69 CS
62 70 SCLK
63 71 IIC-CLK1
64 72 IIC-DATA1
65 73 FF/REW-L
66 74 JUST CLOCK
67 75 VOLUME
68 76 CAP-PWM
69 77 DRUM-PWM
70 78 CAP FULL
71 79 REEL-S
72 80 REEL-T

81 VCR_A_MUTE
82 TV_A_MUTE
83 SP/LP/EP-H
84 CA/MA_SEL
98 AMP-VCC
99 ANALOG VCC
100 DEW
33 E/V_MASK/PLAY LED
32 RENT_H
31 ON-TIMER LED

C1004 10P CH
C1046 10P CH
C1047 18P CH
L1001 2.2uH
C1026 0.01 F
R1040 33K 1/4W
X1001 100CT01207
C1040 18P CH
C1048 18P CH
C1049 22P CH
X1002 100DA32R0
C1045 10P CH
C1050 10P CH
RESET

FROM/TO CHROMA
HD
VD
AFT_M
SCL
SDA
OSD_R
OSD_G
OSD_B
OSD_BLK
POWER_FAIL
X-RAY_TEST
VCR_POWER_H
TV_POWER_H
PROTECT
IIC_OFF
H_CTL

FROM/TO IN/OUT
VCR_A_MUTE
TV_POWER_H
REC_LED
T-REC_LED
KEY_A
KEY_B
REMOCON_IN
EXT_MUTE
EXT_A_MUTE
AT+5V

TO SOUND AMP
TV_POWER_H
TV_A_MUTE

W899
W900
H.SW TP1002 NC
W825
W834
CAP F/R
CAP_LIMIT
LDM_CTL
R1010 3.3K 1/4W
C1024 0.01 F
D1010 1SS133
C1042 0.01 F
R1048 4.7K
R1039 4.7K 1/4W
R1042 4.7K 1/4W
R1046 4.7K 1/4W
R1047 4.7K
R1049 4.7K
R1052 390 1/4W
R1043 390 1/4W
R1030 47K
R1019 47K
R1051 18K
C1003_1 6.3V 1000 YK
C1021 16V 10 KA
C1017 0.1 F
D1002 1SS133
SYSTEM RESET IC IC1003 R3111N311A/C
OUT IN GND

MS_SEN A Q1009 RPI-352C40N
MS_SEN B Q1003 RPI-352C40N
REEL SENS Q1001 RPI-303
REEL SENS Q1005 RPI-303
R1083 33K
R1050 100
R1087 33K

CAUTION: DIGITAL TRANSISTOR

G.SIGNAL
R.SIGNAL
B.SIGNAL
TUNER VIDEO SIGNAL
DEFLECTION SIGNAL
CAPSTAN AFC SIGNAL
CYLINDER AFC SIGNAL
CYLINDER APC SIGNAL

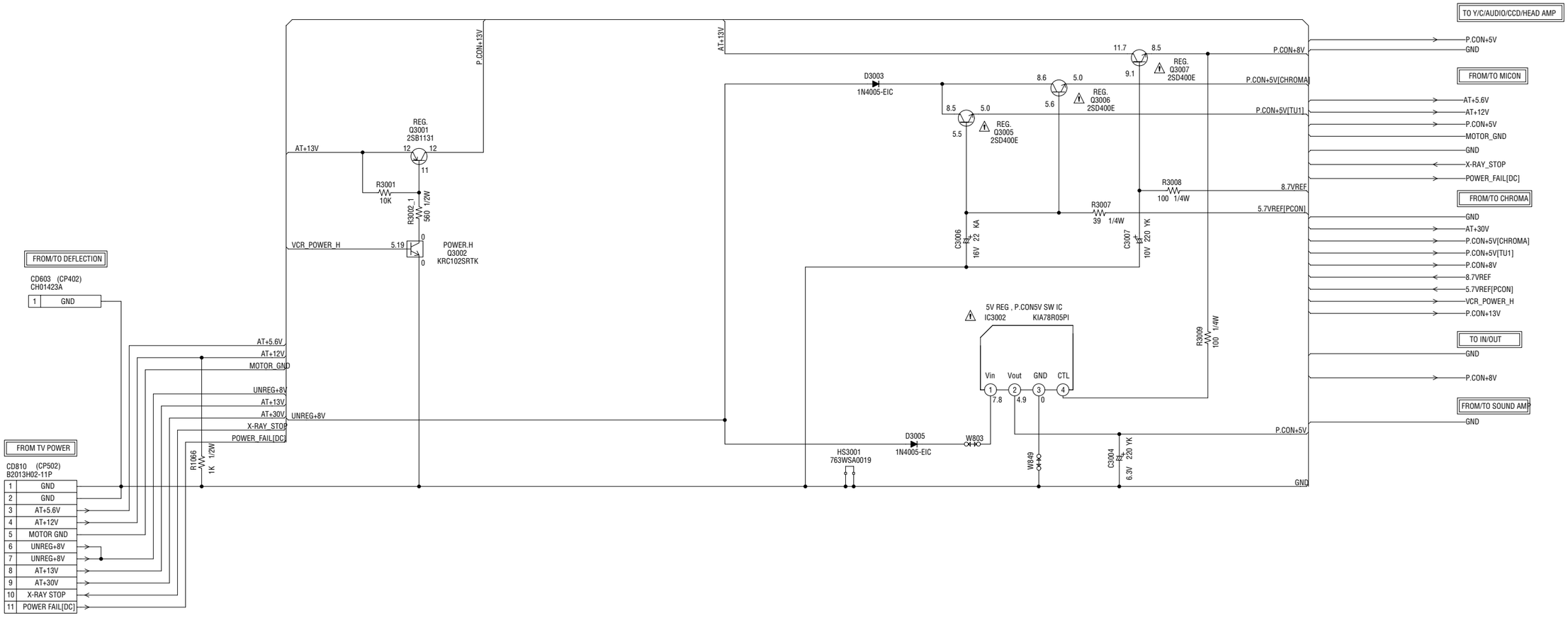
PCB010
VMA238

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

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

REGULATOR 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 。

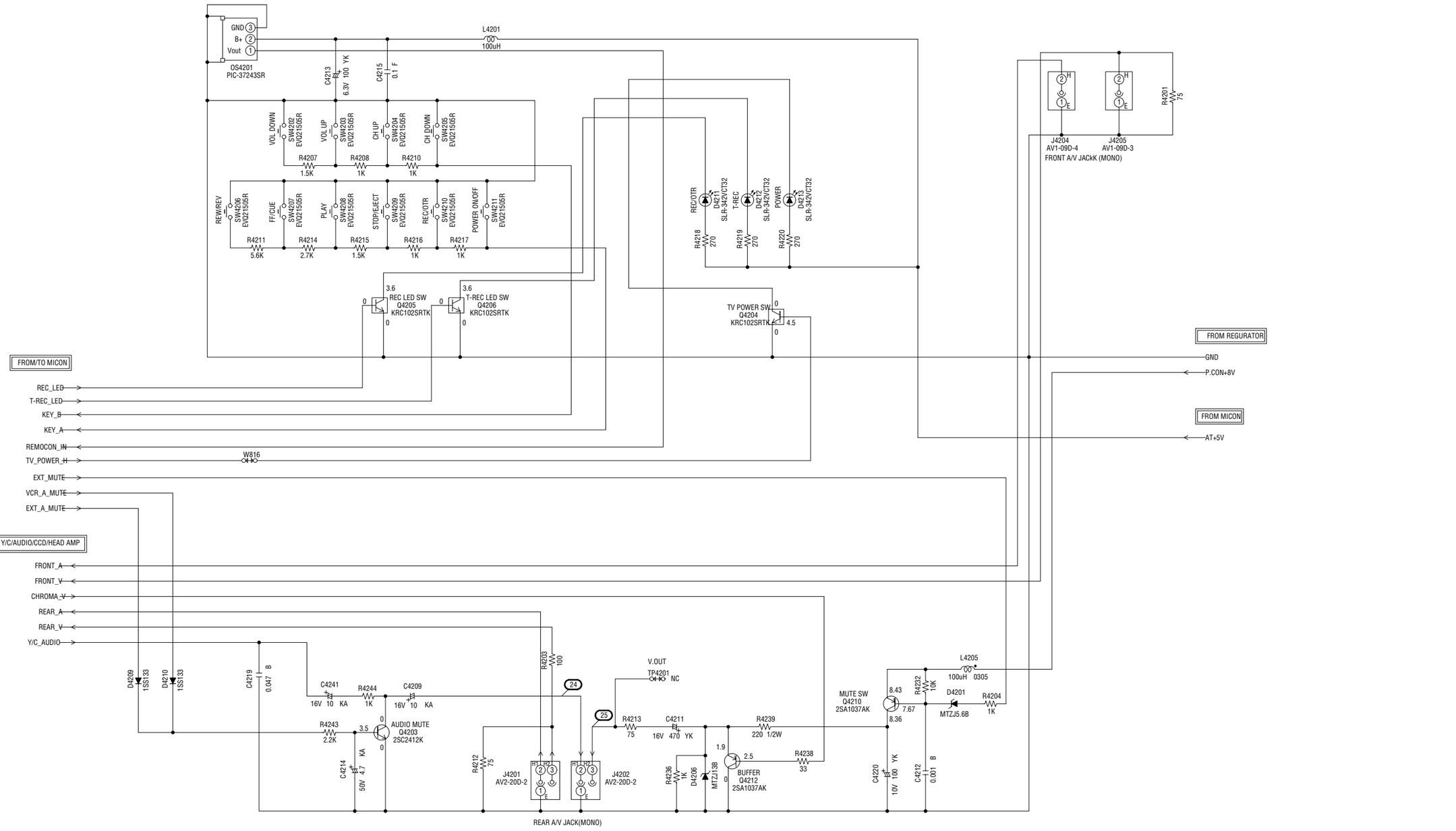
ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

CAUTION: DIGITAL TRANSISTOR

PCB010
VMA238

IN/OUT SCHEMATIC DIAGRAM

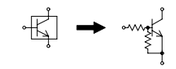
(SYSCON PCB)



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

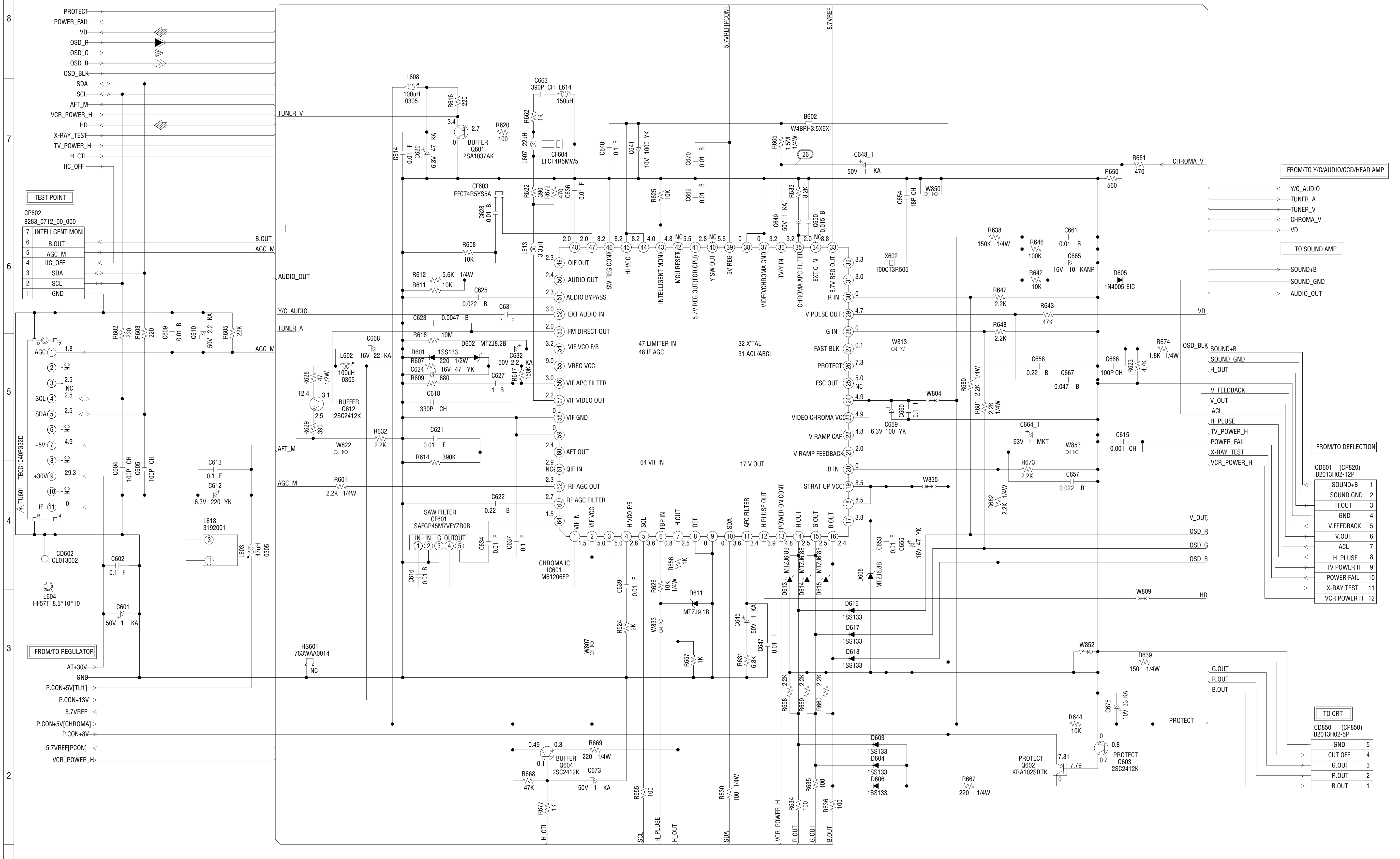
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

CAUTION: DIGITAL TRANSISTOR



PCB010
VMA238

CHROMA SCHEMATIC DIAGRAM (SYSCON PCB)



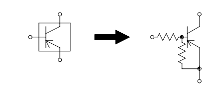
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

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。

CAUTION: DIGITAL TRANSISTOR

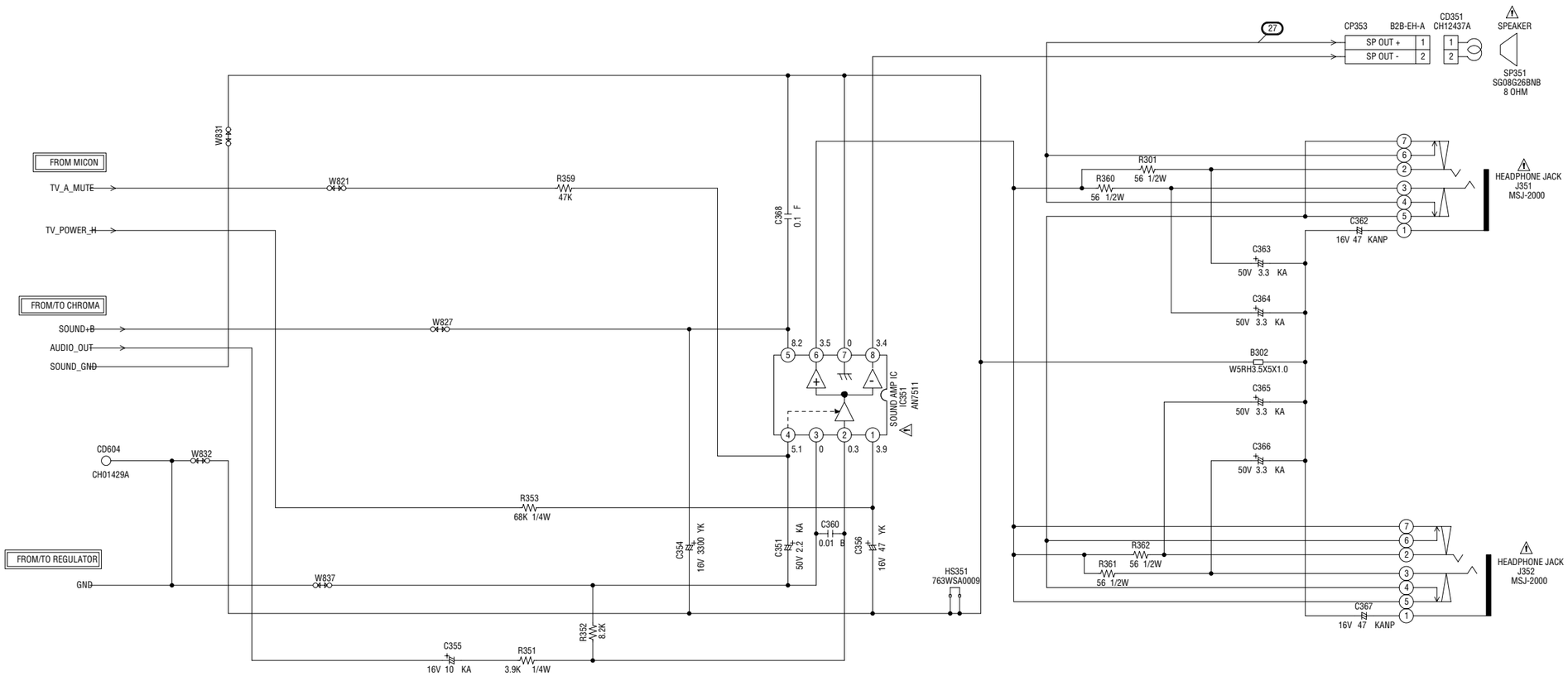


R.SIGNAL
G.SIGNAL
B.SIGNAL
DEFLECTION SIGNAL

PCB010
VMA238

SOUND AMP 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。

PCB010
VMA238

TV POWER SCHEMATIC DIAGRAM
(MAIN PCB)

CAUTION: DIGITAL TRANSISTOR

CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE FUSE5A 125V (F501),2.5A 125V(F502) AND 7A 125V(ICP502).

ATTENTION: POUR UNE PROTECTION CONTINUE LES RISQUES D'INCEIE N'UTILISER QUE DES FUSIBLE DE MEME TYPE 5A 125V (F501),2.5A 125V(F502) AND 7A 125V(ICP502).

CAUTION: ICP502 ARE MANUFACTURED BY LITTELFUSE INC.,TYPE 251.

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

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

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

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

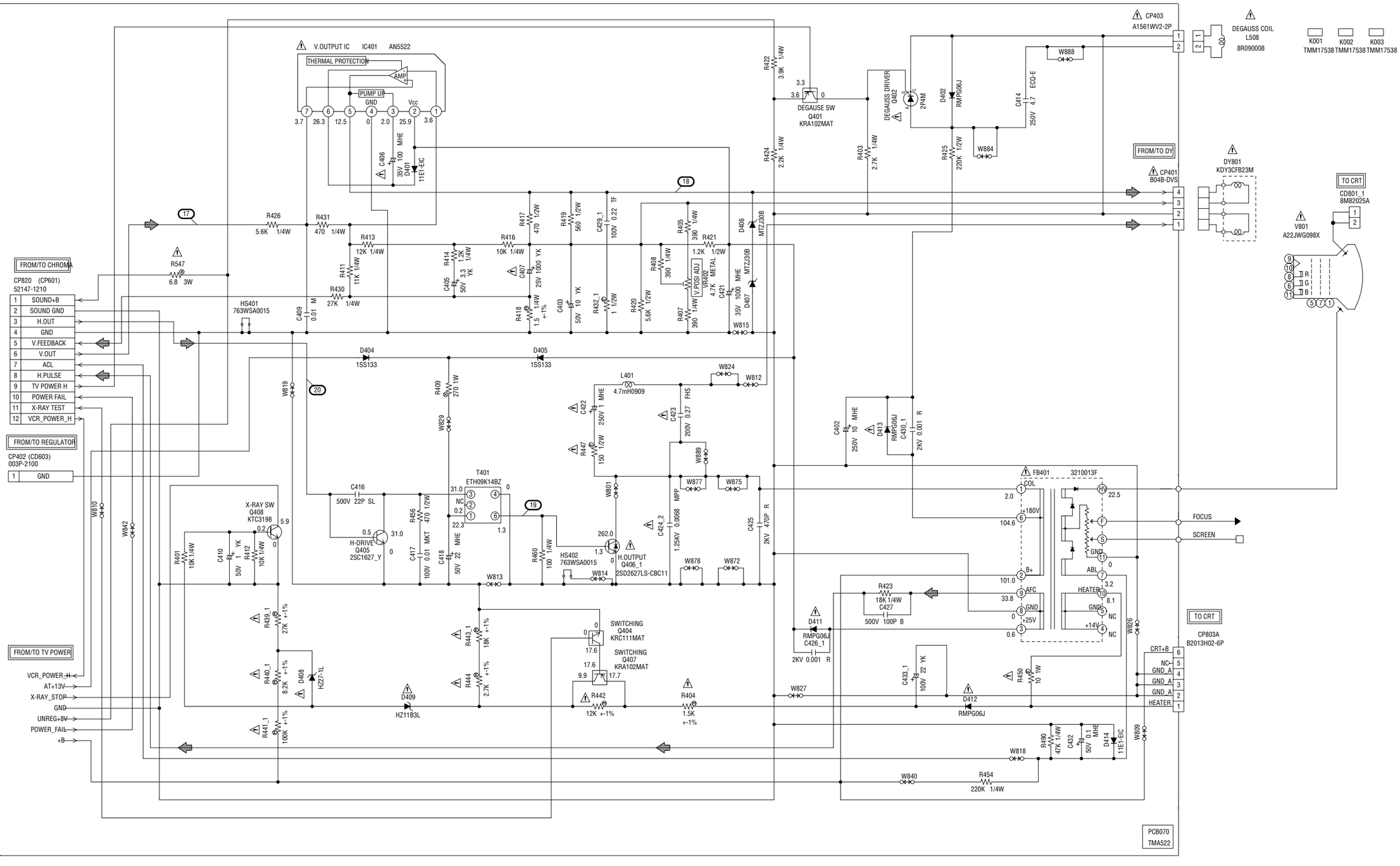
TO DEFLECTION: AT+13V, X-RAY_STOP, POWER_FAIL, UNREG+8V, +B, VCR_POWER_H

FROM/TO POWER CP502 (CD810) 52147-1110

GND	1
GND	2
AT+5.6V	3
AT+12V	4
MOTER GND	5
UNREG+8V	6
UNREG+8V	7
AT+13V	8
AT+30V	9
X-RAY_STOP	10
POWER_FAIL[DC]	11

PCB070
TMA522

DEFLECTION SCHEMATIC DIAGRAM
(MAIN PCB)



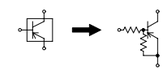
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK。

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

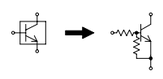
ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

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

CAUTION: DIGITAL TRANSISTOR

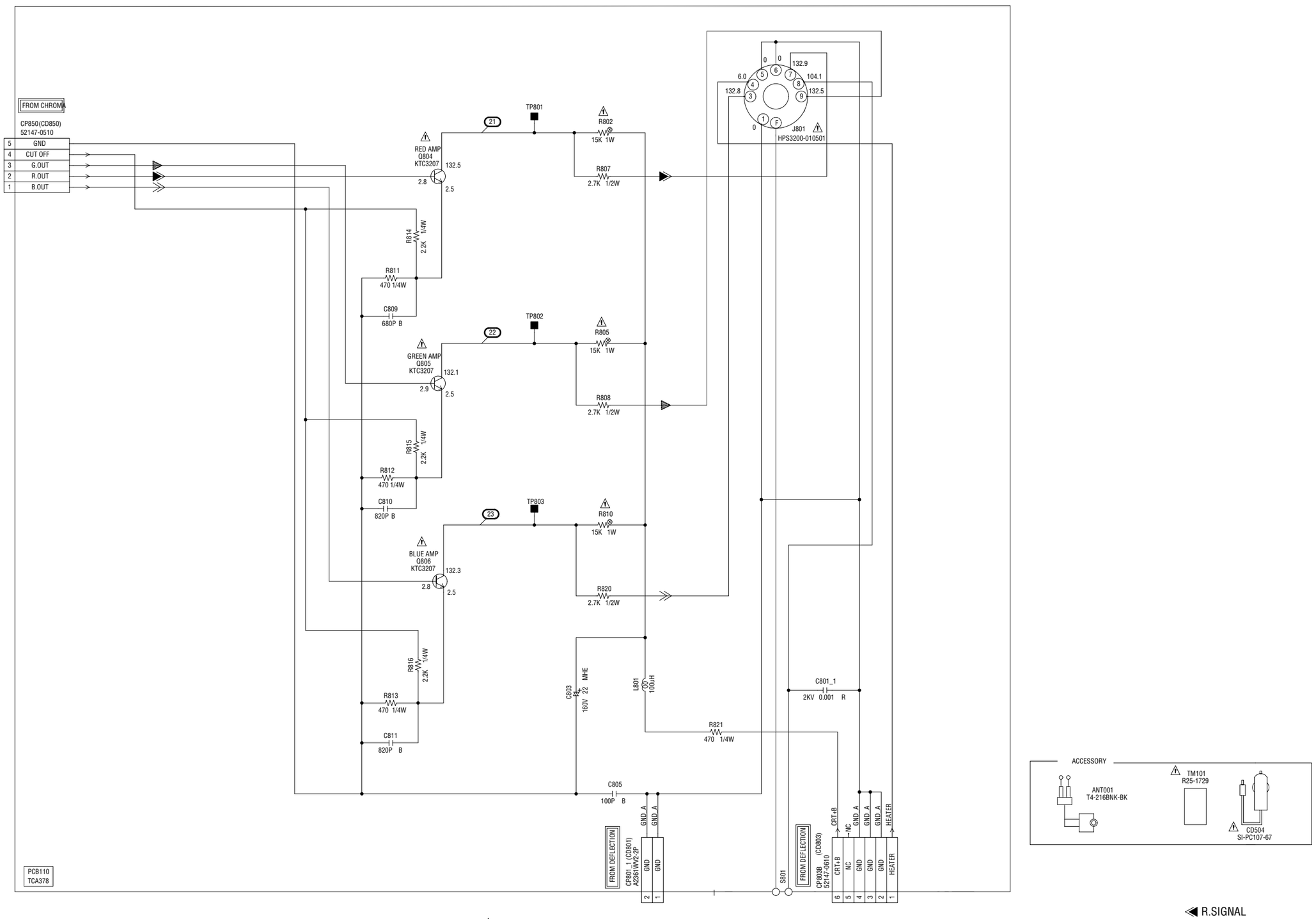


CAUTION: DIGITAL TRANSISTOR



DEFLECTION SIGNAL

CRT SCHEMATIC DIAGRAM
(CRT PCB)



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

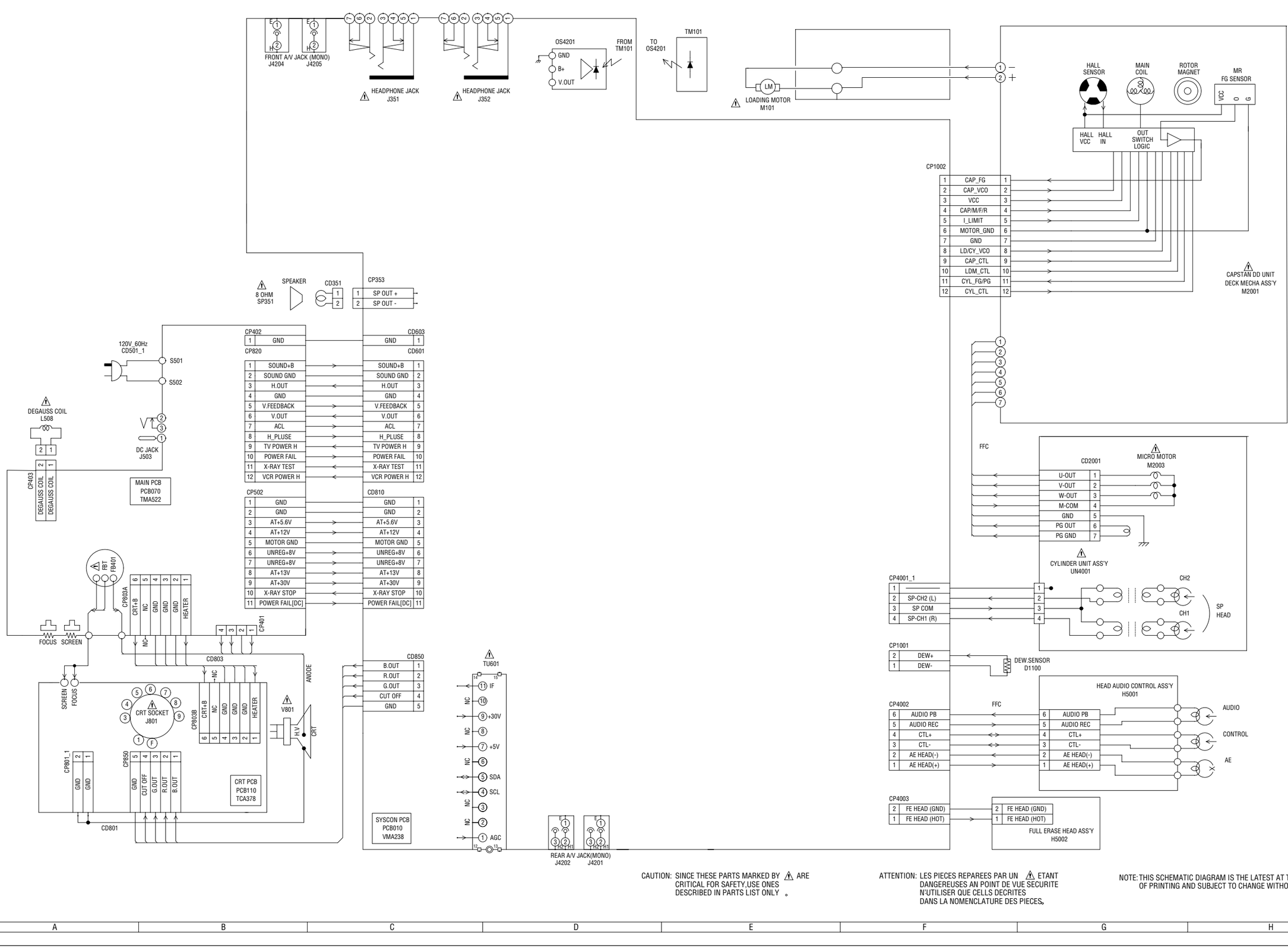
ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

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

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

◀◀ R.SIGNAL
◀ G.SIGNAL
≪ B.SIGNAL

INTERCONNECTION DIAGRAM



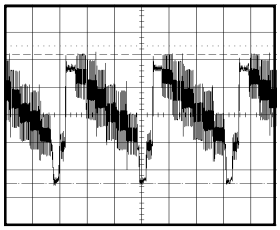
CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

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

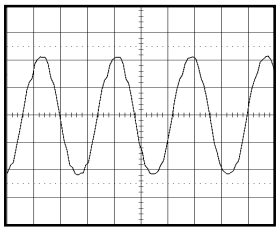
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

WAVEFORMS

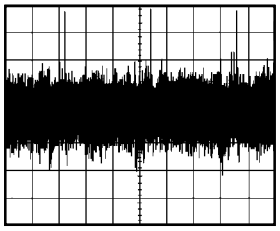
Y/C/AUDIO/CCD/HEAD AMP



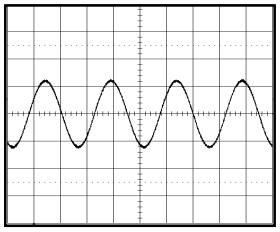
① PB
0.5V 20μs/div



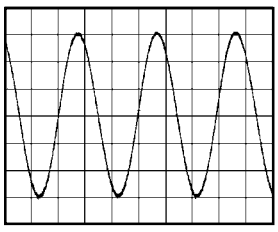
② POWER ON
100mV 0.1μs/div



③ PB
10mV 20us/div

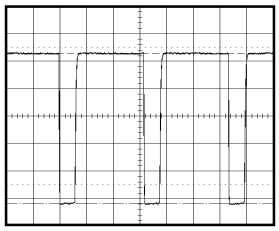


④ PB
0.5V 1ms/div

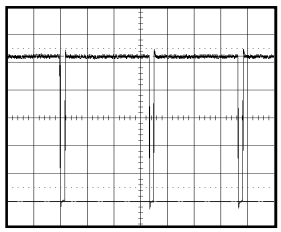


⑤ REC
10.0V 5us/div

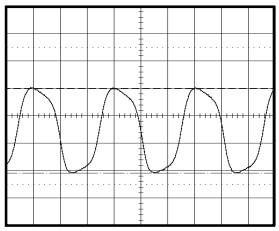
MICON



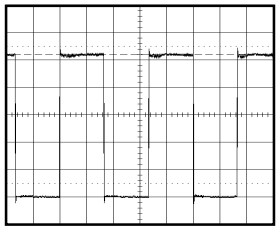
⑥ POWER ON
1.0V 20μs/div



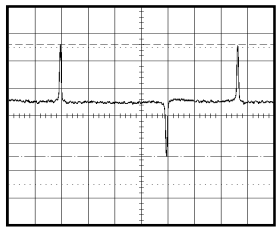
⑦ POWER ON
0.5V 10ms/div



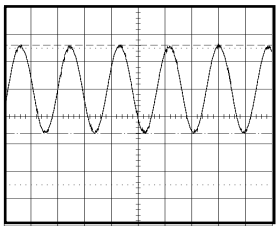
⑧ POWER ON
1.0V 10μs/div



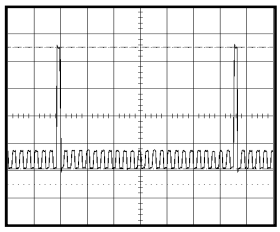
⑨ PB
1.0V 10ms/div



⑩ PB
1.0V 5ms/div

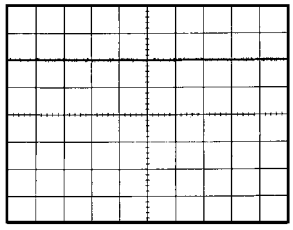


⑪ PB
0.5V 0.5ms/div

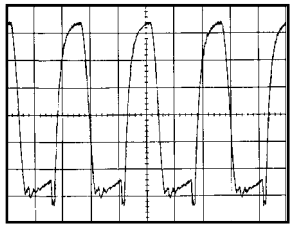


⑬ PB
1.0V 5ms/div

TV POWER

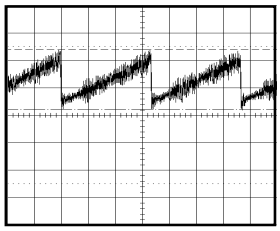


⑮ 5.0V 20ms/div



⑯ 500mV 5μs/div

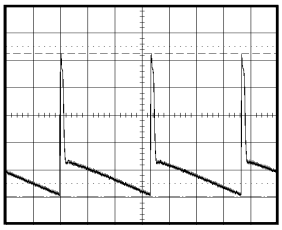
DEFLECTION



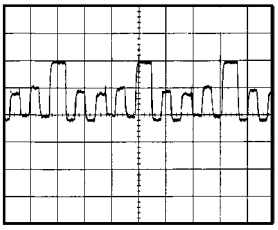
⑰ 0.5V 5ms/div

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

WAVEFORMS

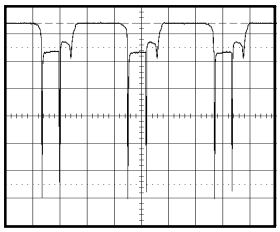


(18) 10.0V 5ms/div

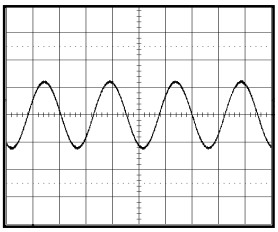


(23) 50.0V 20µs/div

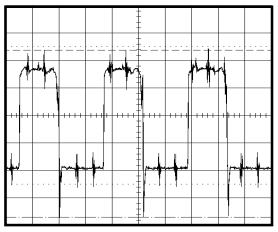
IN/OUT



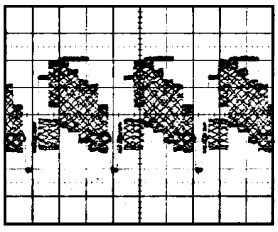
(19) 2.0V 20µs/div



(24) PB
0.5V 1ms/div

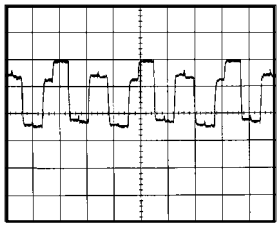


(20) 200mV 20µs/div



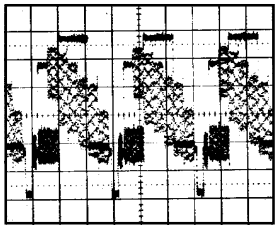
(25) 0.5V 20µs/div

CRT

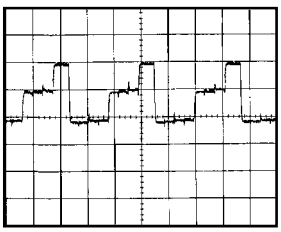


(21) 50.0V 20µs/div

CHROMA/IF

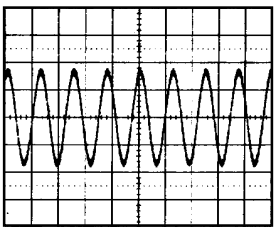


(26) 200mV 20µs/div



(22) 50.0V 20µs/div

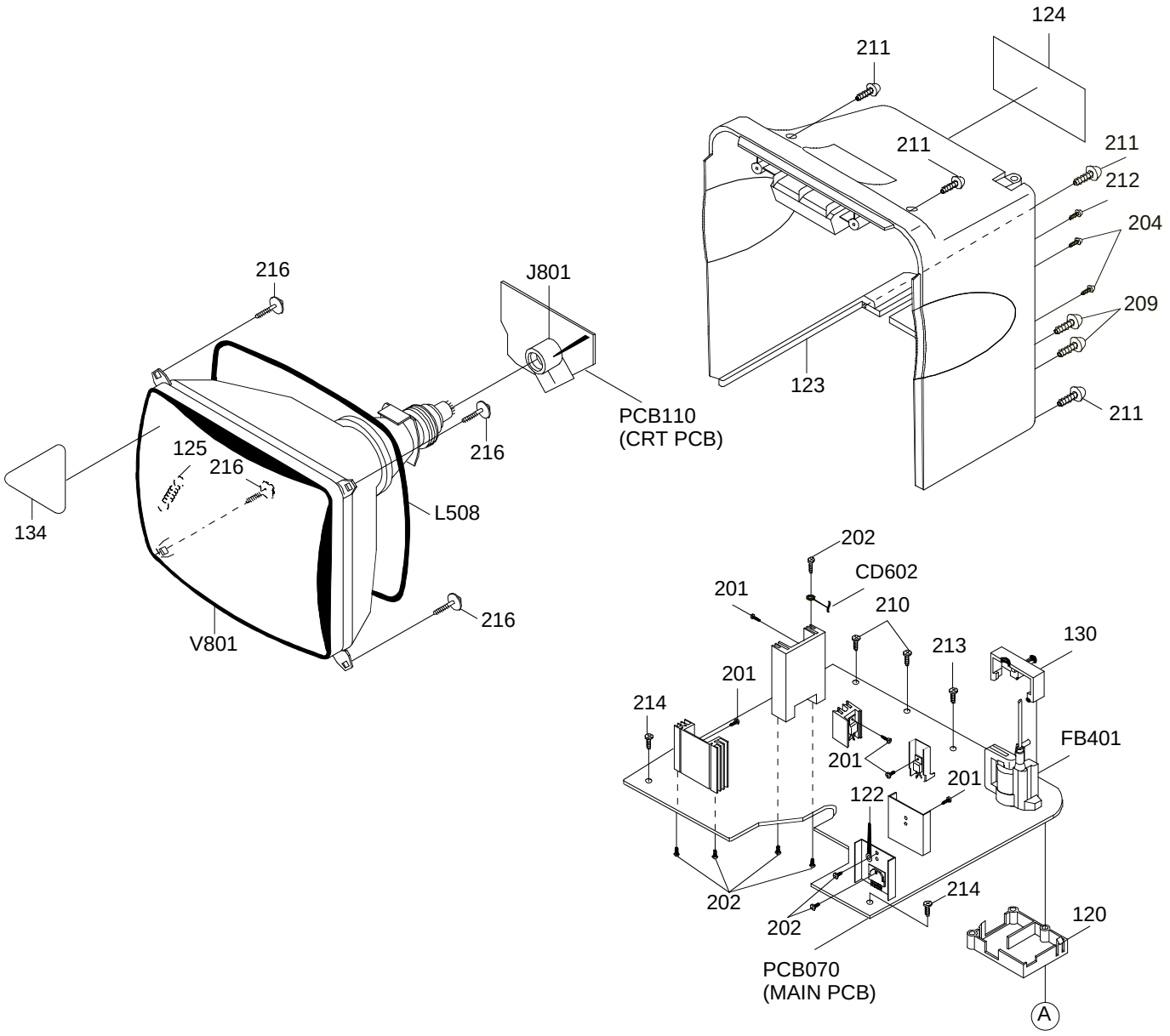
SOUND AMP

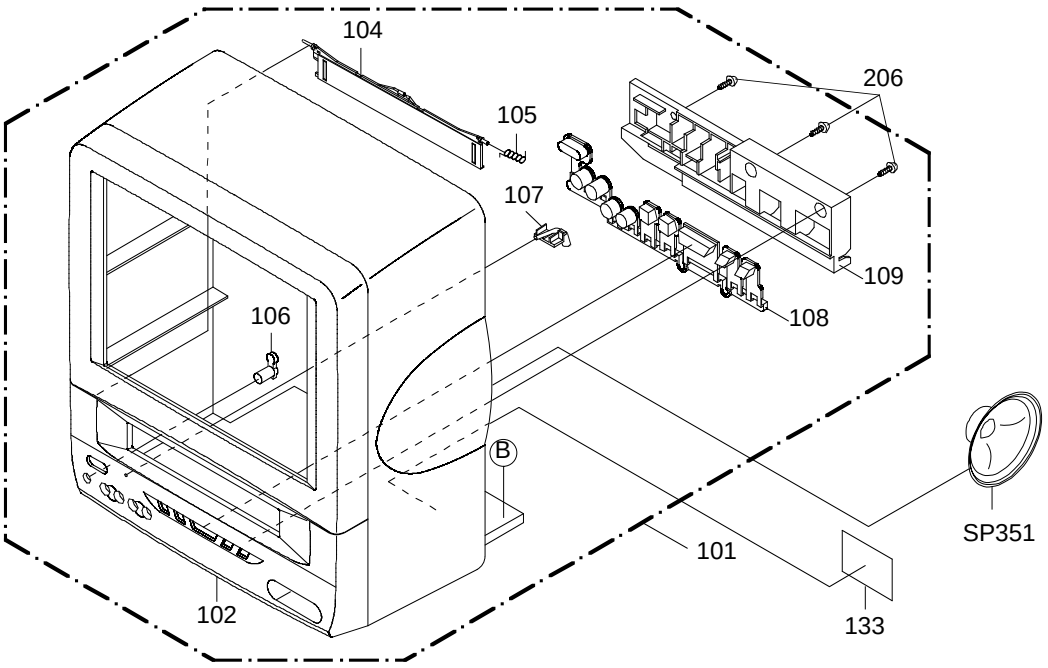


(27) 200mV 2ms/div

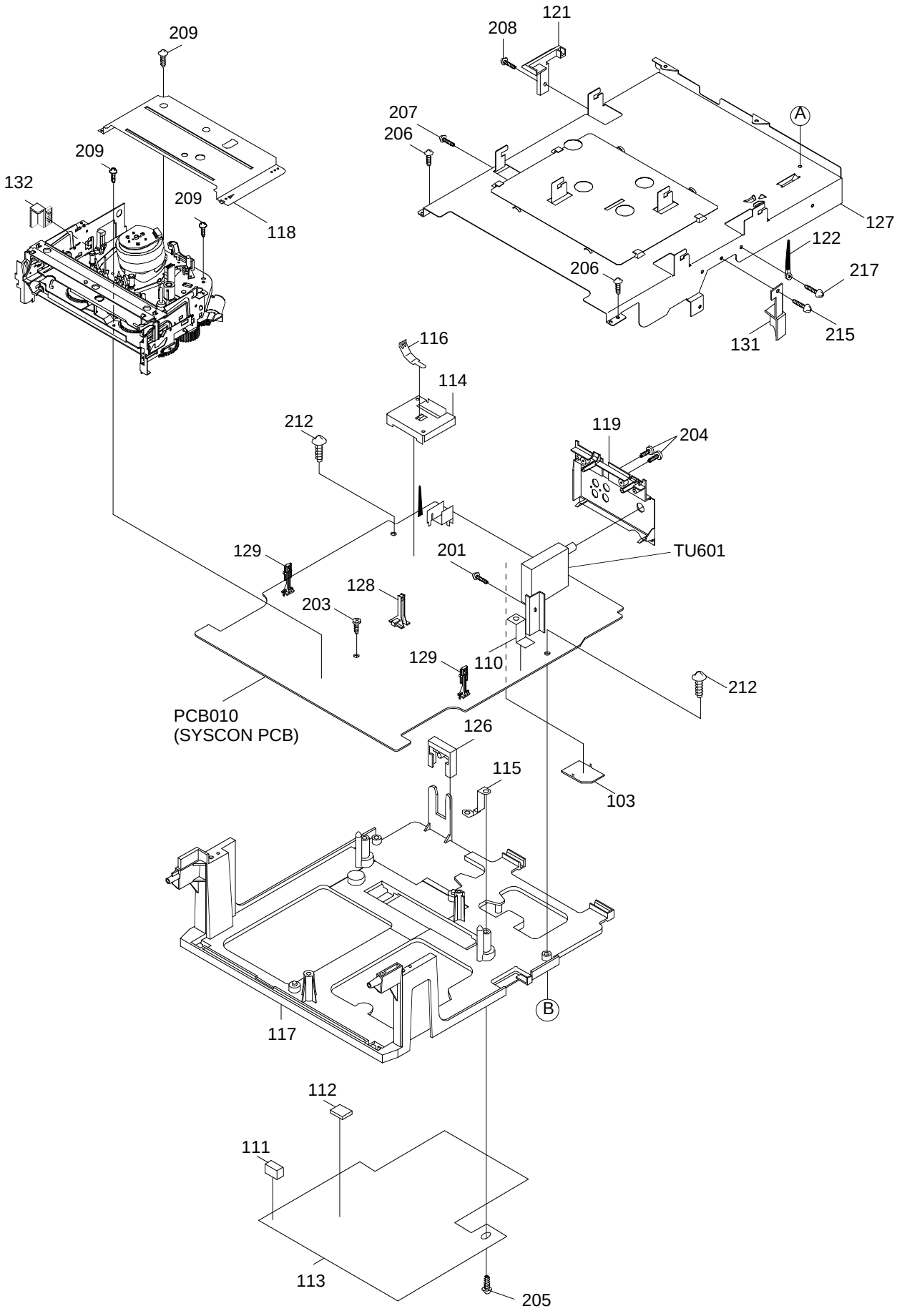
NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

MECHANICAL EXPLODED VIEW

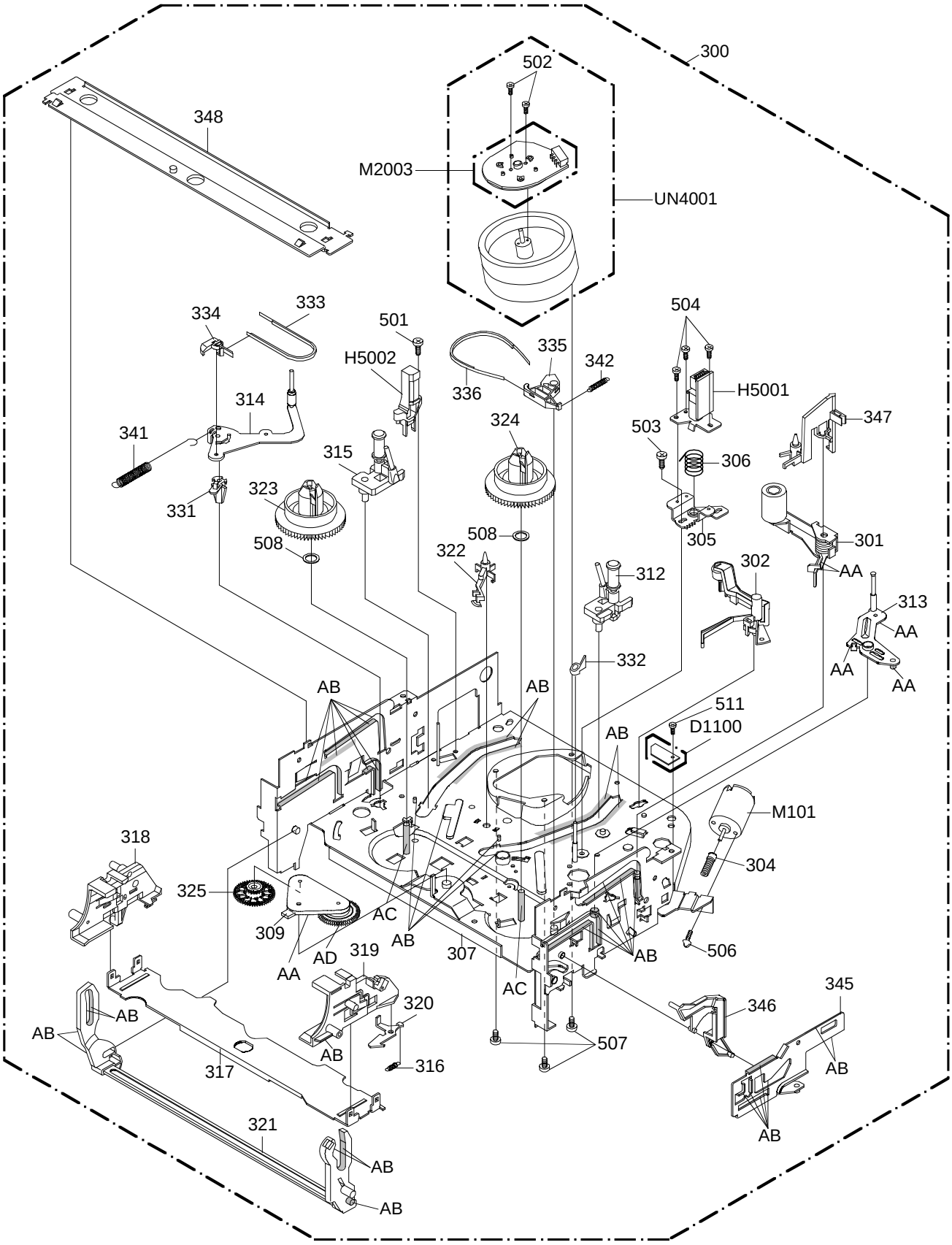




MECHANICAL EXPLODED VIEW



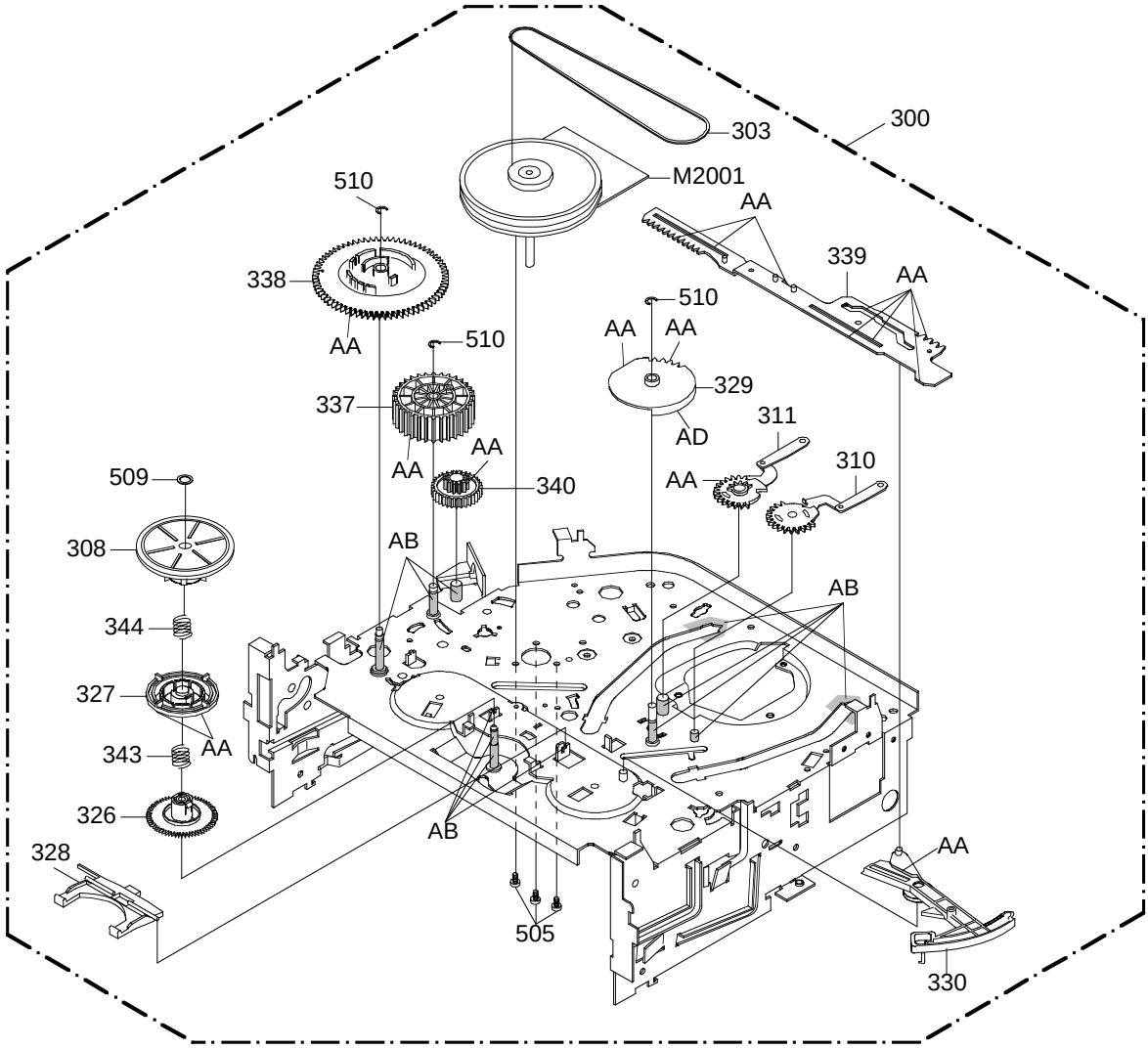
CHASSIS EXPLODED VIEW (TOP VIEW)



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

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

CHASSIS EXPLODED VIEW (BOTTOM VIEW)



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

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

MECHANICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION		
101	A5B004I720	CABINET,FRONT ASS'Y		
102	701WPJB521	CABINET,FRONT		
103	752WSAA033	SHIELD,IC		
104	712WPJB073	FLAT,FLAP		
105	743WKA0032	SPRING,FLAP(COMBO)		
106	713WPA0136	GUIDE,REMOCON		
107	713WPA0135	GLASS,LED		
108	735WPBA257	BUTTON,FRAME		
109	738WPAA009	BUTTON,BASE		
110	753WSA0118	PLATE,EARTH-SYSCON		
111	800WFA0037	CUSHION		15x5xT=6
112	800WFA0038	CUSHION		10x10xT=2
113	752WSAA028	SHIELD BOTTOM		
114	752WSA0230	SHIELD,CASE HEAD AMP		
115	753WSA0144	PLATE,BOTTOM-EARTH		
116	753WUAA006	SPRING,EARTH HEAD AMP		
117	761WPA0230	HOLDER,DECK		
118	752WSA0263	SHIELD,COVER DECK		
119	771WPA0255	PLATE,JACK		
120	761WPA0223	HOLDER,FBT		
121	761WPA0232	HOLDER,M/PCB		
122	8995034000	CORD CLIP UL CO.		
123	702WPAA199	CABINET,BACK		
124	722A08A099	SHEET,RATING		
125	741WUA0002	SPRING,EARTH		
126	761WPA0231	HOLDER,BUSH		
127	752WSA0251	PLATE,DECK SHIELD		
128	85OP700037	HOLDER,LED		
129	85OP700038	HOLDER,END SENSOR		
130	761WPAA052	COVER FBT		
131	755WPAA012	PLATE,COVER LIGHT (L)		
132	755WPAA013	PLATE,COVER LIGHT (R)		
133	7260000330	SHEET,CRT SERVICEMAN		
134	723000B559	FILM,DECORATION		
201	8109I30A04	SCREW,TAP TITE(B)	WH7	3x10
202	8109630802	SCREW,TAP TITE(B)	BRAZIER	3x8
203	8110330804	SCREW,TAP TITE(P)	FLAT	3x8
204	8110630A04	SCREW,TAP TITE(P)	BRAZIER	3x10
205	8110630604	SCREW,TAP TITE(P)	BRAZIER	3x6
206	8110630804	SCREW,TAP TITE(P)	BRAZIER	3x8
207	8107226604	SCREW,TAP TITE(S)	BIND	2.6x6
208	8107230804	SCREW,TAP TITE(S)	BIND	3x8
209	8110630A24	SCREW,TAP TITE(P)	BRAZIER	3x12
210	8107930604	SCREW,CUP(S)		3x6
211	8117540A64	SCREW,TAPPING(B0)	TRUSS	4x16
212	8117540B04	SCREW,TAPPING(B0)	TRUSS	4x20
213	8107630B04	SCREW,TAP TITE(S)	BRAZIER	3x20
214	8107630604	SCREW,TAP TITE(S)	BRAZIER	3x6
215	8107630804	SCREW,TAP TITE(S)	BRAZIER	3x8
216	8141J40B84	SCREW,TAP TITE(P)	GW15	4x28
217	8107230604	SCREW,TAP TITE(S)	BIND	3x6
---	JA5K0200	POLYBAG		
---	J5B00401	INSTRUCTION BOOK		
---	J5780102	WARRANTY SHEET		
---	A5B004I975	INSTRUCTION BOOK KIT		
---	791WHA0023	LAMIFILM BAG		
---	792WHA0299	PACKAGE,TOP		
---	792WHA0300	PACKAGE,BOTTOM		
---	793WCDB001	GIFT BOX		

CHASSIS REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION		REF. NO.	PART NO.	DESCRIPTION	
300	A5B005B420A	DECK ASS'Y	A5B005B420A	501	8107226804	SCREW,TAP TITE(S) BIND	2.6x8
				502	810A123504	SEMS A	M2.3x5.0
301	85OA400227	PINCH ROLLER BLOCK		503	8107226404	SCREW,TAP TITE(S) BIND	2.6x4
302	85OA500026	AHC ASS'Y		504	8102120604	SCREW,PAN	M2x6
303	85OP200290	BELT,CAPSTAN (S)		505	8109126604	SCREW,TAP TITE(B) PAN	2.6x6
304	85OP600581	WORM		506	810A130404	SCREW/WASHER(A)	M3x4
305	85OP500083	BASE,AC HEAD		507	810A126504	SCREW/WASHER(A)	M2.6x5
306	85OP800324	SPRING,AC HEAD		508	82Q264713N	POLYSLIDER WASHER	2.6x4.7xT0.13
307	85OA000459	MAIN CHASSIS ASS'Y		509	82P184505N	POLYSLIDER WASHER(CUT)	1.8x4.5xT0.5
308	85OA200089	CLUTCH ASS'Y					
309	85OA200090	ARM IDLER ASS'Y		510	83ETW30000	E-RING	3.0
				511	8107226604	SCREW,TAP TITE(S) BIND	2.6x6
310	85OA300065	LOADING ARM S UNIT					
311	85OA300066	LOADING ARM T UNIT		CD1501	122H071603	CORD JUMPER	SMCD-7X151
312	85OA400223	INCLINED BASE T UINT 3S		CD1502	122Y021902	CORD JUMPER	2Y021902
313	85OA400232	P5 ARM ASS'Y 2		D1100	DAK0000170	DEW SENSORCW/AL,PLATE	HDP-05-26
314	85OA400233	TENSION ARM ASS'Y (WT)		H5001	1523D91034	HEAD (AUDIO CONTROL)	HVMXA1072A
315	85OA400231	INCLINED BASE S UNIT		H5002	1543D02013	HEAD (FULL ERASE)	HVFHP0032A
316	85OP800358	SPRING,LOCKER		⚠ M101	1596P98001	MOTOR (LOADING)	MXN13FB12K3
317	85OP900736	CASS,HOLDER		⚠ M2001	1510S98036	CAPSTAN DD UNIT	F2QVB08
318	85OP900748	CASS,SIDE L		⚠ M2003	1589S11014	MICRO MOTOR	I2OAL03
319	85OP900749	CASS,SIDE R		⚠ UN4001	A4E104A500	CYLINDER UNIT ASS'Y	A4E104A500
320	85OP900739	LOCKER,R					
321	85OA900228	LINK UNIT					
322	85OP000496	POST,CASS GUIDE					
323	85OP200291	REEL,S (S)					
324	85OP200292	REEL,T (S)					
325	85OP200308	GEAR,IDLER					
326	85OP200311	GEAR,CLUTCH					
327	85OP200312	GEAR,COUPLING					
328	85OP200313	LEVER,CLUTCH					
329	85OP300194	GEAR,MAIN LOADING					
330	85OP400490	LEVER,TENSION					
331	85OP400492	HOLDER,TENSION					
332	85OP400520	CAP.P4					
333	85OP400532	BAND,TENSION					
334	85OP400533	CONNECT,TENSION					
335	85OP600573	ARM,BRAKE T					
336	85OP600574	BAND,BRAKE T					
337	85OP600577	CAM,PINCH ROLLER					
338	85OP600578	CAM,MAIN					
339	85OP600579	ROD,MAIN					
340	85OP600582	GEAR,JOINT					
341	85OP800322	SPRING,TENSION					
342	85OP800350	SPRING,BRAKE T					
343	85OP800355	SPRING,COUPLING					
344	85OP800356	SPRING,RING					
345	85OP900750	LEVER,LINK 2					
346	85OP900744	LEVER,FLAP					
347	85OP900745	CASS,OPENER					
348	85OP900746	BRACKET,TOP 3V					

ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	
		RESISTORS	
⚠ R404	R4X5T6152F	R,METAL	1.5K OHM 1/6W
R409	R3X181271J	R,METAL OXIDE	270 OHM 1W
⚠ R439	R4X5T6273F	R,METAL	27K OHM 1/6W
⚠ R440	R4X5T6822F	R,METAL	8.2K OHM 1/6W
⚠ R441	R4X5T6104F	R,METAL	100K OHM 1/6W
⚠ R442	R4X5T6123F	R,METAL	12K OHM 1/6W
⚠ R443	R4X5T6183F	R,METAL	18K OHM 1/6W
⚠ R447	R65582151J	R,FUSE	150 OHM 1/2W
⚠ R450	R65581100J	R,FUSE	10 OHM 1W
⚠ R500	R0G3K2275K	RC	2.7M OHM 1/2W
⚠ R501	R5X2CD010J	R,CEMENT	1 OHM 5W
⚠ R502	R3X28B100J	R,METAL OXIDE	10 OHM 3W
⚠ R505	R002T2563J	RC	56K OHM 1/2W
⚠ R511	R002T4105J	RC	1M OHM 1/4W
⚠ R513	R002T4102J	RC	1K OHM 1/4W
⚠ R520	R002T4102J	RC	1K OHM 1/4W
⚠ R528	R63581R22J	R,FUSE	0.22 OHM 1W
⚠ R529	R002T4272J	RC	2.7K OHM 1/4W
⚠ R530	R3X181R22J	R,METAL OXIDE	0.22 OHM 1W
⚠ R545	R3X181331J	R,METAL OXIDE	330 OHM 1W
⚠ R547	R3X28B6R8J	R,METAL OXIDE	6.8 OHM 3W
⚠ R802	R3X181153J	R,METAL OXIDE	15K OHM 1W
⚠ R805	R3X181153J	R,METAL OXIDE	15K OHM 1W
⚠ R810	R3X181153J	R,METAL OXIDE	15K OHM 1W
		CAPACITORS	
C354	E0EL02332M	CE	3300 UF 16V
⚠ C406	E5EZU4101M	CE	100 UF 35V
⚠ C407	E02LF3102M	CE	1000 UF 25V
C414	P21503475K	CMP	4.7 UF 250V ECQ-E
C421	E5EZ04102M	CE	1000 UF 35V
⚠ C422	E5EZTD010M	CE	1 UF 250V
⚠ C423	P447F2274J	CMPP	0.27 UF 200V FHS
⚠ C424	P4N8FJ682H	CMPP	0.0068UF 1.25KV
C425	C03L0R7Q2K	CC	470 PF 2KV R
C426	C03L0R713K	CC	0.001 UF 2KV R
C430	C03L0R713K	CC	0.001 UF 2KV R
⚠ C433	E02LU8220M	CE	22 UF 100V
⚠ C502	C0JBB05H3K	CC	0.0022UF 500V B
⚠ C503	C0JBB05H3K	CC	0.0022UF 500V B
⚠ C505	P2472B224M	CMP	0.22UF 275V PHE840
⚠ C507	E62NFC221M	CE	220 UF 200V
C513	C03L0R713K	CC	0.001 UF 2KV R
C515	E62FF3152M	CE	1500 UF 25V
C518	C03L0R7H3K	CC	0.0022UF 2KV R
C523	CB3930MQ3M	CC	0.0047UF 250V
C525	C03L0R7Q2K	CC	470 PF 2KV R
⚠ C534	E62NFB101M	CE	100 UF 160V
C535	E5EZF2222M	CE	2200 UF 16V
⚠ C536	E5EZT3471M	CE	470 UF 25V
⚠ C537	E5EZF3102M	CE	1000 UF 25V
⚠ C538	E02LU5470M	CE	47 UF 50V
⚠ C540	E02LU50R1M	CE	0.1 UF 50V
C544	E5EZF3102M	CE	1000 UF 25V
C546	C03L0R7H3K	CC	0.0022UF 2KV R
C551	E62FF3152M	CE	1500 UF 25V
C801	C03L0R713K	CC	0.001 UF 2KV R
		DIODES	
D401	D2WT011E10	DIODE SILICON	11E1-EIC
D402	D2LTPG06J0	DIODE SILICON	RMPG06J-G3
D404	D1VT001330	DIODE,SILICON	1SS133T-77
D405	D1VT001330	DIODE,SILICON	1SS133T-77
D406	D97U03001B	DIODE,ZENER	MTZJ30B T-77
D407	D97U03001B	DIODE,ZENER	MTZJ30B T-77
⚠ D408	D94TA27011	DIODE ZENER	HZ27-1L TD
⚠ D409	D94TA11B13	DIODE ZENER	HZ11B3L TD
⚠ D411	D2LTPG06J0	DIODE SILICON	RMPG06J-G3
⚠ D412	D2LTPG06J0	DIODE SILICON	RMPG06J-G3
⚠ D413	D2LTPG06J0	DIODE SILICON	RMPG06J-G3
D414	D2WT011E10	DIODE SILICON	11E1-EIC
D501	D97U01001B	DIODE,ZENER	MTZJ10B T-77
D502	D1VT001330	DIODE,SILICON	1SS133T-77
⚠ D503	D2WTRM11C0	DIODE SILICON	RM11C-EIC
⚠ D504	D2WTRM11C0	DIODE SILICON	RM11C-EIC
D505	D94TA27011	DIODE ZENER	HZ27-1L TD
D506	D230PF6DT0	DIODE SILICON	FEPF6DT
⚠ D507	D97U01801B	DIODE,ZENER	MTZJ18B T-77
D508	D1VT001330	DIODE,SILICON	1SS133T-77

REF. NO.	PART NO.	DESCRIPTION	
		DIODES	
⚠ D509	D2WXRU2AM0	DIODE SILICON	RU2AM-EIC
⚠ D510	D2WXRU2AM0	DIODE SILICON	RU2AM-EIC
D511	D28TELS6N6	DIODE RECTIFER	10ELS6N-TA1B2
D512	D2WT011E10	DIODE SILICON	11E1-EIC
D513	D1VT001330	DIODE,SILICON	1SS133T-77
D514	D1VT001330	DIODE,SILICON	1SS133T-77
⚠ D515	D97U03301B	DIODE,ZENER	MTZJ33B T-77
D516	D1VT001330	DIODE,SILICON	1SS133T-77
D517	D1VT001330	DIODE,SILICON	1SS133T-77
D518	D2LTPG06J0	DIODE SILICON	RMPG06J-G3
D519	D1VT001330	DIODE,SILICON	1SS133T-77
D520	D1VT001330	DIODE,SILICON	1SS133T-77
D521	D2WXB290S0	DIODE SILICON	SB290S
D522	D97U01601B	DIODE ZENER	MTZJ16B T-77
D523	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D524	D1VT001330	DIODE,SILICON	1SS133T-77
D525	D1VT001330	DIODE,SILICON	1SS133T-77
D528	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D530	D1VT001330	DIODE,SILICON	1SS133T-77
⚠ D531	D2WXB290S0	DIODE SILICON	SB290S
D533	D1VT001330	DIODE,SILICON	1SS133T-77
D534	D97U01801B	DIODE,ZENER	MTZJ18B T-77
⚠ D535	D2WTRM11C0	DIODE SILICON	RM11C-EIC
⚠ D536	D2WTRM11C0	DIODE SILICON	RM11C-EIC
⚠ D537	D28TELS2N2	DIODE RECTIFER	10ELS2N-TA1B2
⚠ D539	D2WT011E10	DIODE SILICON	11E1-EIC
⚠ D540	D2WT011E10	DIODE SILICON	11E1-EIC
⚠ D541	D2WT011E10	DIODE SILICON	11E1-EIC
⚠ D542	D28TELS2N2	DIODE RECTIFER	10ELS2N-TA1B2
⚠ D545	D2WXB290S0	DIODE SILICON	SB290S
D546	D1VT001330	DIODE,SILICON	1SS133T-77
D547	D1VT001330	DIODE,SILICON	1SS133T-77
⚠ D548	D1VT001330	DIODE,SILICON	1SS133T-77
D550	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D551	D97U02R21B	DIODE,ZENER	MTZJ2.2B T-77
D601	D1VT001330	DIODE,SILICON	1SS133T-77
D602	D97U08R21B	DIODE,ZENER	MTZJ8.2B T-77
D603	D1VT001330	DIODE,SILICON	1SS133T-77
D604	D1VT001330	DIODE,SILICON	1SS133T-77
D605	D2WXN40050	DIODE SILICON	1N4005-EIC
D606	D1VT001330	DIODE,SILICON	1SS133T-77
D608	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D611	D97U09R11B	DIODE,ZENER	MTZJ9.1B T-77
D613	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D614	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D615	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D616	D1VT001330	DIODE,SILICON	1SS133T-77
D617	D1VT001330	DIODE,SILICON	1SS133T-77
D618	D1VT001330	DIODE,SILICON	1SS133T-77
D1001	D1VT001330	DIODE,SILICON	1SS133T-77
D1002	D1VT001330	DIODE,SILICON	1SS133T-77
D1003	0010100320	INFRARED LED	LNA2702L010R
D1004	D97U05R61C	DIODE,ZENER	MTZJ5.6C T-77
D1005	D2WXSB1400	DIODE SCHOTTKY	SB140-EIC
D1006	D2WXSB1400	DIODE SCHOTTKY	SB140-EIC
D1010	D1VT001330	DIODE,SILICON	1SS133T-77
D3003	D2WXN40050	DIODE SILICON	1N4005-EIC
D3005	D2WXN40050	DIODE SILICON	1N4005-EIC
D4201	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D4206	D97U01301B	DIODE,ZENER	MTZJ13B T-77
D4209	D1VT001330	DIODE,SILICON	1SS133T-77
D4210	D1VT001330	DIODE,SILICON	1SS133T-77
D4211	0021721150	LED	SLR-342VCT32
D4212	0021721150	LED	SLR-342VCT32
D4213	0021721150	LED	SLR-342VCT32
		ICS	
IC351	I01DP75110	IC	AN7511
⚠ IC401	I01TD55220	IC	AN5522
⚠ IC501	I1KA97805A	IC	KIA7805API
⚠ IC504	I0QD023680	IC	NJM2368D
⚠ IC506	0002E00610	PHOTO COUPLER	LTV-817M-VB
IC601	I06FC61206	IC	M61206FP
IC1001	I56F57071A	IC	OEC7071A
IC1003	IC7J0311A0	IC	R3111N311A/C-TR
IC1099	A5B004B015	IC	S-24C04BDP-LA
IC3002	I1KA98R050	IC	KIA78R05PI
IC4001	I03F301MN0	IC	LA71201M-N-MPB

ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	
TRANSISTORS			
Q401	TPATB03003	COMPOUND TRANSISTOR	KRA102MAT
Q402	TF2002P4M0	THYRISTOR	2P4M
Q404	TNATJ03003	COMPOUND TRANSISTOR	KRC111MAT
⚠ Q405	TC5T01627Y	TRANSISTOR SILICON	2SC1627_Y(TPE2)
⚠ Q406	TD30026270	TRANSISTOR SILICON	2SD2627LS-CBC11
Q407	TPATB03003	COMPOUND TRANSISTOR	KRA102MAT
Q408	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
Q501	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
⚠ Q502	TC5T021204	TRANSISTOR,SILICON	2SC2120Y(TPE2)
Q503	TNATJ03003	COMPOUND TRANSISTOR	KRC111MAT
⚠ Q505	T410029030	FET	2SK2903-01MR
Q507	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
Q509	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
Q510	TJXG5NC500	FET	STP5NC50FP
Q511	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
Q512	TAAT012714	TRANSISTOR, SILICON	KTA1271_Y-AT
Q514	TNYTB03001	COMPOUND TRANSISTOR	DTC114ESTP
Q516	TNATJ03003	COMPOUND TRANSISTOR	KRC111MAT
Q517	TAAT012714	TRANSISTOR, SILICON	KTA1271_Y-AT
Q518	TNYTB03001	COMPOUND TRANSISTOR	DTC114ESTP
Q601	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q602	TPAAB05001	COMPOUND TRANSISTOR	KRA102SRTK
Q603	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S
Q604	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S
Q612	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S
⚠ Q804	TCAT032070	TRANSISTOR SILICON	KTC3207-AT
⚠ Q805	TCAT032070	TRANSISTOR SILICON	KTC3207-AT
⚠ Q806	TCAT032070	TRANSISTOR SILICON	KTC3207-AT
Q1001	0002700690	PHOTO COUPLER	RPI-303 or
	0002700590	PHOTO COUPLER	RPI-301
Q1003	0002700680	PHOTO COUPLER	RPI-352C40N or
	0002700670	PHOTO COUPLER	RPI-352Q02
Q1004	TNAAC05002	COMPOUND TRANSISTOR	KRA103SRTK
Q1005	0002700690	PHOTO COUPLER	RPI-303 or
	0002700590	PHOTO COUPLER	RPI-301
Q1006	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q1008	0000M00390	PHOTO TRANSISTOR	ST-304L
Q1009	0002700680	PHOTO COUPLER	RPI-352C40N or
	0002700670	PHOTO COUPLER	RPI-352Q02
Q1013	0000M00390	PHOTO TRANSISTOR	ST-304L
Q1024	TNAAC05002	COMPOUND TRANSISTOR	KRA103SRTK
Q3001	TB3T011310	TRANSISTOR SILICON	2SB1131(S,T)-AE
Q3002	TNAAB05003	COMPOUND TRANSISTOR	KRA102SRTK
Q3005	TDWT00400E	TRANSISTOR SILICON	2SD400E
Q3006	TDWT00400E	TRANSISTOR SILICON	2SD400E
Q3007	TDWT00400E	TRANSISTOR SILICON	2SD400E
Q4001	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
Q4002	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
Q4003	TPAAC05002	COMPOUND TRANSISTOR	KRA103SRTK
Q4005	TAATA12660	TRANSISTOR,SILICON	KTA1266-AT(Y,GR)
Q4006	TCAT032034	TRANSISTOR, SILICON	KTC3203_Y-AT
Q4007	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S
Q4009	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q4010	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q4011	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S
Q4012	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S
Q4203	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S
Q4204	TNAAB05003	COMPOUND TRANSISTOR	KRC102SRTK
Q4205	TNAAB05003	COMPOUND TRANSISTOR	KRC102SRTK
Q4206	TNAAB05003	COMPOUND TRANSISTOR	KRC102SRTK
Q4210	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q4212	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
COILS &TRANSFORMERS			
L401	021679472K	COIL	4.7 MH
⚠ L501	029T000092	COIL,LINE FILTER	1R0A103F24
L503	021767100K	COIL	10 UH
⚠ L508	028R090008	COIL,DEGAUSS	8R090008
L602	02167F101J	COIL	100 UH
L603	02167F470J	COIL	47 UH
L604	02A6A8A0A1	CORE,FERRITE	HF57T18.5*10*10
L607	021LA6220K	COIL	22 UH
L608	02167F101J	COIL	100 UH
L613	021LA63R3K	COIL	3.3 UH
L614	021LA6151K	COIL	150 UH
L618	0331920018	COIL	3192001
L801	021673101K	COIL	100 UH
L1001	021LA62R2K	COIL	2.2 UH

REF. NO.	PART NO.	DESCRIPTION	
COILS &TRANSFORMERS			
L4001	02167F220J	COIL	22 UH
L4003	02167F101J	COIL	100 UH
L4004	02167F220J	COIL	22 UH
L4005	02167F470J	COIL	47 UH
L4006	02167F470J	COIL	47 UH
L4007	0326230038	COIL,TRAP	2623003
L4201	021LA6101K	COIL	100 UH
L4205	02167F101J	COIL	100 UH
T401	045009003J	TRANS,HORIZONTAL DRIVE	ETH09K14BZ
⚠ T501	0481290834	TRANSFORMER,SWITCHING	81290834
⚠ T502	0481290824	TRANSFORMER,SWITCHING	81290824
T4001	031626009R	COIL,BIAS OSC	1626009
JACKS			
J351	060J131015	HEADPHONE JACK	MSJ-2000
⚠ J352	060J131015	HEADPHONE JACK	MSJ-2000
⚠ J503	0602602006	JACK DC	HEC0824-010010
⚠ J801	066X120014	SOCKET,CRT	HPS3200-010501
J4201	060Q401050	RCA JACK	AV2-20D-2
J4202	060Q401050	RCA JACK	AV2-20D-2
J4204	060Q401076	RCA JACK	AV1-09D-4
J4205	060Q401077	RCA JACK	AV1-09D-3
SWITCHES			
SW1001	0508A11002	SWITCH(LEAF)	MXS01380MPP0
SW4202	0504101T34	SWITCH,TACT	EVQ21505R
SW4203	0504101T34	SWITCH,TACT	EVQ21505R
SW4204	0504101T34	SWITCH,TACT	EVQ21505R
SW4205	0504101T34	SWITCH,TACT	EVQ21505R
SW4206	0504101T34	SWITCH,TACT	EVQ21505R
SW4207	0504101T34	SWITCH,TACT	EVQ21505R
SW4208	0504101T34	SWITCH,TACT	EVQ21505R
SW4209	0504101T34	SWITCH,TACT	EVQ21505R
SW4210	0504101T34	SWITCH,TACT	EVQ21505R
SW4211	0504101T34	SWITCH,TACT	EVQ21505R
VARIABLE RESISTORS			
VR402	V1263Q3BT7	VOLUME,SEMI FIXED	RH0683CS3R
VR501	V1163H3BTC	VOLUME,SEMI FIXED	EVNCYAA03BE3
VR502	V1163Q3BTC	VOLUME,SEMI FIXED	EVNCYAA03BQ3
P.C.BOARD ASSEMBLIES			
⚠ PCB010	A5B004I010	PCB ASS'Y	VMA238A
⚠ PCB070	A5B003I070	PCB ASS'Y	TMA522A
⚠ PCB110	A5B003I110	PCB ASS'Y	TCA378A
MISCELLANEOUS			
ANT001	125C108027	ANTENNA ROD	T4-216BNK-BK
B302	024HT03553	CORE,BEADS	W5RH3.5X5X1.0
B501	024HT03563	CORE,BEADS	W4BRH3.5X6X1.0X2
B502	024HT03553	CORE,BEADS	W5RH3.5X5X1.0
B503	024HT03563	CORE,BEADS	W4BRH3.5X6X1.0X2
B505	024HT03553	CORE,BEADS	W5RH3.5X5X1.0
B507	024HT03553	CORE,BEADS	W5RH3.5X5X1.0
B602	024HT03564	CORE,BEADS	W4BRH3.5X6X1
CD351	06CH12437A	CORD CONNECTOR	CH12437A
⚠ CD501	120R414903	CORD AC BUSH	0R414903
⚠ CD504	121B164101	CORD,CAR BATTERY	SI-PC107-67
CD601	067U012039	WIRE HOLDER	B2013H02-12P
CD601	WKL6028038	FLAT CABLE	AWG26 12C BLACK 280MM
CD602	06CL013002	CORD CONNECTOR	CL013002
CD603	06CH01423A	CORD CONNECTOR	CH01423A
CD604	06CH01429A	CORD EIS CONNECTOR	CH01429A
CD801	068M82025A	CORD CONNECTOR	8M82025A
CD803	WDL6017038	FLAT CABLE	AWG26 6C BLACK 170MM
CD810	067U011029	WIRE HOLDER	B2013H02-11P
CD810	WJL6835038	FLAT CABLE	AWG26 11C GRAY 350MM
CD850	067U005049	WIRE HOLDER	B2013H02-5P
CD850	WCL6834038	FLAT CABLE	AWG26 5C GRAY 340MM
CF601	1022045R72	FILTER,SAW	SAFGP45M7VFYZR0B or
	1022T45R72	FILTER,SAW	SAF45MFY220ZR
CF603	1011T4R504	FILTER,CERAMIC	EFCT4R5YS5A
CF604	1011T4R517	FILTER,CERAMIC	EFCT4R5MW5
CP353	069X120249	CONNECTOR PCB SIDE	B2B-EH-A
⚠ CP401	069X440029	CONNECTOR PCB SIDE	B04B-DVS
CP402	069W01001A	CONNECTOR PCB SIDE	003P-2100
⚠ CP403	069S420110	CONNECTOR PCB SIDE	A1561WV2-2P
CP502	069R2B0589	CONNECTOR PCB SIDE	52147-1110
CP602	069E270129	CONNECTOR PCB SIDE	8283_0712_00_000
CP801	069S320010	CONNECTOR PCB SIDE	A2361WV2-2P
CP820	069R2C0589	CONNECTOR PCB SIDE	52147-1210
CP850	069R250589	CONNECTOR PCB SIDE	52147-0510

ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION		
		MISCELLANEOUS		
	CD4001	122F061502	CORD JUMPER	2F061502
	CP1001	069R220021	CONNECTOR PCB SIDE	52287-0211
	CP1002	06972C0010	CONNECTOR PCB SIDE	TMC-J12P-B2
	CP4001	0697240600	CONNECTOR PCB SIDE	TOC-C04X-B1
	CP4002	069J760029	CONNECTOR PCB SIDE	IMSA-9604S-06Z14
	CP4003	0697120320	CONNECTOR PCB SIDE	TMC-T02X-E1
	CP803A	067U006049	WIRE HOLDER	B2013H02-6P
	CP803B	069R260589	CONNECTOR PCB SIDE	52147-0610
	CUS011	800WFAA006	CUSHION A	
⚠	DY801	0271080901	DY	KDY3CFB23M
⚠	F501	081PC05004	FUSE	51MS050LCC
⚠	F502	081PC2R504	FUSE	51MS025LCC
⚠	FB401	043210013F	TRANSFORMER,FLYBACK	3210013F
	FH501	06710T0006	HOLDER,FUSE	EYF-52BC
	FH502	06710T0006	HOLDER,FUSE	EYF-52BC
	FH503	06710T0006	HOLDER,FUSE	EYF-52BC
	FH504	06710T0006	HOLDER,FUSE	EYF-52BC
⚠	ICP502	083PC10002	MICRO FUSE	251010
⚠	K001	1291000016	WEDGE	TMM17538
⚠	K002	1291000016	WEDGE	TMM17538
⚠	K003	1291000016	WEDGE	TMM17538
	OS4201	077Q004017	REMOTE RECEIVER	PIC-37243SR
⚠	RY503	0560V10118	RELAY	ALKS325
⚠	SP351	070C732002	SPEAKER	SG08G26BNB or
		070W132003	SPEAKER	NS-300RW
	TM101	076R0CG020	TRANSMITTER	R25-1729
⚠	TU601	0145K00055	TUNER,VHF-UHF	TECC1040PG32D
⚠	V801	09D1090401	CRT W/O DY	A22JWG098X
	X602	100CT3R505	CRYSTAL HC-49/C	3.579545MHz
	X1001	100CT01207	CRYSTAL HC-49/U-S	12MHz
	X1002	100DA32R01	CRYSTAL DT-26	32.768KHz
	X4001	100CT3R508	CRYSTAL HC-49/U	3.579545MHz

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

SPEC.NO.	M5B0-04I
O/R NO.	W1Y5008