

Zentralwerkstatt und
Ersatzteildepot
für ORION-Produkte

**Schwalbe**
Service & Versand GmbH

Postfach 10 10 26
63264 Dreieich
Max-Planck-Str. 20
63303 Dreieich

Ersatzteil-Bestellung

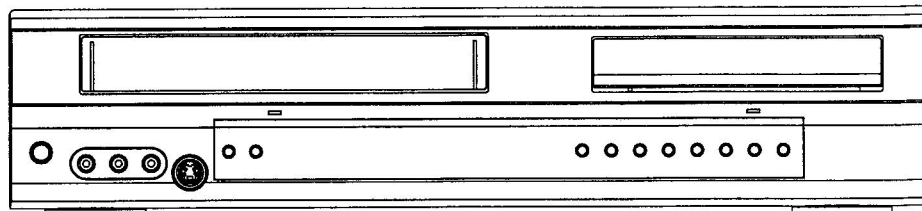
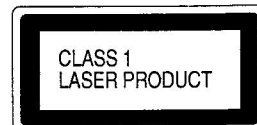
Tel.: (06103) 39 99-95 Fax.: (06103) 39 99-79

SERVICE MANUAL

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Teil 1 ORION VDR-4002

DVD-RW RECORDER & VHS VIDEO CASSETTE RECORDER



ORIGINAL CHASSIS CODE A

Best. Nr. SM4002

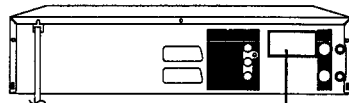
Design and specifications are subject to change without notice.

IMPORTANT WARNING

CAUTION:

DVD PLAYER IS A CLASS 1 LASER PRODUCT. HOWEVER THIS PLAYER USES A VISIBLE LASER BEAM WHICH COULD CAUSE HAZARDOUS RADIATION EXPOSURE IF DIRECTED. BE SURE TO OPERATE THE PLAYER CORRECTLY AS INSTRUCTED.

THE FOLLOWING CAUTION LABEL IS LOCATED ON THE REAR PANEL OF THE PLAYER.



(Printed on the Rear Panel)

WHEN THIS PLAYER IS PLUGGED TO THE WALL OUTLET, DO NOT PLACE YOUR EYES CLOSE TO THE OPENING OF THE DISC TRAY AND OTHER OPENINGS TO LOOK INTO THE INSIDE OF THIS PLAYER.

USE OF CONTROLS OR ADJUSTMENTS OR PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

DO NOT OPEN COVERS AND DO NOT REPAIR YOURSELF. REFER SERVICING TO QUALIFIED PERSONNEL.

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. USE THE DESIGNATED PARTS

The parts in this equipment have the specific characters of incombustibility and withstand voltage for safety. Therefore, the part which is replaced should be used the part which has the same character.

Especially as to the important parts for safety which is indicated in the circuit diagram or the table of parts as a \triangle mark, the designated parts must be used.

3. 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.

4. 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.

HOW TO ORDER PARTS

Please include the following informations when you order parts. (Particularly the CHASSIS CODE.)

1. MODEL NUMBER and CHASSIS CODE

The MODEL NUMBER can be found on the back of each product and the CHASSIS CODE can be found at the end of the SERIAL NUMBER.

2. PART NO. and DESCRIPTION

You can find it in your SERVICE MANUAL.

DISC REMOVAL METHOD AT NO POWER SUPPLY

1. Insert a fine rod (wire etc.) into the hole of the Front Cabinet as shown by the arrow. (Refer to Fig. 1)
The Tray is opened.
2. Draw the Tray.

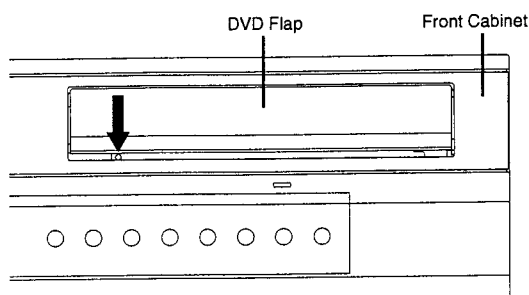


Fig. 1

TAPE REMOVAL METHOD AT NO POWER SUPPLY

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

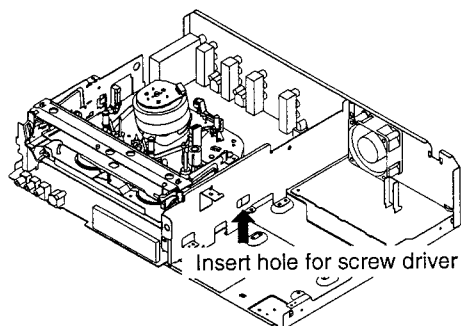


Fig. 1

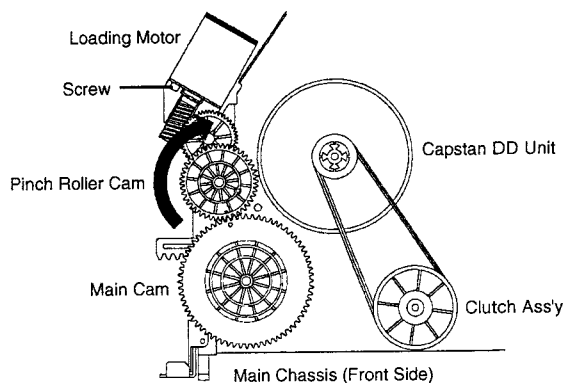


Fig. 2

PARENTAL CONTROL - RATING LEVEL 4 DIGIT PASSWORD CANCELLATION

If the stored 4 digit password in the Rating Level menu needs to be cancelled, please follow the steps below.

1. Turn Unit ON.
2. Press and hold the '7' key on the remote control unit.
3. Simultaneously press and hold the 'STOP' key on the front panel.
4. Hold both keys for more than 2 seconds.
5. The On Screen Display message 'PASSWORD UNLOCK' will appear.
6. The 4 digit password has now been cleared

NB: No indications on the screen when the Parental Lock is setting.

TRAY LOCK

Tray cannot be opened by setting the Tray Lock, please follow the steps below.

1. Turn Unit ON.
2. Press and hold the '0' key on the remote control unit.
3. Simultaneously press and hold the 'STOP' key on the front panel.
4. Hold both keys for more than 2 seconds.
5. Press the OPEN/CLOSE key on the front panel to check the Tray Lock setting.

NB: No indications on the screen when the Tray Lock is setting.

To unlock the Tray Lock, please follow the steps below.

1. Turn Unit ON.
2. Simultaneously press and hold the 'PLAY' button and 'CH UP' button on the front panel.
3. Hold both keys for more than 2 second.
4. The On Screen Display message 'FACTORY INITIALIZE' will appear.
5. The Tray Lock has now been cleared.
6. Turn Unit OFF.

NB: The above procedure will reset ALL of the player's settings to the default factory state.

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GENERAL SPECIFICATIONS

G-1	Outline of the product		DVD-R/-RW Video Recorder & VHS Player/Recorder		
G-2	DVD System	Color System	PAL		
		Disc Format	Rec	DVD-R/-RW	
			Play	DVD-R/-RW, DVD-Video, CD-DA, CD-R/-RW, VIDEO CD, SVCD	
		Disc Diameter		120 mm , 80 mm	
		Deck	Disc Loading System	Front Disc Loading	
			Motor	3 Motors	
		Pick up		1-Lens 2-Beams System	
		Rec Time (Aprox.) at 4.7GB Disc	XP SP LP SLP	1 hour	at 10Mbps
				2 hour	at 5Mbps
				4 hour	at 2.5Mbps
				6 hour	at 1.6Mbps
		Playback time (Max)	DVD 1-Layer	135min	(4.7GB)
			DVD 2-Layer	245min	(8.5GB)
			CD	74min	
VIDEO CD	74min				
Search speed	Actual	Fwd	4 step 2-45 times (DVD,VIDEO CD) 4-40 times (CD)		
		Rev	4 step 2-45 times (DVD,VIDEO CD) 4-40 times (CD)		
	Actual	Fwd	1/8-1/2 times		
		Rev	--		
G-3	VCR System	System	VHS Player / Recorder		
		Video System	PAL		
		Hi-Fi STEREO	Yes		
		NTSC PB(PAL60Hz)	Yes		
		Deck	DECK	OVD-7	
			Loading System	Front	
			Motor	3	
		Heads	Video Head	4Head	
			FM Audio Head	2Head	
		Audio / Control		Mono / Yes	
			Erase (Full Track Erase)	Yes	
		Tape Speed	Rec	SP/LP	
			NTSC	-	
			Play	SP/LP SP	
Fast Forward / Rewind Time (Approx.)	at 250C	FF:1'12" / REW:1'12"			
	with Cassette	E-180			
Forward/Reverse	NTSC or PAL-M	SP/LP = 3x,5x			
Picture Search	PAL or SECAM	SP/LP=5x,7x / 7x, 13x			
Frame Advance		Yes			
Slow Speed		1/5, 1/10, 1/30			
G-4	Tuning System	Broadcasting System	CCIR System BG		
		Tuner and Receive CH	System	1Tuner	
			Destination	Oscar (w/HYPER)	
			Tuning System	F-Synth	
			Input Impedance	VHF/UHF 75 ohm	
		Intermediate Frequency	CH Coverage	E2-E4,X-Z+2,S1-S10,E5-E12,S11-S41, E21-E69	
			Picture (FP)	38.9 MHz	
			Sound (FS)	33.4 MHz	
			FP-FS	5.5 MHz	
		Auto Tuning Method		C.C.I.R CH PLAN	
		Auto Guide Ch Area			
		Preset CH		80 CH	
		RF Converter Output	Channel	-	
			Level/Impedance	-	
Sound Selector	-				
			-		
Stereo/Dual TV Sound		G.ST/NICAM DUAL			
Tuner Sound Muting		Yes			

GENERAL SPECIFICATIONS

G-5	Power	Power Source	AC DC	230V 50Hz -
		Power Consumption	Stand by (FIP Off)	33 W at 230V 50Hz
			Stand by (FIP On)	5.5 W at 230V 50Hz
			Per Year	6 W at 230V 50Hz -- W
Protector	Power Fuse	Yes		
	Safety Circuit	Yes		
	IC Protector(Micro Fuse)	No		
G-6	Regulation	Safety	CE	
		Radiation	CE	
		Laser	-	
G-7	Temperature	Operation	5oC - 35oC	
		Storage	-20oC - 60oC	
G-8	Operating Humidity		Less than 80% RH	
G-9	Signal	Video Signal	Output Level	1 V p-p / 75 ohm (DVD, VCR)
			S/N Ratio (Weighted)	65 dB (DVD-Video) 53 dB (VCR)
			Horizontal Resolution	500 Lines (DVD-Video) 240 Lines (VCR)
		RGB Signal	Output Level	0.7V p-p/75 ohm
			Audio Signal	Input Level Microphone
		Input Level Line		-3.8 dBm / 50k ohm (VCR, 0dBm=0.775Vrms)
		Output Level Line		-3.8 dBm / 1k ohm (VCR, 0dBm=0.775Vrms) -12dB / 1k ohm (DVD, -20dBFs 0dBFs=2.0Vrms)
		Digital Output Level		0.5 V p-p / 75 ohm (DVD)
		S/N Ratio at (Weighted)		90dB (DVD-Video), 42dB (VCR at SP)
		Harmonic Distortion (1KHz) Typical		0.06% (DVD-Video), 1.5% (VCR at SP)
		Frequency Response : DVD Mode at DVD		4 Hz - 22 kHz
		DVD Mode at VIDEO CD		4 Hz - 20 kHz
		DVD Mode at SVCD		4 Hz - 20 kHz
		DVD Mode at CD		4 Hz - 20 kHz
		VCR Mode at SP	100 Hz - 10 kHz	
		VCR Mode at LP	100 Hz - 5 kHz	
		VCR Mode at SLP	-	
		Hi-Fi Audio Signal	Dynamic Range : More than	75dB
			Frequency Response	20Hz ~20kHz
			Wow And Flutter : Less than	0.01 %Wrms
Channel Separation : More than	60 dB			
Harmonic Distortion : Less than	0.01			

GENERAL SPECIFICATIONS

G-10	On Screen	Menu	Yes
	Display	Menu Type	Character
	(DVD)	Timer Rec Set	Yes
		Setup	Yes
		System Setup	Yes
		Language	Yes
		OSD Language	Yes
		DVD Menu	Yes
		Audio	Yes
		Subtitle	Yes
		Parental	Yes
		Password Lock/Unlock	Yes
		Rating Level	Yes
		Clock	Yes
		Clock Set	Yes
		Auto Clock(Auto Time)	No
		Disc Setup	Yes
		New Disc Format	Yes
		Reformat as DVD VR	Yes
		Reformat as DVD Video	Yes
		Finalize	Yes
		Protect Disc	Yes
		Undo Finalize	Yes
		Other	Yes
		Dimmer	Yes
		Display/Call On/Off	Yes
		AV Setup	Yes
		Video	Yes
	TV Screen	Yes	
	Still Mode	Yes	
	No Noise Background	Yes	
	Brightness	Yes	
	DVD Output	Yes	
	AV2	Yes	
	AV3 Input	Yes	
	Color System	No	
	Audio	Yes	
	DRC (Dynamic Range Control)	Yes	
	Virtual Surround (Spatializer(N-2-2))	Yes	
	External Audio Input Selection	Yes	
	NICAM	Yes	
	DOLBY DIGITAL OUTPUT	Yes	
	Rec Setup	Yes	
	Initial Rec To	Yes	
	Initial Rec Mode	Yes	
	Auto Chapter	Yes	
	Index Picture	Yes	
	Bilingual Recording	Yes	
	CH Setup	Yes	
	CH tuning	Yes	
	CH	Yes	
	Skip	Yes	
	Decoder	Yes	
	Move	Yes	
	Tuning System	Yes	
	Tuning	No	
	Auto Tuning	Yes	
	Other	Yes	
	JPEG Interval	Yes	

GENERAL SPECIFICATIONS

G-10	Title Menu (VR Mode)		Yes
	Chapter		
	Add Chapter Mark		Yes
	Combine Chapters		Yes
	Play		Yes
	Rename Title		Yes
	Title Protect		No
	Thumb Nail Setting		No
	Delete Title		Yes
	Title Combine		No
	Title Divide		No
	Edit Title		Yes
	Rename Disc		Yes
	Genre		No
	Play List		
	Play		Yes
	Chapter		No
	Rename Title		Yes
	Delete Title		Yes
	Title Combine		Yes
	Title Divide		No
	Edit Title		Yes
	Title Menu (Video Mode)		Yes
	Chapter		No
	Chapter Mark Add		No
	Chapter Mark Delete		No
	Play		Yes
	Title Name		No
	Title Protect		No
	Thumb Nail Setting		No
	Title Delete		No
	Title Combine		No
	Title Divide		No
	Edit Title		No
	Rename Disc		Yes
	Genre		No
	Play List		No
	Chapter		No
	Title Name		No
	Title Delete		No
	Title Combine		No
	Title Divide		No
	Cut		No
	Dubbing		Yes
	DVD >>> VCR		Yes
	VCR >>> DVD		Yes
	Disc Information		Yes
	Disc Type		Yes
	Disc Remain Time		Yes
	Open		Yes
	Close		No
	No disc		Yes
	Reading		Yes
	Play		Yes
	Pause/Still		Yes
	Stop		Yes
	Prohibit Mark		Yes
	Step		Yes
	Skip (>>)		Yes
	Skip (<<)		Yes
	Random		Yes (CD, VIDEO CD, SVCD)
	Repeat		Yes
	Slow+ ##		Yes
	Slow- ##		No
	Search+ ##		Yes
	Search- ##		Yes
	Time Search (Jump)		Yes
	Resume		Yes
	Title No.		Yes
	Chapter No.		Yes
	Track No.		Yes
	Time		Yes
	Sub Title No.		Yes
	Angle No.		Yes
	Vocal On/Off		Yes
	Audio No.		Yes
	Audio Stereo L/R		Yes (VIDEO CD, SVCD)
	Zoom		Yes
	Marker No.		No
	Program Play Back		Yes (CD, MP3, WMA, SVCD, VIDEO CD)
	MP3 / WMA / JPEG		Yes
	Folder Name		Yes
	File Name		Yes
	File No		Yes
	Time		Yes
	Track No		Yes
	Progressive Scan Out On/Off		No

GENERAL SPECIFICATIONS

	On Screen Display (VCR)	Menu		No
		Menu Type		-
		Play/Stop/FF/Rew/Rec/OTR (ITR)/T-Rec/Pause/Eject/Tape In (Symbol Mark)		Yes
		CH/AV (LINE)		Yes
		Clock		Yes
		Repeat		Yes
		Tape Counter		Yes
		Index		Yes
		Tape Speed		Yes
		Decoder		No
		Sound		Yes
		Manual Tracking (Bar Setting)		Yes
		Hi-Fi		Yes
		Zero Return		Yes
OTPB		No		
G-11	OSD Language	DVD OSD	English, French, Spanish, German, Italian	
		VCR OSD	English, French, Spanish, German, Italian	
G-12	Clock, Timer and Timer Back-up	Calendar		1990/1/1 - 2081/12/31
		Timer Events		8Program / 1Month
		One Touch Recording Max Time		6 hours
		OTPB Valid Time		No
		Timer Back-up (at Power Off Mode)		30 min
G-13	Display	Display		Yes
		Display Type		6Digit Fluorescent Indicator
		Clock		Yes (24h)
			AM	No
			PM	No
		Counter	VCR	Yes (hour: min: sec)
			DVD	Yes (hour: min: sec)
			CD	Yes (min: sec)
		TV/VCR		Yes
		CD		Yes
		DVD		Yes
			VR Mode	Yes
			Video Mode	No
		DVD-R		Yes
		DVD-RW		Yes
		DVD+R		No
		DVD+RW		No
		DVD-RAM		No
		Disc In		Yes
		Tape In		Yes
		T-Rec		Yes
		XP		Yes
		SP		Yes
		LP		Yes
		SLP		Yes
		EP		No
		VP		No
		Counter Remain		No
		Chapter		No
		Title		No
		Track No.		Yes
		Repeat (A-B/All)		No
		Play (VCR Side)		Yes
		Pause / Still (VCR Side)		Yes
		Rec (VCR Side)		Yes
		Play (DVD Side)		Yes
		Pause / Still / Step (DVD Side)		Yes
		Rec (DVD Side)		Yes
		RF Output CH		No
		Eject		Yes
		Stop		No
		FF / Cue		No
		REW / Review		No
		OTR (ITR)		No
		Hi-Fi		No
		CH/AV		Yes
		BS		No
		CATV		No
		Progressive Scan Out		No
		Under processing		Yes
		PBC (Play Back Control)		No

GENERAL SPECIFICATIONS

G-14	Remote Control	Unit	RC-JJ	
		Glow in Dark Remocon	No	
		LCD	No	
		Format	NEC	
		Custom Code	71-8EH	
		Power Source	3V	
		Voltage (D.C)	UM-4 x 2 pcs	
		UM size x pcs	49 Keys	
	Total Keys		49 Keys	
	Keys	POWER	Yes	
		EJECT	Yes	
		OPEN / CLOSE	Yes	
		DVD / VCR	Yes	
		1	Yes	
		2	Yes	
		3	Yes	
		4	Yes	
		5	Yes	
		6	Yes	
		7	Yes	
		8	Yes	
		9	Yes	
		0	Yes	
		0 / 10		No
		11		No
		12		No
		T-REC	Yes	
		INPUT SELECT	Yes	
		CLEAR / CANCEL	Yes	
		RETURN	Yes	
		DISPLAY / CALL	Yes	
		TOP MENU / TITLE LIST	Yes	
		UP / CH+	Yes	
		DOWN / CH-	Yes	
		LEFT / TRACKING-	Yes	
		RIGHT / TRACKING+	Yes	
		SELECT / ENTER	Yes	
		DVD MENU	Yes	
		SETUP	Yes	
		STOP	Yes	
		PLAY	Yes	
		PAUSE / STILL / STEP	Yes	
	<<SKIP / INDEX-	Yes		
	<<SEARCH / REW	Yes		
	SEARCH>> / F.FWD	Yes		
	SKIP>> / INDEX+	Yes		
	ONE TOUCH REPEAT	Yes		
	CM SKIP	Yes		
	<<SLOW		No	
	SLOW>>	Yes		
	REC / OTR	Yes		
	REC MODE / SPEED	Yes		
	DUBBING	Yes		
	AUDIO / AUDIO SELECT	Yes		
	MARKER		No	
	ZOOM	Yes		
	REPEAT A-B	Yes		
	ZERO RETURN	Yes		
	ANGLE / COUNTER RESET	Yes		
	SUB TITLE / ATR	Yes		
	PLAY MODE / REPEAT	Yes		
	CLOCK / COUNTER	Yes		
	CHAPTER MARK		No	
	NAVI MARK		No	
	TV / VCR	Yes		
	PROGRESSIVE		No	

GENERAL SPECIFICATIONS

G-15	Features (DVD & VCR)	Auto Power Off		No	
		CM Skip (30sec x 6 Times)	Yes		
		Copy (Tape to Disc, Disc to Tape)	Yes (By Conditioning)		
		VIDEO PLUS+ (SHOWVIEW, G-CODE)		No	
		Auto Set Up (CH Auto Set Up/ Auto Clock)		No	
		ATS		No	
		PDC		No	
		VPS		No	
		Energy Star		No	
		Analog BS		No	
		Power On Memory		No	
	Features (DVD)	Parental Lock	Yes		
		Echo		No	
		Mic Mixing		No	
		DV Rec		No	
		Timeshift Playback		No	
		Video CD Playback	Yes		
		SVCD Playback	Yes		
			Overlay Graphics And Text		No
			Command List		No
			Entry Point Jump		No
		MP3 Playback	Yes		
		WMA Playback	Yes		
		JPEG Playback	Yes		
		Progressive Scan Out		No	
		Digital Out	(Dolby Digital)	Yes	
			(MPEG)	Yes	
			(PCM)	Yes	
			(DTS)	Yes	
		Down Mix Out	(Dolby Digital)	Yes	
			(DTS)		No
	Spatializer (N-2-2)	Yes			
	Screen Saver		No		
Auto Stop		No			
Tray Lock	Yes				
One Touch Repeat	Yes				
Audio DAC	192kHz / 24bit				
Features (VCR)	Auto Head Cleaning	Yes			
	Auto Tracking	Yes			
	Index Search	Yes			
	HQ (VHS Standard High Quality)	Yes			
	Auto Power On, Auto Play, Auto Rewind, Auto Eject	Yes			
	Forward/Reverse Picture Search	Yes			
	SQPB (PAL SP Mode Only)		No		
	Rec End Search		No		
	CS Easy		No		
G-16	Accessories	Owner's Manual	Yes		
			Language	German	
			w/Guarantee Card	Yes	
		Remote Control Unit	Yes		
		Dew Caution Sheet		No	
		Battery	Yes		
			UM size x pcs	UM-4 x 2 pcs	
		Blank DVD-RW DISC (4.7GB)	Yes		
		Blank DVD-R DISC (4.7GB)		No	
		Tape Rewinder		No	
		Safety Tip		No	
		Toll Free Insert Sheet		No	
		Quick Set-Up Sheet		No (1st O/R Lot)	
		Information Sheet	Yes (From 2nd Lot)		
		75 Ohm Coaxial Cable	Yes		
			type	Yes (0.9m) Double shield	
		U/V Mixer		No	
		DC Car Cord (Center+)		No	
		Guarantee Card		No	
		Warning Sheet		No	
		Circuit Diagram		No	
		Antenna Change Plug		No	
		Service Facility List		No	
		Important Safeguard		No	
		Dew/AHC Caution Sheet		No	
		AC Plug Adapter		No	
		AC Cord		No	
		AV Cord (2Pin-1Pin)		No	
		Registration Card		No	
		21pin Cable (Double Shield)	Yes		
		300 ohm to 75 ohm Antenna Adapter		No	

GENERAL SPECIFICATIONS

G-17	Interface	Switch	Front	Power	Yes		
				Play	Yes		
				Eject (VCR)	Yes		
				Stop	Yes		
				Rec / OTR	Yes		
				Open / Close (DVD)	Yes		
				CH +	Yes		
				CH -	Yes		
			FF / Search(>>)	Yes			
			Rew / Search(<<)	Yes			
			Still / Pause	No			
			Shuttle (Search / REV / FWD)	No			
			DVD / VCR	Yes			
			Main Power SW	No			
			S-Video / Component Video Selector	No			
			RF Out (Slide SW)	No			
		Main Power SW	No				
		Volume	Rear	Phones Volume	No		
				Mic Volume	No		
				Echo Volume	No		
		Terminals	Front	Video In	RCA x1 (Yellow) S-Video x 1 (DVD Rec Only)		
				Audio In	RCA x 2 (Stereo, White/Red)		
				DV In (IEEE1394)	No		
				Rear	Video Output	No	
					Audio Output	RCA x 2 (Stereo, White/Red) Coaxial x 1 (Digital Audio, DVD Signal Only)	
				Rear	Video In	No	
			Audio In		No		
			Optical Digital Audio Out		No		
			Euro Scart		2SCART		
			Ext Speaker		No		
			VHF/UHF Antenna Input/Output		DIN Type		
			AC Inlet		No		
			Indicator		LED	Power	No
						Rec	No
T-Rec	No						
TV/VCR	No						
DVD	Yes (GREEN)						
VCR	Yes (AMBER)						
Surround	No						
Level Meter	No						
G-18	Set Size		Approx. W x D x H (mm)	430 x 311.5 x 99			
G-19	Weight	Net (Approx.)		5.5 kg (12.1 lbs)			
		Gross (Approx.)		6.5 kg (14.3 lbs)			
G-20	Carton	Master Carton		No			
			Content	--- Sets			
			Material	--- / ---			
			Dimensions W x D x H (mm)	---			
			Description of Origin	---			
			Gift Box	Yes			
		Material		Single/Full Color			
		W/Color Photo Label		No			
		Dimensions W x D x H (mm)		500 x 430 x 180			
		Design		As Per BUYER 's			
		Description of Origin		No			
		Drop Test	Natural Dropping At	Height (cm)	1 Corner / 3 Edges / 6 Surfaces 80 cm		
Container Stuffing	1,623 Sets/40' container						
G-21	Material	Cabinet Front	PS 94HB				
		PCB	Non-Halogen Demand Eyelet Demand				
			No No				
G-22	Environment	Pb Free	Lead-free Solder				
			Other				
			No No				
		Cd Free	No				

DISASSEMBLY INSTRUCTIONS

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

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

1. Remove the 5 screws ①.
2. Remove the Top Cabinet in the direction of arrow (A).
3. Disconnect the following connector: (CP681).
4. Unlock the 9 supports ②.
5. Remove the Front Cabinet in the direction of arrow (B).
6. Remove the 3 screws ③.
7. Remove the Operation PCB in the direction of arrow (C).

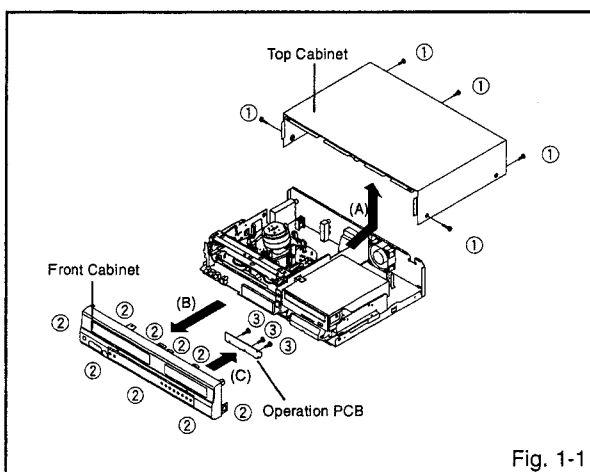


Fig. 1-1

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

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

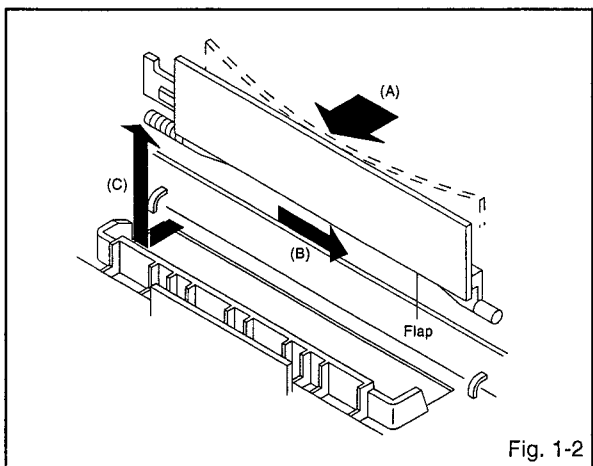


Fig. 1-2

1-3: DECK CD AND DVD/HD MPEG PCB (Refer to Fig. 1-3)

1. Remove the 6 screws ①.
2. Disconnect the following connectors: (CP504, CP1703, CP8301, CP8302, CP8303).
3. Remove the Deck CD Block in the direction of arrow (A).
4. Remove the 4 screws ②.
5. Remove the MPEG Shield in the direction of arrow (B).
6. Disconnect the following connector: (CP4006).
7. Remove the DVD/HD MPEG PCB in the direction of arrow (C).
8. Remove the 2 screws ③.
9. Remove the DVD Angle (L) in the direction of arrow (D).
10. Remove the 2 screws ④.
11. Remove the DVD Angle (R) in the direction of arrow (E).

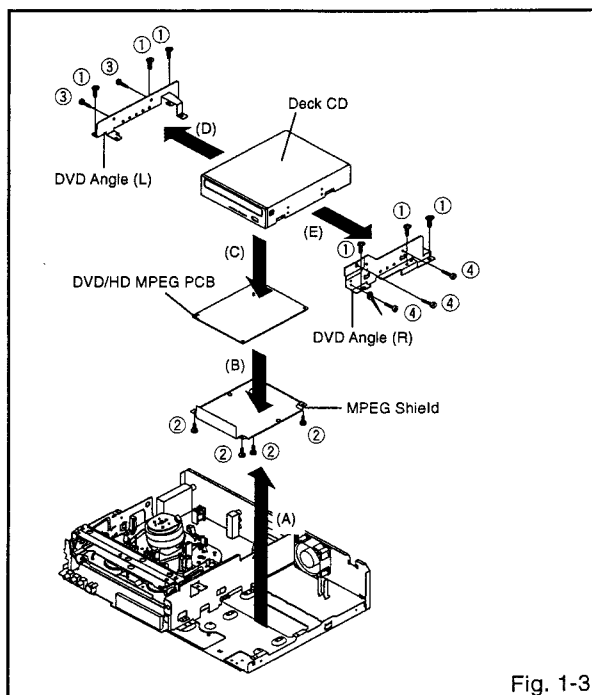
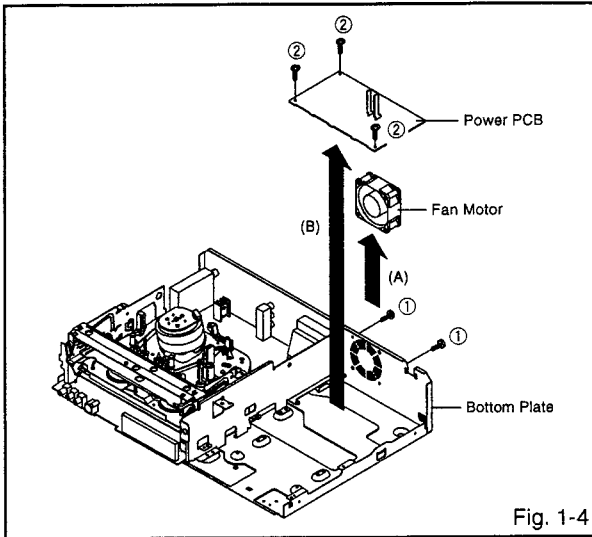


Fig. 1-3

DISASSEMBLY INSTRUCTIONS

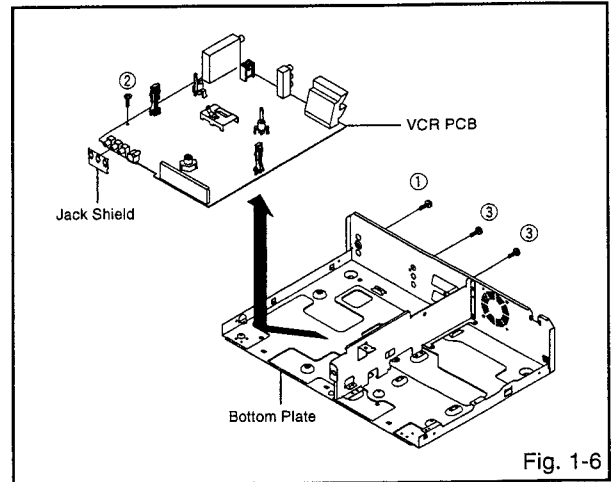
1-4: POWER PCB (Refer to Fig. 1-4)

1. Remove the 2 screws ①.
2. Disconnect the following connector: (CP506).
3. Remove the Fan Motor in the direction of arrow (A).
4. Remove the 3 screws ②.
5. Disconnect the following connector: (CP1701).
6. Remove the Power PCB in the direction of arrow (B).



1-6: VCR PCB (Refer to Fig. 1-6)

1. Remove the screw ①.
2. Remove the screw ②.
3. Remove the 2 screws ③.
4. Remove the Jack Shield.
5. Remove the VCR PCB in the direction of arrow.

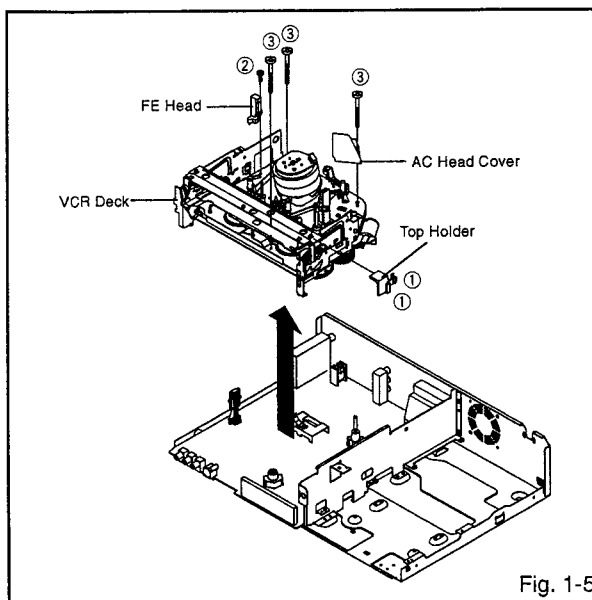


1-5: VCR DECK (Refer to Fig. 1-5)

NOTE

Do not remove the cable at the FE Head section. The FE Head may be damaged if you remove the cable by force.

1. Unlock the 2 supports ① and remove the Top Holder.
2. Remove the screw ②.
3. Remove the FE Head.
4. Move the Cassette Holder Ass'y to the back side.
5. Remove the 3 screws ③.
6. Disconnect the following connectors:
(CP101, CP102, CP3001).
7. Remove the AC Head Cover and VCR Deck in the direction of arrow.



DISASSEMBLY INSTRUCTIONS

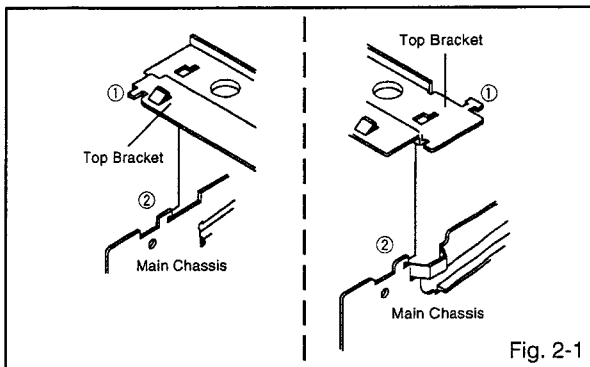
2. REMOVAL OF VCR DECK PARTS

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

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

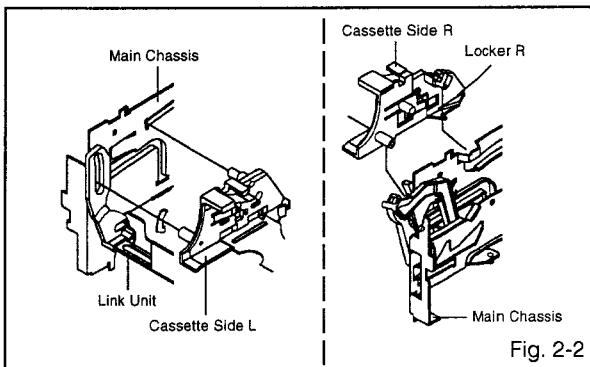
NOTE

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



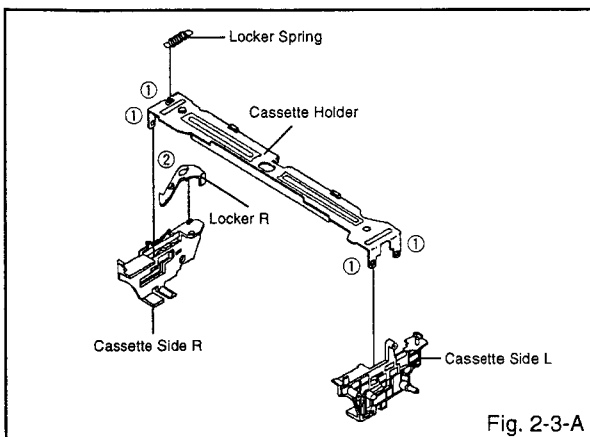
2-2: CASSETTE HOLDER ASS'Y (Refer to Fig. 2-2)

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



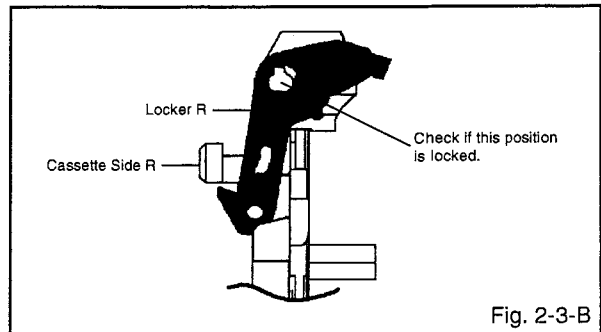
2-3: CASSETTE SIDE L/R (Refer to Fig. 2-3-A)

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



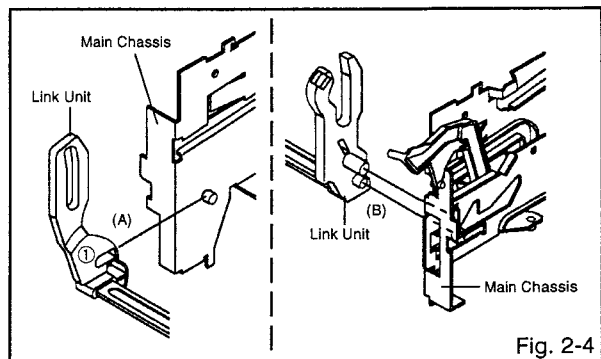
NOTE

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



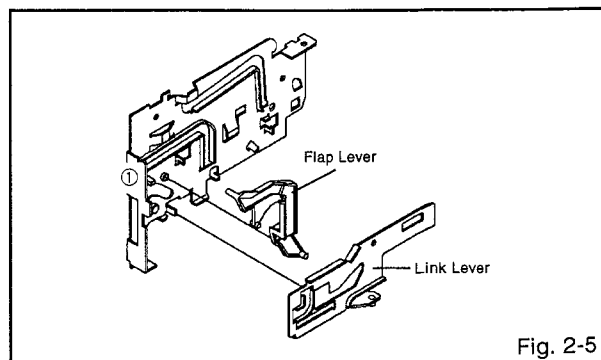
2-4: LINK UNIT (Refer to Fig. 2-4)

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



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

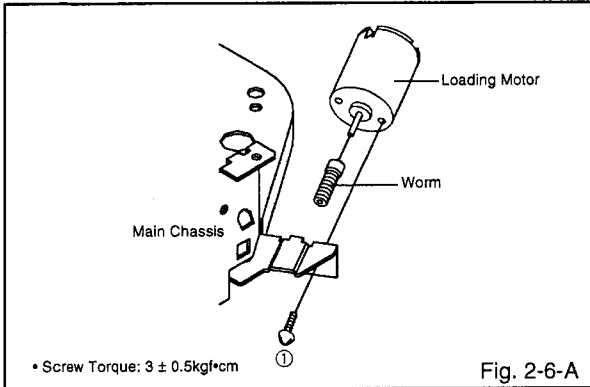
1. Extend the support ①.
2. Remove the Link Lever.
3. Remove the Flap Lever.



DISASSEMBLY INSTRUCTIONS

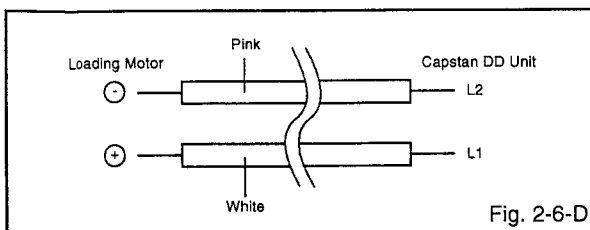
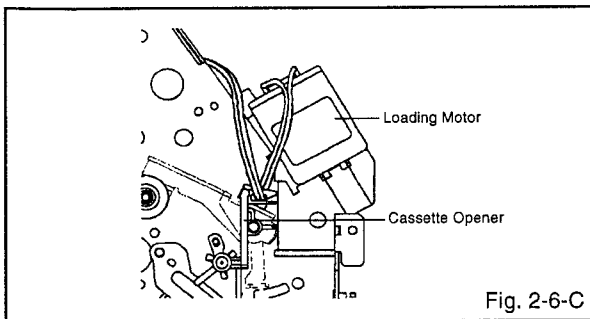
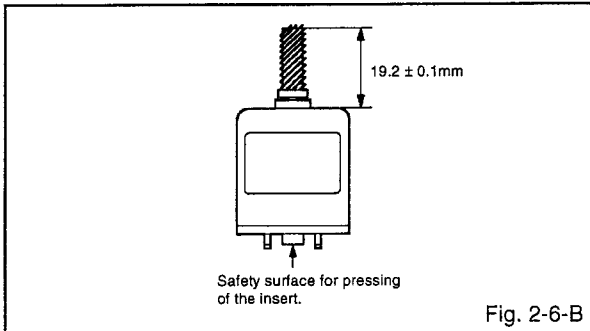
2-6: LOADING MOTOR/WORM (Refer to Fig. 2-6-A)

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



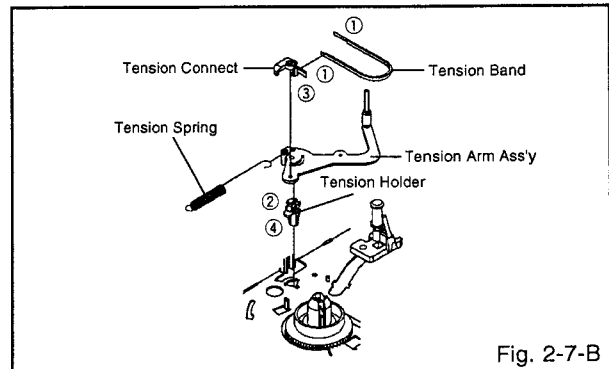
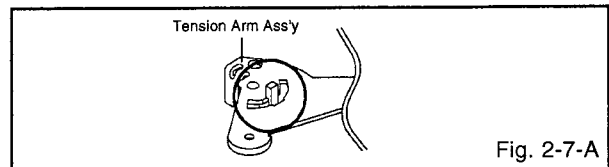
NOTE

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



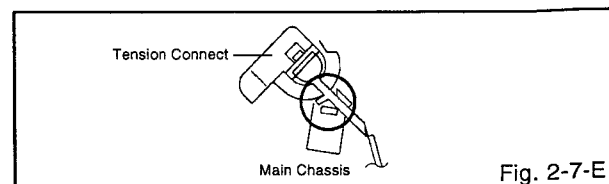
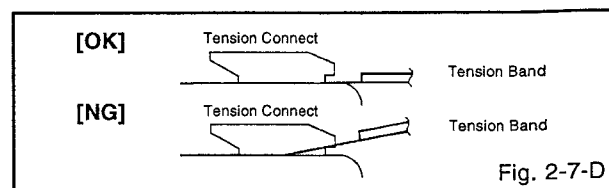
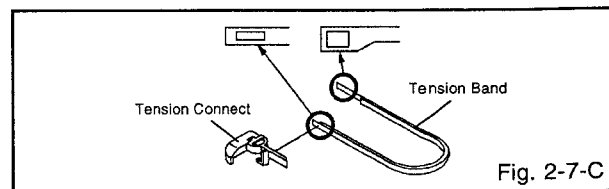
2-7: TENSION ASS'Y (Refer to Fig. 2-7-B)

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



NOTE

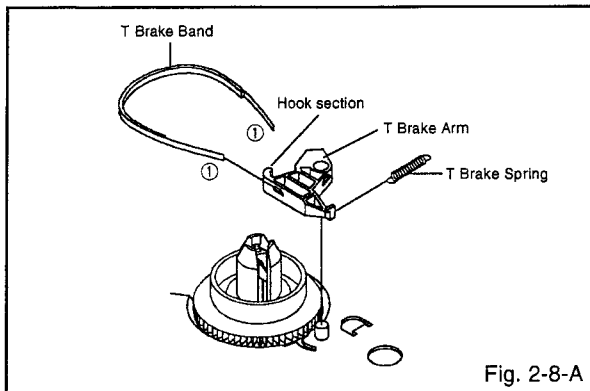
1. In case of the Tension Band installation, note the direction of the installation. (Refer to Fig. 2-7-C)
2. In case of the Tension Band installation, install correctly as Fig. 2-7-D.
3. In case of the Tension Connect installation, install as the circled section of Fig. 2-7-E.



DISASSEMBLY INSTRUCTIONS

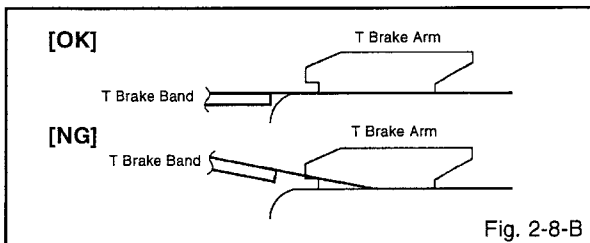
2-8: T BRAKE ARM/T BRAKE BAND (Refer to Fig. 2-8-A)

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



NOTE

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

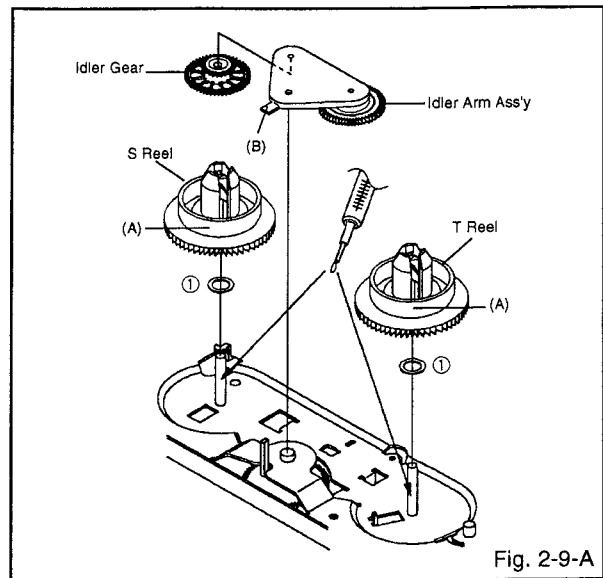


2-9: S REEL/T REEL/IDLER ARM ASS'Y/IDLER GEAR (Refer to Fig. 2-9-A)

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

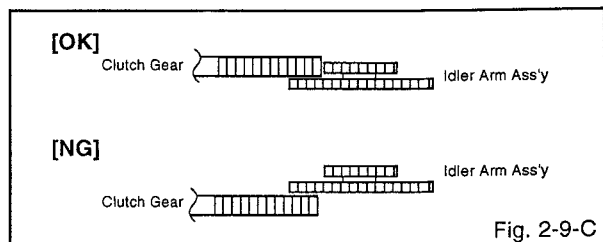
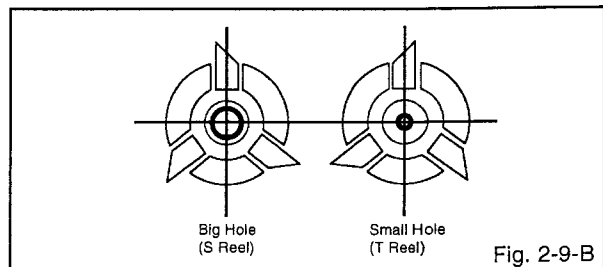
NOTE

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



NOTE

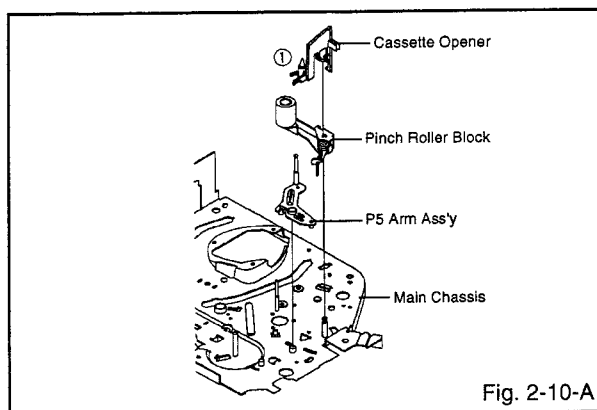
1. In case of the S Reel and T Reel installation, check if the correct parts are installed. (Refer to Fig. 2-9-B)
2. In case of the Idler Arm Ass'y installation, install correctly as Fig. 2-9-C. And also set it so that the section "B" of Fig. 2-9-A is placed under the Main Chassis tab.



DISASSEMBLY INSTRUCTIONS

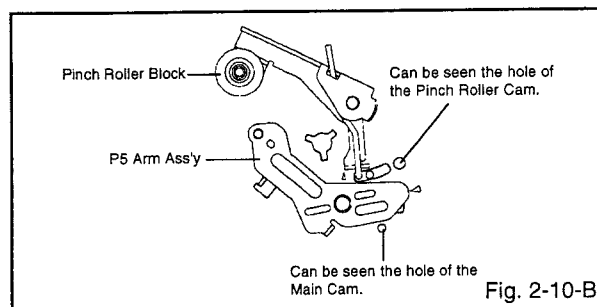
2-10: CASSETTE OPENER/PINCH ROLLER BLOCK/ P5 ARM ASS'Y (Refer to Fig. 2-10-A)

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



NOTE

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

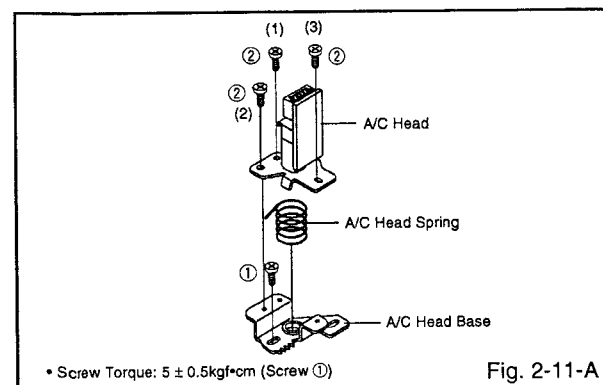


2-11: A/C HEAD (Refer to Fig. 2-11-A)

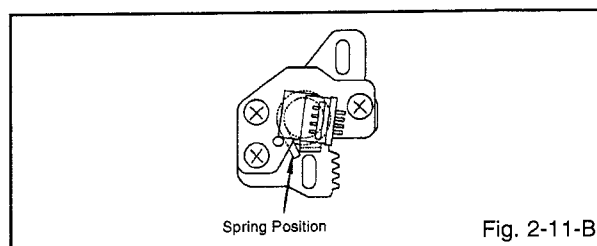
1. Remove the screw ①.
2. Remove the A/C Head Base.
3. Remove the 3 screws ②.
4. Remove the A/C Head and A/C Head Spring.

NOTE

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

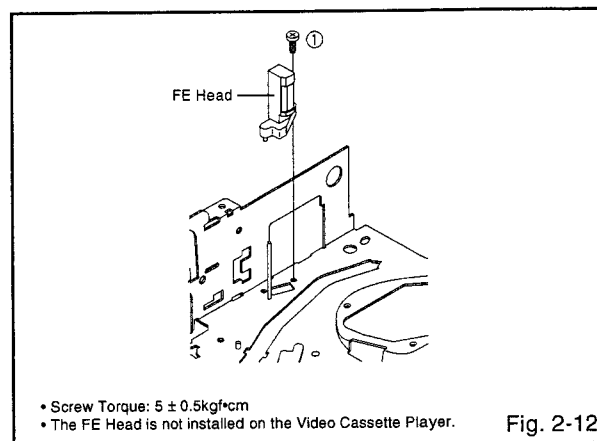


• Screw Torque: $5 \pm 0.5\text{kgf}\cdot\text{cm}$ (Screw ①)



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

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



• Screw Torque: $5 \pm 0.5\text{kgf}\cdot\text{cm}$

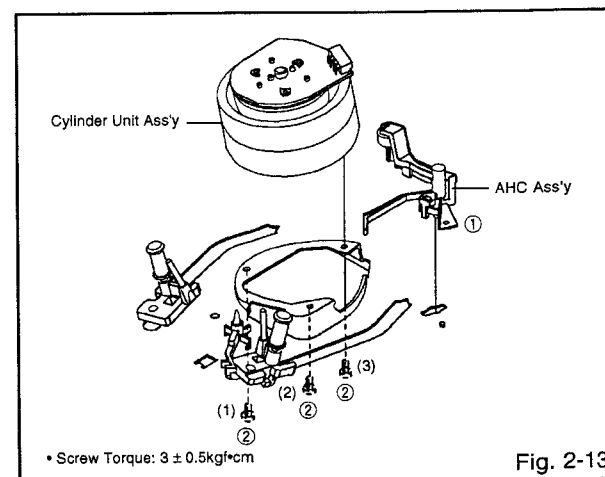
• The FE Head is not installed on the Video Cassette Player.

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

1. 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.

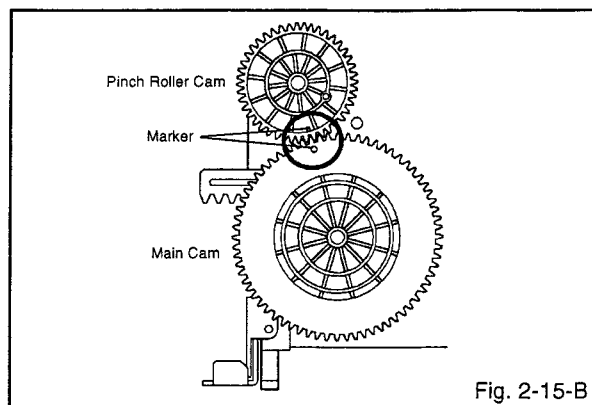
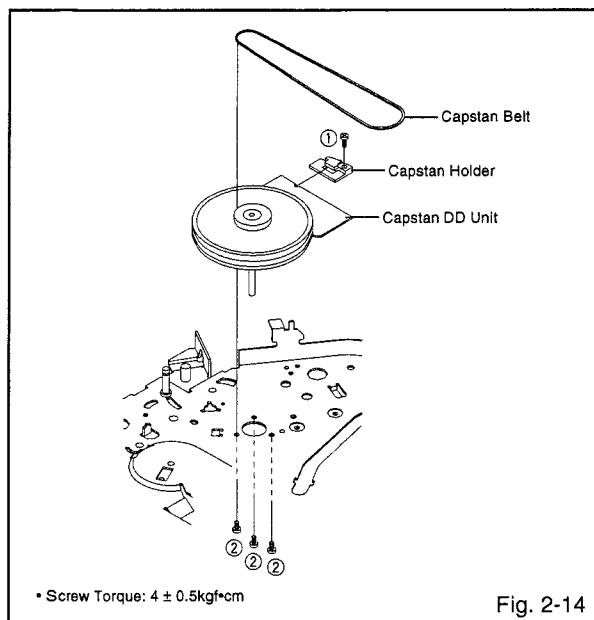


• Screw Torque: $3 \pm 0.5\text{kgf}\cdot\text{cm}$

DISASSEMBLY INSTRUCTIONS

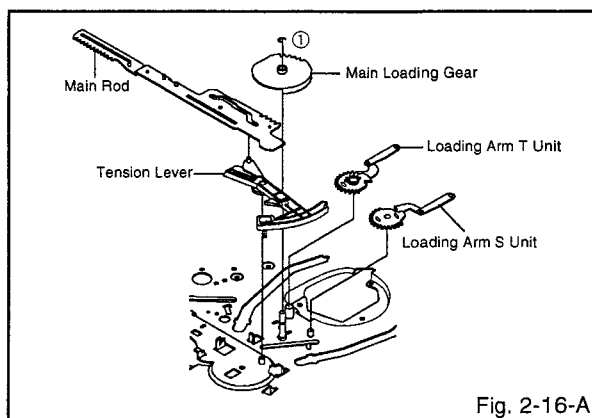
2-14: CAPSTAN DD UNIT (Refer to Fig. 2-14)

1. Remove the Capstan Belt.
2. Remove the screw ①.
3. Remove the Capstan Holder.
4. Remove the 3 screws ②.
5. Remove the Capstan DD Unit.



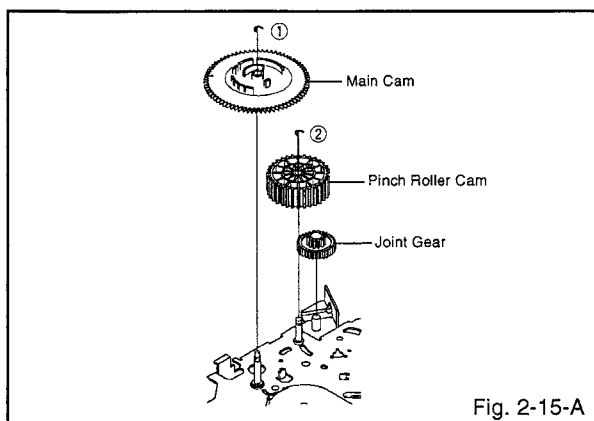
2-16: LOADING GEAR S/T UNIT (Refer to Fig. 2-16-A)

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.



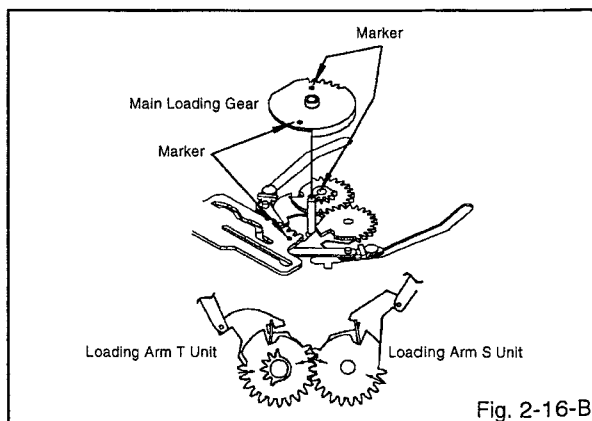
2-15: MAIN CAM/PINCH ROLLER CAM/JOINT GEAR (Refer to Fig. 2-15-A)

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



NOTE

1. 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)



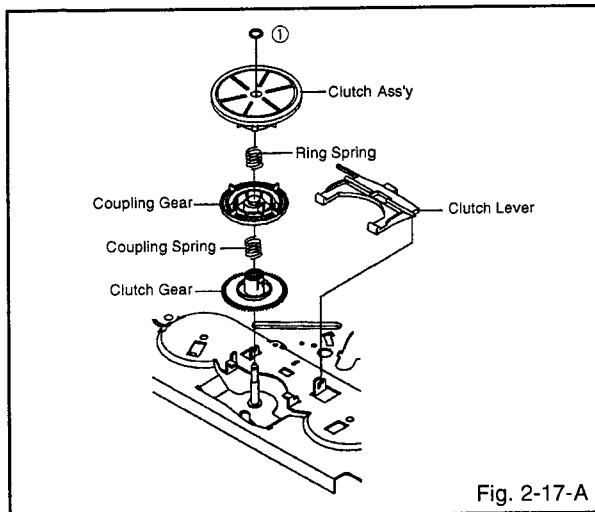
NOTE

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)

DISASSEMBLY INSTRUCTIONS

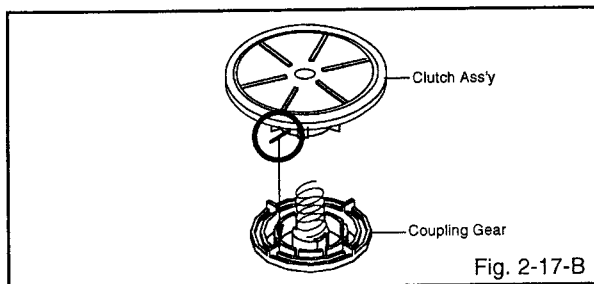
2-17: CLUTCH ASS'Y/RING SPRING/CLUTCH LEVER/ CLUTCH GEAR (Refer to Fig. 2-17-A)

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



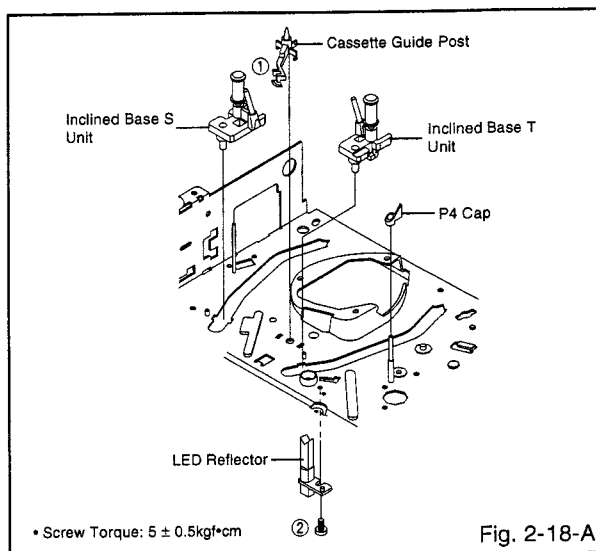
NOTE

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



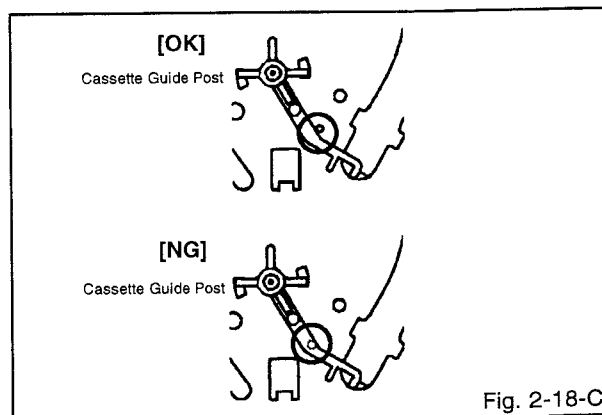
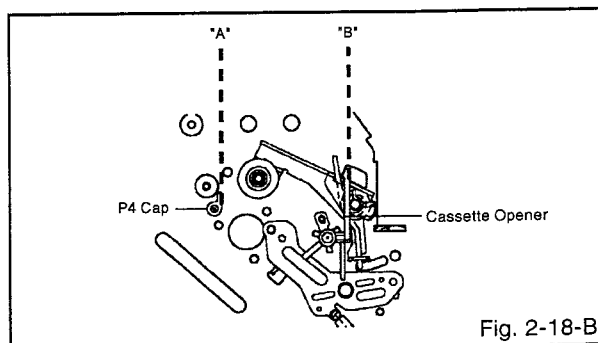
2-18: CASSETTE GUIDE POST/INCLINED BASE S/T UNIT/P4 CAP/LED REFLECTOR (Refer to Fig. 2-18-A)

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



NOTE

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



DISASSEMBLY INSTRUCTIONS

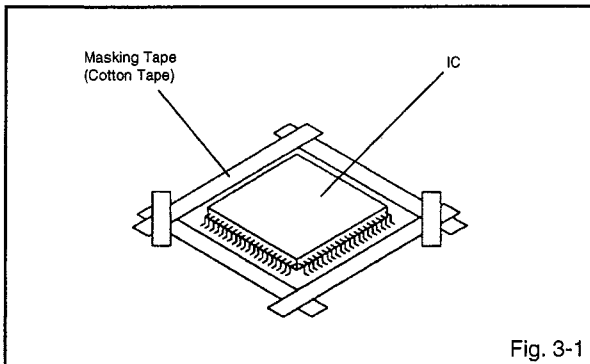
3. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC

REMOVAL

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

NOTE

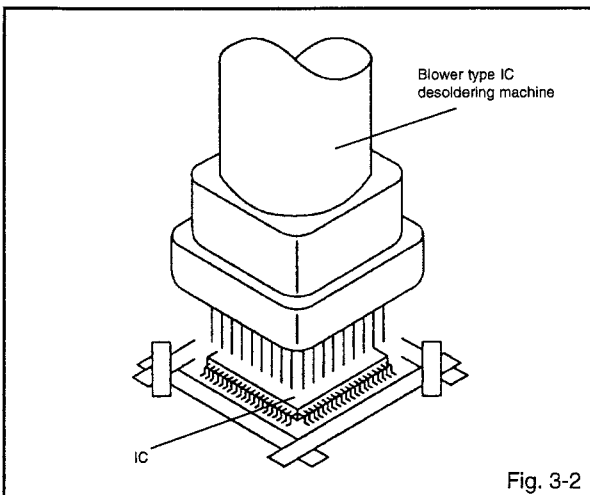
Masking is carried out on all the parts located within 10 mm distance from IC leads.



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

NOTE

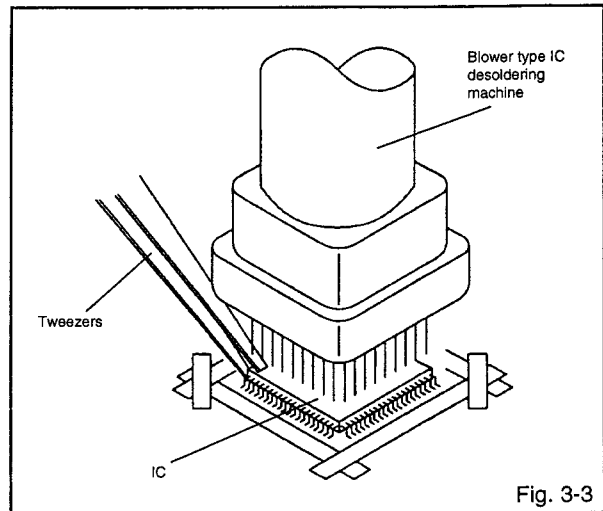
Do not add the rotating and the back and forth directions force on the IC, until IC can move back and forth easily after desoldering the IC leads completely.



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

NOTE

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

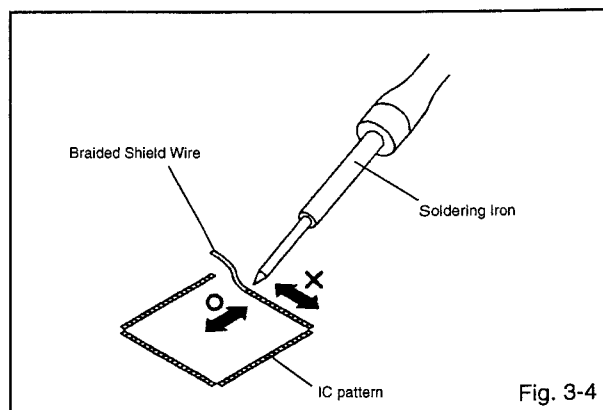


4. Peel off the Masking Tape.

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

NOTE

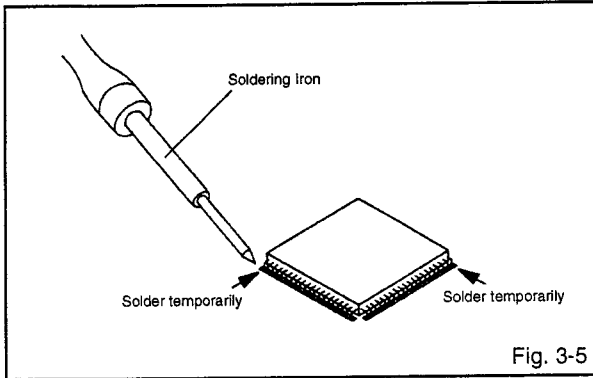
Do not move the Braided Shield Wire in the vertical direction towards the IC pattern.



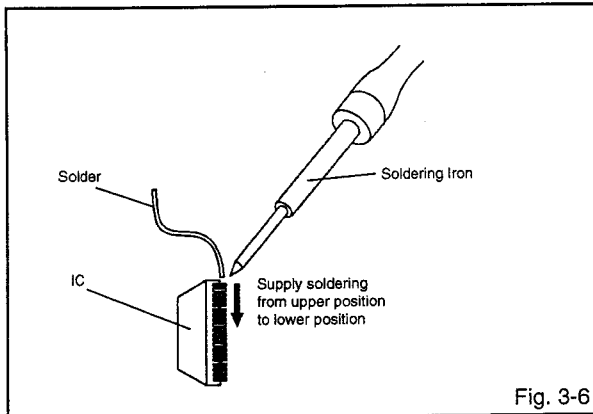
DISASSEMBLY INSTRUCTIONS

INSTALLATION

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



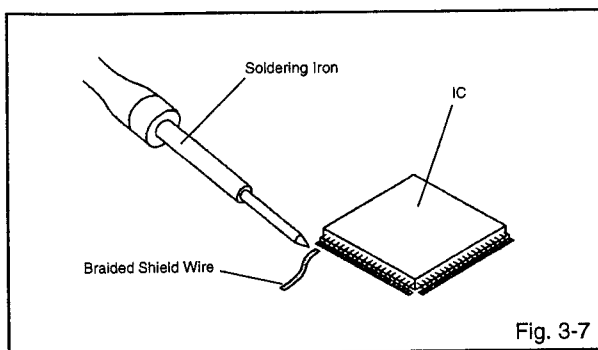
2. Supply the solder from the upper position of IC leads sliding to the lower position of the IC leads. (Refer to Fig. 3-6.)



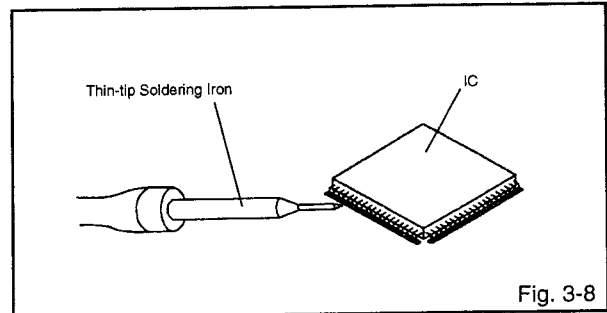
3. Absorb the solder left on the lead using the Braided Shield Wire. (Refer to Fig. 3-7.)

NOTE

Do not absorb the solder to excess.



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



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

NOTE

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

KEY TO ABBREVIATIONS

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

KEY TO ABBREVIATIONS

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

SERVICE MODE LIST

This unit provided with the following SERVICE MODES so you can repair, examine and adjust easily.
 To enter to the SERVICE MODE function, press and hold both buttons simultaneously on the main unit or on the main unit and on the remote control for more than a standard time in the appropriate condition. (See below chart.)
 In case of the main unit and remote control, press the remote control buttons first, then press the main unit buttons.

Set Condition	Set Key	Set Key	Standard Time	Operations
VCR mode	CH UP	FF	2 sec.	PLAY/REC total hours are displayed on the TV Monitor. 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".
Power On	CH UP	PLAY	2 sec.	Initialization of the factory on VCR. 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, and PLAY/REC total hours.
VCR mode (Playback)	CH UP	CH DOWN	2 sec.	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.
VCR mode	CH UP	REC	2 sec.	The BOT, EOT, and the Reel Sensor do not work and the VCR deck can be operated without a cassette tape. Refer to the "PREPARATION FOR SERVICING"
VCR mode (Playback)	VCR/DVD	REC	2 sec.	Adjust the PG SHIFTER automatically. Refer to the "ELECTRICAL ADJUSTMENT".
Power Off	CH DOWN	POWER	2 sec.	VCR operation mode at no connection of DVD. Refer to the "PREPARATION FOR SERVICING" NOTE: Although the DVD is connected, the DVD mode cannot be selected.

Set Condition	Set Key	Remocon Key	Standard Time	Operations
DVD mode (STOP)	STOP	0	2 sec.	Tray cannot be opened. Refer to the "TRAY LOCK". NOTE: No indications on the screen when the Tray Lock is setting. The function will only work without the setting of DVD disc at DVD mode.
DVD mode (No disc)	STOP	6	2 sec.	Initialization of the factory on DVD. NOTE: Do not use this for the normal servicing. This function will only work without the setting of DVD disc at DVD mode. While pressing the Remocon Key for more than 2 seconds, press the Set Key simultaneously.
DVD mode (No disc)	STOP	7	2 sec.	Releasing of PARENTAL LOCK. Refer to the "PARENTAL CONTROL - RATING LEVEL". NOTE: The function will only work without the setting of DVD disc at DVD mode.

PREVENTIVE CHECKS AND SERVICE INTERVALS

The following standard table depends on environmental conditions and usage.

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

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

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

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

■ : Clean

● : Check it and if necessary, replace it.

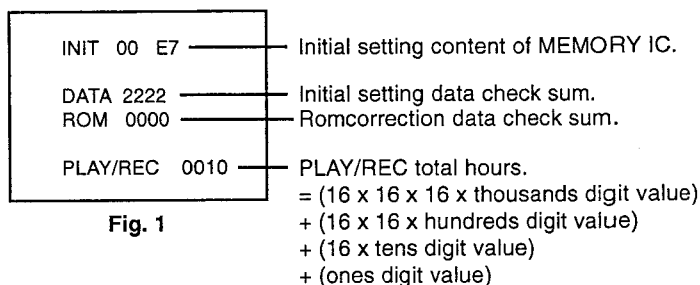
CONFIRMATION OF HOURS USED

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".

1. Connect the set to TV Monitor.
2. Turn on the POWER, and set to the VCR mode.
3. Press both CH UP button on the set and the FF button on the set for more than 2 seconds.
The Fig. 1 screen will appear on TV Monitor.
4. After the confirmation of using hours, turn off the power.



PREVENTIVE CHECKS AND SERVICE INTERVALS

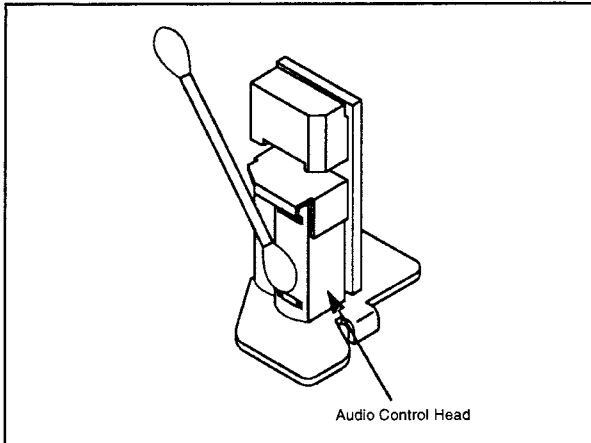
CLEANING

NOTE

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

1. AUDIO CONTROL HEAD

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



2. TAPE RUNNING SYSTEM

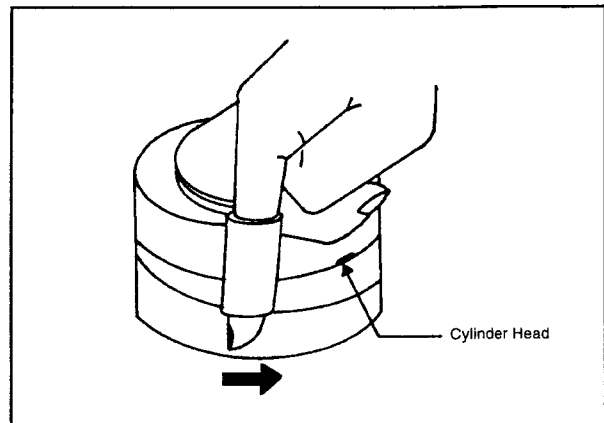
When cleaning the tape transport system, use the gauze moistened with isopropyl alcohol.

3. CYLINDER

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

NOTE

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



WHEN REPLACING EEPROM (MEMORY) IC

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

NOTE: No need setting for after INIT 59.

INIT	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
00	E7	41	78	04	12	CE	36	AF	98	95	8A	1B	2A	09	29	13
10	44	84	28	34	34	4A	A7	51	9F	3A	00	0D	BF	10	00	00
20	64	42	30	60	56	65	5F	00	9F	18	FA	5F	00	00	00	00
30	00	00	00	00	00	00	00	00	00	00	5F	00	9F	18	FA	4F
40	00	00	00	AF	00	AF	FF	0F	00	00	21	01	00	2D	0C	0E
50	7A	00	00	70	05	00	00	00	00	00	---	---	---	---	---	---

Table 1

1. Connect the set to TV Monitor.
2. Turn on the POWER, and set to the VCR mode.
3. Press both CH UP button on the set and the FF button on the set for more than 2 seconds.
ADDRESS and DATA will appear on TV Monitor as **Fig 1**.

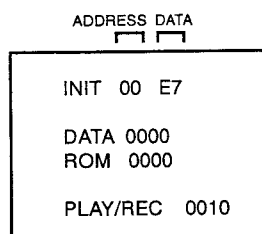





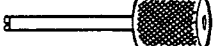
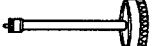
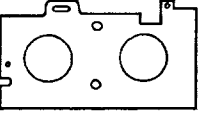
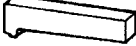
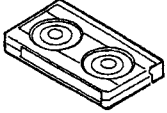

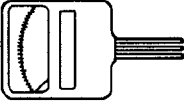
Fig. 1

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

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

10. Turn on the POWER, and set to the VCR mode.
11. Press both CH UP button on the set and the PLAY button on the set for more than 2 seconds.
12. After the finishing of the initializing of shipping, the unit will turn off automatically.
The unit will now have the correct DATA for the new MEMORY IC.

SERVICING FIXTURES AND TOOLS

<p>(For 2 head 1 speed model, 4 head model) VHS Alignment Tape JG001E (VP₁S-LI6³) JG001F (VP₁S-CO1³) JG001R (VP₁S-LI6³H) JG001U (VP₁S-X6³)</p> 	<p>(For 2 head 2 speed model) VHS Alignment Tape JG001C (VP₂S-LI6³) JG001D (VP₂S-CO1³) JG001V (VP₂S-X6³)</p> 	<p>JG002B Adapter JG002E Dial Torque Gauge (10~90gf*cm) JG002F (60~600gf*cm)</p> 	<p>JG005 Post Adjustment Screwdriver Part No. SV-TG0-030-000 (small)</p> 
<p>JG153 X Value Adjustment Screwdriver</p> 	<p>JG022 Master Plane</p> 	<p>JG024A Reel Disk Height Adjustment Jig</p> 	<p>JG100A Torque Tape (VHT-063)</p> 
<p>JG154 Cable</p> 	<p>JG185 Tentelometer</p> 		

Ref. No.	Part No.	Parts Name	Remarks
JG001E	APJG001E00	VHS Alignment Tape	Monoscope, 6KHz (For 2 head 1 speed model, 4 head model)
JG001F	APJG001F00	VHS Alignment Tape	Color Bar, 1KHz (For 2 head 1 speed model, 4 head model)
JG001R	APJG001R00	VHS Alignment Tape	Hi-Fi Audio (For Hi-Fi model)
JG001U	APJG001U00	VHS Alignment Tape	X Value Adjustment (For 2 head 1 speed model, 4 head model)
JG001C	APJG001C00	VHS Alignment Tape	Monoscope, 6KHz (For 2 head 2 speed model)
JG001D	APJG001D00	VHS Alignment Tape	Color Bar, 1KHz (For 2 head 2 speed model)
JG001V	APJG001V00	VHS Alignment Tape	X Value Adjustment (For 2 head 2 speed model)
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
JG185	APJG185000	Tentelometer	Confirmation of Tape Tension on Playback

PREPARATION FOR SERVICING

1. While pressing the CH DOWN button on the set for more than 2 seconds, press the POWER button on the set simultaneously at the Power OFF. Although the DVD is connected, the DVD mode cannot be selected.
2. Press both CH UP button on the set and the REC button on the set for more than 2 seconds.
(The BOT, EOT, and the Reel Sensor do not work and the VCR deck can be operated without a cassette tape.)
3. In case of using a cassette tape, press the EJECT button to insert or eject a cassette tape.
Turn on the power and re-check the cable before checking the trouble points.

When you servicing with connection of DVD, perform the operations above step 2 to step 3.

MECHANICAL ADJUSTMENTS

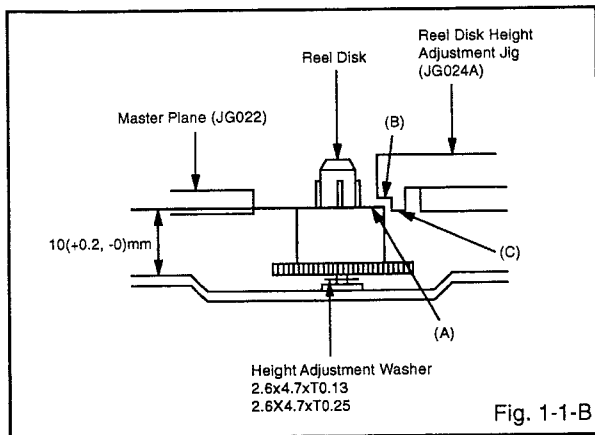
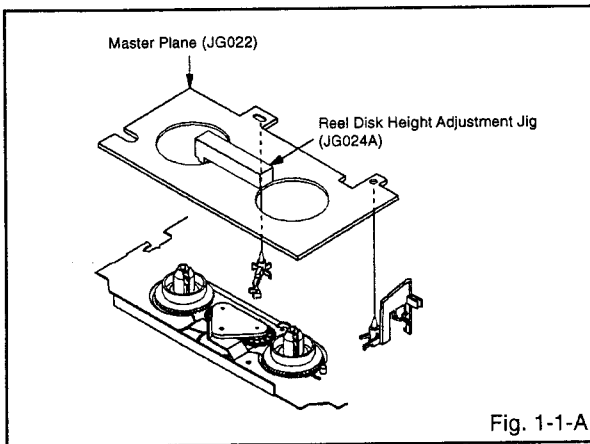
1. CONFIRMATION AND ADJUSTMENT

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.)

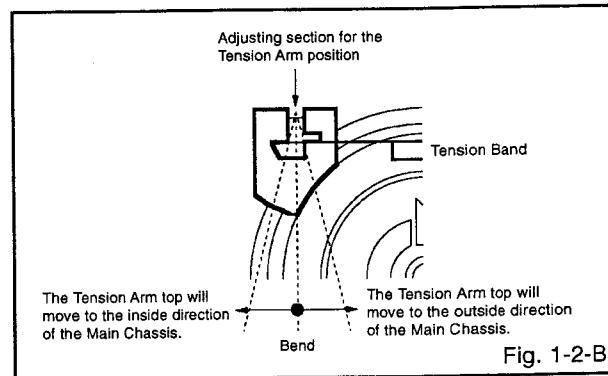
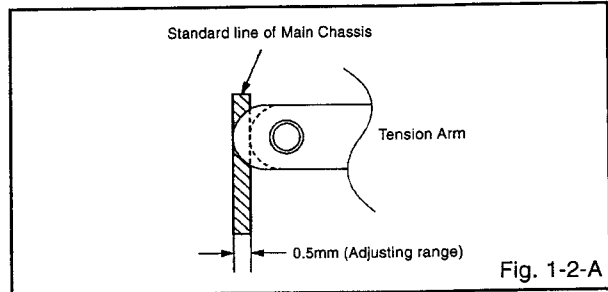
1-1: CONFIRMATION AND ADJUSTMENT OF REEL DISK HEIGHT

- Turn on the power and set to the STOP mode.
- 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.
- 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.
- Adjust the other reel in the same way.



1-2: CONFIRMATION AND ADJUSTMENT OF TENSION POST POSITION

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

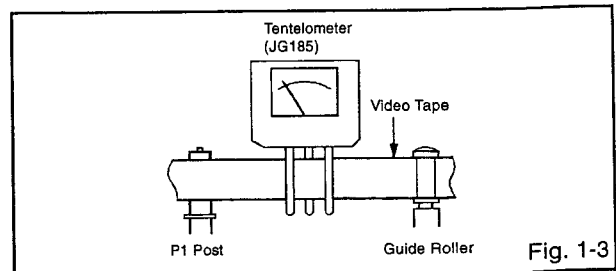


1-3: CONFIRMATION OF PLAYBACK TORQUE AND BACK TENSION TORQUE DURING PLAYBACK

- Load a video tape (E-180) recorded in standard speed mode. Set the unit to the PLAY mode.
- Install the tentelometer (**JG185**) as shown in Fig. 1-3. Confirm that the meter indicates $20 \pm 2\text{gf}$ in the beginning of playback.

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

- 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.
- Confirm that the right meter of the torque tape indicates 50~90gf•cm during playback in SP mode.
- Confirm that the left meter of the torque tape indicates 25~40gf•cm during playback in SP mode.



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.

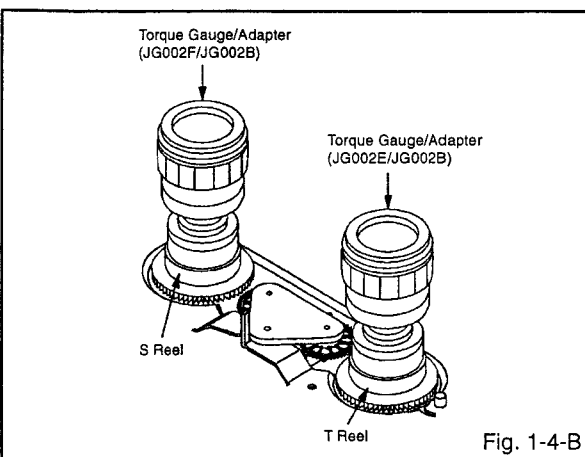
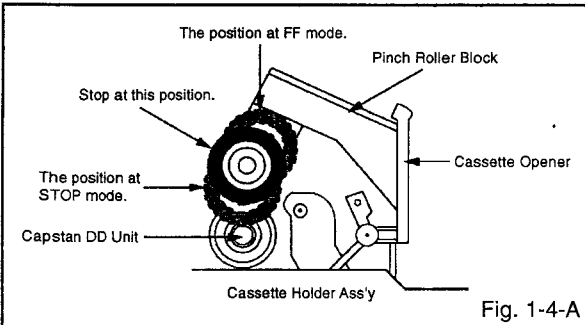
1-5: CONFIRMATION OF REEL BRAKE TORQUE

(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.



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

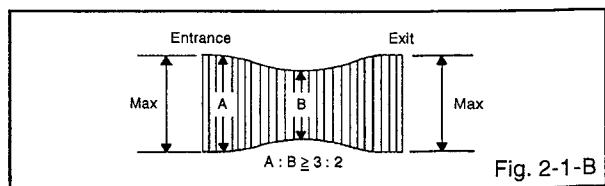
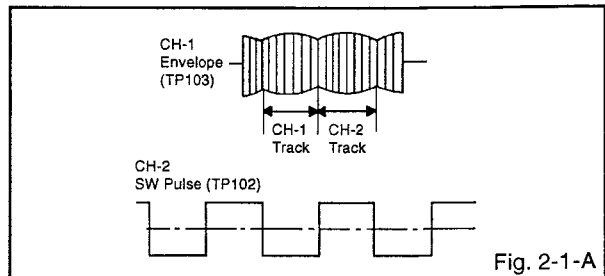
Tape Running Mechanism is adjusted precisely at the factory. Adjustment is not necessary as usual. When you replace the parts of the tape running mechanism because of long term usage or failure, the confirmation and adjustment are necessary.

2-1: GUIDE ROLLER

1. Playback the VHS Alignment Tape (JG001C or JG001E). (Refer to SERVICING FIXTURE AND TOOLS)
2. Connect CH-1 of the oscilloscope to TP103 (Envelope) and CH-2 to TP102 (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)



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 (JG001C or JG001E). (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.

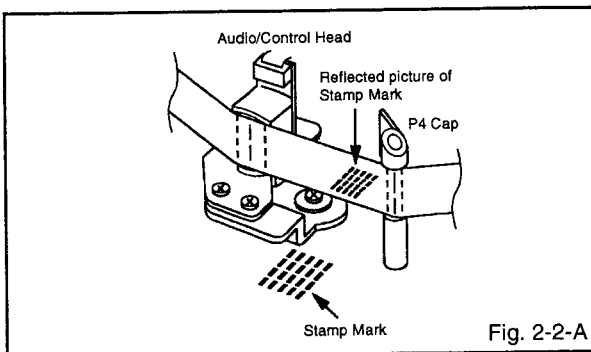


Fig. 2-2-A

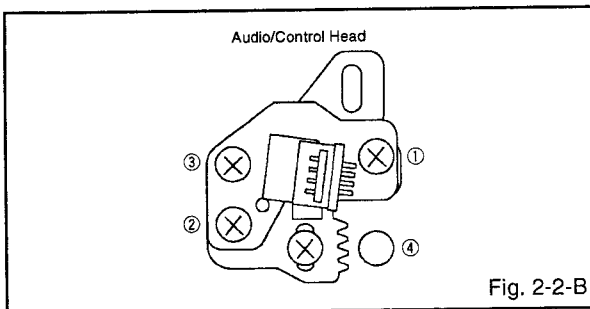


Fig. 2-2-B

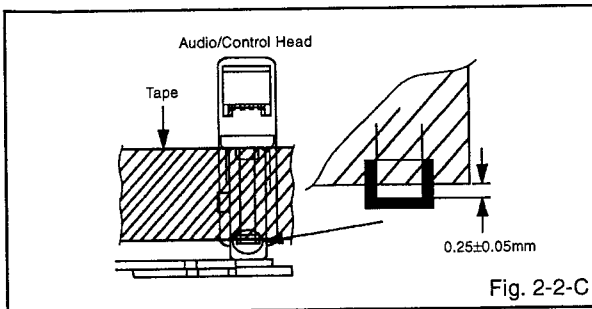


Fig. 2-2-C

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 **TP102**, CH-2 to **TP103** and CH-3 to **HOT side of Audio Out Jack**.
6. Playback the VHS Alignment Tape (JG001U or JG001V). (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**.

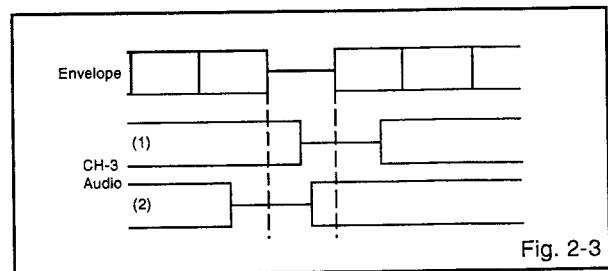


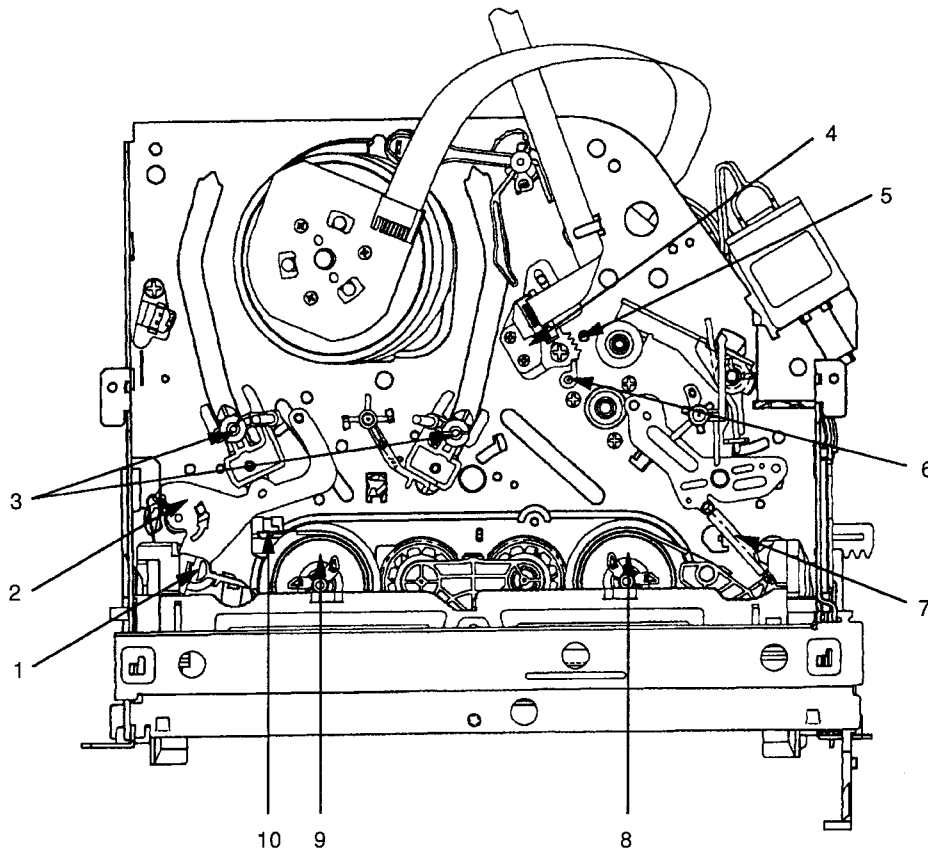
Fig. 2-3

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

1. Connect CH-1 of the oscilloscope to **TP102** and CH-2 to the **Hi-Fi Audio Out Jack**.
2. Playback the VHS Alignment Tape (JG001R). (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 | 6. P4 Post |
| 2. Tension Arm | 7. T Brake Spring |
| 3. Guide Roller | 8. T Reel |
| 4. Audio/Control Head | 9. S Reel |
| 5. X value adjustment driver hole | 10. Adjusting section for the Tension Arm position |

ELECTRICAL ADJUSTMENTS

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

1. BASIC ADJUSTMENT

CAUTION

- 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.)

1-1: PG SHIFTER

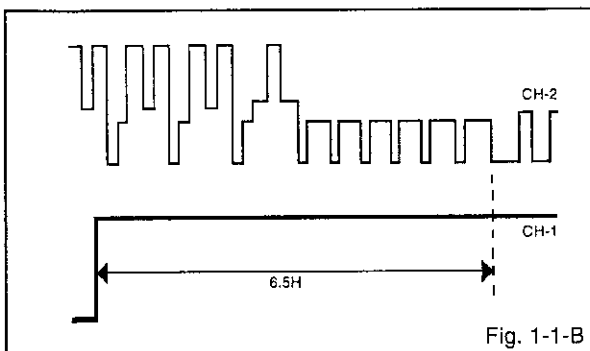
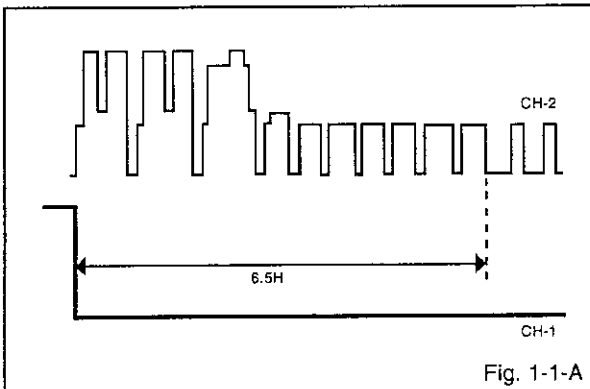
CONDITIONS

MODE-PLAYBACK

Input Signal-Alignment Tape (**JG001E**)

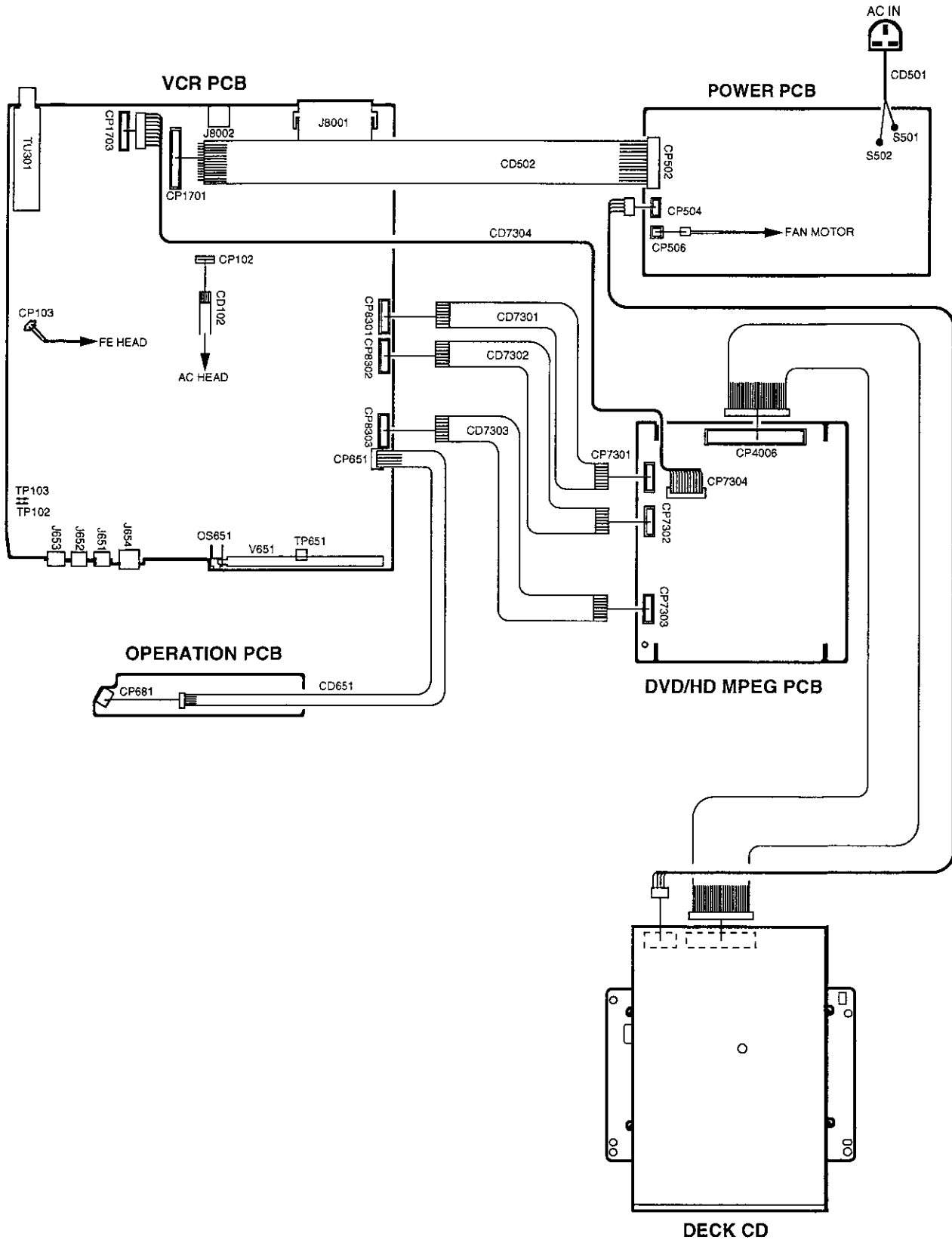
INSTRUCTIONS

1. Connect CH-1 on the oscilloscope to **TP102** and CH-2 to **J8001**.
2. Playback the alignment tape. (**JG001E**)
3. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
4. Press both CH UP button on the set and the STOP button on the set for more than 2 seconds.



ELECTRICAL ADJUSTMENTS

2. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE (WIRING CONNECTION)



Zentralwerkstatt und
Ersatzteildepot
für ORION-Produkte



Postfach 10 10 26
63264 Dreieich
Max-Planck-Str. 20
63303 Dreieich

Ersatzteil-Bestellung

Tel.: (06103) 39 99-95 Fax.: (06103) 39 99-79

SERVICE MANUAL

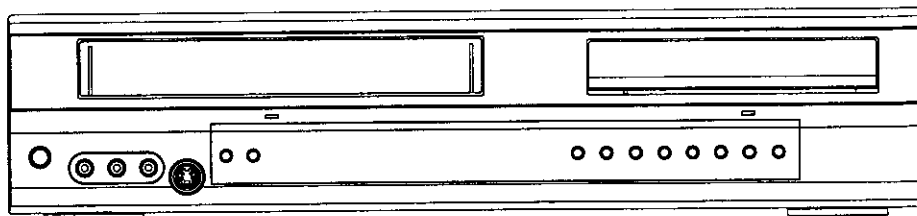
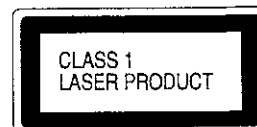
Nachdruck bzw. Kopieren dieser Unterlagen ist grundsätzlich verboten!

Teil 2

ORION

VDR-4002

DVD-RW RECORDER & VHS VIDEO CASSETTE RECORDER

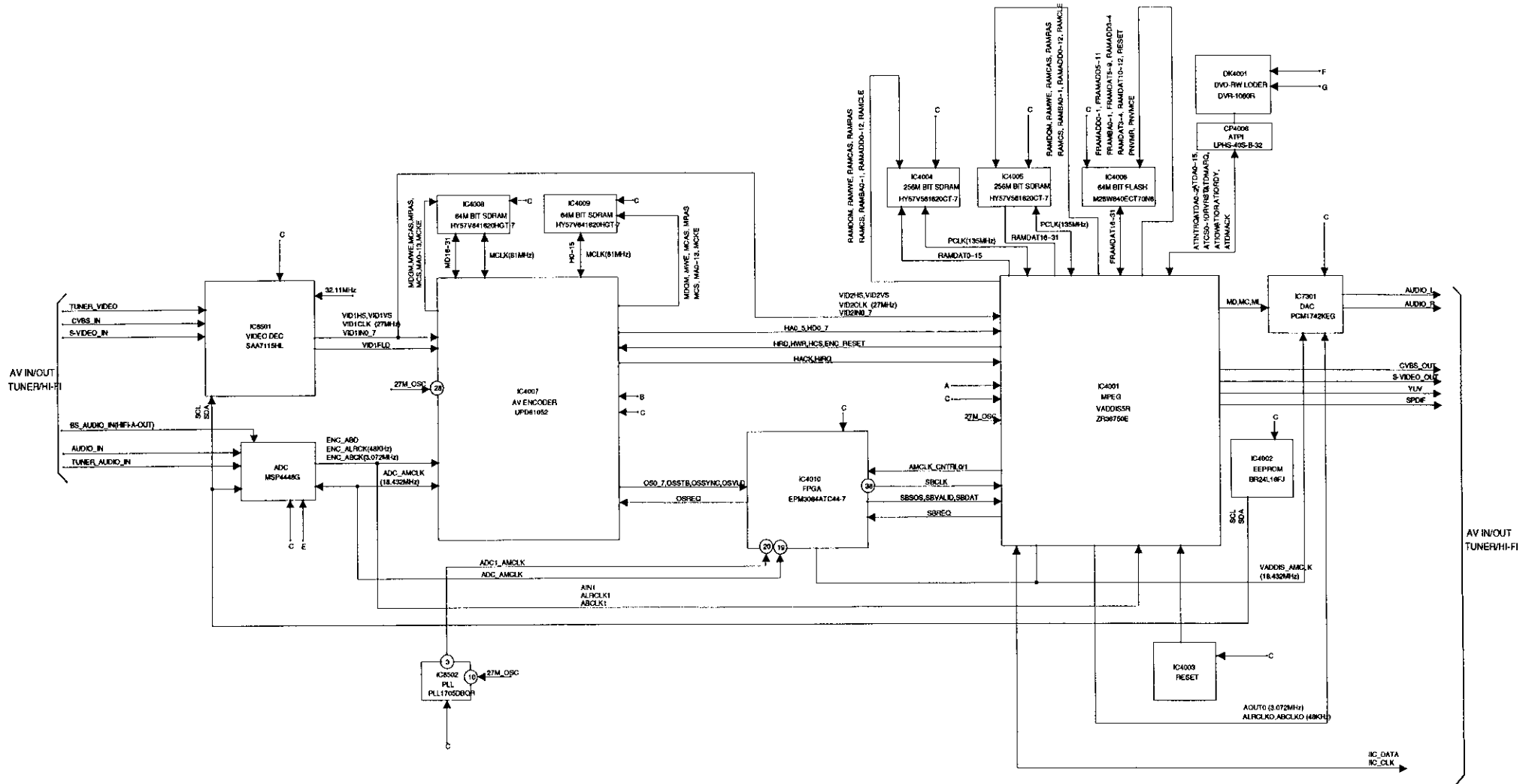


ORIGINAL CHASSIS CODE A

Best. Nr. SM4002-2

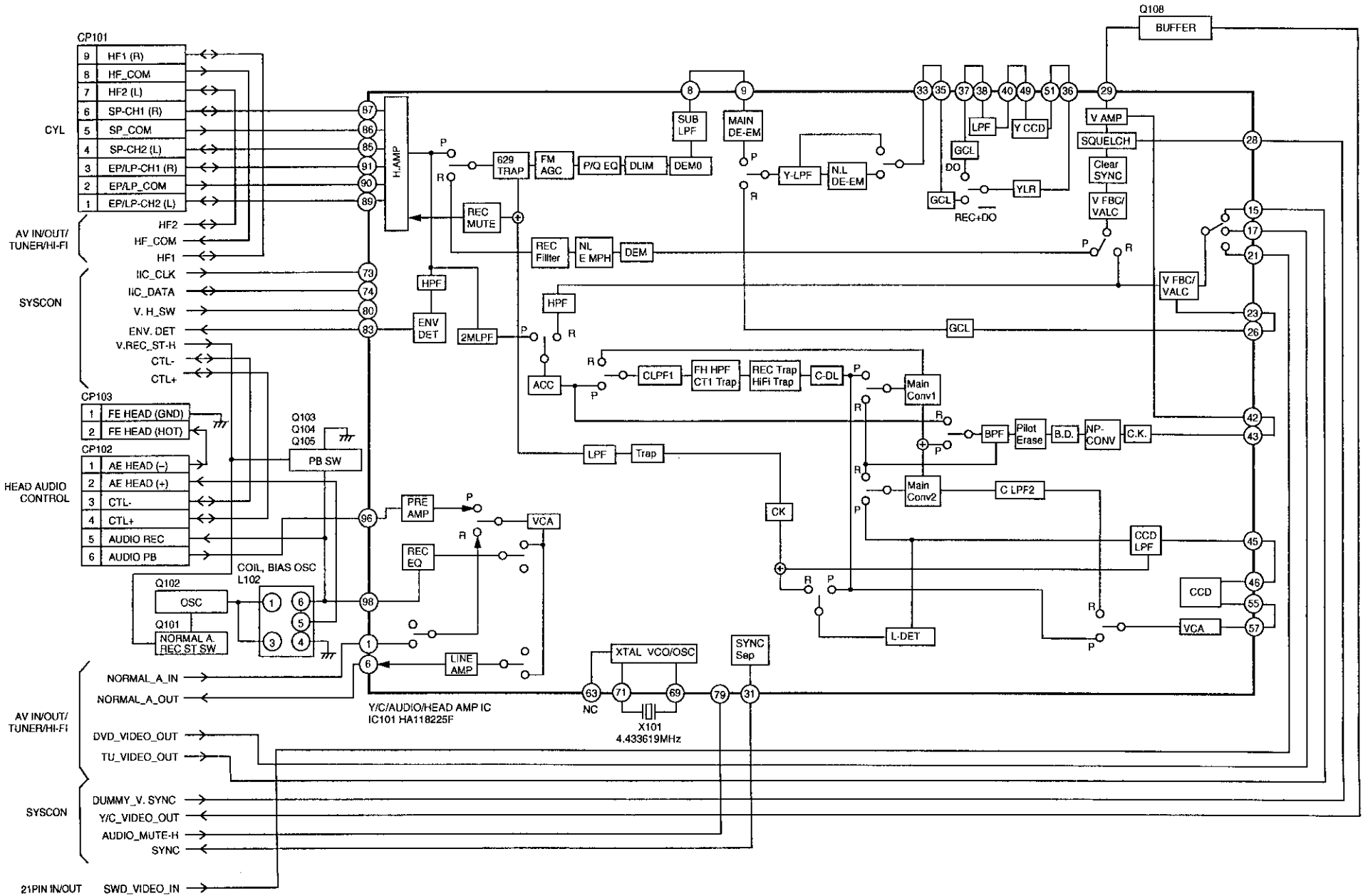
Design and specifications are subject to change without notice.

MPEGBLOCKDIAGRAM

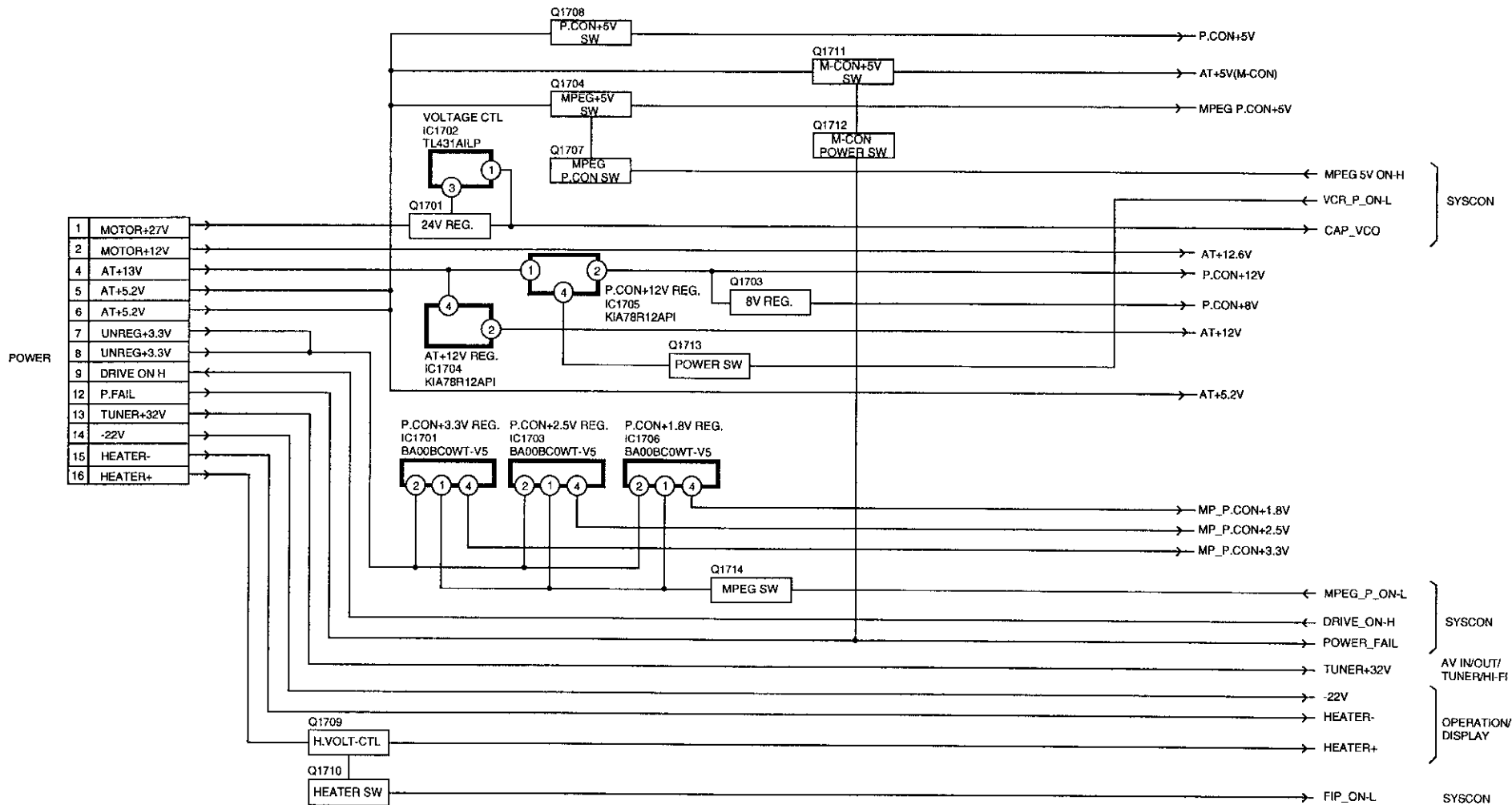


- A MP.P.CON-1.8V
 - B MP.P.CON-2.5V
 - C MP.P.CON-1.3V
 - D MP.P.CON-D5V
 - E MP.P.CON-A5V
- REGULATOR
- F P.CON-12V
 - G P.CON-D5V
- POWER

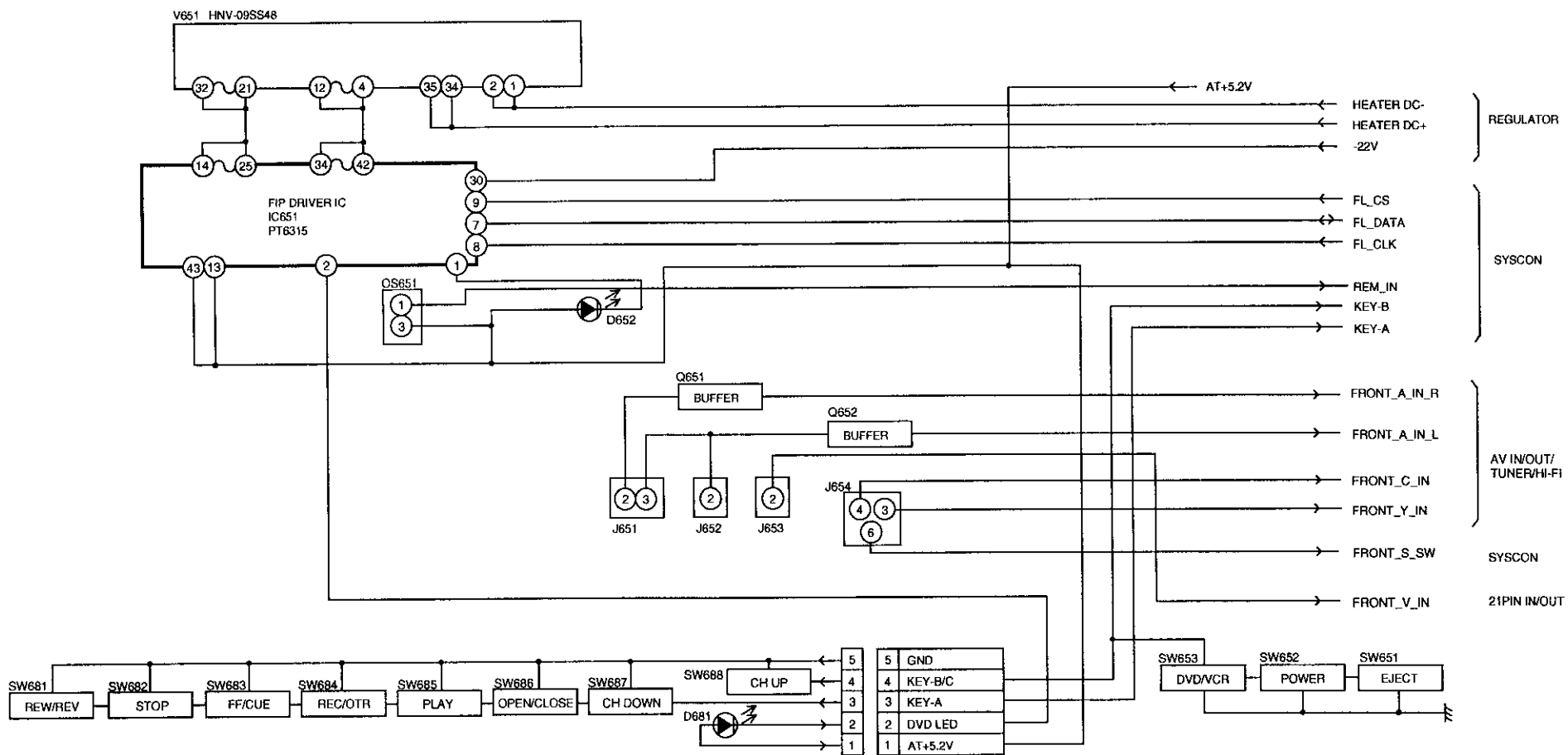
Y/C/AUDIO/HEAD AMP BLOCK DIAGRAM



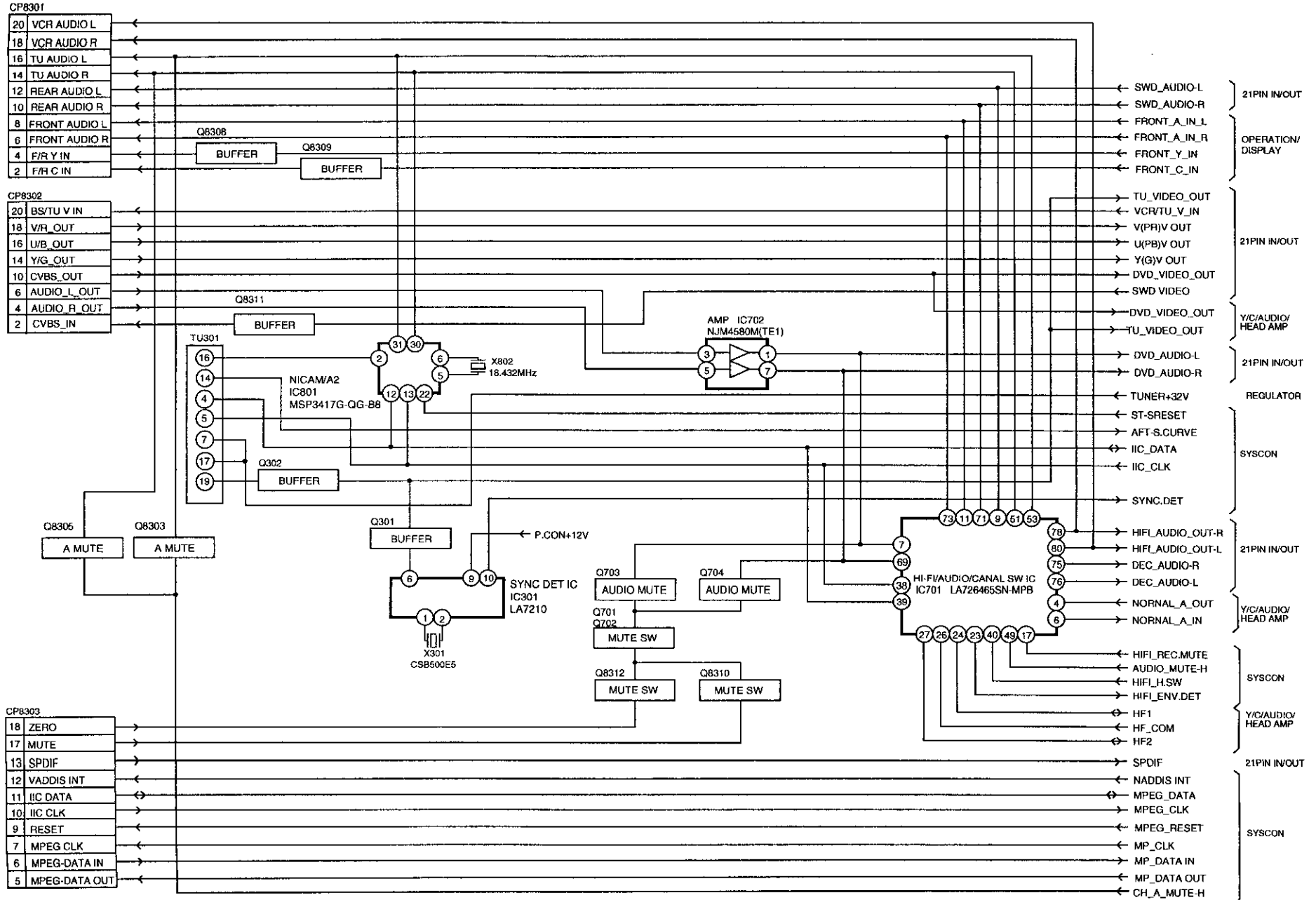
REGULATOR BLOCK DIAGRAM



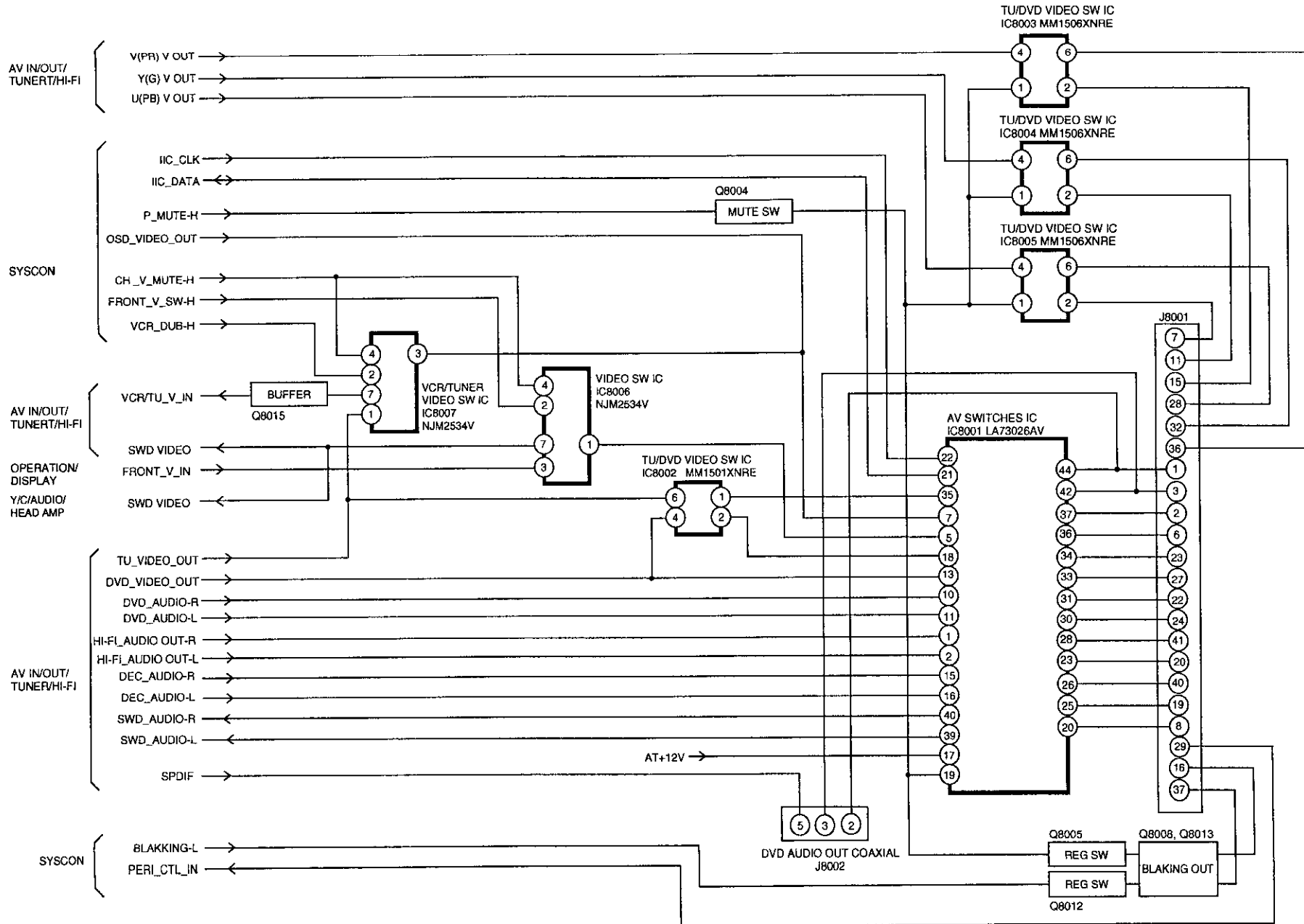
OPERATION/DISPLAY BLOCK DIAGRAM



AV IN/OUT/TUNER/HI-FI BLOCK DIAGRAM

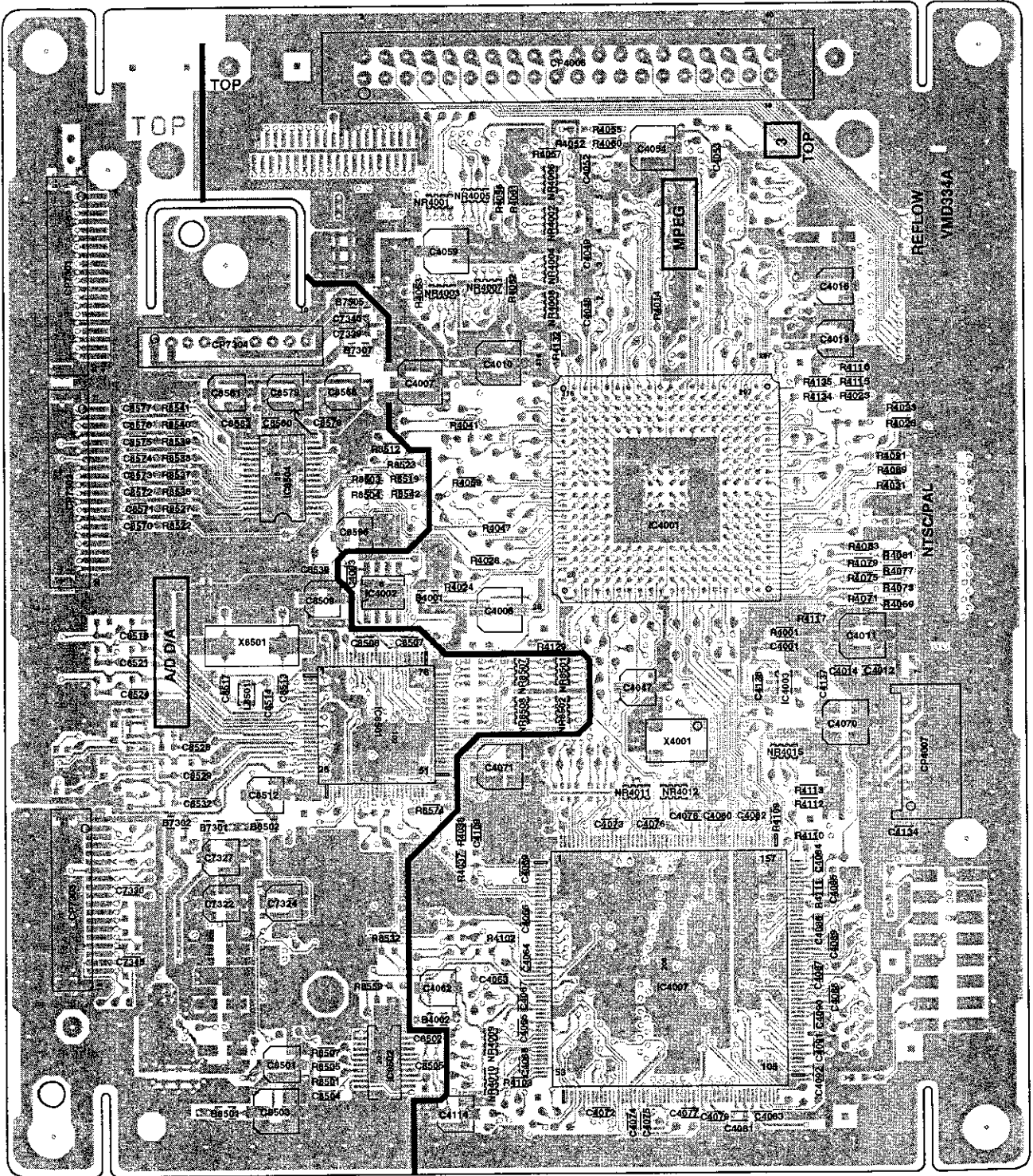


21PIN IN/OUT BLOCK DIAGRAM



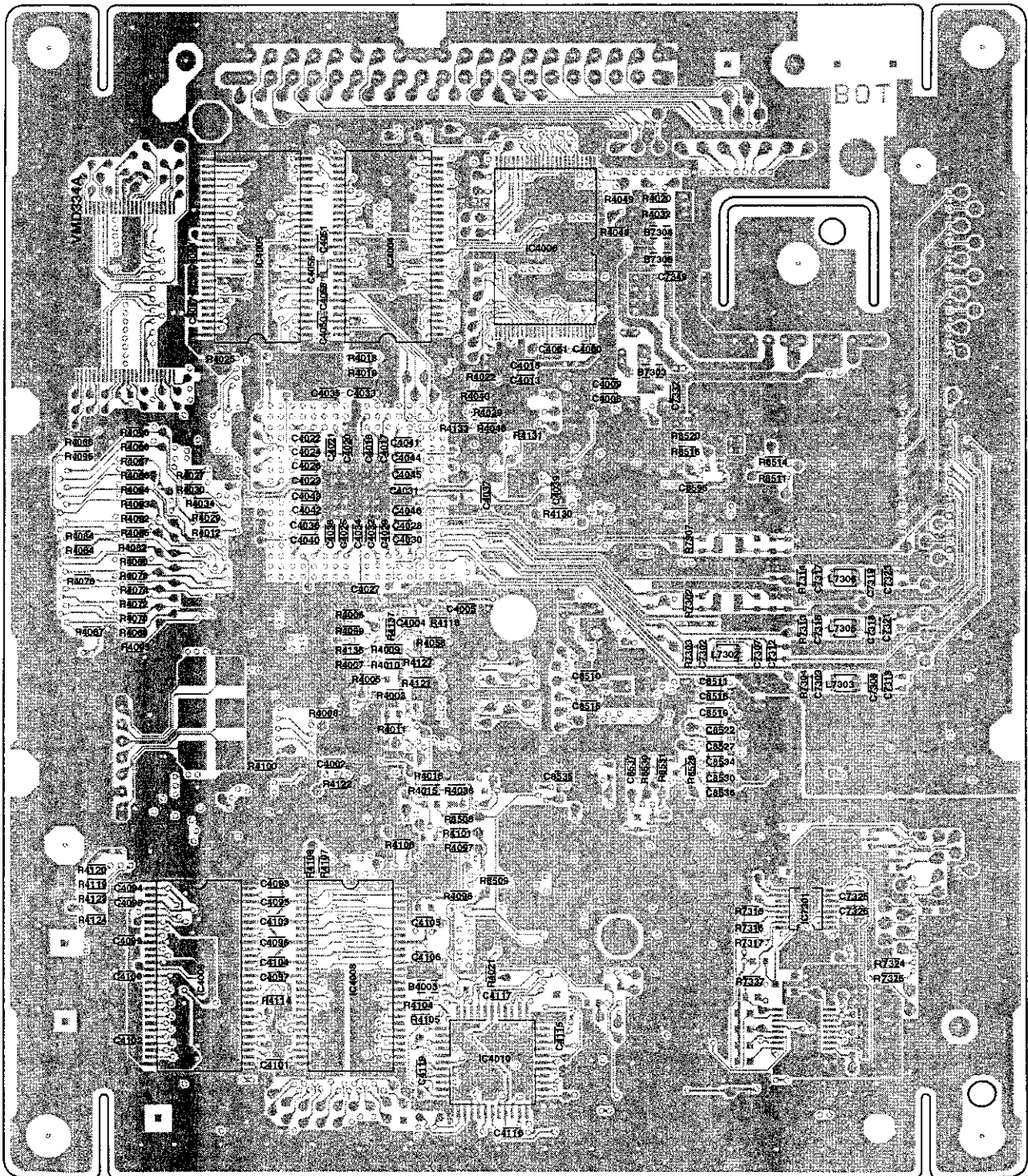
PRINTED CIRCUIT BOARDS

DVD/HD MPEG (TOP SIDE)



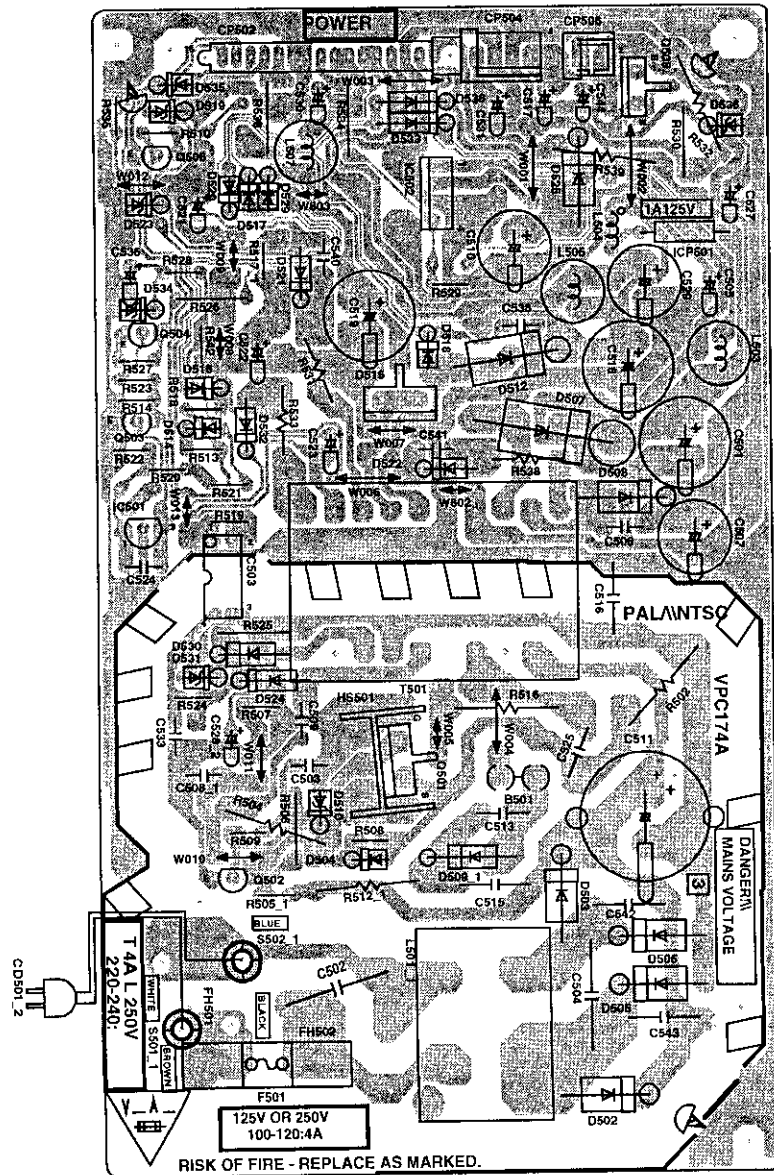
PRINTED CIRCUIT BOARDS

DVD/HD MPEG (BOTTOM SIDE)

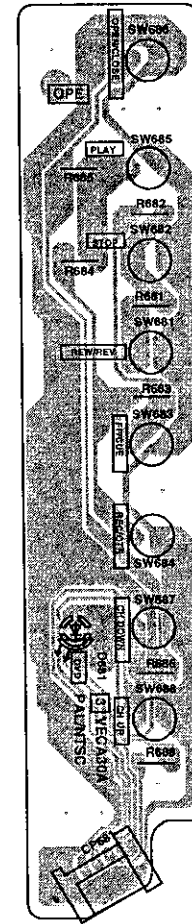


PRINTED CIRCUIT BOARDS

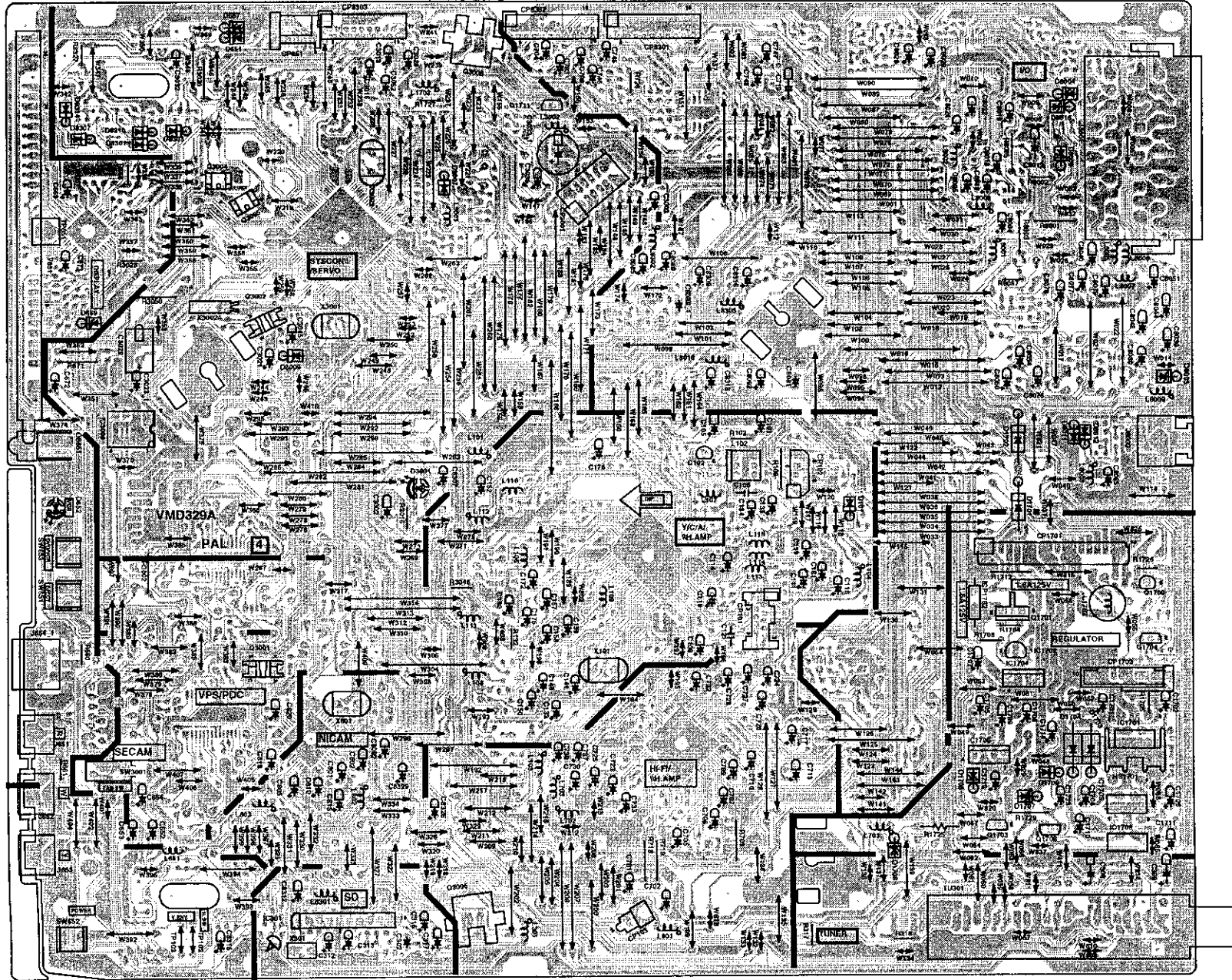
**POWER
SOLDER SIDE**



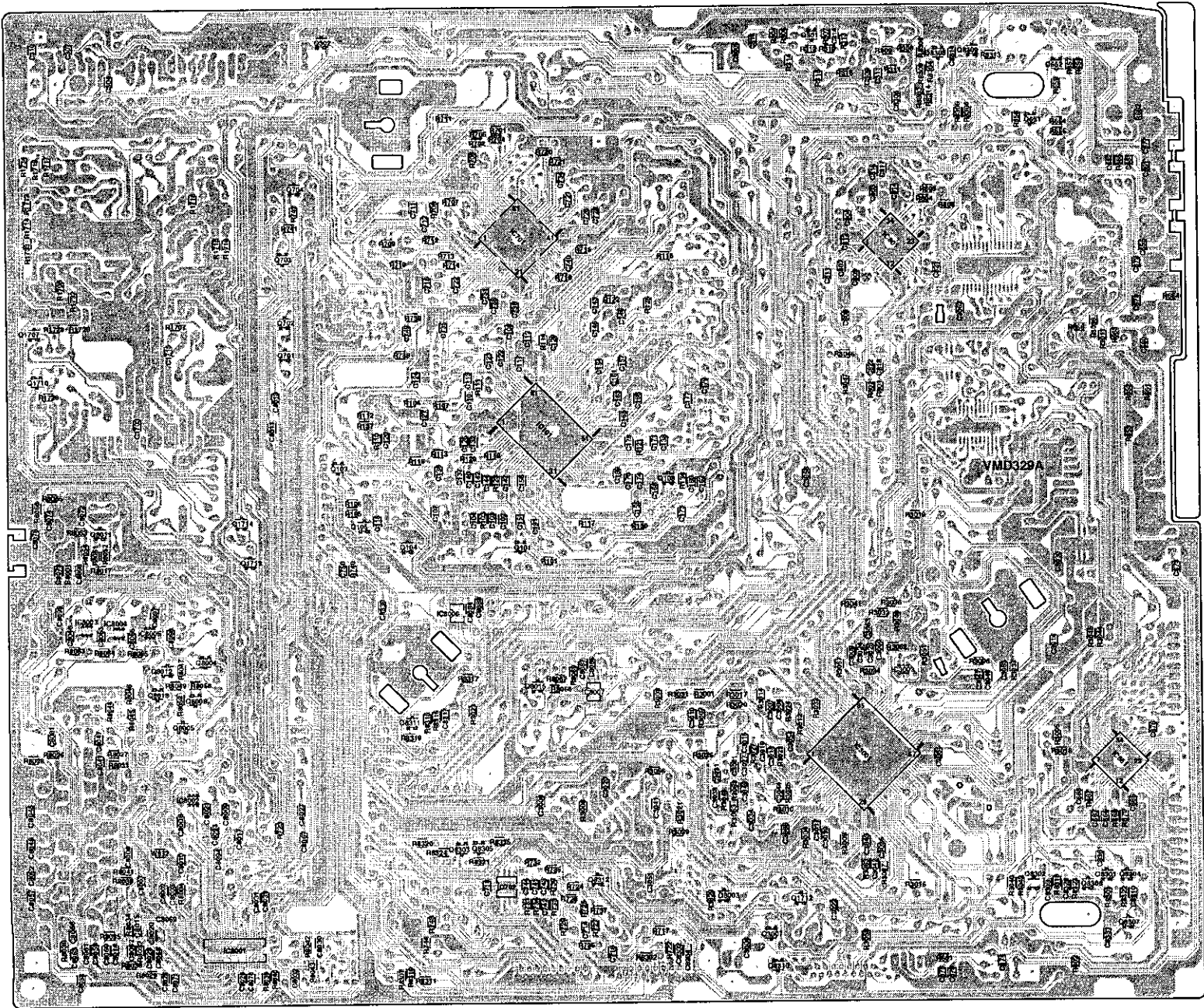
**OPERATION
SOLDER SIDE**



PRINTED CIRCUIT BOARDS
VCR (INSERTED PARTS)
SOLDER SIDE



PRINTED CIRCUIT BOARDS
VCR (CHIP MOUNTED PARTS)
SOLDER SIDE



AV ENCODER SCHEMATIC DIAGRAM (DVD/HD MPEG PCB)

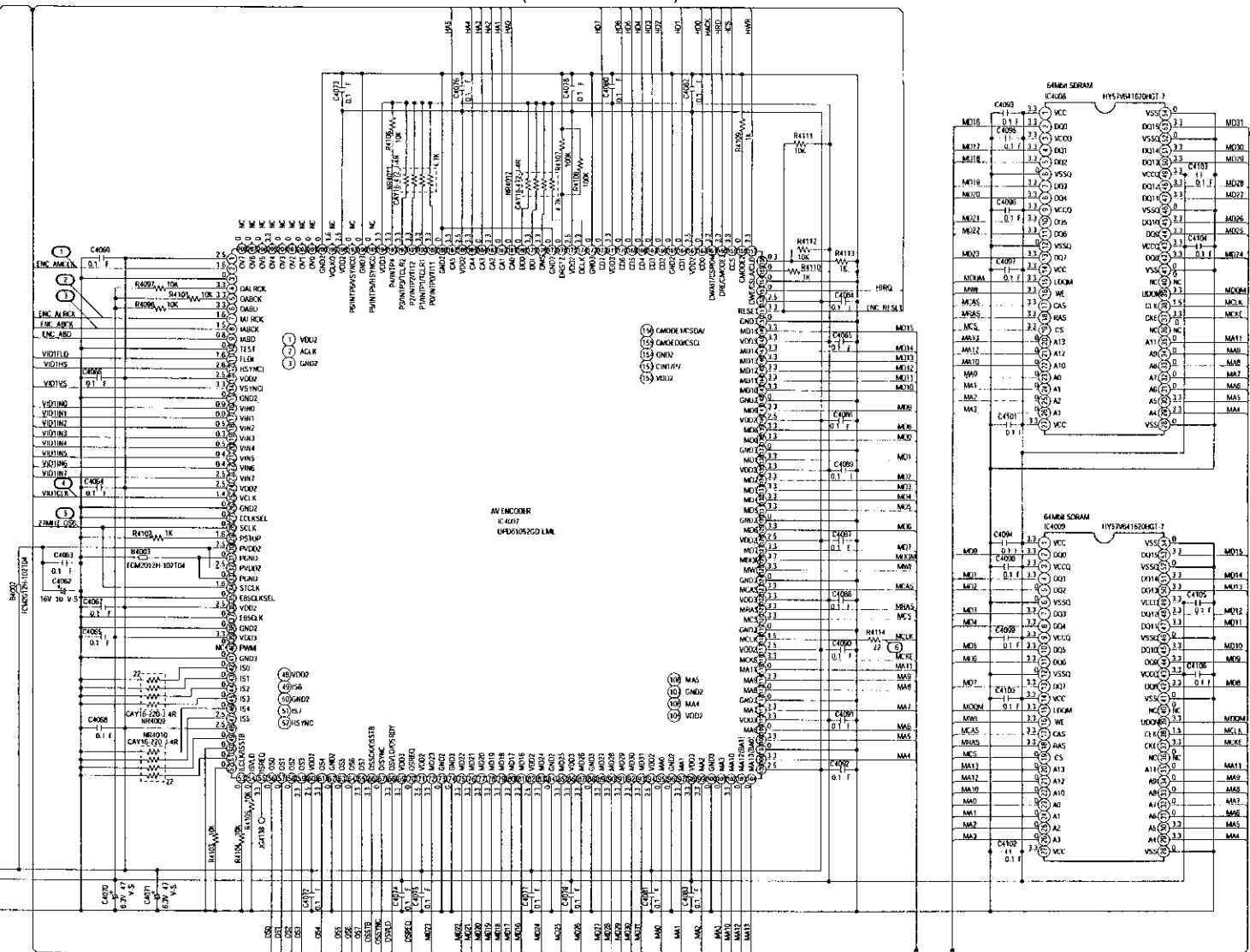
FROM TO AUDIO AUX
ENC_A1_RCK
ENC_A2_RCK
ENC_A3_RCK

FROM TO VIDEO COLOR IN
VID10L
VID10S
VID10V
VID10R
VID10G
VID10B
VID10Y
VID10C
VID10M
VID10E
VID10F
VID10K

FROM TO PCLK
ENC_A1_MCLK
OSC1
OSC2
OSC3
OSC4
OSC5
OSC6
OSC7
OSC8
OSC9
OSC10

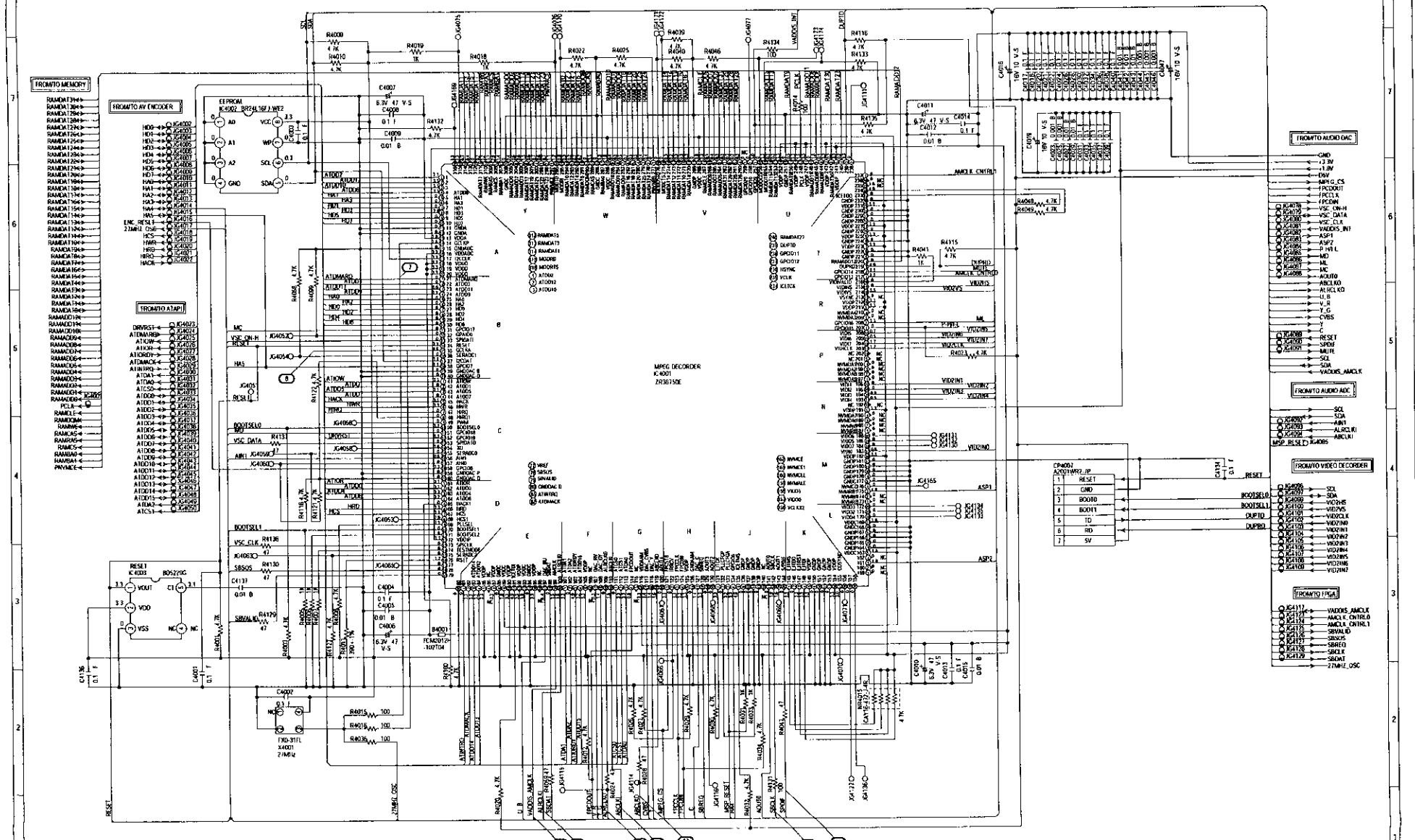
FROM TO AMP I/O
2PHASE_OSC
HNS
HNS1
HNS2
HNS3
HNS4
HNS5
HNS6
HNS7
HNS8
HNS9
HNS10
HNS11
HNS12
HNS13
HNS14
HNS15
HNS16
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HNS91
HNS92
HNS93
HNS94
HNS95
HNS96
HNS97
HNS98
HNS99
HNS100

FROM TO AUDIO ENC
+2.5V
+3.3V
GND



MPEG SCHEMATIC DIAGRAM

(DVD/HD MPEG PCB)

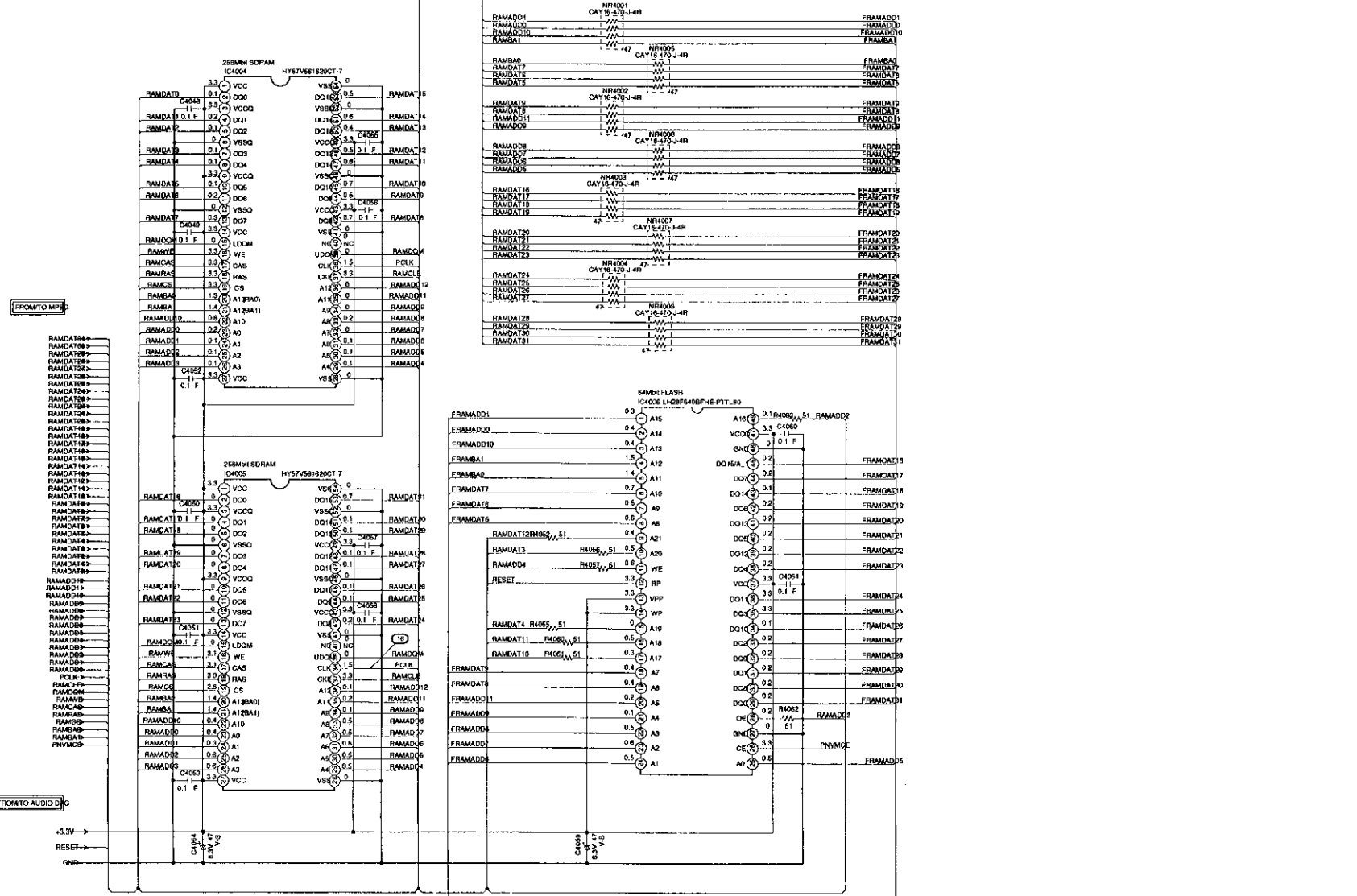


NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

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

PCB10
VM0314

MEMORY SCHEMATIC DIAGRAM (DVD/HD MPEG PCB)



FROM TO MP3

FROM TO AUDIO D/C

+3.3V
RESET
GND

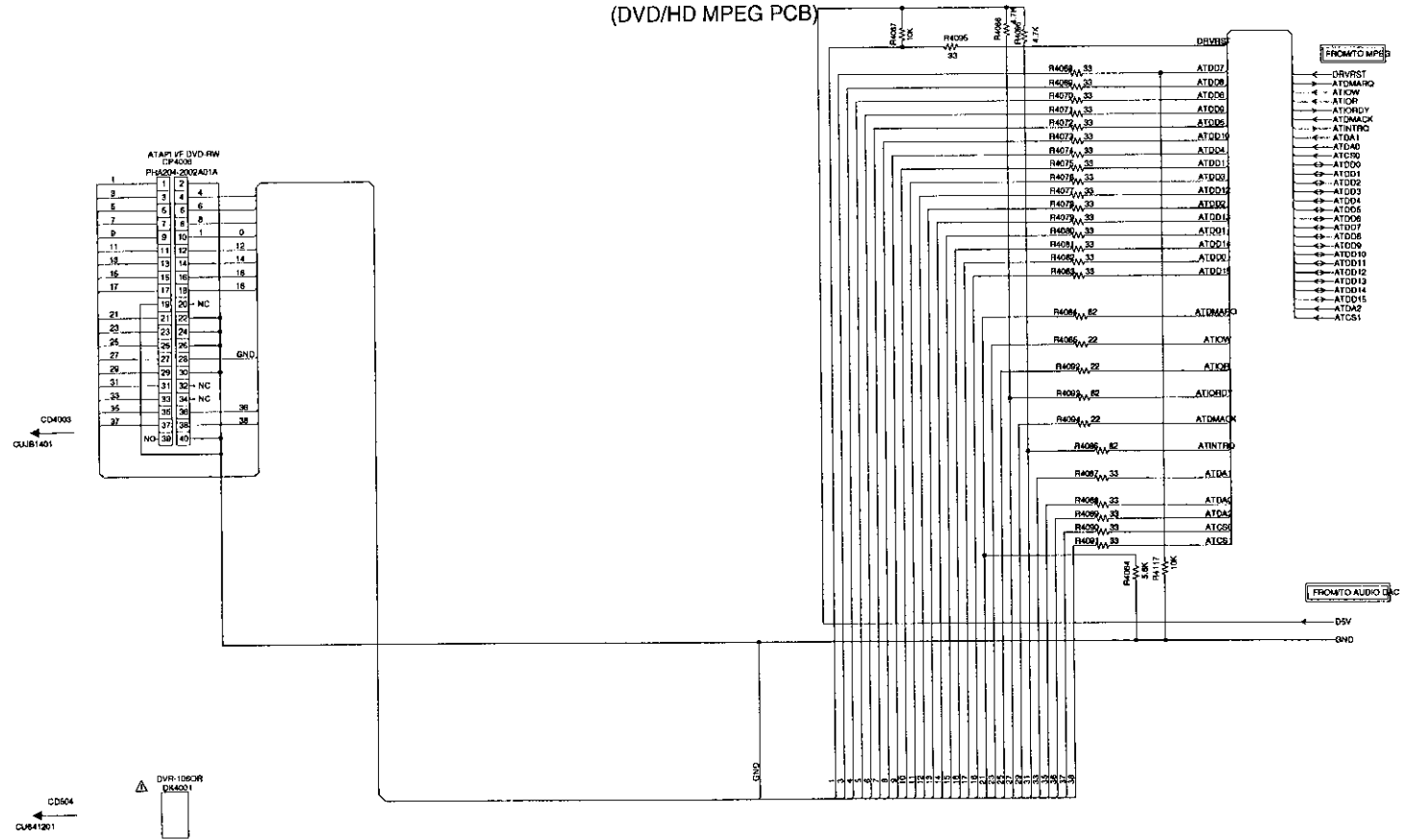
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE

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

PCB#
VMC334

ATAPI SCHEMATIC DIAGRAM

(DVD/HD MPEG PCB)



CAUTION THESE PARTS MARKED WITH THIS SYMBOL ARE DANGEROUS AT POINT OF VIEW SECURITE CRITICAL FOR SAFETY USE ONES DESCRIBED IN PARTS LIST ONLY

ATTENTION PIÈCES REPARÉES PAR UN ATANT DANGEREUSES AN POINT DE VUE SECURITE UTILISER QUE CELLS DECRITÉS DANS LA NOMENCLATURE DES PIÈCES

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

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

PCB101
VMD334

FPGA SCHEMATIC DIAGRAM

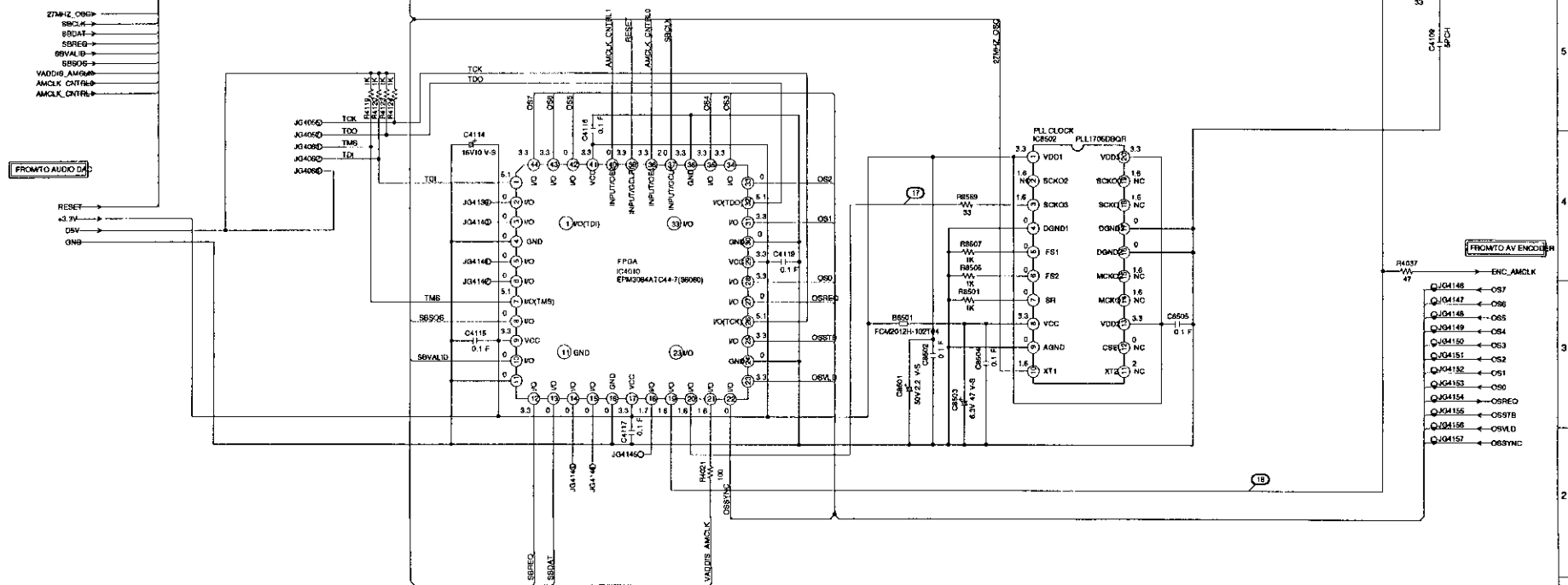
(DVD/HD MPEG PCB)

FROM TO MPEG

FROM TO AUDIO DA

FROM TO AUDIO AD

FROM TO AV ENCODER



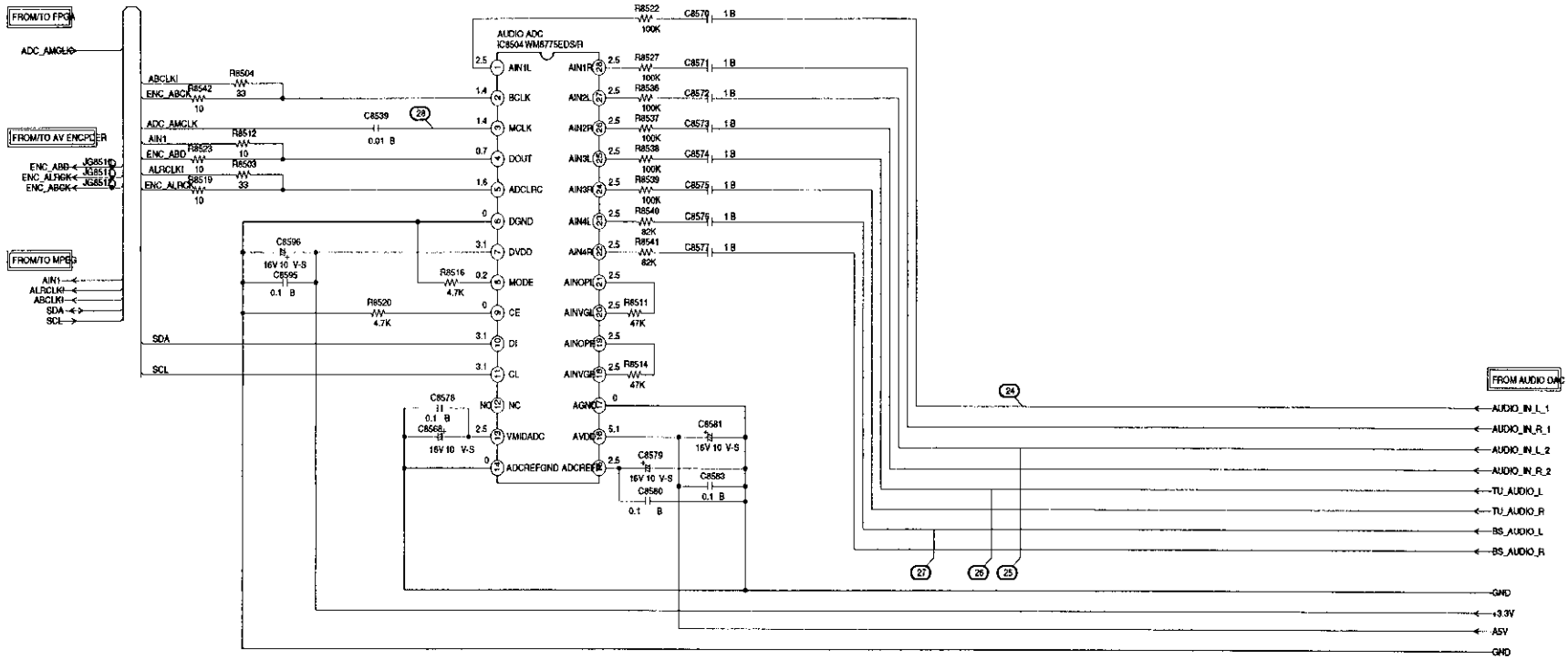
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE

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

PC9810
VMD234

AUDIO ADC SCHEMATIC DIAGRAM

(DVD/HD MPEG PCB)

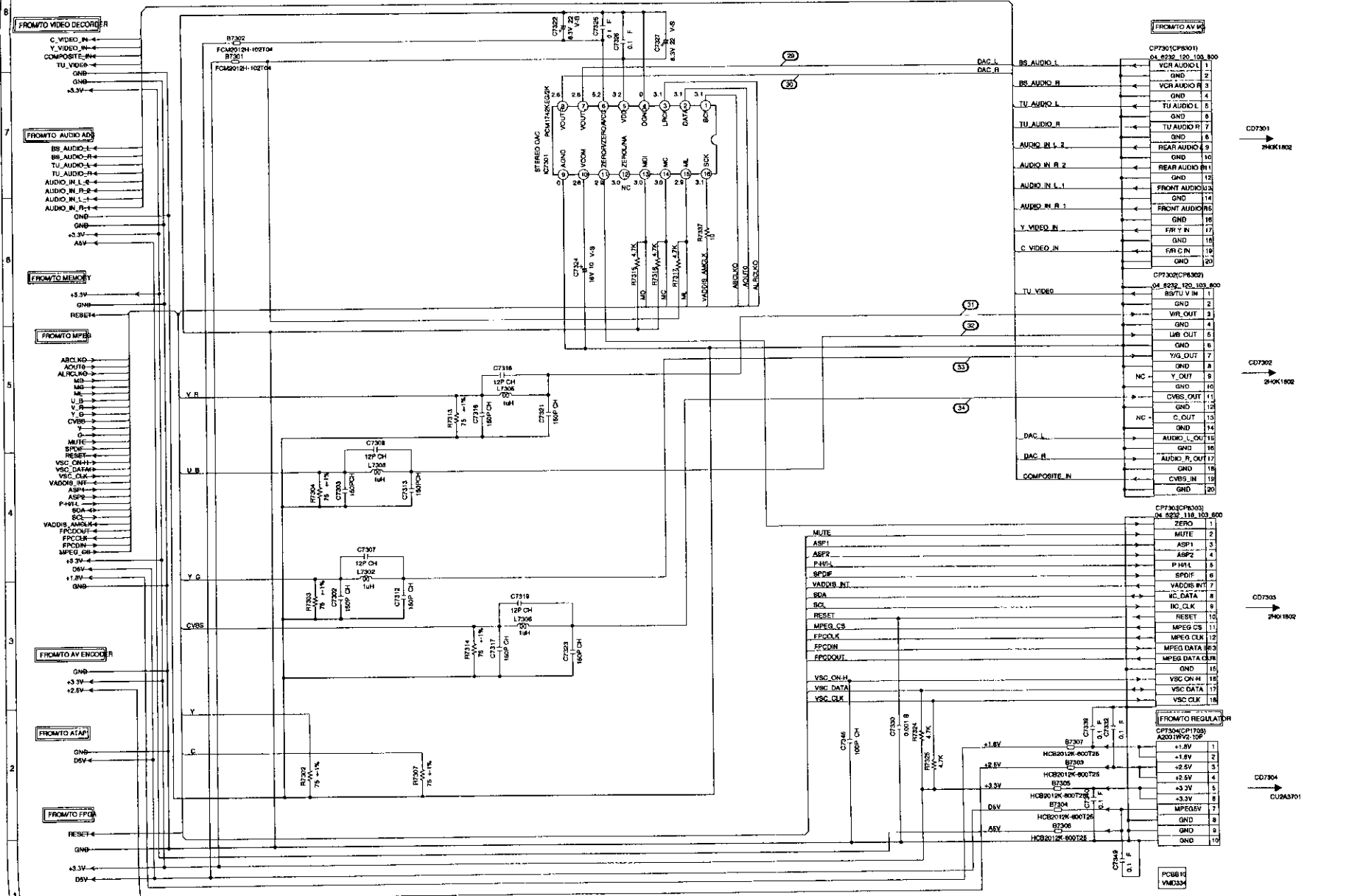


NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

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

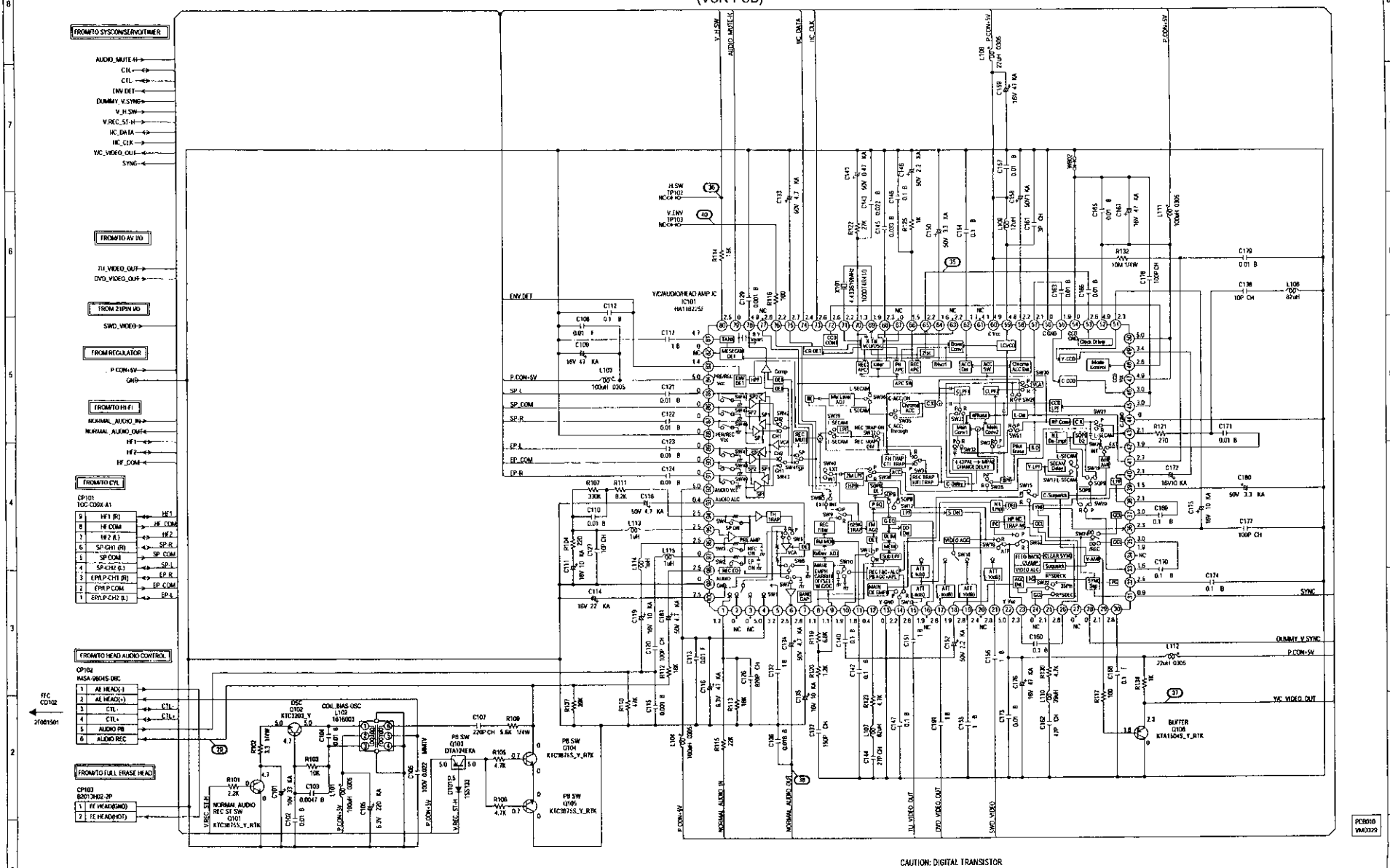
PCBB10
VM034

AUDIO DAC SCHEMATIC DIAGRAM (DVD/HD MPEG PCB)



NOTETHIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME; THE DC VOLTAGE EACH PART WAS OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

Y/C/AUDIO/HEAD AMP SECAM SCHEMATIC DIAGRAM (VCR PCB)



- FROM TO SYS/SENSE/OUT/ME/R**
- AUDIO_MUTE_H →
 - CFL →
 - CFL →
 - ENV_DET →
 - DUMMY_VSYNG →
 - V_H_SW →
 - V_REC_ST_H →
 - IC_DATA →
 - IC_CLK →
 - VC_VIDEO_OUT →
 - SYNG →

- FROM TO AV IO**
- TV_VIDEO_OUT →
 - DVD_VIDEO_OUT →

- FROM TO 21PIN IO**
- SWD_VIDEO →

- FROM REGULATOR**
- P_CON-SV →
 - GN →

- FROM TO FR F1**
- NORMAL_AUDIO_IN →
 - NORMAL_AUDIO_OUT →
 - RF →
 - RF →
 - RF_COM →

- FROM TO CYL**
- CP101
TCC CD04 A1
- 9 HE1 (R) → HE1
 - 8 HE COM → HE COM
 - 7 HE2 (L) → HE2
 - 6 SP-CH1 (R) → SP COM
 - 5 SP COM → SP COM
 - 4 SP-CH2 (L) → SP L
 - 3 EP-P-CH1 (R) → EP R
 - 2 EP-P COM → EP COM
 - 1 EP-L-CH2 (L) → EP L

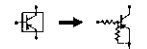
- FROM TO HEAD AUDIO CONTROL**
- CP102
MASA 9645 OSC
- 1 HE HEAD1 →
 - 2 HE HEAD2 →
 - 3 CTL →
 - 4 AUDIO PH →
 - 5 AUDIO REC →

- FROM TO FULL ERASE HEAD**
- CP103
SD03822 2P
- 1 FE HEAD(ND) →
 - 2 FE HEAD(OT) →

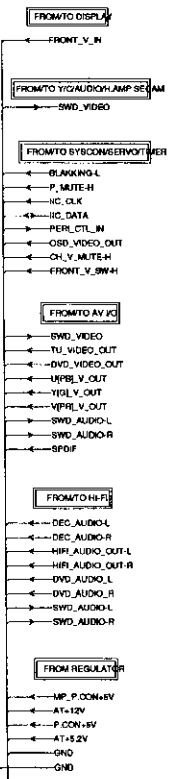
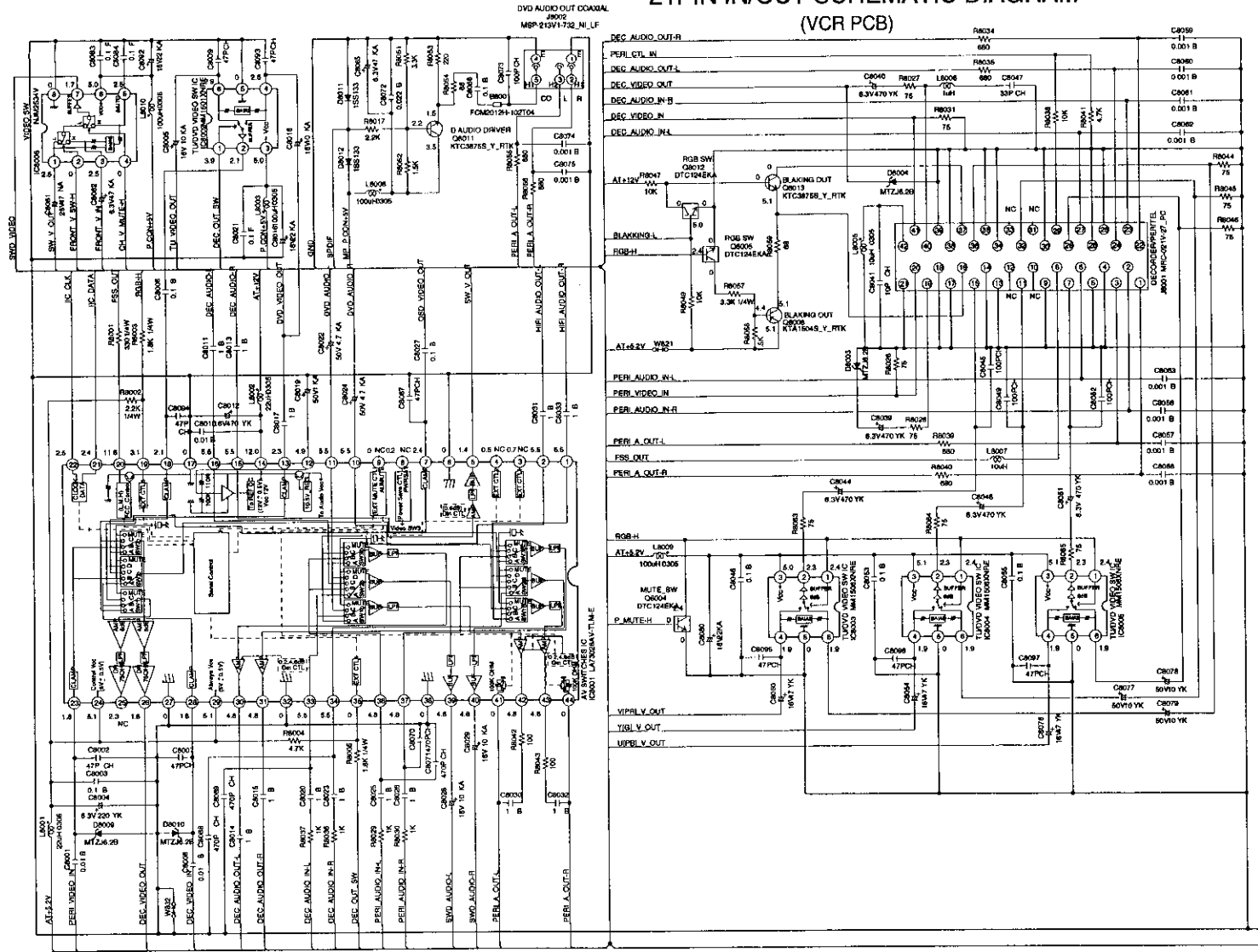
NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

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

CAUTION: DIGITAL TRANSISTOR



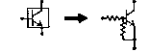
21PIN IN/OUT SCHEMATIC DIAGRAM (VCR PCB)



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

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

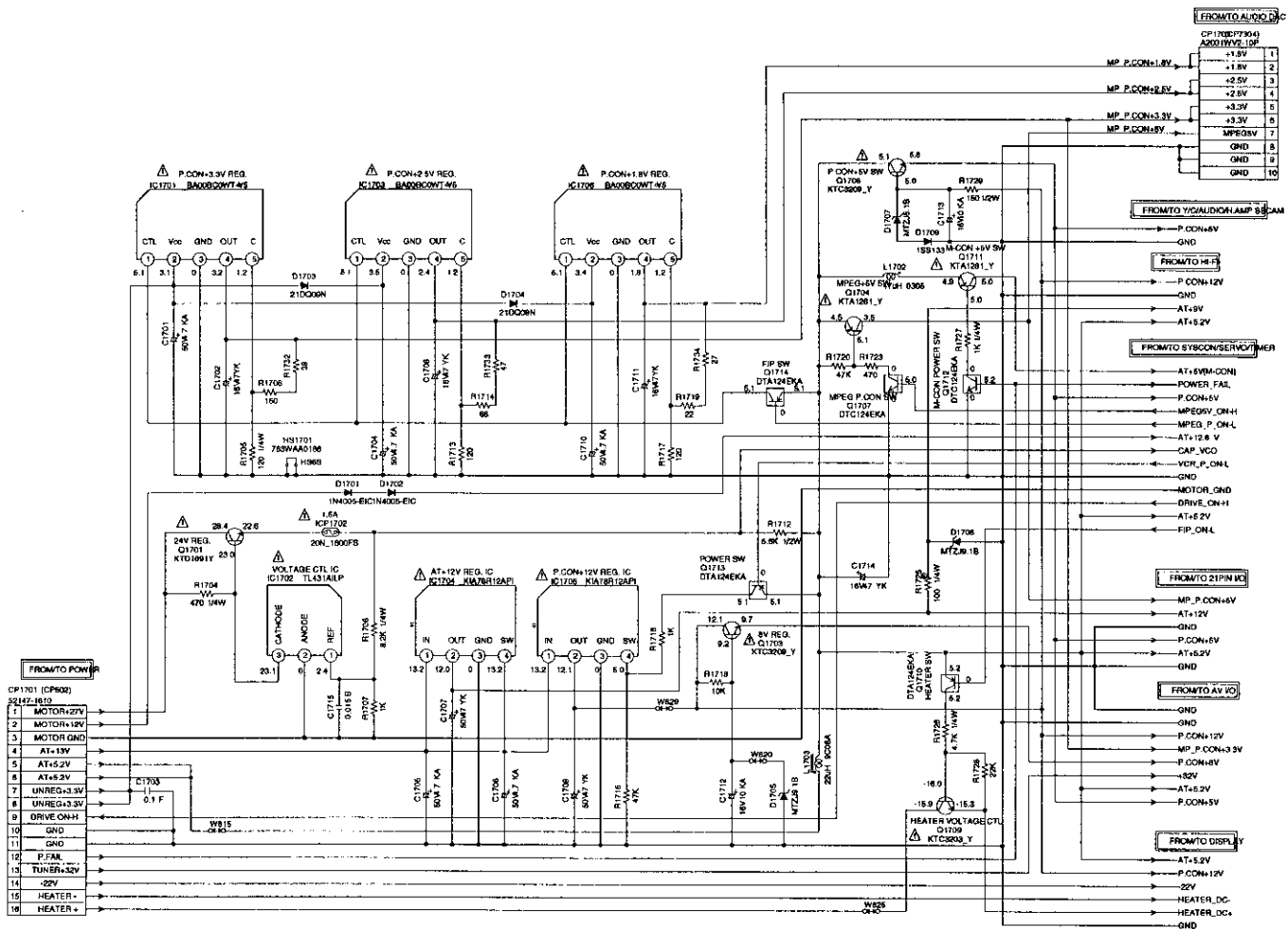
CAUTION: DIGITAL TRANSISTOR



PCB010
VMD020

REGULATOR SCHEMATIC DIAGRAM

(VCR PCB)



NOTE: THE DC VOLTAGE EACH PART WAS NOTED IN THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE DURING PLAYBACK.

ATTENTION: LES PIÈCES RÉPARÉES PAR UN MÉTANT DANGEREUSES AN POINT DE VUE SECURITE UTILISER QUE CELLES IDENTIFIEES DANS LA NOMENCLATURE DES RIECES

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

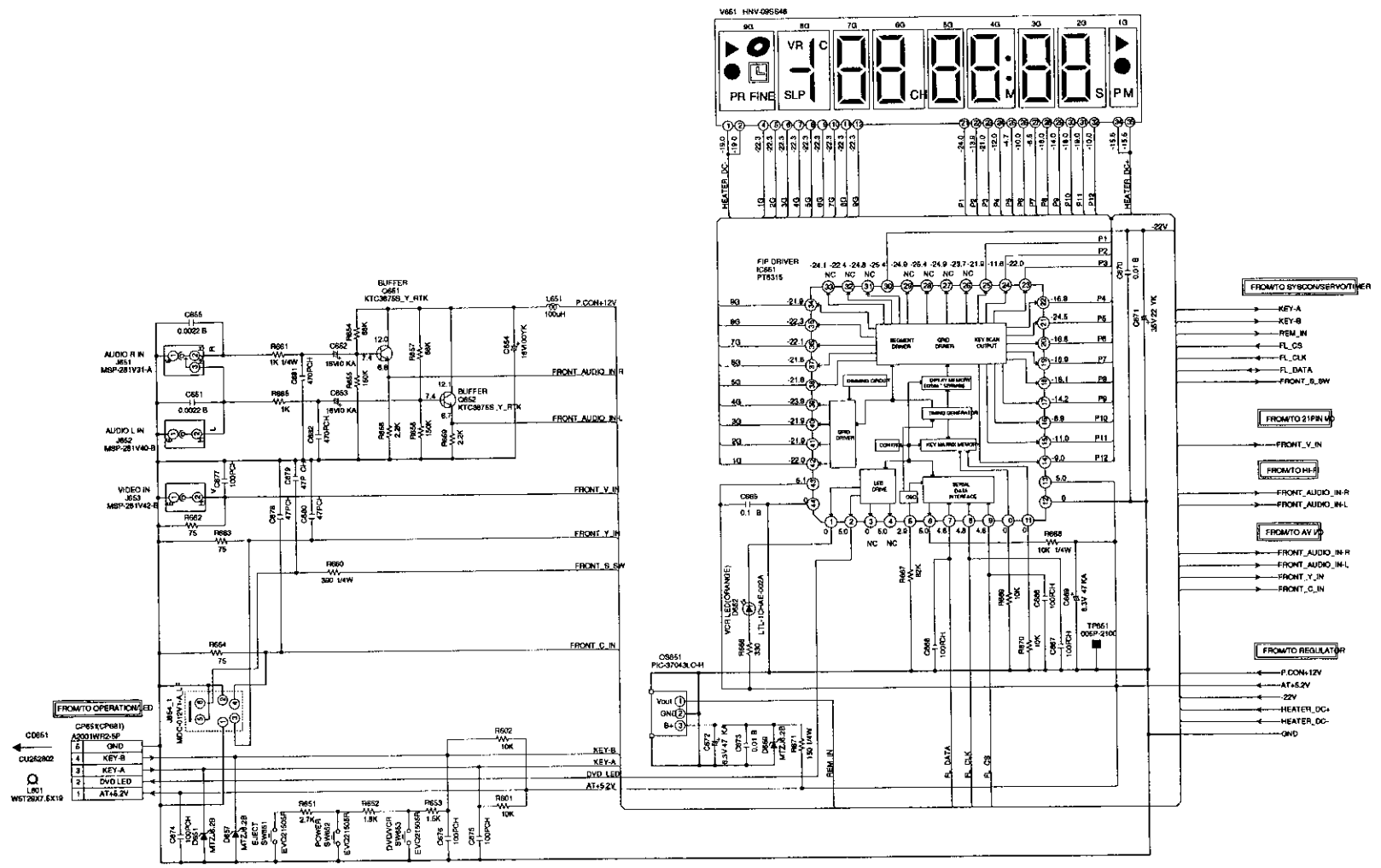
CAUTION: DIGITAL TRANSISTOR



CAUTION: DIGITAL TRANSISTOR

DISPLAY SCHEMATIC DIAGRAM

(VCR PCB)



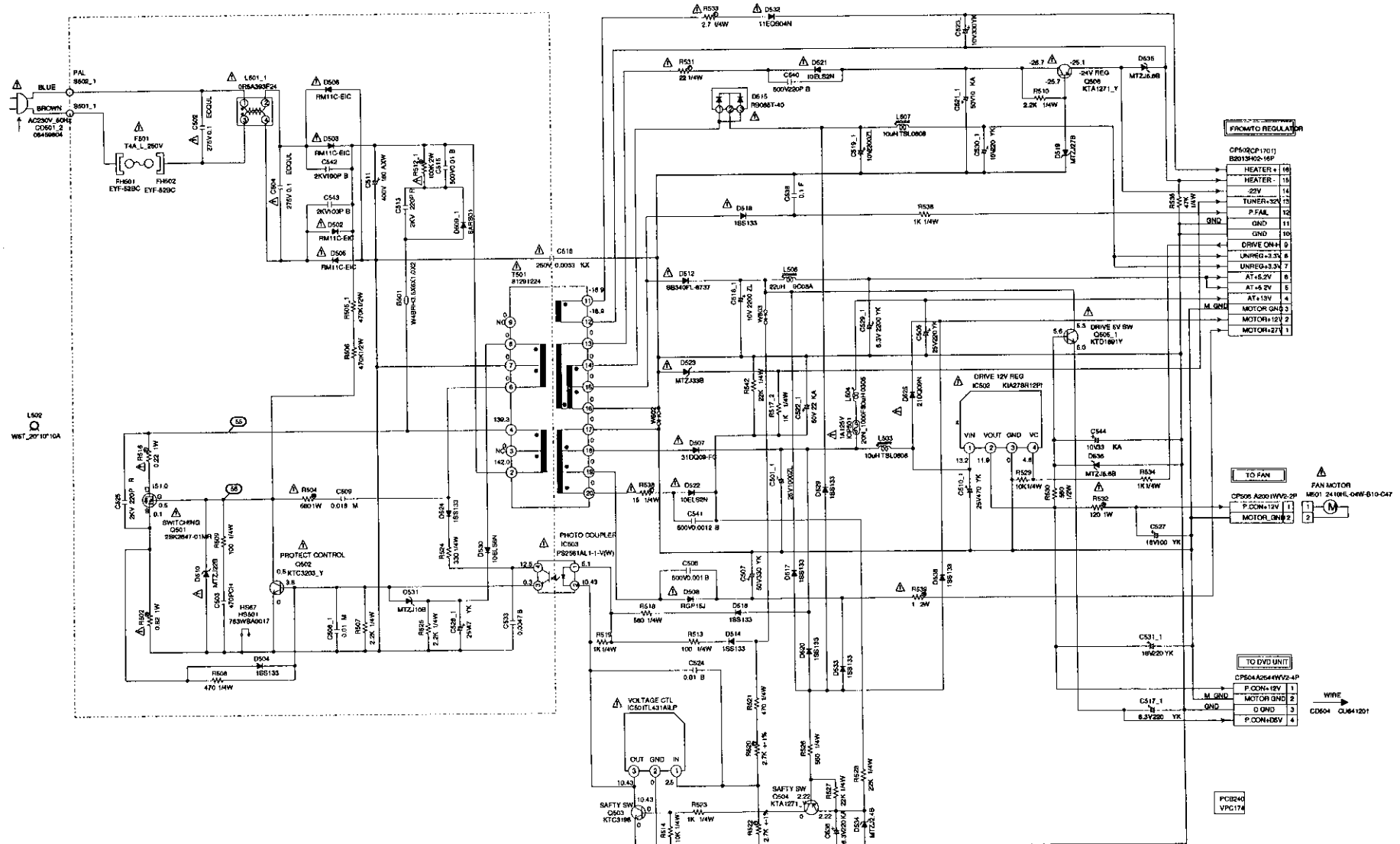
NOTE THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

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

PCB010
VMO329

POWER SCHEMATIC DIAGRAM

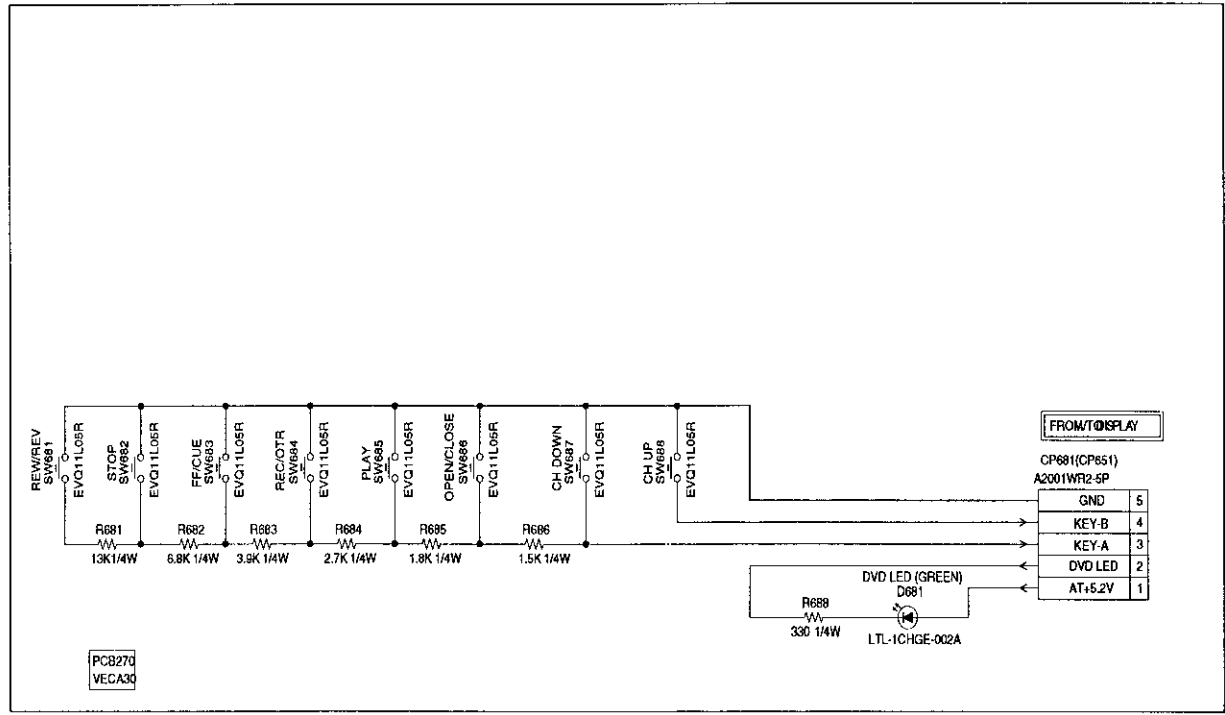
(POWER PCB)



CAUTION THESE PARTS MARKED **ARE ATTENTION** LES PIÈCES REPAREES **PAR ATTENTION** NOTE THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.
 CRITICAL FOR SAFETY USE ONLY DANGEREUSES AN POINT DE VUE SECURITE D'UTILISER QUE CELLES DECRITES DANS LA NOMENCLATURE DES REECES

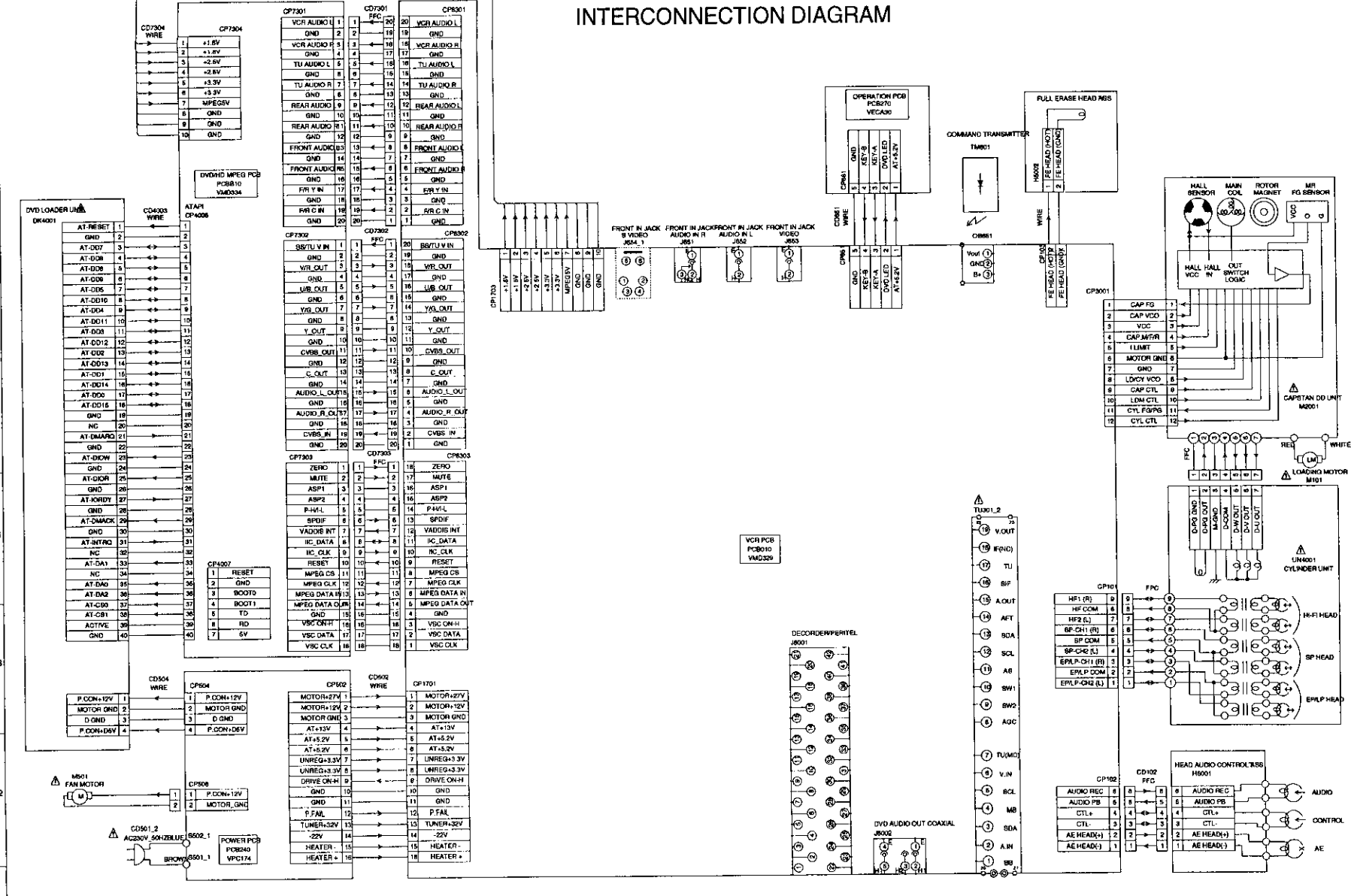
OPERATION/LED SCHEMATIC DIAGRAM

(OPERATION PCB)



NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK. NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

INTERCONNECTION DIAGRAM



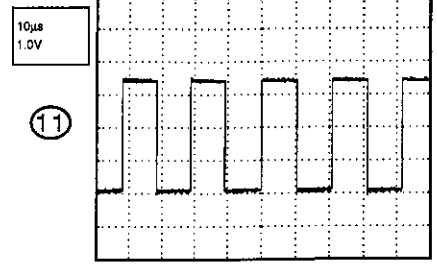
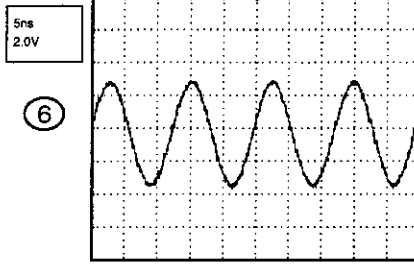
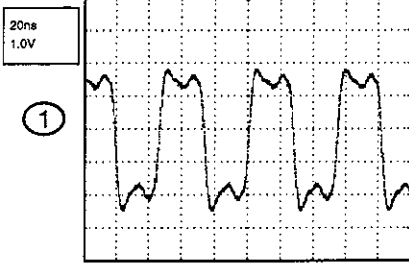
CAUTION THESE PARTS MARKED WIRE CRITICAL FOR SAFETY USE ONES DESCRIBED IN PARTS LIST ONLY

ATTENTION PIÈCES RÉPARÉES PARVENANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLES DECRITES DANS LA NOMENCLATURE DES REÇES

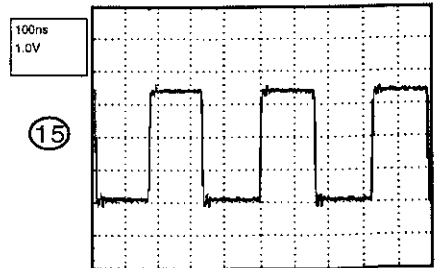
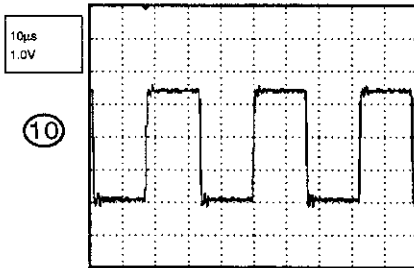
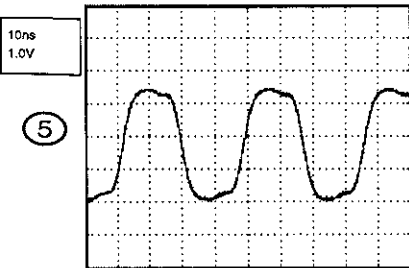
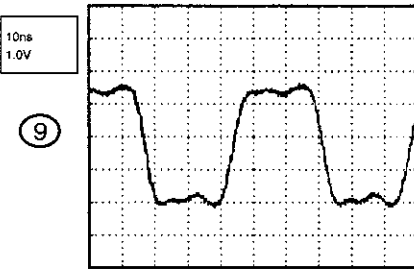
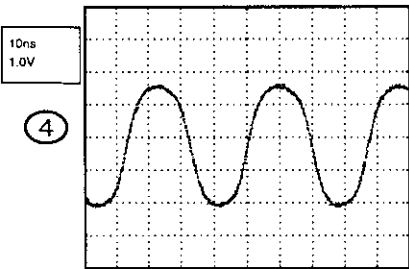
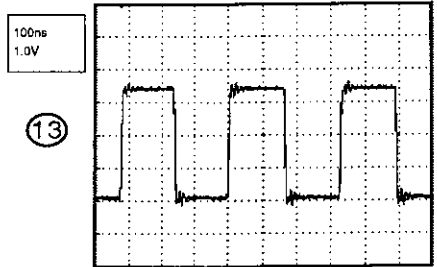
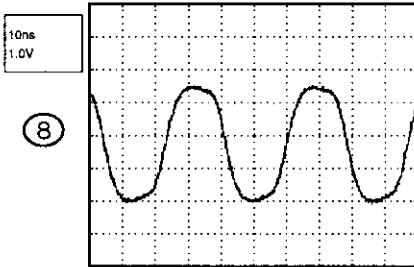
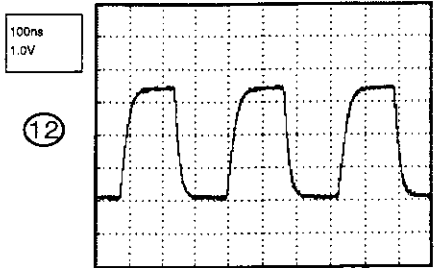
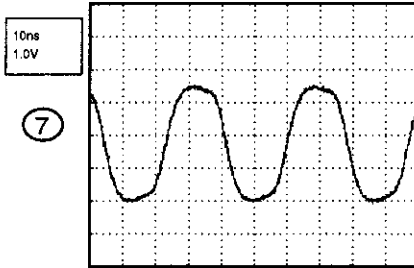
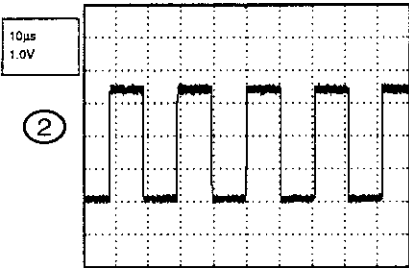
NOTE THIS INTERCONNECTION DIAGRAM IS THE LATEST EDITION OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE

WAVEFORMS

AV ENCODER



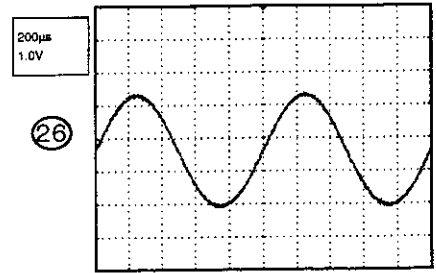
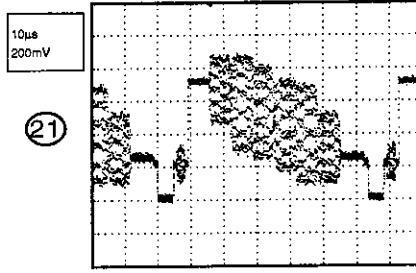
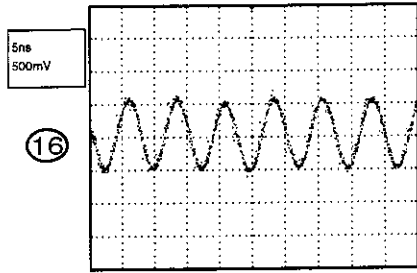
MPEG



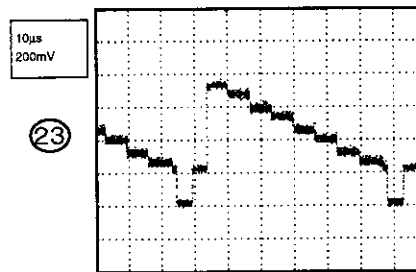
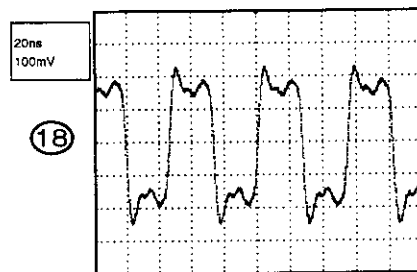
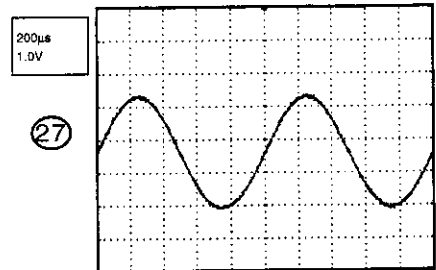
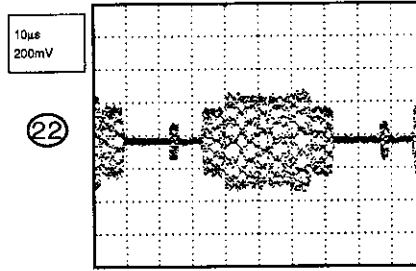
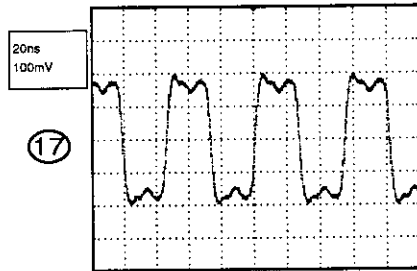
NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

WAVEFORMS

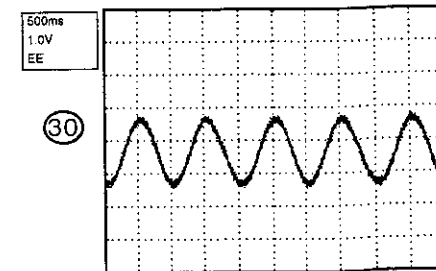
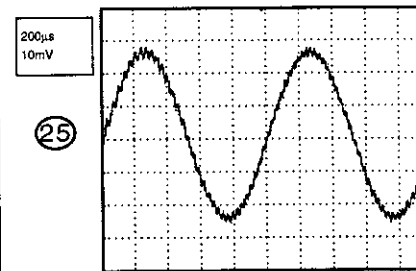
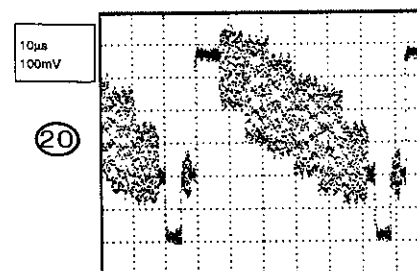
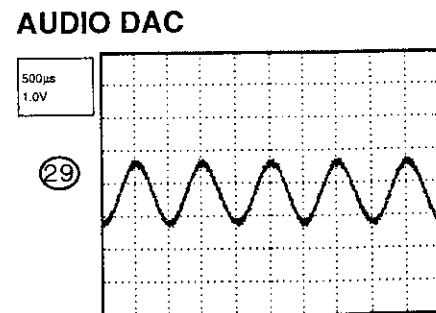
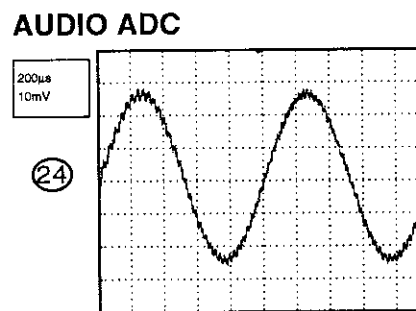
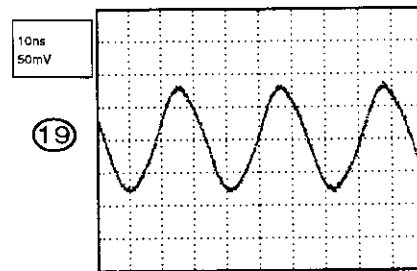
MEMORY



FPGA



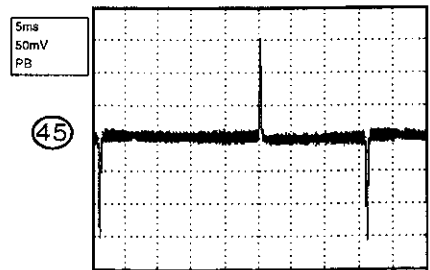
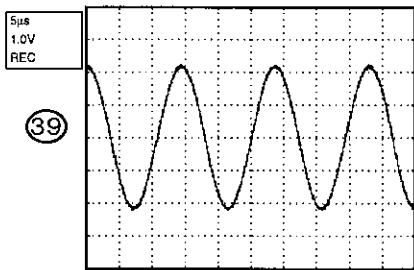
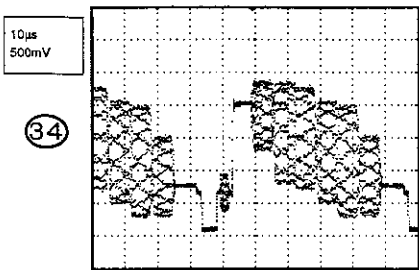
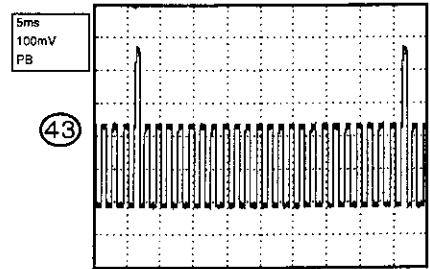
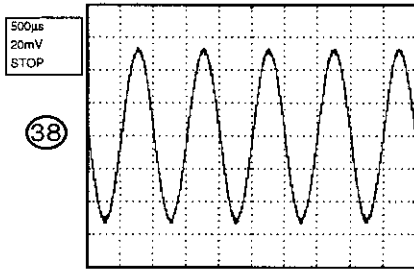
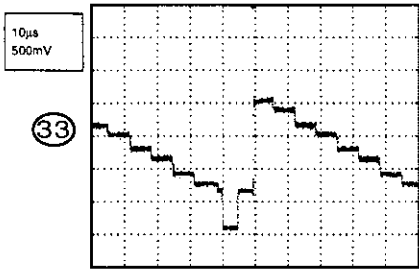
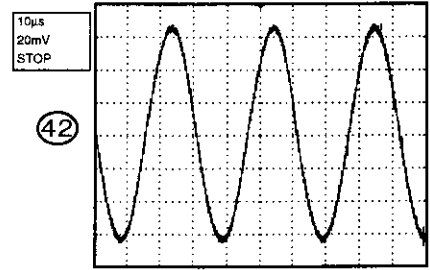
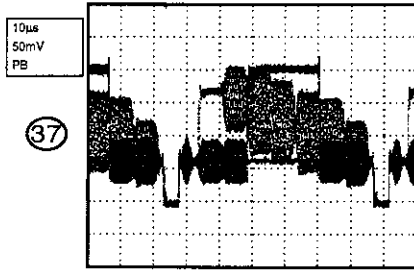
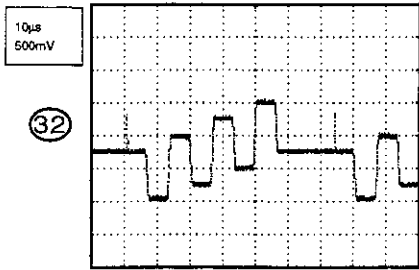
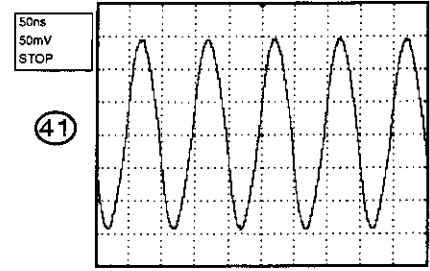
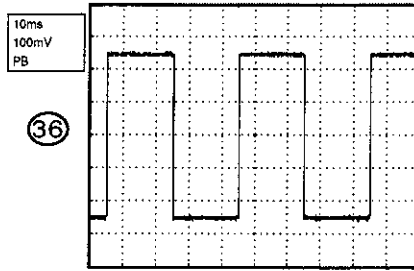
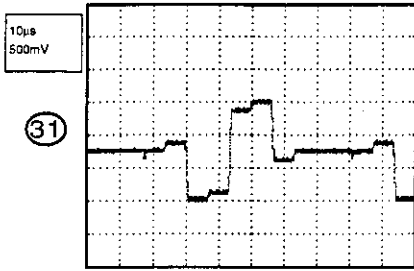
VIDEO DECODER



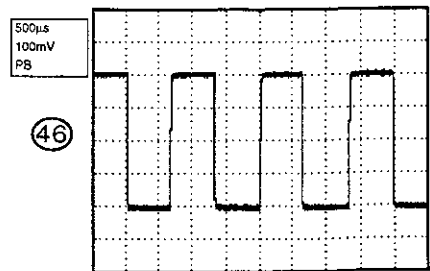
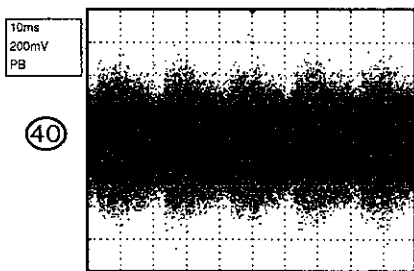
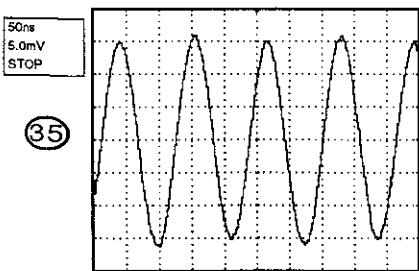
NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

WAVEFORMS

SYSCON/SERVO/TIMER

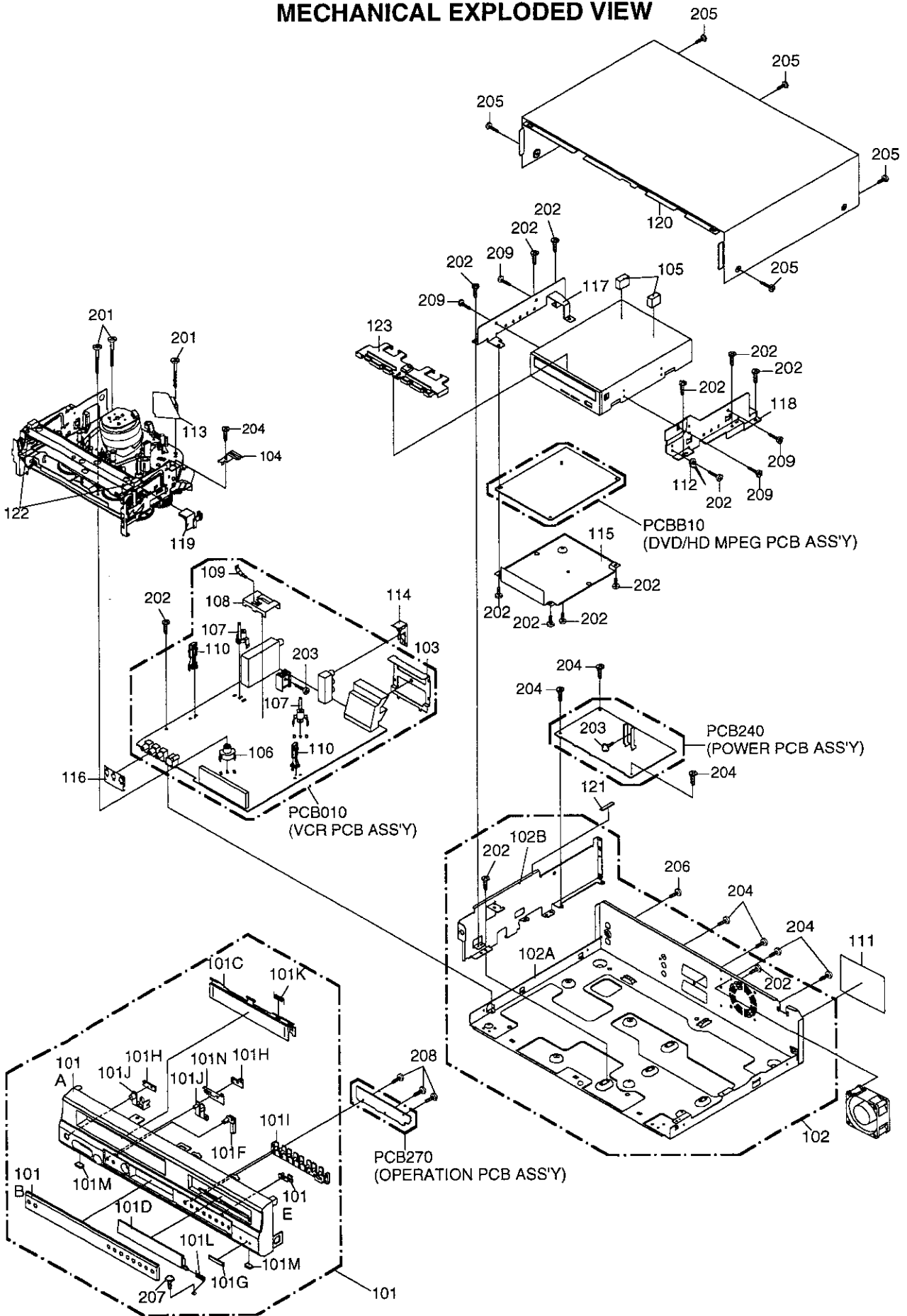


Y/C/AUDIO/HEAD AMP

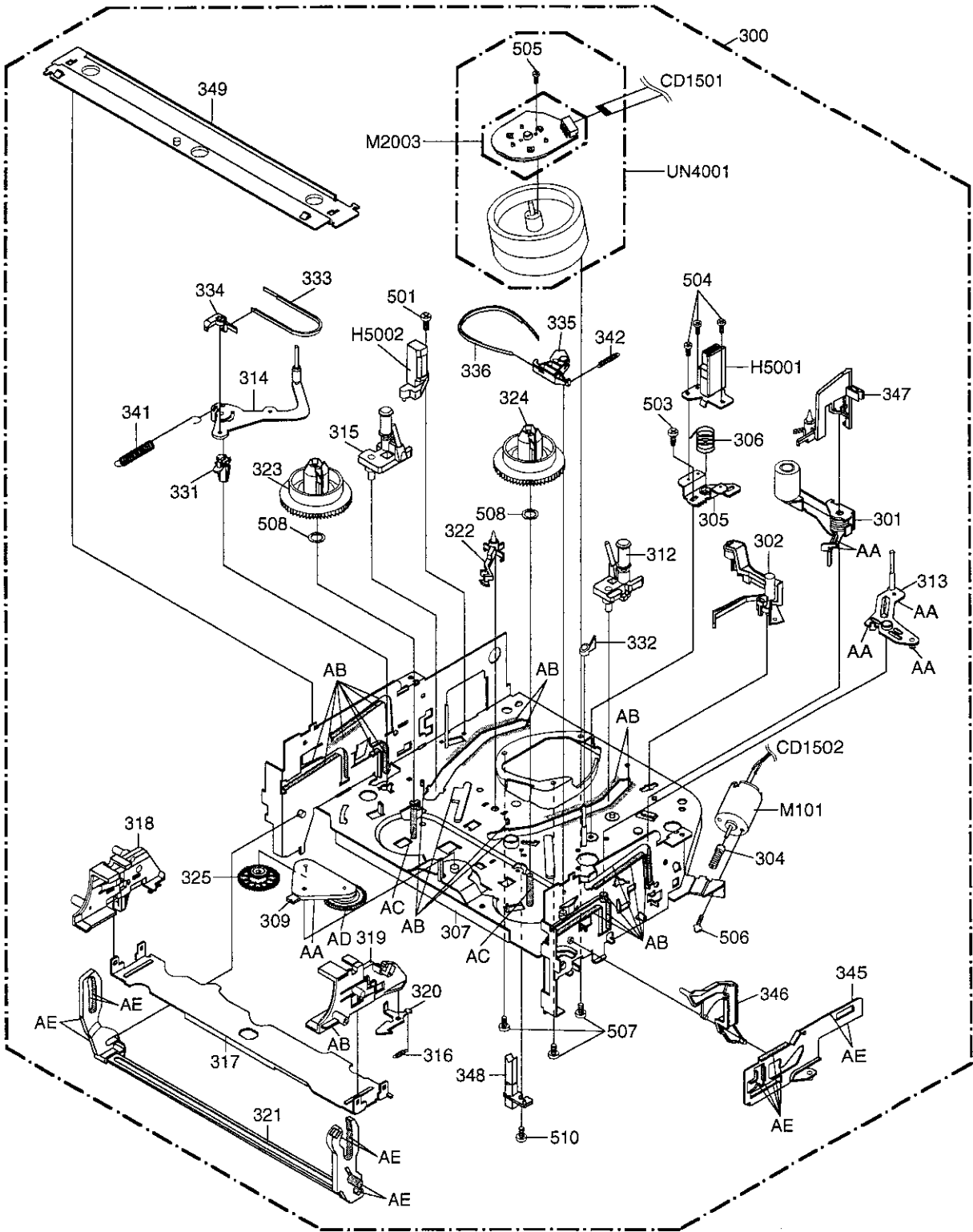


NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

MECHANICAL EXPLODED VIEW



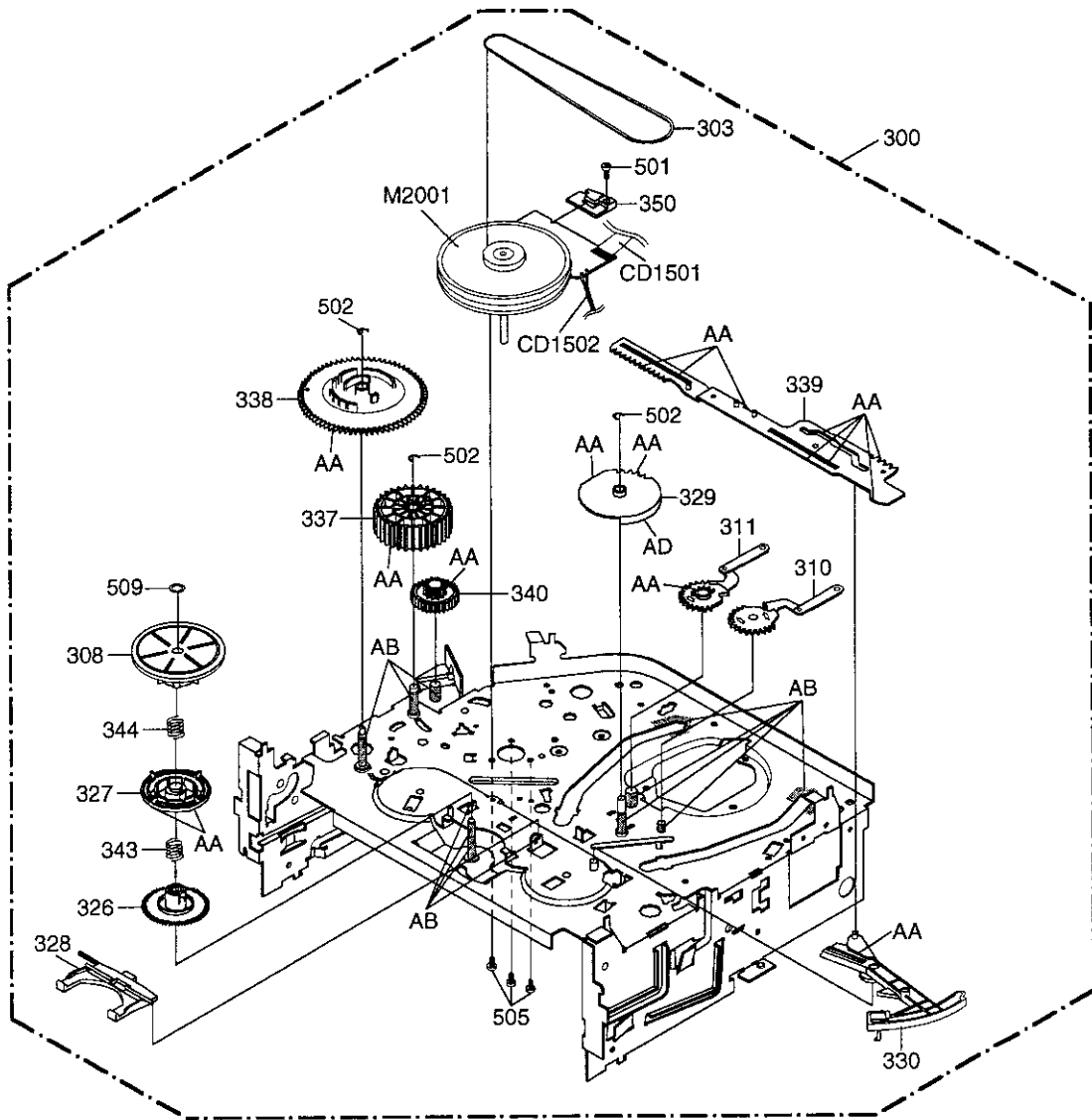
CHASSIS EXPLODED VIEW (TOP VIEW)



CLASS	PART NO.	PART NAME	MARK
GREASE	Y315061000	G-555G	AA
	Y315071000	MG-33	AB
	Y31D011000	FG-84M	AC
	Y315041000	FL-721	AD
	Y315141000	G-313Y	AE

NOTE: Applying positions AA, AB, AC, AD and AE 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.	PART NAME	MARK
GREASE	Y315061000	G-555G	AA
	Y315071000	MG-33	AB
	Y31D011000	FG-84M	AC
	Y315041000	FL-721	AD
	Y315141000	G-313Y	AE

NOTE: Applying positions AA, AB, AC, AD and AE 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	7A7010012B	FRONT,CABI ASS'Y	
101A	701WPJ1272	CABINET,FRONT	
101B	711WPD0654	PLATE,DISPLAY	
101C	712WPJ0861	FLAP,VCR	
101D	712WPQ0002	FLAP,DVD	
101E	713WPA0303	GLASS,LED-DVD	
101F	713WPA0304	GLASS,LED-VCR	
101G	7232020756	BADGE,BRAND	
101H	738WPA0083	STOPPER,BUTTON	
101I	738WPB0024	BUTTON,FRAME-DVD	
101J	738WPB0025	BUTTON,FRAME-VCR	
101K	743WKA0042	SPRING,FLAP	
101L	743WKA0050	SPRING,FLAP-DVD	
101M	800WFA0045	CUSHION,LEG	
101N	753WUA0067	SPRING,EARTH DISPLAY	
102	7G7610003B	BOTTOM,CABI ASS'Y	
102A	702WSA0209	PLATE,BOTTOM	
102B	761WSA0154	ANGLE,CENTER	
103	761WSA0104	SHIELD,21PIN	
104	753WUA0062	SPRING,EARTH-TOP	
105	8965TS2020	CUSHION	20x15x12
106	701WPA0686	HOLDER,DECK	
107	701WPA0751	HOLDER,DECK	
108	752WSA0230	SHIELD,CASE H/AMP	
109	753WUAA006	SPRING,EARTH H/AMP	
110	85OP700038	HOLDER,END SENSOR	
111	7222022662	SHEET,RATING	
112	899EFBA002	WIRING-CLIP	
113	752WSA0275	COVER,AC HEAD	
114	752WSA0290	SHIELD,COMPO	
115	752WSA0391	SHIELD,MPEG	
116	752WUA0008	SHIELD,JACK	
117	761WSA0150	ANGLE,DVD(L)	
118	761WSA0151	ANGLE,DVD(R)	
119	701WPA0781	HOLDER,TOP	
120	702WSB0092	CABINET,TOP	
121	800WFA0055	CUSHION	20x5xT1
122	8965TS1017	CUSHION	17.5x20x14
123	713WPA0308	HOLDER,DVD	
201	8109130B94	SCREW,TAP TITE(B) R PAN	3x29
202	8109230704	SCREW,TAP TITE(B) R BIND	3x7
203	8109130A04	SCREW,TAP TITE(B) WH7	3x10
204	8109230804	SCREW,TAP TITE(B) BIND	3x8
205	8109K30601	SCREW,TAP TITE(B) BIND	3x6
206	8107230404	SCREW,TAP TITE(S) BIND	3x4
207	8110E26804	SCREW,TAP TITE(P) WH10	M2.6x8
208	8110226804	SCREW,TAP TITE(P) BIND	2.6x8
209	8102230604	SCREW,BIND	M3x6
---	791WHA0108	GIFT,SHEET	
---	792WHA0516	PACKAGE,FRONT	
---	792WHA0519	PACKAGE,BACK	
---	793WCD1548	GIFT BOX	
---	795WCA0662	PAD,DVD/VR	155x250
---	A2D501T975	INSTRUCTION BOOK KIT	
---	J2D50101A	INSTRUCTION BOOK	
---	J2A50429A	INFORMATION SHEET	
---	JB5U0200	POLYBAG,INSTRUCTION	

CHASSIS REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
300	A2D501A420A	DECK ASSY A2D501A420A	501	8107226804	SCREW,TAP TITE(S) BIND 2.6x8
301	85OA400240	PINCH ROLLER BLOCK (VA)	502	83ETW30000	E-RING 3.0
302	85OA500026	AHC ASS'Y	503	8107226404	SCREW,TAP TITE(S) BIND 2.6x4
303	85OP200290	BELT,CAPSTAN (S)	504	8102120604	SCREW,PAN M2x6
304	85OP600581	WORM	505	8109126604	SCREW,TAP TITE(B) PAN 2.6x6
305	85OP500083	BASE,AC HEAD	506	810A130404	SCREW/WASHER(A) M3x4
306	85OP800324	SPRING,AC HEAD	507	810A126504	SCREW/WASHER(A) M2.6x5
307	85OA000459	MAIN CHASSIS ASS'Y	508	82Q264713N	POLYSLIDER WASHER 2.6x4.7xT0.13
308	85OA200089	CLUTCH ASS'Y	509	82P184505N	POLYSLIDER WASHER(CUT) 1.8x4.5xT0.5
309	85OA200090	ARM IDLER ASS'Y	510	8107226604	SCREW,TAP TITE(S) BIND 2.6x6
310	85OA300065	LOADING ARM S UNIT	CD1501	122H071603	CORD JUMPER SMCD-7X151
311	85OA300066	LOADING ARM T UNIT	CD1502	122Y021902	CORD JUMPER 2Y021902
312	85OA400223	INCLINED BASE T UNIT 3S	H5001	1523Q91003	HEAD (AUDIO CONTROL) VTR-1X2RPE22-756
313	85OA400232	P5 ARM ASS'Y 2	H5002	1543Q02014	HEAD (FULL ERASE) VTR-1X2ERS11-154
314	85OA400235	TENSION ARM ASS'Y 2	△ M101	1596S98001	MOTOR (LOADING) MDB2B66
315	85OA400231	INCLINED BASE S UNIT	△ M2001	1510S98043	CAPSTAN DD UNIT F2QVB58
316	85OP800367	SPRING,LOCKER	△ M2003	1589S11020	MICRO MOTOR I2OAL34
317	85OP900736	CASS,HOLDER	△ UN4001	A2D501A500	CYLINDER UNIT ASS'Y A2D501A500
318	85OP900748	CASS,SIDE L			
319	85OP900749	CASS,SIDE R			
320	85OP900739	LOCKER,R			
321	85OA900228	LINK UNIT			
322	85OP000496	POST,CASS GUIDE			
323	85OP200316	REEL,S (S)			
324	85OP200317	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	85OP400542	BAND,TENSION			
334	85OP400533	CONNECT,TENSION			
335	85OP600573	ARM,BRAKE T			
336	85OP600584	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	85OP800360	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	85OP700035	REFLECTOR,LED			
349	85OP900746	BRACKET,TOP 3V			
350	85OP400549	HOLDER,CAPSTAN			

ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
RESISTORS			DIODES		
▲ R502	R3X181R82J	R,METAL OXIDE 0.82 OHM 1W	D8011	D1VT001330	DIODE,SILICON 1SS133T-77
▲ R504	R3X181561J	R,METAL OXIDE 560 OHM 1W	D8012	D1VT001330	DIODE,SILICON 1SS133T-77
R505	R012U2474J	RC 470K OHM 1/2W	D8301	D1VTB721Q0	DIODE,SCHOTTKY RB721Q-40 T-77
▲ R512	R3X28A104J	R,METAL OXIDE 100K OHM 2W	D8303	D1VTB721Q0	DIODE,SCHOTTKY RB721Q-40 T-77
▲ R516	R63581R22J	R,FUSE 0.22 OHM 1W	D8307	D1VTB721Q0	DIODE,SCHOTTKY RB721Q-40 T-77
▲ R531	R65584220J	R,FUSE 22 OHM 1/4W	D8310	D1VTB721Q0	DIODE,SCHOTTKY RB721Q-40 T-77
▲ R532	R3X181121J	R,METAL OXIDE 120 OHM 1W	D8314	D1VTB721Q0	DIODE,SCHOTTKY RB721Q-40 T-77
▲ R533	R655842R7J	R,FUSE 2.7 OHM 1/4W	ICS		
▲ R538	R65584150J	R,FUSE 15 OHM 1/4W	IC101	I04F38225F	IC HA118225F
▲ R539	R3X28A010J	R,METAL OXIDE 1 OHM 2W	IC301	I03S072100	IC LA7210
R1725	R65584101J	R,FUSE 100 OHM 1/4W	▲ IC501	I0CJ9AILP0	IC TL431AILP
CAPACITORS			▲ IC502	I1KA78R120	IC KIA278R12PI
C501	E62FF3102M	CE 1000 UF 25V	▲ IC503	000220002W	IC PHOTO COUPLER PS2561AL1-1-V(W)
▲ C502	P2122B104M	CMP 0.1 UF 275V ECQUL	IC651	I0FK063150	IC PT6315
▲ C504	P2122B104M	CMP 0.1 UF 275V ECQUL	IC701	I03F7646SM	IC LA72646SM-MPB
C511	E62PFH181M	CE 180 UF 400V	IC702	I0QJ045800	IC NJM4580M(Te1)
C513	C0PLRR7H2K	CC 220 PF 2KV R	IC801	I19FF34170	IC MSP3417G-QG-B8
C515	C0J0B0514K	CC 0.01 UF 500V B	▲ IC1701	I07F90WTP0	IC BA00BC0WT-V5
▲ C516	CD39E0ML3M	CC 0.0033UF 250V	▲ IC1702	I0CJ9AILP0	IC TL431AILP or
C518	E62F01222M	CE 2200 UF 10V	▲ IC1703	I1KJ9A431A	IC KIA431A-AT
C519	E62F01222M	CE 2200 UF 10V	▲ IC1704	I07F90WTP0	IC BA00BC0WT-V5
C525	C0PLRR7H2K	CC 220 PF 2KV R	▲ IC1705	I1KA98R12A	IC KIA78R12API
C542	C0JBB0712K	CC 100 PF 2KV B	▲ IC1706	I07F90WTP0	IC KIA78R12API
C543	C0JBB0712K	CC 100 PF 2KV B	▲ IC3001	I54F50145A	IC BA00BC0WT-V5
DIODES			IC3003	I07F90WTP0	IC OEC0145A
D101	D1VT001330	DIODE,SILICON 1SS133T-77	IC3009	A2D501T015	IC XC61CN3102SR
▲ D502	D2WTRM11C0	DIODE,SILICON RM11C-EIC	IC4001	ICQM067500	IC INIT DATA ZR36750E
▲ D503	D2WTRM11C0	DIODE,SILICON RM11C-EIC	IC4002	I57F04L160	IC BR24L16FJ-WE2
D504	D1VT001330	DIODE,SILICON 1SS133T-77	IC4003	I97F052290	IC BD5229G
▲ D505	D2WTRM11C0	DIODE,SILICON RM11C-EIC	IC4004	ICLJ020CT7	IC HY57V561620CT-7
▲ D506	D2WTRM11C0	DIODE,SILICON RM11C-EIC	IC4005	ICLJ020CT7	IC HY57V561620CT-7
▲ D507	D28F31DQ09	DIODE,SCHOTTKY 31DQ09-FC	IC4006	I5LJ0640BS	IC LH28F640BFHE-PTTL80
▲ D508	D23TGP15J0	DIODE,SILICON RGP15J-G23	IC4007	I52K010520	IC UPD61052GD-LML
D509	D2BARS010	DIODE,SILICON SARS01-V1	IC4008	I03J00HGT7	IC HY57V641620HGT-7
▲ D510	D97U02201B	DIODE,ZENER MTZJ22B T-77	IC4009	I03J00HGT7	IC HY57V641620HGT-7
▲ D512	D2LKB340F0	DIODE,SCHOTTKY SB340FL-6737	IC4010	I03J00HGT7	IC EPM3064ATC44-7(36060)
D514	D1VT001330	DIODE,SILICON 1SS133T-77	IC7301	I17F02KEG0	IC PCM1742KEG/2K
▲ D515	D27A85T400	DIODE,SCHOTTKY RB085T-40	IC8001	I03F0026A0	IC LA73026AV-TLM-E
D516	D1VT001330	DIODE,SILICON 1SS133T-77	IC8002	I0UF015010	IC MM1501XNRE
D517	D1VT001330	DIODE,SILICON 1SS133T-77	IC8003	I0UF015060	IC MM1506XNRE
▲ D518	D1VT001330	DIODE,SILICON 1SS133T-77	IC8004	I0UF015060	IC MM1506XNRE
D519	D97U02701B	DIODE,ZENER MTZJ27B T-77	IC8005	I0UF015060	IC MM1506XNRE
D520	D1VT001330	DIODE,SILICON 1SS133T-77	IC8006	I0QF02534V	IC NJM2534V(Te2)
▲ D521	D28TELS2N2	DIODE,RECTIFIER 10EL52N-TA1B2	IC8007	I0QF02534V	IC NJM2534V(Te2)
▲ D522	D28TELS2N2	DIODE,RECTIFIER 10EL52N-TA1B2	IC8501	I50K071150	IC SAA7115HL
▲ D523	D97U03301B	DIODE,ZENER MTZJ33B T-77	IC8502	I17F017050	IC PLL1705DBQR
D524	D1VT001330	DIODE,SILICON 1SS133T-77	IC8504	I03J007750	IC WM8775EDS/R
▲ D525	D28T21DQ09	DIODE,SCHOTTKY 21DQ09N-TA2B1	TRANSISTORS		
D529	D1VT001330	DIODE,SILICON 1SS133T-77	Q101	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK
D530	D28TELS6N6	DIODE,RECTIFIER 10EL56N-TA1B2	Q102	TCAT032034	TRANSISTOR,SILICON KTC3203_Y-AT
D531	D97U01001B	DIODE,ZENER MTZJ10B T-77	Q103	TPYJC05001	COMPOUND TRANSISTOR DTA124EKAT146
▲ D532	D28TQS04N0	DIODE,SCHOTTKY 11EQS04N-TA1B2	Q104	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK
D533	D1VT001330	DIODE,SILICON 1SS133T-77	Q105	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK
D534	D97U02R41B	DIODE,ZENER MTZJ2.4B T-77	Q108	TAA1504SY	TRANSISTOR,SILICON KTA1504S_Y_RTK
D535	D97U05R61B	DIODE,ZENER MTZJ5.6B T-77	Q301	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK
D536	D97U05R61B	DIODE,ZENER MTZJ5.6B T-77	Q302	TAA1504SY	TRANSISTOR,SILICON KTA1504S_Y_RTK
D538	D1VT001330	DIODE,SILICON 1SS133T-77	▲ Q501	T410K26470	FET 2SK2647-01MR
D651	D97U06R21B	DIODE,ZENER MTZJ6.2B T-77	▲ Q502	TCAT032034	TRANSISTOR,SILICON KTC3203_Y-AT
D652	0021E3Q030	LED LTL-1CHAE-002A	Q503	TCATC31980	TRANSISTOR,SILICON KTC3198-AT(Y,GR)
D657	D97U06R21B	DIODE,ZENER MTZJ6.2B T-77	Q504	TAAT012714	TRANSISTOR,SILICON KTA1271_Y-AT
D659	D97U06R21B	DIODE,ZENER MTZJ6.2B T-77	▲ Q505	TDA0016910	TRANSISTOR,SILICON KTD1691Y
D681	0021E5Q210	LED LTL-1CHGE-002A	▲ Q506	TAAT012714	TRANSISTOR,SILICON KTA1271_Y-AT
D1701	D2WXXN40050	DIODE,SILICON 1N4005-EIC	Q651	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK
D1702	D2WXXN40050	DIODE,SILICON 1N4005-EIC	Q652	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK
D1703	D28T21DQ09	DIODE,SCHOTTKY 21DQ09N-TA2B1	Q701	TNYJC05001	COMPOUND TRANSISTOR DTC124EKAT146
D1704	D28T21DQ09	DIODE,SCHOTTKY 21DQ09N-TA2B1	Q702	TPYJA05001	COMPOUND TRANSISTOR DTA143EKAT146
D1705	D97U09R11B	DIODE,ZENER MTZJ9.1B T-77	Q703	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK
D1707	D97U05R11B	DIODE,ZENER MTZJ5.1B T-77	Q704	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK
D1708	D97U09R11B	DIODE,ZENER MTZJ9.1B T-77	▲ Q1701	TDA0016910	TRANSISTOR,SILICON KTD1691Y
D1709	D1VT001330	DIODE,SILICON 1SS133T-77	▲ Q1703	TCAT03209Y	TRANSISTOR,SILICON KTC3209_Y-AT
D3001	0010E00330	INFRARED LED LTE-3271T-012A-O	▲ Q1704	TAAT01281Y	TRANSISTOR,SILICON KTA1281_Y
D3007	D1VT001330	DIODE,SILICON 1SS133T-77	Q1707	TNYJC05001	COMPOUND TRANSISTOR DTC124EKAT146
D3009	D1VT001330	DIODE,SILICON 1SS133T-77	▲ Q1708	TCAT03209Y	TRANSISTOR,SILICON KTC3209_Y-AT
D8003	D97U06R21B	DIODE,ZENER MTZJ6.2B T-77	▲ Q1709	TCAT032034	TRANSISTOR,SILICON KTC3203_Y-AT
D8004	D97U06R21B	DIODE,ZENER MTZJ6.2B T-77	Q1710	TPYJC05001	COMPOUND TRANSISTOR DTA124EKAT146
D8009	D97U06R21B	DIODE,ZENER MTZJ6.2B T-77	▲ Q1711	TAAT01281Y	TRANSISTOR,SILICON KTA1281_Y
D8010	D97U06R21B	DIODE,ZENER MTZJ6.2B T-77			

ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
TRANSISTORS			COILS & TRANSFORMERS		
Q1712	TNYJC05001	COMPOUND TRANSISTOR DTC124EKAT146	L8003	02167F101J	COIL 100 UH
Q1713	TPYJC05001	COMPOUND TRANSISTOR DTA124EKAT146	L8005	02167F100J	COIL 10 UH
Q1714	TPYJC05001	COMPOUND TRANSISTOR DTA124EKAT146	L8006	021LA61R0M	COIL 1 UH or
Q3001	0002700690	PHOTO COUPLER RPI-303		0216A61R0K	COIL 1 UH
Q3002	0002700690	PHOTO COUPLER RPI-303	L8007	021LA6100J	COIL 10 UH or
Q3003	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK		0216A6100K	COIL 10 UH
Q3004	0002700680	PHOTO COUPLER RPI-352C40N	L8008	02167F101J	COIL 100 UH
Q3005	0002700680	PHOTO COUPLER RPI-352C40N	L8009	02167F101J	COIL 100 UH
Q3006	0000M00390	PHOTO TRANSISTOR ST-304L	L8010	02167F101J	COIL 100 UH
Q3007	TPYJA05001	COMPOUND TRANSISTOR DTA143EKAT146	L8301	02167F101J	COIL 100 UH
Q3008	0000M00390	PHOTO TRANSISTOR ST-304L	L8302	02167F101J	COIL 100 UH
Q8004	TNYJC05001	COMPOUND TRANSISTOR DTC124EKAT146	L8303	02167F101J	COIL 100 UH
Q8005	TNYJC05001	COMPOUND TRANSISTOR DTC124EKAT146	L8501	0216S74R7J	COIL 4.7 UH
Q8008	TAAA1504SY	TRANSISTOR,SILICON KTA1504S_Y_RTK	△ T501	0481291224	TRANSFORMER,SWITCHING 81291224
Q8011	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK	JACKS		
Q8012	TNYJC05001	COMPOUND TRANSISTOR DTC124EKAT146	J651	060J421039	RCA JACK MSP-281V31-A
Q8013	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK	J652	060J401098	RCA JACK MSP-281V40-B
Q8015	TAAA1504SY	TRANSISTOR,SILICON KTA1504S_Y_RTK	J653	060J401099	RCA JACK MSP-281V42-B
Q8301	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK	J654	063D700010	JACK MDC-012V1-A_LF or
Q8302	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK		063D700007	JACK MDC-012V1-A
Q8303	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK	J8001	063D000077	SOCKET,21PIN MRC-021V-27_PC
Q8304	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK	J8002	060J411033	RCA JACK MSP-213V1-732_NL_LF
Q8305	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK	SWITCHES		
Q8306	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK	SW651	0504101T34	SWITCH,TACT EVQ21505R
Q8307	TCAA3875SY	TRANSISTOR,SILICON KTC3875S_Y_RTK	SW652	0504101T34	SWITCH,TACT EVQ21505R
Q8308	TAAA1504SY	TRANSISTOR,SILICON KTA1504S_Y_RTK	SW653	0504101T34	SWITCH,TACT EVQ21505R
Q8309	TAAA1504SY	TRANSISTOR,SILICON KTA1504S_Y_RTK	SW681	0504R01T38	SWITCH,TACT EVQ11L05R
Q8310	TPYJC05001	COMPOUND TRANSISTOR DTA124EKAT146	SW682	0504R01T38	SWITCH,TACT EVQ11L05R
Q8311	TAAA1504SY	TRANSISTOR,SILICON KTA1504S_Y_RTK	SW683	0504R01T38	SWITCH,TACT EVQ11L05R
Q8312	TPYJC05001	COMPOUND TRANSISTOR DTA124EKAT146	SW684	0504R01T38	SWITCH,TACT EVQ11L05R
COILS & TRANSFORMERS			P.C BOARD ASSEMBLIES		
L101	02167F101J	COIL 100 UH	PCB010	A2D501T010	PCB ASS'Y VMD329A
L102	031616003R	COIL,BIAS OSC 1616003	PCB240	A2D501T240	PCB ASS'Y VPC174A
L103	02167F101J	COIL 100 UH	PCB270	A2D501T270	PCB ASS'Y VECA30A
L104	02167F101J	COIL 100 UH	PCBB10	A2D501TB10	PCB ASS'Y VMD334A
L106	021LA6820K	COIL 82 UH	MISCELLANEOUS		
L107	021LA6820K	COIL 82 UH	B501	024HT03563	CORE,BEADS W4BRH3.5X6X1.0X2
L108	02167F220J	COIL 22 UH	B4001	024HC31022	CORE,BEADS FCM2012H-102T04
L109	021LA6120J	COIL 12 UH	B4002	024HC31022	CORE,BEADS FCM2012H-102T04
	0216A6120K	COIL 12 UH	B4003	024HC31022	CORE,BEADS FCM2012H-102T04
L110	021LA6390J	COIL 39 UH	B7301	024HC31022	CORE,BEADS FCM2012H-102T04
	0216A6390K	COIL 39 UH	B7302	024HC31022	CORE,BEADS FCM2012H-102T04
L111	02167F101J	COIL 100 UH	B7303	024HC36001	CORE,BEADS HCB2012K-600T25
L112	02167F220J	COIL 22 UH	B7304	024HC36001	CORE,BEADS HCB2012K-600T25
L113	021LA61R0M	COIL 1 UH	B7305	024HC36001	CORE,BEADS HCB2012K-600T25
L114	021LA61R0M	COIL 1 UH	B7306	024HC36001	CORE,BEADS HCB2012K-600T25
L115	021LA61R0M	COIL 1 UH	B7307	024HC36001	CORE,BEADS HCB2012K-600T25
L301	02167F101J	COIL 100 UH	B8001	024HC31022	CORE,BEADS FCM2012H-102T04
△ L501	029T000108	COIL,LINE FILTER 0R5A393F24	B8501	024HC31022	CORE,BEADS FCM2012H-102T04
L502	02AHB0A0A4	CORE,FERRITE W5T_20*10*10A	B8502	024HC31022	CORE,BEADS FCM2012H-102T04
L503	02167E100K	COIL 10 UH	BT601	1412004008	BATTERY,MANGAN R03(AB)E_2P_G
L504	02167F100J	COIL 10 UH	CD102	122F061501	CORD,JUMPER 2F061501
L506	021W7A220K	COIL 22 UH	△ CD501	1206459804	CORD,AC BUSH 6459804
	02167E220K	COIL 22 UH	CD502	WPL6028038	FLAT CABLE AWM2468 AWG26 16C BLACK 280MM
L507	02167E100K	COIL 10 UH	CD504	06CU641201	CORD,CONNECTOR CU641201
L601	02AHB9A972	CORE,FERRITE W5T29X7.5X19	CD601	06CDVA5003	CABLE,21PIN S-1002B
L651	021LA6101J	COIL 100 UH	CD651	06CU252802	CORD,CONNECTOR CU252802
	0216A6101K	COIL 100 UH	CP101	0697290620	CONNECTOR PCB SIDE TOC-C09X-A1
L701	02167F220J	COIL 22 UH	CP102	069J780599	CONNECTOR PCB SIDE IMSA-9604S-06C
L702	02167F220J	COIL 22 UH	CP103	067U002019	WIRE HOLDER B2013H02-2P
L703	02167F220J	COIL 22 UH	CP502	067U016019	WIRE HOLDER B2013H02-16P
L801	02167F220J	COIL 22 UH	CP504	069V140339	CONNECTOR PCB SIDE A2544WV2-4P
L802	02167F220J	COIL 22 UH	CP506	069S220629	CONNECTOR PCB SIDE A2001WV2-2P
L803	02167F220J	COIL 22 UH	CP651	069S250639	CONNECTOR PCB SIDE A2001WR2-5P
L1702	02167F470J	COIL 47 UH	CP681	069S250639	CONNECTOR PCB SIDE A2001WR2-5P
L1703	021W7A220K	COIL 22 UH	CD4003	06CUJB1401	CORD,CONNECTOR CUJB1401
	02167E220K	COIL 22 UH	QD6002	06CDL02002	RF CABLE PAL FTZ CDL02002
L3002	02167F220J	COIL 22 UH	CD7301	122H0K1802	CORD,JUMPER 2H0K1802
L3003	021LA6120J	COIL 12 UH	CD7302	122H0K1802	CORD,JUMPER 2H0K1802
	0216A6120K	COIL 12 UH	CD7303	122H011802	CORD,JUMPER 2H011802
L7302	0216S71R0J	COIL 1 UH	CD7304	06CU2A3701	CORD,CONNECTOR CU2A3701
L7303	0216S71R0J	COIL 1 UH	CP1701	069R2G0589	CONNECTOR PCB SIDE 52147-1610
L7305	0216S71R0J	COIL 1 UH			
L7306	0216S71R0J	COIL 1 UH			
L8001	02167F220J	COIL 22 UH			
L8002	02167F220J	COIL 22 UH			

ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
MISCELLANEOUS		
CP1703	069S2A0629	CONNECTOR PCB SIDE A2001WV2-10P
CP3001	06972C0010	CONNECTOR PCB SIDE TMC-J12P-B2
CP4006	06A9604010	CONNECTOR PCB SIDE PHA204-2002A01A
CP4007	069S270639	CONNECTOR PCB SIDE A2001WR2-7P
CP7301	069EVKT040	CONNECTOR PCB SIDE 04_6232_120_103_800
CP7302	069EVKT040	CONNECTOR PCB SIDE 04_6232_120_103_800
CP7303	069EVIT040	CONNECTOR PCB SIDE 04_6232_118_103_800
CP7304	069S2A0629	CONNECTOR PCB SIDE A2001WV2-10P
CP8301	069JVK0200	CONNECTOR PCB SIDE IMSA-9615S-20C-PP-A
CP8302	069JVK0200	CONNECTOR PCB SIDE IMSA-9615S-20C-PP-A
CP8303	069JVI0200	CONNECTOR PCB SIDE IMSA-9615S-18C-PP-A
▲ DK4001	169V00027A	DECK CD DVR-1060R
DISC601	1474111002	DVD-RW DISC DVD-RW47EB
EL2402	124120301A	EYE LET XRY20X30BD
▲ F501	080NT04004	FUSE 50T040H
FH501	06710T0006	HOLDER,FUSE EYF-52BC
FH502	06710T0006	HOLDER,FUSE EYF-52BC
▲ ICP501	0835C01003	MICRO FUSE 20N_1000FS
▲ ICP1702	0835C01603	MICRO FUSE 20N_1600FS
▲ M501	1519X56L03	FAN MOTOR 2410ML-04W-B10-C47
NR4001	110N4470M3	R,NETWORK CAY16-470-J-4R
NR4002	110N4470M3	R,NETWORK CAY16-470-J-4R
NR4003	110N4470M3	R,NETWORK CAY16-470-J-4R
NR4004	110N4470M3	R,NETWORK CAY16-470-J-4R
NR4005	110N4470M3	R,NETWORK CAY16-470-J-4R
NR4006	110N4470M3	R,NETWORK CAY16-470-J-4R
NR4007	110N4470M3	R,NETWORK CAY16-470-J-4R
NR4008	110N4470M3	R,NETWORK CAY16-470-J-4R
NR4009	110N4220M3	R,NETWORK CAY16-220-J-4R
NR4010	110N4220M3	R,NETWORK CAY16-220-J-4R
NR4011	110N4472M3	R,NETWORK CAY16-472-J-4R
NR4012	110N4472M3	R,NETWORK CAY16-472-J-4R
NR4015	110N4472M3	R,NETWORK CAY16-472-J-4R
NR8501	110N4220M3	R,NETWORK CAY16-220-J-4R
NR8502	110N4220M3	R,NETWORK CAY16-220-J-4R
NR8507	110N4000M3	R,NETWORK CAY16-000-J-4R
NR8508	110N4000M3	R,NETWORK CAY16-000-J-4R
OS651	077Q037009	REMOTE RECEIVER PIC-37043LO-H
TM601	076R0J020	TRANSMITTER R25-2097
▲ TU301	0162K01033	RF UNIT TCMK0601PD20D
V651	096F90R404	TUBE FLUORESCENT DISPLAY HNV-09SS48
X101	100DT4R410	CRYSTAL AT-49
X301	1002A0R503	CERAMIC OSCILLATOR CSB500E5
X801	100CT01803	CRYSTAL HC-49U-S
X3001	100CT01002	CRYSTAL HC-49U-S
X3002	100DA32R01	CRYSTAL DT-26
X3003	100CT01701	CRYSTAL HC-49U-S
X4001	100WT02707	CRYSTAL FXO-31FL
X8501	100CT03203	CRYSTAL CX-49G

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