

TEAC®

SERVICE MANUAL

A-450

Stereo Cassette Deck with Dolby* System



GENERAL INTRODUCTON

This Service Manual is provided to assist service technicians throughout the world to properly adjust, repair and maintain the TEAC A-450 Stereo Cassette Deck. The A-450 is designed to be used with a high quality stereo amplifier system. It contains many of the standard TEAC features such as selectable BIAS and EQ, DIN, MIC, LINE Inputs, PAUSE Control, Auto-End-Stop, PEAK LEVEL Indicator, Large VU Meters, TAPE RUN Indicator, etc. In addition it has Dolby NR Circuitry, DOLBY FM/COPY Facility, FM MPX Filter, MIC/LINE Mixing, Outer-rotor Motor and unexcelled Wow and Flutter Specs.

If adjustments or repairs are too complicated and are difficult for you to accomplish, or if you have any technical questions, please contact the nearest TEAC Factory Service Department or write directly to a TEAC office, the addresses of which are written on the back cover.

This manual is written specifically for the A-450 Model distributed in the U.S.A. and Canada. However, the differences in models distributed elsewhere is very small. See the chart on page 30 for a comparison of the various models.

NOTE

When ordering replacement parts, please refer to the PARTS LIST which is printed separately from this manual.

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TEAC CORPORATION

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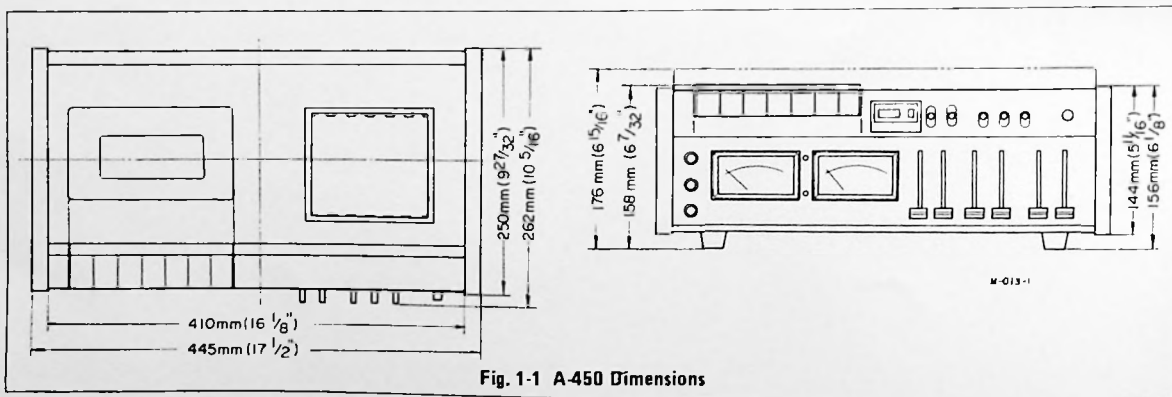


Fig. 1-1 A-450 Dimensions

1. SPECIFICATIONS & SERVICE DATA

SPECIFICATIONS

Track System	4-track, 2-channel stereo
Heads	Two: Erase and Record/Playback
Type of Tape	Cassette tape, C-60 and C-90 (Philips type)
Tape Speed	4.8 cm/s (1-7/8 ips)
Inputs (level and impedance)	Microphones: Min. input level: $-67 \text{ dB} \pm 2 \text{ dB}$ (10 Kohms or more) Line: Specified input level: -5 dB (50 Kohms) Min. input level: $-15 \text{ dB} \pm 2 \text{ dB}$ DIN*: Min. input level: $-35 \text{ dB} \pm 2 \text{ dB}$ DOLBY FM/COPY: $-15 \text{ dB} \pm 2 \text{ dB}$
Outputs (level and impedance)	Line out: Max. output level: $-3.5 \text{ dB} \pm 1 \text{ dB}$ (50 Kohms) Specified output level: -5 dB Headphones: Specified output level: $-21 \text{ dB} \pm 2 \text{ dB}$ (8 ohms)
Equalization	EQ 1: $3180 \mu\text{s} + 70 \mu\text{s}$ (for CrO ₂ tape) EQ 2: $3180 \mu\text{s} + 70 \mu\text{s}$ (for FeCr tape) EQ 3: $3180 \mu\text{s} + 120 \mu\text{s}$ (for regular Hi-Fi tape)
Head Configuration	1/2-track, 1-channel Erase Head 1/4-track, 2-channel Record/Playback Head
Motor	Hysteresis synchronous outer-rotor motor
Bias Frequency	100 kHz
Operating Position	Horizontal
Power Requirements	117V AC, 60 Hz (U.S.A./Canada Models) 100/117/220/240V AC, 50/60 Hz (General Export Models) 220V AC, 50 Hz (Europe Models)
Power Consumption	18 W
Weight	9.5 kg (21 lbs) net

* Pursuant to DIN Standards

SERVICE DATA

Mechanical	
Tape Speed Deviation	3,000 Hz ± 30 Hz
Wow and Flutter	Playback: 0.07% (WRMS) Record/Playback: 0.10% (WRMS)
Pinch Roller Pressure	400 g ± 20 g (13.5 ~ 15.0 oz)
Reel Torque	Take Up: 40 ~ 70 g·cm (0.6 ~ 1.0 oz·inch) Fast Forward: 100 g·cm (1.4 oz·inch) or more Rewind: 100 g·cm (1.4 oz·inch) or more
Fast Winding Time	100 seconds for C-60
End-stop Activate Time	4 seconds ± 2 sec.
Electrical	
Frequency Response	Refer to frequency response limits charts on page 18 and 24.
Signal to Noise Ratio	Playback method: 47 dB minimum Record/Playback method: BIAS/EQ 1: 47 dB minimum BIAS/EQ 2, 3: 45 dB minimum With Dolby Noise Reduction used for recording and playback, S/N ratio is improved by 5 dB at 1 kHz and 10 dB at frequencies over 5 kHz.
Erase Efficiency	65 dB minimum
Channel Separation	30 dB minimum (at 1 kHz)
Crosstalk between Adjacent Tracks	40 dB minimum (at 125 Hz)
Total Harmonic Distortion	BIAS/EQ 1: 2.5% (maximum) BIAS/EQ 2: 2.5% (maximum) BIAS/EQ 3: 2.5% (maximum)

- NOTE: ● Improvements may result in Specifications and Service Data changes.
● Value of "dB" in the Data refer to 0 dB = 0.775V, except where specified. If a Test Set or VTVM calibrated to 0 dB = 1V is to be used, appropriate compensation should be made.

2. TEST EQUIPMENT REQUIRED

1. **Spring scale:** For take-up torque check: 0 – 70 g (0 – 2.5 oz.)
For fast forward & rewind torque checks: 0 – 200 g (0 – 7.0 oz.)
2. **String:** Length: about 50 cm (20")
3. **Cassette Reel Adapter:** Diameter: 22 mm
* The tools above (1 – 3) are constructed as shown in Fig. 2-2.
4. **Cassette Torque Meter:** For take-up torque check: 0 – 100 g·cm (0 – 1.4 oz. inch)
For fast forward & rewind torque checks: 0 – 160 g·cm (0 – 2.2 oz. inch)
* Use of the Cassette Torque Meter instead of the spring scale, if you have one, is recommended for easier measuring. (See Fig. 4-6 on page 13)
* When ordering Cassette Torque Meter, allow for longer delivery time that is required for it.
5. **Spring scale:** For Pinch Roller pressure check: 0 – 1 kg (2.2 lbs)
6. **Wow/flutter meter:** MEGURO DENPA SOKKI K.K., Model MK-668A
7. **Frequency counter:** Digital type, capable of 10 Hz to 100 kHz indication.
8. **AF oscillator:** 10 Hz – 100 kHz
9. **AC VTVM:** 0.1 mV – 300 V
10. **Attenuator:** General Purpose
11. **Distortion analyzer:** Basic frequency 400 Hz/1 kHz
12. **Oscilloscope:** General Purpose
13. **Band-pass filter:** 1 kHz narrow band-pass type
14. **Test load resistor:** Non inductive type 8 ohm/1 W
15. **Plastic alignment tool:**
16. **Head demagnetizer:** TEAC E-1 or equivalent
17. **Cleaner:** TEAC TZ-261 Tape Recorder Cleaner kit or pure alcohol
18. **Oil:** TEAC TZ-255 Oil kit or equivalent

TEAC TEST TAPE

REMARKS: 0 dB = DIN Reference Level (333 Hz)

For tape speed & wow/flutter test

- MTT-111: • For Playback method
• 3,000 Hz/–10 dB
- MTT-502: • For Record/playback method (blank tape)

For playback performance alignment

- MTT-150: • For Dolby level Calibration
• Dolby B-type tone (modulated 400 Hz tone), 200 nWb/m
- MTT-116K: • For frequency response test for EQ 1 & 2 (CrO₂ & Fe-Cr)
• 3180 μs + 70 μs
• 315 Hz/–4 dB, 31.5 Hz – 14 kHz/–24 dB
- MTT116U: • For frequency response test for EQ 3 (Hi-Fi tape)
• 3180 μs + 120 μs
• 315 Hz/–4 dB, 31.5 Hz – 14 kHz/–24 dB

For record performance alignment (blank tape)

- MTT-505TB: For BIAS 1/EQ 1 (CrO₂)
- MTT-504T: For BIAS 2/EQ 2 (Fe-Cr)
- MTT-501: For BIAS 3/EQ 3 (Hi-Fi tape)

NOTE: The TEAC test tapes require longer delivery time.



Fig. 2-1 TEAC Test Tape

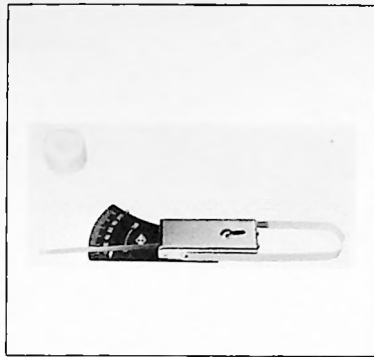


Fig. 2-2 Spring Scale & Cassette Reel Adapter

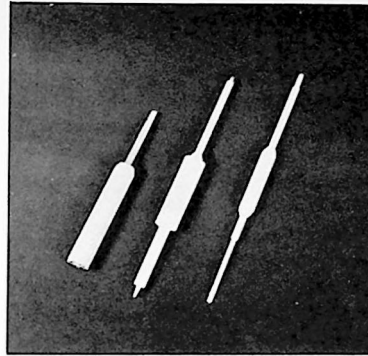


Fig. 2-3 Plastic Alignment Tool

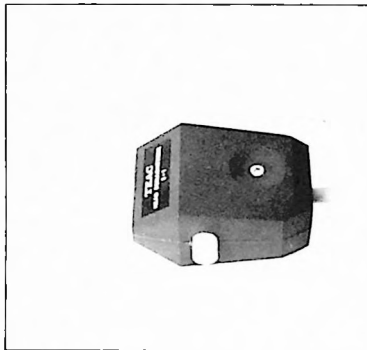


Fig. 2-4 E-1 Head Demagnetizer



Fig. 2-5 TZ-261 Tape Recorder Cleaner Kit



Fig. 2-6 TZ-255 Oil Kit

3. PARTIAL DIS-ASSEMBLY OF MAIN PARTS

NOTE

1. Use the proper tools. Demagnetize the tools before use.
2. When mounting or removing a spring, pay heed to the position (direction) of the anchor or hook. The wrong position may result in a change in the tension.
3. When reassembling, don't forget to reinstall all hardware such as springs and washers, etc.
4. For assembling hardware shape identification, see ASSEMBLING HARDWARE CODING LIST on the Parts List.

3-1. CASE/FRONT PANEL

Remove the parts in the following sequence.

1. Left and right Sideboards (C and E)
2. Head Cover (B)
3. Cassette Storage Tray (A)
4. Trim Case Cover (D)
5. Bottom Cover (H)
6. Six Knobs (G)
7. Front Panel (F)

When removing or installing the Front Panel, set the BIAS/EQ Switches to the 2 position and other switches to the upper position to make work easier.

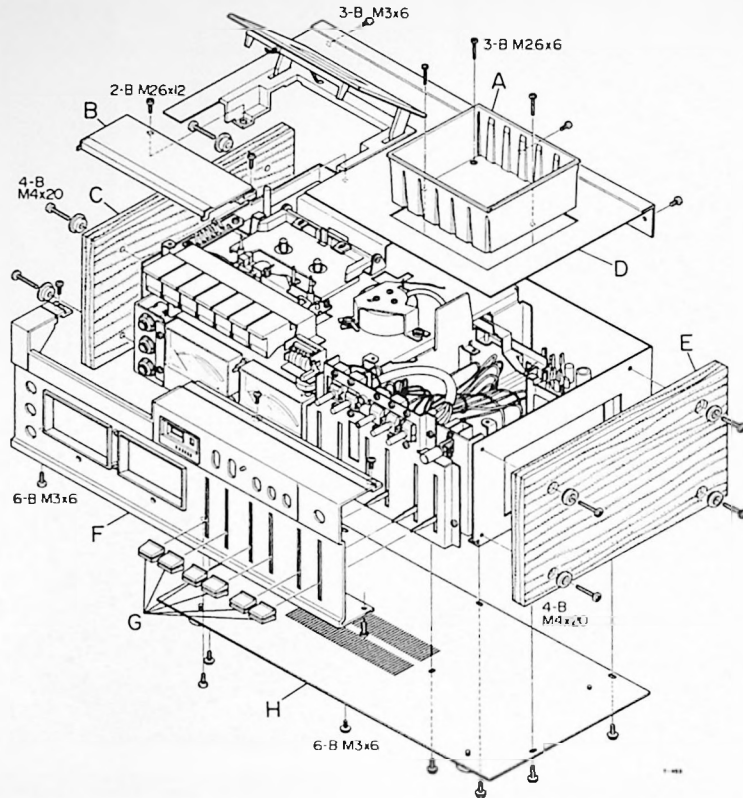


Fig. 3-1 Case/Front Panel Removal

3-2. MOTOR

1. Remove the Trim Case Cover. See the above section.
2. Release the Drive Belt from the Motor Pulley.
3. Unsolder the 3 wires of the Motor Ass'y from the 2L-5P terminal strip located inside of the main chassis. Note the color code and the position of each wire prior to unsoldering the Motor leads.
4. Lift the Motor Ass'y out of the chassis.

NOTE

1. When re-assembling, clean the pulley and the Belt with TEAC TZ-261 Cleaner kit ("A" for the Pulley, "B" for the Belt) or with pure alcohol.
2. Take off or remount the Motor Ass'y taking care not to scratch or otherwise damage the Motor Pulley.
3. When re-attaching the Drive Belt to the Pulley do not twist or stretch the belt.

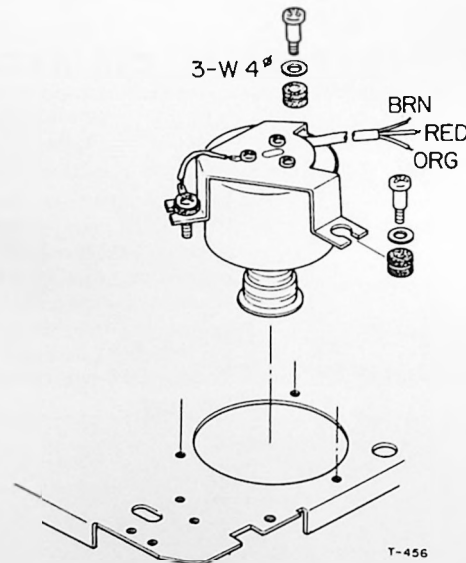


Fig. 3-2 Motor Replacement

3-3. CASSETTE HOLDER

1. Remove the Trim Case Cover. See 3-1 Section on page 6.
2. Loosen the screw (G) and then partially turn the Stopper Bracket (H) in the direction of the arrow to enable the Cassette Holder (D) to be readily removed.
3. Remove the Spring (E) from the hook (C) of the Cassette Holder.
4. Remove the other end of the Spring (E) from the Lever (F) to retain it.
5. Remove the Cassette Holder Shaft (A) by taking off the 2 E-rings to separate the Cassette Holder from the Cassette Holder Retainer (B).
6. Remove the Cassette Holder from the Retainer.
7. If necessary, remove the Retainer from the chassis by taking off the 2 screws.

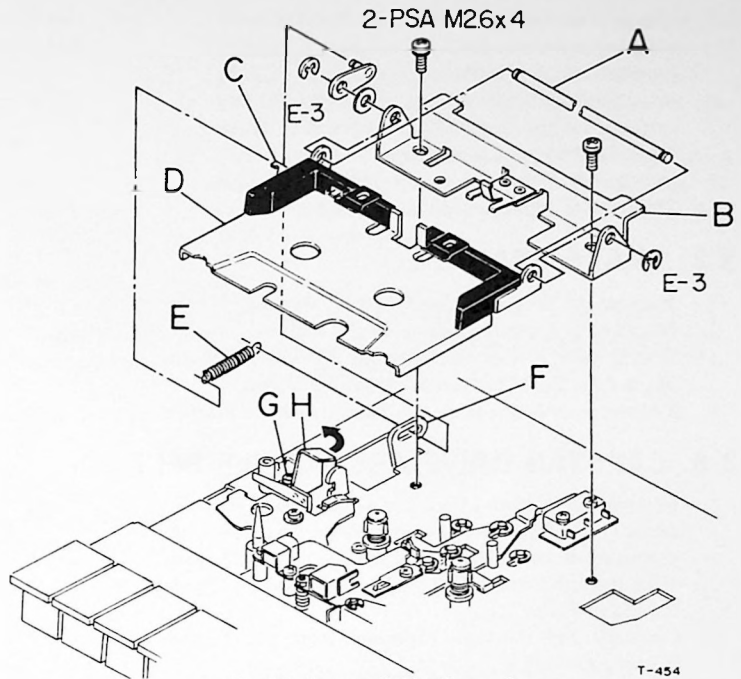


Fig. 3-3 Cassette Holder Removal

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3-4. HEAD/PINCH ROLLER

3-4A. HEAD

After removing the Trim Case Cover (see 3-1), do the following procedure.

1. Unsolder each lead wire from the terminal pin of the heads to facilitate replacement. To re-solder each head wire to the newly replaced head, refer to Fig. 3-5.
2. Lift up the heads after taking off the hardware mounting them. When removing the nut, do not lose Washer (F) and Spring (G).

3-4B. PINCH ROLLER

1. Remove the E-ring (A) and remove the Spring (C) from the hook (D) of the Head Base Plate and the tab of the Pinch Roller Ass'y (B).
2. Remove the Pinch Roller Ass'y from the pivot stud pin (E).

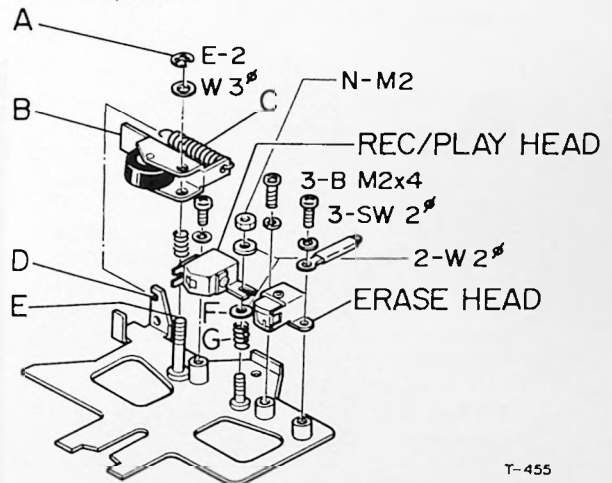


Fig. 3-4 Head/Pinch Roller Replacement

T-455

NOTE

1. After replacing the head, always adjust the head alignment especially the Record/Playback Head's azimuth (see 7-1-1), and then secure the screws and/or the nut with a drop of locking paint.

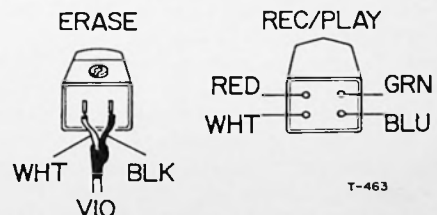


Fig. 3-5 Head Wiring Diagram

T-463

2. Connect the wires to the head terminal pins quickly to prevent breaking of internal wires of the head due to overheating.
3. After replacement, always clean the driving surfaces of the Pinch Roller with the TEAC TZ-261B Rubber Cleaner or with pure alcohol, then proceed directly to the PINCH ROLLER PRESSURE adjustment section. See page 11.

3-5. BRAKE BRACKET

1. Remove the Trim Case Cover. See 3-1 section.
2. Remove the Cassette Holder. See 3-3 section.
3. Detach the 2 E-rings (A) and then take off the Spring (B) and the Brake Bracket (C) from the chassis.
4. Remove each Brake Shoe (D) from the Brake Bracket.

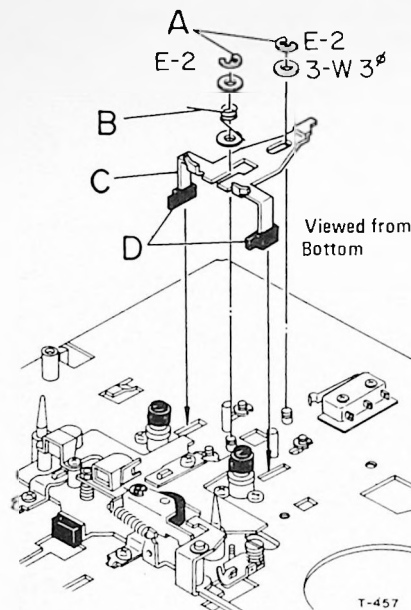


Fig. 3-6 Brake Bracket Removal

3-6. CAPSTAN DRIVE ASS'Y/DRIVE BELT

1. Remove the Bottom Cover. See 3-1 section.
2. Detach the Flywheel Bearing Plate (A) from the mounting studs (D and F) by taking off the 2 screws.
3. Take out the Drive Belt (C) from the Flywheel (B) and the Motor Pulley (G).
4. Carefully lift out the Flywheel from the Capstan Housing Ass'y (E).
5. Remove the Capstan Housing Ass'y from the chassis by unscrewing the 3 screws.

NOTE

1. Since the Capstan Drive Ass'y is a precision part, TEAC specially distributes the Flywheel and the Capstan Housing Ass'y as a whole assembly. Hence, always replace the Flywheel together with the Capstan Housing Ass'y.
2. Clean all driving surfaces of the Flywheel and the Drive Belt with TEAC TZ-261 Cleaner kit ("A" for Flywheel, "B" for Belt) or with pure alcohol.
3. Do not bend the Capstan Shaft as this will increase wow/flutter or speed deviation.
4. During re-assembly re-attach the Drive Belt without twisting or stretching it.
5. The Belt should always be attached right and in the predetermined place.

Lubrication:

For lubrication of the newly replaced Capstan Drive Ass'y, the following should be observed.

1. Apply a drop of a light machine oil of good quality (e.g.: TEAC TZ-255) with an oil applicator to the shaft of the Flywheel and spread oil evenly over the shaft with a flannel cloth. After installing the Flywheel, be sure to clean the tape moving portion of shaft with TEAC TZ-261 A Head Cleaner or with pure alcohol.

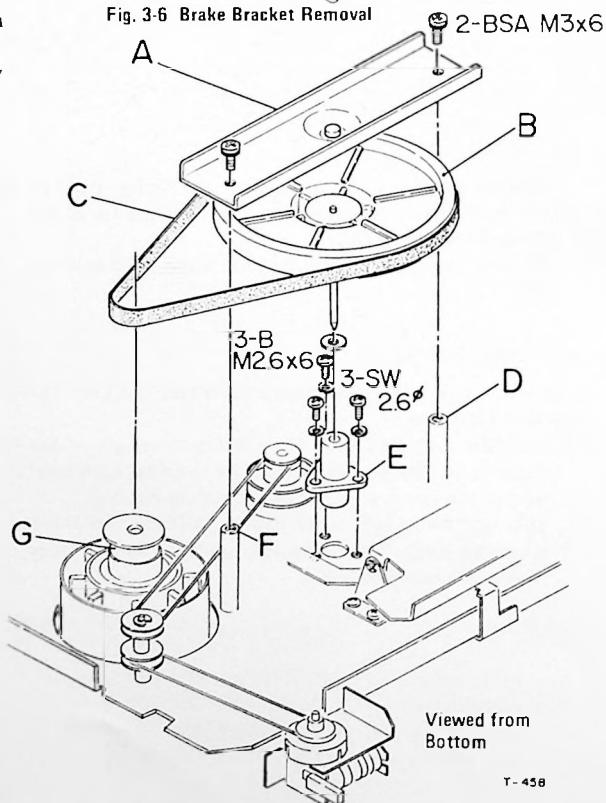


Fig. 3-7 Capstan Drive Ass'y/Drive Belt Replacements

2. Apply a drop of the proper oil in the same way as above to the innermost area of capstan shaft (next to the Flywheel).
3. Apply a film of light grease to the well of the Flywheel Bearing Plate.

3-7. REEL TABLE

1. Remove the Trim Case Cover. See 3-1 section.
2. See Fig. 3-8 for step 2 to 4. Remove the Spring (A) from the hook (B) of the Cassette Holder (D).
3. Loosen the screw on the Stopper Bracket (C) and then partially turn the Bracket in the direction indicated by the arrow.
4. Rotate the Cassette Holder away from the Reel Tables (E and F).
5. Remove the Bottom Cover. See 3-1 section.
6. Remove the Drive Belt and the Flywheel. See 3-6.
7. See Fig. 3-9 for step 7 to 9. When only the Supply Reel Table (J) is to be removed, first take out the Back

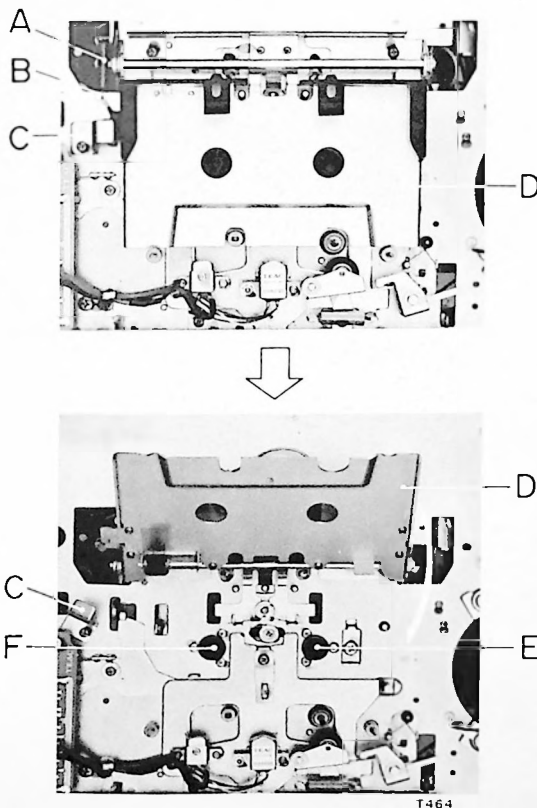


Fig. 3-8 Rotation of Cassette Holder

8. Tension Bracket (H) riding in the Wheel by taking off the Screw (G). At this time, note the predetermined position (direction) of the Spring (I) for reinstalling.
8. For Detaching the Take-up Reel Table (K), first take out the Large Counter Belt (L).
9. Take off the screws mounting the Reel Table which requires replacement; next, with the PLAY key depressed to release the Brake Shoes (M) from the Reel Tables, pull out the table.

NOTE

Always replace the complete Reel Table Ass'y as an entire assembly, "Take-up" or "Supply".

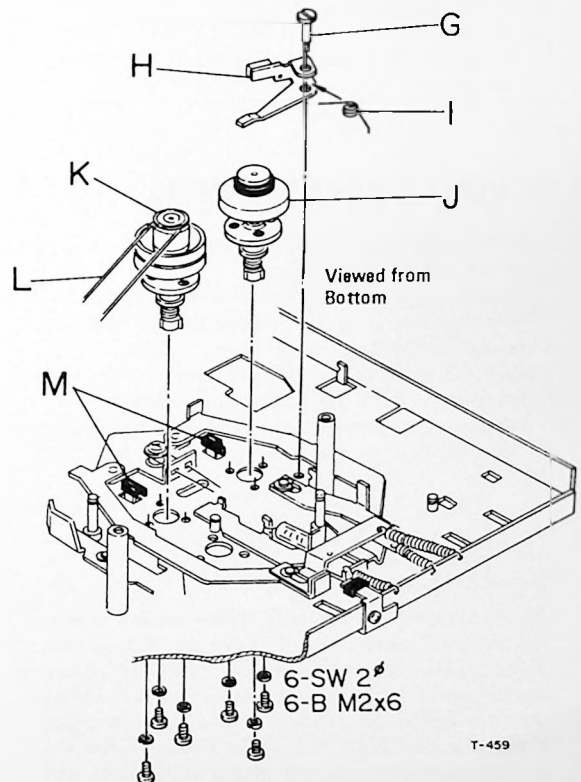


Fig. 3-9 Reel Tables Replacement

3-8. FAST WIND ROLLER ASS'Y

1. Remove the Trim Case Cover. See 3-1 section.
2. Rotate the Cassette Holder away from the Reel Tables. See 3-7 section on page 9.
3. Remove the Bottom Cover. See 3-1 section.
4. Remove the Drive Belt and the Flywheel. See 3-6.
5. Remove the Spring (C) from the hook (G) of the F.F. Lever.
6. Gently take off the 2 E-rings (B and H) and lift out the Fast Wind Roller Ass'y (A) from the stud (F). In doing this do not tilt the assembly at any angle as this may damage the Roller Pin (D) and the Spring (E) or cause them to be bent or broken.
7. If it is necessary to further disassemble the Fast Wind Roller Ass'y, refer to the DETAIL OF "A" figure.

NOTE

During remounting of the removed Fast Wind Roller Ass'y, do the following:

1. Lubricate the entire shaft with a thin application of light machine oil. (e.g.: TEAC TZ-255)
2. Clean the Fast Wind Belt and all friction surfaces of the Rollers with TEAC TZ-261B Rubber Cleaner or with pure alcohol before re-installing the Belt.

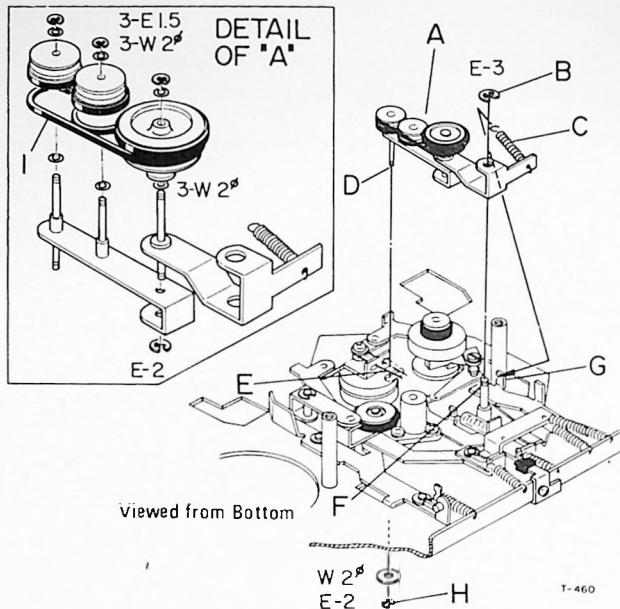


Fig. 3-10 Fast Wind Roller Ass'y Replacement

3-9. POWER TRANSFORMER

1. Remove the Trim Case Cover and the Bottom Cover. See 3-1 section on page 6.
2. Unsolder each wire of the Power Transformer (B). Note the color code and position of each wire prior to unsoldering the Transformer leads.
3. Take off the 4 screws (G) and remove the complete Transformer Ass'y (A) from the main chassis.
4. Separate the Transformer body and the Mounting Plates (D, E, F) by taking off the 2 screws (C).

NOTE

When reinstalling the new Transformer, loosely tighten the 2 screws (C) to attach the Transformer body and the mounting plate (E). Then after attaching the complete Transformer Ass'y (A) to the main chassis, position the transformer body by sliding it in either direction as shown by the arrows to find the position that produces the lowest hum. After this, firmly tighten the 2 screws (C).

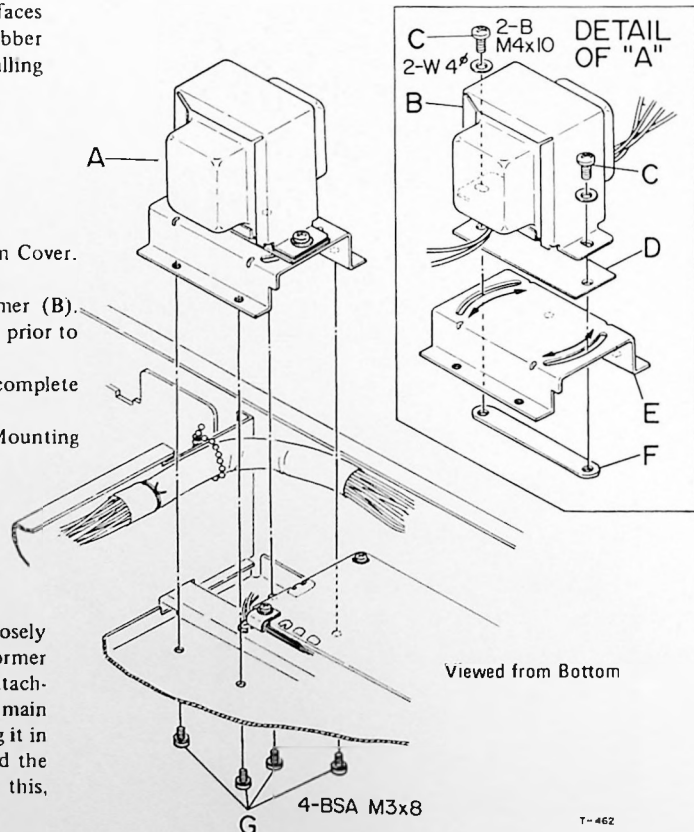


Fig. 3-11 Power Transformer Replacement

3-10. PLAY IDLER ASS'Y

1. Remove the Bottom Cover. See 3-1 section.
2. Take out the Drive Belt and the Flywheel. See 3-6.
3. Lift off the Play Idler Ass'y (B) with the Spring (C) removed from the mounting pin (E) and the E-ring (A) taken off from the pivot stud pin (D).
4. For further disassembly of the Play Idler Ass'y, refer to the DETAIL "B". When remounting, clean the driving surface of the Idler with the TEAC TZ-261B Rubber Cleaner or with pure alcohol.

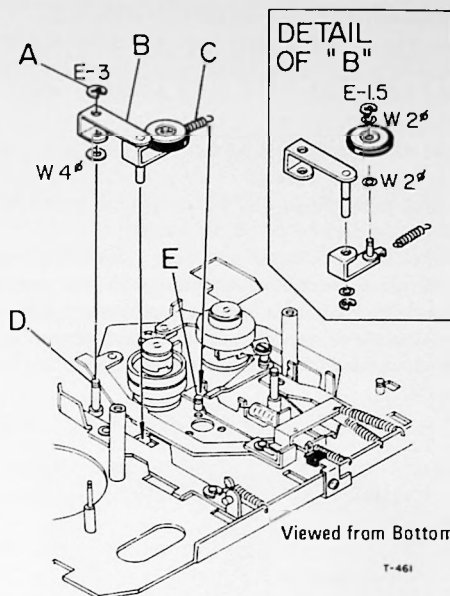


Fig. 3-12 Play Idler Ass'y Replacement

4. MECHANICAL CHECKS AND ADJUSTMENTS

NOTE

All the mechanical checks and adjustments should be done with the Trim Case Cover removed. (See Section 3-1)

4-1. PINCH ROLLER PRESSURE

Specification: 400 g \pm 20 g (13.5 ~ 15.0 oz.)

1. Switch on POWER.
2. Place the deck in the PLAY mode with no tape loaded.
3. Attach the spring scale to the Pinch Roller shaft as shown in Fig. 4-1.
4. Gently pull the scale away (in the direction of the arrow) until the Capstan shaft and the Pinch Roller are completely separated.
5. Gradually release the tension on the scale until the Pinch Roller just begins to rotate. The scale should then be reading approximately 400 g \pm 20 g (13.5 ~ 15.0 oz.).
6. If the reading is out of specified range, adjust the tension of the Pressure Spring by bending the tab of the Pinch Roller Ass'y slightly.

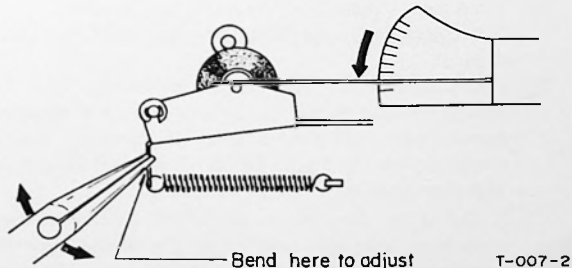


Fig. 4-1 Pinch Roller Pressure Measurement

4-2. TAKE-UP TORQUE

Specification: 40 ~ 70 g·cm (0.6 ~ 1.0 oz·inch)

1. Rotate the cassette holder away from the reel tables. See 3-7 section.
2. Switch on POWER.
3. Set the Cassette Reel Adapter (22 mm Dia.), connected to the spring scale (0 ~ 70 g, or 0 ~ 2.5 oz.) by the string as shown in Fig. 4-2 on the Take-up Reel Table.
4. Place the deck in the PLAY mode.
5. Allow the rotation of the Reel Table to pull the scale pointer toward the Adapter with the spring scale moving in the same direction at nearly the same speed as the tape would be moved, and obtain the scale reading. Make reading only when the pointer becomes stable.
6. The scale should indicate Force of 36 ~ 64 g (1.3 ~ 2.2 oz.). This corresponds to a torque of 40 ~ 70 g·cm (0.6 ~ 1.0 oz·inch). For the torque calculation, refer to Fig. 4-3.
7. If the reading is out of specified range, clean the driving surfaces of the Reel Table Ass'y, and all other driving parts relative to the take up torque function with the TEAC TZ-261B Rubber Cleaner or with pure alcohol
8. If the above cleaning is ineffective for torque correction, replace the Reel Table Ass'y. (See Section 3-7)

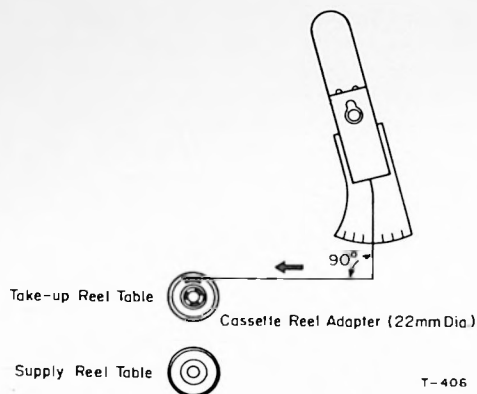
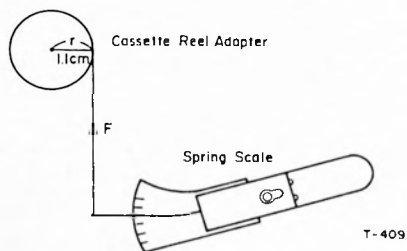


Fig. 4-2 Take-up/Fast Forward Torque Measurement



$$T = F \times r$$

T: torque (g·cm)

F: force (g)

r: radius (cm)

For example:

If F = 41 g

$$T = F \times r$$

$$= 41 \times 1.1$$

$$\approx 45 \text{ (g·cm)}$$

Consequently the torque is 45 g·cm.

Fig. 4-3 Torque Calculation Method

4-3. FAST FORWARD TORQUE

Specification: 100 g·cm (1.4 oz·inch) or more

1. Repeat step 1 and 2 in 4-2 above.
2. Set the Cassette Reel Adapter (22 mm Dia.), connected to the spring scale (0 ~ 200 g, or 0 ~ 7.0 oz.) by the string as shown in Fig. 4-2, on the Take-up Reel Table.
3. Place the deck in the Fast Forward mode.
4. Allow the rotation of the Reel Table to pull the scale pointer toward the Adapter, and obtain the scale reading. Do not read until the pointer becomes stable.
5. The scale should indicate 91 g (3.2 oz.) or more. This corresponds to a torque of 100 g·cm (1.4 oz·inch) or more.
6. If the indication is out of specified range, clean the driving surfaces of the Reel Table Ass'y and all other driving parts relative to the fast forward torque function with the TEAC TZ-261 B Rubber Cleaner or with pure alcohol.
7. If the above cleaning is ineffective for the torque correction, bend the spring (see Fig. 4-5) to get the specified torque value.

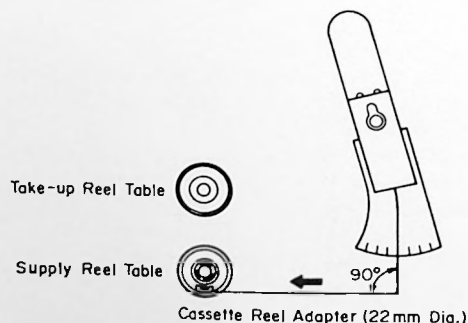


Fig. 4-4 Rewind Torque Measurement

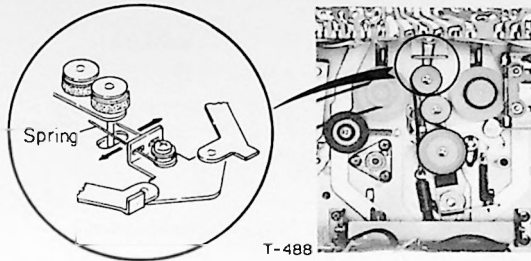


Fig. 4-5 F. FWD & Rewind Torque Measurement

4-4. REWIND TORQUE

Specification: 100 g cm (1.4 oz·inch) or more

1. Repeat the 4-3 procedure, but use the Supply Reel Table and Rewind mode for measuring the rewind torque. (See Fig. 4-4)
2. The specified value is the same as that of the fast forward torque. See step 5 in 4-3.

TORQUE MEASUREMENT USING THE CASSETTE TORQUE METER

The torque measurements can be easily done with the Cassette Torque Meter indicated below.

For take-up torque measurement: 0 ~ 100 g·cm

For fast forward and rewind torque measurements: 0 ~ 160 g·cm

By use of this, it is possible to directly obtain the torque value without calculation, and to do the measurement simply with no removal of any parts. If repairs are necessary, the Trim Case Cover and the Bottom Cover must be removed.

Load the Meter on the deck and read the pointer indication on the dial scale for each tape movement operation.

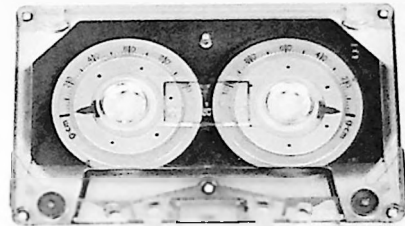


Fig. 4-6 Cassette Torque Meter

4-5. BRAKE TENSION

1. Switch on POWER.
2. Load a TEAC MTT-501 test tape.
3. Check for excess slack or tightness of the tape when operation is changed from play, fast forward and rewind mode to stop mode, respectively.
4. If brake action is too "tight" or "loose", adjust by bending the arms of the Brake Bracket in or out as shown by the arrows in Fig. 4-7.

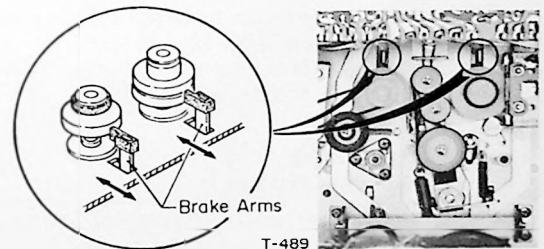


Fig. 4-7 Brake Tension Adjustment

4-6. TAPE SPEED/WOW AND FLUTTER

Specification:

Tape Speed Deviation: 3,000 Hz \pm 30 Hz
Wow and Flutter: Playback: 0.07% (WRMS)
Record/Playback: 0.10% (WRMS)

NOTE

1. Before performing this adjustment, clean all parts in the tape path, particularly the Capstan, the Pinch Roller and the Heads with the appropriate liquid from the TEAC TZ-261 Cleaner Kit or with pure alcohol.
2. Wow and flutter should be checked in two ways: Playback only and Record/Playback methods. First check, and correct if necessary, tape speed and wow and flutter using the playback only method. Then measure wow and flutter using record and playback method.
3. As the measured results may vary with respect to location on tape at which it was taken, three points – at beginning, middle and near the end of the tape – should be measured.

4-6-1. TAPE SPEED

1. Connect test equipment to the deck, except the AF oscillator, as shown in Fig. 4-8.
2. Set the OUTPUT control on the deck to proper setting.
3. Set the EQ switch to the "3" position, and then load and play a TEAC MTT-111 test tape (3,000 Hz signal is recorded).
4. Verify the reading on the frequency counter is within the specified range of 3,000 Hz \pm 30 Hz.
5. If the tape speed is extremely out of the specification, check the Pinch Roller pressure and the tape driving function for correction, and make sure the tape path is clean.

4-6-2. WOW AND FLUTTER

After making the tape speed measurement, perform the wow and flutter test using the Playback Method and the Record/Playback Method successively.

PLAYBACK METHOD

1. Repeat steps 1 – 3 in 4-6-1.
2. Read the indication on the wow and flutter meter.
3. The wow and flutter value should be 0.07% WRMS, max.
4. If the wow and flutter is out of the specification, check the Pinch Roller pressure and the take-up torque, and see that the tape path is clean, and that the Capstan Belt is not stretched or oily.
5. If the above checks are ineffective for excessive wow and flutter correction, repair or replace the Pinch Roller, the Capstan Belt and/or any other defective parts.

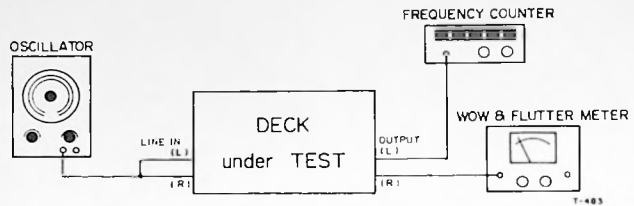


Fig. 4-8 Tape Speed/Wow and Flutter Measurement Setup

RECORD/PLAYBACK METHOD

NOTE

When using this method, adopt the maximum wow and flutter value obtained by repeated play and stop modes of operation. This operation is necessary to make sure wow and flutter content between record and playback will not be in phase to create a false reading.

1. Connect test equipment to the deck as shown in Fig. 4-8.
2. Set both LINE and OUTPUT controls on the deck to proper setting.
3. Load a TEAC MTT-502 test tape (blank) and set the BIAS/EQ switches in the "3" positions.
4. Apply and record a 3,000 Hz signal.
5. Rewind and play this recorded portion.
6. Read the indication on the wow and flutter meter.
7. The wow and flutter value should be 0.10% WRMS, max.
8. If the measured value is out of the specification, repair using the same methods as stated in steps 4 – 5 in the Playback Method procedure.

BOTTOM VIEW w/ FLYWHEEL REMOVED

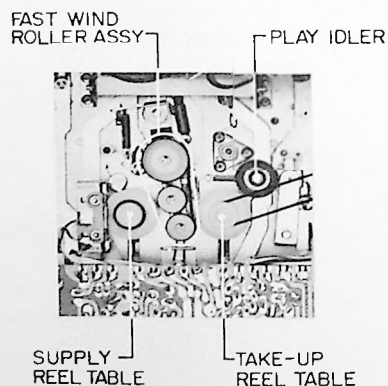
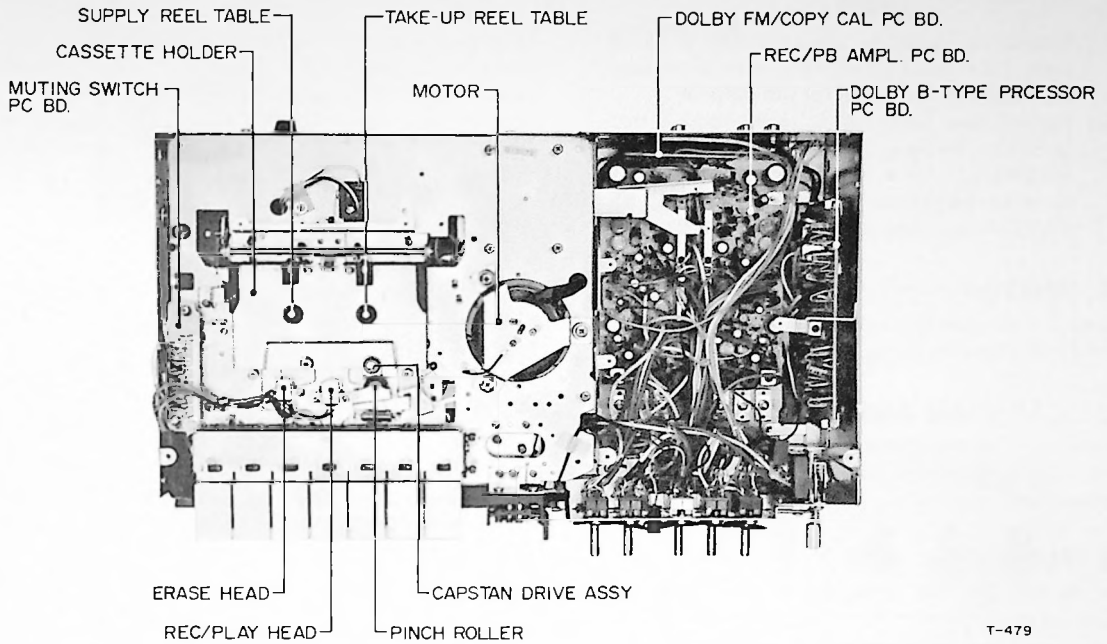


Fig. 5-1 Bottom View w/Flywheel Removed

5. PARTS LOCATION

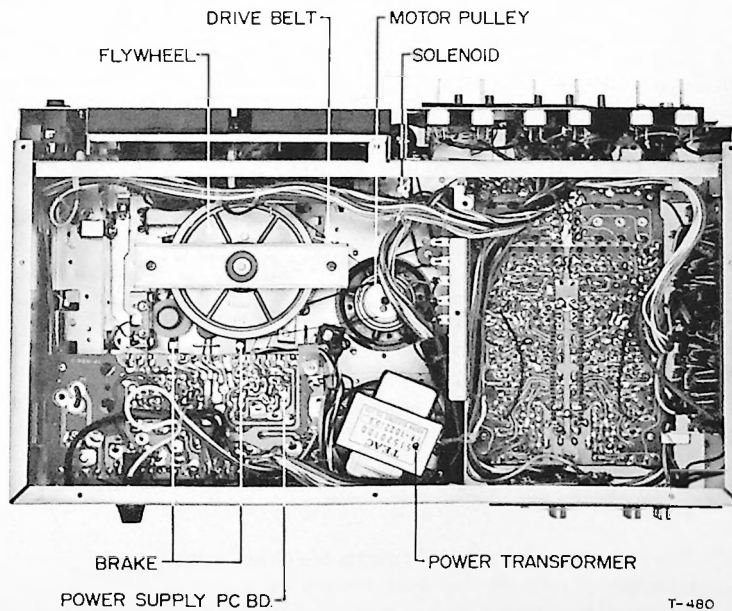
TOP VIEW



T-479

Fig. 5-2 Top View

BOTTOM VIEW



T-480

Fig. 5-3 Bottom View

6. LUBRICATION

NOTE

1. Lubrication should be generally done at about every 1,000 hours of operating time of the tape deck. Use high quality oil for this purpose.
2. For efficient oiling, it is recommended that lubrication be done after nearly 1 hour of idling of the deck.
3. No other lubrication is normally necessary with the following exceptions.

6-1. MOTOR

Apply 1 or 2 drops (approx. 0.2 cc) of a light machine oil with an oil applicator to the oiling hole of the Motor.

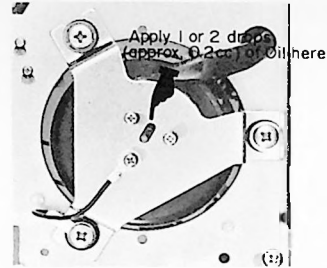


Fig. 6-1 Lubrication of Motor

6-2. CAPSTAN ASS'Y

Apply 1 or 2 drops (approx. 0.2 cc) of a light machine oil with an oil applicator to the shaft bearing portion of the Capstan Assy.

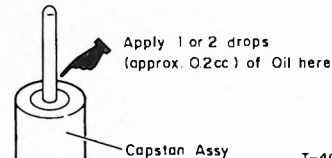


Fig. 6-2 Lubrication of Capstan Ass'y

6-3. FLYWHEEL ASS'Y

See Section 3-6 for lubrication of the newly replaced Flywheel Assy.

7. ELECTRICAL CHECKS AND ADJUSTMENTS

GENERAL NOTICE

1. Before performing adjustments on the amplifier section of this deck, thoroughly clean and demagnetize the entire tape path, particularly erase head, record/playback head, capstan shaft and pinch roller.
 2. Make sure the deck is set for the proper voltage and frequency for your locality.
 3. In general, checks and adjustments for other than specified items, are done in the sequence of left channel then right channel. Double designated REF. NO. indicates left channel/right channel (example: VR101/201).
 4. Value of "dB" in the text refers to 0 dB = 0.775 V, except where specified. If a VTVM calibrated to 0 dB = 1 V is to be used, appropriate compensation should be made.
 5. The VTVM used in the procedures, including the measurement at CAL test points, must have load impedance of 1 M Ω or more.
 6. To correctly complete these performance checks, keep the order as explained in this chapter.
 7. All checks and adjustments should be made with all Cabinet parts, except for the Front Panel, removed. (See Section 3-1)
- * For each procedure, make the initial equipment test set up, connections and switch/control settings as shown in the associated illustrations.
- ** Each of the switches shown in the boxed-in area of the photograph have effect on the procedures.

7-1. PLAYBACK PERFORMANCE

NOTE

Except for the Playback Frequency Response checks, all alignments in the **PLAYBACK PERFORMANCE** only have to be done with the EQ switch set to position 3 unless there is a special reason which requires that other positions also be checked.

7-1-1. RECORD/PLAYBACK HEAD AZIMUTH ADJUSTMENTS

1. Load and play a TEAC MTT-150 test tape.
2. Make sure the phase relationship between the 2 signals (left channel and right channel) is within 45° on the oscilloscope.
3. Load a TEAC MTT-116U test tape.
4. Play the 10 kHz signal section of the tape.
5. Slowly adjust the azimuth adjusting nut for the maximum indication on the VTVM.
6. Secure the nut with a drop of locking paint.

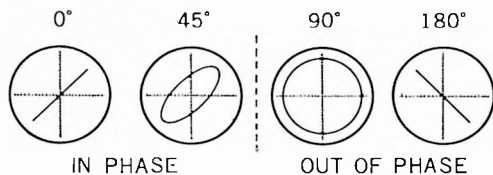


Fig. 7-1 Confirming Phase Relationship

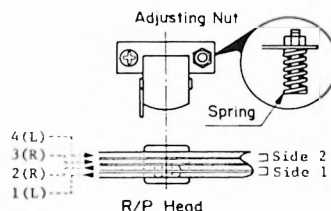


Fig. 7-2 Head Azimuth Adjustments Location

7-1-2. SPECIFIED OUTPUT LEVEL SETTING

1. Load and play a TEAC MTT-150 test tape.
2. Adjust VR102/202 for 100 mV (-18 dB) on VTVM connected to the CAL test points.
3. Change the VTVM connection to the OUTPUT jacks.
4. Set the OUTPUT controls fully clockwise.
5. Confirm that the output level is -3.5 dB \pm 1 dB (461 mV \sim 580 mV).
6. Set the OUTPUT controls for a reading of -5 dB (435 mV). This is the specified output level. At this time, the physical position of the OUTPUT controls indicates the Specified Control Settings referred to in subsequent procedures.

IMPORTANT

After this setting is done, do not disturb the Specified Control Setting of the OUTPUT controls until the remaining checks and adjustments are completed.

CONNECTION

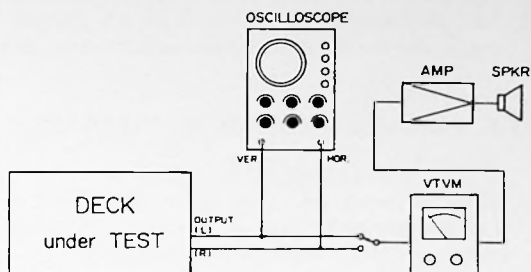
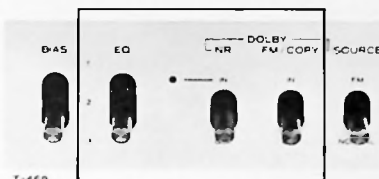


Fig. 7-3 Connection

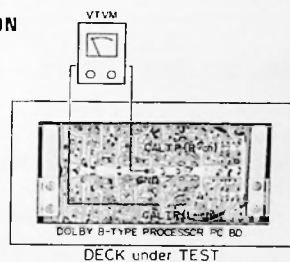
SWITCH & CONTROL SETTING:



OUTPUT Control: Proper setting

CONNECTION

(A)



(B)

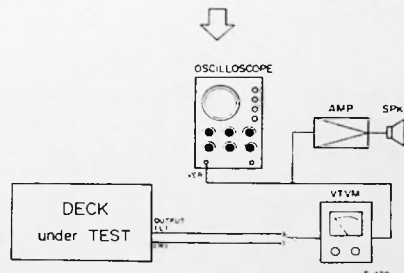


Fig. 7-4 Connections

SWITCH & CONTROL SETTING: Same as 7-1-1.

7-1-3. VU METER CALIBRATION —PLAYBACK—

7. Adjust VR107/207 for +3 VU (□□) on the VU meter.
8. Set the DOLBY NR switch to the IN position and make sure the VU meter indication is the same, also.

7-1-4. FREQUENCY RESPONSE —PLAYBACK—

NOTE

In the following procedure, adjust VR101/201 so that the measured values on all setting of the EQ switch are within the specified response limits.

Hi-Fi TAPE

9. Load a TEAC MTT-116U test tape and play its test signals from 40 Hz up to 14 kHz.
10. Adjust VR101/201 so that the readings of the higher frequency signals on the VTVM are within the response limits.

CrO₂ & Fe-Cr TAPES

11. Repeat the above procedure, with the following exceptions.

Test tape: MTT-116K
EQ switch: Both "1 & 2" positions

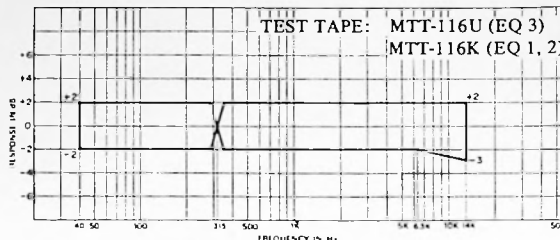


Fig. 7-5 Playback Frequency Response Limits

NOTE

If the response does not meet the specified response limits, the head should be checked for accumulated oxide or dirt. Then, if no dirt is found, the head azimuth should be readjusted.

7-1-5. SIGNAL TO NOISE RATIO —PLAYBACK—

1. Place the deck in the PLAY-PAUSE mode.
2. Read the indication on the VTVM.
3. The VTVM should indicate -52 dB minimum (1.94 mV maximum).
4. This corresponds to a signal-to-noise ratio of 47 dB (minimum): difference between residual noise -52 dB and the specified output level -5 dB (435 mV).

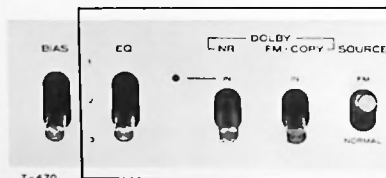
NOTE

Since the polarity of the AC plug has some effect on the signal-to noise ratio, the plug can be reversed in the wall socket when checking the signal-to-noise ratio. The worse case value should be within the indicated value above.

Specification: 47 dB (minimum)

CONNECTION: See Fig. 7-4 (B)

SWITCH & CONTROL SETTING:



OUTPUT Control:
Specified Control Setting (See 7-1-2)

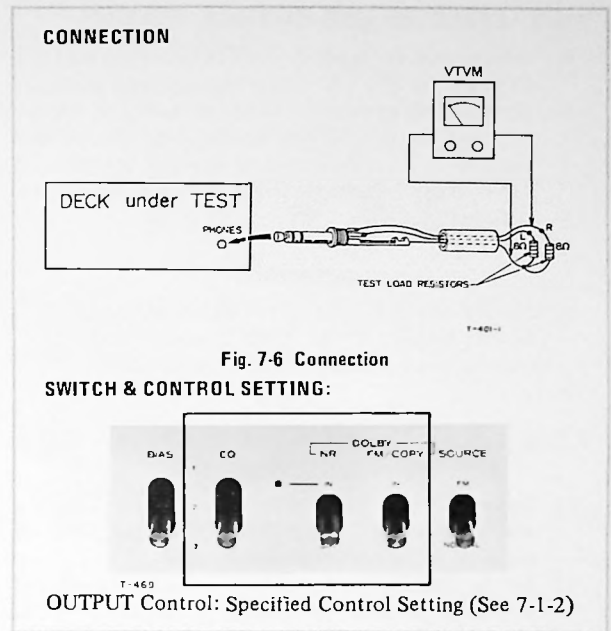
7-1-6. HEADPHONE OUTPUT LEVEL CHECKS

NOTE

An 8 ohm non-inductive resistor should be used as the test load resistor.

1. Load and play a TEAC MTT-150 test tape.
2. Measure the level across the test load resistor.

Specification: $-21 \text{ dB} \pm 2 \text{ dB}$ (54.8 mV – 86 mV)



7-2. MONITOR PERFORMANCE

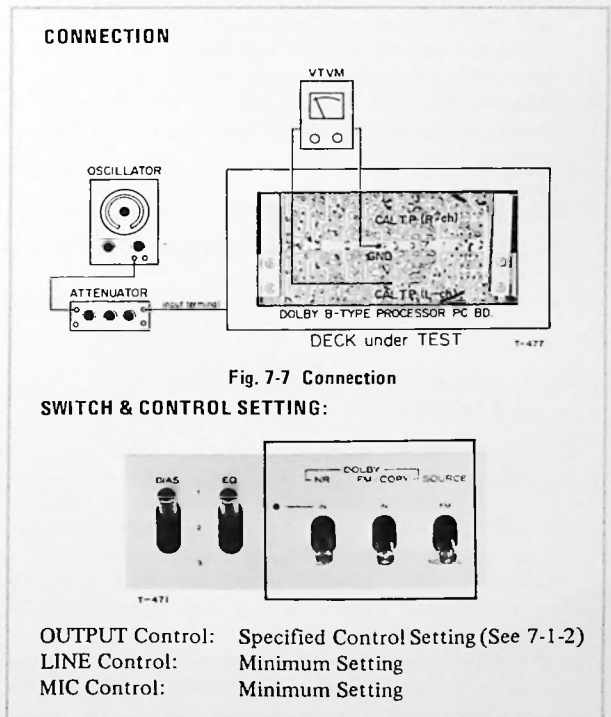
7-2-1. MINIMUM INPUT LEVEL CHECKS

NOTE

To prevent mis-measurements for the following procedures, any connection cords other than these for the respective input check must be removed.

For example: Do not connect the Microphone and the DIN cords to respective input jacks when checking for the LINE inputs.

1. Load any recordable tape.
2. Place the deck in the RECORD-PAUSE mode.
3. Set the MIC controls to maximum.
4. Apply a 400 Hz signal at $-67 \text{ dB} \pm 2 \text{ dB}$ ($274 \mu\text{V} \sim 435 \mu\text{V}$) to the MIC jacks and check for 100 mV (-18 dB) on the VTVM connected to the Dolby test points. (Minimum Input Level checks for the MIC jack)
5. Apply a 400 Hz signal at $-35 \text{ dB} \pm 2 \text{ dB}$ ($10.9 \text{ mV} \sim 17.3 \text{ mV}$) to the input terminals of the DIN connector and check for 100 mV. (Minimum Input Level checks for the DIN inputs)
6. After checking, reduce the MIC controls to minimum to prevent noise insertion during subsequent procedures.
7. Set the LINE controls to maximum.
8. Apply a 400 Hz signal at $-15 \text{ dB} \pm 2 \text{ dB}$ ($109 \text{ mV} \sim 173 \text{ mV}$) to the LINE IN jacks and check for 100 mV. (Minimum Input Level checks for the LINE inputs)



7-2-2. SPECIFIED LINE CONTROL SETTING

9. Apply a 400 Hz signal at -5 dB (435 mV) to the LINE IN jacks. See Fig. 7-8.
10. Set the LINE controls to obtain the reading of 100 mV (-18 dB) on the VTVM. At this time, the physical position of the LINE controls indicates the Specified LINE Control Setting referred to in subsequent procedures.

IMPORTANT

After this setting is done, do not disturb the Specified Control Setting of the LINE controls until the remaining checks and adjustments are completed.

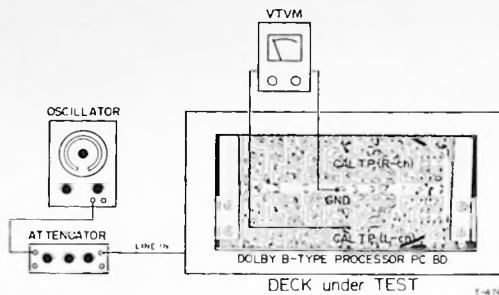


Fig. 7-8 Connection

7-2-3. DOLBY FM/COPY CAL CONTROL SETTING

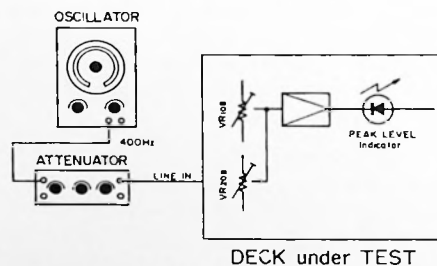
11. Set the DOLBY FM/COPY switch to IN and apply a 400 Hz signal at -14 dB (154 mV) to the LINE IN jacks.
12. Set the DOLBY FM/COPY-CAL controls on the A-450 rear panel to obtain the reading of 100 mV (-18 dB) on the VTVM.

NOTE

When the DOLBY FM/COPY switch is IN, the LINE and MIC controls have no control over the input signal and only the DOLBY FM/COPY CAL controls (on the back panel) can adjust the input level. However, for the convenience of the following procedure, do not disturb the LINE and MIC control settings.

7-2-4. VUMETER CALIBRATION —RECORD—

13. Set the DOLBY FM/COPY switch to OUT and apply a 400 Hz signal at -5 dB (435 mV)
14. Adjust VR106/206 for $+3$ VU (\square) on the VU meter.



7-2-5. LED PEAK LEVEL INDICATOR CALIBRATION

15. Adjust VR108 so that the PEAK LEVEL indicator lights as shown in Fig. 7-9, when a 400 Hz signal is applied at required level to the left channel LINE IN jack. Keep the right channel LINE IN jack disconnected from an AF oscillator.
16. For the right channel, repeat the above procedure except adjust VR208. Keep the left channel LINE IN jack disconnected from the AF oscillator.
17. After setting both channels, make sure when required signal is simultaneously applied to both channels, the indicator reacts the same as above.

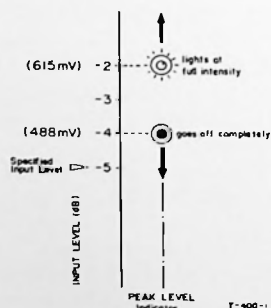


Fig. 7-9 LED Peak Level Indicator Setting

7-2-6. DOLBY NR EFFECT MEASUREMENT

1. Load any recordable tape.
2. Place the deck in the RECORD-PAUSE mode.
3. Apply a 1 kHz signal at proper level.
4. Adjust the Attenuator for 10 mV (-38 dB) on the VTVM. Note this reading for temporary reference level for the following measurements.
5. Set the DOLBY NR switch to IN.
6. Make sure the reading reduces 5 dB \pm 1 dB from the reference level.
7. Reset the DOLBY NR switch to OUT.
8. Repeat the above procedures (steps 3 - 6), with the following exceptions.

Applied test signal: 10 kHz
 Reading on VTVM: 3.2 mV (-48 dB)
 (Reference level)

Variation from reference: 10 dB \pm 1 dB

Specification:

Variation from reference at 1 KHz: 5 dB \pm 1 dB

Variation from reference at 10 KHz: 10 dB \pm 1 dB

7-2-7. DOLBY FM COMPENSATOR EFFICIENCY CHECKS

1. Load any recordable tape.
2. Place the deck in the RECORD-PAUSE mode.
3. Apply a 400 Hz signal at -14 dB (154 mV).
4. Read the VTVM indication.
 Note this reading for temporary reference level for the following measurements.
5. Apply a 10 kHz signal at -14 dB.
6. Make sure the reading raises 8 dB \pm 1 dB from the reference level.
7. Set the SOURCE switch to NORMAL.
8. Repeat the above procedures (steps 3 - 5).
9. Make sure the reading of the 10 kHz signal is within \pm 1 dB from temporary reference level of 400 Hz signal.

Specifications:

Variation from reference at FM (SOURCE switch):

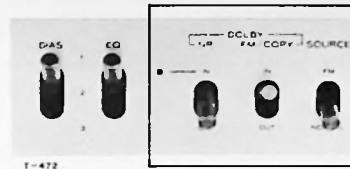
8 dB \pm 1 dB

Variation from reference at NORMAL (SOURCE switch):

0 dB \pm 1 dB

CONNECTION: See Fig. 7-8

SWITCH & CONTROL SETTING:



OUTPUT Control: Specified Control Setting (See 7-1-2)
 LINE Control: Specified Control Setting (See 7-2-2)
 MIC Control: Minimum Setting

NOTE

Do not move any control setting above, though these control settings are ineffective in these checks. See 7-2-3 NOTE for details.

CONNECTION

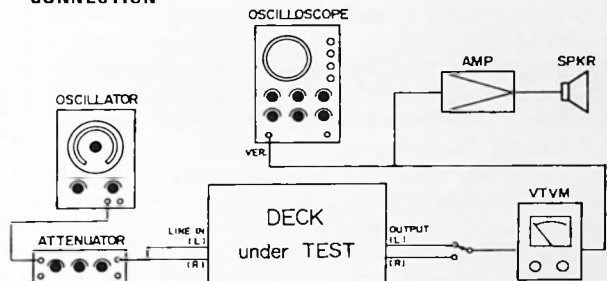
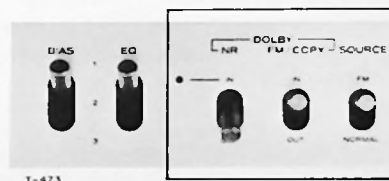


Fig. 7-10 Connection

SWITCH & CONTROL SETTING:



OUTPUT Control: Specified Control Setting (See 7-1-2)
 LINE Control: Specified Control Setting (See 7-2-2)
 MIC Control: Minimum Setting

NOTE

Do not move any control setting above, though these controls settings are ineffective in these checks. See 7-2-3 NOTE for details.

7-3. RECORDING PERFORMANCE

IMPORTANT

Before making any adjustments of the amplifier, be sure that all tests in the playback performance section have been accomplished and that all adjustments are correct. The playback performance should be properly adjusted.

7-3-1. BIAS TRAP ADJUSTMENTS

NOTE

The VTVM used in this procedure must have load impedance of 1 M Ω or more.

1. Load any recordable tape.
2. Place the deck in the RECORD-PAUSE mode with no signal applied.
3. Adjust L102/202 for a minimum reading.

7-3-2. RECORD BIAS SETTING

CrO₂ TAPE

1. Load a TEAC MTT-505TB test tape.
2. Adjust VC-101/201 to minimum (counter clockwise) position.
3. Apply and record a 1 kHz signal at -15 dB (137 mV).
4. Rewind and play this recorded section and note the VTVM indication.
5. Turn VC101/201 clockwise slightly and record another section of tape.
6. Rewind over this section and play the tape again and note the VTVM indication.
7. Repeat this operation of recording, rewinding, playing, and adjusting until the peak value on the VTVM is obtained.
8. Then, adjust VC101/201 slightly further clockwise until the level decreases by 0.5 dB from the peak level.
9. After the above adjustment is done, apply and record two tone signals in turn; a 1 kHz signal and a 10 kHz signal, both at -38 dB (9.75 mV).
10. Adjust VC101/201 slightly until identical values at both frequencies are found using the same process as explained above.

NOTE

After adjusting the bias setting, the output level of the 1 kHz signal must stay finally within the limits (1.5 dB over-bias from the peak) as indicated in the Fig. 7-12.

Fe-Cr TAPE

11. This adjustment is the same as using the method described in the "CrO₂ Tape" with the exceptions of following items.

BIAS/EQ switches: "2" position
 Test tape: MTT-504T
 Adjustments: VC102/202

CONNECTION

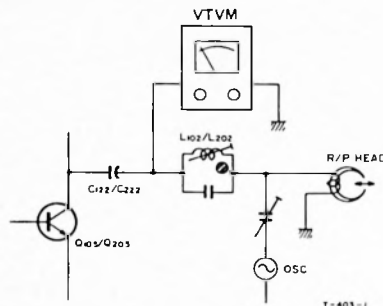


Fig. 7-11 Connection

SWITCH & CONTROL SETTING:



OUTPUT Control: Specified Control Setting (See 7-1-2)
 LINE Control: Specified Control Setting (See 7-2-2)
 MIC Control: Minimum Setting

CONNECTION: See Fig. 7-10

SWITCH & CONTROL SETTING:

all the same as above section.

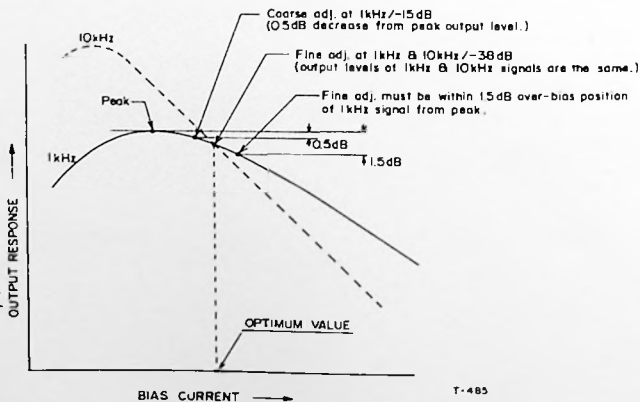


Fig. 7-12 Bias Adjustments (CrO₂ & FeCr tapes)

Hi-Fi TAPE

12. Load a TEAC MTT-501 test tape with the BIAS/EQ switches set to the "3" position and with the DOLBY NR switch set to IN.
13. Apply and record 2 tone signals, in turn; a 400 Hz tone at -38 dB (9.75 mV) and a 10 kHz tone at -38 dB.
14. Rewind and play this recorded section.
15. Compare the differences between the output level of the 400 Hz signal and that of the 10 kHz signal.
16. The output level of the 10 kHz signal must be 4 dB above the 400 Hz signal level.
17. Adjust VC103/203 to achieve this, continuing the process of the recording-rewinding-playing-adjusting.

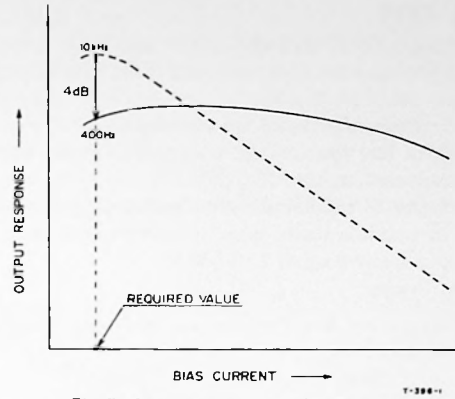


Fig. 7-13 Bias Adjustments (Hi-Fi tape)

7-3-3. RECORD LEVEL SETTING

Cr₂ TAPE

18. Load a TEAC MTT-505TB test tape and set the BIAS/EQ switches to the "1" position.
19. Apply and record a 400 Hz test signal at -5 dB (435 mV).
20. Rewind and play this recorded section.
21. Adjust VR103/203 to obtain -5 dB.
22. Continue the process of the recording-rewinding-playing-adjusting until this -5 dB is obtained.

Fe-Cr TAPE

23. Repeat the above procedure, with the following exceptions.

BIAS/EQ switches: "2" position
 Test tape: MTT-504T
 Adjustments: VR104/204

Hi-Fi TAPE

24. Repeat the above "Cr₂ Tape" procedure, with the following exceptions.

BIAS/EQ switches: "3" position
 Test tape: MTT-501
 Adjustments: VR105/205

7-3-4. DISTORTION CHECKS

Cr₂ TAPE

1. Load a TEAC MTT-505TB test tape.
2. Apply and record a 400 Hz test tone at -8 dB (308 mV).
3. Rewind and play this recorded section.
4. Read the indicated value on the distortion analyzer.

Fe-Cr TAPE

5. Repeat the above procedure, with the following exceptions.

BIAS/EQ switches:
 "2" position
 Test tape: MTT-504T

Hi-Fi TAPE

6. Repeat the above "Cr₂ Tape" procedure, with the following exceptions.

BIAS/EQ switches:
 "3" position
 Test tape: MTT-501

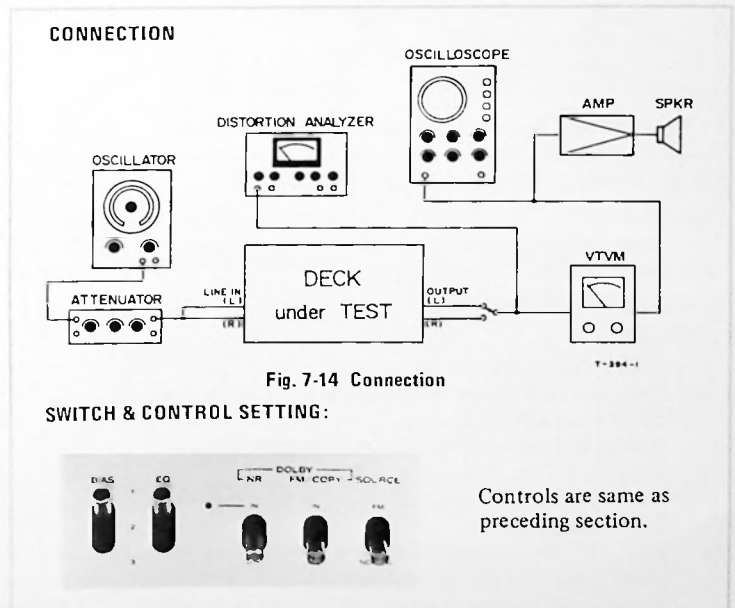
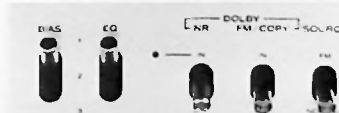


Fig. 7-14 Connection

SWITCH & CONTROL SETTING:



Controls are same as preceding section.

Specification: 2.5% or less (w/ 3 types of tape)

7-3-5. FREQUENCY RESPONSE —OVERALL—

CrO₂ TAPE

1. Load a TEAC MTT-505TB test tape.
2. Apply and record a test signal from 31.5 Hz to 14 kHz at -38 dB (9.75 mV).
3. Rewind and play this recorded section.
4. Make sure the readings on the VTVM are within the response limits.
5. In case of any deviation in the High frequency range of the response limits, clean the heads and if this cleaning is ineffective adjust L103/203.

Fe-Cr TAPE

6. Repeat the above procedure, with the following exceptions.

BIAS/EQ switches: "2" position
 Test tape: MTT-504T
 Adjustments: L105/205

Hi-Fi TAPE

7. Repeat the above "CrO₂ Tape" procedure, with the following exceptions.

BIAS/EQ switches: "3" position
 DOLBY NR switch: IN
 Test tape: MTT-501
 Applied frequencies: 40 Hz ~ 12.5 kHz
 Adjustments: L104/204

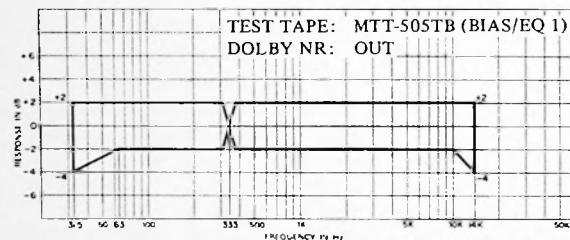


Fig. 7-15 Overall Frequency Response Limits (for BIAS/EQ 1)

CONNECTION: See Fig. 7-10

SWITCH & CONTROL SETTING:

OUTPUT Control: Specified Setting (See 7-1-2)
 LINE Control: Specified Setting (See 7-2-2)
 MIC Control: Minimum Setting

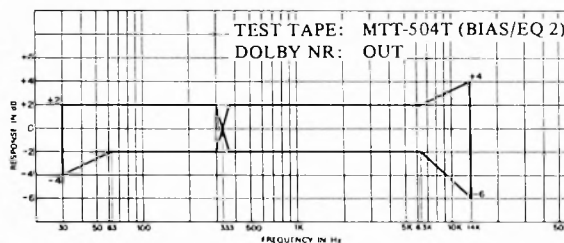


Fig. 7-16 Overall Frequency Response Limits (for BIAS/EQ 2)

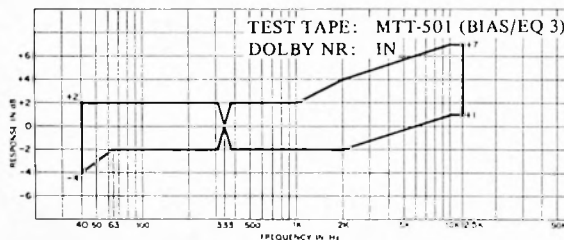


Fig. 7-17 Overall Frequency Response Limits (for BIAS/EQ 3)

7-3-6. SIGNAL TO NOISE RATIO —OVERALL—

Specification:

CrO₂ tape: 47 dB (minimum)
 FeCr tape: 45 dB (minimum)
 Hi-Fi tape: 45 dB (minimum)

CrO₂ TAPE

1. Load a TEAC MTT-505TB test tape.
2. Place the deck in the record mode for a few seconds with no signal applied.
3. Rewind and play this recorded section.
4. Read the indication on the VTVM.
5. The VTVM should indicate -52 dB minimum (1.94 mV maximum).
6. This -52 dB corresponds to the specified signal-to-noise ratio of 47 dB (minimum): the difference between the residual noise of -52 dB and the specified output level -5 dB (435 mV).

CONNECTION: See Fig. 7-4 (B)

SWITCH & CONTROL SETTING:

OUTPUT Control: Specified Control Setting (See 7-1-2)
 LINE Control: Specified Control Setting (See 7-2-2)
 MIC Control: Minimum Setting

Fe-Cr TAPE

7. Repeat the above procedure, except use the TEAC MTT-504T test tape and set BIAS/EQ switches to "2" position.
8. The VTVM should indicate -50 dB minimum (2.44 mV maximum).
9. This -50 dB corresponds to the specified signal-to-noise ratio of 45 dB (minimum): the difference between the residual noise of -50 dB and the specified output level -5 dB.

Hi-Fi TAPE

10. Repeat the above "CrO₂ Tape" procedure, except use the TEAC MTT-501 test tape and set BIAS/EQ switches to "3" position.
11. The VTVM should indicate -50 dB minimum.
12. This -50 dB corresponds to the specified signal-to-noise ratio of 45 dB (minimum): the difference between the residual noise of -50 dB and the specified output level -5 dB.

7-3-7. ERASE EFFICIENCY

NOTE

To measure erase efficiency, a 1 kHz narrow bandpass filter should be used. The test signal delivered from the AF oscillator should be tuned to the filter used.

CrO₂ TAPE

1. Load a TEAC MTT-505TB test tape.
2. Apply and record a 1 kHz signal at +5 dB (1.37 V) for several seconds. (1)
3. Rewind the tape to the mid-point of the recording and remove the signal from the LINE IN jacks. (2)
4. Place the deck in the record mode and record through this previously recorded portion with no input signal applied. (3)
5. Rewind the tape to the starting point of the 1 kHz signal recorded portion. (4)
6. Play the tape and read the indication on the VTVM to obtain the output level of both the unerased portion and the erased portion of the recorded section. (5)
7. Measure the output level differences between the 2 portions.

Specification: 65 dB (minimum)

Fe-Cr & Hi-Fi TAPES

The erase efficiency checks for these tapes usually may be omitted unless the technician wants to confirm they also are within specifications.

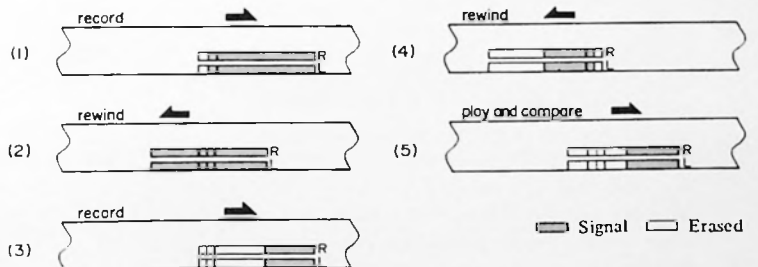
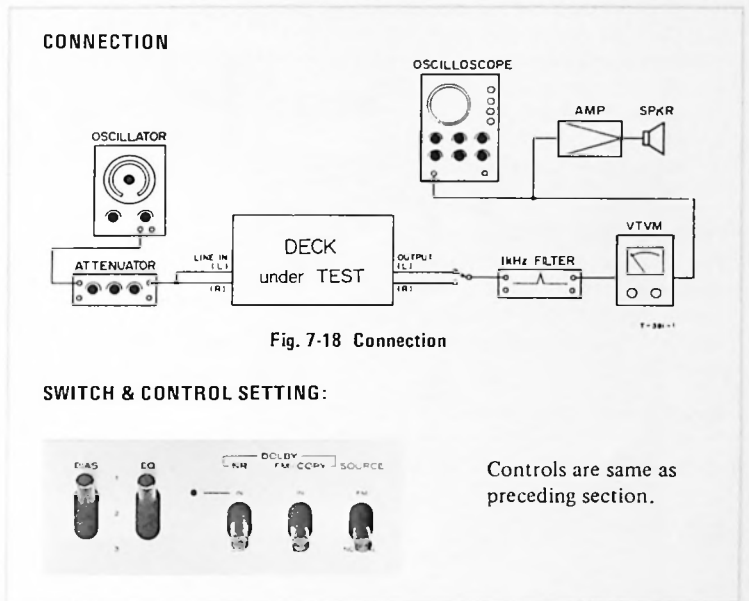


Fig. 7-19 Erase Efficiency Check Procedure

7-3-8. CHANNEL SEPARATION

CrO₂ TAPE

NOTE

To check channel separation (cross talk between channels), a 1 kHz narrow bandpass filter should be used. The test signal delivered from an AF oscillator should be tuned to the filter used.

1. Load a TEAC MTT-505TB test tape.
2. Apply a 1 kHz test tone at -5 dB (435 mV) into the left channel.
3. Place the deck in the record mode for about 30 seconds. (1)
4. Rewind the tape to the starting point of recording. (2)
5. Play the tape and measure the output level differences between the left and right channels. (3)

Fe-Cr & Hi-Fi TAPES

The channel separation checks for these tapes usually may be omitted unless the technician wishes to confirm that they also are within specifications.

Specification: 30 dB (minimum)

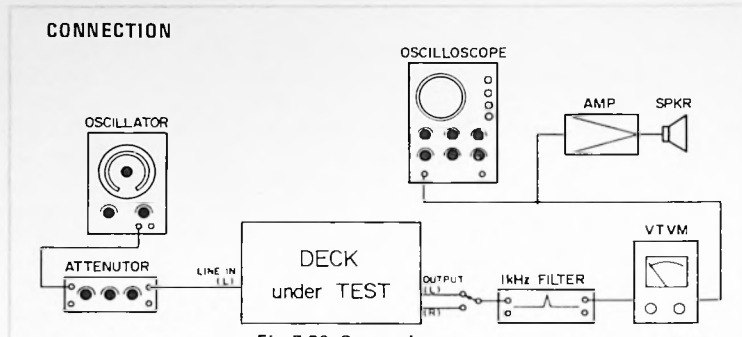


Fig. 7-20 Connection

SWITCH & CONTROL SETTING:



Controls are same as preceding section.

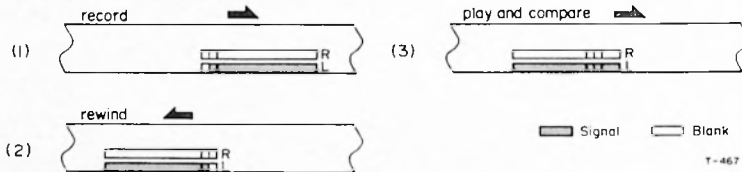


Fig. 7-21 Channel Separation Check Procedure

7-3-9. ADJACENT TRACK CROSSTALK MEASUREMENT

CrO₂ TAPE

NOTE

The tape must be completely erased or demagnetized prior to this procedure.

1. Load a TEAC MTT-505TB test tape.
2. Apply a 125 Hz test signal at -5 dB (435 mV).
3. Place the deck in the record mode for about 30 seconds. (1)
4. Rewind the tape to the starting point of recording. (2)
5. Play the tape and measure the output level of the recorded portion. Note this reading for temporary reference level for the following measurements. (3)
6. Remove the test tape, turn it over and replace it in the deck. (4)
7. Play the tape back and read the output level. (5)
8. Get the differences between this reading and the reading previously measured of the 125 Hz signal.

Specification: 40 dB (minimum)

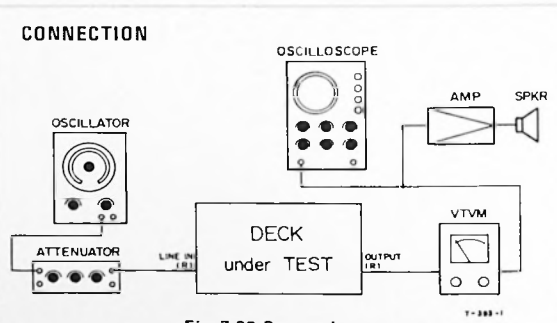


Fig. 7-22 Connection

SWITCH & CONTROL SETTING:



OUTPUT Control: Specified Control Setting (See 7-1-2)
 LINE Control: Specified Control Setting (See 7-2-2)
 MIC Control: Minimum Setting

Fe-Cr & Hi-Fi TAPE

9. The crosstalk between adjacent tracks checks for these tapes usually may be omitted unless the technician wishes to confirm that they also are within specifications.

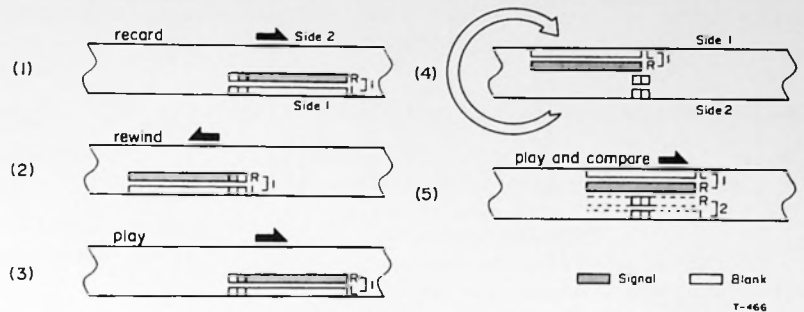


Fig. 7-23 Adjacent Track Crosstalk Measurement Procedure

7-4. ADJUSTMENT LOCATION

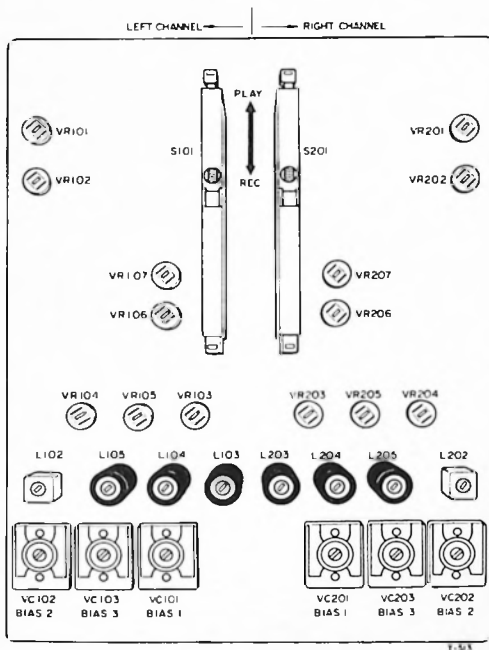
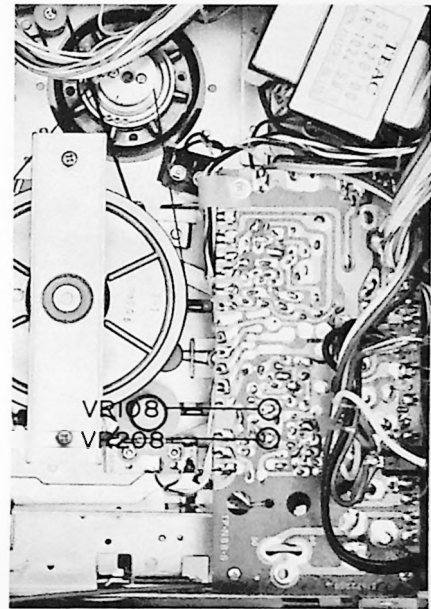


Fig. 7-24 Adjustment Location (on RECORD/PLAYBACK AMPL. PC BD.)



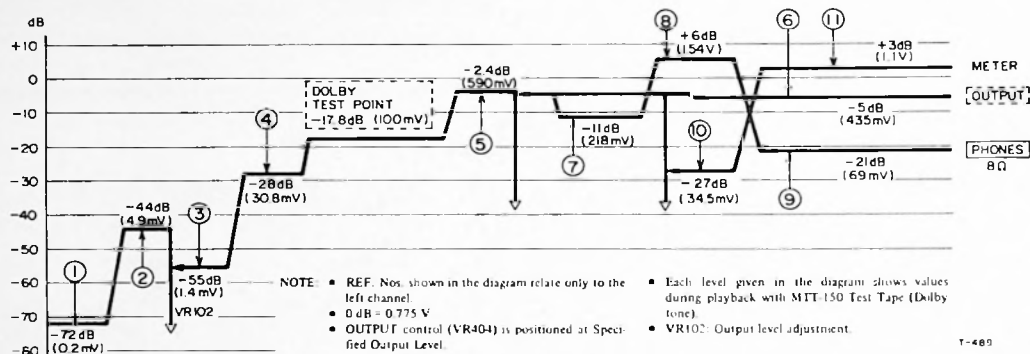
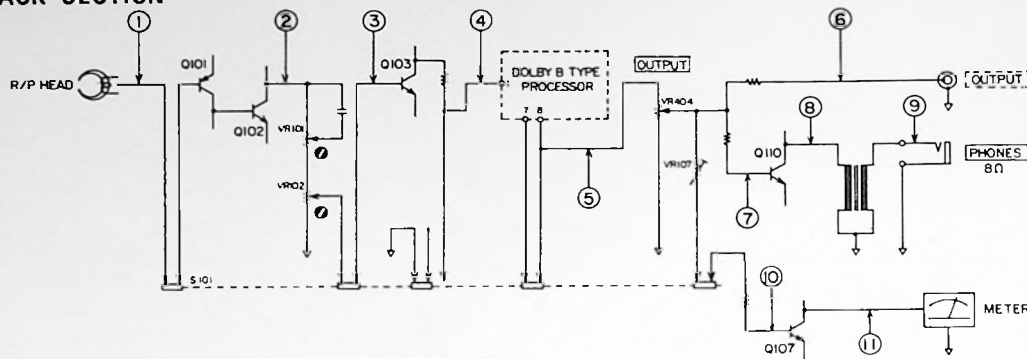
T-516

Fig. 7-25 Adjustment Location (on POWER SUPPLY PC BD.)

VR101/201	Playback EQ	VC101/201	Record bias (1)
VR102/202	Playback level	VC102/202	Record bias (2)
VR103/203	Record level (1)	VC103/203	Record bias (3)
VR104/204	Record level (2)	L102/202	Bias trap
VR105/205	Record level (3)	L103/203	Record EQ (1)
VR106/206	VU meter calibration (Record)	L104/204	Record EQ (3)
VR107/207	VU meter calibration (Playback)	L105/205	Record EQ (2)
VR108/208	Peak level indicator adj.		

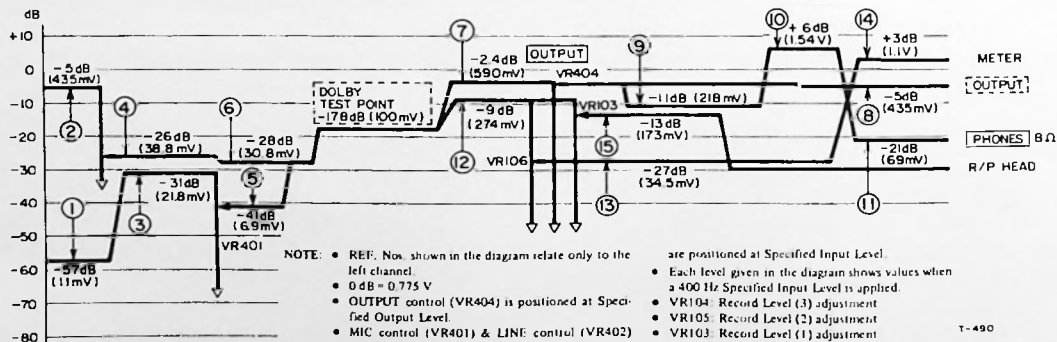
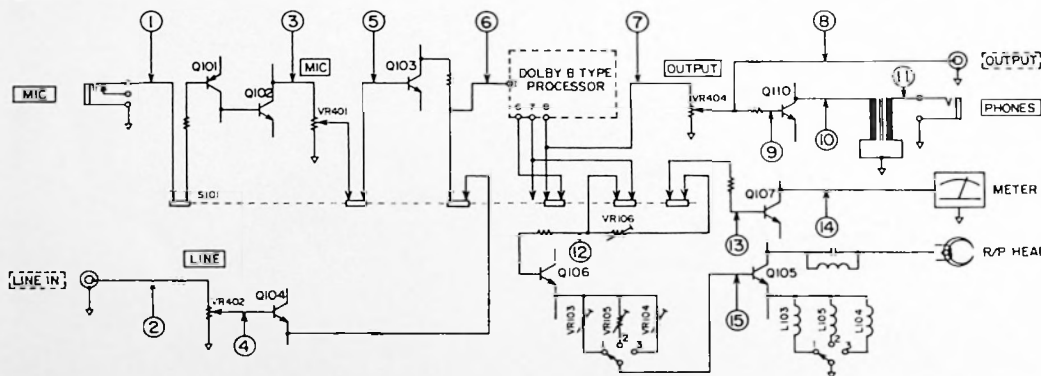
8. LEVEL DIAGRAM

PLAYBACK SECTION



T-489

RECORDING SECTION



T-490

9. TROUBLE-SHOOTING

NOTE

REF. No's indicated in the following table refer to the left channel, for the right channel REF. No. identification, see schematic diagram.

TAPE TRANSPORT SECTION

1. Fuse blows when POWER is switched ON
 - Defective Power Transformer
2. Auto End-stop will not work in Play and/or Fast Wind. +B voltage not present between terminal A of SCR and GND.
 - Defective Resistor R307
 - Defective Diode D302Solenoid will not energize when SCR terminals A and K are switched ON.
 - Defective Switch S109
 - Defective SolenoidSolenoid will not work when SCR terminals A and G are shorted together.
 - Defective SCR
3. Tape winds onto Capstan Shaft.
 - Defective Pinch Roller
 - Defective Take-up Reel Table Ass'y
 - Idler slipping
 - Tape path wrong (improper Tape Guide position bad Head mounting)
4. Excessive Wow and Flutter
 - Defective Pinch Roller, Pinch Roller pressure incorrect
 - Capstan Belt stretched or oily
5. Capstan does not rotate
 - Capstan Belt off
 - Defective Motor
6. Index Counter will not count
 - Counter reset button not fully depressed.
 - Counter Belt off

AMPLIFIER SECTION



1. No sound in playback mode
Noise (hum or clicking noise) appear when touching head wires.
 - Poor soldering of head terminations
 - Defective HeadSound can be heard during recording
 - Defective Switch S101
 - Defective Transistor Q101, Q102
 - Defective Parts associated with parts indicated aboveSound cannot be heard during recording.
 - Defective Transistor Q101, Q102, Q103
 - Defective Dolby NR Circuit

- Defective Parts associated with parts indicated above
2. Level Meter will not indicate in playback mode.
 - Defective Level Meter
 - Defective Transistor Q107
 - Defective Semi-fixed Resistor VR107
 - Defective Parts associated with parts indicated above
 3. Loss of high frequencies in playback mode
High frequencies too low
 - Defective Transistor Q102
 - Playback equalizer circuit wrongHigh frequencies are several dB below specified response limits
 - Head dirty or defectiveLoss of high frequencies including level variation
 - Improper head-to-tape contact
 - Unstable functioning of tape transport mechanism
 4. Poor playback signal-to-noise ratio
Excessive hum - reduced when changing Power Transformer.
 - Defective Power TransformerExcessive white noise (hiss and circuit noise)
 - Defective Head
 - Defective Transistor Q101, Q102
 - Associated circuitry of Transistor Q101, Q102Wave form varies continuously
 - Defective Transistor Q101, Q102
 - Defective Capacitor C 102, C108
 - Defective Parts associated with parts indicated above
 5. Does not record
Can record when changing Bias Switch setting
 - Defective Bias Switch
 - Defective Trimmer Capacitors VC101, VC102, VC103
 - Defective Parts associated with parts indicated aboveCannot erase, also
 - Bias Oscillator Ass'y faultyCan erase - sound from record monitor mode is normal
 - Head dirty
 - Defective Transistor Q105, Q106
 - Defective Switch S101
 - Defective Circuitry of Q105, Q106

10. MODEL DIFFERENCES COMPARISON CHART — BETWEEN U.S.A./CANADA MODELS & OTHER AREA MODELS —

There are several differences between U.S.A./CANADA models and models distributed in other areas. They are indicated in the following table.

10-1. FUNCTIONAL DIFFERENCE TABLE

Item \ Models	U.S.A./CANADA	All except U.S.A./CANADA	Remarks
1. Switch Construction	 <p style="text-align: center;">(See the Remarks.)</p>		Meaning of BIAS/EQ switch nos on U.S.A./CANADA models: 1: For CrO ₂ tape 2: For FeCr tape 3: For Regular Hi-Fi tape
2. AC Outlet Socket	Not provided	Provided	Installed on Back Panel
3. Fuse for AC Outlet	Not provided	Provided	
4. Dolby FM Compensator Circuit	Provided	Not provided	
5. A 19 kHz Filter Switch	Provided (See the Remarks.)	Not provided	This Switch functions together with SOURCE Switch. When SOURCE Switch is at FM position, the Filter circuit is also activated.

10-2. ELECTRICAL ALIGNMENT SECTION (FOR ALL EXCEPT U.S.A./CANADA MODELS)

There are BIAS and EQ Switch differences between U.S.A./CANADA models and those distributed in other areas as shown in the table on the right. Electrical alignments on U.S.A./CANADA models, however, are nearly all applicable to models distributed in other areas with the following exception:

a. ADJUSTMENT LOCATION

For U.S.A./CANADA models, refer to Fig. 7-24 on page 27.

BIAS and EQ Switch Comparison Chart

Switch Setting Position	Indication	
	U.S.A./CANADA	All ex. U.S.A./CANADA
Upper	1 (CrO ₂)	CrO ₂
Medium	2 (FeCr)	* HIGH
Lower	3 (*HIGH)	* NORMAL

* HIGH refers to Low noise, high output tape;
NORMAL, regular tape

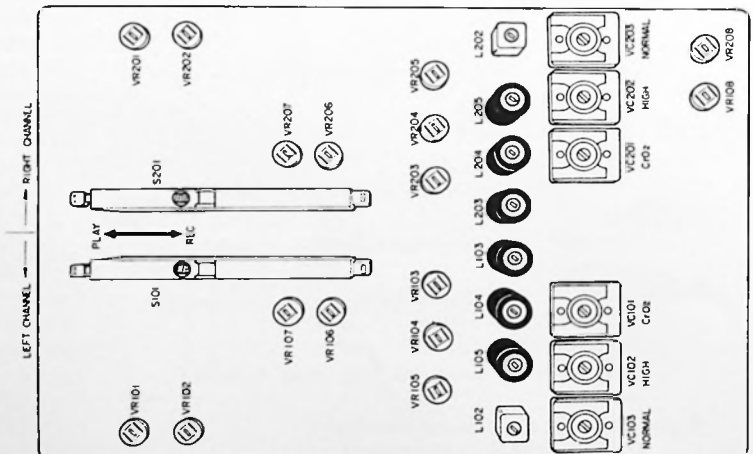


Fig. 10-1 Adjustment Location (on REC/PLAY AMPL. PC BD.)

b. BIAS ADJUSTMENTS

All deck can be tested using the procedures stated on page 22, "CrO₂ TAPE" in 7-3-2 using the following additional information as applicable.

BIAS/EQ Switch Setting	TEAC Test Tape	Adjustments
CrO ₂	MTT-505TB	VC101/201
HIGH	MTT-501	VC102/202
NORMAL	MTT-502R	VC103/203

c. FREQUENCY SPECTRUM DIAGRAMS

Frequency Response limits other than the subsequent 2 graphs are the same as ones for U.S.A./CANADA decks.

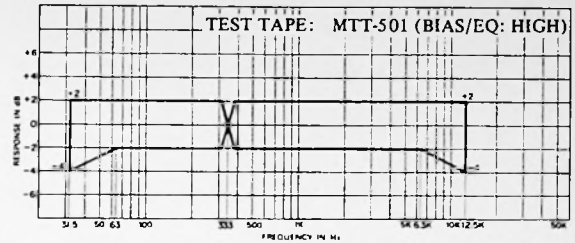


Fig. 10-2 Overall Frequency Response Limits (for BIAS/EQ: HIGH)

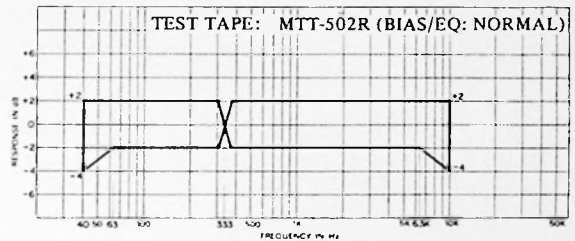


Fig. 10-3 Overall Frequency Response Limits (for BIAS/EQ: NORMAL)

10-3. FREQUENCY & VOLTAGE CONVERSION

a. FREQUENCY CONVERSION PROCEDURE (FOR ALL EXCEPT U.S.A./CANADA MODELS)

1. Disconnect the AC Power Cord and remove all audio cables.
2. Remove the Bottom Cover, release the Drive Belt.
3. Take off the 2 screws from the Motor Pulley and invert the Motor Pulley. (Small diameter on top for 60 Hz, large for 50 Hz.)
4. Re-install the Belt on the pulley (top section) and verify that the Belt is not riding on the lips of the pulleys.
5. Reinstall the screws.
6. Rotate the Flywheel several turns to check for proper seating.
7. The Frequency Selector Bar on the Power Supply PC Board must be re-set to the correct frequency as

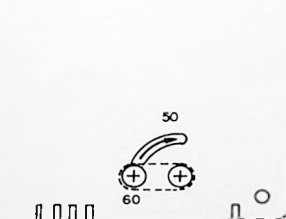


Fig. 10-4 Power Supply PC BD.

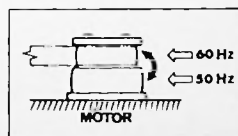


Fig. 10-5 Motor Pulley

8. indicated in the illustration.
8. Replace the Bottom Cover.

b. VOLTAGE SELECTOR SETTING PROCEDURE (FOR GENERAL EXPORT MODELS)

1. Remove the AC Power Cord from the deck.
2. Take off the 2 screws holding the protective Guard over the Voltage Selector Plug, and remove the Guard.
3. Pull out the Plug and re-insert it so the desired voltage appears in the cut-out window.
4. Re-install the protective Guard.

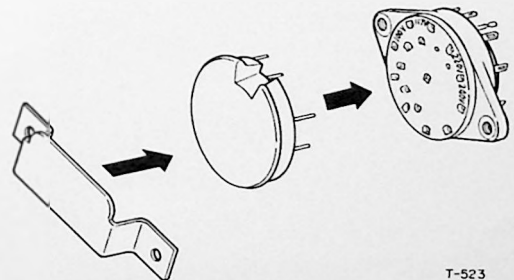


Fig. 10-6 Voltage Conversion

T-523

A-450

Stereo Cassette Deck with Dolby System

TEAC

TEAC CORPORATION	3-7-3 NAKA-CHO, MUSASHINO, TOKYO	PHONE: (0422) 53-1111
TEAC CORPORATION OF AMERICA	7733 TELEGRAPH ROAD, MONTEBELLO, CALIFORNIA 90640	PHONE: (213) 726-0303
TEAC HONGKONG LIMITED	FLAT 78, PORTLAND HOUSE, 7TH FLOOR, BLOCK C, No. 41-D, MA TAU WEI ROAD, KOWLOON, HONG KONG.	PHONE: 3-659071

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