

1. SPECIFICATIONS

Format:	VHS PAL standard
Video recording system:	Two rotary heads, helical scan system
Video signal:	PAL colour and I signals, 625 lines
Recording/playing time:	240 min max. with SHARP E-240 tape (SP) 480 min max. with SHARP E-240 tape (LP)
Tape width:	12.7mm
Tape speed:	23.39 mm/s (SP) 11.70 mm/s (LP)
Antenna:	75 ohm unbalanced
Receiving channel:	Models for U.K. UHF Channel E21-E69 Models for Ireland VHS Channel IrA-E12 UHF Channel E21-E69 CATV S1-S41
RF converter output signal:	UHF Channel E21-E69 (Preset to CH E36) (Models for U.K.) UHF Channel E30-E39 (Preset to CH E36) (Models for Ireland)
Power requirement:	AC230V-240V, 50Hz (Models for U.K.) AC230V, 50Hz (Models for Ireland)
Power consumption:	Approx. 17 W (AC230V/50Hz) (VC-M26HM/LM, MH27HM, M271LM) Approx. 20W (AC230V/50Hz) (VC-MH67HM/LM, MH68HM)
Operating temperature:	5°C to 40°C
Storage temperature:	-20°C to 55°C
Weight:	Approx. 3.5 kg
Dimensions:	360 mm (W) x 286 mm (D) x 94 mm (H)
VIDEO	
Input:	1.0 Vp-p, 75 ohm
Output:	1.0 Vp-p, 75 ohm
S/N ratio:	45 dB (SP mode)
Horizontal resolution:	Approx. 260 lines (SP mode with Supper Picture)
AUDIO	
Input:	0 dBs = 0.775 Vrms Line1: -3.8 dBs, 10k ohm Line2: -3.8dBs, 10k ohm (VC-MH67HM/LM, MH68HM)
Output:	Line1: -3.8 dBs, 1k ohm Line2: -3.8dBs, 1k ohm (VC-MH67HM/LM, MH68HM) REAR RCA: -5dBs, 1k ohm (VC-MH67HM/LM, MH68HM)
S/N ratio:	46 dB min. (SP mode)
Frequency response:	80 Hz ~ 10 kHz (SP mode) 80Hz ~ 5kHz (LP mode)
Hi-Fi dynamic range:	85 dB min. (VC-MH67HM/LM, MH68HM)
Hi-Fi WOW and flutter:	0.005% Max. (VC-MH67HM/LM, MH68HM)
Hi-Fi Frequency response:	20Hz ~20kHz (VC-MH67HM/LM, MH68HM)
Hi-Fi Distortion:	0.5% Max. (VC-MH67HM/LM, MH68HM)
Hi-Fi closs talk (at 1kHz):	60dB min. (VC-MH67HM/LM, MH68HM)
Accessories included:	75 ohm coaxial cable Operation manual Infrared remote control Battery (2pcs.)

As part of our policy of continuous improvement, we reserve the right to alter design and specifications without notice.

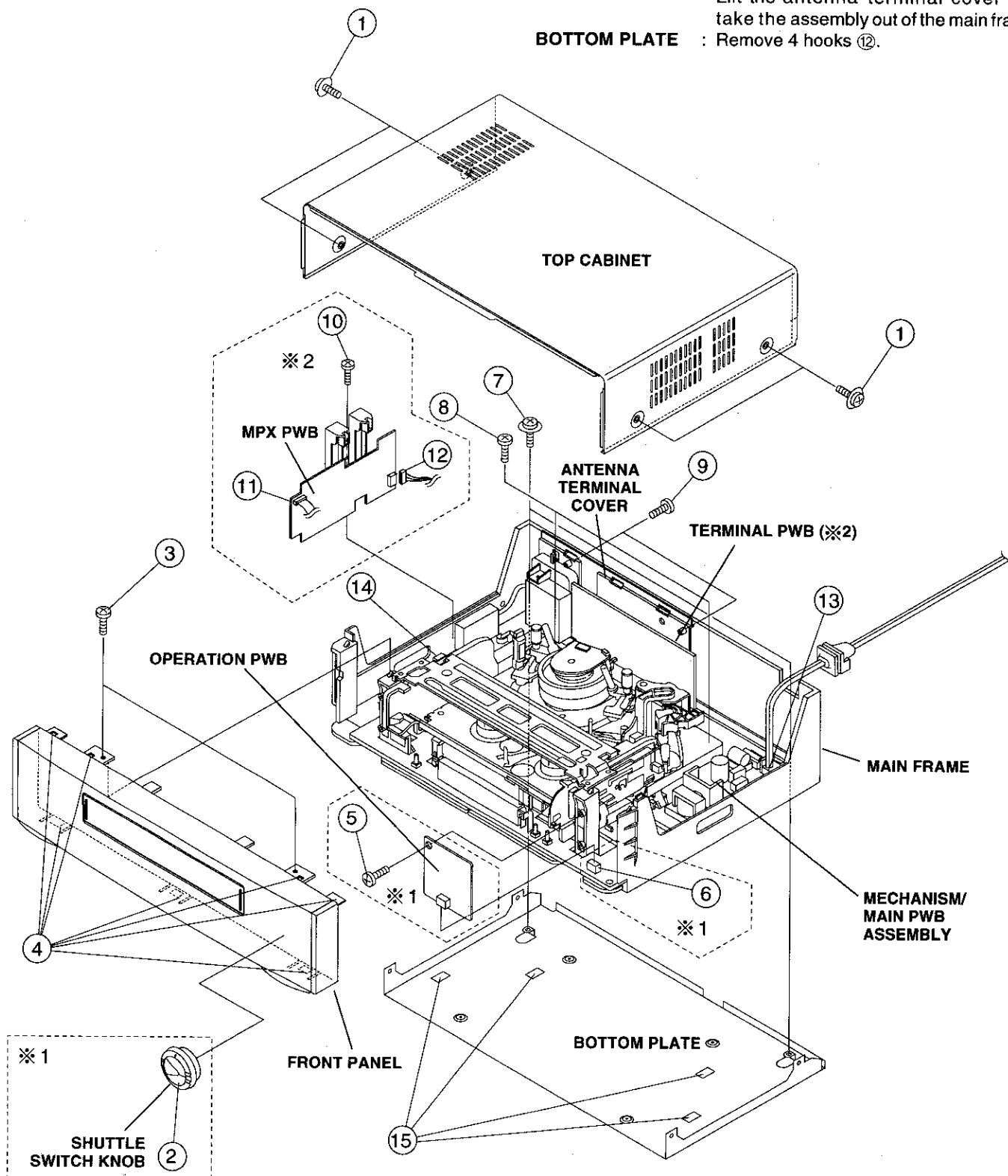
Note: The antenna must correspond to the new standard DIN 45325 (IEC 169 - 2) for combined UHF/VHF antenna with 75 ohm connector.

2. DISASSEMBLY AND REASSEMBLY

2-1 DISASSEMBLY OF MAJOR BLOCKS

- TOP CABINET** : Remove 4 screws ①.
FRONT PANEL : Remove shuttle switch ② (※1). Remove 2 screws ③ and 7 clips ④.
OPERATION PWB (※1) : Remove 1 screw ⑤ and take it out of connector ⑥.

- MPX PWB (※2)** : Remove 1 screw ⑩, 1 FFC ⑪ and 1 connector ⑫.
MECHANISM/MAIN PWB ASSEMBLY : Remove 2 screw ⑦, 2 screws ⑧, 2 screws ⑨ and 1 connector ⑬. Remove 1 hook ⑭.
 Lift the antenna terminal cover and take the assembly out of the main frame.
BOTTOM PLATE : Remove 4 hooks ⑮.

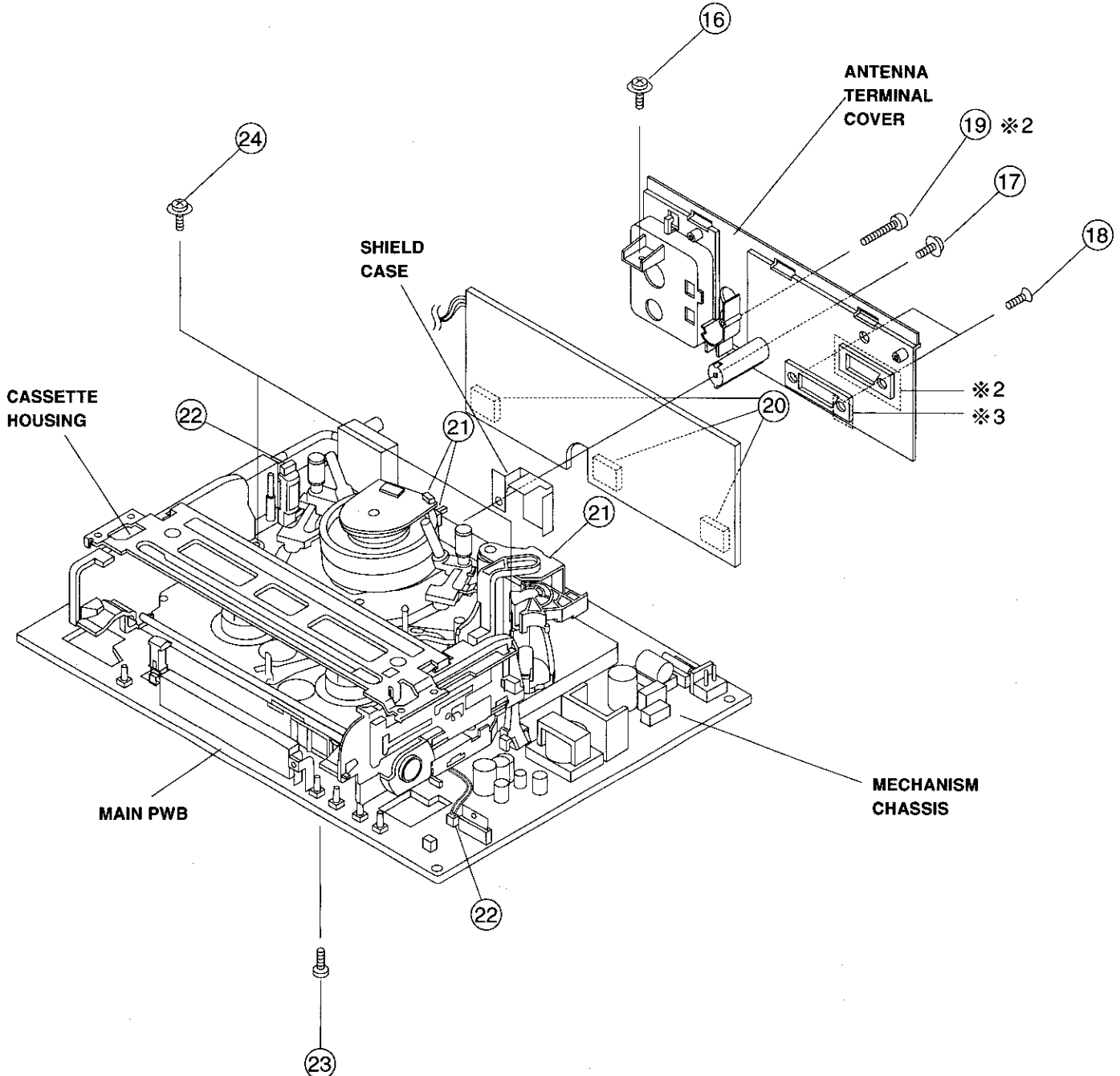


2-2 DISASSEMBLING THE MECHANISM/MAIN PWB ASSEMBLY

- ANTENNA TERMINAL COVER** : Remove 1 screw ①⑥, 1 screw ①⑦, 2 screw ①⑧ and 1 screw ①⑨ (※2).
- TERMINAL PWB (※2)** : Take it out of 3 connectors ②⑩. Remove the shield case.
- MECHANISM CHASSIS/** : Remove 3 FFCs ②⑪ and 2 harnesses ②⑫. Be careful not to confuse the top and

- CASSETTE HOUSING ASSEMBLY**
- CASSETTE HOUSING**

- bottom of the FFC. Remove 1 screw ②⑬ from behind the main PWB. Remove the mechanism chassis assembly straight up from the main PWB with care not to damage their surrounding parts.
- : Remove 2 screws ②⑭.



※2 VC-MH67HM/LM, MH68HM
 ※3 Except ※2

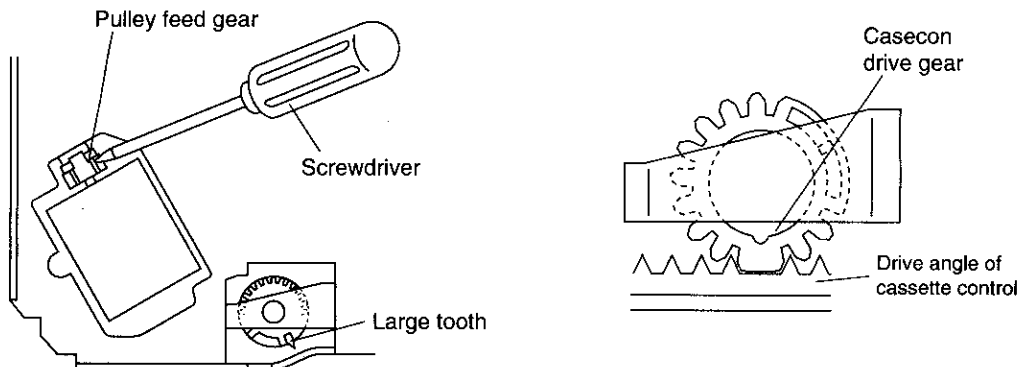
2-3 PRECAUTIONS IN REASSEMBLING

MOUNTING THE CASSETTE CONTROLLER

Initial setting is indispensable before placing the cassette controller in the mechanism. The initial setting is made in two ways; electrical and mechanical.

Electrical setting:

Make a short-circuit between TP5003 and TP5004 and be sure that the mechanism is back to its initial setting position (*1). Now place the cassette controller in position. (This method is used when the mechanism has been already set on its PWB.)



Mechanical setting:

Turn the loading motor's pulley feed gear using a screwdriver and be sure that the mechanism is back to its initial setting position (*1). Now place the cassette controller in position. (This method is applicable for the mechanism alone.)

COUPLING THE MECHANISM TO THE PWB

Match the mechanism's projections with the two symbols (round reference and oval sub-reference) on the main PWB. Place the mechanism straight down in position with due care so that the mechanism chassis's outer edges should not damage any parts nearby.

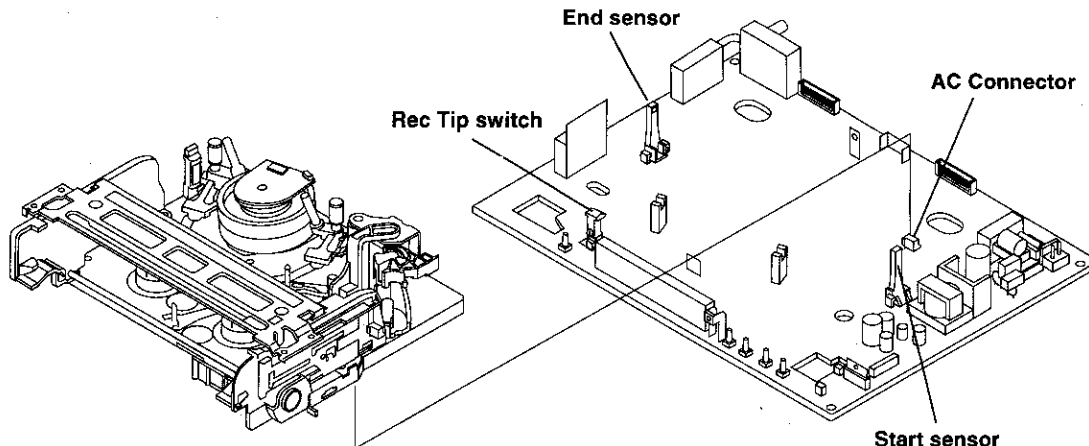
Tighten up the two screws (one for fixing the mechanism and the head amplifier shield, the other on the main PWB's soldering side and located near the loading motor) to fix the mechanism and main PWB. Reconnect the FFC cables (AD, AH and AA) and harness (AE and AL) between the mechanism and main PWB.

Parts to pay attention to:

Start and end sensors D715 and D714

Rec tip switch S701

Take special care of the AC connector (board to board) between the mechanism and main PWB.








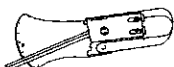
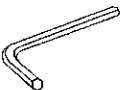
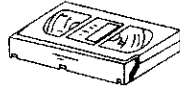
4. ADJUSTMENT, REPLACEMENT AND ASSEMBLY OF MECHANICAL UNITS

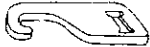
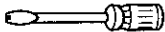

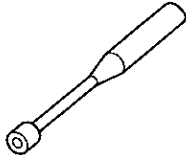


Here we will describe a relatively simple service work in the field, not referring to the more complicated repairs which would require the use of special equipment and tools (drum assembly replacement, for example).

We are sure that the easy-to-handle tools listed below would be more than handy for periodical maintenance to keep the machine in its original working condition.

TOOLS NECESSARY FOR ADJUSTING THE MECHANICAL UNITS

The following tools are required for proper service and satisfactory repair.

No.	Jig Item	Part No.	Code	Configuration	Remarks			
1	Reel Disk Height Adjusting Jig	JiGRH0002	BR		These Jigs are used for checking and adjusting the reel disk height.			
2	Master Plane Jig	JiGMP0001	BY					
4	Torque Gauge (90g)	JiGTG0090	CM		These Jigs are used for checking and adjusting the torque of take-up and supply reel disks.			
	Torque Gauge (1.2kg)	JiGTG1200	CN					
5	Gauge Head	JiGTH0006	AW					
6	Cassette Torque Meter	JiGVHT-063	CZ			This cassette torque meter is used for checking and adjusting the torque of take-up for measuring tape back tension.		
7	Tension Gauge (300g)	JiGCG0300	BF			There are two gauges used for the tension measurements, 300 g and 2.0kg.		
	Tension Gauge (2.0kg)	JiGSG2000	BS					
8	Hex Wrench (0.9mm)	JiGHW0009	AE		These Jigs are used for loosening or tightening special hexagon type screws.			
	Hex Wrench (1.5mm)	JiGHW0015	AE					
9					These tapes are especially used for electrical fine adjustment.			
					Video	Audio	HiFi Audio	Track
	Alignment Tape (PAL)	VROCPSV	CK		625 Monoscope	6k	—	49µm
				PAL Color Bar	1k	—	49µm	
	Alignment Tape (PAL)	VROUBZFS			6k		35µm	

No.	Jig Item	Part No.	Code	Configuration	Remarks
11	Tension Gauge Adapter	JiGADP003	BK		This Jig is used with the tension gauge. Rotary transformer clearance adjusting jig.
12	Special Bladed Screwdriver	JiGDRIvERH-4	AP		This screwdriver is used for adjusting the guide roller height.
14	Torque Driver	JiGTD1200	CB		This is used to screw down resinmade parts: the specified torque is 5kg.
15	M3 type 5.5 mm square box driver for reverse guide	JiGDRIvER11055	AR		This Jig is used for height adjustment of the reverse guide (for reverse guide height adjustment).
17	Reverse Guide Height Adjusting Jig	JiGRVGH-F18	BU		This Jig is used for height adjustment of the reverse guide.
18	Gear Driver	JiGDRIvER-6	BM		For X value adjustment

MECHANICAL PARTS REQUIRING PERIODICAL INSPECTION

Use the following table as a guide to maintain the mechanical parts in good operating condition.

Parts	Maintained	500 hrs.	1000 hrs.	1500 hrs.	2000 hrs.	Possible symptom encountered	Remarks
Guide roller ass'y		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	Lateral noises Head occasionally blocked	Abnormal rotation or significant vibration requires replacement.
Sup Guide Shaft		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		Clean tape contact part with the specified cleaning liquid.
Retaining guide		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Slant pole		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>		
Upper and lower drum		<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Poor S/N ratio, no colour Poor flatness of the envelope with alignment tape	Clean tape contact area with the specified cleaning liquid.
Full-erase head		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	Poor colour, beating	
A/C head		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	Low or distorted audio	
Capstan D.D. Motor		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	No tape running, uneven colour	
Pinch roller		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>	No tape running, tape slack	Clean rubber and rubber contact area with the specified cleaning liquid.
Drive belt			<input type="checkbox"/>		<input type="radio"/>	No tape running, tape slack, no fast forward/rewind motion	
Tension band ass'y					<input type="radio"/>	Cassette not loaded or unloaded	
Loading Motor					<input type="radio"/>		
Idler Wheel ass'y					<input type="radio"/>	No tape running	
Limitier pulley ass'y			<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>		
Supply/take-up Main brake levers					<input type="radio"/>	Tape slack	
AHC (Automatic Head Cleaner) (VC-MH67HM/LM, MH68HM)			<input type="radio"/>		<input type="radio"/>		Replace the roller of the cleaner when it wears down. Just change the AHC roller assembly for new one.

NOTE: : Part replacement.
 : Cleaning (For cleaning, use a lint-free cloth dampened with pure isopropyl alcohol).
 : Oil refilling (The indicated point should be lubricated with high quality spindle oil every 1000hrs).

If the reading is out of the specified value, clean or replace the part.

REMOVAL AND REASSEMBLY OF CASSETTE HOUSING CONTROL ASSEMBLY

• Removal

1. Set the cassette ejected condition in the cassette eject mode.
2. Unplug the recorder from the main source.
3. Follow the procedures below in the specified order.
 - a) Remove the cassette housing installation screws ①.
 - b) Slide and pull out the cassette housing control assembly upward.

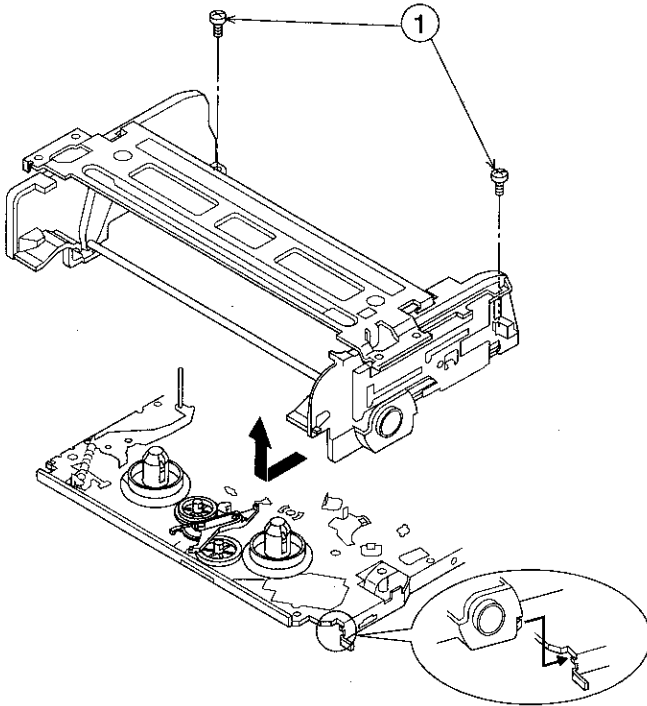


Figure 4-1.

• Reassembly

1. Before installation of the cassette housing control assembly, make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB. Plug in the power cord. The cassette control drive gear starts and stops just when the big face gear shows in the mechanism chassis window. Engage the tooth 2 of the casecon drive gear with the tooth 3 of the cassette control drive angle as shown in Fig. 4-2, to position the cassette control on the mechanism chassis.

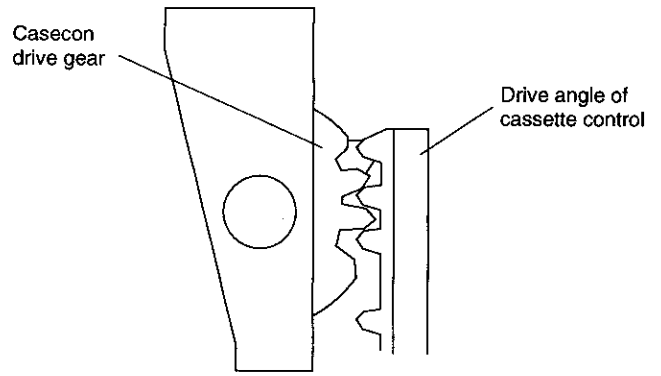


Figure 4-2.

2. Follow the procedures for removal in the reverse order.

Notes:

- ① In using a magnet screw driver, be sure to keep it away from the A/C head, FE (Full Erase) head, and the drum.
- ② In removal and reassembly, take care not to hit the cassette housing control assembly and tools against the guide pin, drum, or the like there about.
- ③ Load the cassette once onto the cassette housing control assembly after reassembly.

TO RUN A TAPE WITHOUT THE CASSETTE HOUSING CONTROL ASSEMBLY

1. Be sure to make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB before turning on the power.
2. Plug in the power cord.
3. Turn on the power switch.
4. Open the lid of a cassette tape by hand.
5. Hold the lid with two pieces of vinyl tape.
6. Set the cassette tape in the mechanism shassis.
7. Stabilize the cassette tape with a weight (500g) to prevent floating.
8. Perform running test.

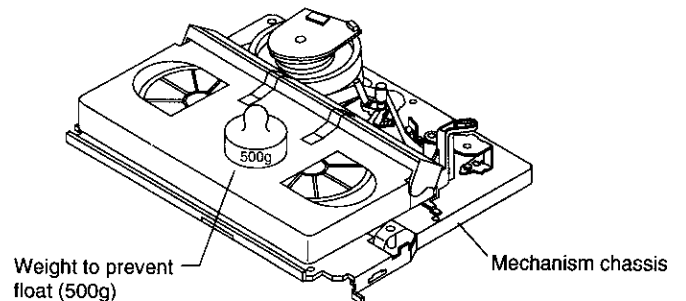


Figure 4-3.

Note:

The weight should not be more than 500g.

REPLACEMENT AND HEIGHT CHECKING AND ADJUSTMENT OF REEL DISKS

• Removal (Supply and Take-up reel disks)

1. Remove the cassette housing control assembly.
2. Pull the tension band out of the tension arm.
3. Release the supply/take-up auxiliary brake lever by hand, which makes unnecessary removal of the supply main brake and the take-up main brake.
4. Open the hook at the top of the reel disk, and remove the reel disk.

<In the EJECT or UL STOP mode>

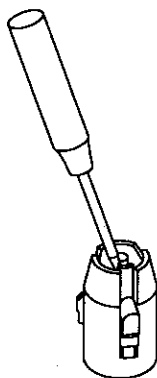
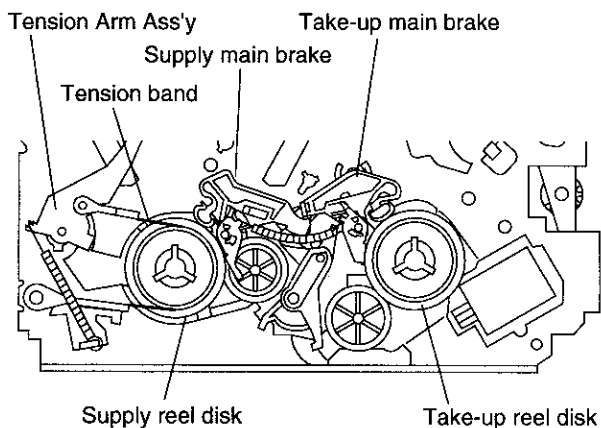


Figure 4-4.

Note:

When the tension band is pressed in the direction of the arrow for removal, the catch is hard to be deformed.

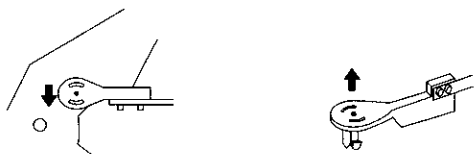


Figure 4-5.

• Reassembly (Supply reel disk)

1. Clean the reel disk shaft and apply oil to it.
2. Align the phase of the reel disk to that of the reel relay gear, and install a new supply reel disk onto the shaft.

3. Replace the tension band around the supply reel disk, and insert it into the hole of the tension arm with the supply auxiliary brake lever released.
4. Check the reel disk height.

Notes:

1. Take enough care not to deform the tension band during installation of the supply reel disk.
2. Be careful not to damage the supply main brake and the reel relay gear.

• Reassembly (Take-up reel disk)

1. Clean the reel disk shaft and apply oil to it.
2. Release the take-up auxiliary brake lever to align the phase of the reel disk to that of the reel relay gear and to install a new take-up reel disk onto the shaft.
3. Check the reel disk height and reassemble the take-up main brake.

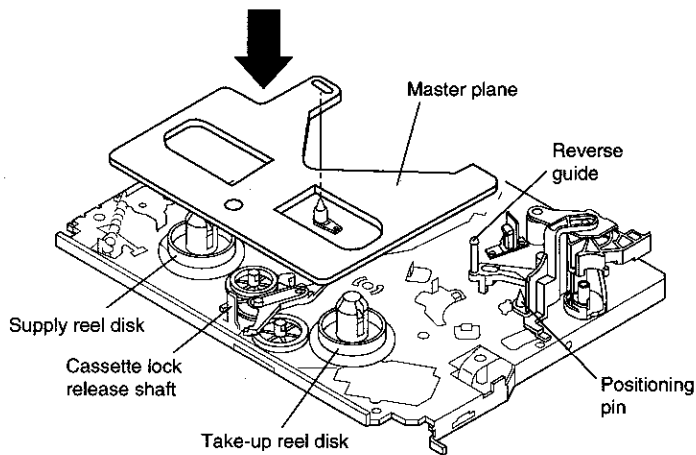
Note:

Take care not to damage the take-up main brake.
 * After reassembly, check the video search rewind back tension (see page 16), and check the brake torque (see page 18).

• Height checking and adjustment

Note:

Place the master plane onto the mechanism unit, taking care not to hit the drum (see Figure 4-6).



Set the master plane releasing the reverse guide by a finger.

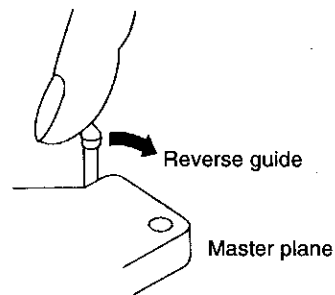


Figure 4-6.

Note:

When placing the master plane, move a little the reverse guide toward the loading.

* Be careful that the reverse guide is not moved too much. Otherwise, it may be broken.

- Check that the reel disk is lower than part A but higher than part B. If the height is not correct, readjust the reel disk height by changing the poly-slider washer under the reel disk.

Note:

Whenever replacing the reel disk, perform the height checking and adjustment.

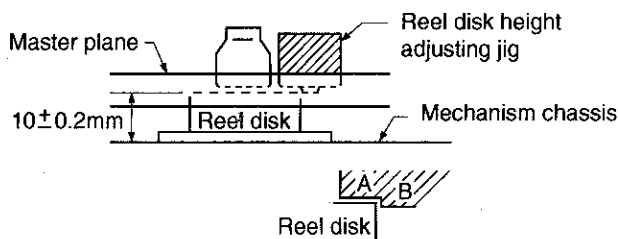


Figure 4-7.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN FAST FORWARD MODE

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB. Now turn on the power.

Setting

1. Set a torque gauge to zero on the scale. Place it on the take-up reel disk.
2. Press the FF button to set the mechanism to the fast forward mode.
3. To calculate the remaining capacity of the play back mode, slowly rotate the supply reel disk, and then shift it into the forward mode.

Checking

1. Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the take-up direction.
2. Check to see if the take-up torque is higher than 69 mN-m (700 gf-cm).

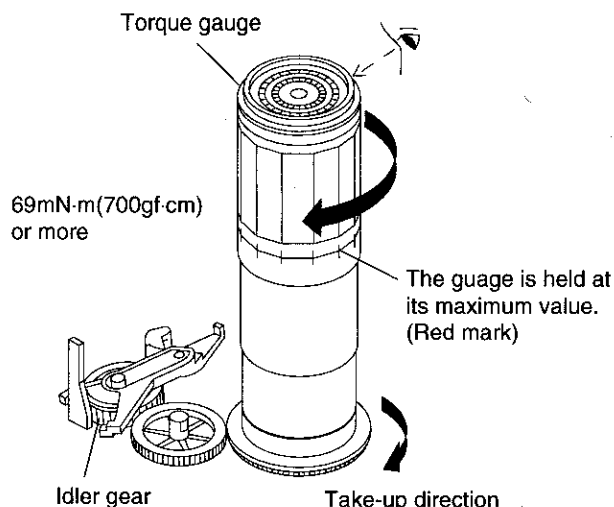


Figure 4-8.

Adjustment

1. If the take-up torque is outside the range, clean the capstan D.D. motor pulley, drive belt and limiter pulley with cleaning liquid, then recheck the torque.
2. If the take-up torque is still out of range, replace the drive belt.

Notes:

1. Hold down the torque gauge so that it may not fly off.
2. When checking the take-up torque, do not keep the reel disk locked for a longer time.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN REWIND MODE

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB. Now turn on the power.

Setting

1. Set a torque gauge to zero on the scale. Place it on the supply reel disk.
2. Press the REW button to set the mechanism to the rewind mode.
3. To calculate the remaining capacity, slowly rotate the take-up reel disk, and then shift it into the rewind mode.

Checking

1. Turn the torque gauge slowly (one rotation every 2 to 3 seconds) by hand in the take-up direction.
2. Check to see if the take-up torque is higher than 69 mN-m (700 gf-cm).

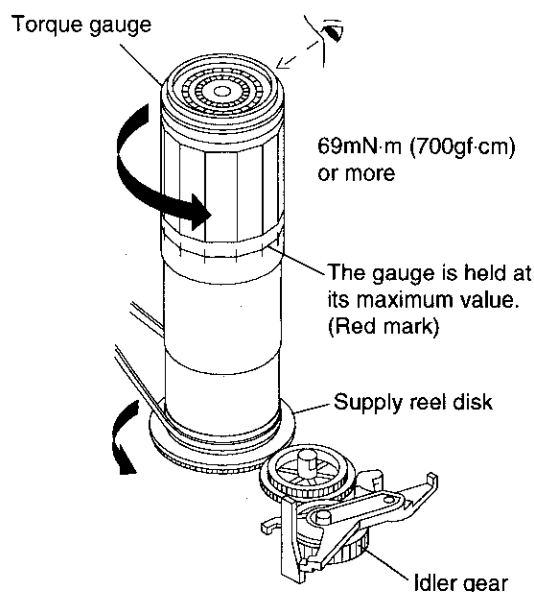


Figure 4-9.

• **Adjustment**

1. If the take-up torque is outside the range, clean the capstan D.D. motor pulley, drive belt and limiter pulley with cleaning liquid, then recheck the torque.
2. If the take-up torque is still out of range, replace the drive belt.

Notes:

1. Hold down the torque gauge so that it may not fly off.
2. When checking the take-up torque, do not keep the reel disk locked for a longer time.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN PLAYBACK MODE

1. Remove the cassette housing control assembly.
2. Make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB. Now turn on the power.
3. Open the lid of the cassette torque meter, and hold it with two pieces of vinyl tapes.
4. Load the cassette torque meter into the unit.
5. Put the weight (500g) on the cassette torque meter.
6. Press the REC button to put the unit in REC mode.

Set value LP $10.5 \pm 3.8\text{mN}\cdot\text{m}$ ($107 \pm 39\text{gf}\cdot\text{cm}$)

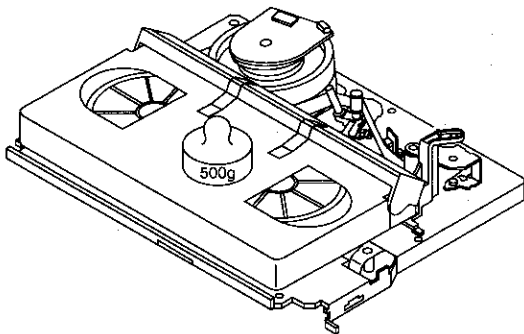


Figure 4-10.

• **Checking**

1. Check that the torque is in the range of $10.5 \pm 3.8\text{mN}\cdot\text{m}$ ($107 \pm 39\text{gf}\cdot\text{cm}$) in the LP record mode.
2. The torque fluctuates due to the rotational deviation of the limiter pulley ass'y. Use the center of the fluctuation as the value.
3. Place the ass'y in the LP record mode, and check that the take-up torque is within the range.

• **Adjustment**

If the take-up torque in the playback mode is outside the range, replace the limiter pulley ass'y.

Note:

Stabilize the cassette torque meter to prevent floating.

CHECKING AND ADJUSTMENT OF TAKE-UP TORQUE IN VIDEO SEARCH REWIND MODE

- **Remove the cassette housing control assembly.**

- **Make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB. Now turn on the power.**

• **Setting**

1. Push the PLAY button to place the ass'y in the playback mode.
2. Push the REW button to place the ass'y in the video search rewind mode.

• **Checking**

1. Place the torque gauge on the supply reel disk, and turn it counterclockwise very slowly (one rotation every 1 to 2 seconds) and check that the torque is within the set value $14.0 \pm 3.9\text{mN}\cdot\text{m}$ ($144 \pm 40\text{gf}\cdot\text{cm}$).

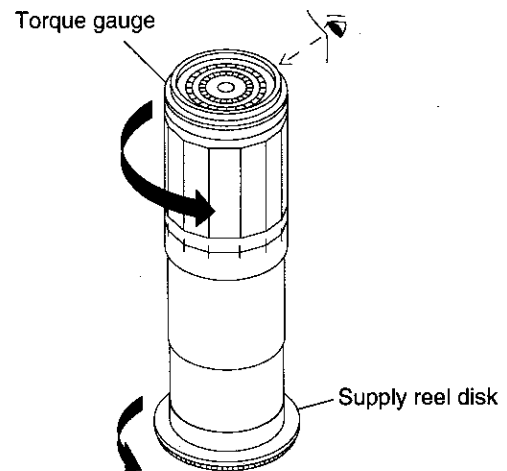


Figure 4-11.

Note:

Set the torque gauge securely on the supply reel disk. If it is not secure, the measurement will be incorrect.

• **Adjustment**

If the take-up torque in video search rewind mode is outside the range, replace the limiter pulley ass'y.

Note:

The torque fluctuates due to the rotational deviation of the limiter pulley ass'y. Use the center of the fluctuation at the value.

CHECKING THE VIDEO SEARCH REWIND BACK TENSION

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB. Now turn on the power.
- **Checking**
 1. Push the PLAY button to place the ass'y in the playback mode.
 2. Push the rewind button to place the ass'y in the video search rewind mode.
 3. Place the torque gauge on the take-up reel disk, and turn it counterclockwise very slowly (one rotation every 2 to 3 seconds) and check that the torque is within the set value $4.9 \pm 2 \text{ mN}\cdot\text{m}$ ($50 \pm 20 \text{ gf}\cdot\text{cm}$).

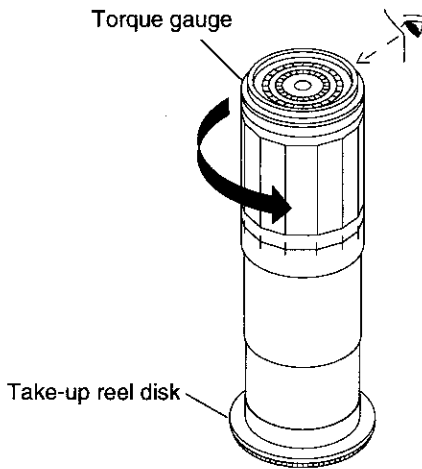


Figure 4-12.

Notes:

- ① Set the torque gauge securely on the take-up reel disk. If it is not secure, the measurement will be incorrect.
- ② Measure the torque applying the torque gauge's weight.

CHECKING THE PINCH ROLLER PRESSURE

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB. Now turn on the power.

• Checking

Push the PLAY button to place the ass'y in the playback mode.

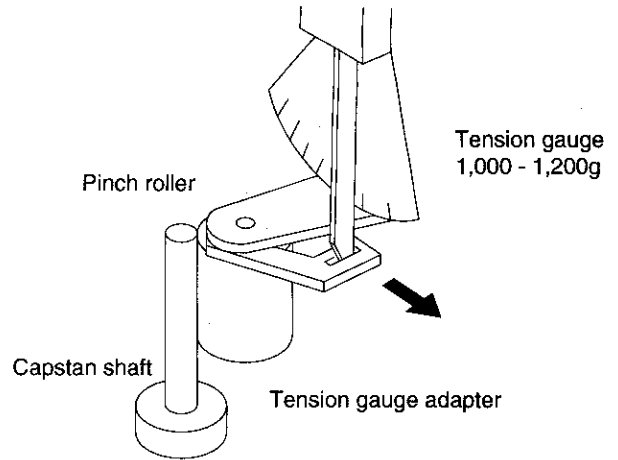


Figure 4-13.

1. Detach the pinch roller from the capstan shaft.
2. Set the tension gauge by hooking the tension gauge adapter onto the pinch roller shaft.
3. Gradually release the pressure to allow the pinch roller to touch the capstan shaft. When the pinch roller just touches the capstan shaft, read the indication on the gauge.
4. Check that the reading of the tension gauge is in the range of 900 to 1200 g.

CHECKING AND ADJUSTMENT OF TENSION POLE POSITION

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB. Now turn on the power.

• Setting

1. Open the lid of cassette tape (E-180), and hold it with two pieces of vinyl tapes.
2. Load the cassette tape into the unit.
3. Put the weight (500g) on the cassette tape.
4. Make the adjustment with the beginning of a E-180 tape.

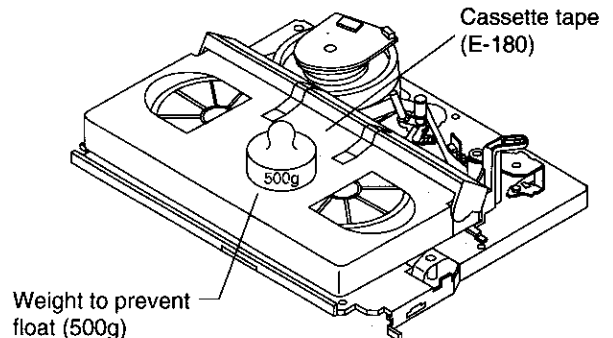


Figure 4-14.

• Checking

1. Set a cassette tape, press the REC button and get the tape loaded. Now check the tension pole position.

2. Visually check to see if the center of the tension pole is in alignment with the line 1.3 mm left of the center line of the sup guide shaft. Readjust as required in the following steps.

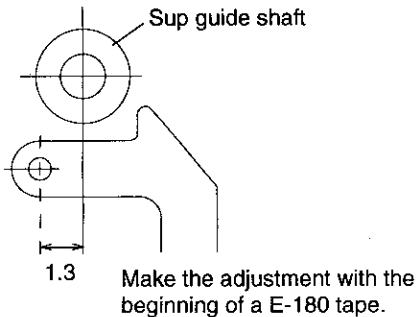


Figure 4-15.

- ① If the center of tension pole is at the left from the dotted line:

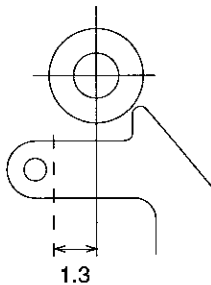


Figure 4-16.

Put a bladed screwdriver into the tension pole ADJUSTER and turn it clockwise.

- ② If the end is at the right from the dotted line:

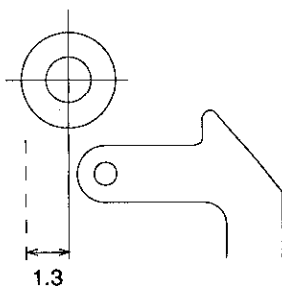


Figure 4-17.

Put a bladed screwdriver into the tension pole adjuster to turn it counter-clockwise.

- ③ Adjustable range of the tension pole ajuster.
- ④ Adjustable range of tension pole adjusting cam.

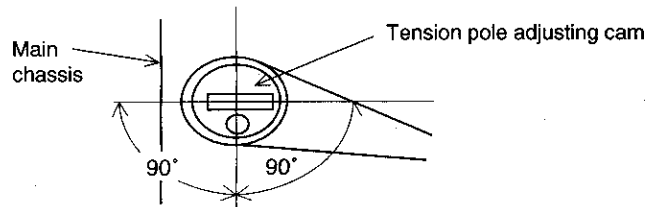


Figure 4-18.

Adjust the tension pole adjuster so that the circle mark on the cam be within 90° left and right.

CHEKING AND ADJUSTMENT OF RECORD/PLAYBACK BACK TENSION

- Remove the cassette housing control assembly.
- Make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB. Now turn on the power.
- **Setting**
 1. Open the lid of cassette torque meter, and hold it with two pieces of vinyl tapes.
 2. Load the cassette torque meter into the unit.
 3. Put the weight (500g) on the cassette torque meter.

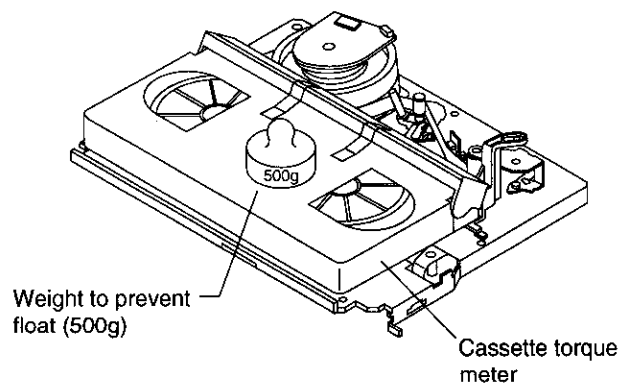


Figure 4-19.

- **Checking**
 1. Push the REC button to place the unit in the record mode.
 2. Check that the back tension indicated by the gauge is within the set range 36.5 to 52 g.cm.

Notes:

1. Make sure that the video cassette tape is over the retaining guide.
2. Make sure that the tape is not slack nor damaged at either end.

• **Adjustment**

1. If the reading of the cassette torque meter is less than specified, move the tension spring hook toward A.
2. If the reading of the cassette torque meter is more than specified, move the tension spring hook toward B.

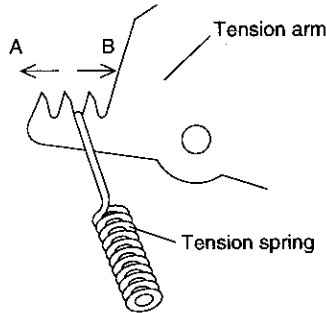
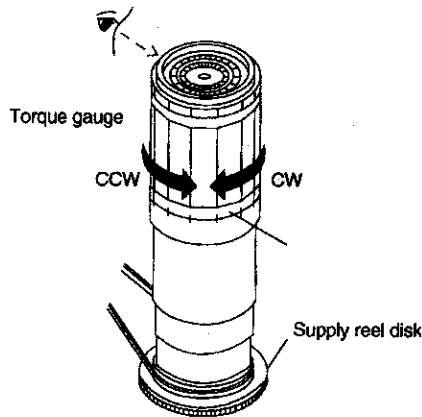


Figure 4-20.

CHECKING THE BRAKE TORQUE

• **Checking the brake torque at the supply side**



CCW: 5.4~10.3mN·m (55~105gf·cm)
CW: 10.3~23mN·m (105~235gf·cm)

Figure 4-21.

• **Remove the cassette housing control assembly.**

• **Make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB. Now turn on the power.**

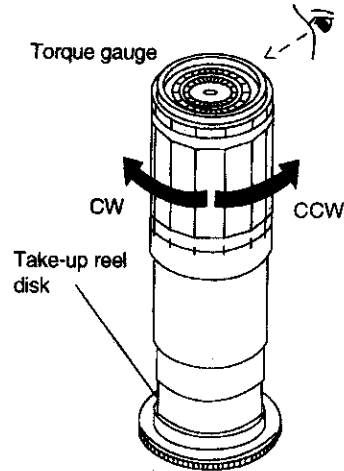
• **Setting**

1. Set a torque gauge to zero on the scale. Place it on the supply reel disk.
2. Switch from the FF mode to the STOP mode.
3. Disconnect the AC power plug.

• **Checking**

1. Rotate the torque gauge (approx. one revolution per 2 seconds) in the clockwise (CW) direction and counterclockwise (CCW) direction of the supply brake so that the reel disk and the indicator of the torque gauge rotate at an equal rate. Check that the values are within the range of CW direction = 10.3 ~23mN·m (105~235gf·cm), CCW direction = 5.4~10.3mN·m (55 ~105gf·cm), and that the brake torque in the CW direction is at least twice as high as that in the CCW direction.

• **Checking the brake torque at the take-up side**



CCW: 9.3~17.2mN·m (95~175gf·cm)
CW: 3.4~8.3mN·m (35~85gf·cm)

Figure 4-22.

• **Remove the cassette housing control assembly.**

• **Make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB. Now turn on the power.**

• **Setting**

1. Set a torque gauge to zero on the scale. Place it on the take-up reel disk.
2. Switch from the FF mode to the STOP mode.
3. Disconnect the AC power plug.

• **Checking**

1. Rotate the torque gauge (approx. one revolution per 2 seconds) in the clockwise (CW) direction and counterclockwise (CCW) direction of the take-up brake so that the reel disk and the indicator of the torque gauge rotate at an equal rate. Check that the values are within the range of CCW direction= 9.3~17.2mN·m (95~175gf·cm), CW direction = 3.4~8.3mN·m (35~85gf·cm), and that the brake torque in the CCW direction is at least twice as high as that in the CW direction.

• **Adjustment of the brake torque at the supply side and the take-up side**

1. If the supply or take-up brake torque is outside the range, clean the supply or take-up reel disk brake lever pad, then recheck the torque.
2. If the supply or take-up brake torque is still outside the range, replace the main brake ass'y.

Note:

When the main brake is replaced, perform the height checking and adjustment of reel disks (see page 13), and the brake torque checking.

REPLACEMENT OF A/C (Audio/Control) HEAD

1. Remove the cassette housing control assembly.
2. Place the unit in the unloading mode, and unplug the power cord.

• Removal

1. Remove the screws (A)(B)(C)(1)(2).
2. Unsolder the A/C head PWB soldered to the A/C head assembly.

Notes:

1. After replacement, be sure to perform the adjustment of the tape drive train (see page 20). Under any circumstances, avoid touching the head. Clean the head, if touched with your finger, with alcohol.
2. Take care that the springs do not fly off when removing the screws (A)(B)(C).

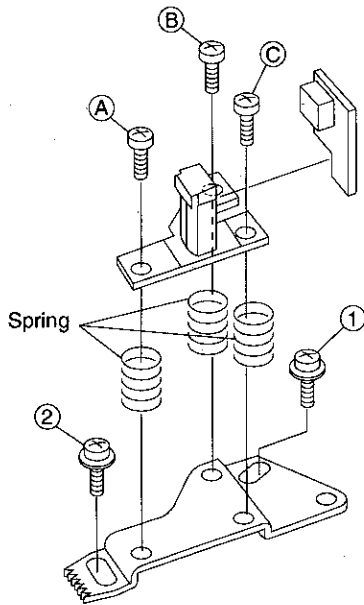


Figure 4-23.

• Replacement

1. Solder the removed A/C head PWB onto a new A/C head assembly.
2. Using the slide calipers, set 10.3 mm for the height of the A/C head arm (bottom surface) to the A/C head plate (screw area). (3 places) (See the figure below.)

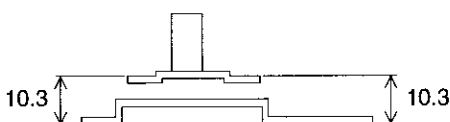
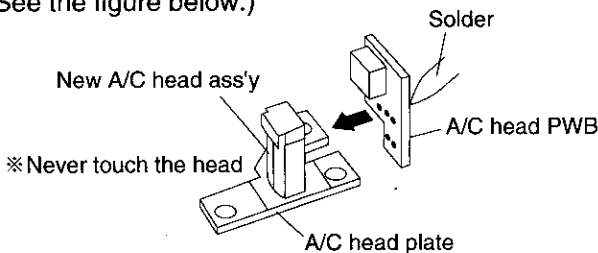


Figure 4-24.

3. Align the left end of the gear of the A/C head arm to the mark on the chassis, and temporarily tighten the screws (1) and (2) to allow the A/C head arm to smoothly move.
 (Reference: Temporary tightening torque: 0.2 N.m as preferable)

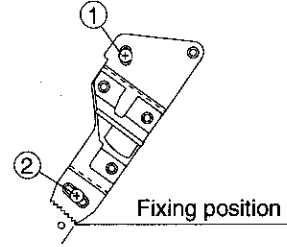


Figure 4-25.

Note:

Take care that the adjustment or height of the A/C head may vary during final tightening if the screws (1) or (2) is temporarily tightened to be loose.

[A/C head height rough adjustment]

• Setting

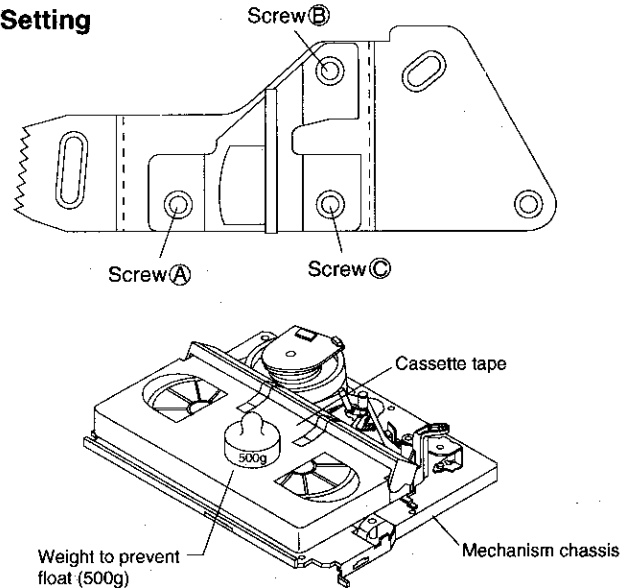


Figure 4-26.

- ① Set the cassette tape to the mechanism chassis.
- ② Press the PLAY button to put the unit in the playback mode.
- ③ Roughly adjust the height of the A/C head by turning the screw (C) until the tape is in the position shown below.

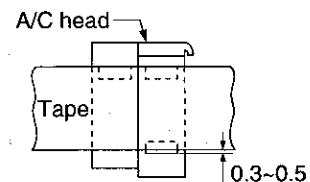


Figure 4-27.

• Adjustment

Adjust the screw (C) visually so that the control head is visible 0.3 to 0.5mm below the bottom of the tape.

HEIGHT ADJUSTMENT OF REVERSE GUIDE

[Height adjustment of reverse guide]

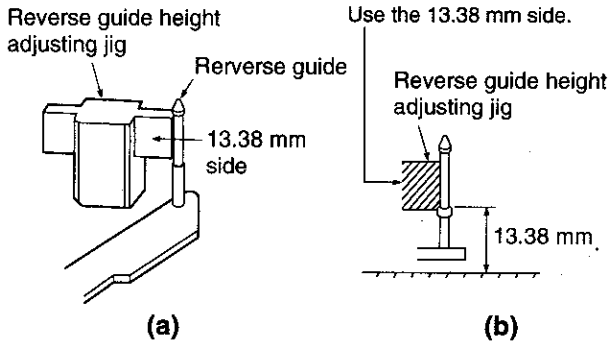


Figure 4-28.

1. In the tape load mode, make adjustment at the 13.38mm side first and then rotate the reverse guide adjuster nut by 1/10 turn counterclockwise.
2. Actually load the unit with a tape, put it in the play mode, and make sure the tape is free from wrinkles near the reverse guide.
3. Use a commercially available box driver to turn the height adjusting nut.

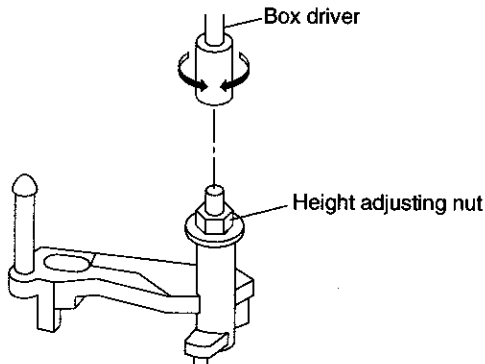


Figure 4-29.

ADJUSTMENT OF TAPE DRIVE TRAIN

1. Remove the cassette housing control assembly.
2. Make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB. Now turn on the power.
3. Check and adjust the position of the tension pole. (See page 16.)
4. Check and adjust the video search rewind back tension. (See page 16.)
5. Set the A/C head. (See page 19.)
6. Rough adjustment of tape drive train.
 - a) Connect the oscilloscope to the test point for PB CHROMA envelope output (TP2201). Set the synchronism of the oscilloscope to EXT. The PB CHROMA signal is to be triggered by the head switching pulse (TP2202).
 - b) Loosen the setscrew at the lower part of the guide roller, and adjust it with HEXAGON WRENCH (JiGHW0009) so that the guide roller turns smoothly. (Do not overloosen the setscrew, which causes insecurity of the guide roller.) (See Figure 4-30.)
 - c) Set the alignment tape (monoscope pattern) on the reel disk, and place the unit in the playback mode.

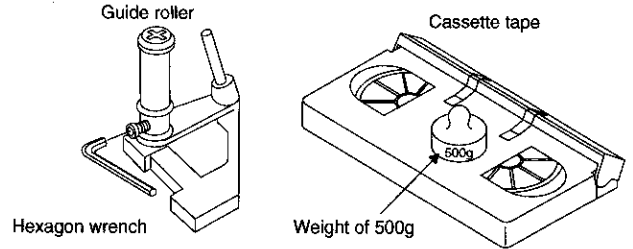


Figure 4-30.

Figure 4-31.

(Place a 500 g weight on the cassette tape to prevent floating of the cassette tape.)

- d) In the X value adjustment mode (see the Electrical Adjustment), change the envelope waveform from MAX to MIN, and MIN to MAX by pushing the (+) or (-) tracking button, and check a flat response is obtained on the waveform.
- e) If a flat response cannot be obtained, roughly adjust the guide rollers on the supply side and take-up side using an adjusting screw driver until a flat response can be obtained.
- f) Tighten the screw (A) to eliminate wrinkles from the tape of the retain guide flange area. Replace the tape to check the tape on the retain guide flange area for wrinkles.
 - (1) No wrinkle is present.
Turn the screw (A) clockwise to generate wrinkles on the tape at the flange area, and then back off the screw (A) as far as the wrinkles are just eliminated.
 - (2) Wrinkles are present.
Turn the screw (A) counterclockwise as far as the wrinkles are just eliminated.

Reference:
If the screw (A) is turned clockwise, wrinkles will be produced on the lower flange.

Notes:

1. Place the tracking control in the center position, and adjust the X-position so that the PB CHROMA envelope becomes maximum for easier rough adjustment of the tape drive train.
2. In the rough adjustment, pay particular attention to the outlet side.

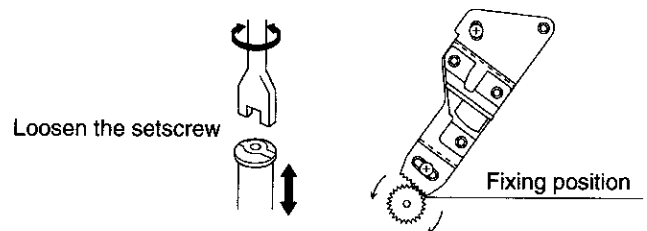


Figure 4-32.

Figure 4-33.

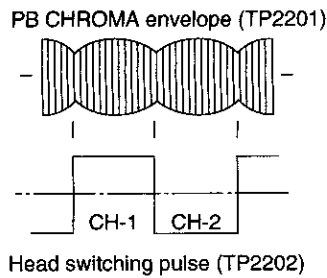


Figure 4-34.

7. Adjustment of A/C head height and azimuth

- a) Connect an oscilloscope to the audio output terminal.
- b) Using the alignment tape with linear audio pre-recorded signal of 1 kHz, adjust the screws **B** and **C** to maximize the audio output, and adjust the screw **A** to eliminate wrinkles from the tape at the retain guide flange. (Refer to P20-6-f.) Repeatedly adjust the screws **B**, **C** and **A** in this sequence until the audio output becomes the maximum. (1 to 3 times as ordinary)
- c) Using the alignment tape which records a linear audio signal of 6 kHz, finally adjust the screw **B** until the audio output becomes the maximum.

8. Adjustment of tape drive train and X-Position

(Use the Alignment tape VROUBZFS for adjustment of VC-M26HM, M27HM)

- a) Connect the oscilloscope to the test points (TP2201) for PB CHROMA envelope output. Set the synchronism of the oscilloscope to EXT. The PB CHROMA signal is to be triggered by the head switching pulse (TP2202).
- b) Play back the tape drive train alignment tape.
- c) Push the (+) or (-) button to change the envelope waveform from MAX to MIN, and MIN to MAX. Adjust the guide roller's height on the supply and take-up sides with an adjusting screw driver, to obtain an envelope waveform that is as flat as possible.
- d) If the tape is above or below the helical lead, the PB CHROMA waveform will take the shape shown in Figure 4-35.
- e) Adjust for maximum flatness of the envelope as the step 6, e) in page 20.

	When the tape is above the helical lead.		When the tape is below the helical lead.	
	Supply side	Take-up side	Supply side	Take-up side
Adjustment	Supply side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Take-up side guide roller rotated in clockwise direction (lowers guide roller) to flatten envelope.	Supply side guide roller rotated in counterclockwise direction (raises guide roller) to make the tape float above the helical lead. The supply side guide roller is then rotated in the clockwise direction to flatten the envelope.	Take-up side guide roller rotated in counterclockwise direction (raises guide roller) to make the tape float above the helical lead. The take-up side guide roller is then rotated in the clockwise direction to flatten the envelope.

Figure 4-35.

- f) Push the (+) or (-) tracking button to check that a flat response is obtained on the envelope waveform.
 - g) Secure the guide roller by tightening the guide roller setscrew in the unloading mode.
 - h) Play back the tape drive train alignment tape to check that the envelope waveform does not change.
9. Adjustment of A/C head X-position.
- a) In the X value adjustment mode (see the Electrical Adjustment), make a short-circuit between TP5005 and TP5006, both located at the center on your side on the main PWB, to center the tracking.
 - b) Move the A/C head arm with an adjusting gear driver, and adjust the A/C head position for maximum head switching pulse hi side envelope. Finally tighten the screws ① and ②. (First tighten the screw ①, and next the screw ②.) (Figure 4-23①②)
(Reference: Final tightening torque: 0.6 N.m as preferable.)
 - c) Adjust the playback switching point.
 - d) Check the flatness of the envelope waveform and sound by playing back a recorded tape.

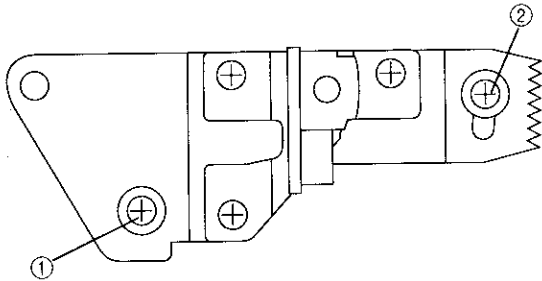


Figure 4-36.

REPLACEMENT OF THE CAPSTAN D.D. (DIRECT DRIVE) MOTOR

- Remove the cassette housing control assembly.
- Removal (Follow the order of indicated numbers.)

1. Disconnect from the board-to-board connector on the main PWB.
2. Remove the drive belt ①.
3. Remove the screws ②.

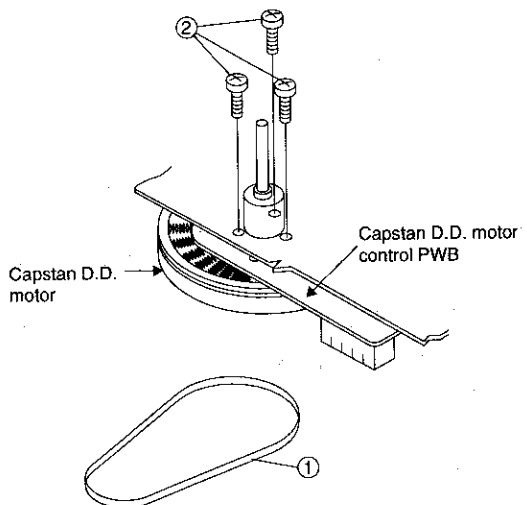


Figure 4-37.

• Reassembly

1. Mount the capstan motor on the mechanism chassis making sure not to allow the capstan shaft to hit the mechanism chassis, and attach it with the three screws.
2. Attach the reel belt. Reconnect to the board-to-board connector on the main PWB.

Notes:

1. After installing the capstan D.D. motor, be sure to rotate the capstan D.D. motor and check the movement.
2. Check the servo circuit.

REPLACEMENT OF DRUM D.D. MOTOR

1. Put the unit in the cassette eject position.
2. Unplug the power cord.

• Removal (Reverse the order in reassembly.)

1. Disconnect the FFC cable ①.
2. Unscrew the D.D. stator assembly fixing screws ②.
3. Take out the D.D. stator assembly ③.
4. Unscrew the D.D. rotor assembly fixing screws ④.
5. Take out the D.D. rotor assembly ⑤.

Notes:

1. In removing the D.D. stator assembly, part of the drum earth spring pops out of the pre-load collar. Be careful not to lose it.
2. Secure the D.D. rotor assembly so that the installation positioning holes in the D.D. rotor assembly and upper drum assembly match. (Match the upper drum's notch with the rotor's hole.)
3. Be careful not to damage the upper drum or the video head.
4. Be sure that the hall device and the D.D. stator assembly are not damaged by the D.D. rotor assembly or other parts.
5. After installation, adjust the playback switching point.

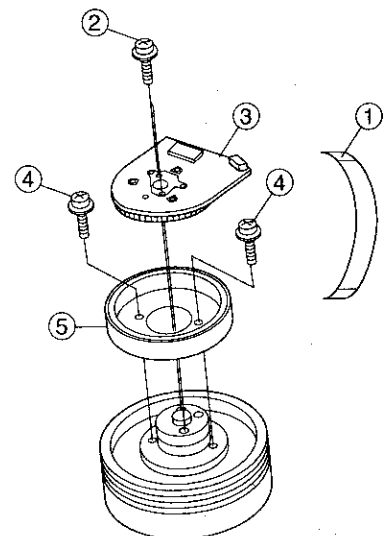


Figure 4-38.

ASSEMBLE THE MECHANISM'S PARTS REQUIRING THE PHASE MATCHING IN THE STEPS BELOW.

1. Assembling the pinch roller assembly, reverse guide assembly and the pinch drive cam (on the front of the mechanism chassis).
2. Mounting the shifter (on the back of the mechanism chassis).
3. Mounting the master cam (on the back of the mechanism chassis).
4. Mounting the connection gear, slow brake and loading motor assemblies (on the back of the mechanism chassis).

1. Assembling the pinch roller assembly, reverse guide assembly and the pinch drive cam (on the front of the mechanism chassis).

Place the following parts in position in numerical order.

- (1) Reverse drive lever ①
- (2) Reverse guide spring ②
- (3) Reverse guide lever ass'y ③
- (4) R/G adjusting nut ④
- (5) Pinch drive cam ⑤
- (6) Pinch roller ass'y ⑥
- (7) Open lever ⑦

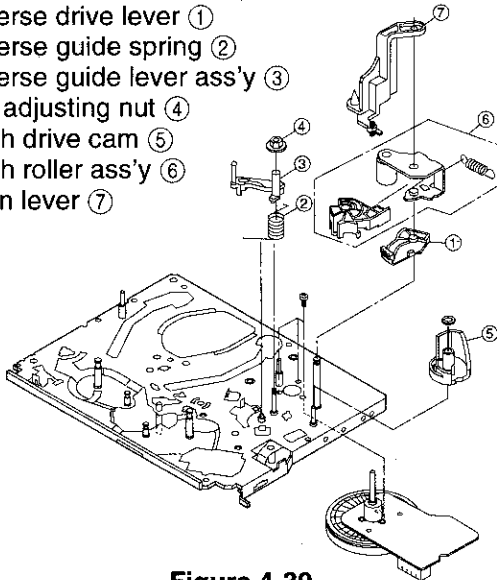


Figure 4-39.

③ Insert Pinch Roller/Pinch Double Action Lever Ass'y.

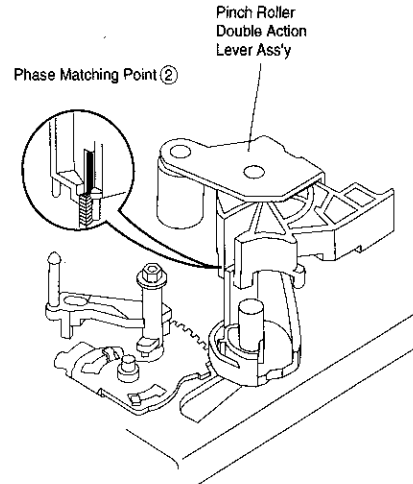


Figure 4-40-2.

④ Insert Open Lever.

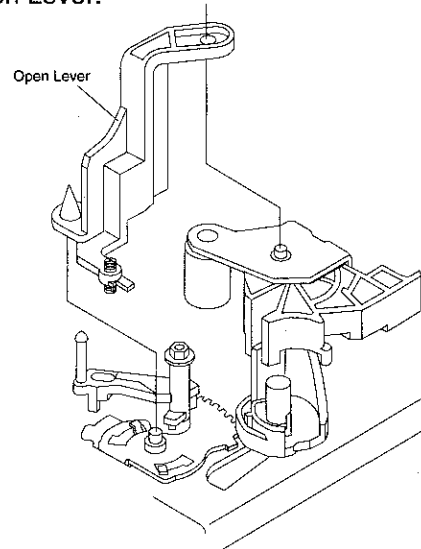
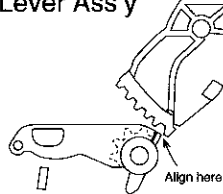


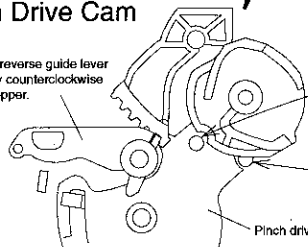
Figure 4-40-3.

① Insert Reverse Guide Lever Ass'y



② Insert Pinch Drive Cam

Turn the reverse guide lever assembly counterclockwise to the stopper.



Insert the pinch drive cam, aligning its notch to the projection on the pinch drive lever assembly.

Insert the pinch drive lever assembly, aligning its notch to the projection on the chassis.

Pinch drive lever ass'y

Figure 4-40-1

2. Mounting the shifter (on the back of the mechanism chassis).

1. Make sure that the loading gear is at the point ① as shown below.
2. Place the shifter in position, keeping in mind the 6 insertion points and the three relief points.
3. For the phase matching at the insertion point ①, see the point ② as shown below.
4. Finally fix the shifter with two washers located on insert points ① and ④.

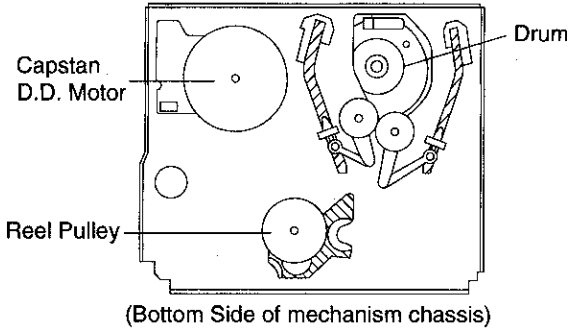


Figure 4-41.

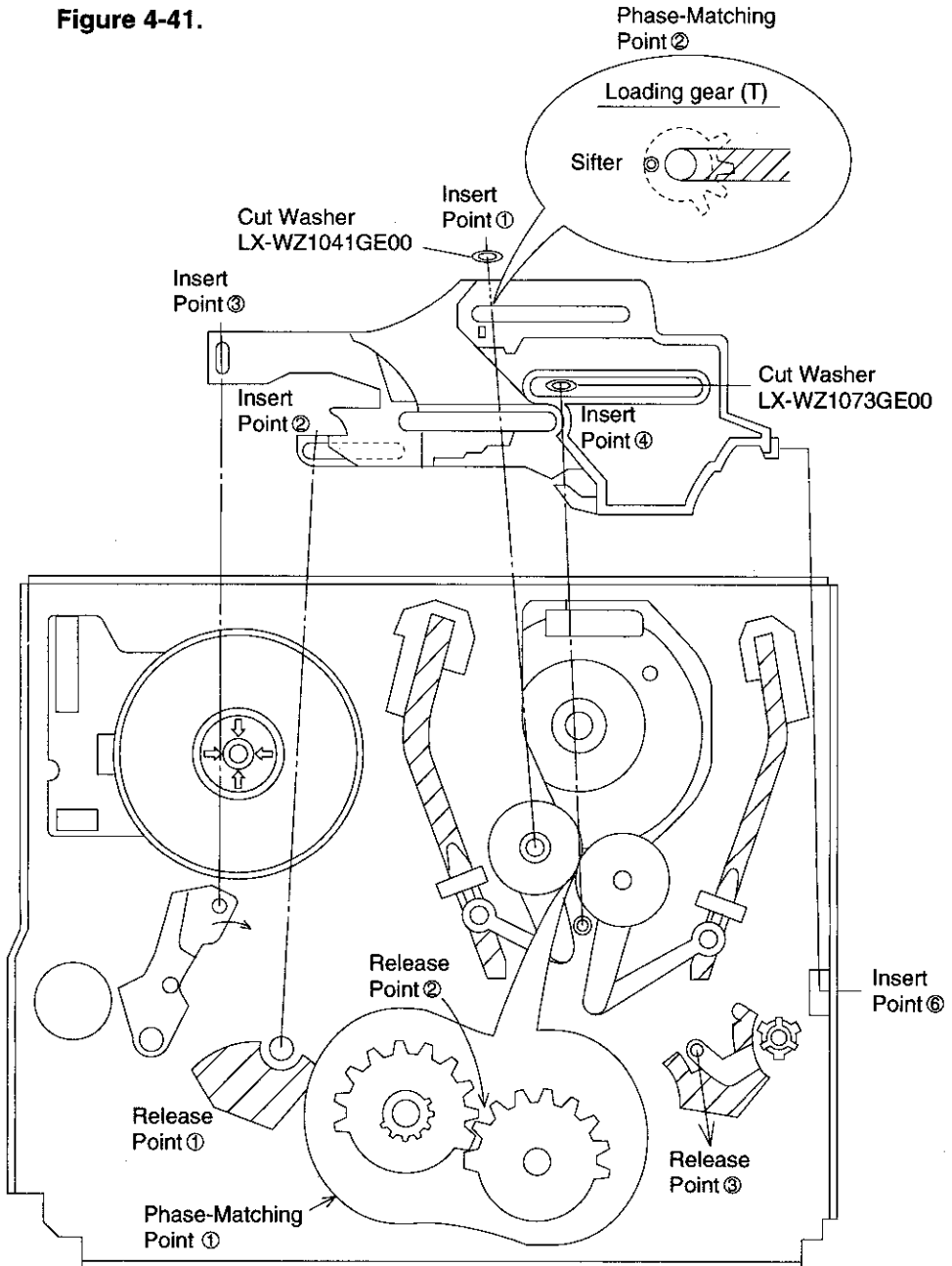
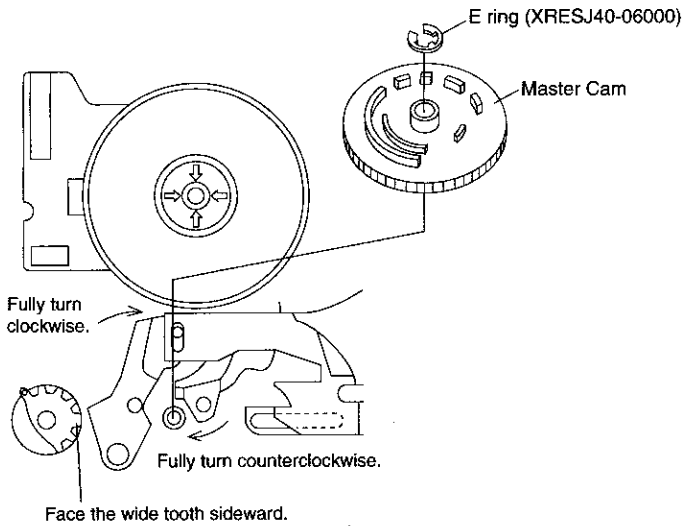


Figure 4-42.

3. Mounting the master cam (on the back of the mechanism chassis).

- (1) Make sure beforehand that the shifter is at the point as shown below.
- (2) Place the master cam in the position as shown below.



Note:

See the figure below for the phase matching between the master cam and the cassette control drive gear.

- (3) Finally fix the master cam with E ring.

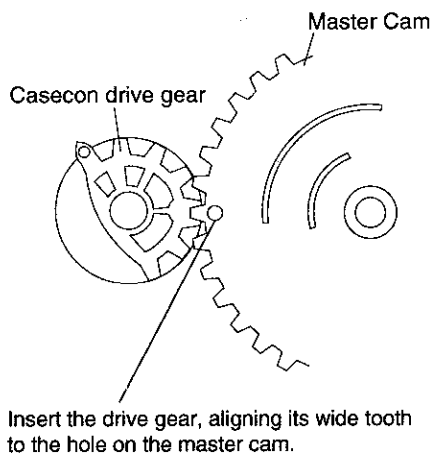


Figure 4-43.

REPLACEMENT OF LOADING MOTOR

• **Removal**

Remove 2 screws.

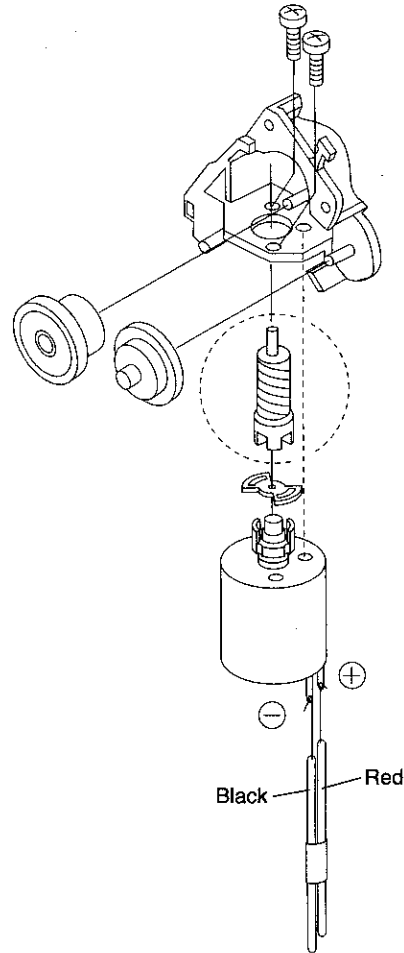


Figure 4-44.

• **Replacement**

- 1 Take out the old loading motor. Place a replacement loading motor as shown above (figure 4-44.).

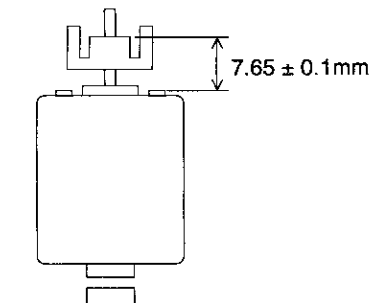


Figure 4-45.

Press-fit the loading motor pulley with a force of less than 98N (10 kgf). Be sure that the pulley is 7.65 ± 0.1 mm away from the motor.

ASSEMBLY OF CASSETTE HOUSING

1 Framer ass'y

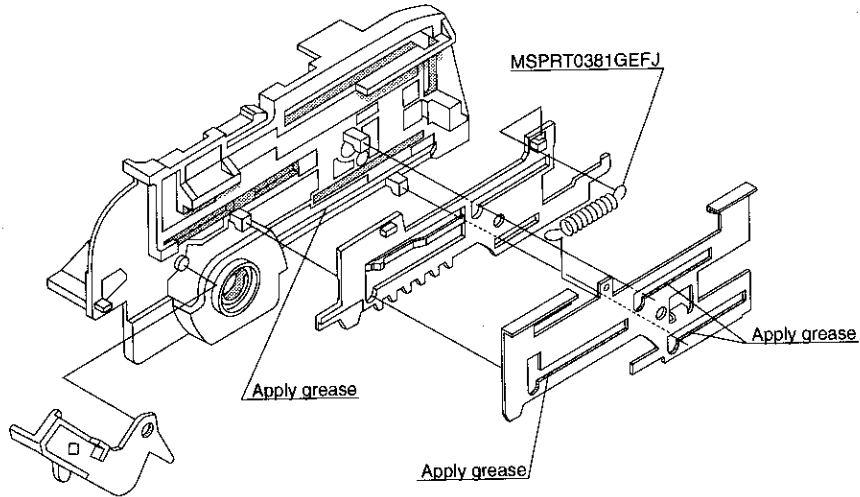


Figure 4-46.

2 Synchro Gear, Drive Gear L and Drive Gear R

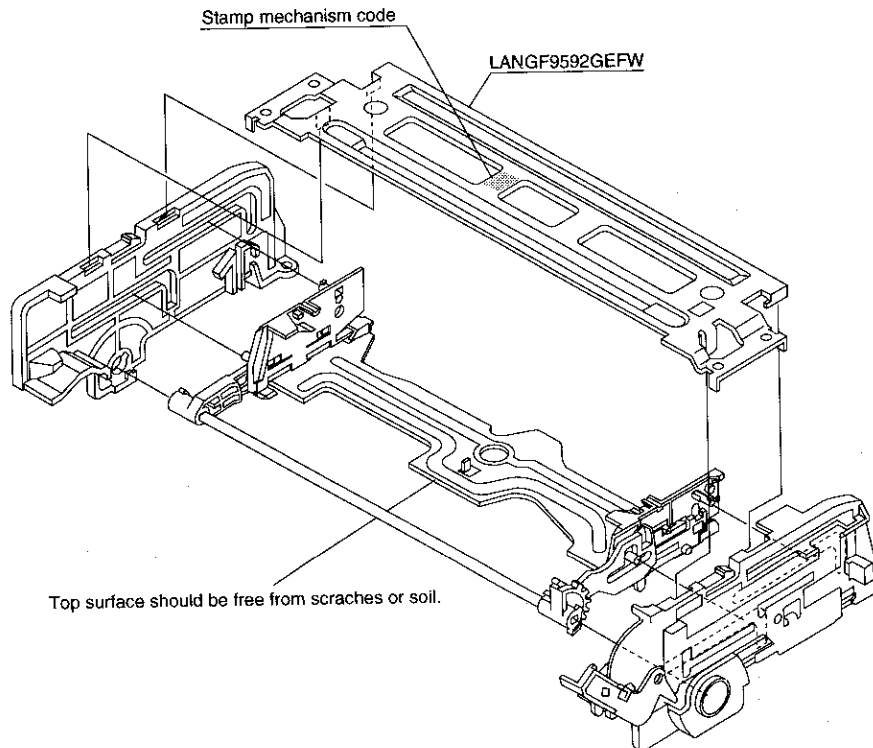


Figure 4-47.

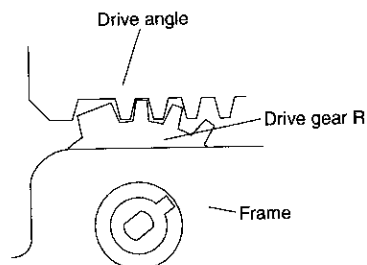


Figure 4-48.

5. ELECTRICAL ADJUSTMENT

Notes:

- Before the adjustment:

Electrical adjustments discussed here are often required after replacement of electronic components and mechanical parts such as video heads.

Check that the mechanism and all electric components are in good working condition prior to the adjustments, otherwise adjustments can not be completed.

- Instruments required:

- | | |
|---|---|
| <input type="radio"/> Colour TV monitor | <input type="radio"/> Dual-trace oscilloscope |
| <input type="radio"/> Audio signal generator | <input type="radio"/> AC milli-voltmeter |
| <input type="radio"/> DC voltmeter | <input type="radio"/> Frequency counter |
| <input type="radio"/> Blank video cassette tape | <input type="radio"/> Alignment tape (VROCPSV) |
| <input type="radio"/> Screwdriver for adjustment | <input type="radio"/> Alignment tape (VROATSV) |
| <input type="radio"/> Colour bar signal generator | <input type="radio"/> Alignment tape (VROCBFFS) |

✕ Servicing precautions

When the IC703 (E²PROM) has been replaced, make the following reprogramming. Depending on models, the IC703 (E²PROM) has been factory-adjusted for its memory function.

It's therefore necessary to reprogram the memory function for the model in question.

Note that the servo circuit requires readjustments for the head switching point, slow and still modes.

• Location of controls and test points

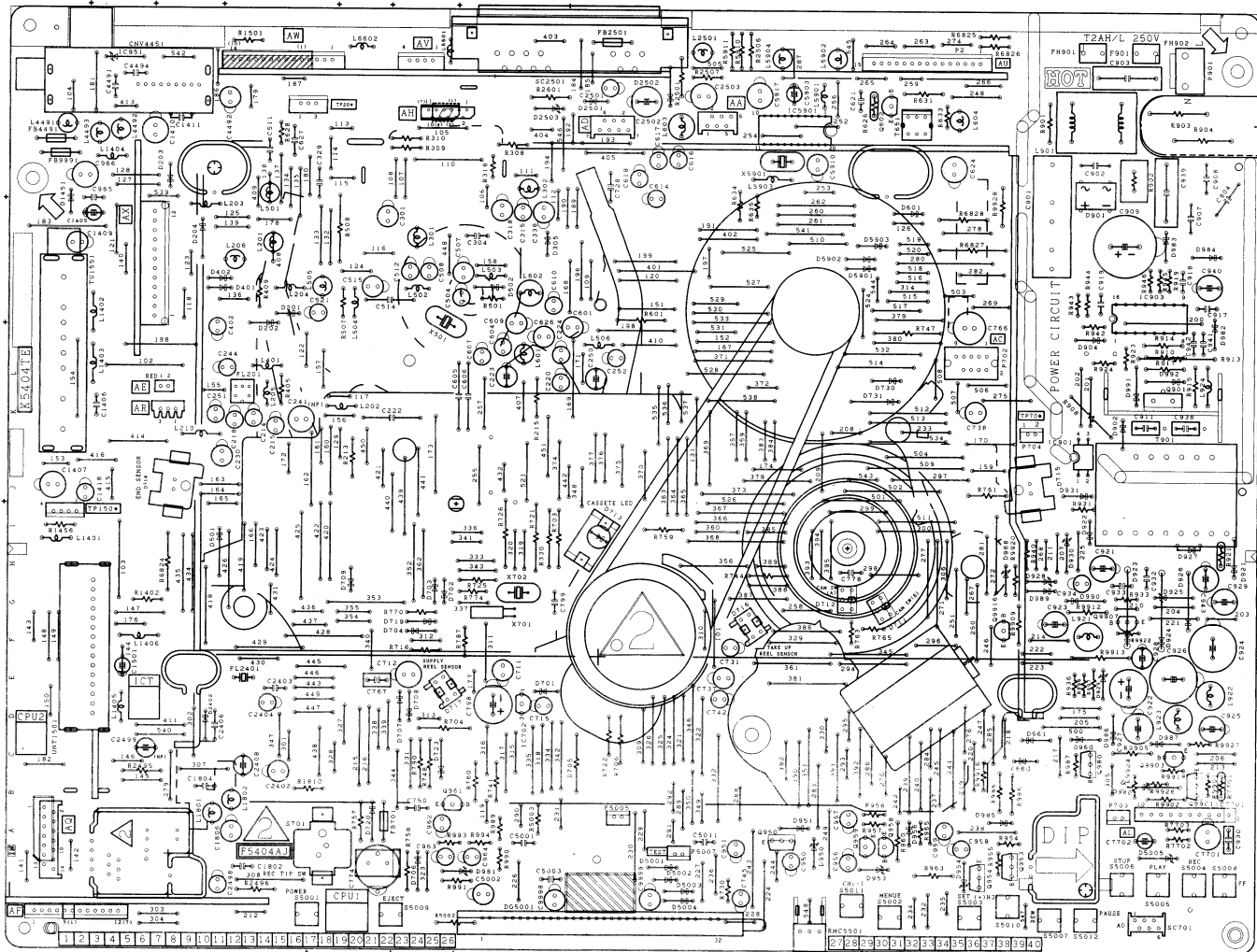


Figure 5-1.

SERVO CIRCUIT ADJUSTMENT

ADJUSTMENT OF HEAD SWITCHING POINT

Measuring instrument	Dual-trace oscilloscope Colour TV monitor
Mode	Playback
Cassette	Alignment tape (VROCPSV)
Test point	TP2202 (H.S.W.P.) to CH-1, VIDEO OUT jack to CH-2 (CH-1 trigger slope switch at (+), internal trigger at CH-1 side.)
Specification	$6.5 \pm 0.5H$ (lines)

1. Remove the front panel and play the alignment tape. (VROCPSV)
(Playback picture on the monitor screen.)
2. Make for a moment short-circuit between TP5001 and TP5002, both located at the front side on the main PWB.

Be sure that all the fluorescent display tubes light up into the TEST mode.

(See Note below)

3. Press the PLAY button.
Be sure the "PLAY" appears in the fluorescent display tubes flashing (about 1Hz) into the auto PG adjustment operating.

Note:

When the manual PG adjustment, observe the waveform with an oscilloscope and make adjustment FF or REW button so that the specification.

4. Stop the "PLAY" appears in the flashing of fluorescent display tubes at adjusted.
5. Press the STOP button in the return to normal mode.
6. Make this checking of waveform on the oscilloscope screen be as shown in Figure 5-2. just after the head switching point have been adjusted.

Note:

- ① Set-up of TEST mode.
When the adjustment of HEAD SWITCHING POINT, AUTO TRACKING function is invalid.
- ② When the cassette housing control ass'y is removed, set-up of mechanism operating mode.
 - 1) Replug the AC power cord it a few minutes later.
 - 2) Make a short-circuit between TP5005 and TP5006, both located at the front side on the main PWB with a 22 ohm resistor, to center the tracking.
 - 3) AC power cord is plugged in.
 - 4) You can mechanism operating mode, Replug the AC power cord a few minutes later.

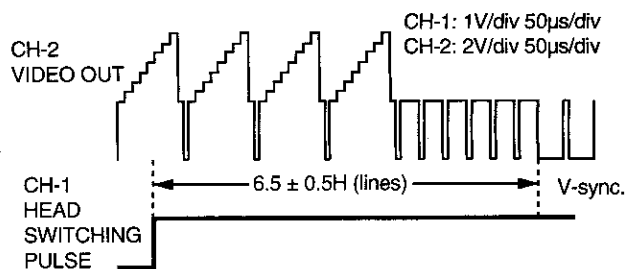


Figure 5-2.

ADJUSTMENT OF SLOW TRACKING PRE-SET (VC-M26HM/LM, M27HM, M271LM)

Measuring instrument	Colour TV monitor
Mode	Playback
Cassette	Self-recorded tape (See Note below)
Control	Tracking control buttons (+) or (-)
Specification	Reference of following step 6.

1. Have the unit to receive a good TV broadcast or feed a video signal to the VIDEO IN jack. (See note ② below)
2. Set the tape speed in SP mode by using the remote control and record the signal on tape.
3. Rewind and play the tape where signal was recorded in above step.
4. Press the SLOW button on the remote control, and playback the recorded portion in the slow mode.
5. Make for a moment short-circuit between TP5001 and TP5002, both located at the front side on the main PWB.
Be sure that all the fluorescent display tubes light up into the TEST mode.
6. Look at the monitor screen and adjust the (+) or (-) TRACKING buttons so that the position of noise come following Figure 5-3 (a) and (b).
7. Press the STOP button to return to normal mode.
8. Play the tape a few seconds then press the SLOW button again and make sure there is no noise in the screen.
(For the LP mode put adjustment at the same adjustment way as SP mode.)

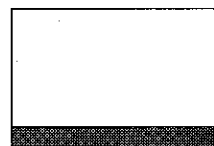
Notes:

- ① Self-recorded tape means a cassette whose program was recorded by the unit being adjusted.
- ② The TV program will not be recorded if RCA or 21 pin plugs are plugged in to the AUDIO/VIDEO input terminals.



(SP)

Figure 5-3(a)



(SP)

Figure 5-3(b)

The mark is noise

ADJUSTMENT OF SP/LP SLOW TRACKING PRESET

Measuring instrument	Colour TV monitor
Mode	Playback
Cassette	Self-recorded tape (SP/LP mode) (See Note below)
Control	Tracking control buttons (+) or (-)
Specification	Minimized noise on monitor screen

1. Have the unit to receive a good TV broadcast or feed a video signal to the VIDEO IN jack. (See note ② below)
2. Set the tape speed in SP mode by using the remote control and record the signal on tape.
3. Rewind and play the tape where signal was recorded in above step.
4. Press the SLOW button on the remote control, and playback the recorded portion in the slow mode.
5. Make for a moment short-circuit between TP5001 and TP5002, both located at the front side on the main PWB.
Be sure that all the fluorescent display tubes light up into the TEST mode.
6. Look at the monitor screen and adjust the (+) or (-) TRACKING buttons so that the there is noise disappears from the screen.
7. Press the STOP button to return to normal mode.
8. Play the tape a few seconds then press the SLOW button again and make sure there is no noise in the screen.
(For the LP mode put adjustment at the same adjustment way as SP mode.)

Notes:

- ① Self-recorded tape means a cassette whose program was recorded by the unit being adjusted.
- ② The TV program will not be recorded if RCA or 21pin plugs are plugged in to the AUDIO/VIDEO input terminals.

ADJUSTMENT OF FV(False Vertical Sync) OF STILL PICTURE

Measuring instrument	Colour TV monitor
Mode	Playback still
Cassette	Self-recorded tape (SP mode) (See Note below ②)
Control	Tracking control buttons (+) or (-)
Specification	No vertical jitter of picture

1. Play a cassette which was recorded by the unit in SP mode.
2. Press the PAUSE/STILL button to freeze the picture.
3. Look at the monitor screen and adjust (+) or (-) TRACKING buttons so that the vertical jitter of the picture to be minimized.
4. Play and freeze the self-recorded tape in SP mode and make sure vertical jitter of the picture is not noticeable.
(For the LP mode put adjustment at the same adjustment way as SP mode.)

Note:

- ① The FV goes back to the it's initial state when the unit is put into the system controller reset mode due to power failure, etc.
In this case, preset the FV once again.
- ② Self-recorded tape is a cassette whose program was recorded by the unit being adjusted.

Y/C CIRCUIT ADJUSTMENT

CHECKING OF VIDEO E-E LEVEL

Measuring instrument	Oscilloscope
Mode	E-E or Record
Input signal	EIA colour bar (1.0Vp-p)
Test point	VIDEO OUT jack
Specification	$0.95 \pm 0.15V_{p-p}$

1. Connect a 75 ohm terminating resistor to the VIDEO OUT jack and connect an oscilloscope across this terminating resistor.
(See Note below.)
2. Feed a colour bar signal to the VIDEO IN jack.
3. Make sure that the E-E signal amplitude is 1.0Vp-p as shown in Figure 5-4.

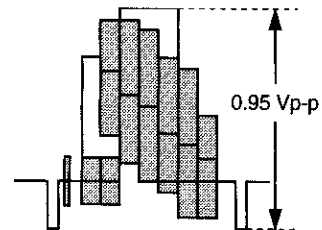


Figure 5-4.

Notes:

If the 75 ohm terminating resistor is missing, the signal amplitude will be doubled.

CHECKING OF WHITE CLIP LEVEL

Measuring instrument	Oscilloscope
Mode	E-E or Record
Input signal	EIA colour bar (1.0Vp-p)
Test point	Pin(78) of IC201, GND
Specification	190 ± 5% (See note below)

1. Connect an oscilloscope to pin (78) of IC201 and GND.
2. Feed the colour bar signal to the VIDEO IN jack and set the unit in E-E or recording mode.
3. Make sure that the overshoot of the video signal is clipped at 190% as shown in Figure 5-5.

Note:

From sync tip to white peak, the level is 100%.
 The white clip level is 90% above the white level.

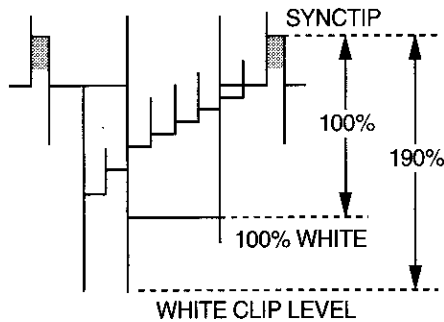


Figure 5-5.

CHECKING OF RECORD LEVEL

Measuring instrument	Dual-trace oscilloscope
Mode	Record mode
Input signal	EIA colour bar (1.0Vp-p)
Test point	Chroma (Red) R305 terminal lead at C329 side (Sig.) ~ GND Sync tip R304 terminal lead at C330 side (Sig.) ~ GND
Specification	Chroma (Red): 400~600mVp-p Sync tip: 150~220mVp-p

1. Feed the colour bar signal to the VIDEO IN jack and set the unit in recording mode.
2. Connect a dual-trace oscilloscope to each test point shown in table.
3. Make sure so that the amplitude of the chroma (Red) portion and the sync tip portion are specified as shown in Figure 5-6.

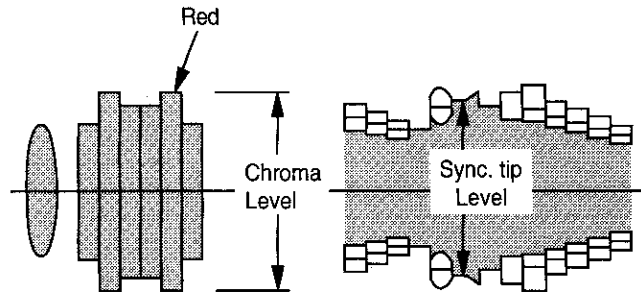


Figure 5-6 (a).

Figure 5-6 (b).

CHECKING OF PLAYBACK LEVEL

Measuring instrument	Oscilloscope
Mode	Record/Playback
Input signal	EIA colour bar (1.0Vp-p)
Test point	VIDEO OUT jack
Specification	0.95 ± 0.15Vp-p

1. Be sure that E-E level has been correctly specified.
2. Connect a 75 ohm terminating resistor to the VIDEO OUT jack and connect an oscilloscope across this terminating resistor.
(See Note below ①.)
3. Feed a colour bar signal to the VIDEO IN jack and set the unit in recording mode.
4. Play the colour bar portion of the recorded tape.
5. Make sure that the output signal amplitude is 1.0Vp-p as shown in Figure 5-7.

Note:

- ① If the 75 ohm terminating resistor is missing, the signal amplitude will be doubled.
- ② Set the S.PICTURE switch turn off.

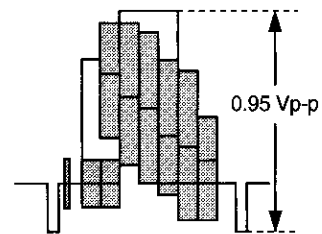


Figure 5-7.

CHECKING OF S.PICTURE

Press the S.PICTURE button on the VCR.

"S.PICTURE ON (or OFF)" will appear on the TV screen for a few seconds.

Each time the button is pressed, the mode switches between ON and OFF.

ON:

Normally leave the mode set to ON.

This high picture quality function will create a clearer image during playback.

OFF"

Set to OFF when playing back a tape on the VCR while editing or when strong noise appears on the screen.

Set to OFF when using the VCR as an editing source.

Notes:

- ① This function only operates during playback. It will not operate when recording or watching a TV programme with the VCR tuner.
- ② This function can not be set to ON/OFF with the MENU screen displayed.

AUDIO CIRCUIT ADJUSTMENT. IMPORTANT NOTES ON HI-FI SECTION.

- Location of controls and test points

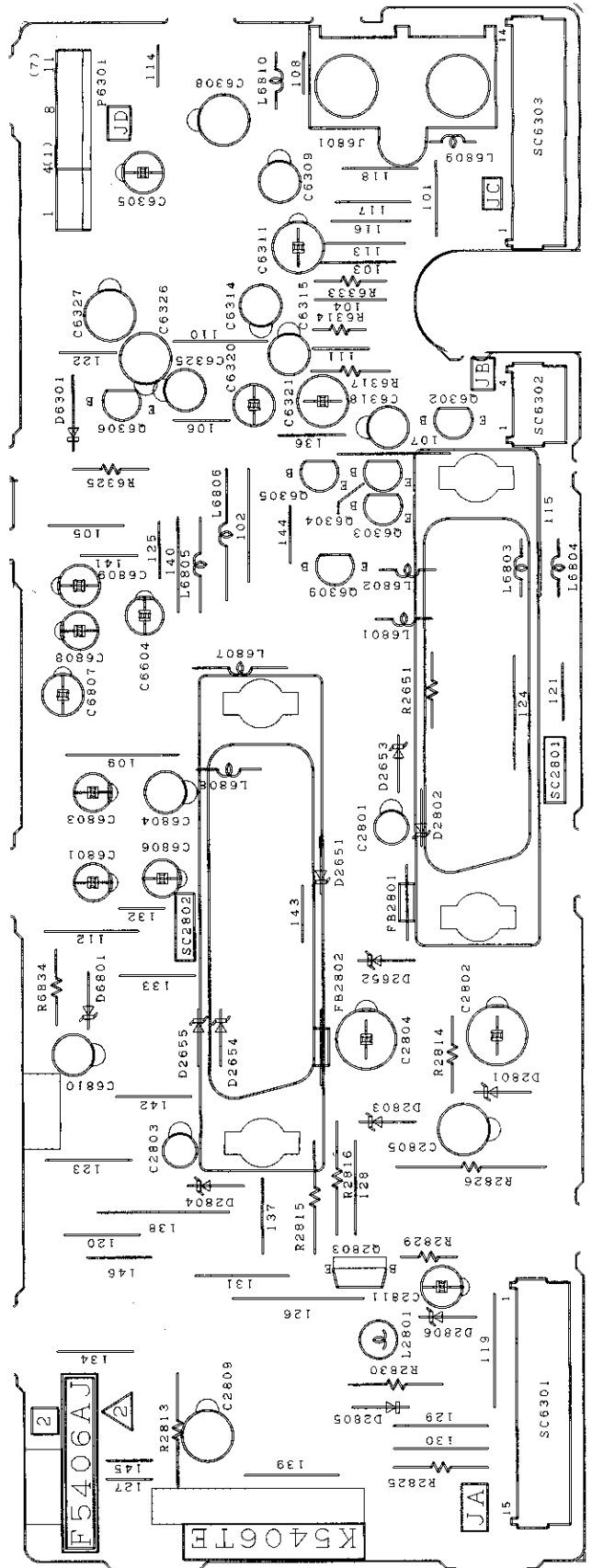


Figure 5-8.

1. SERVICING OF THE Hi-Fi block.

1) "RECORD MODE".

Under this condition record a stereo broadcast on tape and adjust control.

2) "PLAYBACK MODE".

Under this condition play a Hi-Fi tape and adjust control.

(You can select the audio output channels in the playback mode by pressing the AUDIO OUT button on the remote control or the SET UP button on the VCR.

Set the desired Audio Output mode by pressing the (+) or (-) button.

The Audio output mode is controlled by the AUDIO OUT button on the remote control. The VCR is normally set to the Hi-Fi mode, with L and R displayed on the VCR display, and normal stereo sound output. Press the AUDIO OUT button and only the Hi-Fi Left channel audio is heard from both the Right and Left speakers. Press the AUDIO OUT button again and only the Hi-Fi Right channel audio is heard from both the Right and Left speakers.

Press again and only the mono linear track is selected. The above sequence is then repeated each time the AUDIO OUT button is pressed.)

1. Connect an AC milli-voltmeter to the AUDIO OUT jack.
2. Playback the Alignment tape (VROCPZC).
3. Make sure that the audio output level is as specified.

CHECKING OF Hi-Fi AUDIO PLAYBACK LEVEL

Measuring instrument	AC milli-voltmeter
Mode	Playback
Cassette	Alignment tape (VROCBFFS)
Test point	AUDIO OUT jack
Specification	-5 ± 2dBs (at RCA jack) -3.8 ± 2dBs (at 21pin jack)

1. Connect an AC milli-voltmeter to the AUDIO OUT jack.
2. Play the alignment tape (VROCBFFS).
3. Make sure that the AUDIO OUT level is as specified.

Note:

Check the PLAYBACK level is less than 2.0dBs both Left and Right channels.

CHECKING OF E-E LEVEL

Measuring instrument	AC milli-voltmeter
Mode	E-E or REC mode
Input signal	1kHz, -3.8dBs (at 21pin jack)
Test point	AUDIO OUT jack
Specification	-5 ± 3dBs (at RCA jack) -3.8 ± 3dBs (at 21pin jack)

1. Feed the audio signal shown in table to the left channel of the AUDIO IN jack.
2. Connect an AC milli-voltmeter to the left channel of the AUDIO OUT jack and right channel of the AUDIO OUT jack.
3. Make sure that the milli-voltmeter reads special value. (Check the level is less than 2dBs both Left and Right channels.)

CHECKING OF LINEAR AUDIO PLAYBACK LEVEL

Measuring instrument	AC milli-voltmeter
Mode	Playback
Cassette	Alignment tape.(VROCPZC)
Test point	AUDIO OUT jack
Specification	-9 ^{+2dB} _{-2dB} (at RCA jack) -7.8 ^{+2dB} _{-2dB} (at 21pin jack)

CHECKING OF Hi-Fi/NOMAL AUDIO SELF-RECORD/PLAYBACK LEVEL

Measuring instrument	AC milli-voltmeter
Mode	Record/playback
Input signal	1kHz, -3.8dBs (at 21pin jack)
Test point	AUDIO OUT jack
Specification	-5.0 ± 3dBs (at RCA jack) -3.8 ± 3dBs (at 21pin jack)

1. Feed the audio signal shown in table to the Left channel of the AUDIO IN jack.
2. Connect an AC milli-voltmeter to the Left channel of the AUDIO OUT jack and Right channel of the AUDIO OUT jack.
3. Make sure so that the milli-voltmeter reads specified value.

Note:

Check the PLAYBACK level is less than 2.0dBs both Left and Right channels.

CHECKING OF ERASE VOLTAGE AND OSCILLATION FREQUENCY

Measuring instrument	Oscilloscope
Mode	Record
Test point	Full erase head
Control	T651
Specification	$70 \pm 5\text{kHz}$, 40Vp-p or greater

1. Put the unit in record mode.
2. Connect an oscilloscope across the full erase head.
3. Make sure the erase voltage across the full erase head is approx. 40Vp-p or more and frequency is $70 \pm 5\text{kHz}$.

RF CIRCUIT ADJUSTMENT

ADJUSTMENT OF RF AGC CIRCUIT

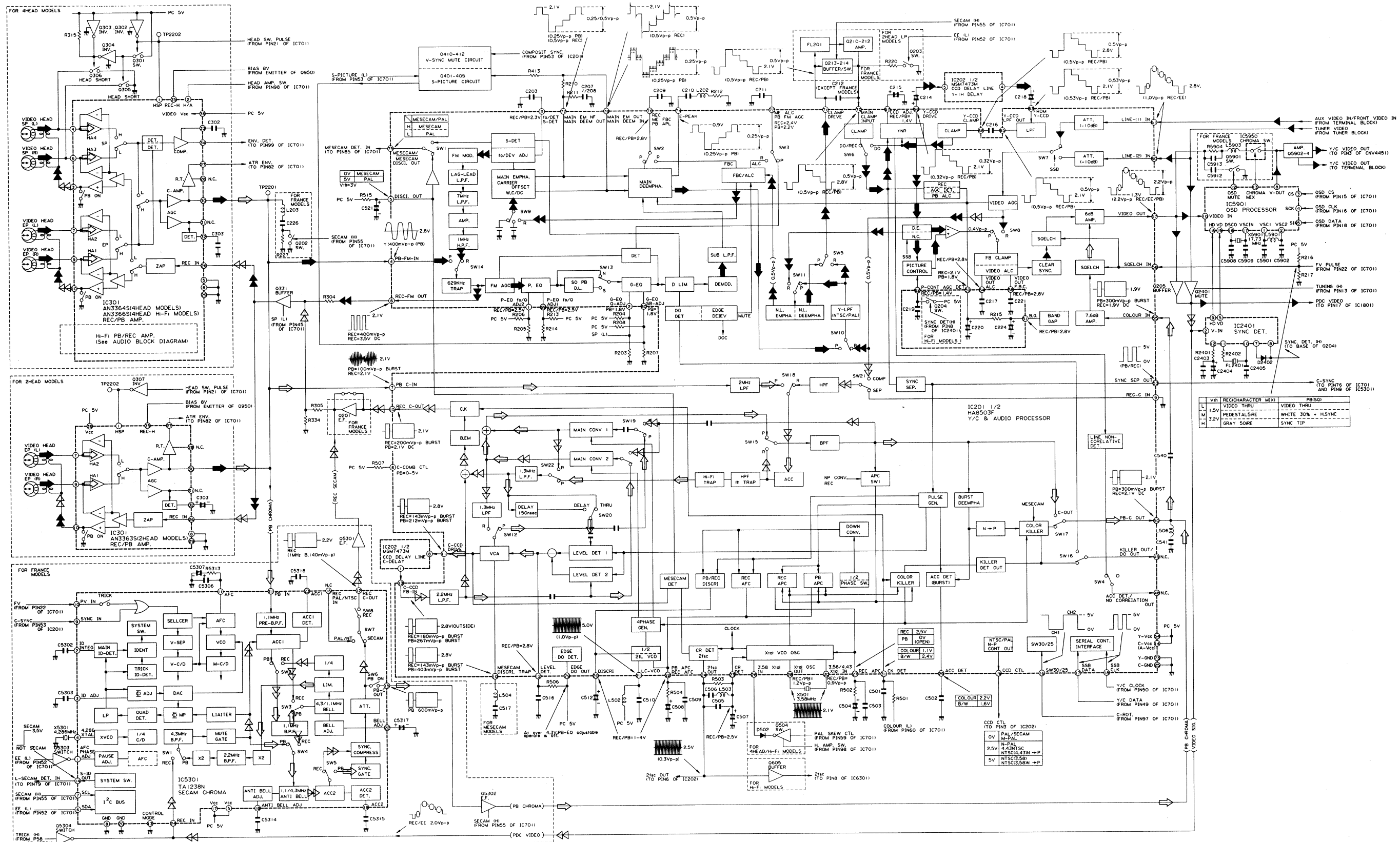
Measuring instrument	DC voltmeter and VHF signal generator
Mode	RF signal at I69-CH (HM models) (by UHF signal generator) or I-J-CH (LM models) (by VHF signal generator) (EBU colour bar signal at 87.5% modulated.)
Test point	TP1552 (Sig.) TP1554 (GND)
Control	VR001 AGC control
Specification	$2.7 \pm 0.1\text{V}$ (HM models) $2.6 \pm 0.1\text{V}$ (LM models)

1. Receive the I69 channel signal (HM models) or I-J-channel signal (LM models) (colour bar signal at 87.5% modulated.) at Input field strength: $70\text{dB}\mu\text{V}$ of antenna terminal.
2. Connect a DC voltmeter to test points shown in table.
3. Adjust VR001 (AGC control) in the IF pack so that the voltage be specified.

VC-M26HM/LM VC-MH67HM/LM VC-M26HM/LM VC-MH67HM/LM
 VC-M27HM VC-MH68HM VC-M27HM VC-MH68HM
 VC-M271LM VC-M271LM

SIGNAL FLOW BLOCK DIAGRAM

⇒ PB CHROMINANCE SIGNAL ⇒ PB LUMINANCE SIGNAL ⇒ E-E SIGNAL
 ⇨ REC CHROMINANCE SIGNAL ⇨ REC LUMINANCE SIGNAL

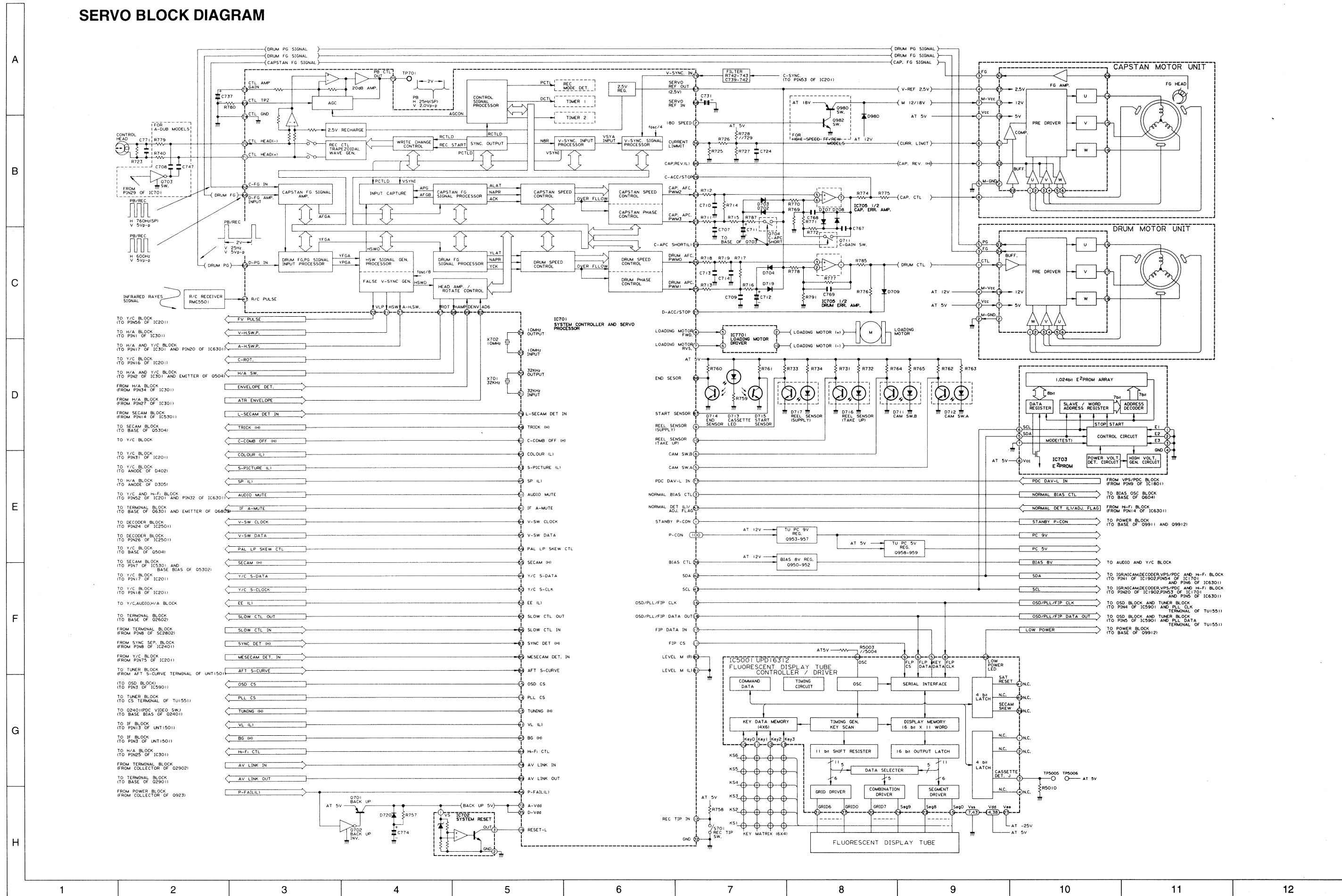


VIN	RECHARACTER MIXI	PBSQ
L	VIDEO THRU	VIDEO THRU
L	1.5V PEDESTAL/SRE	WHITE 30% + HSYNC
M	3.2V GRAY 50%	SYNC TIP

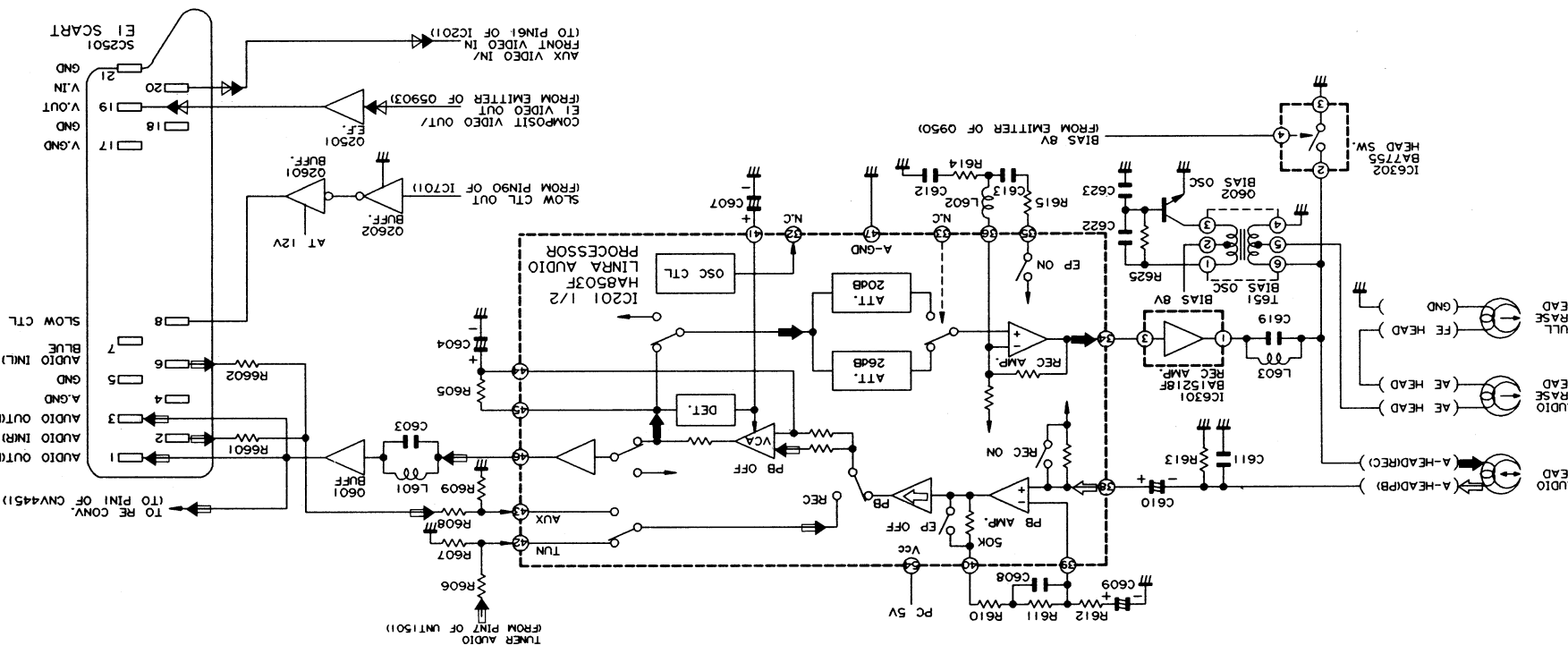
8. BLOCK DIAGRAMS

SERVO BLOCK DIAGRAM

VC-M26HM/LM VC-M27HM VC-MH67HM/LM VC-MH68HM VC-M271LM VC-MH67HM/LM VC-MH68HM



AUDIO CIRCUIT BLOCK DIAGRAM
(VC-M26HM/LM, M27HM, M271LM)



VC-M26HM/LM VC-MH67HM/LM
 VC-M27HM VC-MH68HM
 VC-M271LM VC-M271LM

PLAYBACK SIGNAL
 RECORDING SIGNAL
 E-E SIGNAL

POWER CIRCUIT BLOCK DIAGRAM

