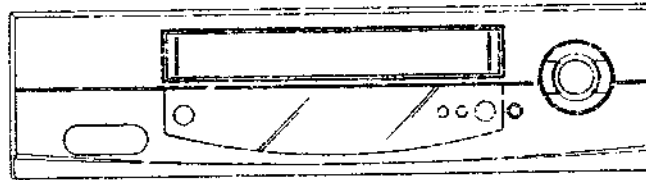


# SERVICE MANUAL

## ORION VH-521 / VH-521SI

VIDEO CASSETTE RECORDER



ORIGINAL  
CHASSIS CODE A

Best. Nr. SM521

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Design and specifications are subject to change without notice.

## 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  $\Delta$  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

You can find it in the back of your unit.

#### 2. PART NO. and DESCRIPTION

You can find it in your SERVICE MANUAL.

## CONTENTS

SERVICING NOTICES ON CHECKING .....	A1-1
HOW TO ORDER PARTS .....	A1-1
CONTENTS .....	A2-1
GENERAL SPECIFICATIONS .....	A3-1-A3-4
DISASSEMBLY INSTRUCTIONS	
1. REMOVAL OF MECHANICAL PARTS AND P. C. BOARDS .....	B1-1
2. REMOVAL OF DECK PARTS .....	B2-1-B2-6
3. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC .....	B3-1, B3-2
KEY TO ABBREVIATIONS .....	C1-1, C1-2
SERVICE MODE LIST .....	C2-1
PREVENTIVE CHECKS AND SERVICE INTERVALS .....	C3-1, C3-2
WHEN REPLACING EEPROM (MEMORY) IC .....	C4-1
SERVICING FIXTURES AND TOOLS .....	C5-1
PREPARATION FOR SERVICING .....	C5-1
MECHANICAL ADJUSTMENTS .....	D1-1-D1-4
ELECTRICAL ADJUSTMENTS .....	D2-1-D2-3
BLOCK DIAGRAMS	
Y/CAUDIO/HEAD AMP .....	E-1, E-2
TUNER/21PIN/OSD/VPS .....	E-3, E-4
SYSTEM CONTROL/SERVO/TIMER .....	E-5, E-6
OPERATION/POWER .....	E-7, E-8
PRINTED CIRCUIT BOARDS	
SYSCON .....	F-1-F-4
SCHEMATIC DIAGRAMS	
Y/CAUDIO/HEAD AMP .....	G-1, G-2
SYSTEM CONTROL/SERVO/TIMER .....	G-3, G-4
POWER .....	G-5, G-6
OPERATION .....	G-7, G-8
TUNER .....	G-9, G-10
21PIN/OSD/VPS .....	G-11, G-12
INTERCONNECTION DIAGRAM .....	G-13, G-14
WAVEFORMS .....	H-1
MECHANICAL EXPLODED VIEW .....	I-1
CHASSIS EXPLODED VIEWS .....	I-2, I-3
MECHANICAL REPLACEMENT PARTS LIST .....	J1-1
CHASSIS REPLACEMENT PARTS LIST .....	J2-1
ELECTRICAL REPLACEMENT PARTS LIST .....	J3-1, J3-2

## GENERAL SPECIFICATIONS

G-1	VCR System	System	VHS Player / Recorder		
		Video System	PAL		
		Hi-Fi STEREO	No		
		NTSC PA(PAL60Hz)	Yes		
		Deck	DVD-7		
		DECK Loading System	Front		
		Moore	3		
		Heads	2-Head		
		Video Head	No		
		FM Audio Head	No		
G-2	Tuning System	Audio Control	Mono/Yes		
		Erase(Full Track Erase)	Yes		
		Tape Rec	SP		
		Speed	NTSC		
		Play	PAL		
			NTSC		
		Fast Forward / Rewind Time (Approx.)	FF:112"/REW:112"		
			with Cassette		
		Forward/Reverse	NTSC or PAL-M		
		Picture Search	PAL or SECAM		
G-3	Power	System	CCIR System BG		
		Tuner and Receive CH	1Tuner		
		Destination	Oscar(W/HYPER)		
		Tuning System	F-Synth		
		Input Impedance	VHF/UHF 75 Ohm		
		CH Coverage	E2-E4, X-2x2, S1-S10, E5-E12, S11-S41, E21-E69		
		Intermediate Frequency	Picture(FP)		
			Sound(FS)		
			FP-FS		
		Preset CH	80CH		
G-4	Regulation	RF Converter Output	Yes		
		Channel	36 ch, 23-69 ch		
		Level/Impedance	73 dBu / 75 Ohm		
		Sound Selector	No		
		Stereo/Dual TV Sound	No		
		Tuner Sound Muting	Yes		
		Power Source	AC		
		Power Consumption	DC		
			(at AC)		
			Stand by (at AC)		
G-5	Temperature	Protector	Power Fuse		
			Dew Sensor		
		Safety	CE		
		Radiation	CE		
		Operation	5°C - 40°C		
		Storage	-20°C - 60°C		
		Operating Humidity	Less than 80% RH		
		G-6	Signal	Input Level	1 V p-p/75 ohm
				Output Level	1 V p-p/75 ohm
				S/N Ratio (Weighted)	53
Horizontal Resolution at SP Mode	240Line				
Input Level	-3.8dB/50Kohm				
Output Level	-3.8dB/1 Kohm				
S/N Ratio at SP (Weighted)	42 dB				
Harmonic Distortion (10KHz)	1.5%				
Frequency Response	at SP 100Hz - 10KHz				
	at LP				
G-7	Hi-Fi Audio Signal	Dynamic Range	More than		
		Frequency Response			
		Wow And Flutter	Less than		
		Channel Separation	More than		
		Harmonic Distortion	Less than		
		G-8	On Screen Display	Menu	Yes
				Menu Type	Character
				ATS	No
				Timer Rec Sel	Yes
				VCR Extension	Yes
Auto Repeat On/Off	Yes				
Scene Repeat	Yes				
Audio Dubbing	No				
VCR Set-Up	No				
NICAM Auto/Off	No				

## GENERAL SPECIFICATIONS

G-9	OSD Language	Audio Mix On/Off	No
		Color System	No
		Sharpness	Yes
		BBE On/Off	No
		CH Set-Up	Yes
		CH Tuning	Yes
		Auto Tuning	Yes
		CH Mapping	Yes
		Guide CH Set	No
		Pin Code Registration	No
G-10	Clock, Timer and Timer Back-up	System Set-Up	Yes
		Clock Set	Yes
		Language	Yes
		(Calendar - 24H)	
		G-CODE(or SHOWVIEW or PLUSCODE)No. Entry	No
		NICAM 1/2, NICAM Off, Audio Output	No
		Stereo Audio Output, Bilingual	No
		Play/Stop/FF/Rew/Rec/OTR/T-Rec/Pause/Eject/Tape In (Symbol Mark)	Yes
		Others	CH/AV
			Clock/Date
G-11	Display	Repeat	No
		Pin Code	No
		Tape Counter	Yes
		Index	Yes
		Hotel Lock	No
		Tape Speed	No
		Manual Tracking (Bar Setting)	Yes
		Hi-Fi	No
		S-Repeat/SR-R/SR-Play	Yes
		VPS	No
PDC	No		
TEST Signal	Yes		
G-12	Remote Control	Eng / Ger / Fre / Spa / Ita	
		OSD Language Setting	Gar
		Calendar	1990/1/1 - 2081/12/31
		Timer Events	8 prog / 1 month
		One Touch Recording Max Time	SP:5 Hours
		OTPB Valid Time	
		Timer Back-up (at Power Off Mode)	30 min.
		Indicator	Yes
		Indicator Type	LED Module
		Clock/Counter, CH, Timer, Rec, OTR, Play	Yes
Rec, FF (Cue), Raw (Rev), Stop, ATR, Eject	Yes		
Pause	Yes		
Still	Yes		
Slow	Yes		
W/L, Y, M, D, Start, End	No		
AFT	No		
Repeat	No		
A-DUB	No		
VCR	Yes		
Memory	No		
Index	No		
VPS	No		
PDC	No		
SP	No		
LP	No		
SLP	No		
AM	No		
PM	No		
F1, F2	No		
RF Output CH	Yes		
Tape In	Yes		
Unit	RC-ED		
Glow in Dark Remocon	No		
Power Source	Voltage(D.C)		
	3V		
UM size x pcs	UM-4 x 2 pcs		
Total Keys	31 Keys		
Keys	Power		
	1		
	2		
	3		
	4		
	5		
	6		
	7		
	8		
	9		

### GENERAL SPECIFICATIONS

		0 / AV	Yes	
		CH / Tracking Up	Yes	
		CH / Tracking Down	Yes	
		Input Select	Yes	No
		Play		No
		Play / Up		No
		Play / Up / Slow	Yes	
		F.Fwd / Right	Yes	
		Rev / Left	Yes	
		Pause		No
		Pause/Still	Yes	
		Stop/Down	Yes	
		Rec/DTR	Yes	
		Eject	Yes	
		Counter Reset	Yes	
		Speed		No
		Timer Rec	Yes	
		Index	Yes	
		TV / VCR	Yes	
		Program	Yes	
		Program / Video Plus+		No
		Auto Tracking		No
		Self Tracking +		No
		Self Tracking -		No
		Menu	Yes	
		Enter	Yes	
		Cancel/Ch Skip	Yes	
		Call	Yes	
		Zero Return	Yes	
		Clock/Counter	Yes	
		CM Skip		No
		Audio Select		No
G-13	Features	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	
		Auto Repeat	Yes	
		Auto Power Off	Yes	
		VIDEO PLUS+(SHOWVIEW,G-CODE)		No
		ATS		No
		PDC		No
		VPS		No
		Reverse Slow		No
		One Touch Playback		No
		Picture Control(Sharpness)	Yes	
		Auto Tuning	Yes	
		Channel Lock		No
		Hotel Lock		No
		Anti Theft		No
		Audio Dubbing		No
		Remote Control Code 1/2		No
		BBE Audio		No
		Rec END Search		No
		SQPB		No
		CATV	Yes	
		CM Skip(30sec x 6 Times)		No
G-14	Accessories	Owner's Manual	Yes	No
		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	
		Tape Rewinder		No
		Safety Tip		No
		Toll Free Insert Sheet		No
		Quick Set-Up Sheet	Yes	
		Information Sheet	Yes	
		75 Ohm Coaxial Cable	Yes	
		type	Double shield	
		UV Meter		No
		DC Car Cord (Center+)		No
		Guarantee Card		No
		Warning Sheet		No
		Circuit Diagram		No
		Antenna Charge Plug		No

### GENERAL SPECIFICATIONS

		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		No
		300 ohm to 75 ohm Antenna Adapter		No
G-15	Interface	Switch	Power	Yes
			Play	Yes
			Pause/Still	
			System Select	No
			One Touch Playback	No
			Channel Up	Yes
			Channel Down	Yes
			F.FWD/Cue	Yes
			Rev/Rev	Yes
			Eject/Stop	Yes
			Rec/DTR	Yes
			Main Power SW	No
		Indicator	Power	No
			Stand by	No
			Rec/DTR	No
			Repeat	No
			Tape In	No
			Kurupaka Guide	No
			One Touch Playback	No
	Terminals	Front	Video Input	No
			Audio Input	No
			Other Terminal	No
		Rear	Video Input	No
			Audio Input	No
			Video Output	No
			Audio Output	No
			Euro Scart	1-SCART
			Ext Speaker	No
			DC Jack 12V(Center +)	No
			VHF/UHF Antenna Input/Output	DIN Type
			AC Inlet	No
G-16	Set Size		Approx. W x D x H (mm)	360 x 220 x 95
G-17	Weight		Net (Approx.)	3.2 kg (- lbs)
			Gross (Approx.)	3.8 kg (- lbs)
G-18	Carton	Master Carton		No
		Content		
		Material		
		Dimensions W x D x H (mm)		
		Description of Origin		
		Gift Box	Yes	
		Material	Single/White	
		Dimensions W x D x H (mm)	429 x 292 x 168	
		Plap Package	Yes	
		Design	As Per BUYER's	
		Description of Origin		No
		Drop Test	Natural Dropping	1 Corner / 3 Edges / 6 Surfaces
		Height (cm)	80	
		Container Stuffing(40' container)	2992	Sets
G-19	Cabinet Material	Cabinet Front		PS 94HB

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

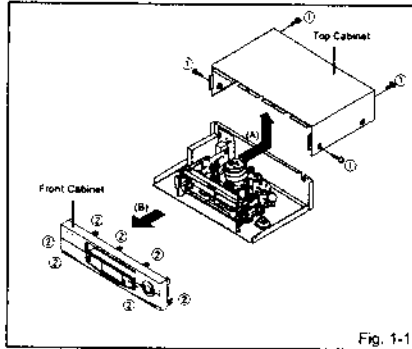


Fig. 1-1

#### 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 tilt in direction of arrow (C).

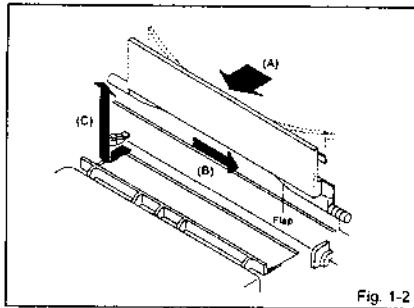


Fig. 1-2

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

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

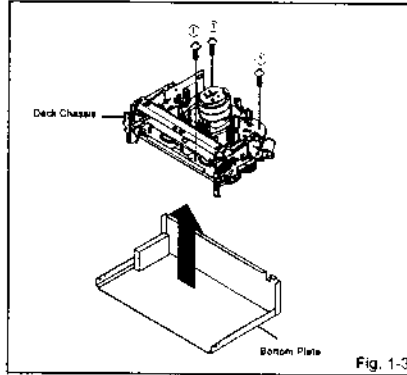


Fig. 1-3

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

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

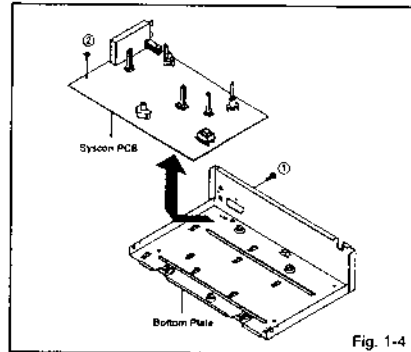


Fig. 1-4

## DISASSEMBLY INSTRUCTIONS

### 2. REMOVAL OF DECK PARTS

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

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

#### NOTE

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

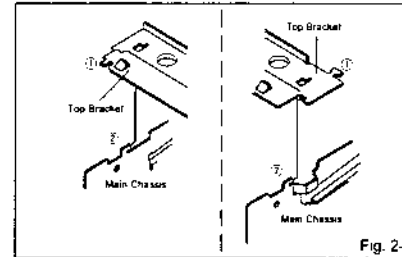


Fig. 2-1

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

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

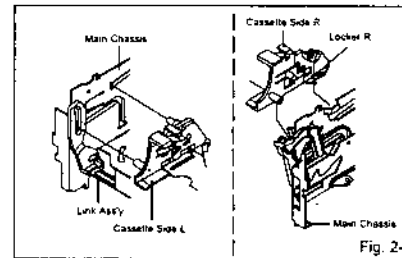


Fig. 2-2

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

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

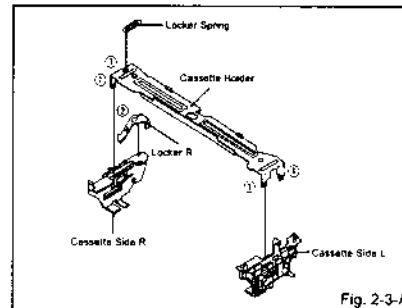


Fig. 2-3-A

#### NOTE

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

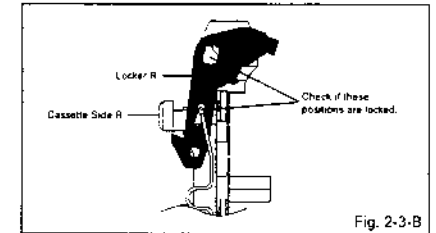


Fig. 2-3-B

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

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

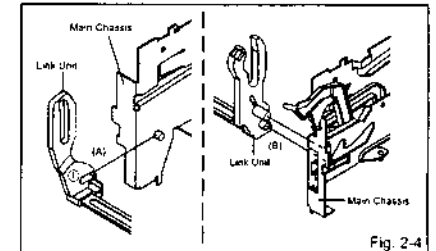


Fig. 2-4

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

1. Remove the Link Lever.
2. Remove the Flap Lever.

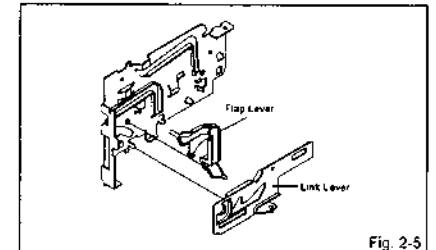
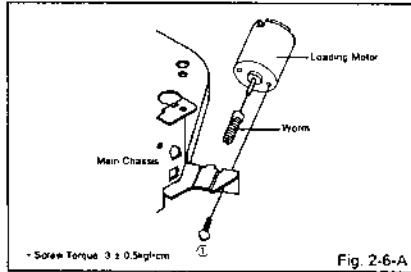


Fig. 2-5

## DISASSEMBLY INSTRUCTIONS

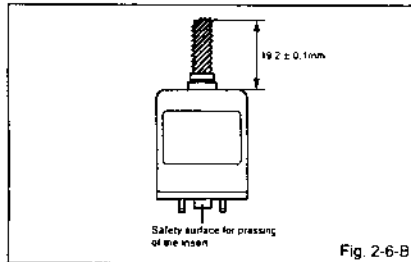
### 2-6: LOADING MOTOR/WORM (Refer to Fig. 2-6-A)

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



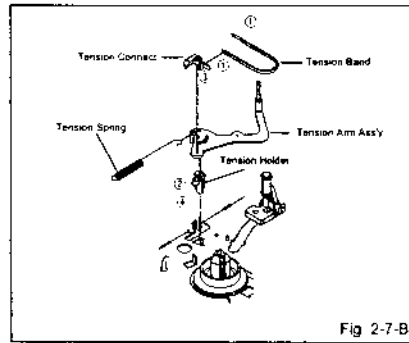
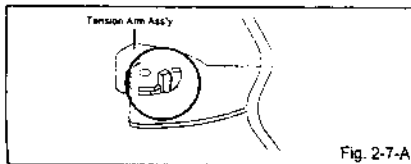
#### NOTE

1. In case of the Worm installation, check if the value of the Fig. 2-6-B is correct.



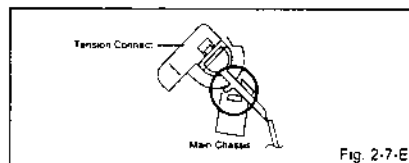
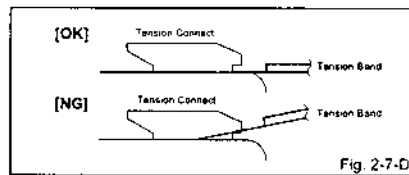
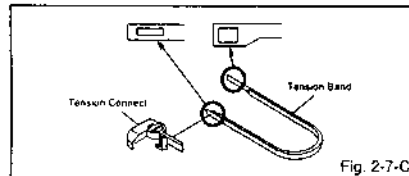
### 2-7: TENSION ASSY (Refer to Fig. 2-7-B)

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

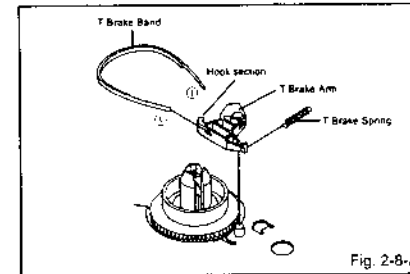
1. In case of the Tension Band installation, note the direction of the installation. (Refer to Fig. 2-7-C)
2. In case of the Tension Band installation, install correctly as Fig. 2-7-D.
3. In case of the Tension Connect installation, install as the circled section of Fig. 2-7-E.



## DISASSEMBLY INSTRUCTIONS

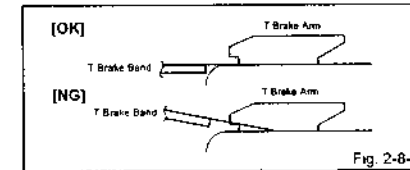
### 2-8: T BRAKE ARM/T BRAKE BAND (Refer to Fig. 2-8-A)

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

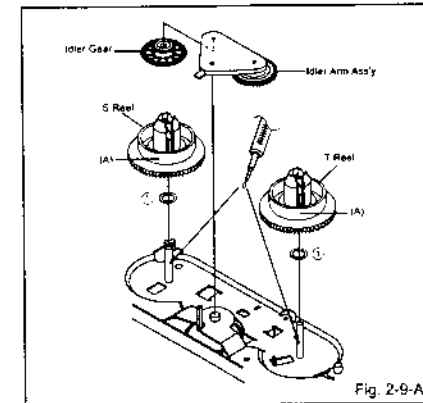


### 2-9: S REEL/T REEL/IDLER ARM ASSY/IDLER GEAR (Refer to Fig. 2-9-A)

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.

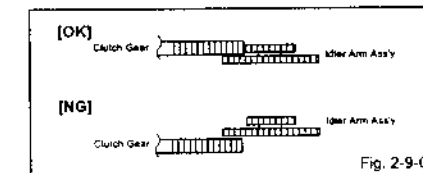
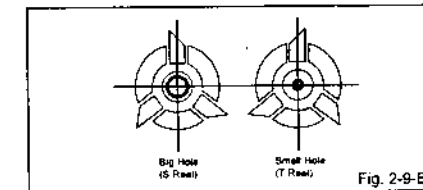
#### NOTE

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 (MG-33). (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

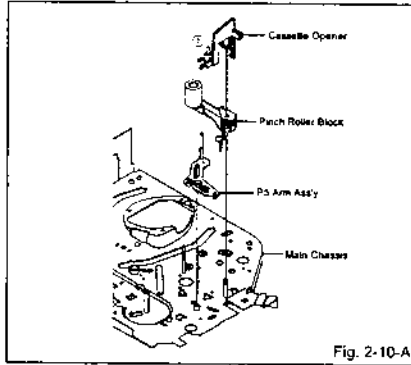
1. In case of the S Reel and T Reel installation, check if the correct parts are installed. (Refer to Fig. 2-9-B)
2. In case of the Idler Arm Ass'y installation, install correctly as Fig. 2-9-C.



## DISASSEMBLY INSTRUCTIONS

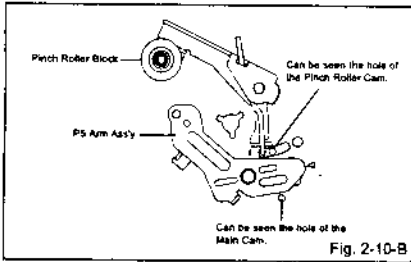
### 2-10: CASSETTE OPENER/PINCH ROLLER BLOCK/ P5 ARM ASS'Y (Refer to Fig. 2-10-A)

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



#### NOTE

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

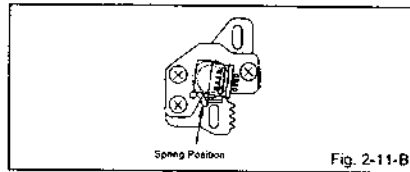
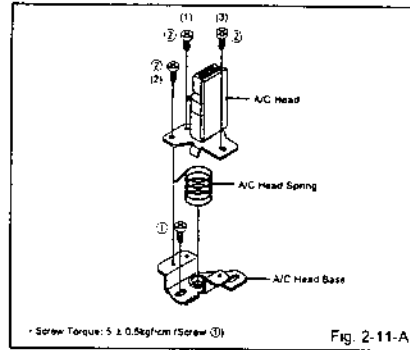


### 2-11: A/C HEAD (Refer to Fig. 2-11-A)

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

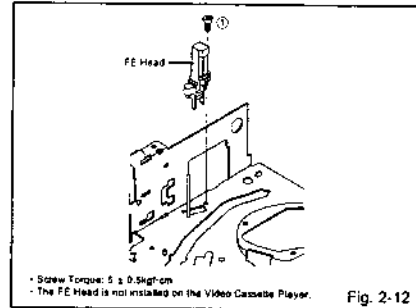
#### NOTE

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



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

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



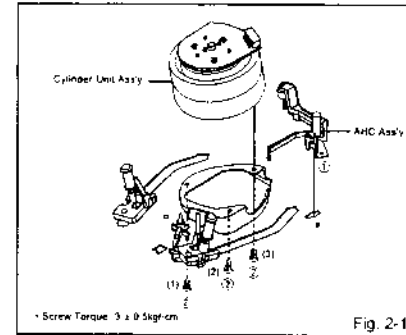
## DISASSEMBLY INSTRUCTIONS

### 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.

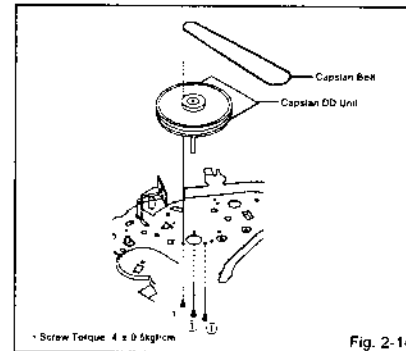
#### NOTE

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.



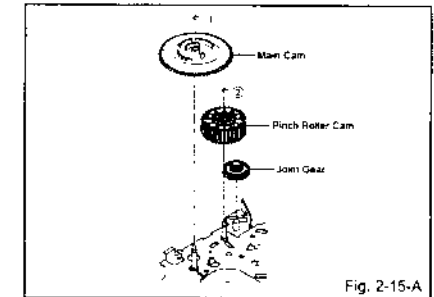
### 2-14: CAPSTAN DD UNIT (Refer to Fig. 2-14)

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



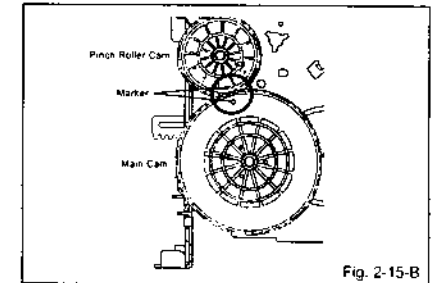
### 2-15: MAIN CAM/PINCH ROLLER CAM/JOINT GEAR (Refer to Fig. 2-15-A)

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



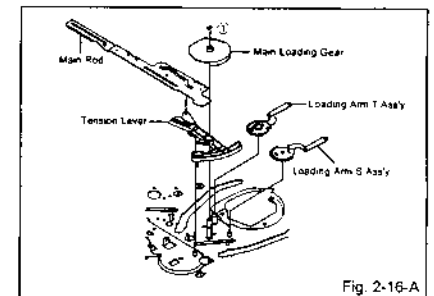
#### NOTE

1. In case of the Pinch Roller Cam and Main Cam installation, install them as the circled section of Fig. 2-15-B so that each marker is met. (Refer to Fig. 2-15-B)



### 2-16: LOADING GEAR S/T ASS'Y (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 Ass'y and Loading Arm T Ass'y.



## DISASSEMBLY INSTRUCTIONS

### NOTE

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

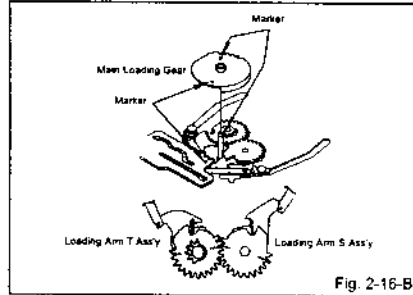


Fig. 2-16-B

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

- Remove the Polyslider Washer (1).
- Remove the Clutch Assy and Ring Spring.
- Remove the Clutch Lever.
- Remove the Coupling Gear, Coupling Spring and Clutch Gear.

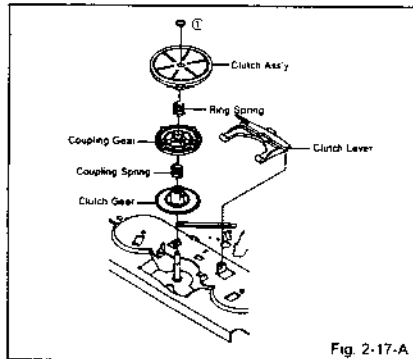


Fig. 2-17-A

### NOTE

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

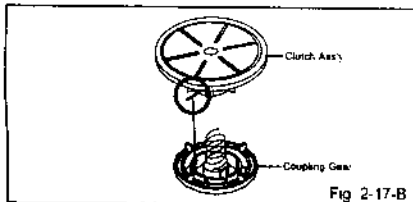


Fig. 2-17-B

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

- Remove the P4 Cap.
- Unlock the support (1) and remove the Cassette Guide Post.
- Remove the Inclined Base S Unit and Inclined Base T Unit.

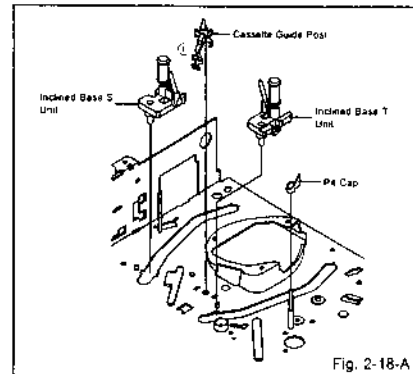


Fig. 2-18-A

### NOTE

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

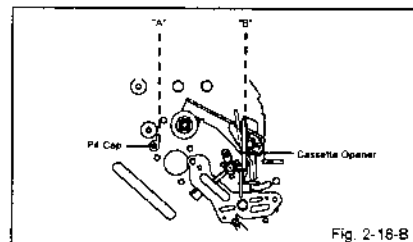


Fig. 2-18-B

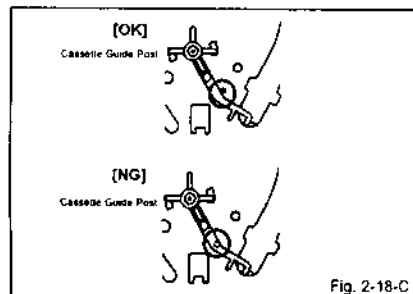


Fig. 2-18-C

## DISASSEMBLY INSTRUCTIONS

### 3. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC

#### REMOVAL

- 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.

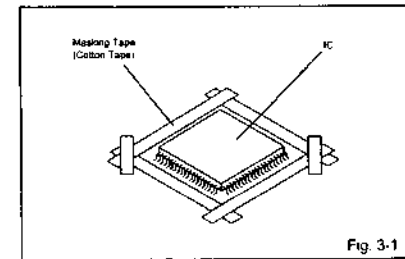


Fig. 3-1

- 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.

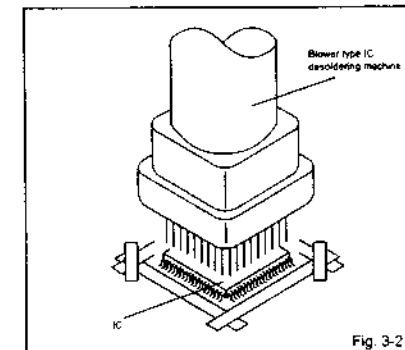


Fig. 3-2

- 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.

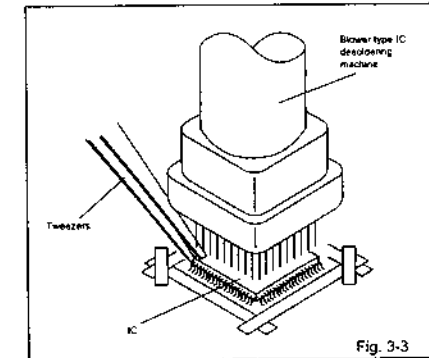


Fig. 3-3

- Peel off the Masking Tape.

- 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.

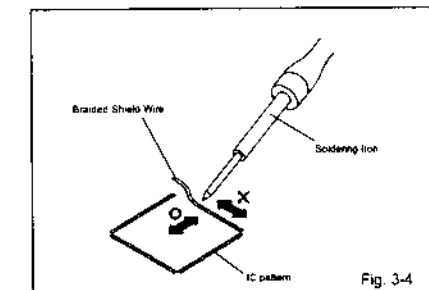


Fig. 3-4



## DISASSEMBLY INSTRUCTIONS

### INSTALLATION

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

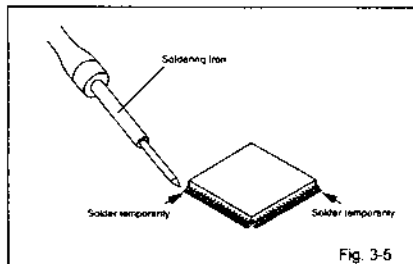


Fig. 3-5

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

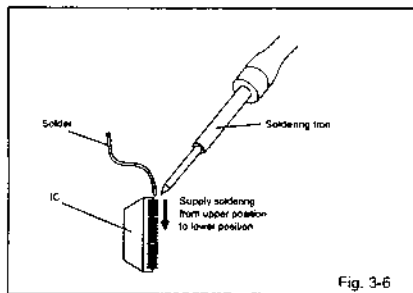


Fig. 3-6

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.

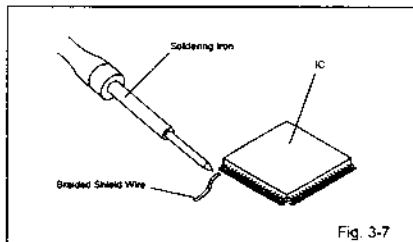


Fig. 3-7

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

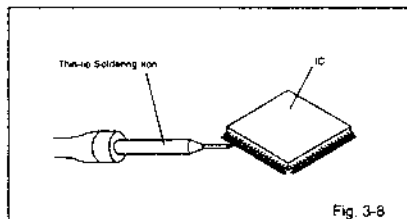


Fig. 3-8

5. Finally, confirm the soldering status on four sides of the IC using a magnifying glass.

Confirm that no abnormality is found on the soldering position and installation position of the parts around the IC. If some abnormality is found, correct by resoldering.

#### NOTE

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

## KEY TO ABBREVIATIONS

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

Method	Operations
Press both PLAY button and CH UP button on the set for more than 2 seconds.	Initialization of the factory. NOTE: Do not use this for the normal servicing.
While pressing the CH UP key on the set, press the FF key on the set for more than 2 seconds.	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".
Press the ATR button on the remote control for more than 2 seconds during PLAY.	Adjusting of the Tracking to the center position. Refer to the "MECHANICAL ADJUSTMENT" (GUIDE ROLLER) and "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
While pressing the CH UP button on the set, press the STOP button on the set for more than 2 seconds during PLAY.	Adjust the PG SHIFTER automatically. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
Make the short circuit between the test point of SERVICE and the GND.	The EOT/BOT/Reel sensor do not work at this moment. Refer to the "PREPARATION FOR SERVICING"

## PREVENTIVE CHECKS AND SERVICE INTERVALS

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

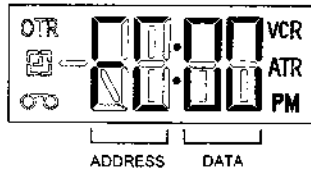
Time Parts Name	500 hours	1,000 hours	1,500 hours	2,000 hours	3,000 hours	Notes
Audio Control Head	■	■	■	■	■	Clean those parts in contact with the tape.
Full Erase Head (Recorder only)	■	■	■	■	■	
Capstan Belt			■	■	●	Clean the rubber, and parts which the rubber touches.
Pinch Roller	■	■	■	■	■ ●	
Capstan DD Unit					●	
Loading Motor					●	
Tension Band					●	
Capstan Shaft	■	■	■	■	■	Replace when rolling becomes abnormal.
Tape Running Guide Post	■	■	■	■	■	
Cylinder Unit	■	■	■	■	●	Clean the Head

- : Clean
- : Replace

## CONFIRMATION OF HOURS USED

PLAY/REC total hours can be checked on the display. Total hours are displayed in 16 system of notation.

- Turn on the POWER.
- While pressing the CH UP button on the set, press the FF button on the set for more than 2 seconds.
- Adjust the ADDRESS to "FD" by FF or REW button and read the DATA.  
(This DATA becomes the thousands digit and hundreds digit value of the following formula.)
- Adjust the ADDRESS to "FE" by FF or REW button and read the DATA.  
(This DATA becomes the tens digit and ones digit value of the following formula.)
- After the confirmation of using hours, turn off the power.



$$(16 \times 16 \times 16 \times \text{thousands digit value}) + (16 \times 16 \times \text{hundreds digit value}) + (16 \times \text{tens digit value}) + (\text{ones digit value})$$

## 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.

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
C0	B2	1A	00	00	00	F5	44	31	00	3D	B2	9F	97	8E	41	43
D0	C6	A2	04	04	00	FF	00	00	39	9F	82	0A	42	35	A3	87
E0	09	5E	08	F0	05	F3	00	00	00	00	5F	0A	00	05	F0	
F0	00	00	00	00	00	00	00	00	00	00	00	00	90			

Table 1

- Turn on the POWER.
- While pressing the CH UP button on the set, press the FF button on the set for more than 2 seconds. ADDRESS and DATA should appear as FIG 1.

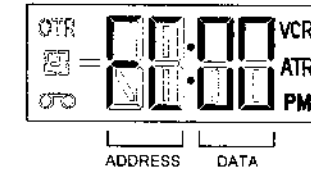


Fig. 1

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

## PREVENTIVE CHECKS AND SERVICE INTERVALS

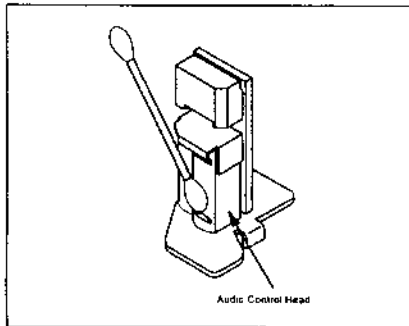
### CLEANING

#### 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

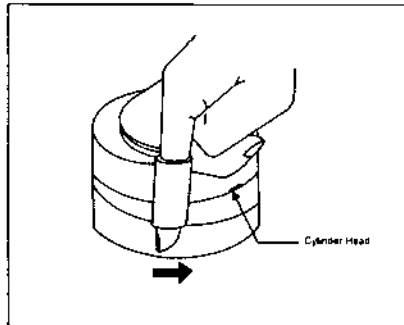
When cleaning the tape transport system, use the gauze moistened with isopropyl alcohol.

#### 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.



## MECHANICAL ADJUSTMENTS

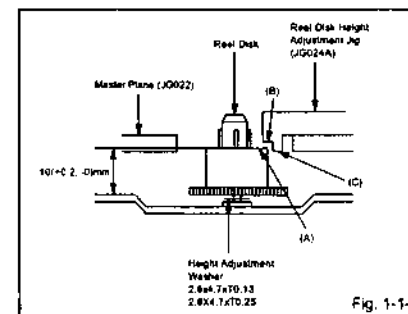
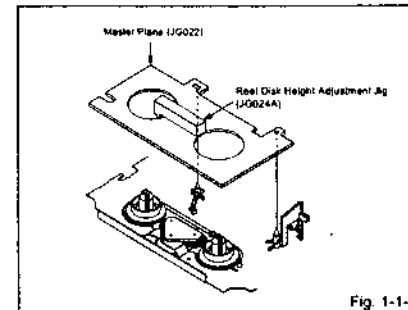
### 1. CONFIRMATION AND ADJUSTMENT

Read the following NOTES before starting work.

- Place an object which weighs between 450g~500g on the Cassette Tape to keep it steady when you want to make the tape run without the Cassette Holder. (Do not place an object which weighs over 500g.)
- When you activate the deck without the Cassette Holder, short circuit between TP1001 and GND. (Refer to ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE) In this condition the BOT/EOT/Reel Sensor will not function.

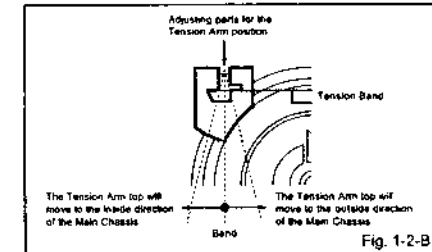
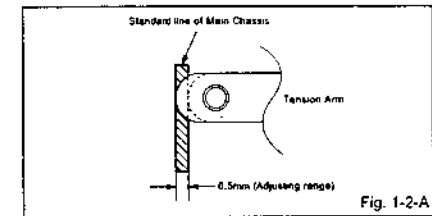
#### 1-1: CONFIRMATION AND ADJUSTMENT OF REEL DISK HEIGHT

- 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 parts 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.

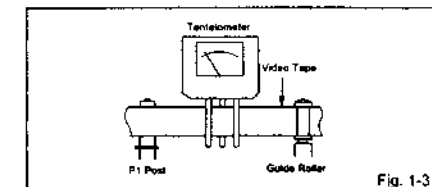


#### 1-3: CONFIRMATION OF PLAYBACK TORQUE AND BACK TENSION TORQUE DURING PLAYBACK




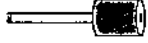
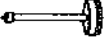

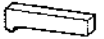



- Load a video tape (E-180) recorded in standard speed mode. Set the unit to the PLAY mode.
- Install the tentelometer as shown in Fig. 1-3. Confirm that the meter indicates  $20 \pm 2$ gf in the beginning of playback.

#### • 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.



## SERVICING FIXTURES AND TOOLS

<p>(For 2 head 1 speed model, 4 head model) VHS Alignment Tape JG001E (VP-S-LI6<sup>+</sup>) JG001F (VP-S-CO1<sup>+</sup>) JG001R (VP-S-LI6<sup>+</sup>H) JG001U (VP-S-X6<sup>+</sup>)</p> 	<p>(For 2 head 2 speed model) VHS Alignment Tape JG001C (VP-S-LI6<sup>+</sup>) JG001D (VP-S-CO1<sup>+</sup>) JG001V (VP-S-X6<sup>+</sup>)</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>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 Assy)
JG002E	APJG002E00	Dial Torque Gauge (10-90gf·cm)	Brake Torque (T Reel Assy)
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

## PREPARATION FOR SERVICING

### How to use the Servicing Fixture

- Short circuit between TP1001 and Ground with the cable JG154.  
(Refer to ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE)  
The EOT, BOT and Reel Sensor do not work at this moment.  
At that time, the STOP/EJECT button is available to insert and eject the Cassette Tape.

## MECHANICAL ADJUSTMENTS

### 1-4: CONFIRMATION OF VSR TORQUE

- 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)

- 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

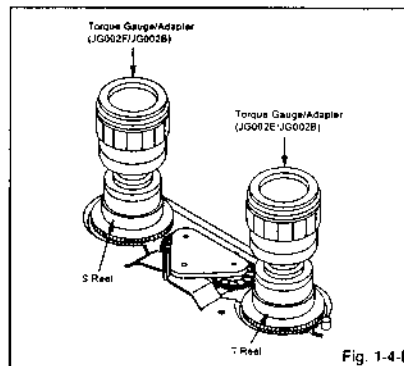
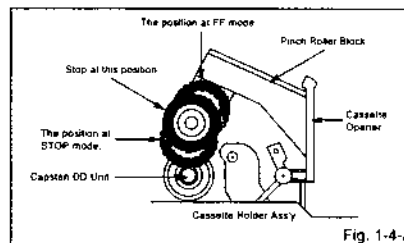
(S Reel Brake) (Refer to Fig. 1-4-B)

- 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.
- Move the Idler Assy from the S Reel.
- Install the Torque Gauge (JG002F) and Adapter (JG002B) on the S Reel. Turn the Torque Gauge (JG002F) clockwise.

- Then, confirm that it indicates 60-100gf·cm.

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

- 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.
- Move the Idler Assy from the T Reel.
- Install the Torque Gauge (JG002E) and Adapter (JG002B) on the T reel. Turn the Torque Gauge (JG002E) counterclockwise.
- 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 Assy/Clutch Assy
1-5	S Reel side: S Reel/Tension Band/Tension Connect/Tension Arm Assy T Reel side: T Reel/T Brake Band/T Brake Spring/T Brake Arm

## 2. CONFIRMATION AND ADJUSTMENT OF TAPE RUNNING MECHANISM

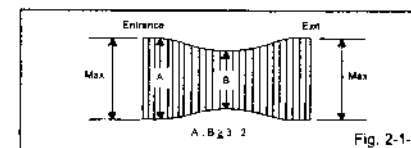
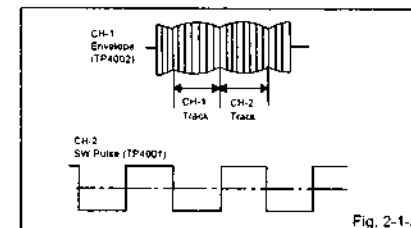
Tape Running Mechanism is adjusted precisely at the factory. Adjustment is not necessary as usual. When you replace the parts of the tape running mechanism because of long term usage or failure, the confirmation and adjustment are necessary.

### 2-1: GUIDE ROLLER

- Playback the VHS Alignment Tape (JG001C or JG001E).  
(Refer to SERVICING FIXTURE AND TOOLS)
- Connect CH-1 of the oscilloscope to TP4002 (Envelope) and CH-2 to TP4001 (SW Pulse).
- Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
- Trigger with SW Pulse and observe the envelope. (Refer to Fig. 2-1-A)
- 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.
- 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).
- 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.

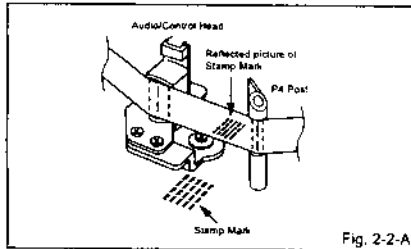


Fig. 2-2-A

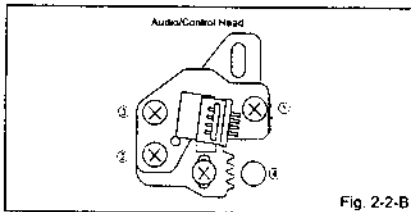


Fig. 2-2-B

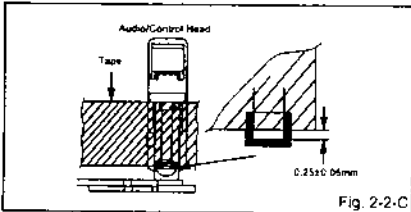


Fig. 2-2-C

### 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 TP4002, CH-2 to TP4001 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.

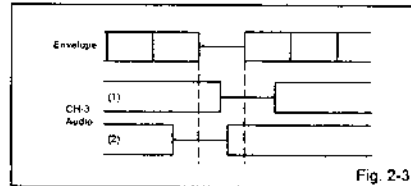


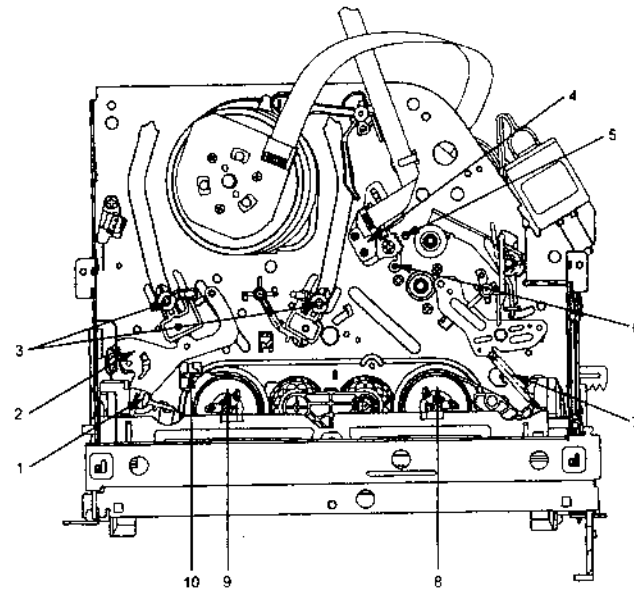
Fig. 2-3

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

1. Connect CH-1 of the oscilloscope to TP4002 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 parts 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 replacing IC's or transistors, use only specified silicon grease (YG6260M).  
(To prevent the damage to IC's and transistors.)

#### 1-1: PG SHIFTER

##### CONDITIONS

MODE-PLAYBACK  
Input Signal-Alignment Tape (JG001E)

##### INSTRUCTIONS

1. Connect CH-1 on the oscilloscope to TP4001 and CH-2 to pin 19 of J4501.
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 and STOP button on the set for more than 2 seconds. If the indicator ATR disappears, the adjustment is finished. (Refer to Fig. 1-1-A, B)

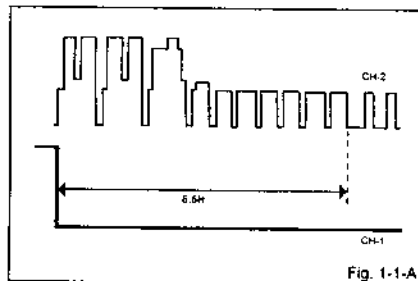


Fig. 1-1-A

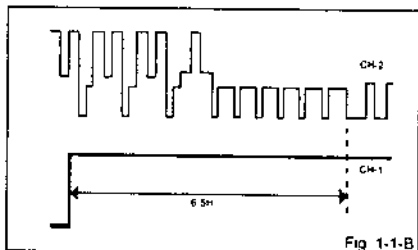


Fig. 1-1-B

#### 1-2: PB-Y LEVEL

##### CONDITIONS

MODE-PLAYBACK  
Input Signal-Alignment Tape (JG001F)

##### INSTRUCTIONS

1. Connect the oscilloscope to pin 19 of J4501 through 75 ohm resistor.
2. Playback the alignment tape. (JG001F)
3. Check if the VIDEO OUTPUT LEVEL is  $1.05 \pm 0.15V_{p-p}$ . (Refer to Fig. 1-2)

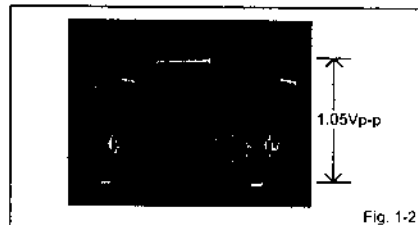


Fig. 1-2

#### 1-3: E-E LEVEL

##### CONDITIONS

MODE-STOP  
Input Signal-PAL Color Bar

##### INSTRUCTIONS

1. Connect the color bar generator to pin 20 of J4501.
2. Connect the oscilloscope to pin 19 of J4501 through 75 ohm resistor.
3. Check if the VIDEO OUTPUT LEVEL is  $1.05 \pm 0.15V_{p-p}$ . (Refer to Fig. 1-3)

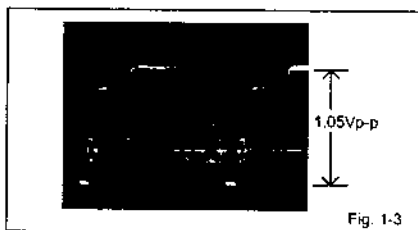


Fig. 1-3

#### 1-4: E-E AUDIO LEVEL

##### CONDITIONS

MODE-STOP  
Input Signal-Audio Signal: 1KHz, 500mVrms  
Input Select-AV

##### INSTRUCTIONS

1. Connect the audio generator to pins 2 and 6 of J4501.
2. Connect the AC voltmeter to pins 1 and 3 of J4501 through 47K ohm resistor.
3. Check if the AUDIO OUTPUT LEVEL is  $500(mV_{rms}) \pm 2(dB)$

## ELECTRICAL ADJUSTMENTS

#### 1-5: PB AUDIO LEVEL

##### CONDITIONS

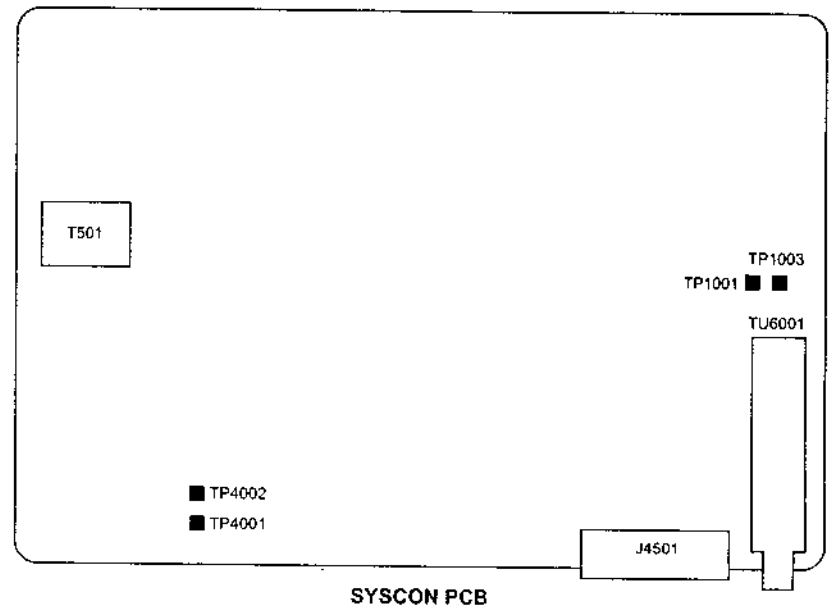
MODE-Self (RECORD and PLAYBACK)  
Input Signal-Audio Signal: 1KHz, 500mVrms  
Video Signal: PAL Color Bar  
Input Select-AV

##### INSTRUCTIONS

1. Connect the color bar generator to pin 20 of J4501.
2. Connect the audio generator to pins 2 and 6 of J4501.
3. Connect the AC voltmeter to pins 1 and 3 of J4501 through 47K ohm resistor.
4. After the input of audio signal and video signal, proceed with the recording.
5. Playback the recorded section and check if the AUDIO OUTPUT LEVEL is  $500(mV_{rms}) \pm 2(dB)$ .

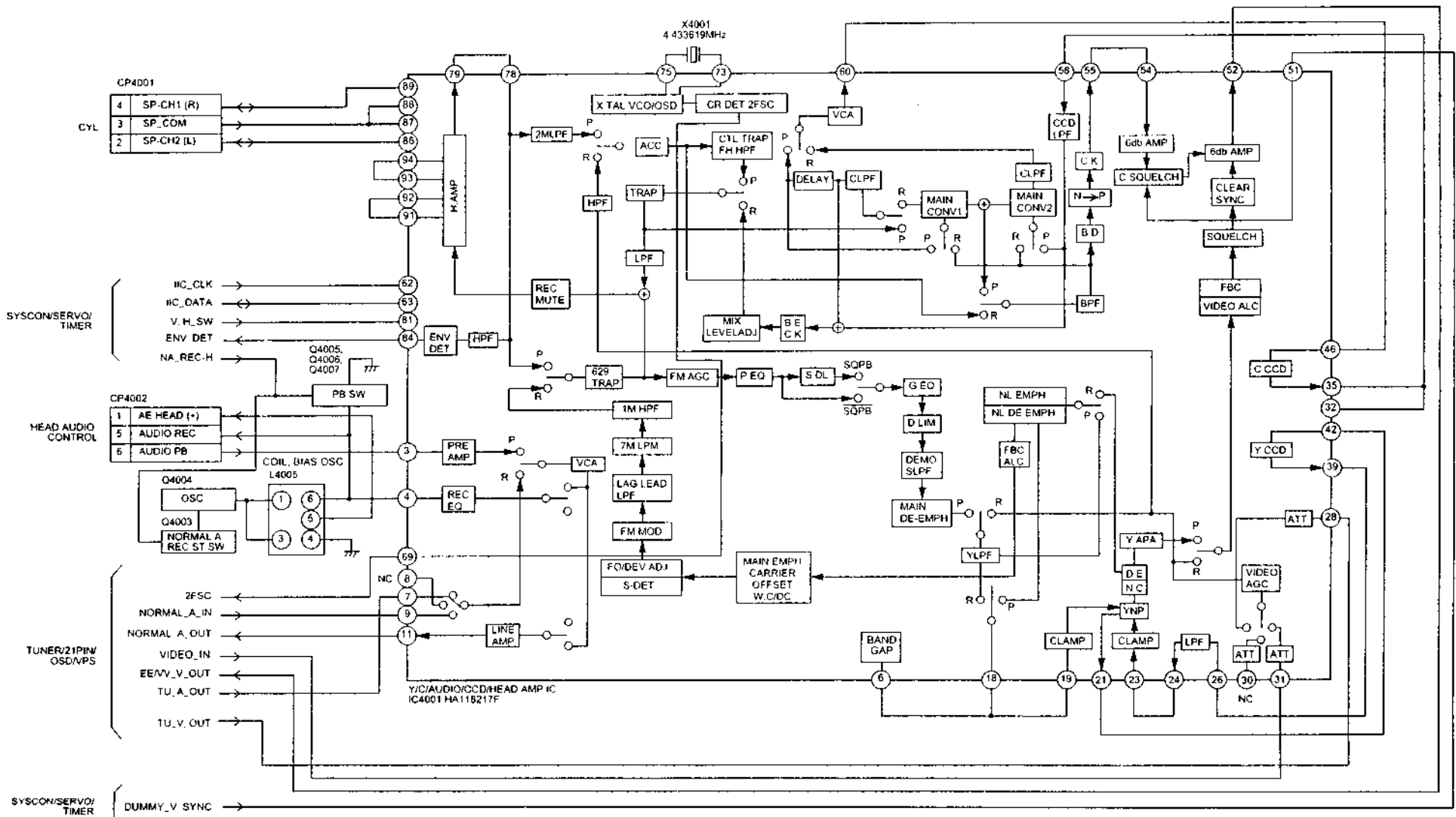
# ELECTRICAL ADJUSTMENTS

## 2. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE

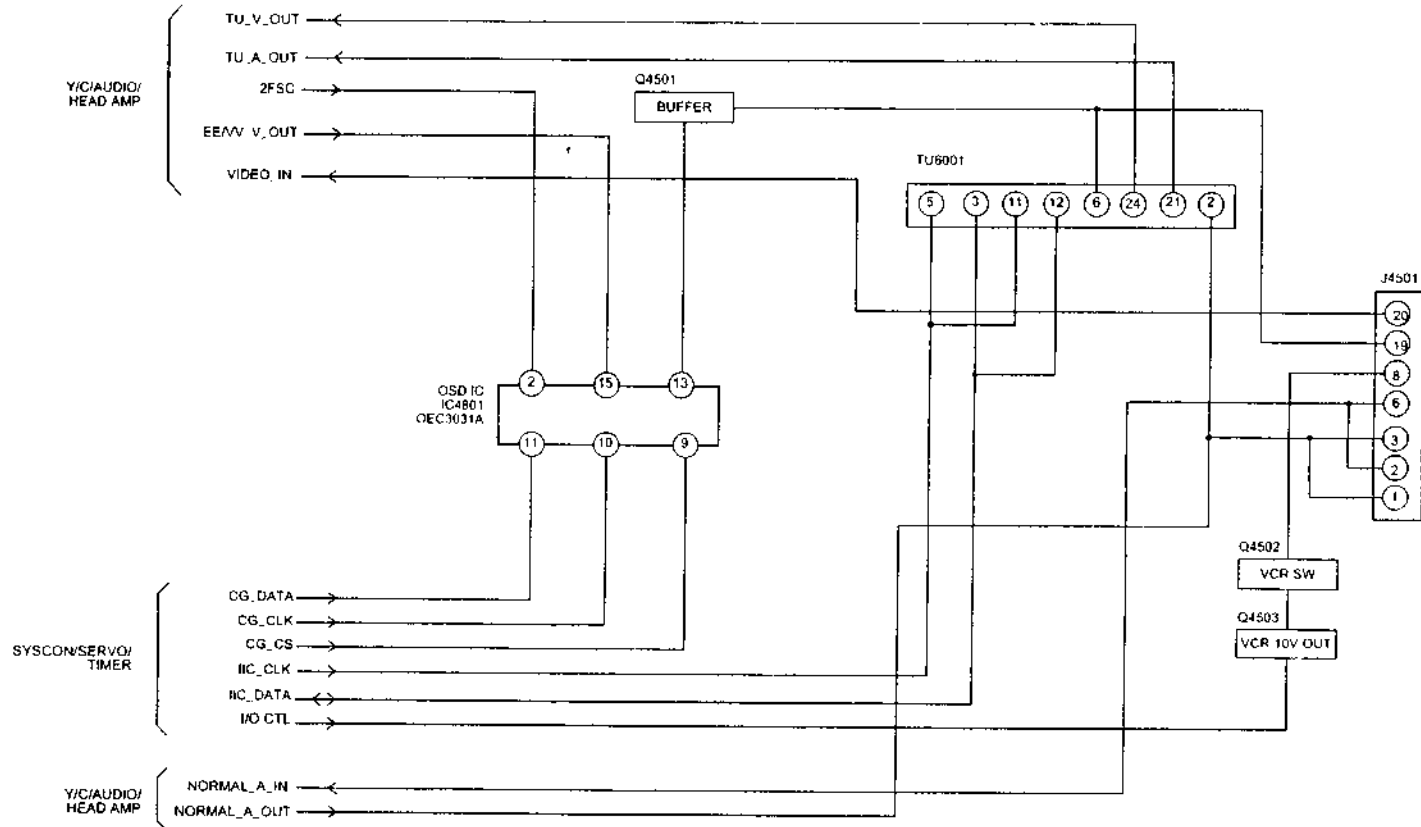




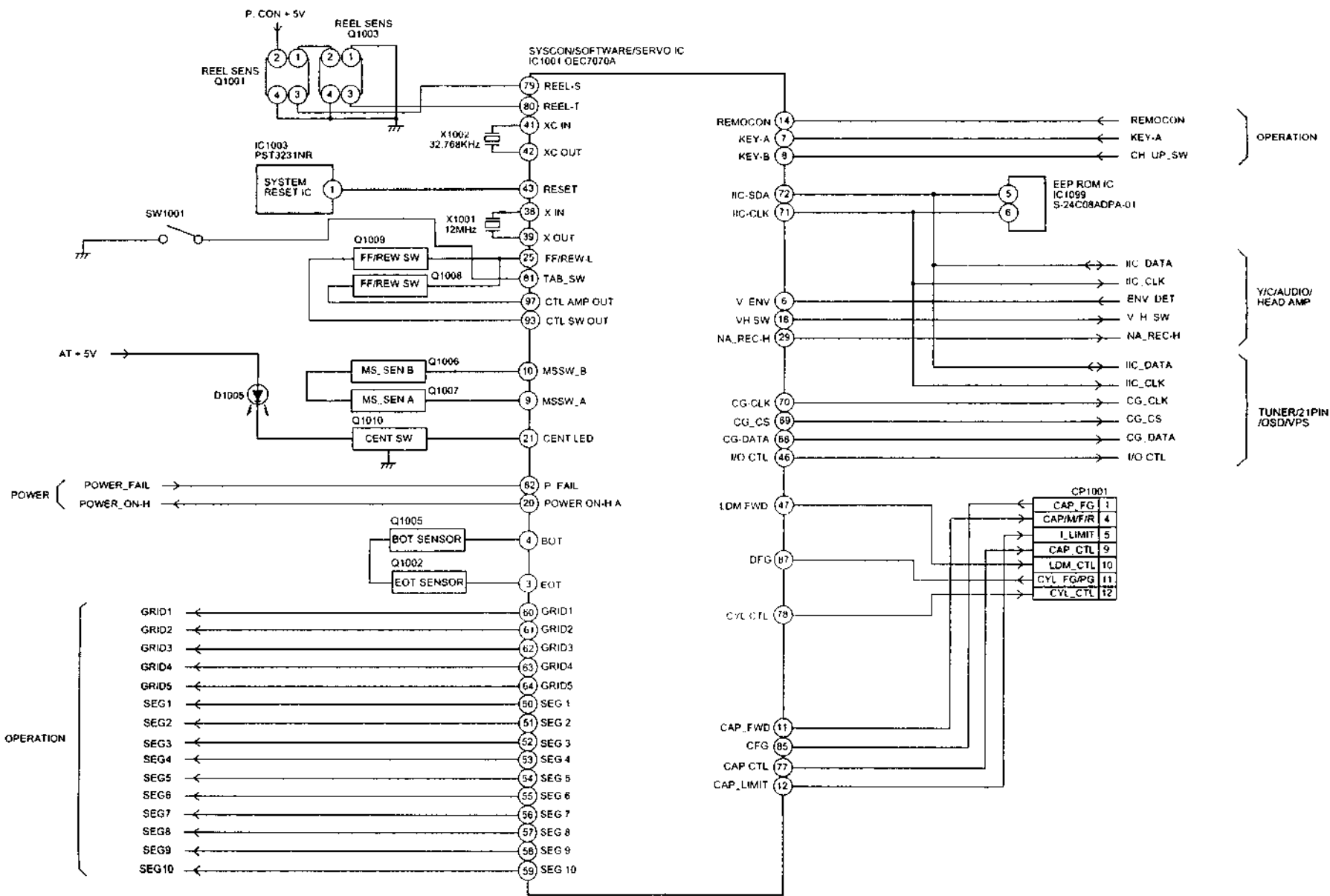
### Y/C/AUDIO/HEAD AMP BLOCK DIAGRAM



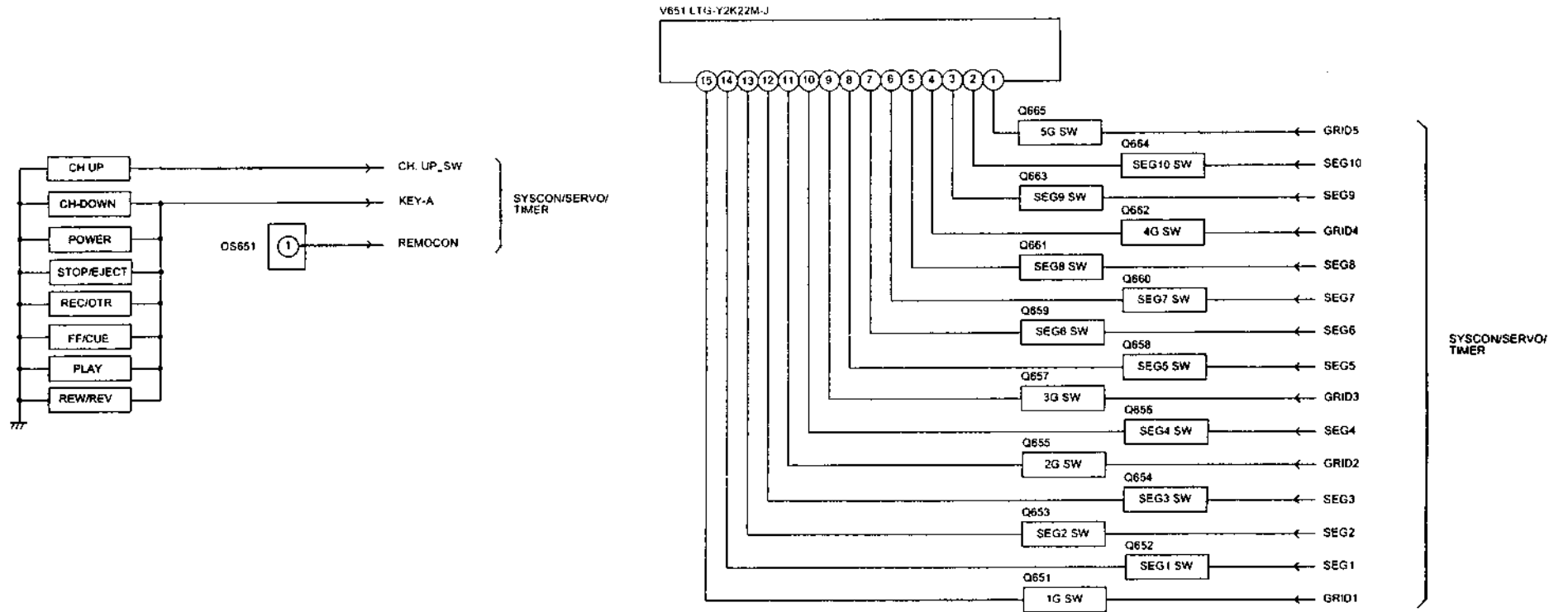
### TUNER/21PIN/OSD/VPS BLOCK DIAGRAM



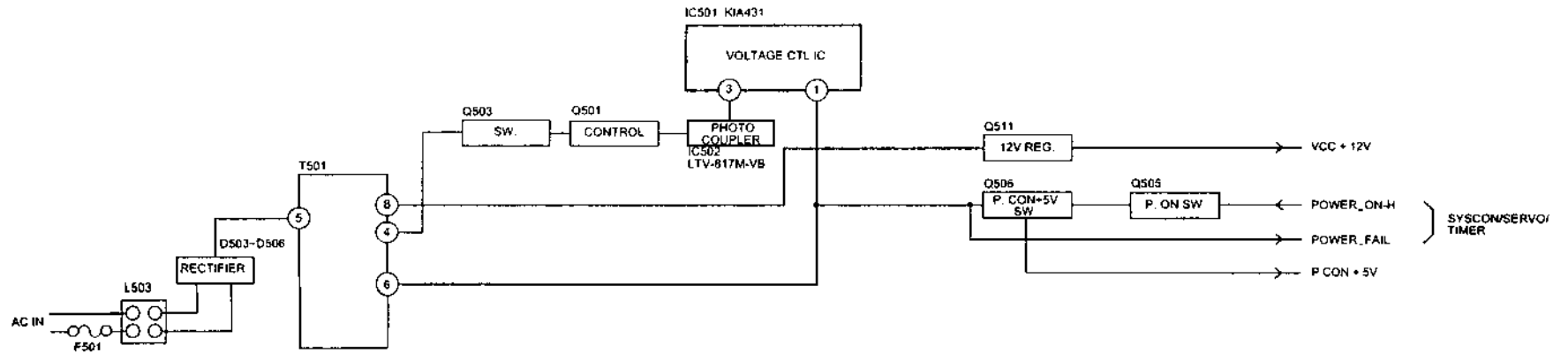
### SYSTEM CONTROL/SERVO/TIMER BLOCK DIAGRAM



### OPERATION BLOCK DIAGRAM



### POWER BLOCK DIAGRAM











# SYSTEM CONTROL/SERV/TIMER SCHEMATIC DIAGRAM (SYSCON PCB)

FROM/TO POWER

FROM/TO DECK

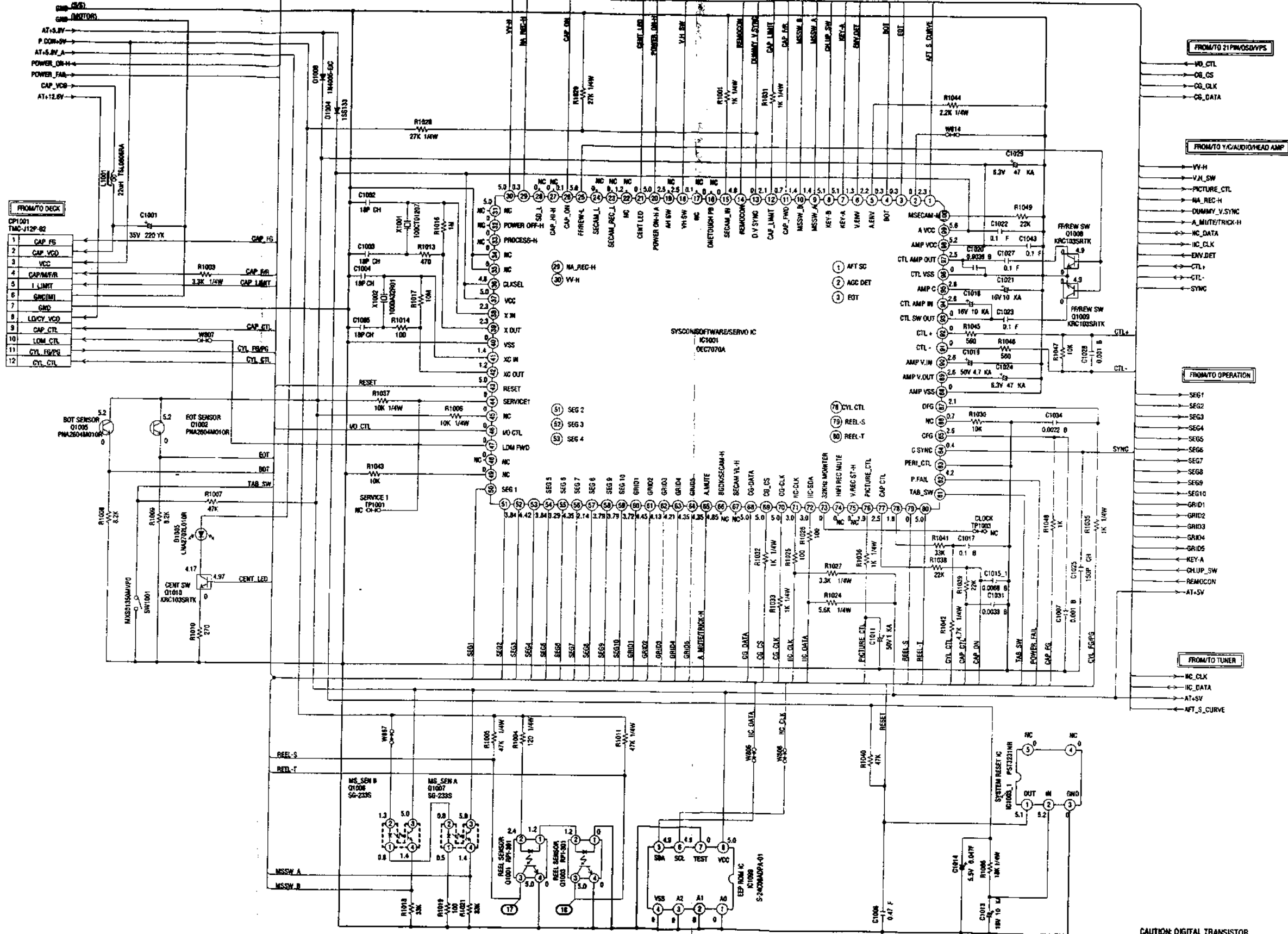
1	CAP FS
2	CAP VCD
3	VCC
4	CAP/MTFR
5	I LIMIT
6	SWCHM1
7	GND
8	LD/CY_VCD
9	CAP_CTL
10	LDM_CTL
11	CTL FS/PS
12	CTL_CTL

FROM/TO 21PMS/DVPS

FROM/TO V/AUDIO/HEAD AMP

FROM/TO OPERATION

FROM/TO TUNER



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

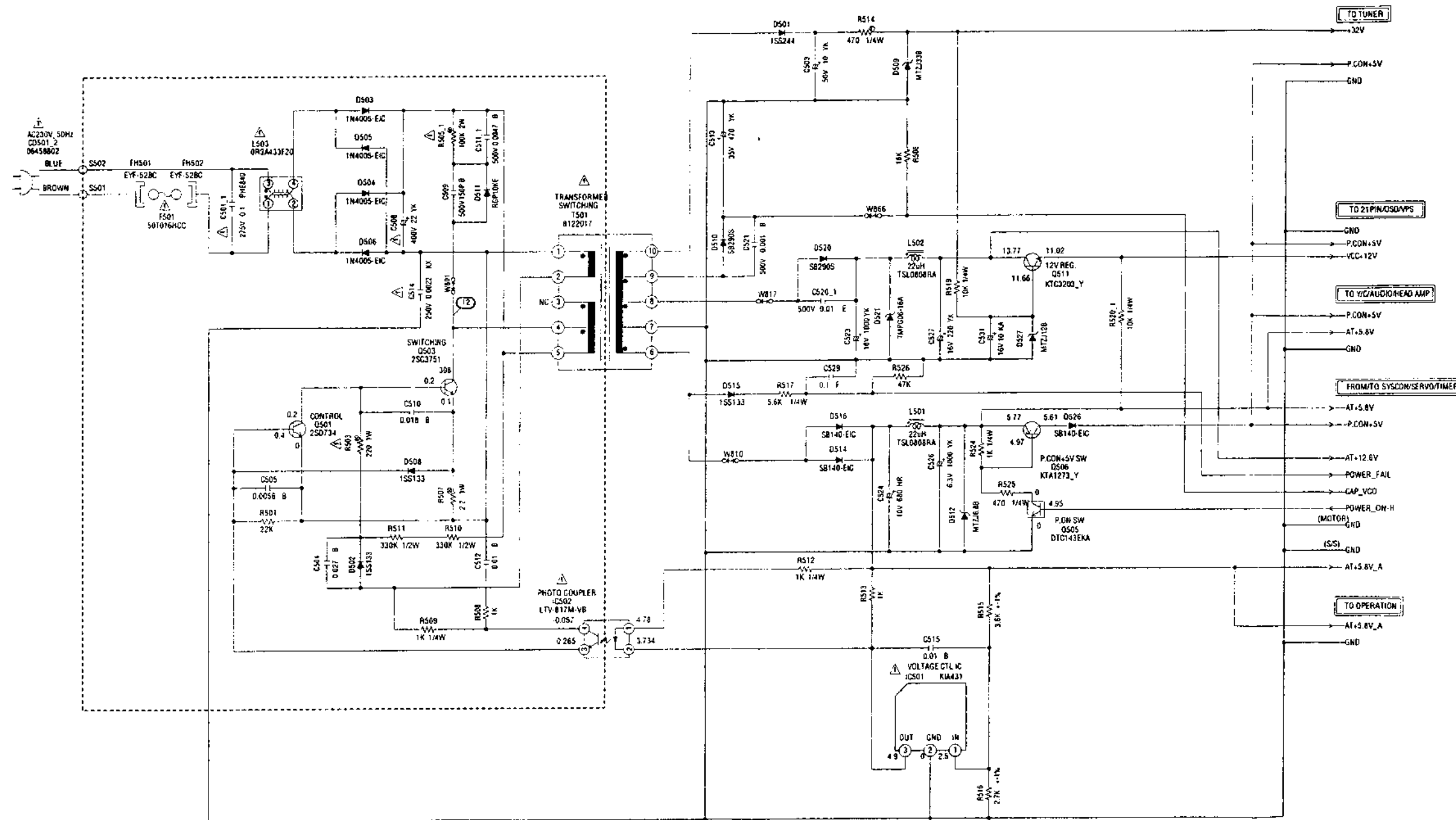
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

CAUTION: DIGITAL TRANSISTOR

PCB110  
YMA231



# POWER SCHEMATIC DIAGRAM (SYSCON PCB)



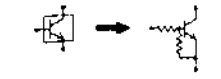
CAUTION: SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

ATTENTION: LES PIÈCES REPAREES PAR UN ETANT DANGEREUSES AN POINT DE VUE SECURITE, N'UTILISER QUE CELLES DECRITES DANS LA NOMENCLATURE DES PIÈCES.

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

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

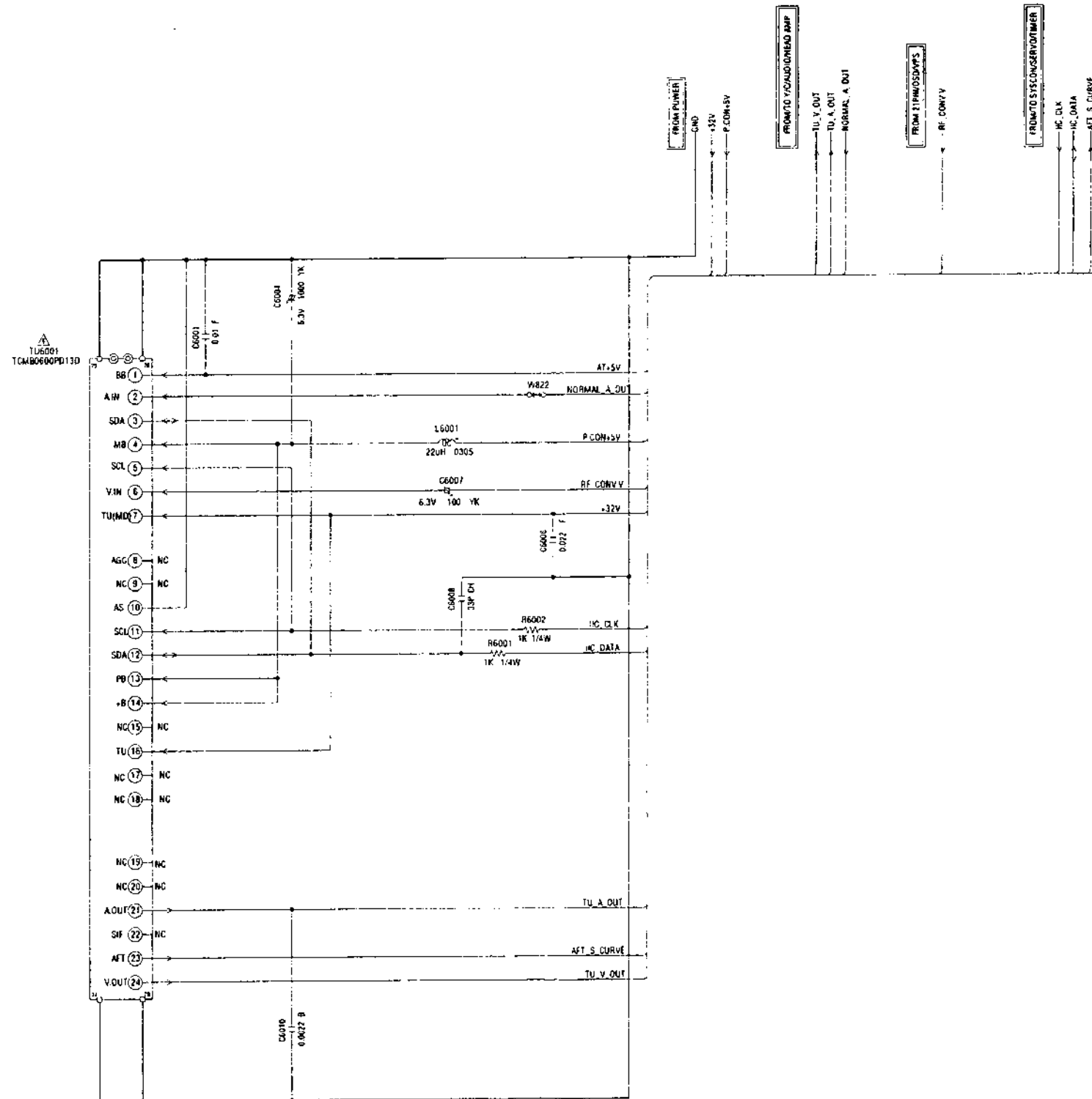
CAUTION: DIGITAL TRANSISTOR



PCB0101  
VMA231H



# TUNER SCHEMATIC DIAGRAM (SYSCON PCB)



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

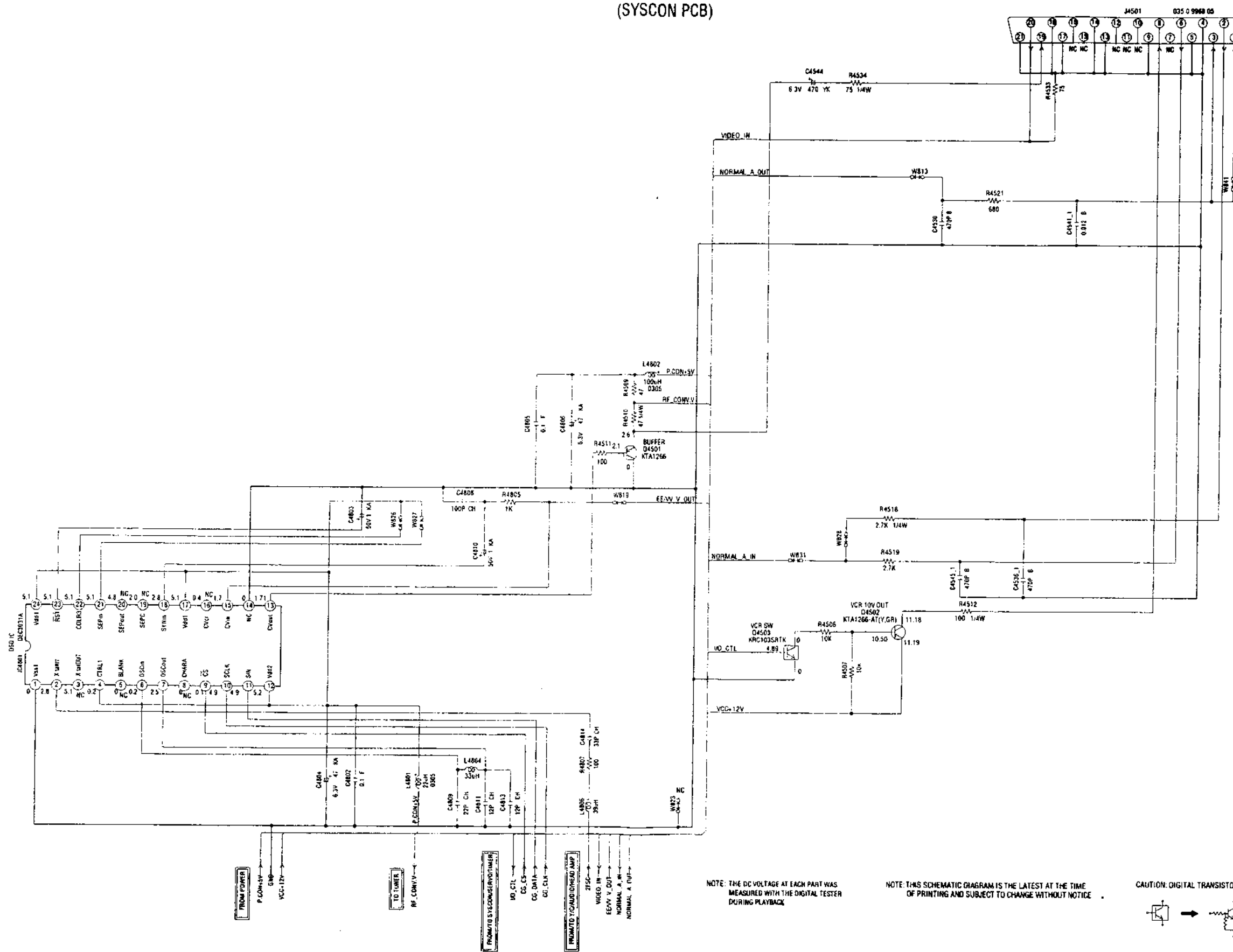
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

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

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

PC8010  
VMA231

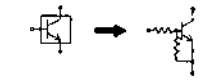
# 21PIN/OSD/VPS SCHEMATIC DIAGRAM (SYSCON PCB)



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

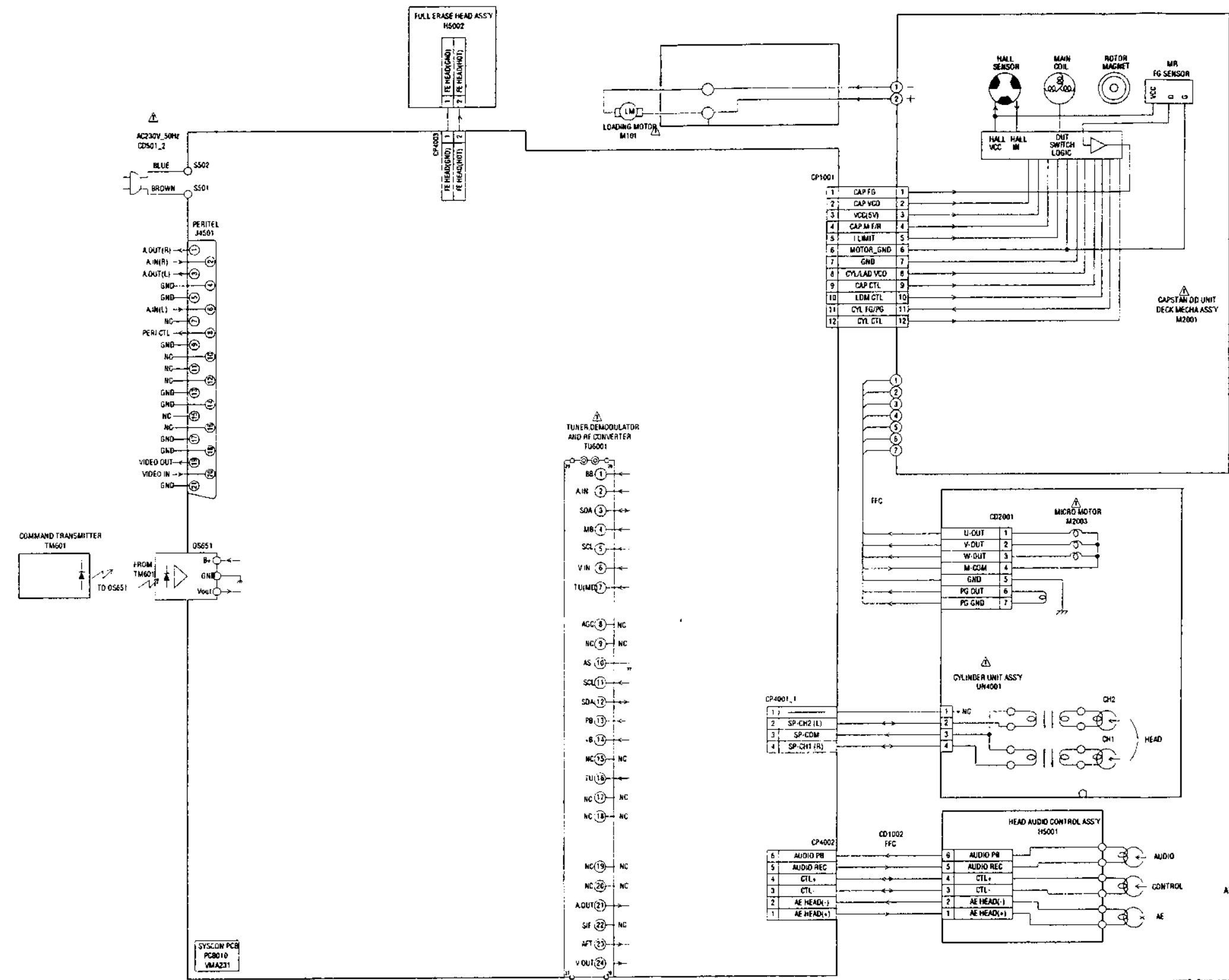
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE

CAUTION: DIGITAL TRANSISTOR



PCB010  
VMA231

# INTERCONNECTION DIAGRAM



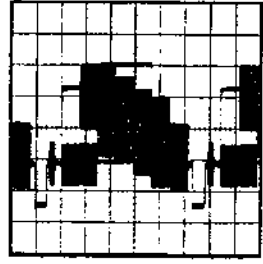
CAUTION: SINCE THESE PARTS MARKED BY ARE CRITICAL FOR SAFETY USE ONES DESCRIBED IN PARTS LIST ONLY.

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

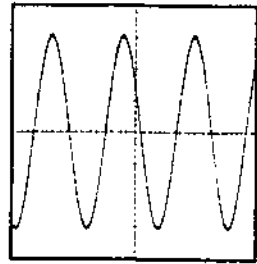
NOTE: THIS INTERCONNECTION DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

## WAVEFORMS

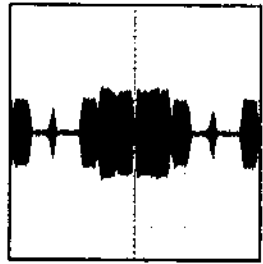
### Y/C/AUDIO/HEAD AMP



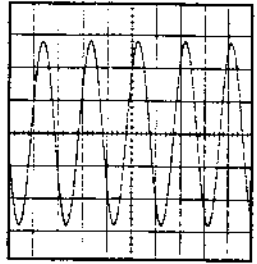
① REC  
0.5V 10 $\mu$ s/div



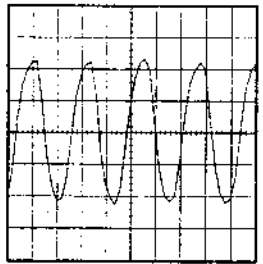
⑥ REC  
10V 5 $\mu$ s/div



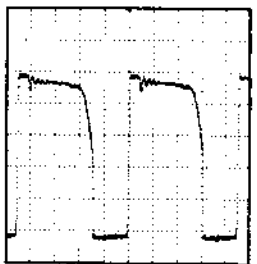
② PB  
200mV 10 $\mu$ s/div



⑦ REC, PB  
200mV 0.5ms/div



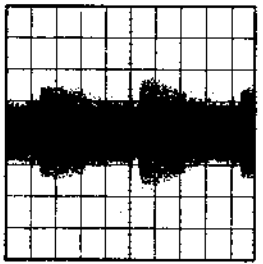
③ POWER ON  
100mV 50ns/div



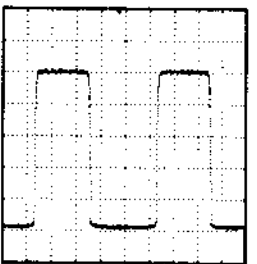
⑫ PB  
2 $\mu$ s 50.0V/div

### POWER

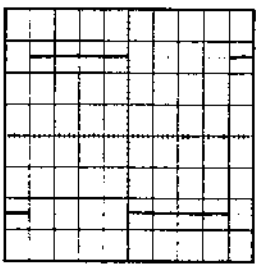
### SYSCON/SERVO/TIMER



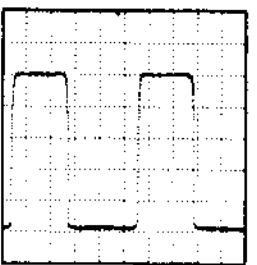
④ PB  
100mV 5ms/div



⑰ PB  
200ms 1.0V/div



⑤ REC, PB  
1V 5ms/div

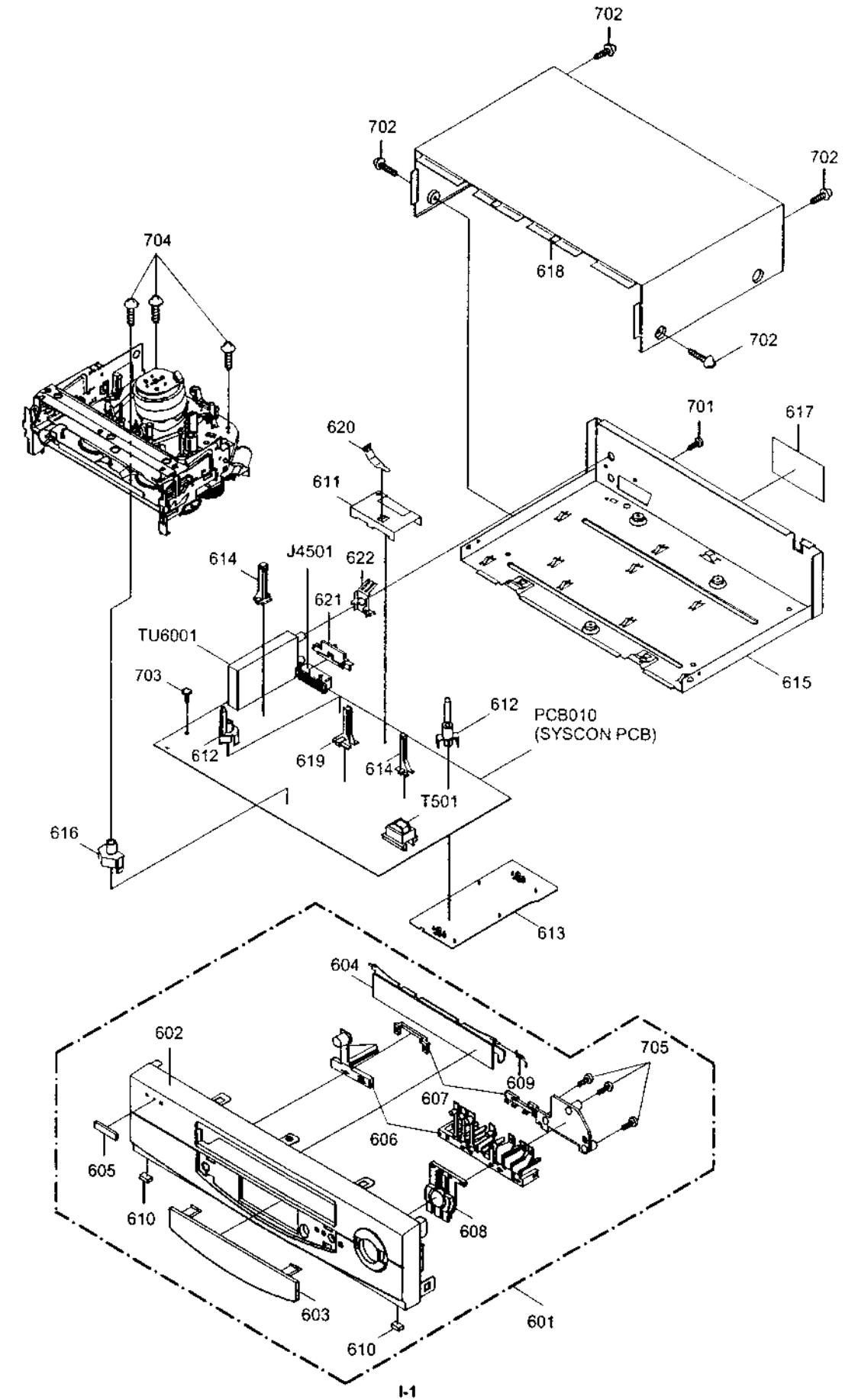


⑱ PB 200ms 1.0V/div

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

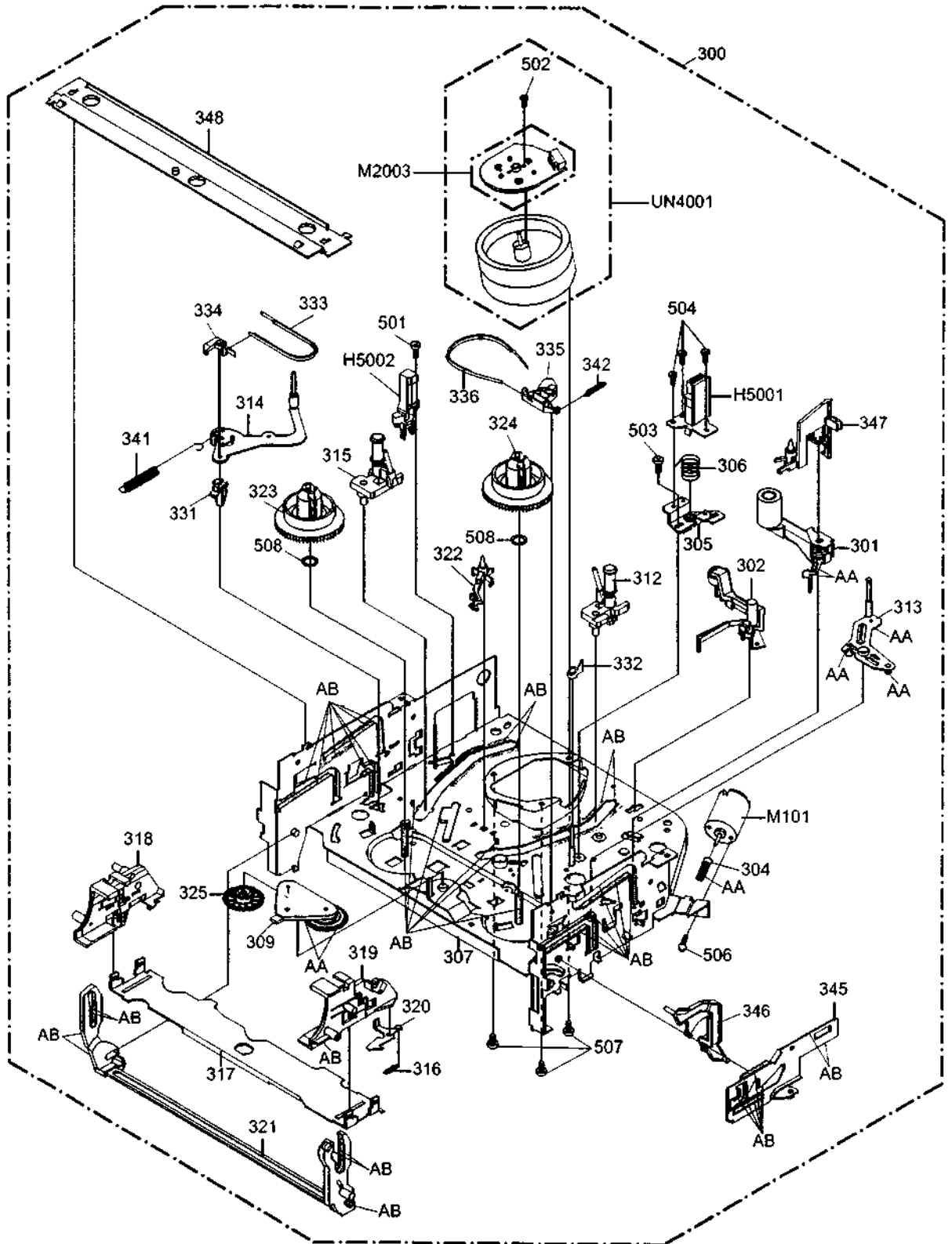
H-1

## MECHANICAL EXPLODED VIEW



I-1

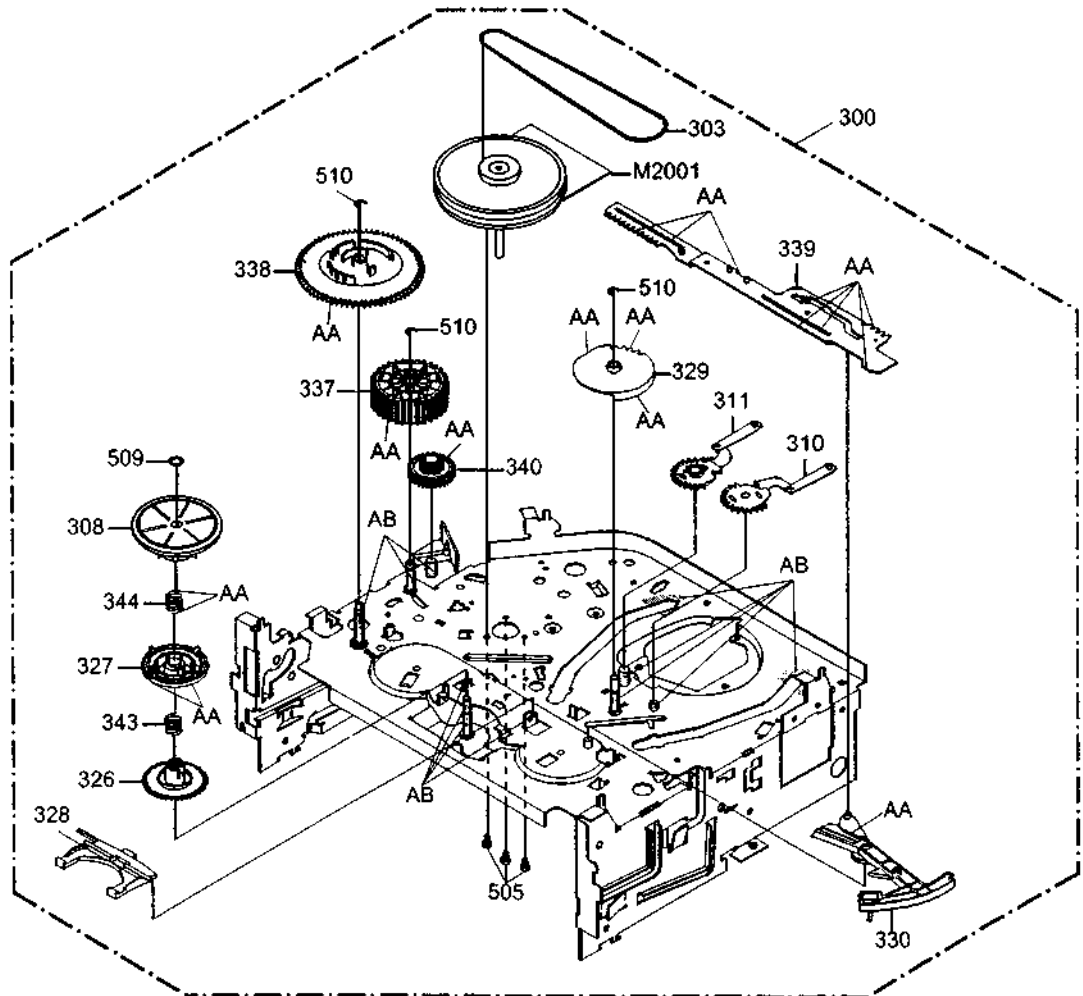
# CHASSIS EXPLODED VIEW (TOP VIEW)



CLASS	PART NO.	MARK
GREASE	G-555G	AA
	MG-33	AB

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

## CHASSIS EXPLODED VIEW (BOTTOM VIEW)



CLASS	PART NO.	MARK
GREASE	G-555G	AA
	MG-33	AB

**NOTE:** Applying positions AA and AB 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		
601	A4F310B720K	CABINET,FRONT ASS'Y		
602	701WPJB449	CABINET,FRONT		
603	711WPOA411	PLATE,DISPLAY		
604	712WPJB191	FLAP		
605	711WPC0005	BADGE,BRAND		
606	735WPAA360	BUTTON,HOLDER		
607	735WPBA298	BUTTON,FRAME		
608	735WPJA483	BUTTON,PLAY		
609	743WKA0032	SPRING,FLAP(COMBO)		
610	800WFA0045	CUSHION,LEG		
611	752WSA0230	SHIELD,CASE HEAD AMP		
612	701WPA0717	HOLDER,DECK		
613	755WPA0024	PLATE,COVER POWER		
614	65OP700036	HOLDER EOT SENSOR		
615	702WSA0094	PLATE,BOTTOM		
616	701WPA0686	HOLDER,DECK		
617	722202A541	SHEET,RATING		
618	702WSB0058	CABINET, TOP		
619	65OP700037	HOLDER,LED		
620	753WUAA006	SPRING,EARTH HEAD AMP		
621	761WPA0229	HOLDER,2:1PIN		
622	753WUAA0057	SPRING,EARTH TUNER		
701	8110230804	SCREW,TAP TITE(P)	BIND	3x8
702	8109230801	SCREW,TAP TITE(B)		3x8
703	8109230704	SCREW,TAP TITE(B)R	BIND	3x7
704	8109130B94	SCREW,TAP TITE(B)R	PAN	3x29
705	8110226804	SCREW,TAP TITE(P)	BIND	2.6x8
--	JB5X0300	POLYBAG		
--	J4E00129	INFORMATION SHEET		
--	J4F31001	INSTRUCTION BOOK		
--	J4F31007	QUICK SET-UP SHEET		
--	A4F310B975	INSTRUCTION BOOK KIT		
--	791UHA0014	GIFT,SHEET		
--	792UCA0004	PULP,PACKAGE		
--	793UCDA830	GIFT BOX		

## CHASSIS REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
300	A4F310B420A	DECK ASS'Y	501	8107226804	SCREW,TAP TITE(S) BIND 2.6x8
		A4F310B420A	502	810A123504	SEMS A M2.3x5.0
301	850A400227	PINCH ROLLER BLOCK	503	8107226404	SCREW,TAP TITE(S) BIND 2.6x4
302	850A500026	AHC ASS'Y	504	8102120604	SCREW,PAN M2x6
303	850P200290	BELT,CAPSTAN (S)	505	8109126604	SCREW,TAP TITE(B) PAN 2.6x6
304	850P600581	WORM	506	810A130404	SCREWWASHER(A) M3x4
305	850P500083	BASE,AC HEAD	507	810A126504	SCREWWASHER(A) M2.6x5
306	850P800324	SPRING,AC HEAD	508	82Q264713N	POLYSLIDER WASHER 2.6x4.7xT0.13
307	850A000459	MAIN CHASSIS ASS'Y	509	82P184505N	POLYSLIDER WASHER(CUT) 1.8x4.5xT0.5
308	850A200089	CLUTCH ASS'Y			
309	850A200090	ARM IDLER ASS'Y	510	83ETW30000	E-RING 3.0
310	850A300065	LOADING ARM S UNIT	CD1501	122H071603	CORD JUMPER SMCD-7X151
311	850A300066	LOADING ARM T UNIT	CD1502	122Y021902	CORD JUMPER 2Y021902
312	850A400223	INCLINED BASE T UNIT 3S	H5001	1523D91034	HEAD (AUDIO CONTROL) HVMXA1072A
313	850A400232	P5 ARM ASS'Y 2	H5002	1543D02013	HEAD (FULL ERASE) HVFHP0032A
314	850A400233	TENSION ARM ASS'Y (WT)	△ M101	1596S98001	MOTOR (LOADING) MDB2B66
315	850A400231	INCLINED BASE S UNIT	△ M2001	1510S98036	CAPSTAN DD UNIT F2QVB08
316	850P800358	SPRING,LOCKER	△ M2003	1589S11014	MICRO MOTOR I2OAL03
317	850P900736	CASS,HOLDER	△ UN4001	A4F310B500	CYLINDER UNIT ASS'Y A4F310B500
318	850P900748	CASS,SIDE L			
319	850P900749	CASS,SIDE R			
320	850P900739	LOCKER,R			
321	850A900226	LINK UNIT			
322	850P000496	POST,CASS GUIDE			
323	850P200291	REEL,S (S)			
324	850P200292	REEL,T (S)			
325	850P200308	GEAR,IDLER			
326	850P200311	GEAR,CLUTCH			
327	850P200312	GEAR,COUPLING			
328	850P200313	LEVER,CLUTCH			
329	850P300194	GEAR,MAIN LOADING			
330	850P400490	LEVER,TENSION			
331	850P400492	HOLDER,TENSION			
332	850P400520	CAP,P4			
333	850P400532	BAND,TENSION			
334	850P400533	CONNECT,TENSION			
335	850P600573	ARM,BRAKE T			
336	850P600574	BAND,BRAKE T			
337	850P600577	CAM,PINCH ROLLER			
338	850P600578	CAM,MAIN			
339	850P600579	ROD,MAIN			
340	850P600582	GEAR,JOINT			
341	850P800322	SPRING,TENSION			
342	850P800350	SPRING,BRAKE T			
343	850P800355	SPRING,COUPLING			
344	850P800356	SPRING,RING			
345	850P900743	LEVER,LINK			
346	850P900744	LEVER,FLAP			
347	850P900745	CASS,OPENER			
348	850P900746	BRACKET, TOP 3V			

# ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
<b>RESISTORS</b>					
△ R503	R3X181221J	R,METAL OXIDE	220 OHM 1W		
△ R505	R3X28A104J	R,METAL OXIDE	100K OHM 2W		
R507	R3X1812R2J	R,METAL OXIDE	2.2 OHM 1W		
R514	R65584471J	R,FUSE	470 OHM 1/4W		
<b>CAPACITORS</b>					
△ C501	P2472B104M	CMP	0.1 UF 275V PHE840		
△ C508	E02LFH220M	CE	22 UF 400V		
△ C514	CB3930MH3M	CC	0.0022UF 250V		
C520	C0JFE0514M	CC	0.01 UF 500V E		
C521	C0J0B0513K	CC	0.001 UF 500V B	or	
	C13VB0713K	CC	0.001 UF 2KV B		
<b>DIODES</b>					
D501	D17T002440	DIODE SILICON	1SS244T-77		
D502	D1VT001330	DIODE,SILICON	1SS133T-77		
D503	D2WXN40050	DIODE SILICON	1N4005-EIC		
D504	D2WXN40050	DIODE SILICON	1N4005-EIC		
D505	D2WXN40050	DIODE SILICON	1N4005-EIC		
D506	D2WXN40050	DIODE SILICON	1N4005-EIC		
D508	D1VT001330	DIODE,SILICON	1SS133T-77		
D509	D97U03301B	DIODE,ZENER	MTZJ33B T-77		
D510	D2WXB290S0	DIODE SILICON	SB290S		
D511	D2LTP10KE0	DIODE,RECTIFIER	RGP10KE-G3		
D512	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77		
D514	D2WXS1400	DIODE SCHOTTKY	SB140-EIC		
D515	D1VT001330	DIODE,SILICON	1SS133T-77		
D516	D2WXS1400	DIODE SCHOTTKY	SB140-EIC		
D520	D2WXB290S0	DIODE SILICON	SB290S		
D521	D93T11601A	DIODE ZENER	TMPG06-16A-G3		
D526	D2WXS1400	DIODE SCHOTTKY	SB140-EIC		
D527	D97U01201B	DIODE,ZENER	MTZJ12B T-77		
D651	D2WXN40050	DIODE SILICON	1N4005-EIC		
D1004	D1VT001330	DIODE,SILICON	1SS133T-77		
D1005	0010100320	INFRARED LED	LNA2702L010R		
D1006	D2WXN40050	DIODE SILICON	1N4005-EIC		
D4001	D1VT001330	DIODE,SILICON	1SS133T-77		
D4002	D1VT001330	DIODE,SILICON	1SS133T-77		
<b>ICs</b>					
△ IC501	11KJ9A4310	IC	KIA431	or	
	10UJ014310	IC	MM1431ATT		
△ IC502	0002E00610	PHOTO COUPLER	LTV-817M-VB		
IC1001	156F57070A	IC	OEC7070A		
IC1003	19UF032310	IC	PST3231NR		
IC1099	A4F310B015	IC	S-24C08ADPA-01		
IC4001	104F38217F	IC	HA118217F		
IC4801	153F3031A	IC	OEC3031A		
<b>TRANSISTORS</b>					
Q501	TD3T007340	TRANSISTOR,SILICON	2SD734(E,F)-AA		
Q503	TC3U037510	TRANSISTOR SILICON	2SC3751		
Q505	TNYJA05001	COMPOUND TRANSISTOR	DTC143EKAT146		
Q506	TAAT01273Y	TRANSISTOR SILICON	KTA1273_Y		
Q511	TCAT032034	TRANSISTOR, SILICON	KTC3203_Y-AT		
Q651	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S		
Q652	TNAAC05002	COMPOUND TRANSISTOR	KRC103SR TK		
Q653	TNAAC05002	COMPOUND TRANSISTOR	KRC103SR TK		
Q654	TNAAC05002	COMPOUND TRANSISTOR	KRC103SR TK		
Q655	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S		
Q656	TNAAC05002	COMPOUND TRANSISTOR	KRC103SR TK		
Q657	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S		
Q658	TNAAC05002	COMPOUND TRANSISTOR	KRC103SR TK		
Q659	TNAAC05002	COMPOUND TRANSISTOR	KRC103SR TK		
Q660	TNAAC05002	COMPOUND TRANSISTOR	KRC103SR TK		
Q661	TNAAC05002	COMPOUND TRANSISTOR	KRC103SR TK		
Q662	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S		
Q663	TNAAC05002	COMPOUND TRANSISTOR	KRC103SR TK		
Q664	TNAAC05002	COMPOUND TRANSISTOR	KRC103SR TK		
Q665	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S		
Q1001	0002700590	PHOTO COUPLER	RPI-301		
Q1002	0000100380	PHOTO TRANSISTOR	PNA2604M010R		
Q1003	0002700590	PHOTO COUPLER	RPI-301		
Q1005	0000100380	PHOTO TRANSISTOR	PNA2604M010R		
Q1006	0002M00580	PHOTO COUPLER	SG-233S		
Q1007	0002M00580	PHOTO COUPLER	SG-233S		
Q1008	TNAAC05002	COMPOUND TRANSISTOR	KRC103SR TK		
Q1009	TNAAC05002	COMPOUND TRANSISTOR	KRC103SR TK		
Q1010	TNAAC05002	COMPOUND TRANSISTOR	KRC103SR TK		
Q4002	TCAT032034	TRANSISTOR, SILICON	KTC3203_Y-AT		
Q4004	TCAT032034	TRANSISTOR, SILICON	KTC3203_Y-AT		
<b>TRANSISTORS</b>					
Q4005	TPAAC05002	COMPOUND TRANSISTOR	KRA103SR TK		
Q4006	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)		
Q4007	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)		
Q4008	T8YJ2412K0	TRANSISTOR SILICON	2SC2412KT146 R,S		
Q4501	TAATA12660	TRANSISTOR,SILICON	KTA1266-AT(Y,GR)		
Q4502	TAATA12660	TRANSISTOR,SILICON	KTA1266-AT(Y,GR)		
Q4503	TNAAC05002	COMPOUND TRANSISTOR	KRC103SR TK		
<b>COILS &amp; TRANSFORMER</b>					
L501	02167E220K	COIL	22 UH		
L502	02167E220K	COIL	22 UH		
△ L503	029T000083	COIL,LINE FILTER	0R3A433F20		
L1001	02167E220K	COIL	22 UH		
L4003	02167F101J	COIL	100 UH		
L4004	02167F101J	COIL	100 UH		
L4005	02167F101J	COIL	100 UH		
△ L4006	031616003R	COIL,BIAS OSC	1616003		
L4008	02167F101J	COIL	100 UH		
L4009	021LA6120K	COIL	12 UH		
L4010	021LA6221K	COIL	220 UH		
L4011	02167F101J	COIL	100 UH		
L4012	021LA6390K	COIL	39 UH		
L4013	02167F101J	COIL	100 UH		
L4014	021LA61R0M	COIL	1 UH		
L4015	021LA61R0M	COIL	1 UH		
L4016	021LA61R0M	COIL	1 UH		
L4801	02167F220J	COIL	22 UH		
L4802	02167F101J	COIL	100 UH		
L4804	021LA6330K	COIL	33 UH		
L4806	021LA6390K	COIL	39 UH		
L6001	02167F220J	COIL	22 UH		
△ T501	0481220174	TRANSFORMER,SWITCHING	8122017		
<b>JACK</b>					
J4501	063G000073	SOCKET 21PIN	035 0 9968 05		
<b>SWITCHES</b>					
SW651	0504201T31	SWITCH,TACT	SKHVBED010		
SW652	0504201T31	SWITCH,TACT	SKHVBED010		
SW653	0504201T31	SWITCH,TACT	SKHVBED010		
SW654	0504201T31	SWITCH,TACT	SKHVBED010		
SW655	0504201T31	SWITCH,TACT	SKHVBED010		
SW656	0504201T31	SWITCH,TACT	SKHVBED010		
SW657	0504201T31	SWITCH,TACT	SKHVBED010		
SW658	0504201T31	SWITCH,TACT	SKHVBED010		
SW1001	0508A11001	SWITCH(LEAF)	MXS01350MVP0		
<b>P.C. BOARD ASSEMBLIES</b>					
PCB010	A4F310B010K	PCB ASSY	VMA231A		
<b>MISCELLANEOUS</b>					
BT601	1412004013	BATTERY,MANGAN	R03(AB)2PXPPI		
△ CD501	1208458802	CORD AC BUSH	6458802		
CD1002	122F061501	CORD JUMPER	2F061501		
CD6002	06CDL02002	RF CABLE PAL FTZ	CDL02002		
CP1001	06972C0010	CONNECTOR PCB SIDE	TMC-J12P-B2		
CP4001	0697240600	CONNECTOR PCB SIDE	TOC-C04X-B1		
CP4002	069J760019	CONNECTOR PCB SIDE	IMS-A-9604S-06Z13		
CP4003	0697120320	CONNECTOR PCB SIDE	TMC-T02X-E1		
CUS011	800WFAA008	CUSHION C			
EL002	124120301A	EYE LET	XRY20X30BD		
△ F501	080NT1R603	FUSE	50T016HCC		
FH501	06710T0006	HOLDER,FUSE	EYF-52BC		
FH502	06710T0006	HOLDER,FUSE	EYF-52BC		
OS651	077Q037001	REMOTE RECEIVER	PIC-37043LO		
TM601	076N0ED110	TRANSMITTER	RC-ED110		
△ TU6001	0162K01025	RF UNIT	TCMB0600PD13D		
V651	0040E94001	LED DISPLAY	LTG-Y2K22M-J		
X1001	100CT01207	CRYSTAL HC-49U-S	12MHz		
X1002	100DA32R01	CRYSTAL 0T-26	32.768KHz		
X4001	100CT4R407	CRYSTAL HC-49U	4.43361MHz		

## ELECTRICAL REPLACEMENT PARTS LIST

### 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

# ORION

## VH-521 SI

# SERVICE MANUAL

### VIDEO CASSETTE RECORDER



**SUPPLEMENT  
CHASSIS CODE A**

This SUPPLEMENT must be used together SERVICE MANUAL for VH-521.  
All other test and repair procedures are as shown in the ORIGINAL MANUAL.  
Please file this SUPPLEMENT with the ORIGINAL VERSIONS.

## ELECTRICAL REPLACEMENT PARTS LIST

REF. NO.	VH-521		VH-521 SI	
	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
TM601	076N0ED110	TRANSMITTER RC-ED110	076N0ED160	TRANSMITTER RC-ED160

## MECHANICAL REPLACEMENT PARTS LIST

REF. NO.	VH-521		VH-521 SI	
	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
601	A4F310B720K	CABINET,FRONT ASS'Y	A4F340B720K	CABINET,FRONT ASS'Y
602	701WPJB449	CABINET,FRONT	701WPJB482	CABINET,FRONT
604	712WPJB191	FLAP	712WPJB234	FLAP
607	735WPBA298	BUTTON,FRAME	735WPBA329	BUTTON,FRAME
608	735WPJA483	BUTTON,PLAY	735WPJA516	BUTTON,PLAY
617	722202A541	SHEET,RATING	722202A554	SHEET,RATING
618	702WSB0058	CABINET, TOP	702WSB0060	CABINET, TOP
---	793UCDA830	GIFT BOX	793UCDA856	GIFT BOX

SPEC. NO.	M4F3-40B
O/R NO.	U1X4521