

## SECTION 2 MECHANICAL ADJUSTMENT

### 2.1 GENERAL

#### 2.1.1 Precautions

**IMPORTANT:**

1. Disconnect from power before removing or soldering components.
2. When removing a screw from the chassis, be careful not to drop it into the mechanism. If a screw should be dropped, be sure to retrieve it.
3. Be extremely careful not to damage either the upper or lower head drum assemblies.
4. The tape transport mechanism has been precisely adjusted at the factory and ordinarily does not require readjustment.
5. When removing a part, be very careful not to damage or displace other parts. (Be especially careful with the guide poles and rotary video head drum.)
6. The cassette housing retracting mechanism presents a hazard of possible injury to fingers or hand due to the differing construction with respect to earlier models. The technique of "tripping" the lowering mechanism with the fingers, as employed with previous versions, must not be used with this model. For the instructive service procedure, see section 2.3.1.
7. Tighten the screws carefully to avoid damage to the cabinet.

#### 2.1.2 Required jigs and tools

For proper mechanical adjustment, the following jigs and tools are strongly recommended. Without them, a long trial-and-error period would be necessary.

In addition, general-purpose tools and a metric hex key (not supplied by JVC) are required.  
The hex key needed for this model is 1.5 mm size.

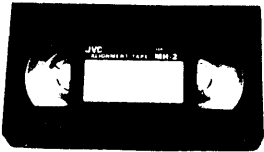


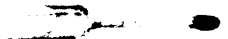



<p>JVC Alignment tape MH-2</p> 	<p>Master plane jig PUJ42146</p> 	<p>Height gauge PUJ42147-2</p> 	<p>JVC oil PU41761</p> 
<p>Torque gauge ass'y PUJ48075-2</p> <p>(Torque meter 600ATG Torque gauge head PUJ48016-2</p> 	<p>Back tension cassette gauge PUJ48076</p> 	<p>Audio/Control head position tool PUJ47351-2</p> 	

Table 2-1 Jigs and tools

**NOTE:** See section 3.1.1 required test equipment and jigs regarding electrical adjustment.

### 2.1.3 Disassembly

#### A: External covers

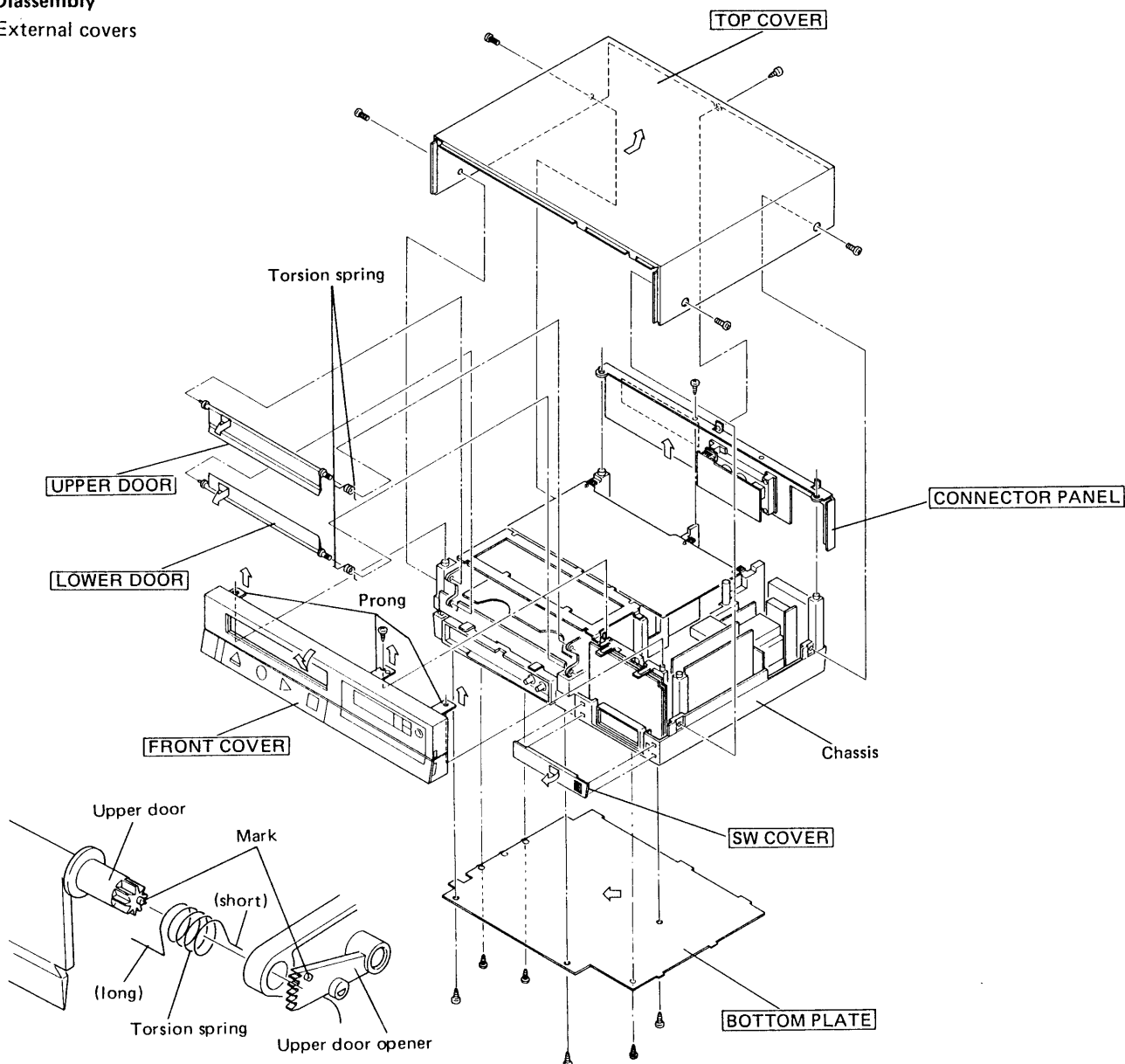


Fig. 2-1(a) External covers

- Top cover
  1. Take out five screws and move the top cover in the arrow direction to remove it.
- Front cover
  1. Remove the top cover.
  2. Take out a screw and pull the three prongs upwards to disengage from chassis.
  3. Move the front cover in the arrow direction to remove it.
- Bottom plate
  1. Take out six screws and move the bottom plate in the arrow direction to remove it.
- Connector panel
  1. Remove the top cover.
  2. Take out a screw and pull the connector panel upwards to remove it.
- Upper door and lower door
  1. Remove the front cover.
  2. Move the lower door in the arrow direction to remove it. Use care regarding the torsion spring.
  3. In the same manner, move the upper door in the arrow direction to remove it. Use care regarding the torsion spring.
  4. When reassemble the doors, perform the following
    - 1) Observe the upper door and recognize the mark on the gear portion.
    - 2) Set the long straight part of the torsion spring toward the upper door.
    - 3) Install the upper door in the state with the mark corresponding with the mark of the upper door opener on the cassette housing.
- SW cover
  1. Move the SW cover in the arrow direction to remove it.

## B: Circuit board assemblies

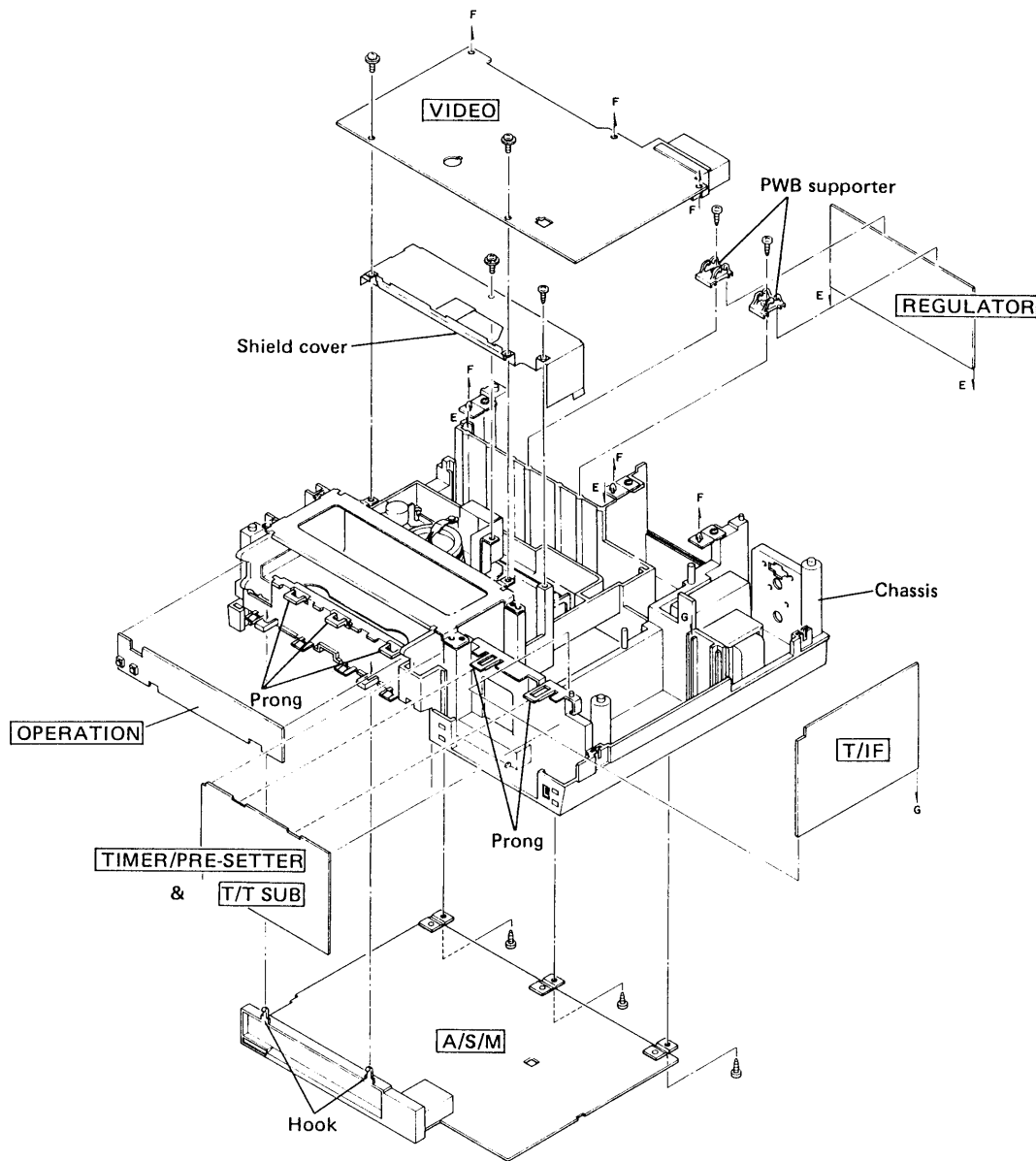


Fig. 2-1(b) Circuit boards

- VIDEO board
  1. Take out two screws and disengage the VIDEO board from three hinges mounted on chassis to remove it.
- REGULATOR board
  1. Take out two screws and remove the PWB supporters.
  2. Pull the REGULATOR board upwards from guides of chassis to remove it.
- OPERATION board
  1. Bend three prongs of chassis upwards to remove the OPERATION board.
- A/S/M board
  1. Remove the OPERATION board.
  2. Bend two hooks of VIDEO board to disengage them from chassis.
  3. Take out three screws and remove the A/S/M board.
- TIMER/PRE-SETTER and T/T SUB boards
  1. Bend two prongs of chassis upwards to remove the TIMER/PRE-SETTER and T/T SUB boards.
- T/IF board
  1. Pull the T/IF board upwards from guides of chassis to remove it.

2.1.4 Layout of main mechanical parts

A: Top view and parts identification

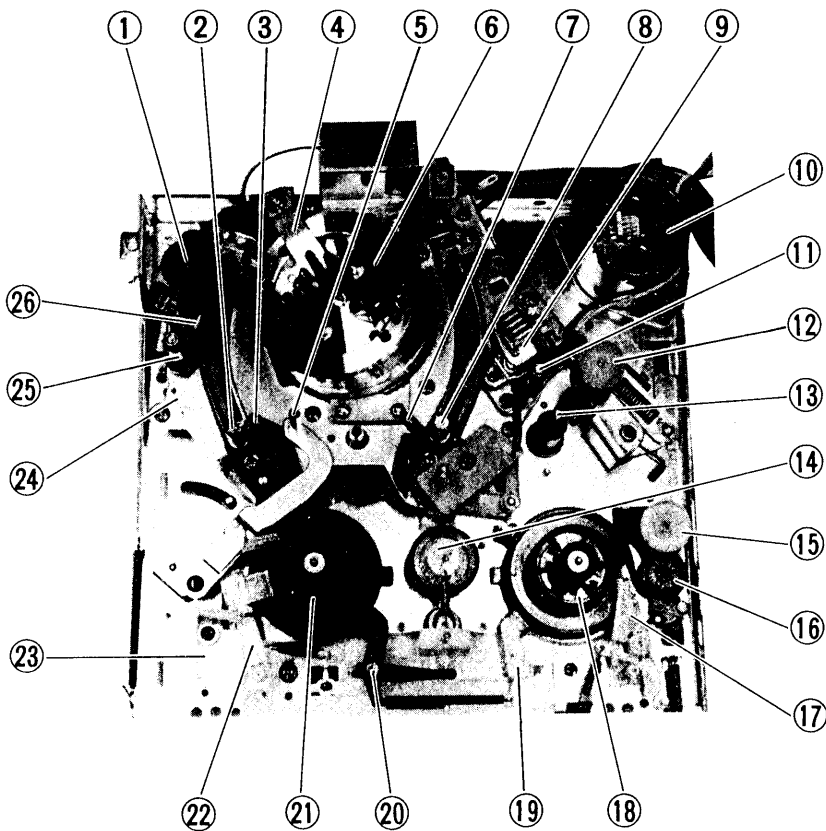


Fig. 2-2(a)

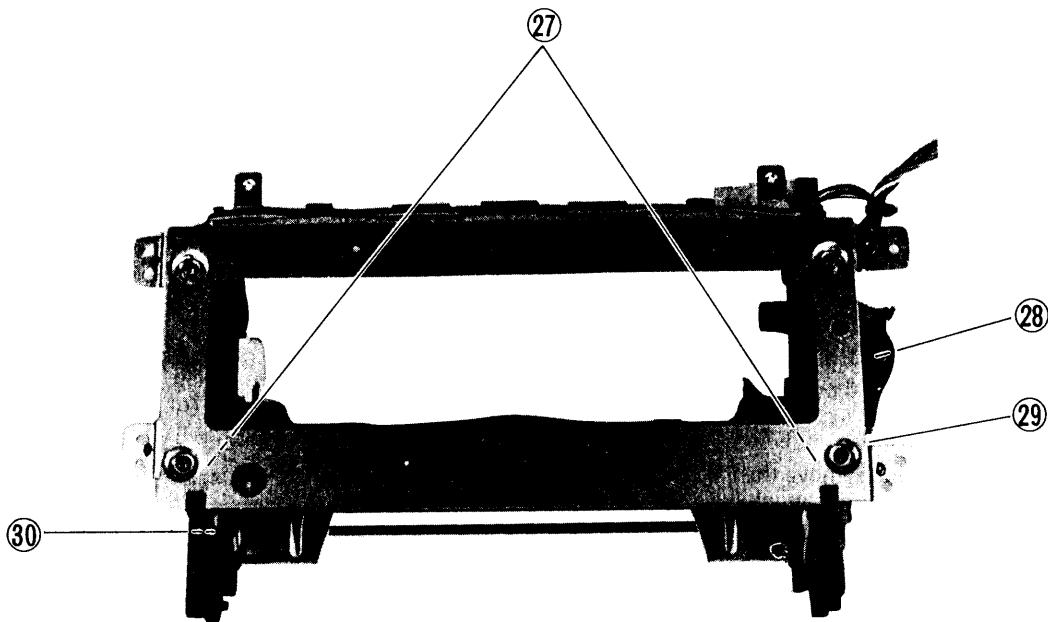


Fig. 2-2(b)

B: Bottom view and parts identification

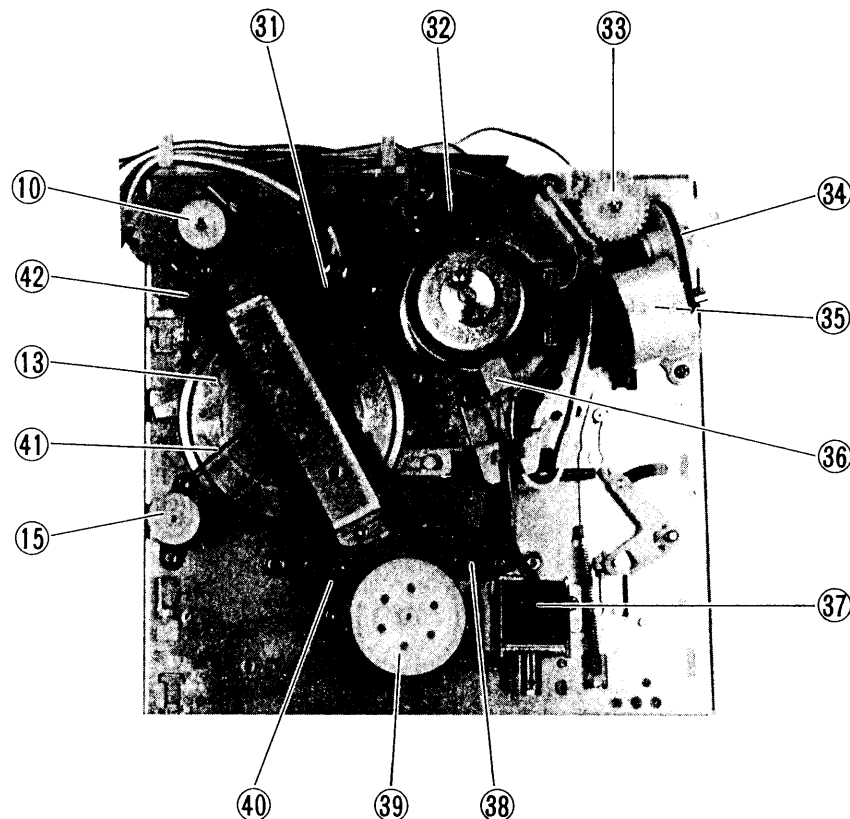


Fig. 2-2(c)

- |  |  |
|--|--|
| 1 Impedance roller                     | 22 Supply tension brake                  |
| 2 Supply guide roller                  | 23 Tension band                          |
| 3 Slant pole (Supply pole base ass'y)  | 24 Guide pin                             |
| 4 Brush                                | 25 Supply guide pole                     |
| 5 Tension pole                         | 26 Full erase head                       |
| 6 Upper drum                           | 27 CASSETTE-IN detect switch             |
| 7 Slant pole (Take-up pole base ass'y) | 28 Cassette motor                        |
| 8 Take-up guide roller                 | 29 HOUSING-UP/DOWN detect switch         |
| 9 Audio/control head                   | 30 REC SAFETY switch                     |
| 10 Capstan motor (— pulley)            | 31 FG board                              |
| 11 Take-up guide pole                  | 32 Leaf switch (UL switch and AL switch) |
| 12 Pinch roller                        | 33 Drive gear                            |
| 13 Capstan (Flywheel ass'y)            | 34 Loading belt                          |
| 14 Reel idler                          | 35 Mode control motor                    |
| 15 Take-up clutch                      | 36 Pick-up head                          |
| 16 Take-up idler arm                   | 37 Solenoid                              |
| 17 Take-up tension brake               | 38 REEL SENSOR board                     |
| 18 Take-up reel disk                   | 39 Center pulley                         |
| 19 Take-up brake                       | 40 Reel belt                             |
| 20 Supply brake                        | 41 Take-up clutch belt                   |
| 21 Supply reel disk                    | 42 Capstan belt                          |

For Service Manuals  
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## 2.2 PERIODIC MAINTENANCE

The following procedures are recommended for maintaining optimum performance and reliability of this video cassette recorder.

### 2.2.1 Cleaning

For cleaning, use a lint-free cloth or gauze dampened with alcohol.

#### A: Tape transport system

1. The following components should be cleaned after every 500 hours of use.
  - 1) Supply guide pin
  - 2) Tension pole
  - 3) Supply guide pole
  - 4) Full erase head
  - 5) Impedance roller
  - 6) Supply guide roller
  - 7) Supply slant pole (Supply pole base assembly)
  - 8) Video head and Drum system
  - 9) Upper surface of drum shaft (Lower drum assembly)
  - 10) Brush
  - 11) Take-up slant pole (Take-up pole base assembly)
  - 12) Take-up guide roller
  - 13) Audio/control head and Audio erase head
  - 14) Take-up guide pole
  - 15) Pinch roller
  - 16) Capstan
2. Since above parts come in direct contact with video tape, they tend to collect dust particles. If allowed to accumulate, dust may lead to damage to the video tape and above parts.
3. After cleaning with alcohol, allow the parts to dry thoroughly before using a cassette tape.

#### NOTE:

When cleaning the two video heads on the upper drum, do not clean them with a vertical stroke.

Use only a gentle back and forth motion in the direction of the tape path.

Use care since they are easily damaged.

When cleaning video heads, A/C head and erase heads, use a lint-free cloth dampened with alcohol.

#### B: Reel drive system

1. The following components should be cleaned after every 1,000 hours of use.
  - Upper section —
  - 17) Center pulley
  - 18) Reel idler
  - 19) Supply reel disk
  - 20) Supply brake
  - 21) Take-up reel disk
  - 22) Take-up brake
  - 23) Take-up clutch
  - 24) Take-up idler
  - Bottom section —
  - 25) Capstan motor
  - 26) Capstan belt
  - 27) Capstan flywheel
  - 28) Take-up clutch belt
  - 29) Take-up clutch
  - 30) Drive gear
  - 31) Loading belt
  - 32) Mode control motor
  - 33) Reel belt
  - 34) Center pulley
2. The above revolving parts are of rubber or come in direct contact with rubber parts. Rubber dust can accumulate and interfere with proper operation.
3. Avoid using excessive alcohol when cleaning rubber parts.

### 2.2.2 Lubrication

The following components should be lubricated with JVC oil after every 2,000 hours of use.

- 1) Shaft of the supply reel disk
- 2) Shaft of the take-up reel disk

After cleaning above shafts with alcohol, lubricate these shafts with one or two drops of JVC oil.

Do not over lubricate.

## 2.3 MAIN ASSEMBLY REPLACEMENTS

As necessary to allow replacement, remove external covers, circuit boards and shield covers. Refer to Fig. 2-3 and replace the parts according to the indicated sequence.

### 2.3.1 Cassette housing and cassette motor

- Cassette housing removal

1. Take out four screws (1) and disengage the connection from A/S/M board.
2. Carefully lift the cassette housing upwards to remove it.

**NOTE:**

For service procedures that call for operation of the set without loading of the tape about the head drum, extract the housing from the interior of the set and position it as described below.

- 1) Set a sheet of insulated material (cardboard, plastic, etc.) on the right side of the chassis at about the T/IF board position.
- 2) Remove the cassette housing from the interior of the set and place it on the insulated sheeting, but do not disengage the connection from the A/S/M board.

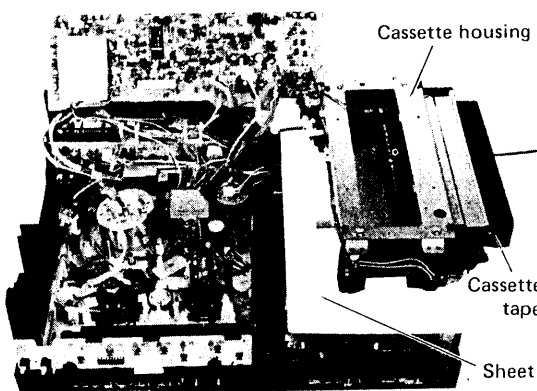


Fig. 2-4

- 3) Insert a cassette into the housing. The housing mechanism functions to retract the cassette.

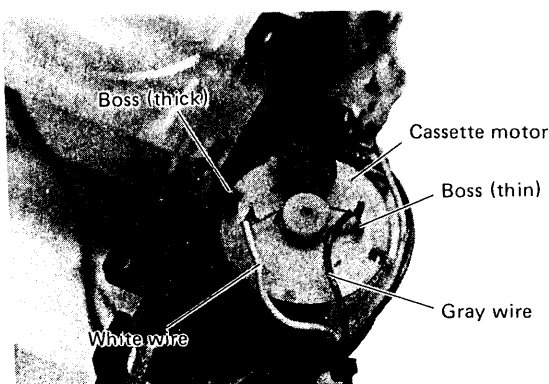


Fig. 2-5 Cassette motor wiring

- 4) Since the required sensors are contained within the housing, after the cassette has been retracted, the desired modes can then be set by using the operation switches.

- Cassette motor

1. Remove the cassette housing.
2. Unsolder the two wires from the cassette motor.
3. Take out two screws (2) and remove the cassette motor.
4. Replace the cassette motor and reassemble by reversing the above steps. Use care regarding the motor wires polarity (see Fig. 2-5).

### 2.3.2 Upper drum and brush

1. Take out screw (3) and remove the brush and earth lug.
2. Unsolder the four wires connecting the lower drum from the relay pins of upper drum (perform quickly to avoid damaging the wires) as shown in Fig. 2-6.

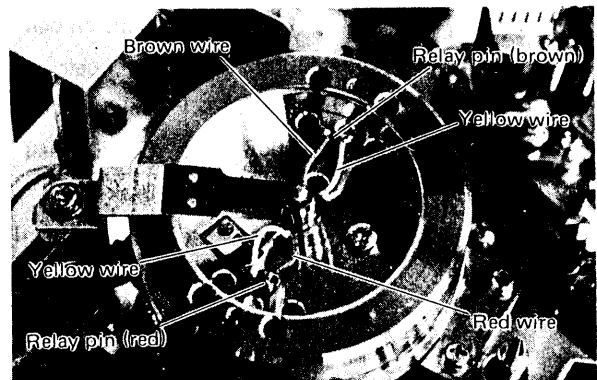


Fig. 2-6 Upper drum wiring

3. Take out two screws (4) and remove the upper drum in the upward direction.
4. Use alcohol to clean the lower face of new upper drum and the upper face of lower drum. When handling and installing the new upper drum, avoid directly touching the video heads and use care not to scratch the drum.
5. Reassemble by reversing the above steps. When resoldering, observe the correct channels (brown : CH-1, red : CH-2) and avoid overheating the wires.
6. Use screw (3) to secure the brush and earth lug. Check that the brush is positioned at the center of the drum shaft.
7. Perform the following checks and adjustments.
  - 1) Control head phase (see section 2.5.8).
  - 2) P.B switching point (see section 3.4.4).
  - 3) Overall checks and adjustments of the video and audio circuits (see section 3.5).

### 2.2.3 Service schedule for main components

The following chart lists the parts of the units which should receive periodic servicing at the recommended intervals. Table 2-2 indicates approximate times when replacement of critical internal parts should be considered. However, in actual usage, these times will vary greatly according to environmental and usage conditions. Routine inspection and maintenance are also important factors that influence equipment life. Note that rubber parts may become aged or deformed after long periods of storage, even if the equipment is not used.

Category	Part No.	Part Name	Periodic Service Schedule (operating hours)				
			1000	2000	3000	4000	5000
HEAD	PU31332L	Upper drum ass'y	○	●	○	●	○
	PU51262-3	Audio/control head ass'y			●		
	PU51263-2	Full erase head					●
MOTOR	PU55371V	Capstan motor		●		●	
	PU48854M	Mode control motor ass'y		●		●	
	PQ40090A	Cassette motor ass'y			●		
IDLER	PQ40134A	Pinch roller arm ass'y			●		
	PU55373	Take-up clutch		●		●	
	PU51402A	Take-up idler arm		●		●	
	PU55374-3	Reel idler		●		●	
BELT	PUM30004	Capstan belt	○	●	○	●	○
	PUM30003-7	Reel belt		●		●	
	PUM30003	Take-up clutch belt		●		●	
	PUM30003-8	Loading belt			●		
BRAKE	PUM30019-2	Brake pad		●		●	
	PU51390A	Tension band ass'y		●		●	
REEL DISK	PU48907D	S. Reel disk ass'y			●		
	PU48907E	T. Reel disk ass'y			●		
BRUSH	PU48678A	Brush ass'y		●		●	

○ Check and replace if necessary.

● Replace.

**Table 2-2** Standard service periods

#### NOTE:

Even if the unit is not used frequently, cleaning, lubrication and replacement of the belts should be undertaken every 2 years.



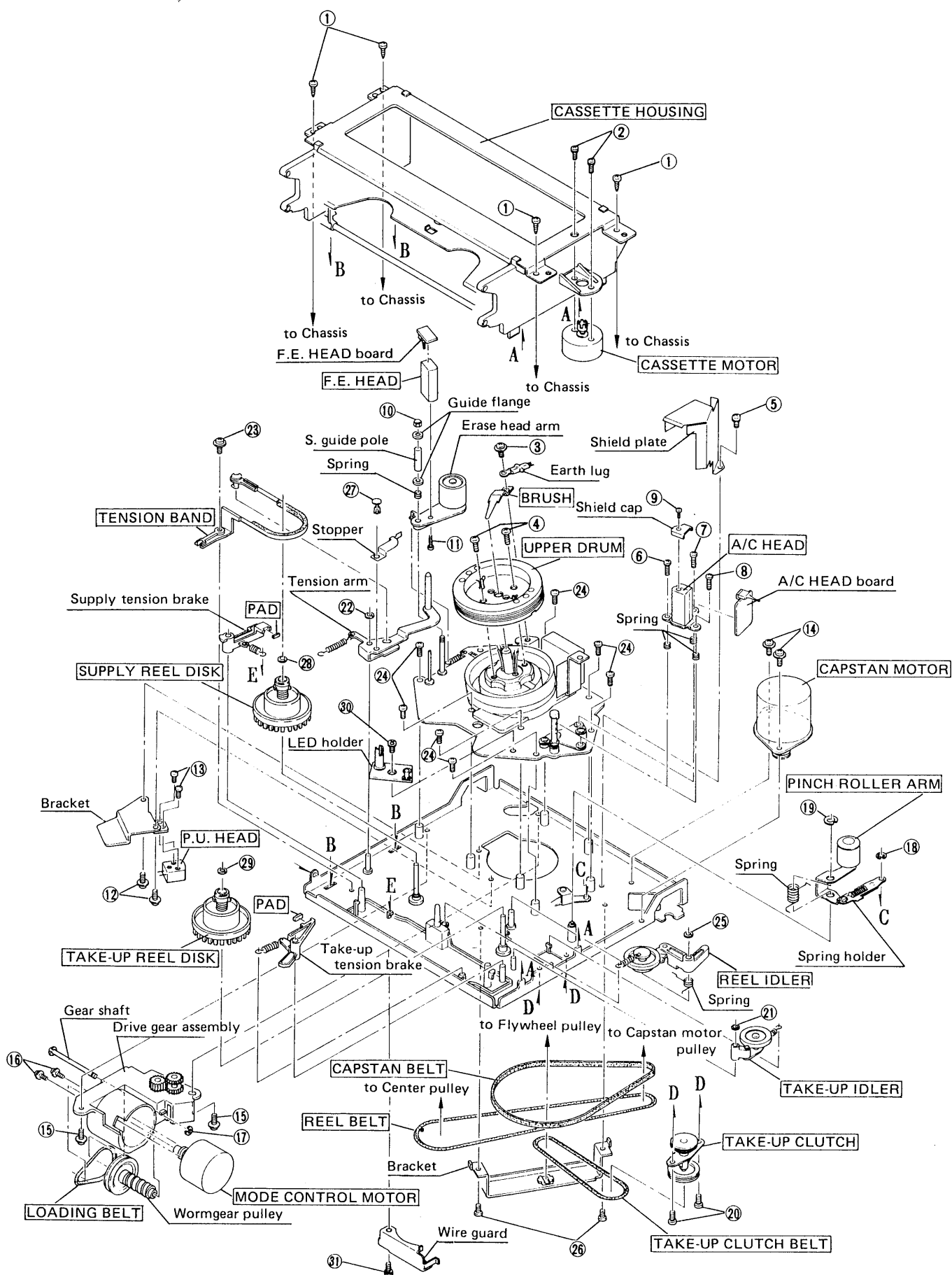


Fig. 2-3 Main assembly replacements

### 2.3.3 Audio/control head

1. Take out screw (5) and remove the shield plate.
2. Take out three screws (6), (7) and (8) to remove the audio/control head. Use care regarding the coil springs.
3. Unsolder the six terminals coming from audio/control head and remove the A/C HEAD board.
4. Take out screw (9) and remove the shield cap on the audio/control head.
5. Replace the audio/control head and reassemble by reversing the above steps without shield cap installation.
6. Perform the following checks and adjustments.

#### A: Tape transport adjustment

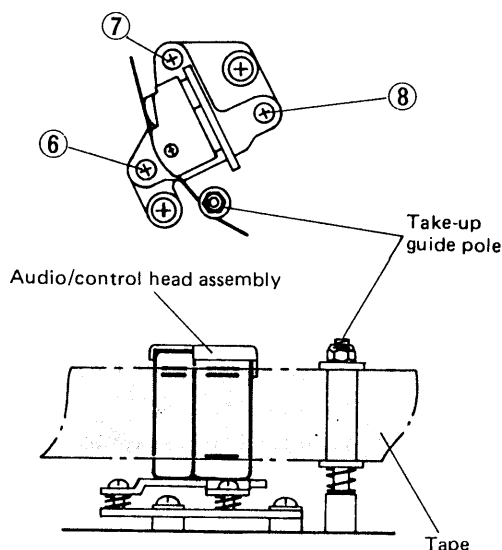


Fig. 2-7 Audio/control head adjustment

- 1) Employ a cassette tape (E-180) and set for PLAY mode.
- 2) Turn screw (8) and adjust for smooth transport at the take-up guide pole. Do not adjust the height of the take-up guide pole itself.

#### B: Audio/control head height and azimuth

- Incorrect audio/control head height can impair audio signal-to-noise ratio when playing back a pre-recorded tape.
  - 1) Connect oscilloscope to CN1-3 (AUDIO OUT) of TERMINAL board.
  - 2) Play 6 kHz segment (stairstep signal) of the alignment tape MH-2.
  - 3) Observe the audio output signal and adjust screw (7) for maximum output level.

- 4) Turn screws (6), (7) and (8) in succession by small and equal increments at a time and adjust for maximum audio output level. With reference to screw (6), adjust azimuth with screw (7) and screw (8) so that small tape wrinkles are not produced at the guide pole, but at the same time, audio output becomes maximum and level fluctuations minimum.
- 5) Reassemble the shield cap on the audio/control head with screw (9).

#### C: Final checks and adjustments

- 1) Perform the interchangeability adjustment (see section 2.5).
- 2) Perform the audio circuit adjustment (see section 3.6).

### 2.3.4 Full erase head

1. Unsolder the two terminals coming from the full erase head and remove the F.E. HEAD board.
2. Take out Nut (10) and remove the supply guide pole, guide flanges and coil spring.
3. Unhook the spring from the erase head arm and remove the erase head arm in the upward direction.
4. Take out screw (11) to remove the full erase head.
5. Replace the full erase head and reassemble by reversing the above steps.
6. Perform the following checks and adjustments.
  - 1) Supply guide pole height adjustment (see section 2.4.2-B).
  - 2) Interchangeability adjustment (see section 2.5).

### 2.3.5 Pick-up head

1. Unsolder the two wires from the pick-up head.

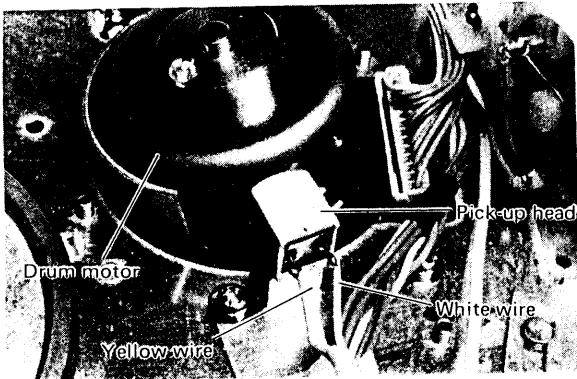


Fig. 2-8 Pick-up head wiring

2. Take out two screws (12) and remove the bracket.
3. Take out two screws (13) to remove the pick-up head.
4. Replace the pick-up head and reassemble by reversing the above steps. Tighten two screws (12) in the state with the bracket moved fully to the rotor side, but does not contact with the both magnets on the rotor.
5. Perform the P.B switching point adjustment (see section 3.3.4).

### 2.3.6 Capstan motor

1. From the bottom side, disengage the reel belt and capstan belt from the capstan motor pulley.
2. Disconnect the cap housing from the capstan motor and take out two screws (14) to remove the capstan motor.
3. Replace the capstan motor and reassemble by reversing the above steps. Use care regarding the capstan motor wiring (see Fig. 2-9).

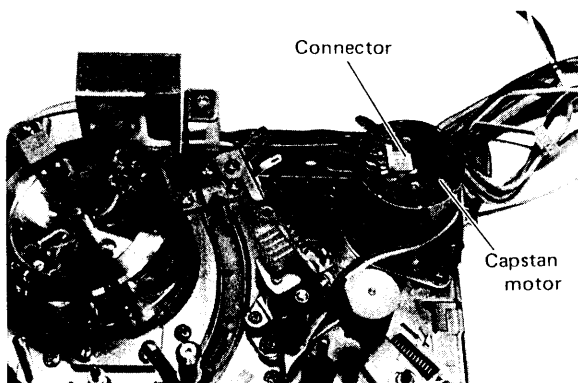


Fig. 2-9 Capstan motor wiring

4. Perform the capstan discriminator adjustment (see section 3.3.3).

### 2.3.7 Mode control motor and loading belt

1. Unsolder the two wires and ceramic capacitor from the mode control motor.

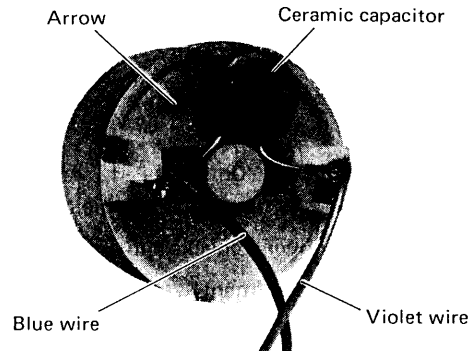


Fig. 2-10 Mode control motor wiring

2. Take out two screws (15) and remove the drive gear assembly.
3. Disengage the loading belt from the motor pulley.
4. Take out two screws (16) to remove the mode control motor.
5. Take out E-ring (17) and pull out the gear shaft to remove the wormgear pulley. Use care regarding the two washers.
6. Replace the loading belt and reassemble by reversing the step 5. If necessary, lubricate the gear shaft with JVC oil after cleaning with alcohol. Do not over lubricate. Avoid staining the loading belt with grease or oil.
7. Replace the mode control motor and reassemble by reversing the above steps 1 to 4. Use care regarding the motor wire polarity (see Fig. 2-10).  
Perform the following steps when install the drive gear assembly.  
1) Turn the drive rings by hand from bottom side and set the supply and take-up pole bases to end of travel (loading end position as shown in Fig. 2-11).

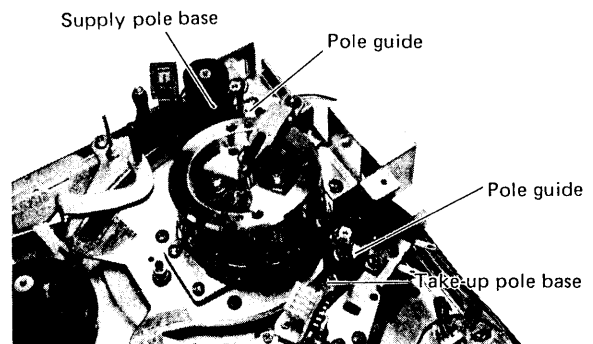


Fig. 2-11 Loading end position

- 2) Install the drive gear assembly and fix with two screws (15).

- Turn the mode control motor pulley by hand to move the loading rings slightly in the unloading direction. Check for equal spacing between the supply pole base and the pole guide, and between the take-up pole base and the pole guide. If not equal, the drive gear assembly mounting position is incorrect. Repeat the above steps 7-7-1) and 2).

### 2.3.8 Pinch roller arm

- Take out E-ring (18) and disengage the spring holder of pinch roller arm from the play lever.
- Take out E-ring (19) to remove the pinch roller arm and torsion spring.
- Replace the pinch roller arm and spread grease on it's parts contact with pinch roller mounting shaft. Avoid staining the pinch roller with grease.
- Reassemble by reversing the above steps.

### 2.3.9 Take-up clutch

- Disengage the take-up clutch belt from the take-up clutch.
- Take out two screws (20) to remove the take-up clutch. Use care regarding the spring of the take up idler when remove the take-up clutch downwards.
- Replace the take-up clutch and reassemble by reversing the above steps.
- Perform the take up torque check by following steps.
  - Set the PLAY mode without cassette housing (see section 2.3.1).
  - Set the torque gauge on the take-up reel disk.

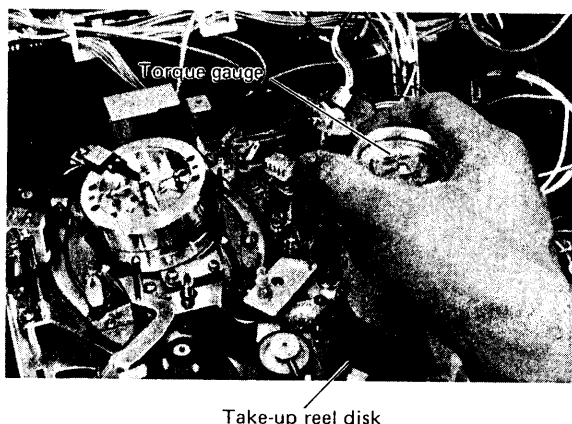


Fig. 2-12 Take-up torque check

- Relax the grip on the torque gauge so that the indicator needle and scale rotate at equal speed, then read the indication. The correct value is between 60 and 100 gcm.
- If not the correct value, confirm the condition of the take-up idler spring and take-up clutch belt. If necessary, exchange the take-up clutch with another new one.

### 2.3.10 Take-up idler

- Unhook the take-up idler spring from the hook of maindeck.
- Take out slit washer (21) to remove the take-up idler upwards.
- Replace the take-up idler and reassemble by reversing the above steps. Use care that the take-up idler is mounted on the correct position.

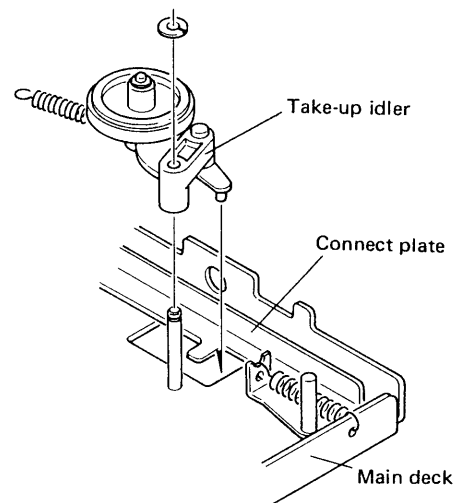


Fig. 2-13 Take up idler position

### 2.3.11 Reel idler

- Take out screw (30) and remove the LED holder.
- Turn the mode control motor pulley by hand to release the idler plate from the reel idler.
- Unhook the reel idler spring from the hook of mold base.
- Take out slit washer (25) to remove the reel idler upwards. Use care regarding the torsion spring under the reel idler.

5. Replace the reel idler and reassemble by reversing the above steps. Check that the torsion spring is mounted on the correct position as shown in Fig. 2-14.

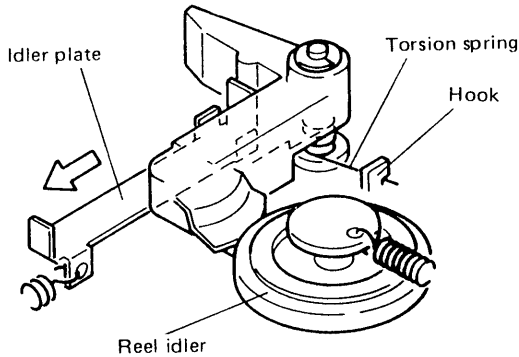


Fig. 2-14 Torsion spring position

### 2.3.12 Reel belt

1. Disengage the take-up clutch belt from the take-up clutch.
2. After taking out screw (31) to remove the wire guard, disengage the reel belt from the center pulley and the capstan motor pulley.
3. Replace the reel belt and reassemble by reversing the above steps.

### 2.3.13 Capstan belt and take-up clutch belt

1. Take out two screws (26) and remove the bracket.
2. Disengage the take-up clutch belt from the take-up clutch and the flywheel pulley.
3. Disengage the reel belt from the center pulley and the capstan motor pulley.
4. Disengage the capstan belt from the flywheel and the capstan motor pulley.
5. Replace the capstan belt and the take-up clutch belt, and reassemble by reversing the above steps.

### 2.3.14 Brake pads

#### • Take-up tension brake pad

1. Unhook the spring of take-up tension brake from the mold base.
2. Turn the take-up tension brake clockwise and remove it upwards.

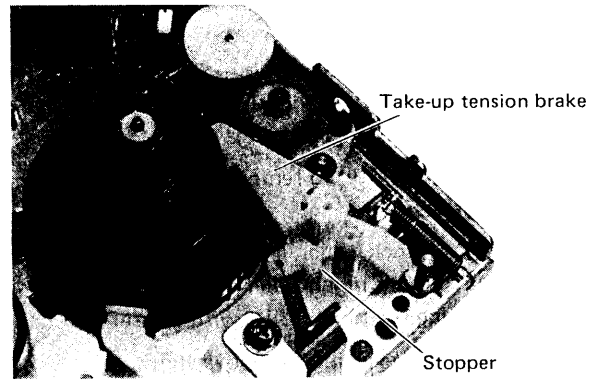


Fig. 2-15 Take-up tension brake

3. Tear off the pad from the take-up tension brake.
4. Stick the new pad on the take-up tension brake and install the take-up tension brake and its spring to the former state.

#### • Supply tension brake pad

5. Take out screw (23) and move the tension band aside.
6. Unhook the spring of supply tension brake from the mold base.
7. Bend the stopper of mold base and remove the supply tension brake upwards.

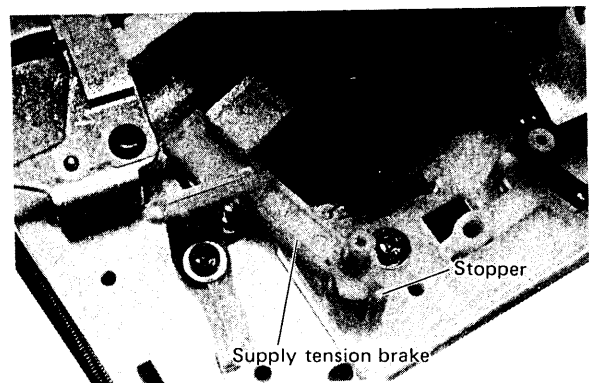


Fig. 2-16 Supply tension brake

8. Replace the pad in the same manner as the take-up pad replacement.
9. Install the supply tension brake and its spring to the former state.
10. Install the tension band and perform the tension pole position adjustment (see section 2.3.15-4).

### 2.3.15 Tension band

1. Take out plastic rivet (27) and remove the stopper bonded on the tension arm.
2. Take out screw (23) and move the tension band bonded on the maindeck, and unhook it from the tension arm to remove it.
3. Replace the tension band and reassemble by the reversing the above steps. Bond the stopper on the tension arm as before. If necessary, bond the tension band.
4. Perform the tension pole position adjustment by the following steps.
  - Tension pole position adjustment.
    - 1) Without tape, set for the PLAY mode (see section 2.3.1).
    - 2) Confirm that the left side of tension pole lies upon the left side of subdeck as shown in Fig. 2-17.

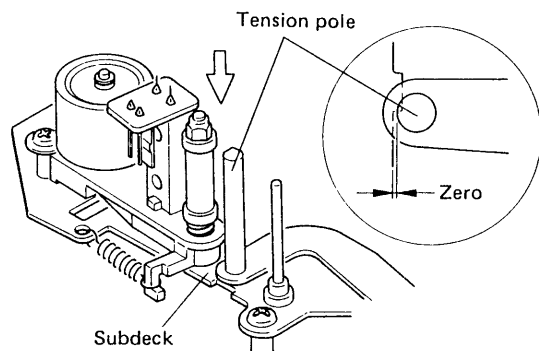


Fig. 2-17 Tension pole position

- 3) If necessary, loosen screw (23) and adjust the tension band holder to obtain the correct tension pole position.

#### NOTE:

If back tension is incorrect, check the tension pole position. Use the back tension cassette gauge and confirm a value of between 28 and 39 gcm. If necessary, replace the tension arm spring and readjust the tension pole position.

### 2.3.16 Reel disks

#### • Supply reel disk

1. Take out slit washer (22) and screw (23), and remove the tension arm and the tension band together. Use care regarding grease on the tension arm.
2. Take out slit washer (28), and turn the supply tension brake counter-clockwise to remove the supply reel disk upwards. Use care regarding the washer and collar.
3. Lubricate the reel shaft with JVC oil after cleaning with alcohol. Do not over lubricate.
4. Replace and install the supply reel disk, and perform the reel disk height check by the following steps.
  - Reel disk height check.
    - 1) Set the master plane jig as shown in Fig. 2-18.

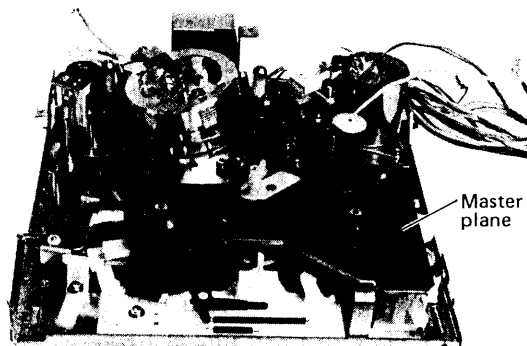


Fig. 2-18 Master plane jig setting

- 2) Use the height gauge and check the reel disk height. Measure at two places 90° apart.
- 3) The correct height is between planes A and B as shown in Fig. 2-19.

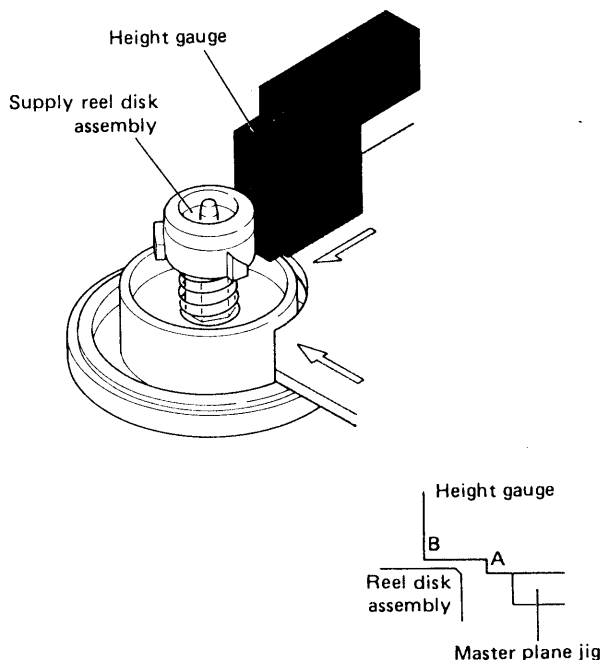


Fig. 2-19 Reel disk height check

- 4) If not the correct, use the height adjustment washers to obtain the correct height as shown in Fig. 2-20.

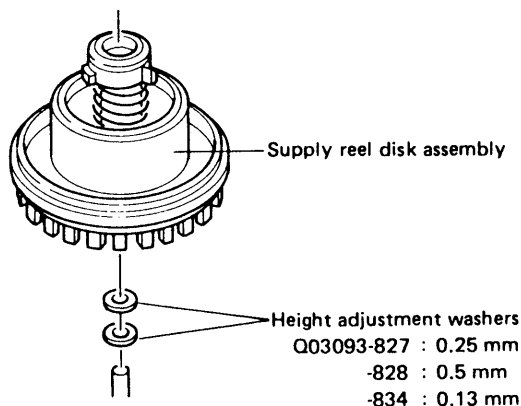


Fig. 2-20 Washers for height adjustment

5. Mount the tension arm and the tension band as before, and perform the tension pole position adjustment (see section 2.3.15-4).
- Take-up reel disk
6. Unhook the spring and turn the take-up tension brake clockwise to remove upwards (see section 2.3.14-1 and 2).
7. Take out slit washer (29) and remove the take-up reel disk upwards. Use care regarding the collar.
8. Lubricate the reel shaft with JVC oil after cleaning with alcohol. Do not over lubricate.
9. Replace and install the take-up reel disk, and perform the reel disk height check in the same manner as the supply side.
10. If not the correct, exchange the collar under the take-up reel disk or take-up reel disk itself for new one.

## 2.4 TAPE TRANSPORT SYSTEM CHECKS AND ADJUSTMENT

The tape transport system has been precisely aligned at the factory and normally does not require readjustment. The following steps are therefore necessary only in cases of severe usage or when replacing parts affecting the tape transport system.

### 2.4.1 Tape transport check

Remove the shield plate (for A/C head) before tape transport check.

1. Employ a 180-minute tape and check at tape beginning and ending portion according to the following steps.
2. Operate the machine between Play and Stop modes several times.  
During Loading and Unloading, observe the tape at the supply and take-up guide rollers and guide poles. Confirm absence of curling, wrinkling, etc. as shown in Fig. 2-21.

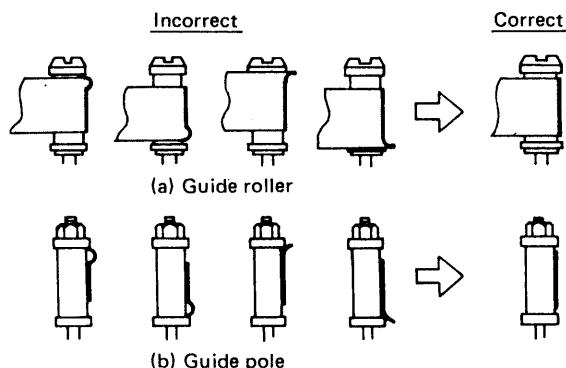


Fig. 2-21 Guide roller and guide pole

3. Observe the tape as it becomes wrapped around drum during loading and as it separates from the drum during unloading.  
Confirm absence of damage to the tape at points (A) and (B) as shown in Fig. 2-22 and absence of contact noise between head tips and tape edge.

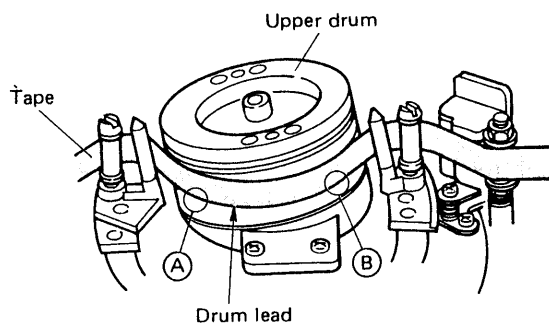


Fig. 2-22 Drum lead check-1

#### NOTES:

1. Slips upward : sound becomes produced by contact between tips of rotating heads and edge of tape.
2. Slips downward : tape curls or wrinkles from contacting lead face (sound may also be produced).
4. During Play mode, observe tape at the input and output portions (C and D in Fig. 2-23) of the head drum lead. Confirm that the tape slips neither upward nor downward with respect to the lead as shown in Fig. 2-24.

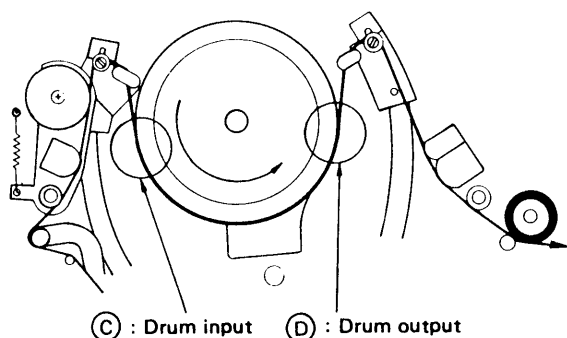


Fig. 2-23 Tape transport check

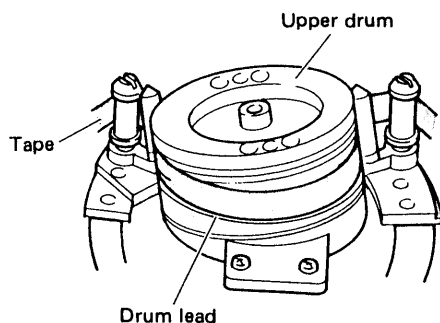


Fig. 2-24 Drum lead check - 2

5. During Play mode, observe the tape at the take-up and supply guide poles and guide rollers. Confirm absence of curling, wrinkling, etc. as shown in Fig. 2-21.
6. If defects are noted the above checks, perform the following adjustments.

#### 2.4.2 Tape transport adjustments

Perform only if defects are noted during tape transport check (2.4.1).

##### A: Guide roller height adjustment

1. Slightly loosen setscrews of the supply and take-up guide rollers as shown in Fig. 2-25.
2. Use a cassette tape and set for Play mode.

3. With a slotted screwdriver, slightly turn the supply guide roller (do not turn more than  $180^\circ$  at a time) and adjust so that at the drum input, the tape travels smoothly in the drum lead without slipping upwards or downwards.
4. Similarly, adjust the take-up guide roller for the drum output.

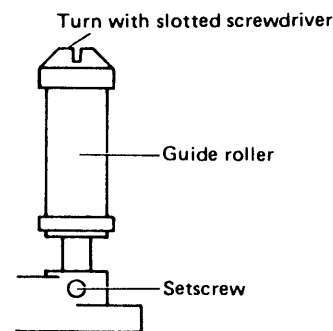


Fig. 2-25 Guide roller height adjustment

#### NOTES:

1. Loosen the setscrews only enough to allow the guide rollers to be turned. If excessively loose, tape motion may turn the rollers inadvertently.
2. Turn the rollers carefully to avoid damage to the tape.

##### B: Guide pole height adjustment

Remove the guide pole cap before take-up guide pole height adjustment.

##### (a) Guide pole height check

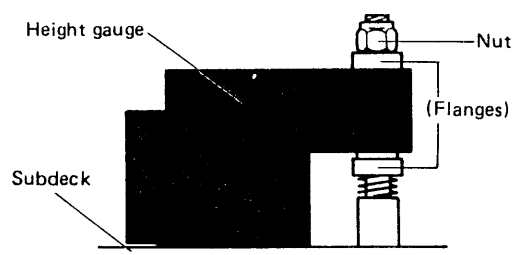


Fig. 2-26 Guide pole height adjustment

1. Set the height gauge on the subdeck as shown in Fig. 2-26.
2. For each guide pole, check the height of the lower face of the upper flange. If necessary, carefully adjust by turning the nut. After adjusting the height using the height gauge, turn the supply side nut  $50^\circ$  counter-clockwise and the take-up side nut  $160^\circ$  clockwise. This will provide the required slight difference in height between the supply and take-up guide poles.
3. If guide pole height has been adjusted, following checks and adjustments are required.



(b) Supply guide pole height adjustment

1. Use a cassette tape and set for Play mode.
2. Use a metric nutdriver to turn the supply guide pole to align the upper flange of the guide pole with the upper edge of the tape as shown by (b) of Fig. 2-21. However, this adjustment must be performed so that at the same time, the upper flange remains within  $\pm 0.5$  mm of the height adjusting jig portion shown in Fig. 2-26.

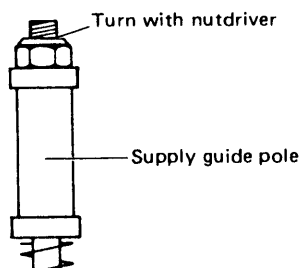


Fig. 2-27 Supply guide pole height adjustment

3. If there is a large discrepancy, check the height of the supply reel disk, tension pole and other mechanical components.

C: Audio/Control head adjustment

1. Employ a cassette tape and set for Play mode.
2. Turn audio/control head screw (C) as shown in Fig. 2-28 and adjust for smooth transport at the take-up guide pole as shown by (b) of Fig. 2-21.

**NOTE:** Do not adjust the height of the take-up guide pole itself.

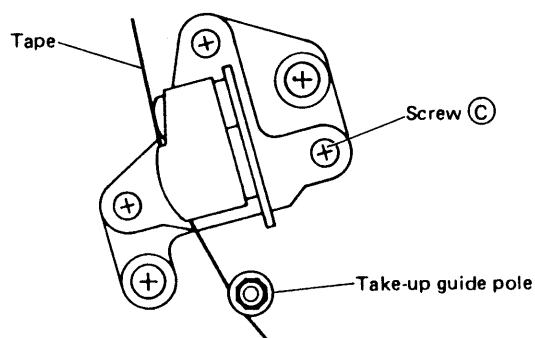


Fig. 2-28 Take-up guide pole

## 2.5 INTERCHANGEABILITY ADJUSTMENT

Before using alignment tape, employ a tape and confirm correct tape transport.

### 2.5.1 Preliminary checks

A: Check sequence 1

1. Connect oscilloscope to TP-106 of the VIDEO board. At this time, trigger the oscilloscope externally with the signal (25 Hz square wave) from TP-411 (DRUM F.F) of the VIDEO board.
2. Play Stairstep portion of the alignment tape MH-2.
3. Turn the Tracking control and adjust for maximum FM output at TP-106.  
Set the Tracking control to AUTO (center click position) and confirm that nearly maximum output is obtained.

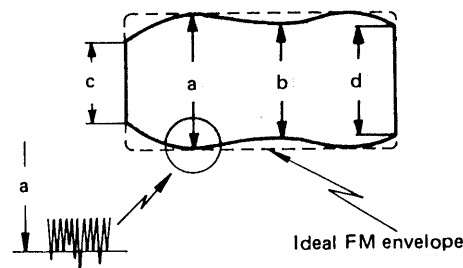


Fig. 2-29 FM waveform (max. output)

4. Refer to Fig. 2-29. Read the level of portion (a) of the waveform. If the waveform is serrated at point (a), read the value at the most uniform serrations as shown at left in Fig. 2-29.

5. Read the maximum FM level (a) and minimum FM level (b), and confirm that:

$$\frac{b}{a} \geq 0.7 \text{ or } 20 \log \frac{b}{a} \geq -3 \text{ dB}$$

6. Read the values at points (c) and (d) [drum input and output] and confirm that:

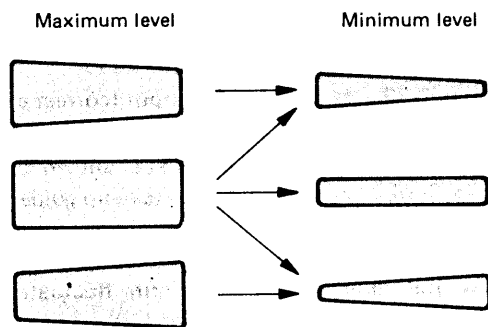
$$\frac{c}{a} \geq 0.5 \text{ and } \frac{d}{a} \geq 0.5 ( \geq -6 \text{ dB} )$$

**NOTES:**

1. Read minimum levels for (b), (c) and (d).
2. If above checks yield normal results, proceed to section 2.5.1 - B.
3. If defects are noted, perform adjustments of section 2.5.2.

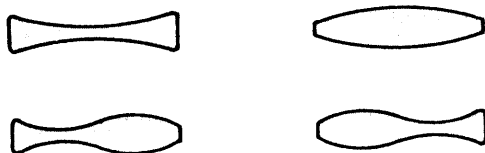
**B: Check sequence 2**

1. Observe the FM waveform as in the previous section (2.5.1 - A) and turn the Tracking control. The waveform variation should be nearly parallel as shown in Fig. 2-30.



**Fig. 2-30** Normal waveform examples

2. If the waveform varies as shown in Fig. 2-31, adjustment becomes required.



**Fig. 2-31** Incorrect waveform examples

**2.5.2 Preliminary adjustments**

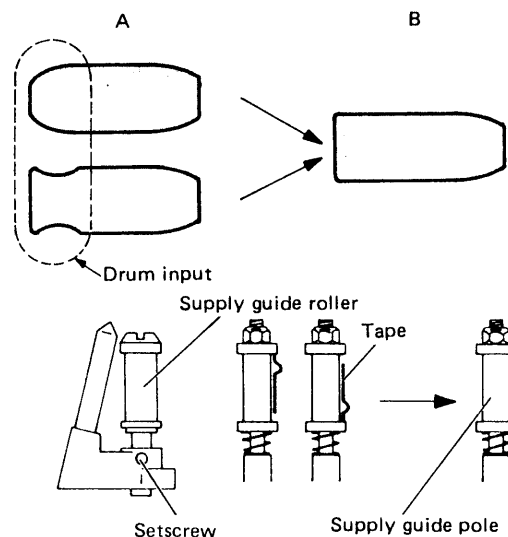
1. Loosen the setscrews of the supply guide roller and take-up guide roller. If the guide rollers turn freely, slightly tighten the setscrews.
2. Connect oscilloscope to TP-106 of the VIDEO board. Trigger the oscilloscope externally with the signal from TP-411 (DRUM F.F) of the VIDEO board.
3. Play the alignment tape (stairstep signal) MH-2.

**A: Drum input**

1. Observe oscilloscope display and adjust the Tracking control for maximum FM output.
  2. Refer to Fig. 2-32. Examples of incorrect waveforms are shown by C in Fig. 2-33, while D indicates the correct adjustment.
- Use a slotted screwdriver to adjust the supply guide roller so that the rising portion (drum input portion) of the waveform becomes flat as shown by B.

**NOTES:**

1. If the guide roller turns freely, tighten the setscrew slightly.
2. Be sure to adjust the guide roller only by small amounts at a time in order to avoid damaging the alignment tape.



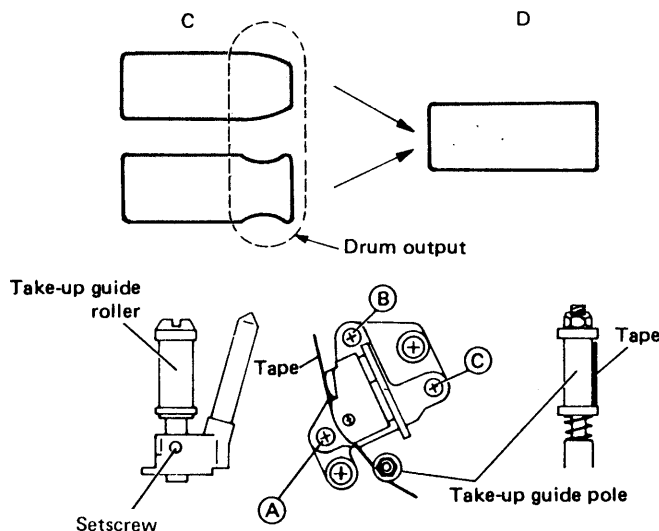
**Fig. 2-32** Drum input adjustment

In addition to observing the waveform, confirm absence of tape slippage or curling at the drum lead and guide poles.

3. At the supply guide pole, if the tape separates from the guide or wrinkling occurs, adjust the guide pole height.

**B: Drum output**

1. In the same manner as for the drum input, turn the take-up guide roller to adjust the falling portion (drum output portion) of the FM waveform. Incorrect examples are shown by C in Fig. 2-33, while D indicates the correct adjustment.
2. If the tape separates from the guide or wrinkling occurs at the take-up guide pole, adjust by turning screw (C) of the audio/control head as shown in Fig. 2-33.



**Fig. 2-33** Drum output adjustment

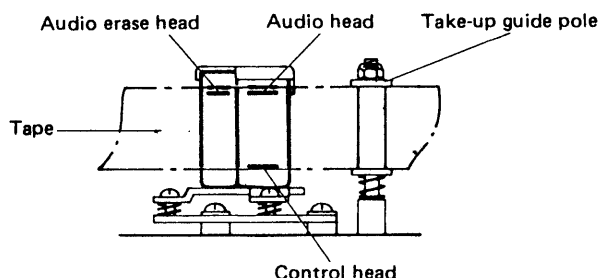


Fig. 2-34 Audio/Control head height

- Carefully and evenly adjust screws (A), (B) and (C) to align the audio/control head height with the tape as shown in Fig. 2-34.

#### NOTES:

- Fine adjustment is not required at this time.  
It is sufficient that the tape is engaged with the guide pole and servo operates stably (control signal picked up).
- If the tape separates from the take-up guide pole or wrinkling occurs, screw (C) (Fig. 2-33) has been turned excessively with respect to screws (A) and (B), causing the audio/control head to incline forward or rearward. Use care to adjust screws (A), (B) and (C) evenly and observe that small wrinkles are not produced at the take-up guide pole.
- Do not disturb the take-up guide pole.

#### 2.5.3 Interchangeability fine adjustment

- Connect oscilloscope to TP-106 of the VIDEO board. Play stairstep segment of the alignment tape MH-2. Observe the FM waveform and adjust the Tracking control for minimum FM output level.

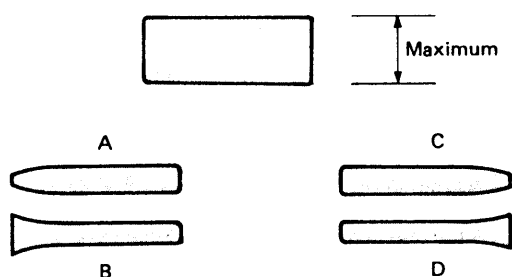


Fig. 2-35 Minimum FM output (incorrect examples)

- If the waveform becomes as shown by A or B of Fig. 2-35, carefully adjust the supply guide roller height so that the waveform becomes as shown by E, F or G of Fig. 2-36.  
At this time, if the waveform fluctuates, adjust to the point of minimum fluctuation.

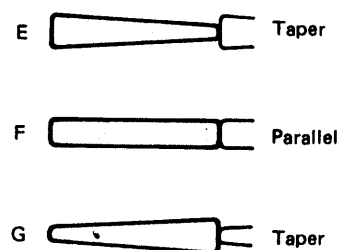


Fig. 2-36 Minimum FM output (correct examples)

- If the FM waveform appears as shown by C or D in Fig. 2-35, carefully adjust the take-up guide roller height to obtain a waveform such as shown by E, F or G of Fig. 2-36.  
At this time, if the waveform fluctuates, adjust to the point minimum fluctuation.
- Vary the Tracking control from maximum to minimum FM output.  
Perform fine adjustment of supply and take-up guide rollers so that waveform variation becomes as shown by E, F or G of Fig. 2-36.

#### 2.5.4 Audio/Control head height, azimuth and inclination

See section 2.3.3 Audio/Control head height and azimuth.

#### 2.5.5 Setscrew tightening

- Check for maximum FM output waveform, maximum audio out and absence of tape wrinkling or other transport irregularities, then secure the guide rollers.  
Perform in Stop mode.
- Since the guide rollers are easily moved, use care when securing.
- After tightening the setscrews, again perform interchangeability final check.

#### 2.5.6 Interchangeability final check

Confirm section 2.5.1 Preliminary checks.

#### 2.5.7 Servo circuit adjustment

- Video head switching position (see section 3.3.4).

#### 2.5.8 Control head phase adjustment

- Connect oscilloscope to TP-106 of the VIDEO board. Trigger the oscilloscope externally with the signal from TP-411 (DRUM F.F) of the VIDEO board.
- Play stairstep portion of the alignment tape MH-2 and observe the oscilloscope display.
- Set the Tracking control to AUTO (center click position).

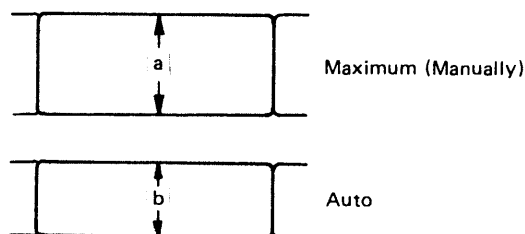


Fig. 2-37 FM output level

4. Confirm that the level difference between this setting and the maximum level obtained manually is:

$$-20 \log \frac{b}{a} \leq 1 \text{ dB or } \frac{b}{a} \geq 0.9$$

5. If necessary, adjust as follows.
6. Set the Tracking control to AUTO and play stairstep segment of the alignment tape MH-2.
7. Loosen two screws (D) and (E) and slide the A/C head assembly fully in the direction to the take-up guide pole.

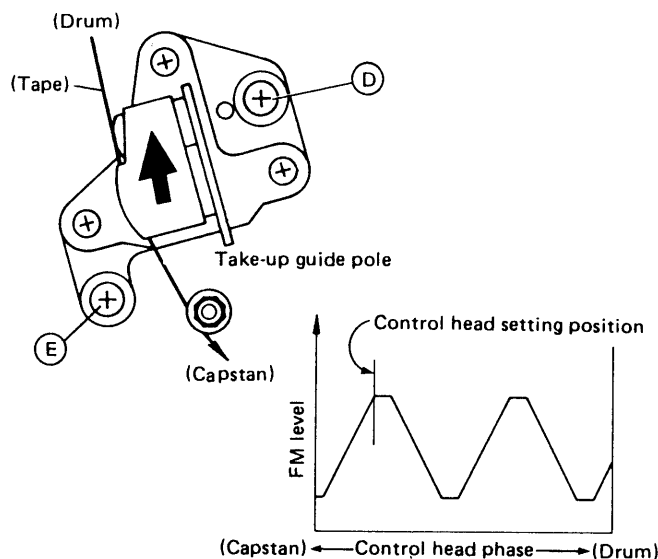


Fig. 2-38 Control head phase adjustment

## 2.5.9 Final checks (recording and playback)

1. Use a blank tape and perform recording and playback. Confirm FM waveform and specifications equivalent to those during playback of alignment tape (stairstep signal). See section 2.5.1.
2. Perform checks and adjustments of the audio recording and playback levels. See section 3.6 Audio circuit.
3. Check other signal systems by referring to section 3 electrical adjustment.

8. Slightly tighten the two screws and play stairstep segment of the alignment tape MH-2.
9. Set the audio/control head position tool (PUJ47351-2) over the screw (D) and insert the pin of the tool into the hole at the side of the screw.
10. Slowly turn the tool and slide the A/C head assembly in the direction of the arrow as shown in Fig. 2-38.
11. Set the A/C head assembly to the position where first maximum FM level is obtained. Tighten two screws (D) and (E).

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## SECTION 3 ELECTRICAL ADJUSTMENTS

### 3.1 PREPARATION

Electrical adjustments are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.

#### 3.1.1 Required test equipment and jig

1. Color TV Monitor
2. Oscilloscope: Wideband
3. Signal generator: Color bar, Stairstep
4. Audio generator
5. Frequency counter
6. Digital voltmeter
7. Alignment tape (MH-2)
8. Regulated DC power supply (5A)

#### 3.1.2 JVC alignment tape contents

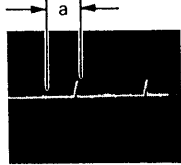

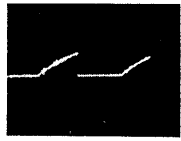
MH-2 contents

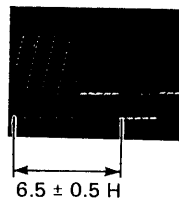
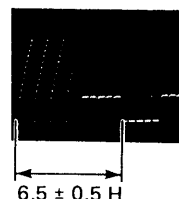
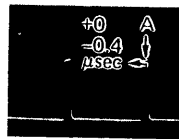
Segment	Playback Time	Video Signal	Audio Signal	Applications
1	10 minutes	Stairstep	6 kHz	<ul style="list-style-type: none"> <li>• Interchangeability checks and adjustments</li> <li>• Servo circuit checks and adjustments</li> <li>• Audio head azimuth adjustments</li> </ul>
2	5 minutes	(none)	3 kHz	<ul style="list-style-type: none"> <li>• Tape speed checks</li> <li>• Wow and flutter checks</li> </ul>
3	10 minutes	Color bar	1 kHz 0dB	<ul style="list-style-type: none"> <li>• Video signal playback circuit checks and adjustments</li> <li>• Audio signal playback circuit checks and adjustments</li> </ul>
4	3 minutes	RF sweep	(none)	<ul style="list-style-type: none"> <li>• Video head resonance checks</li> </ul> <p>Marker: 2 MHz, 4 MHz, 5 MHz</p>

### 3.2 REGULATOR CIRCUIT

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	9.3 V DC Output Voltage	TP2 (SW 9 V) TP3(GND)	R8 (9.3 V ADJ)	REC	<ol style="list-style-type: none"> <li>1. Connect the digital voltmeter between TP2 and TP3.</li> <li>2. Adjust R8 for <math>9.3 \pm 0.1</math> V.</li> </ol>

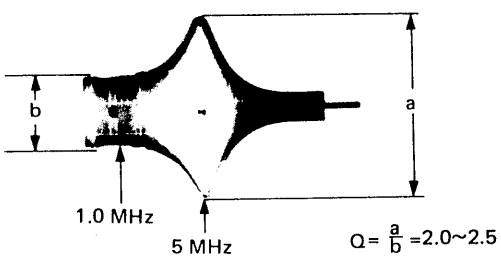
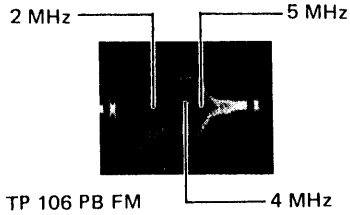
### 3.3 SERVO CIRCUIT

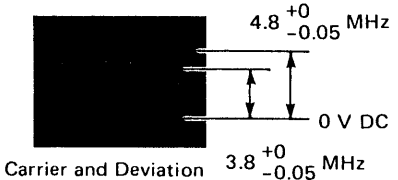
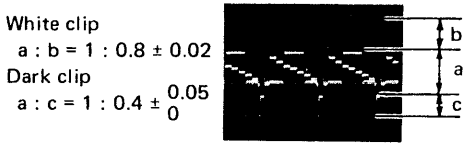
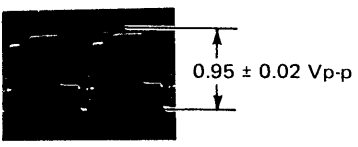
No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Drum Discriminator	TP407 (DRUM S.P. POS.) TP423 (DRUM P/D ERROR)	R463 (DRUM DISCRI)	MH-2 Color bar PB.	<ol style="list-style-type: none"> <li>1. Connect an oscilloscope to TP407 of the A/S/M.CTL board.</li> <li>2. Trigger the oscilloscope externally with the signal from TP411 (DRUM FF.) of the A/S/M.CTL board.</li> <li>3. Play the alignment tape (color bar).</li> <li>4. Adjust R463 so that period "a" becomes fixed and stable.</li> <li>5. Connect the digital voltmeter to TP423 of the A/S/M.CTL board.</li> <li>6. Adjust R463 for <math>4.6 \pm 0.1</math> V.</li> </ol>  <p>TP 407 Drum sampling position</p>
2	Drum Pick Up Pulse Level	TP406 (DRUM PU PULSE)	R459 (D. PU PULSE LEV.)	MH-2 Color bar PB.	<ol style="list-style-type: none"> <li>1. Connect an oscilloscope to TP406 of the A/S/M.CTL board.</li> <li>2. Play the alignment tape (color bar).</li> <li>3. After drum servo is locked, adjust R459 for <math>a = 1.0 \pm 0.1</math> V.</li> </ol>  <p>TP 406 Drum PU pulse level</p>
3	Capstan Discriminator	TP403 (CAP. S.P. POS.) TP422 (CAP. P/D ERROR)	R403 (CAP. DISCRI)	Color bar or TV signal REC	<ol style="list-style-type: none"> <li>1. Connect an oscilloscope to TP403 of the A/S/M.CTL board.</li> <li>2. Record a color bar signal.</li> <li>3. Adjust R403 so that the waveform becomes fixed and stable.</li> <li>4. Connect the digital voltmeter to TP422 of the A/S/M.CTL board.</li> <li>5. Adjust R403 for <math>4.6 \pm 0.1</math> V.</li> </ol>  <p>TP 403 Capstan sampling position</p>

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
4	PB. Switching Point	VIDEO OUT or TP510 (VIDEO OUT)	R450 (CH-1 SW PHASE) R448 (CH-2 SW PHASE)	MH-2 Stairstep PB.	<ol style="list-style-type: none"> <li>1. Connect an oscilloscope to VIDEO OUT or TP510 of the VIDEO board.</li> <li>2. Play the alignment tape (stairstep).</li> <li>3. Trigger the oscilloscope externally (-slope) with the signal from TP411 of the A/S/M.CTL board.</li> <li>4. Adjust R450 to position the trigger point <math>6.5 \pm 0.5</math> H from V. sync.</li> <li>5. Trigger the oscilloscope externally (+slope) with the signal from TP411.</li> <li>6. Adjust R448 to position the trigger point <math>6.5 \pm 0.5</math> H from V. sync.</li> </ol> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <span>CH-1 PB switching point</span> <span>CH-2 PB switching point</span> </div>
5	V. Pulse Position	TV Screen	R446 (V. P POSITION)	MH-2 Color bar PB.	<ol style="list-style-type: none"> <li>1. Set for the STILL playback mode.</li> <li>2. Observe the picture display and adjust R446 for minimum vertical jitter.</li> </ol>
6	H. Discriminator	TP412 (SYNC)	R461 (H. DISCRI)	Color bar REC ↓ PB.	<ol style="list-style-type: none"> <li>1. Connect an oscilloscope to TP412.</li> <li>2. Supply a color bar signal, record then playback.</li> <li>3. Set the trigger slope to pulse (+) and synchronize the oscilloscope with the rising component of the waveform.</li> <li>4. Set the front porch (point A) of the waveform to the center of the oscilloscope display, expand the waveform X5 (five time) and again center point A.</li> <li>5. In the search FF/REW mode, adjust R461 to position the front porch of the H sync waveform at point A (with in <math>\begin{smallmatrix} +0 \\ -0.4 \end{smallmatrix} \mu\text{sec}</math>).</li> </ol> <div style="text-align: center;">  <p>TP 412 SYNC</p> </div>






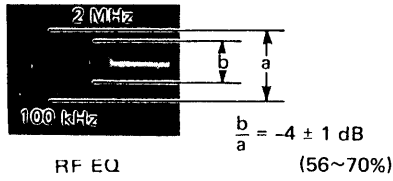
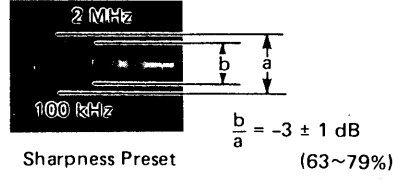
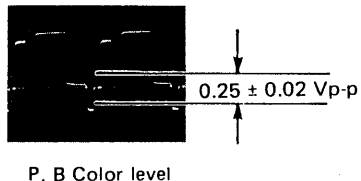
### 3.4 VIDEO CIRCUIT

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Video Head Resonance, Q (Quality) FM Equalizer	Note: This adjustment is generally unnecessary except when replacing the upper drum assembly.			<p>1. Apply the sweep signal from a video sweep generator to TP123 of the VIDEO board.</p> <p>2. Without inserting tape, set for the Play mode. Then adjust the sweep gain so that the waveform does not distort at TP106.</p> <p>3. At TP106 adjust C186 for maximum level at the 5.0 MHz marker position.</p> <p>4. Adjust R200 so that the 5.0 MHz level becomes 2.5 times the 1.0 MHz.</p>  <p>5. In the same manner, adjust C187 and R201 for CH-2.</p>
	A. Factory Service	TP123 (CH-1 REC OUT) TP106 (PB FM)	CH-1 C186 (CH-1 $f_0$ ) R200 (CH-1 Q)	RF Sweep PB.	
		TP124 (CH-2 REC OUT) TP106 (PB FM)	CH-2 C187 (CH-2 $f_0$ ) R201 (CH-2 Q)		
	B. Non-factory Service	TP106 (PB FM)	CH-1 C186 (CH-1 $f_0$ ) R200 (CH-1 Q)	MH-2 RF Sweep PB.	<p>Note: The MH-2 marker appears at 2.0 MHz, 4.0 MHz and 5.0 MHz.</p> <p>1. Trigger the oscilloscope externally with the signal from TP411 of the VIDEO board.</p> <p>2. Play the alignment tape (RF Sweep Signal).</p> <p>3. Use (-) trigger for CH-1 and (+) trigger for CH-2.</p> <p>4. Turn R200 fully clockwise and R201 fully counterclockwise not to damp.</p> <p>5. Adjust C186 to set the CH-1 resonance point to 5.0 MHz and C187 to set the CH-2 resonance point to 5.0 MHz.</p> <p>6. If the levels of CH-1 and CH-2 differ, adjust the higher level channel to match the lower by R200 and R201.</p> <p>7. Record a Video signal, then play back. Confirm absence of flicker and black-white reversal in the reproduced picture. If necessary, carefully re-adjust R200 and R201.</p> 
			CH-2 C187 (CH-2 $f_0$ ) R201 (CH-2 Q)	TV Signal REC ↓ PB.	

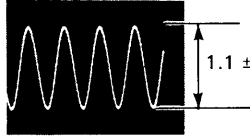

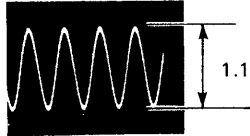
No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
2	Carrier and Deviation	IC103 pin 18  Note: Before adjustment, turn R186 (WHITE CLIP) and R190 (DARK CLIP) fully counterclockwise.  TP106 (PB FM)  Note: These adjustments are generally unnecessary except when replacing IC102 or IC103.	R253 (CARRIER)   R179 (DEVIA-TION)	Color bar REC	<ol style="list-style-type: none"> <li>1. Supply a color bar input signal.</li> <li>2. Connect an oscilloscope to IC103 pin 18 and precisely measure the DC potential of the sync tip. Make a note of this as voltage "A".</li> <li>3. Connect a DC power supply between IC103 pin 18 and ground.</li> <li>4. Without an input signal, set for the REC mode and precisely apply sync tip bias "A" as observed with the oscilloscope.</li> <li>5. Connect a frequency counter to TP106 of the VIDEO board.</li> <li>6. Adjust R253 to obtain <math>3.8 \begin{smallmatrix} +0 \\ -0.05 \end{smallmatrix}</math> MHz.</li> <li>7. Carefully adjust the DC power supply to obtain <math>4.8 \text{ MHz} \pm \begin{smallmatrix} 0 \\ 0.05 \end{smallmatrix}</math> at TP106.</li> <li>8. Precisely read the voltage of IC103 pin 18 with the oscilloscope. Make a note of this as voltage "B".</li> <li>9. Disconnect the DC power supply.</li> <li>10. Supply a color input signal.</li> <li>11. Adjust R179 so that the peak white at IC103 pin 18 becomes equal to voltage "B".</li> </ol>  <p>Carrier and Deviation</p>
3	White and Dark Clip	TP103 (W/D CLIP OUT)	R186 (WHITE CLIP) R190 (DARK CLIP)	Color bar REC	<ol style="list-style-type: none"> <li>1. Supply a color bar signal input.</li> <li>2. Connect an oscilloscope to TP103 of the VIDEO board.</li> <li>3. As shown in the figure, adjust R186 and R190.</li> </ol>  <p>White clip a : b = 1 : 0.8 ± 0.02 Dark clip a : c = 1 : 0.4 ± 0.05</p> <p>TP 103 White and Dark clip</p>
4	E-E Video Level	VIDEO OUT or TP510 (VIDEO OUT)	R168 (E-E LEVEL)	Color bar E-E (STOP)	<ol style="list-style-type: none"> <li>1. Supply a color bar input signal.</li> <li>2. With load at 75 Ω, connect an oscilloscope to VIDEO OUT or TP510.</li> <li>3. Adjust R168 for <math>0.95 \pm 0.02</math> Vp-p.</li> </ol>  <p>E-E Video level</p>

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
5	AFC 625 kHz	TP403 (VCO) TP421 (SW 9 V) TP412 (SUB CONV. OUT)	R427 (AFC)	Color bar REC	<ol style="list-style-type: none"> <li>1. Supply a color bar input signal.</li> <li>2. Connect a <math>470\ \Omega</math> resistor between TP403 and TP421 of the VIDEO board.</li> <li>3. Connect a frequency counter to TP412.</li> <li>4. Adjust R427 to obtain <math>623 \pm 2\ \text{kHz}</math>.</li> </ol>
6	REC FM Level	TP122 (REC CUR- RENT)	R213 (REC FM LEVEL)	Color bar REC	<ol style="list-style-type: none"> <li>1. Supply a color bar input signal.</li> <li>2. Connect an oscilloscope to TP122 of the VIDEO board.</li> <li>3. Adjust R213 so that the pedestal level of the vertical blanking component becomes <math>0.15\ \text{Vp-p}</math>.</li> </ol> <div data-bbox="1051 761 1355 896" data-label="Figure"> </div> <p>TP 122 REC Current</p>
7	VXO (4.43 MHz)	TP406 (VXO)	R437 (VXO(2))	MH-2 Color bar PB.	<ol style="list-style-type: none"> <li>1. Connect a frequency counter to TP406 of the VIDEO board.</li> <li>2. Play the Alignment tape (color bar).</li> <li>3. Adjust R437 for <math>4.433619\ \text{MHz} \pm 50\ \text{Hz}</math>.</li> </ol>
8	REC Color Level	TP404 (PB COLOR)	R411 (REC COLOR)	MH-2 Color bar REC ↓ PB.	<ol style="list-style-type: none"> <li>1. Connect an oscilloscope to TP404 of the VIDEO board.</li> <li>2. Play the alignment tape (color bar), then measure the color level (CH-1). Make a note of this as level "a".</li> <li>3. Supply a color bar signal, record, then playback.</li> <li>4. Adjust R411 so that the color level becomes <math>110 \pm 5\%</math> of the level "a".</li> </ol> <div data-bbox="1061 1487 1305 1624" data-label="Figure"> </div> <p>TP 404 PB color</p>

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
9	Converter Balance	TP423 (CONV. BAL.)	R446 (CONV. BAL.)	Color bar REC ↓ PB.	<ol style="list-style-type: none"> <li>1. Connect an oscilloscope to TP423 of the VIDEO board.</li> <li>2. Supply a color bar signal, record, then playback.</li> <li>3. Adjust R446 for minimum leakage of the 5.06 MHz component.</li> </ol>  <p>TP 423 Conv. Bal</p>
10	PB Y Level	VIDEO OUT or TP510 (VIDEO OUT)	R124 (PB Y LEVEL)	Color bar REC ↓ PB.	<ol style="list-style-type: none"> <li>1. With load at <math>75\ \Omega</math> connect an oscilloscope to VIDEO OUT.</li> <li>2. Supply a color bar signal, record, then playback.</li> <li>3. Adjust R124 for <math>0.95 \pm 0.02</math> Vp-p.</li> </ol>  <p>PB Y level</p>
11	Noise Cancel	TP125 (PEAKING)	R109 (NOISE CANCEL)	Color bar REC ↓ PB.	<ol style="list-style-type: none"> <li>1. Connect a <math>0.022\ \mu\text{F}</math> capacitor between TP125 and TP-GND.</li> <li>2. Connect an oscilloscope to TP125 of the VIDEO board.</li> <li>3. Supply a color bar signal, record then playback.</li> <li>4. Adjust R109 to minimize the output level at TP125.</li> </ol>  <p>TP 125 Peaking</p>

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
12	RF EQ	TP126 (PB Y)	R200 (CH-1 Q) or R201 (CH-2 Q) R145 (RF EQ)	Video sweep REC ↓ PB.	<ol style="list-style-type: none"> <li>1. Connect an oscilloscope to TP126 of the VIDEO board.</li> <li>2. Set the MODE SELECT switch of the terminal to B/W.</li> <li>3. Supply a video sweep (with sync) signal, record, then playback.</li> <li>4. At TP126, measure the 2 MHz levels for CH-1 and CH-2 outputs.</li> <li>5. If the difference of channel level is more than 1 dB, adjust of the Q control (R200 or R201) of the lower level channel to equalize the levels both channels.</li> <li>6. Set the Sharpness control to the center click position.</li> <li>7. Adjust R145 so that the 2 MHz level becomes <math>-4 \pm 1</math> dB (56~70%) with reference to 100 kHz.</li> </ol> 
13	Sharpness Preset	TP510 (VIDEO OUT)	R162 (SHARPNESS PRESET)	Video sweep REC ↓ PB.	<ol style="list-style-type: none"> <li>1. Connect an oscilloscope to TP510 of the VIDEO board.</li> <li>2. Set the Sharpness control to the center click position.</li> <li>3. Record and play back a video sweep (with sync) signal.</li> <li>4. Adjust R162 so that the 2 MHz level becomes <math>-3 \pm 1</math> dB (63~79%) with reference to 100 kHz.</li> </ol> 
14	PB. Color Level	VIDEO OUT	R452 (PB COLOR LEVEL)	Color bar REC ↓ PB.	<ol style="list-style-type: none"> <li>1. With load at <math>75 \Omega</math> and connect an oscilloscope to VIDEO OUT.</li> <li>2. Record and play back a color bar signal.</li> <li>3. Adjust R452 for a burst level of <math>0.25 \pm 0.02</math> Vp-p.</li> </ol> 

### 3.5 AUDIO CIRCUIT (MONO)

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Audio PB. Level	Audio Line Out	R6 (PB LEVEL)	MH-2 1 kHz PB.	<ol style="list-style-type: none"> <li>1. Connect an oscilloscope to AUDIO OUT.</li> <li>2. Play the alignment tape (Audio 1 kHz signal).</li> <li>3. Adjust R6 for <math>-6 \pm 1</math> dBs (<math>1.1 \pm 0.12</math> Vp-p) at AUDIO OUT.</li> </ol>  <p>Audio line out</p>
2	Audio Bias Level	R1 (CN1)	R30 (BIAS CURRENT)	REC	<ol style="list-style-type: none"> <li>1. Connect a digital voltmeter to both end of R1 (CN1) of the A/C Head board.</li> <li>2. Set for the REC mode without signal.</li> <li>3. Adjust R30 for <math>1.2 \pm 0.1</math> mV.</li> </ol> 
3	Audio REC Level	Audio Line Out	R18 (REC LEVEL)	-20 dBs/1 kHz REC ↓ PB.	<ol style="list-style-type: none"> <li>1. Connect an oscilloscope to AUDIO OUT.</li> <li>2. Record and play back a video signal and an audio signal.</li> <li>3. During recording adjust R18 so that the audio output level during playback becomes <math>-6 \pm 1</math> dBs (<math>1.1 \pm 0.12</math> Vp-p).</li> </ol>  <p>Audio line out</p>