TEAC®

SERVICE MANUAL

A-601R

Stereo Cassette Deck with Automatic-Reverse

GENERAL DISCRIPTION

This Service Manual provides all the data required to service and maintain the TEAC A-601R Cassette Deck. It features a specially designed transport mechanism with independent capstans and a precision electromechanical shift for changing the head position during forward and reverse play.
Three-way bias and EQ, Dolby NR, record mute, memory rewind, mic/line mixing and a three way mic attenuator together with many other convenience features make the TEAC A-601R an ideal users' cassette tape deck.

If any of the adjustments or repairs seem too complicated or are difficult to accomplish, please contact the nearest TEAC Factory Service Department or write directly to a TEAC office, the addresses of which are printed on the back cover.

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

TEAC CORPORATION
51032340

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* Noise reduction circuit made under license from Dolby Laboratories. The word "Dolby" and the Double-D symbol are trademarks of Dolby Laboratories.

1. TEST EQUIPMENT REQUIRED

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)
Spring scale:	For Pinch Roller pressure check: 0 – 1 kg (2.2 lbs)
Wow/flutter meter:	MEGURO DENPA SOKKI K.K., Model MK-668A or D & R Co., Model FL-4B.
Frequency counter:	Digital type, capable of 10 Hz to 100 kHz indication.
AF oscillator:	10 Hz – 100 kHz
AC Voltmeter:	0.1 mV – 300 V
Attenuator:	General Purpose
Distortion analyzer:	Basic frequency 400 Hz/1 kHz
Oscilloscope:	General Purpose
Band-pass Filter:	1 kHz narrow band-pass type
Test load resistor:	Non inductive type 8 ohm/1 W
Plastic alignment tool:	
Crab-eye Driver	For screwing or unscrewing Crab-eye Screws
Head demagnetizer:	TEAC E-3 or equivalent
Cleaner:	TEAC TZ-261 Tape Recorder Cleaner kit or pure alcohol
Oil:	TEAC TZ-255 Oil kit or equivalent
Bulk Tape Eraser:	TEAC E-2 or equivalent

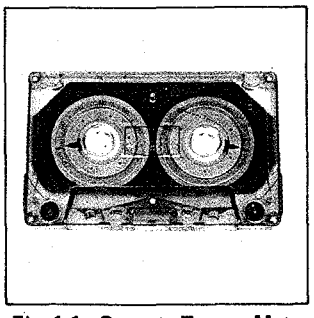

Fig. 1-1 Cassette Torque Meter

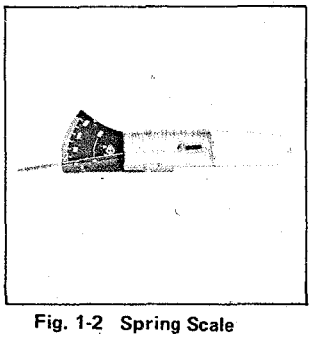

Fig. 1-2 Spring Scale

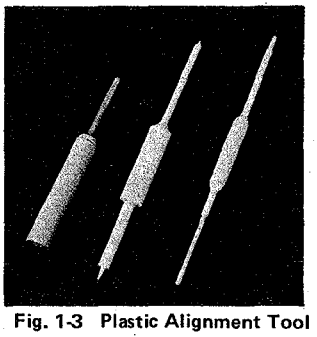

Fig. 1-3 Plastic Alignment Tool

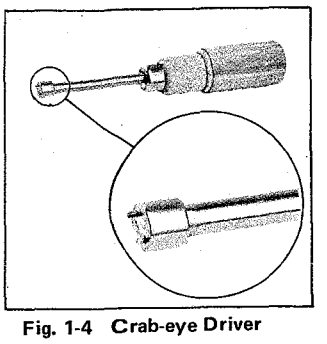

Fig. 1-4 Crab-eye Driver

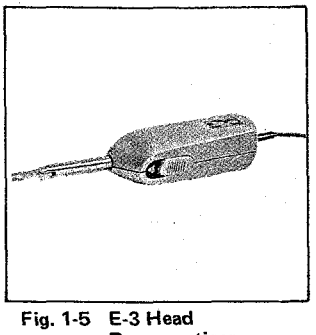

Fig. 1-5 E-3 Head Demagnetizer

Fig. 1-6 TZ-261 Tape Recorder Cleaner Kit

Fig. 1-7 TZ-255 Oil Kit

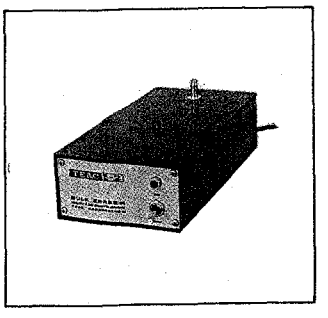

Fig. 1-8 E-2 Bulk Tape Eraser

2. SPECIFICATIONS AND SERVICE DATA

SPECIFICATIONS

Track System	4-track, 2-channel stereo
2 Heads	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	Microphones: Min. input level: –67 dB (346 V)/(10 kohms)
(level and impedance)	Line: Specified input level: –9 dB (275 mV)/(50 kohms)
	Min. input level: –19 dB (86.9 mV)
	DIN*: Min, input level: –35 dB (13.8 mV)
Outputs	Line out: Max. output level: +1 dB (0.869 V)/(into 50 kohms)
(level and load impedance)	Specified output level: –5 dB (436 mV)
	Headphones: Specified output level: –18 dB (97.5 mV)/(8 ohms)
Equalization	CrO_2: 3180 μs + 70 μs
	FeCr: 3180 μs + 70 μs
	NORMAL: 3180 μs + 120 μs
Head Configuration	1/2-track, 1-channel Erase Head
	1/4-track, 2-channel Record/Playback Head
Motor	1 DC Servo (FG type) Motor
Bias Frequency	100 kHz
Operating Position	Horizontal
Power Requirements	100/117/220/240 V AC, 50/60 Hz (General Export Models)
	117 V AC, 60 Hz (USA/Canada Models)
	220 V AC, 50 Hz (Europe Model)
	240 V AC, 50 Hz (U.K./Australia Models)
Power Consumption	29W
Weight	11.8 kg (26 lbs.) net
(w/o wooden case)	
***Pursuant to DIN Standards**	

TEAC TEST TAPES

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-501: • For Record/Playback method (blank tape)

For playback performance alignment

MTT-150: • For Dolby level calibration
• Dolby B-type tone (400 Hz tone), 200 nWb/m

MTT-316: • For frequency response test for EQ, CrO_2, and FeCr
• 3180 μs + 70 μs
• 315 Hz/–4 dB, 31.5 Hz ~ 14 kHz/–24 dB

MTT-216: • For frequency response test for EQ, NORMAL
• 3180 μs + 120 μs
• 315 Hz/–4 dB, 31.5 Hz ~ 14 kHz/–24 dB

For record performance alignment (blank tape)

MTT-505B or similar: For BIAS/EQ: CrO_2
MTT-504 or similar: For BIAS/EQ: FeCr
MTT-501 or similar: For BIAS/EQ: NORMAL

NOTE: The TEAC test tapes require longer delivery time than regular parts.

Fig. 2-1 TEAC Test Tapes

SERVICE DATA

Mechanical

Tape Speed Deviation	3,000 Hz ± 30 Hz
Tape Speed Drift	30 Hz
Forward/Reverse Tape Speed Differential	30 Hz
Wow and Flutter	Playback: 0.10% (WRMS) Record/Playback: 0.25% (RMS)
Pinch Roller Pressure	350 g ± 50 g (10.6 – 14.1 oz)
Reel Torque	Take Up: 40 – 60 g·cm (0.6 – 0.8 oz-inch) Fast Forward and Rewind: 100 – 150 g·cm (1.4 – 2.1 oz-inch)
Fast Winding Time	Approx. 90 seconds for MTT-501 (C-60)

Electrical

Frequency Response	Refer to frequency response limits charts on pages 21, 24 and 25
Signal to Noise Ratio	Playback method: EQ, FeCr and CrO_2 : 48 dB (min.) EQ, NORMAL: 47 dB (min.) Record/Playback method: CrO_2 & FeCr tapes: 47 dB (min.) NORMAL tape: 45 dB (min.) 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 min.
Channel Separation	35 dB min. (at 1 kHz)
Crosstalk between Adjancent Tracks	40 dB min. (at 125 Hz)
Total Harmonic Distortion	BIAS/EQ, CrO_2 and FeCr: 2.5% or less BIAS/EQ, NORMAL: 2.0% or less

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

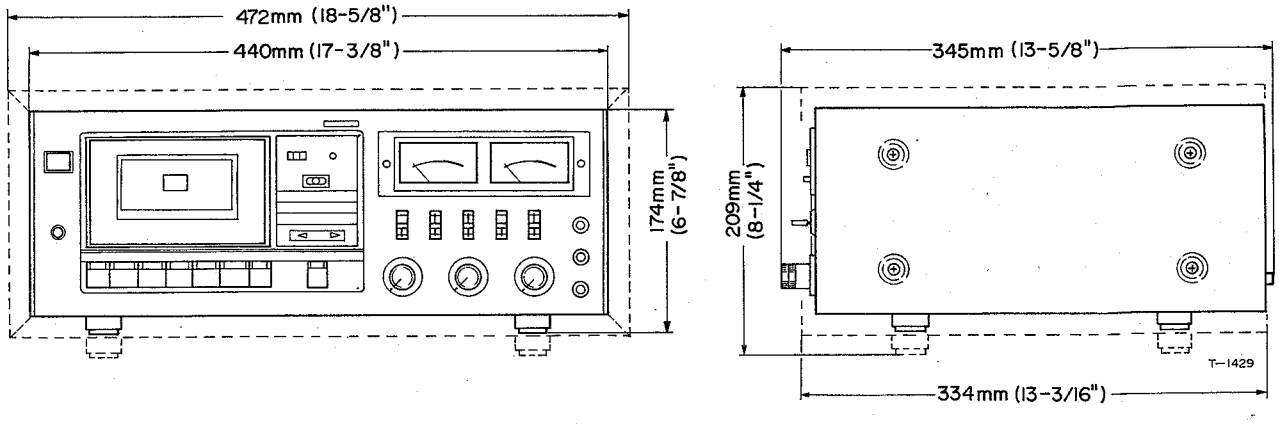

Fig. 2-2 Dimensions

3. PARTS LOCATION

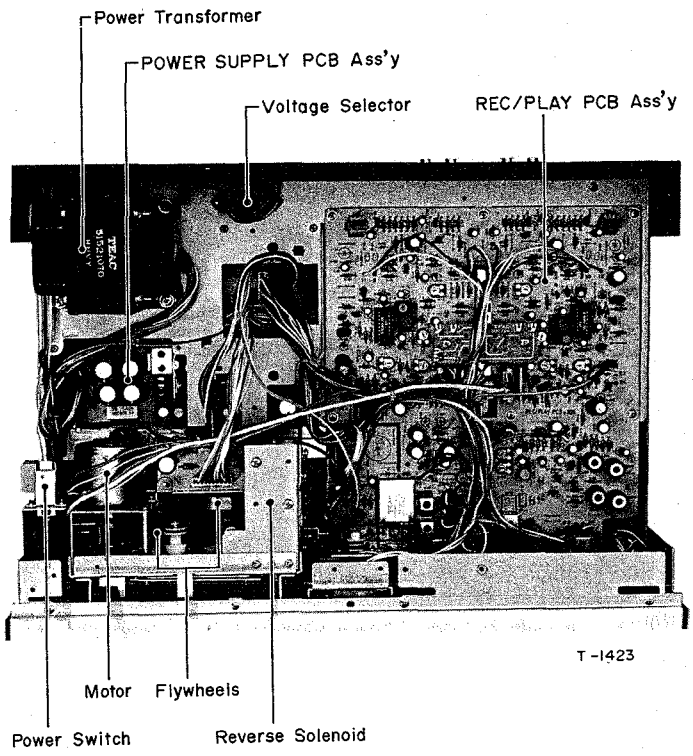

Fig. 3-1 Top View

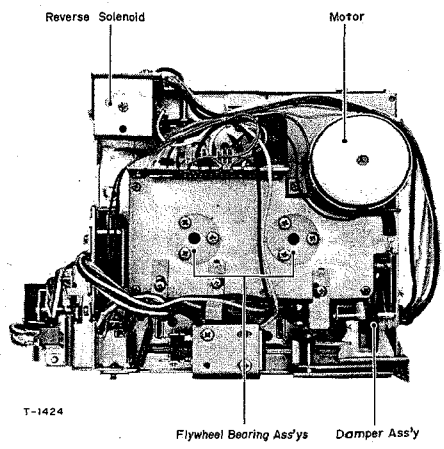

Fig. 3-2 Rear View of Transport Chassis

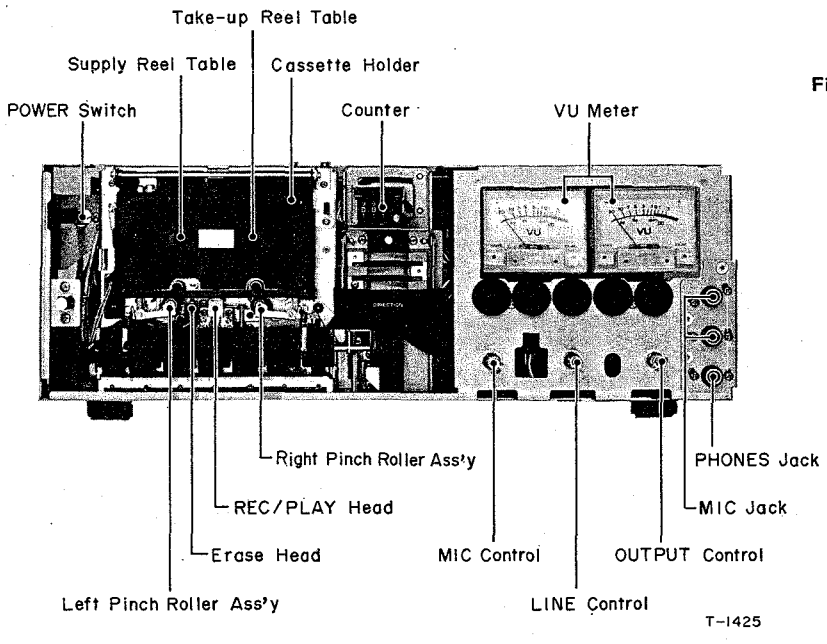

Fig. 3-3 Front View

4. PARTIAL DISASSEMBLY 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 in the Parts List.

4-1 CASE AND FRONT PANEL

1. Remove the Top Cover by removing eight screws (A).
2. Depress the EJECT Key and grasp the Cassette Cover with both hands and lift up to remove, referring to Fig. 4-1.
3. Remove three Knobs A then three Knobs B by loosening the set screws mounting them, leaving three Marker Knobs mounted in the Front Panel.
4. Take off five Switch Knobs.
5. Remove the Front Panel by removing six screws (B).
6. Remove the Bottom Cover by removing screws (D).

NOTE: 1. When disassembling the Meter Cover from the Front Panel Ass'y, a special tool (crab-eye driver) is required to remove the crab-eye screws (C). Refer to paragraph 1 TEST EQUIPMENT REQUIRED on page 3.
2. Be careful not to scratch or mar the Meter Cover during removal or assembly.
3. The Meter Cover screws are screwed into nuts located inside the Front Panel Ass'y. Do not lose these nuts.

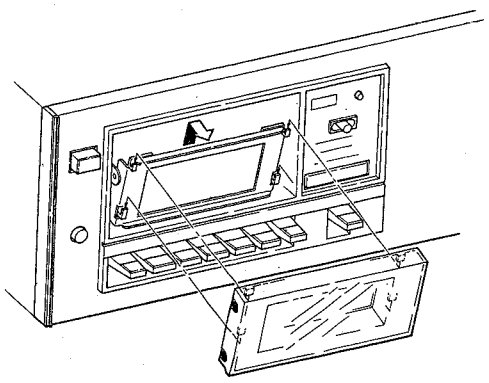

Fig. 4-1 Cassette Cover Removal

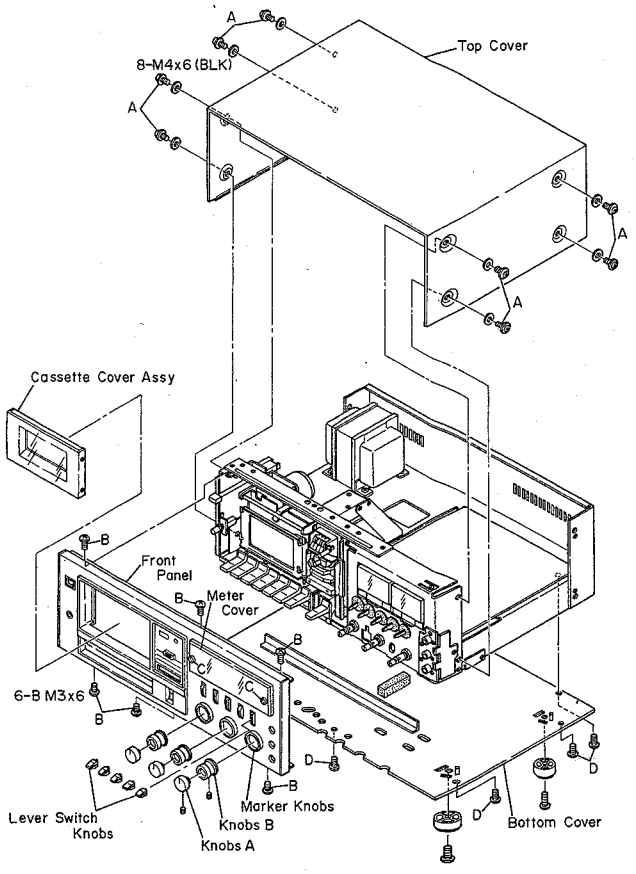

Fig. 4-2 Case and Front Panel

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4-2 TRANSPORT CHASSIS

First remove the Top Cover and the Front Panel, referring to paragraph 4-1.

1. Remove The Counter Belt and retain it.
2. Remove the Chassis Mount. Plate B from the Main Chassis and the Transport Chassis by removing a screw (A) and seven screws (B).
3. Unhook the Record Bar from bottom connecting point of Tape Transport Chassis.
4. Remove the Transport Chassis from the Main Chassis by removing two screws (C) and two screws (D).

NOTE: To disassemble the Transport Chassis completely unplug all the connectors from the Transport Chassis to relative Connectors.

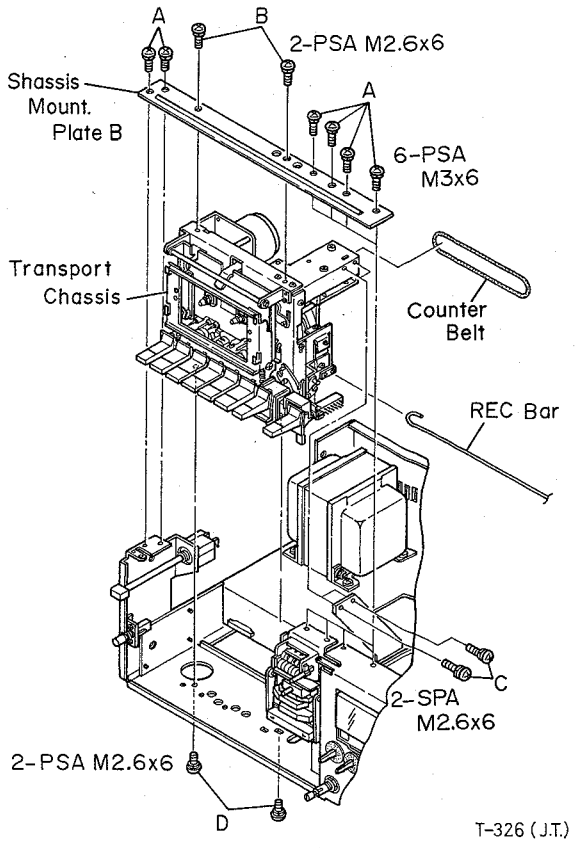


Fig. 4-3 Transport Chassis

4-3 CASSETTE DAMPER (DAMPER CORD STRINGING)

First remove Top Cover referring to paragraph 4-1.

1. Remove the end of Cord String from hook pin (B) on Cassette Holder Ass'y.
2. Remove Damper Spring in contact with Cord String, from spring hook (A) located in the Flywheel Bearing Plate and keep them for remounting.
3. Remove two mounting screws and remove Damper Holder from Damper Bracket.

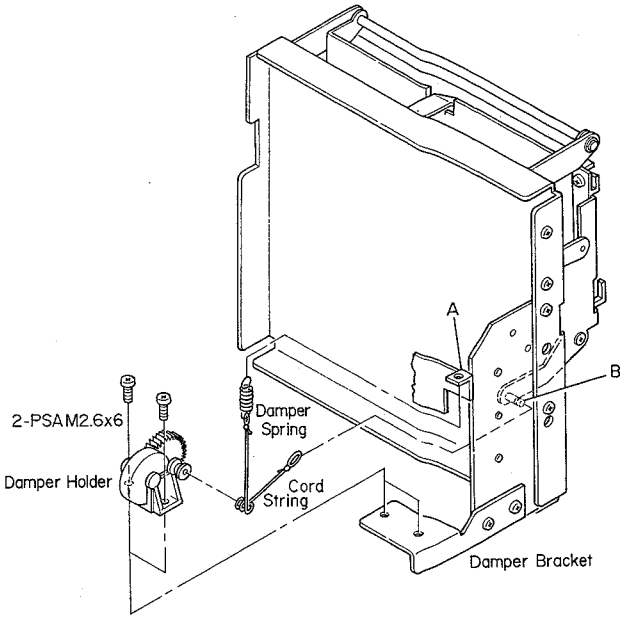


Fig. 4-4 Cassette Damper

4-4 CASSETTE HOLDER ASS'Y

First remove the Top Cover and the Front Panel. See procedure in paragraph 4-1.

1. Disconnect two Cassette Holder Brackets, L and R, from the Transport Chassis by removing two screws (B).
2. Unhook the end of the Cord String from the pin (C) on the Left Cassette Holder Arm.
3. Push down the Holder Arm so that the left Cassette Holder Arm can be disconnected from it.
4. Take off the two E-rings (A) and extract the Cassette Holder Shaft from the Cassette Holder Bracket L, upper holes on the Cassette Holder Ass'y and the Cassette Holder Bracket R in order to separate the Cassette Holder and two Cassette Holder Bracket, L and R.

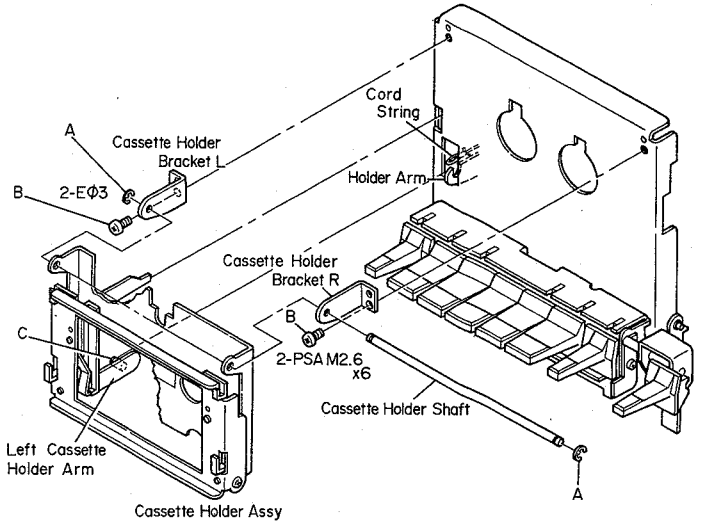


Fig. 4-5 Cassette Holder Ass'y

4-5 PARTIAL ROTATION OF CASSETTE HOLDER

NOTE: Most removal and replacement of such parts as the Reel Table, the Head and the Pinch Roller can be made by partial rotation of the Cassette Holder as described below. In doing this, refer to Fig. 4-5 above.

Fisrt remove the Top Cover, and then the Front Panel. This is illustrated in Fig. 4-2.

1. See the illustration with paragraph 4-4. Depress the EJECT key then unhook the end of the Cord String from the pin located on the left hand side of the Cassette Holder.
2. Release the Cassette Holder by pushing down the Holder Arm and swing the Holder up over the transport mechanism.

4-6 REEL TABLES AND BRAKE PLATE ASS'Y

First remove the Top Cover, the Front Panel (See procedure in 4-1.) then conduct partial rotation of the Cassette Holder (See paragraph 4-5).

1. Remove two screws (C) then separate the Reel Base Ass'y with the Reel Table and the Blake Plate Ass'y.
2. Take off the Counter Belt from the Reel Table Ass'y R and keep it for remounting.
3. Take off the screws (D) mounting the Reel Table (S) which requires, removal or replacement, and separate the Reel Table apart from the Reel Base Ass'y.
4. Detach the E-ring (A), the Brake Spring, the E-ring (B) in that sequence and pull out the Brake Plate Ass'y from the Reel Base Ass'y.

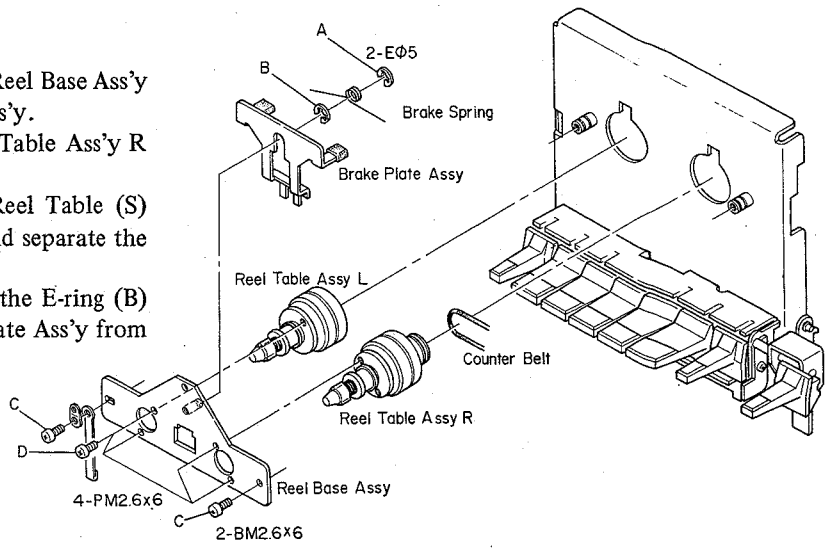


Fig. 4-6 Reel Tables and Brake Plate Ass'y

4-7 HEADS AND PINCH ROLLERS

NOTE: Although Fig. 4-8 gives a full parts breakdown, the following explanation is confined to the direct removal of the Heads and Pinch Rollers.

First remove the Top Cover and the Front Panel as explained in 4-1 and partially rotate the Cassette Holder as described in 4-4.

4-7-1 HEADS

1. Unsolder each lead wire from the terminal pins of the head to facilitate replacement. To resolder each head wire to the newly replaced head, refer to Fig. 4-7.
2. Remove two screws (E) and remove the REC/PLAY Head from the Head Base Plate.
3. Remove the Erase Head Bracket installing the Erase Head by taking off two screws (D).
4. Take off two screws (C) then separate the Erase Head from the Erase Head Bracket.

NOTE: 1. After replacing the head, always adjust the head alignment, especially the REC/PLAY Head's azimuth (see 5-6) and then secure the screw and/or the nut with a drop of locking paint.
2. Connect the wires to the head terminal pins quickly to prevent breaking of internal wires of the head due to overheating.

4-7-2 PINCH ROLLERS

NOTE: The following instructions apply to both Pinch Rollers.

1. Remove the E-ring retaining the Pinch Roller Ass'y and remove the Pinch Roller Spring from the hook (A) of the Head Base Ass'y and the tab of the Pinch Roller Ass'y.
2. Remove the Pinch Roller Ass'y from the pivot stud pin of the Head Base Ass'y and retain the spring (B) for remounting.

NOTE: 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 14.

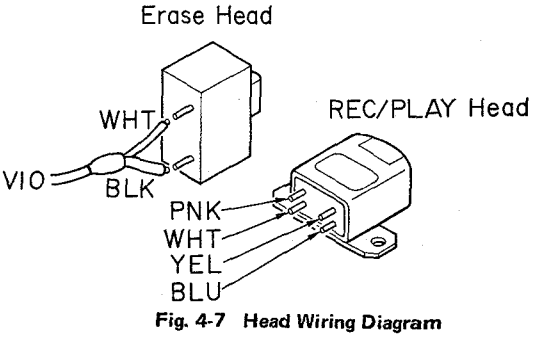


Fig. 4-7 Head Wiring Diagram

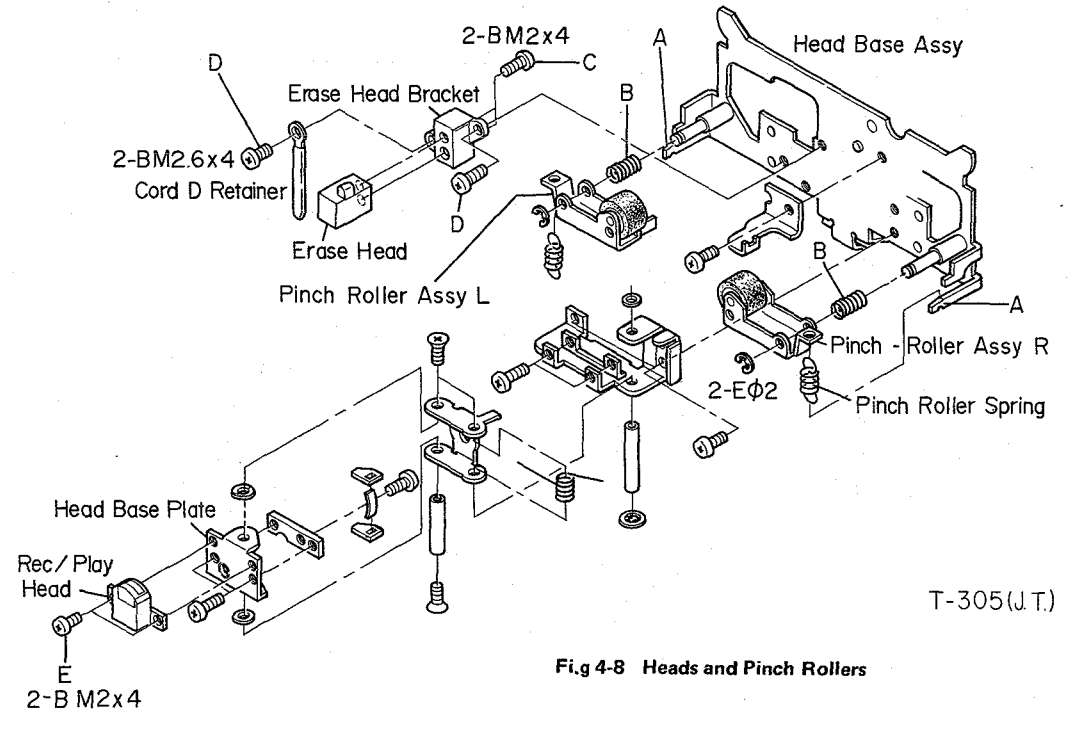


Fig. 4-8 Heads and Pinch Rollers

4-8 MOTOR

First remove the Top Cover. (See paragraph 4-1)

1. See Fig. 4-9. Remove three screws then separate the Side Chassis from the Main Chassis to facilitate dismounting of the Motor.
2. Release the Capstan Drive Belt from the Motor Pulley.
3. Unsolder the two wires to the Motor Ass'y from the PC Board. Note the color code and the position of each wire prior to unsoldering the Motor leads.
4. Remove four mounting screws (A and C) and remove the Motor Base with Motor body from the Transport Chassis.
5. Further remove the Capstan Motor from the Motor Base by removing three mounting screws (B).
6. If necessary, pull out the Motor Pulley from the Motor Shaft by loosening the set screw on the Pulley.

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 Casptan Drive Belt to the Pulley do not twist or stretch the belt.

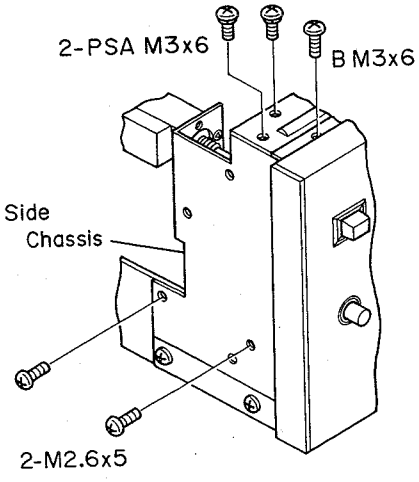


Fig. 4-9 Side Chassis

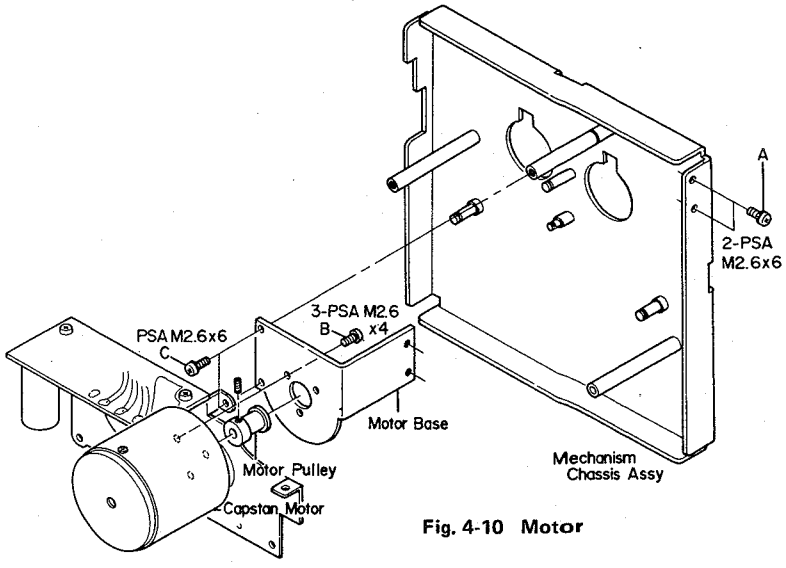


Fig. 4-10 Motor

VOLTAGE AND FREQUENCY SETTING

a. VOLTAGE SELECTOR SETTING PROCEDURE

(FOR GENERAL EXPORT MODELS)

1. Disconnect the power cord of the deck from the source.
2. Turn the deck upside-down on its top and remove the bottom cover by removing screws*. Locate the voltage selector on the bottom of the deck.

NOTE: The voltage selector setting can be checked visually without removing the bottom cover by looking through the cut-out slots in the bottom cover of deck.

3. To increase the selected voltage, turn the slotted center post clockwise using a screwdriver or other suitable tool.
4. To decrease the selected voltage, turn the slotted center post counter-clockwise.
5. The numeral that appears in the cut-out window of the voltage selector indicates the selected voltage (100, 117, 220 or 240).
6. Replace the bottom cover or the wooden case of the deck.

* Decks sold in some limited areas only have a wooden case which must be removed by screws on the bottom of the deck before setting the voltage selector.

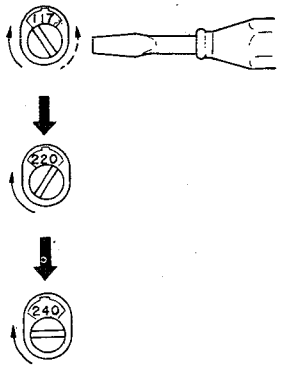


Fig. 4-11 Voltage Selector Setting

b. AC POWER LINE FREQUENCY ADAPTATION

For cassette deck models with DC Capstan Motor, no modification is required for change of power line frequency from 60 Hz to 50 Hz and vice versa.

4-9 CAPSTAN DRIVE ASS'Y

First perform procedures in paragraphs 4-1 and 4-2 so as to dismount the Tape Transport Chassis Ass'y in preparation.

1. Remove the Flywheel Bearing Plate Ass'y from the studs on the Transport Chassis and from the hole on the Motor Base by removing four screws (B).
2. Remove the Capstan Drive Belt from the Motor Pulley then dismount the Motor Base installing the Capstan Motor referring to section 4-8.
3. Remove the Capstan Drive Belt from both Flywheels, then the Fast Wind Belt from the Flywheel Ass'y R and the Idler A Ass'y.
4. Remove two the Oil Retaining Caps from both Capstan Shafts and retain them for remounting.
5. Carefully remove both Flywheel Ass'y from each Housing Ass'y.
6. Remove the Thrust Washers from the shafts of both Flywheel and retain them for remounting.
7. If necessary, remove six mounting screws (A) and the two Housing Ass'ys respectively from the Transport Chassis.

NOTE: 1. Since The Capstan Drive Ass'y is a precision part, TEAC specially distributes the Flywheel and the Housing Ass'y as a whole assembly. Hence, always replace the Flywheel together with the Housing Ass'y.
2. Clean all driving surfaces of the Flywheel, the Motor Pulley and the Drive Belt with TEAC TZ-261 Cleaner kit ("A" for Flywheel and Pulley, "B" for Belt) or with pure alcohol.
3. Do not bend the Capstan Shaft as this will increase wow/flutter or speed deviation.
4. Take off or remount the Motor Ass'y taking care not to scratch or otherwise damage the Motor Pulley.
5. During re-assembly, re-attach the Drive Belt without twisting or stretching it.

4-10 LUBRICATION

Refer to Fig. 4-12.

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.
For efficient oiling. it is recommended that lubrication be done after nearly 1 hour of idling of the deck and while it is still warm.
Normally, it is necessary to lubricate only the areas described below.

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.
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.

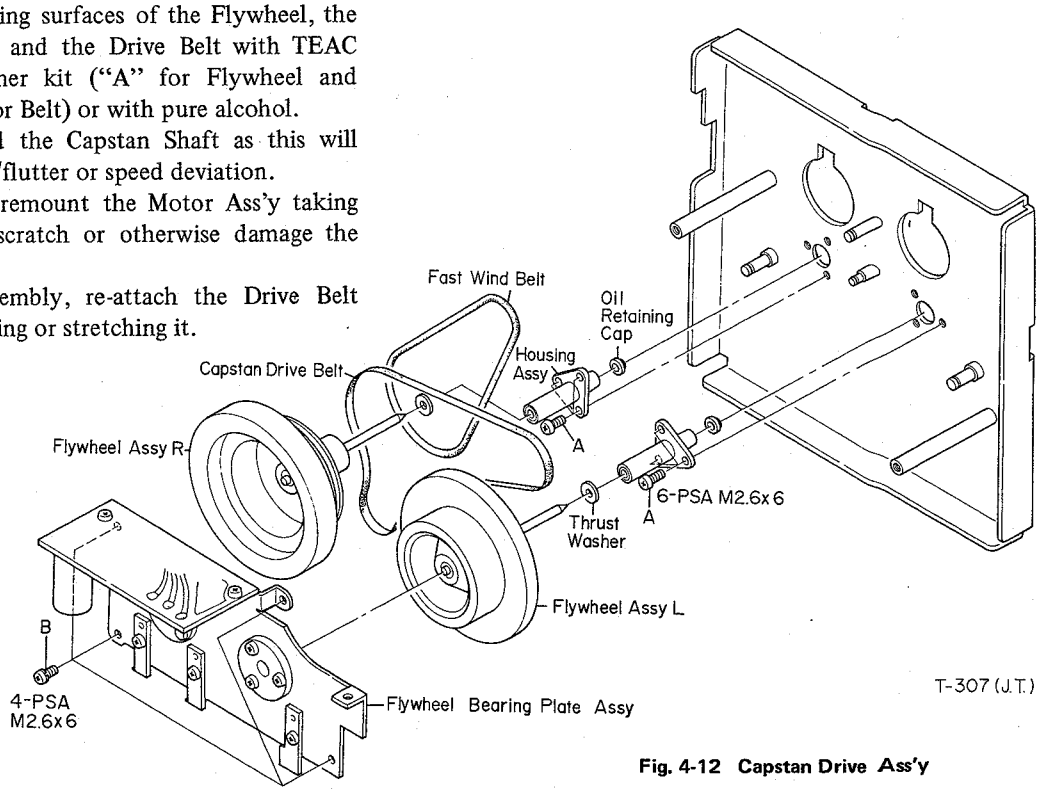


Fig. 4-12 Capstan Drive Ass'y

4-11 IDLERS

First remove the parts listed below as explained previously. When removing the left Play Idler Ass'y only, however, step "b" can be omitted.

a. The Top Cover and the Front Panel. See paragraph 4-1.
b. The Transport Chassis. See paragraph 4-2.
c. The Flywheel Bearing Plate Ass'y, the Motor Base Ass'y with the Motor, the Capstan Drive Belt, the Fast Wind Belt and both Flywheels. See paragraph 4-9.

1. Remove the Play Idler Ass'y (S) from the stud(s) on the Transport Chassis by removing the E-ring(s) (D) and/or C) and unhooking one end of the Idler Play Spring(s).
2. Remove the E-ring (B) and pull out the Idler A Ass'y.
3. Pull out the Idler B Ass'y after unhooking one end of the Idler B Spring from the stud (A) on the Chassis.

NOTE: When remounting these parts, clean the driving surface of them with the TEAC TZ-261B Rubber Cleaner or with pure alcohol.

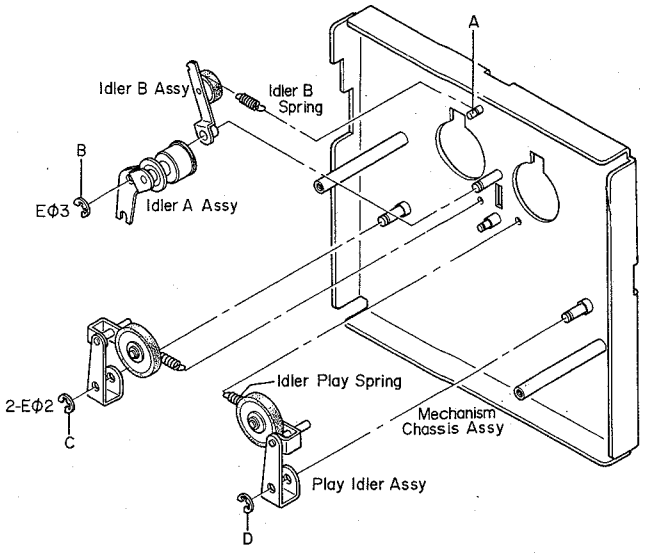


Fig. 4-13 Idlers

5. MECHANICAL CHECKS AND ADJUSTMENTS

5-1 FLYWHEEL THRUST ADJUSTMENT

Specification: 0.2 to 0.4 mm (on both right and left).

NOTE: There are two Flywheels on the A-601R as shown in Figure. The following instruction applies both Flywheels.

1. Switch off POWER.
2. By using a slotted screwdriver with small blade, adjust the Thrust Screw so that there is a clearance of 0.2 to 0.4 mm between the lower end of the Capstan Shaft and the well of the Flywheel Bearing. This adjustment can be made by pushing the Flywheel toward or away from the front of the deck.
3. After adjusting, secure the Thrust Screw with locking paint.

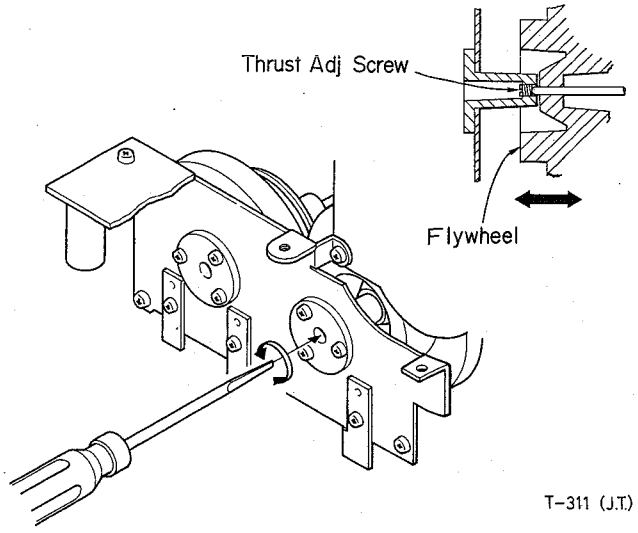


Fig. 5-1 Flywheel Thrust Adjustment

5-2 TAKE-UP TORQUE

Specification: 40 – 60 g-cm (0.6 – 0.8 oz-inch) (in both forward/reverse)

1. Switch on POWER.
2. Load the Cassette Torque Meter (for take-up torque 0 to 100 g-cm or 1.4 oz-inch).
3. Place the deck in the forward or reverse PLAY mode and read the pointer indication on the dial scale.
4. The Meter should indicate a torque of 40 to 60 g-cm (0.6 to 0.8 oz-inch).
5. 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 TEAC TZ-261B Rubber Cleaner or with pure alcohol.

5-3 FAST FORWARD & REWIND TORQUES

Specification: 100 – 150 g-cm (1.4 – 2.1 oz-inch)

1. Switch on POWER.
2. Load the Cassette Torque Meter (for fast forward and rewind torque: 0 to 150 g-cm or 0 to 2.1 oz-inch).
3. Place the deck in the fast forward or rewind mode and read the pointer indication on the dial scale.
4. The Meter should indicate a torque of 100 g-cm – 150 g-cm (1.4 – 2.1 oz-inch).
5. 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 & Rewind torque function with TEAC TZ-261B Rubber Cleaner or with pure alcohol.

5-4 PINCH ROLLER PRESSURE

Specification: 35o g ±50 g (10.6 to 14.1 oz)

NOTE: Although there are two separate Pinch Roller Ass'ys which are on the left hand side and right hand side of the Head Ass'y, only the right hand Pinch Roller is illustrated. All the descriptions in this section, however, apply to both Pinch Rollers.

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.
4. Gently draw the Pinch Roller away from the Capstan shaft in a direction directly downward until the Capstan shaft and the Pinch Roller are completely separated.

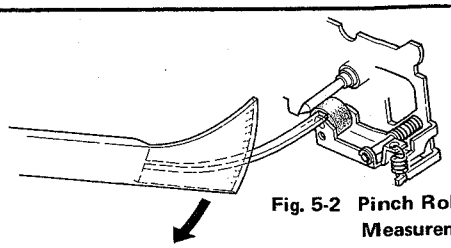


Fig. 5-2 Pinch Roler Pressure Measurement

5. Gradually return the scale back until the Pinch Roller just begins to rotate. The scale should then be reading approximately 350 g ±50 g (10.6 to 14.1 oz).
6. If the reading is out of specified range, replace the Pinch Roller Spring.

5-5 PAUSE TIMING ADJUSTMENT

1. Switch ON power.
2. First set the deck in the forward play mode with no tape loading to conduct this section adjustment.
3. Bend the bent sestion of the Pause Plate in either direction indicated by the arrow so that the following are satisfied in the course of "ON" and OFF" action of the Pause mode.
   a. When in Pause "ON" mode, the reel table and the pinch roller stop their rotation nearly at the same time. (They are located on the right side of the tape transport.) If impossible to achieve this, it is permisible for the reel table to stop slightly earlier than the pinch roller.
   b. When in Pause "OFF" mode, the reel table and the pinch roller rotate almost simultaneously. It is permisible for the this pinch roller to turn a little in advance of the reel table.
4. Adjust Pause Timing for the left hand side of the transport by repeating the same process as above in the reverse play mode.

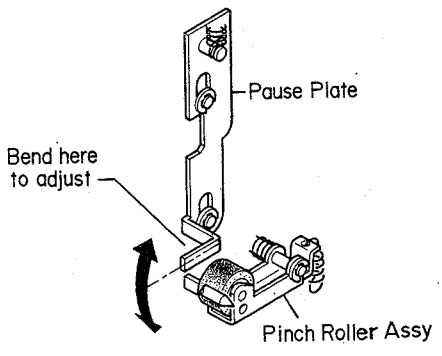


Fig. 5-3 Pause Timing Adjustment

5. After making this adjustment visually, insert a cassette and check that the tape runs smoothly, without undue tension or slackness, and that there is no "monkey talk" sound when the tape motion just begins during operation of the PAUSE control.

5-6 REC/PLAY HEAD HEIGHT/AZIMUTH ADJUSTMENTS

1. Connect the deck and the test equipment as shown in Fig. 5-4
2. Install the Tape Path Test Tape. This special cassette incorporates a mirror and is wound with semi-transparent tape.
3. Set the deck in the forward play mode.
4. During forward play, and while observing the tape movement with the Mirror on the test cassette adjust the height of the REC/PLAY Head by carefully turning the two height/azimuth screws (A and B) for forward play until the bottom edge of the tape is even with the bottom edge of the inner track core.
5. Repeat the same alignment as above in the reverse play mode. Gently rotate the two screws (C and D) for reverse play so that the top edge of tape is flush with the top edge of outer track core surface.
6. Load and play, in both forward and reverse modes, a TEAC MTT-150 test tape.
7. Play the test tape and take the L-ch and R-ch outputs (at roughly equal level) to an oscilloscope in order to make the next adjustment.
8. Make sure the phase relationship between the two signals (L-ch and R-ch) in both forward and reverse modes is within 45 degrees on the oscilloscope.
9. Change the test tape to the TEAC MTT-316 test tape.
10. play the 10 kHz signal section of tape in the forward direction.
11. Slowly adjust the screw (A) for the maximum indication on the AC Voltmeter.
12. Again install the "Mirror" tape and play it in the forward mode then recheck whether the head height adjusted in step 4 is correct or not.
13. If not, re-do the head hight adjustment and the subsequent azimuth adjustment in the forward mode. If necessary repeat these adjustments until ful alignment is achieved.
14. Adjust and check also the height and azimuth in the reverse mode, as above. In this case, adjusting azimuth is done with screw (D).
15. Load the TEAC MTT-506 test tape (blank) and apply and record a 10 kHz signal in the forward direction for a suitable period.
16. Remove this recorded tape, turn it over and replace it in the deck.
17. Play the previously recorded portion of the tape in the reverse mode and make the azimuth adjustment by means of the screw (D), again as in the preceding steps.
18. Change the tape to the MTT-316 tape and finally recheck whether azimuth adjustments in both play modes, forward and reverse are correct.
19. After completing all procedures in the section, secure the four screws with a drop of locking paint.

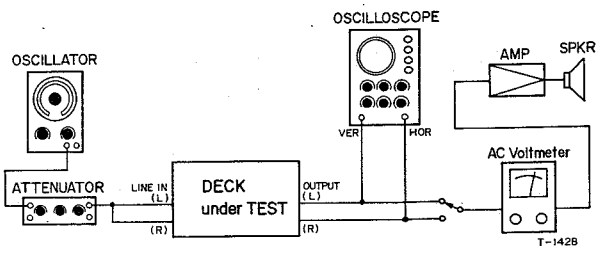


Fig. 5-4 Head Azimuth Adj. Setup

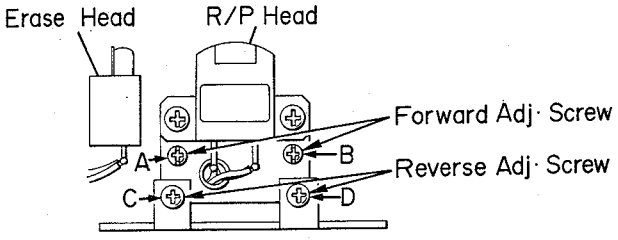


Fig. 5-5 Head Height/Azimuth Adjustments Location

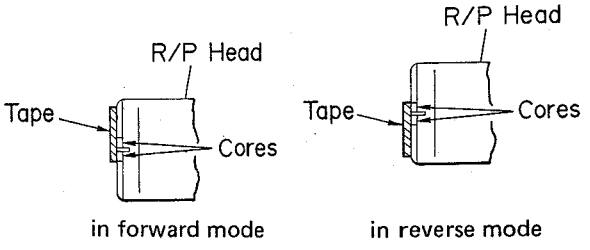


Fig. 5-6 Tape-to-Head Contact Relationship

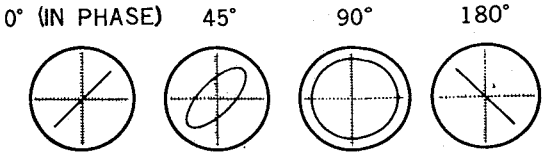


Fig. 5-7 Confirming Phase Relationship

5-7 TAPE SPEED/WOW AND FLUTTER

NOTE: 1. Before performing these adjustments, 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. As the measured results may vary with respect to location on tape at which they were taken, at least two point – at the beginning and near the end of the tape – should be measured. The worst case reading must satisfy the specification.

5-7-1 TAPE SPEED

Specifications:

Deviation: 3,000 Hz ± 30 Hz (in both Forward and Reverse)
Drift: 30 Hz (")
Forward/Reverse Differential: 30 Hz

NOTE: The following adjustments and checks should be done in both forward and reverse play modes.

1. Connect test equipment to the deck as shown in Fig. 5-8.
2. Set the OUTPUT control on the deck to obtain convenient output.
3. Set the EQ switch to the NORMAL position, and then load and play a TEAC MTT-111 test tape (3,000 Hz signal is recorded).
4. Using a common slotted screwdriver whose handle is completely insulated from the screwdriver blade, adjust the control located at the center of the Motor as shown in Fig. 5-9 for reading of 3,000 ±5 Hz on the frequency counter.

   NOTE: This tape speed setting should be done after approx. 30 seconds of operating time of the deck.

5. Then, verify that the reading on the frequency counter is within the specified range of 3,000 Hz ± 30 Hz, that the Tape Speed Drift is within 30 Hz at any portion of the tape run, and that forward/reverse tape speed differential between maximum and minimum values in both forward and reverse modes is also within 30 Hz.
6. If any of these tape speed parameters are significantly out of spec., check the Pinch Roller pressure and the tape driving funcion for correctness, and make sure the tapa path is clean.

5-7-2 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.

Specifications:

Playback: 0.10% (WRMS) (in Forward/Reverse modes)
Record/Playback: 0.25% (RMS)

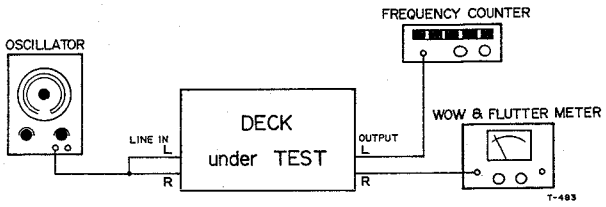


Fig. 5-8 Connection

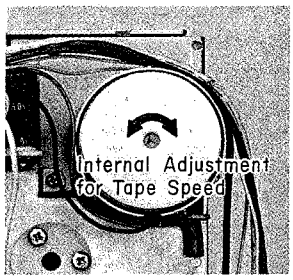


Fig. 5-9 Tape Speed Adjustment Location

PLAYBACK METHOD

NOTE: The following procedures should be done in both forward and reverse modes.

7. Resume playing the MT-111 test tape and read the indication on the wow and flutter meter.
8. The wow and flutter value should be 0.10% WRMS, max. in both modes, forward and reverse.
9. If the wow and flutter is out of specification, check the Pinch Roller Pressure and the take-up torque which depends on direction of tape motion, see that the tape path is clean, and that the Capstan Belt is not stretched or oily.
10. 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.

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.

11. Place the BIAS switch in the NORMAL position.
12. Set LINE and OUTPUT controls on the deck to obtain convenient input and output levels.
13. Load a TEAC MTT-502 test tape (blank).
14. Apply and record a 3,000 Hz signal.
15. Rewind and play this recorded section.
16. Read the indication on the wow and flutter meter.
17. The wow and flutter value should be 0.25% RMS max.
18. If the measured value is out of specification, repair using the same methods as stated in steps 9 and 10 in the Playback Method procedure.

5-8 HEAD BASE ASSEMBLY ADJUSTMENT

1. Remove the Tape Transport Chassis from the main chassis. For details refer to paragraph 4-2.
2. Locate the Head Base shift adjusting screw referring to Fig. 5-10 and tighten it so that when depressing slowly and locking down the Play key, Head Base Plate will moves forward (in the direction of the arrow) completely.
3. At this time, tighten screw to the minimum extent necessary to make the adjustment. Overtightening of the screw will result in excessively stiff action of the PLAY key.
4. After making steps 2 and 3, adjust the position of the sub chassis stopper by means of the screw (A) with the Play key kept depressed so that the head base ass'y can not skew. (ie. rotate in the plane of the ass'y about a roughly median axis)

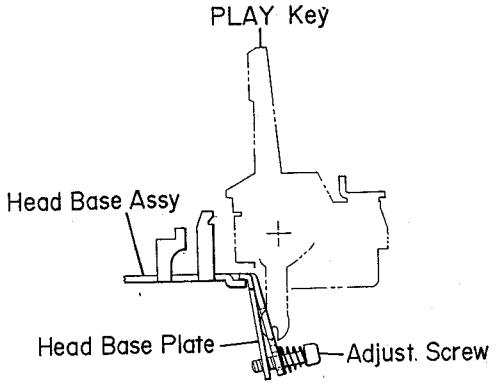


Fig. 5-10 Head Base Assembly Adjustment (1)

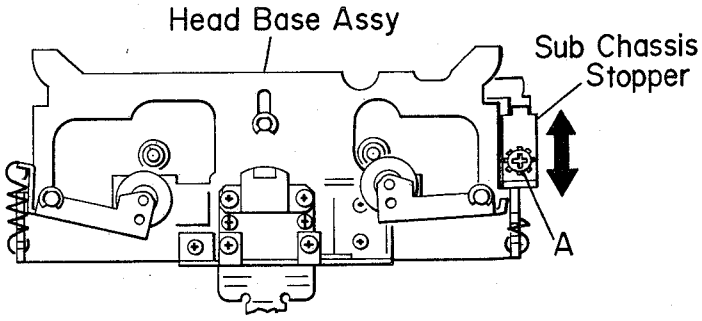


Fig. 5-11 Head Base Assembly Adjustment (2)

5-9 REVERSE SOLENOID POSITIONING ADJUSTMENT

1. Remove Top Cover and Front Panel from the Main Chassis. See Paragraphs 4-1.
2. See Fig. 4-5 for steps 2 to 4. Unhook the end of the Cord String from the pin located on the left side of the Cassette Holder.
3. Depress the EJECT key to open the Cassette Holder.
4. Release the Cassette Holder by pushing down the Holder Arm and swing the Holder up over the transport mechanism. This gives access to the place where adjustment is to be effected.
5. Set the deck in the reverse play mode with no tape inserted to engage the Reverse Solenoid.
6. Adjust the position of the Solenoid by loosening the 2 screws (A) so that the Reverse Lever C pushes the Reverse Drive Spring obviously clear of the flange of the Head Ass'y Lever when in the reverse play mode.
7. After adjusting, retighten the 2 screws of the Solenoid.

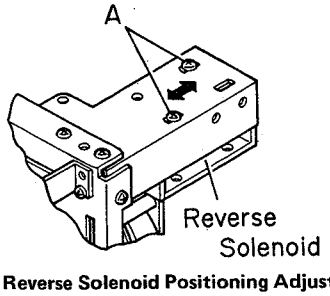


Fig. 5-12 Reverse Solenoid Positioning Adjustment (1)

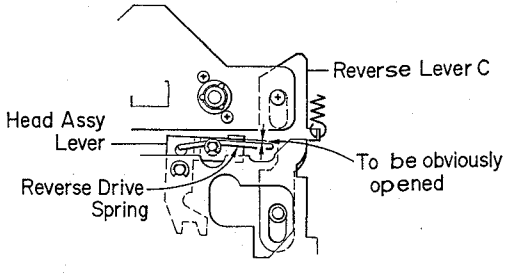


Fig. 5-13 Reverse Solenoid Positioning Adjustment (2)

5-10 LEAF AND MICRO SWITCH INSTALLATION ADJUSTMENTS

NOTE: The following switch installation adjustments should be made in stop mode with power switch OFF.

a. Pause Switches (S405 and S406)
See Fig. 5-15. Check that both Pause Switches are installed equidistantly from the part marked A. Then make sure that these switch actuator tongue plates are kept adequately separated from the bent-portion of the Pause Lever Ass'y, and that these plates does not touch the Timer Base Plate etc.

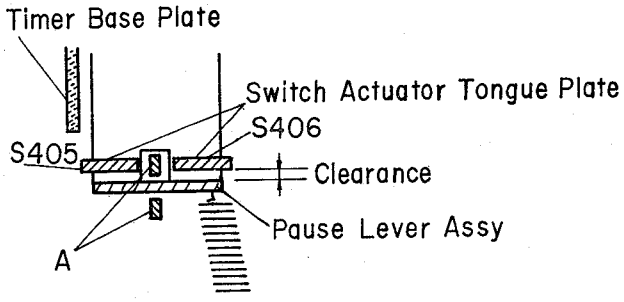


Fig. 5-14 PAUSE Switch Adjustments

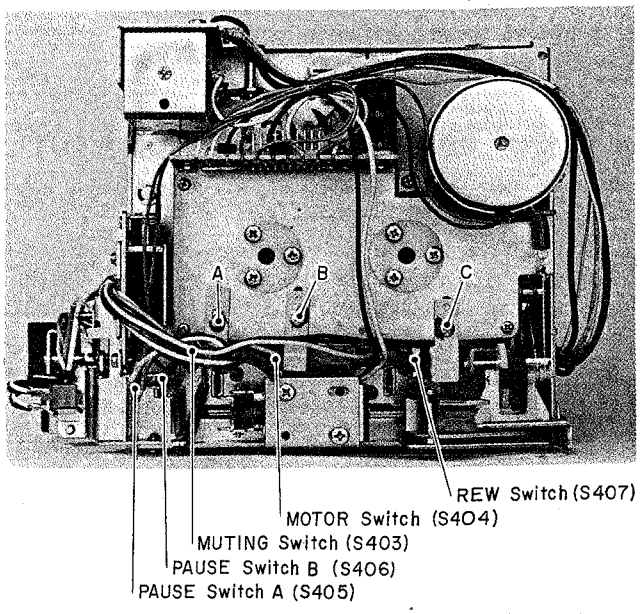


Fig. 5-15 Leaf and Micro Switch Locations

b. Muting and Motor Switches (S403 and S404)
See Fig. 5-16. The gap (A) on the Muting Switch should be as large as possible and greater than that on the Motor Switch (B) so that, when the PLAY key is depressed, the Motor Switch contacts close before the Muting Switch does. In addition, make sure that bent tip of the Switch Actuating Plate is flush with the tongue plate of Motor Switch. Both switch adjustments can be done by means of screws (A and B in Fig. 5-15).

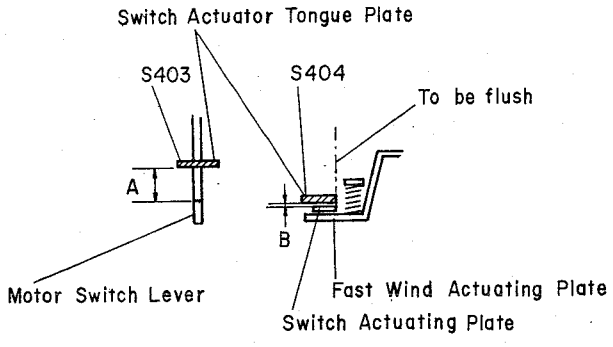


Fig. 5-16 MUTING and MOTOR Switch Adjustments

c. REW Switch (S407)
See Fig. 5-17. Adjust the position of the REW micro switch by means of the screw (C in Fig. 5-15). Give the maximum possible clearance (see illustration) which still allows correct operation of the switch when the REW key is depressed. Maximising this clearance minimises the risk of damage when the REW key is fully (over-) depressed.

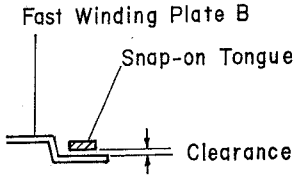


Fig. 5-17 REW Switch Adjustment

5-11 CASSETTE RETAINER ARM AND REC STOPPER CASSETTE ADJUSTMENTS

1. When a cassette loaded in the Cassette Holder is pushed into the lock-close position, check that the Cassette Retainer Arm and the bent-tip of the REC Stopper rise clear of the cassette and snap down firmly onto the cassette when it is fully seated.
2. The Cassette Retainer Arm should apply light pressure to the front edge of the cassette. If the pressure is excessive, or if contact not made, the Cassette Retainer Arm should be bent inwards or outwards as indicated by the arrow C.
3. The REC Stopper is activated by the Cassette Retainer Arm. If the clearance (A) between the two parts is not correct, the REC Stopper will not clear the cassette in time as the housing is closed. Adjustment can be made by bending the rear extention of the REC Stopper up or down (arrow B) as appropriate.

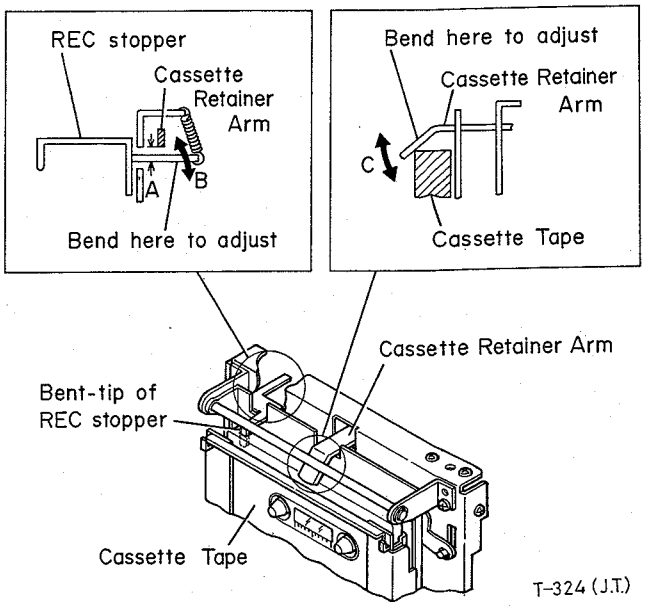


Fig. 5-18 Cassette Retainer Arm and REC Stopper Adjustments

6. ELECTRICAL CHECKS AND ADJUSTMENTS

GENERAL NOTES

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 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 dB = 0.775 V, except where specified. If an AC voltmeter calibrated to 0 dB = 1 V is to be used, appropriate compensation should be made.
5. The AC voltmeter used in the procedures including the measurement at DOLBY test points, must have input impedance of 1MΩ or more.
6. To complete these performance checks correctly, keep the order as explained in this chapter.
7. All checks and adjustments should be made with Top Cover and Front Panel removed. (See Section 4-1)

* For each procedure, make the initial equipment test set up and connections as shown in the associated illustrations.

* Unless indicated otherwise in the procedures, the basic starting conditions for each test will be as given in the chart below.

Switch	Position
MEMORY	OFF
BIAS	CrO_2
EQ	CrO_2
DOLBY NR	OUT
MIC ATT (dB)	

6-1 ADJUSTMENT AND TEST POINT LOCATIONS

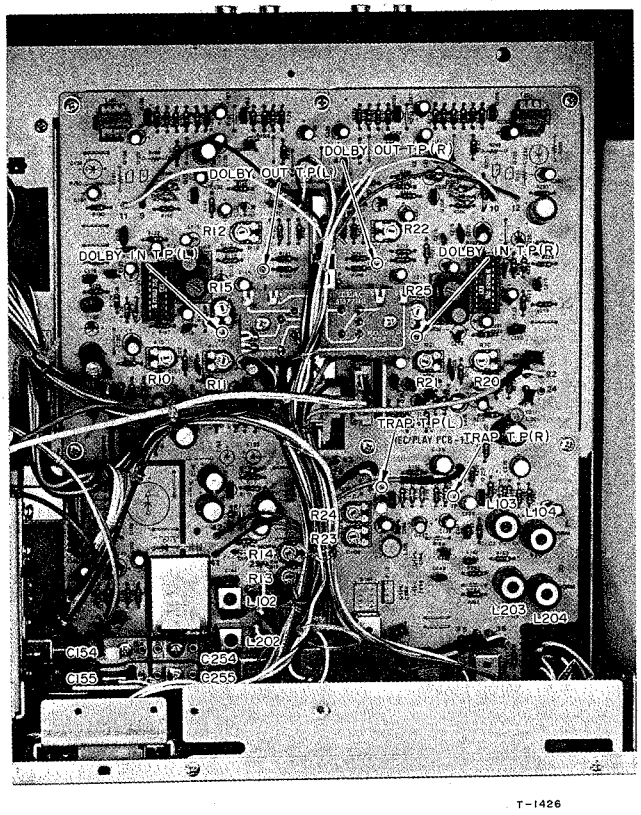


Fig. 6-1 Adjustment and Test Point Locations

C154/C254	Bias Adjustment (CrO_2)
C155/C255	Bias Adjustment (NORMAL, FeCr)
L102/L202	Bias Trap
L103/L203	Record Equalization (CrO_2, FeCr)
L104/L204	Record Equalization (NORMAL)
R10/R20	Playback Output Level Adjustment
R11/R21	Playback Equalization
R12/R22	VU Meter Adjustment
R13/R23	Record Level Adjustment (CrO_2)
R14/R24	Record Level Adjustment (NORMAL, FeCr)
R15/R25	DOLBY IC gain Adjustment

6-2 PLAYBACK PERFORMANCE

NOTE: Except for the Playback Frequency Response checks, all alignments in the PLAYBACK PERFORMANCE have to be done with the EQ switch set to CrO_2 position only, unless there is a special reason which requires that other positions also be checked.

6-2-1 DOLBY IC GAIN SETTING

1. Load any recordable cassette tape and place the deck in REC/PAUSE mode.
2. Connect a AC Voltmeter to the Dolby IN test points.
3. Apply a 400 Hz signal at –9 dB (274 mV) to LINE IN jacks.
4. Adjust LINE level Controls (on front panel) for –25 dB (43.6 mV) level.
5. Connect the AC Voltmeter to the Dolby test points.
6. Adjust R15/R25 controls for 580 mV (–2.5 dB).

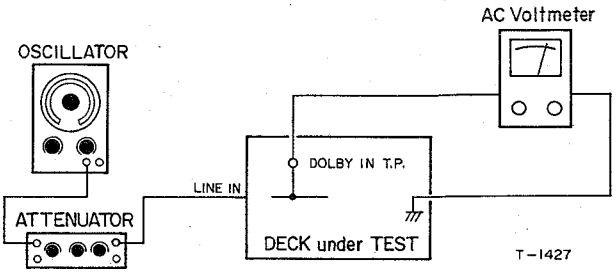


Fig. 6-2 Connection (1)

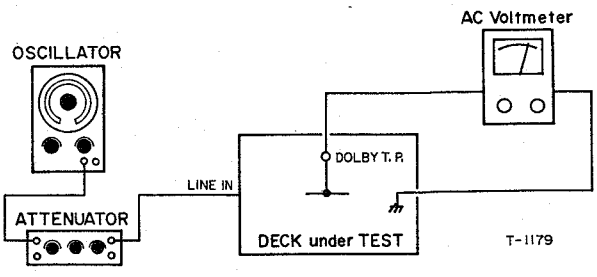


Fig. 6-3 Connection (2)

6-2-2 SPECIFIED OUTPUT LEVEL SETTING

Specifications:

Specified Output Level:	Forward, –5 dB (436 mV) Reverse, –5 dB ±1 dB (388 mV to 489 mV)
Max. Output Level:	Both Forward and Reverse, +1 dB ±2 dB (690 mV to 1.09 mV)

1. Load and play a TEAC MTT-150 test tape in the forward direction.
2. Adjust R10/R20 controls for 580 mV (–2.5 dB) on the AC Voltmeter connected to the DOLBY test points, as shown in Fig. 6-4.
3. Play the tape in the reverse direction and ensure that the Voltmeter indication is within –2.5 dB ±1 dB (518 mV to 652 mV).
4. Change the Voltmeter connection to the OUTPUT jacks as shown in Fig. 6-5.
5. Set the OUTPUT controls fully colockwise.
6. Confirm that the output level is +1 dB ±2 dB (690 mV to 1.09 V) in both modes, forward and reverse playback.
7. In forward direction operation, set the OUTPUT controls so that the Voltmeter reading indicates –5 dB (436 mV). This is the Specified Output Level.
8. Change the tape motion to the reverse direction and ascertain that the Voltmeter reading is within –5 dB ± 1 dB (388 mV to 489 mV).
9. The physical position of the OUTPUT control set in step 7 indicates the Specified Control Setting referred to in subsequent procedures.

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

6-2-3 VU METER CALIBRATION – PLAYBACK –

Specifications: Forward, +3 VU
Reverse, +3 VU ±1 VU

10. With the specified setting in paragraph 6-2-2, play a TEAC MTT-150 test tape in the forward direction.
11. Adjust R12/R22 controls for +3 VU on the VU meter.
12. When changing tape travel to the reverse direction, check that the VU Meter reads +3 VU ±1 VU.

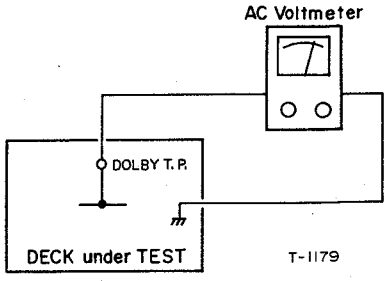


Fig. 6-4 Connection (1)

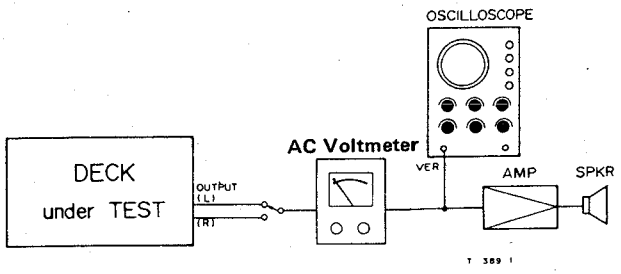


Fig. 6-5 Connection (2)

6-2-4 FREQUENCY RESPONSE – PLAYBACK –

13. Load and play a TEAC MTT-316 test tape in the forward direction and while playing the 4th section of the tape voice labelled as 315 Hz, note this reading for a temporary reference level for the following adjustments.
14. While playing the 10 kHz recorded section, adjust R11/R21 so that 10 kHz is at the same level as the previous reference level in order to match the higher frequency signals with the given response limits.
15. Repeat the same procedure as above in the reverse direction.
16. Control the process of the above steps 13 to 15 until frequency characteristics are satisfied in both direction condition.

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.

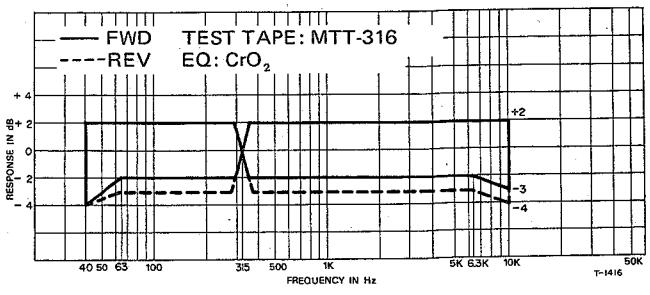


Fig. 6-6 Playback Frequency Response

6-2-5 SIGNAL TO NOISE RATIO – PLAYBACK –

Specifications:

EQ switch, FeCr and CrO_2: 48 dB (min.) (in both forward/reverse modes)

NORMAL: 47 dB (min.) (")

NOTE: The following checks should be done in the forward and then in the reverse direction.

CrO_2 Tape

1. Connect the deck and the test equipment as shown in Fig. 6-5 on page 21.
2. Set the EQ switch to the CrO_2 position.
3. Load and play a TEAC MTT-150 test tape.
4. Confirm that by reproducing the 400 Hz test tone on the tape, the output from the deck is set to the specified output level of –5 dB for the forward direction or –5 dB ±1 dB for the reverse direction respectively.
5. If not, do the procedure stated in paragraph 6-2-2.
6. Change the tape to a TEAC MTT-501 test tape which is completely demagnetized by a bulk tape eraser (such as TEAC E-2) and play it back.
7. Read the indication on the AC Voltmeter.
8. Compare the reading to the specified level.
9. The difference should be 48 dB or more.

FeCr and NORMAL Tapes

10. Repeat the above procedure with the following exceptions.

	FeCr Tape	NORMAL Tape
EQ switch	FeCr position	NORMAL position
Test tape	MTT-504	MTT-501
Specification	48 dB	47 dB

6-2-6 HEADPHONE OUTPUT LEVEL CHECKS

Specification: – 18 dB ±2 dB (77 mV to 122 mV)

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.
3. Level should be –18 dB ±2 dB (77 mV to 122 mV).

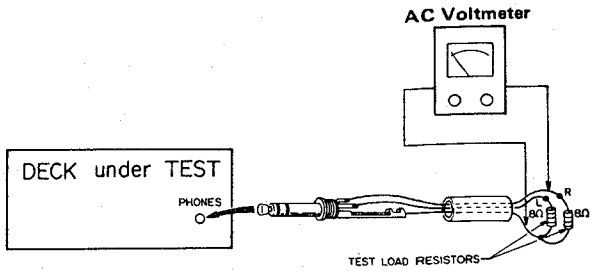


Fig. 6-7 Connection

6-3 MONITOR PERFORMANCE

6-3-1 MINIMUM INPUT LEVEL CHECKS

Specifications:

LINE: –19 dB ±2 dB (69 mV ~ 109 mV)
MIC: –67 dB ±2 dB (274 μV ~ 435 μV)
DIN: –35 dB ±2 dB (10.9 mV ~ 17.3 mV)

NOTE: To prevent mis-measurements for the following procedures, any connection cords other than those 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 IN inputs.

1. Connect the deck under test and the test equipment as shown in Fig. 6-3 on page 20.
2. Load any recordable tape.
3. Place the deck in the RECORD-PAUSE mode.
4. Set the MIC controls to maximum.
5. Apply a 400 Hz signal at –67 dB ±2 dB (274 μV ~ 435 μV) to the MIC jacks and check for 580 mV (–2.5 dB) on the AC Voltmeter connected to the DOLBY test points. (This is the Minimum Input Level check for the MIC jack).
6. Apply a 400 Hz signal at –35 dB ±2 dB (10.9 mV ~ 17.3 mV) to the input terminals of the DIN connector and check for 580 mV. (This is the Minimum Input Level checks for the DIN inputs).
7. After checking, reduce the MIC controls to minimum to present noise insertion during subsequent procedures.
8. Set the LINE controls to maximum.
9. Apply a 400 Hz signal at –19 dB ±2 dB (69 mV ~ 109 mV) to the LINE IN jacks and check for 580 mV. (This is the Minimum Input Level checks for the LINE inputs)

6-3-2 SPECIFIED LINE CONTROL SETTING

Specification:
Specified input level: –9 dB (274 mV)

9. Apply a 400 Hz signal at –9 dB (274 mV) to the LINE IN jacks.
10. Set the LINE controls to obtain a reading of 580 mV (–2.5 dB) on the AC Voltmeter.
11. Change the connection of the AC Voltmeter to the OUTPUT jacks as shown in Fig. 6-8.
12. Check that the level at the OUTPUT jacks is within –5 dB ±1 dB (388 mV to 489 mV). The position of the LINE controls (step 10) indicates the Specified LINE Control setting refered 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.

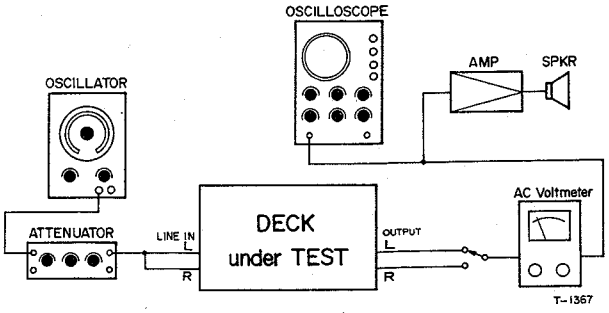


Fig. 6-8 Connection

6-3-3 VU METER CALIBRATION CHECKS

Specification: +3 VU ± 1VU

13. Make certain that the VU Meter on the deck indicates +3 VU ±1 VU.

6-4 RECORDING PERFORMANCE

NOTE: 1. Before making any adjustments of the recording circuit, be sure that all tests in the PLAYBACK and MONITOR performance sections have been accomplished. The preceding performance should be proeperly adjusted; otherwise record calibration would be inaccurate.

2. The adjustments and checks for FeCr and NORMAL tapes usually may be omitted unless the technician wishes to confirm that they also are within specifications, except for the sections where these tape are designated.

6-4-1 BIAS TRAP ADJUSTMENTS

NOTE: The AC voltmeter used in this procedure must have input impedance of 1M ohm 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 at BIAS TRAP test points and ground. See Fig. 6-9.

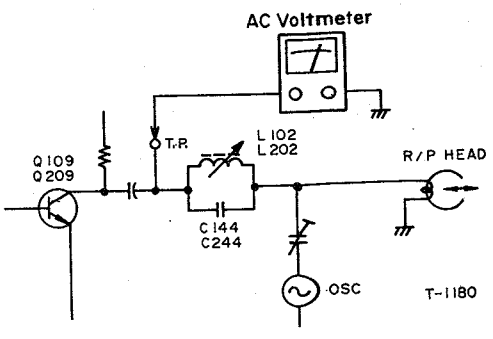


Fig. 6-9 Bias Trap Adjustment Setup

6-4-2 RECORD BIAS SETTING

CrO_2 Tape

1. Connect the deck and the test equipment as shown in Fig. 6-8 on page 23.
2. Load a TEAC MTT-506 test tape.
3. Adjust C154/C254 in a counter clockwise direction until the capacitor leaf springs open completely.
4. Apply and record two tone signals in turn; a 400 Hz signal and 6.3 kHz signal, both at –42 dB (6.15 mV).
5. Rewind and play this recorded section and note the AC voltmeter indication.
6. Turn C154/C254 clockwise slightly and record another section of tape.
7. Rewind over this section and play the tape again and note the AC voltmeter indication.
8. Repeat this operations of recording, rewinding, playing, and adjusting until no difference in playback level between these two signals is obtained.

NORMAL Tape

9. Load a TEAC MTT-501 test tape with the BIAS/EQ switches set to the NORMAL position and the DOLBY NR switch to the IN position.
10. Apply and record 2 tones signals, in turn; a 400 Hz tone at –42 dB (6.15 mV) and a 10 kHz tone at –42 dB.
11. Rewind and play this recorded section.
12. Compare the differences between the output level of the 400 Hz signal and that of the 10 kHz signal.
13. The output level of the 10 kHz signal must be 4 dB above the 400 Hz signal level.
14. Adjust C155/C255 to achieve this, continuing the process of recording-rewinding-playing-adjusting.
15. After finishing these procedures, return the DOLBY NR switch to the OUT position for the following procedures.

6-4-3 RECORD LEVEL SETTING

CrO_2 Tape

16. Set the BIAS/EQ switches to the CrO_2 position and load a TEAC MTT-150 test tape.
17. Play the tape and make sure that levels from OUTPUT jacks are –5 dB (436 mV).
18. Change tape to the MTT-506.
19. Apply and record a 400 Hz test signal at –12 dB (194 mV).
20. Rewind and play this recorded section.
21. Adjust R13/R23 controls to obtain –8 dB (308 mV) at deck's output.
22. Continue the process of the recording-rewinding-playing-adjusting until this –8 dB is obtained.

NORMAL Tape

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

BIAS/EQ switches: NORMAL position
Test tape: MTT-501
Adjustments: R14/R24

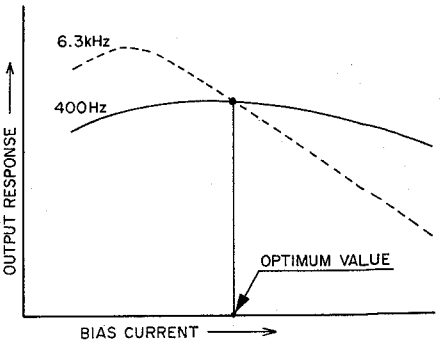


Fig. 6-10 Bias Adjustment (CrO_2 Tape)

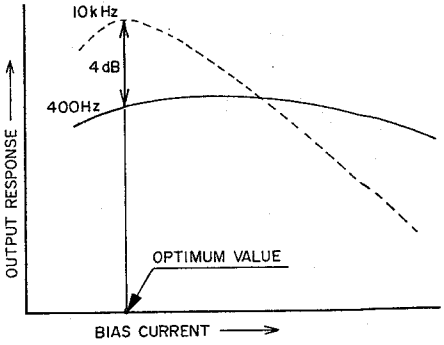


Fig. 6-11 Bias Adjustment (NORMAL Tape)

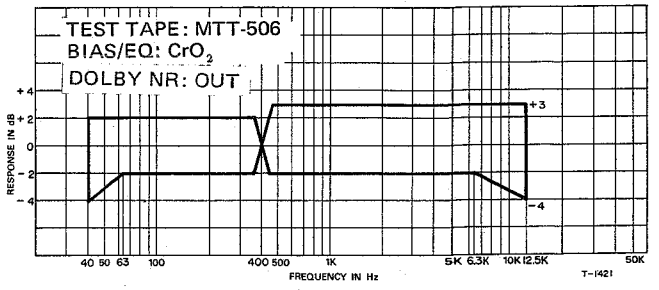


Fig. 6-13 Overall Frequency Response (CrO_2, Forward)

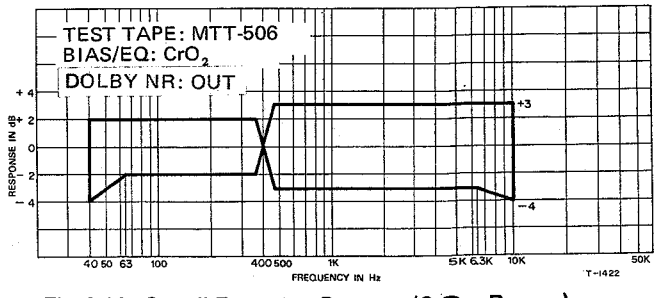


Fig. 6-14 Overall Frequency Response (CrO_2, Reverse)

6-4-4 DISTORTION CHECKS

Specification:
2.5% or less (w/CrO_2 and FeCr Tapes)
2.0% or less (W/NORMAL tape)

CrO_2 Tape

1. Load a TEAC MTT-506 test tape.
2. Apply and record a 400 Hz test tone at –12 dB (194 mV).
3. Rewind and play this recorded section.
4. Read the indicated value on the distortion analyzer.

FeCr and NORMAL Tapes

5. Repeat the above "CrO_2 Tape" procedure with the following exceptions.

	FeCr Tape	NORMAL Tape
BIAS/EQ switches:	FeCr position	NORMAL position
Test Tapes:	MTT-504	MTT-501

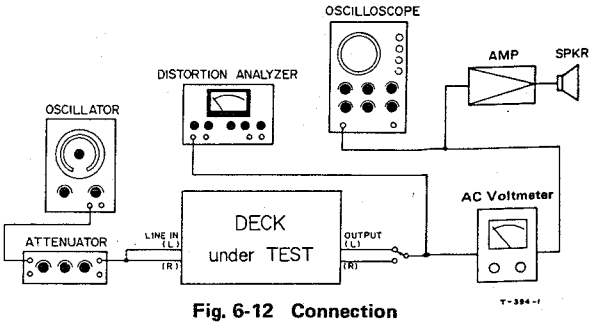


Fig. 6-12 Connection

6-4-5 FREQUENCY RESPONSE – OVERALL –

CrO_2 Tape

1. Connect the deck and the test equipment as shown in Fig. 6-8.
2. Load a TEAC MTT-506 test tape.
3. Apply and record a test signal as required for frequencies in the Fig. 6-13 at –42 dB (6.15 mV).
4. Rewind and play this recorded section in the forward mode.
5. Make sure the readings on the AC voltmeter are within the response limits.
6. Invert the tape and check also the frequency characteristic in the reverse play mode using the previously recorded portion. Refer to Fig. 6-14 for standard.

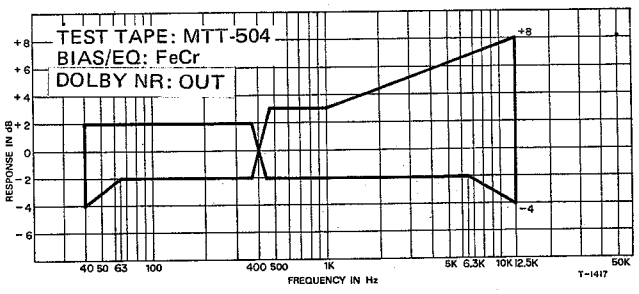


Fig. 6-15 Overall Frequency Response (FeCr, Forward)

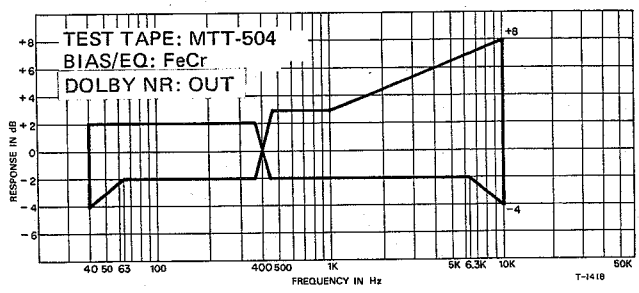


Fig. 6-16 Overall Frequency Response (FeCr, Reverse)

7. In case of any deviation in the high frequency range of the response limits in both play mode, clean the heads and if this cleaning is ineffective, adjust L103/L203.

FeCr and NORMAL Tapes

8. Repeat the above procedures, with the following exceptions.

	FeCr Tape	NORMAL Tape
BIAS/EQ switches:	FeCr position	NORMAL position
Test Tapes:	MTT-504	MTT-501
Charts:	Fig. 6-15, 16	Fig. 6-17, 18
Adjustments:	L103/L203 (same as CrO_2 Tape)	L104/L204

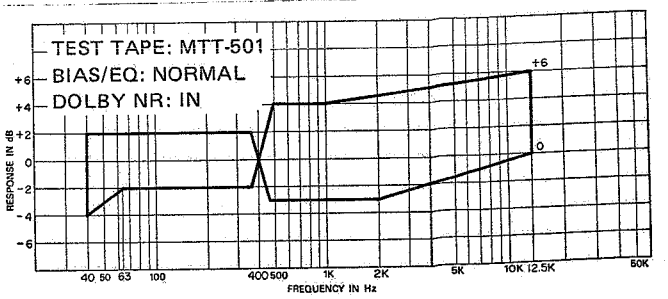


Fig. 6-17 Overall Frequency Response (NORMAL, Forward)

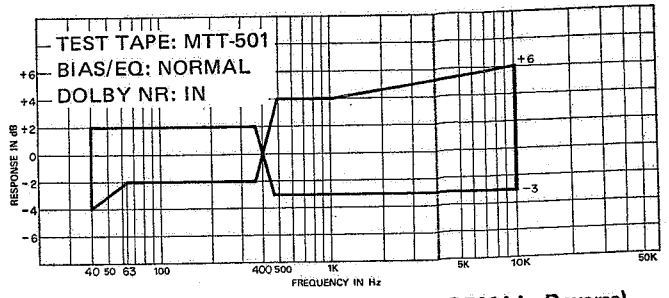


Fig. 6-18 Overall Frequency Response (NORMAL, Reverse)

6-4-6 SIGNAL TO NOISE RATIO – OVERALL –

Specifications:
CrO_2 and FeCr tapes: 47 dB (min.)
NORMAL tape: 45 dB (min.)

CrO_2 Tape

1. Connect the deck and the test equipment as shown in Fig. 6-8.
2. Initially make sure that deck is set in specified record-signals for several seconds.
3. Load the TEAC MTT-506 test tape.
4. Apply and record specified input level of –9 dB of 1 kHz signal for several seconds.
5. Then continue recording with no signal applied for a few seconds.
6. Rewind the tape to the beginning of the 1 kHz signal recorded portion.
7. Play and obtain the output level difference between the 1 kHz signal recorded portion and no signal recorded portion.
8. The difference should meet the specification of 47 dB (min.).

FeCr and NORMAL Tapes

9. Repeat the preceding procedures using the following substitutions.

	FeCr Tape	NORMAL Tape
BIAS/EQ switches:	FeCr position	NORMAL position
Test Tape:	MTT-504	MTT-501

6-4-7 ADJACENT TRACK CROSSTALK MEASUREMENT

Specification: 40 dB (min.)

NOTE: The tape must be completely erased prior to this procedure, Preferably use bulk erased tape.

Numbers in parentheses correspond to steps in Fig. 6-20.

1. Load TEAC MTT-506 test tape.
2. Apply a 125 Hz test signal at –9 dB (274 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 difference between this reading and the reading previously measured for the 125 Hz signal.

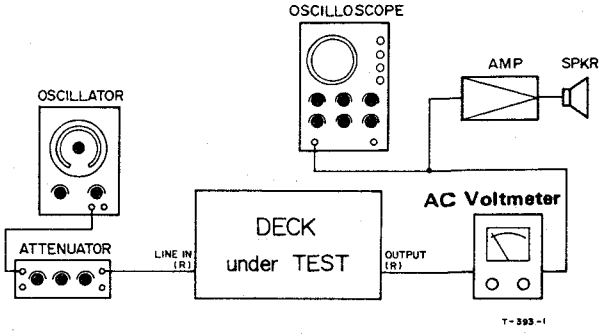


Fig. 6-19 Connection

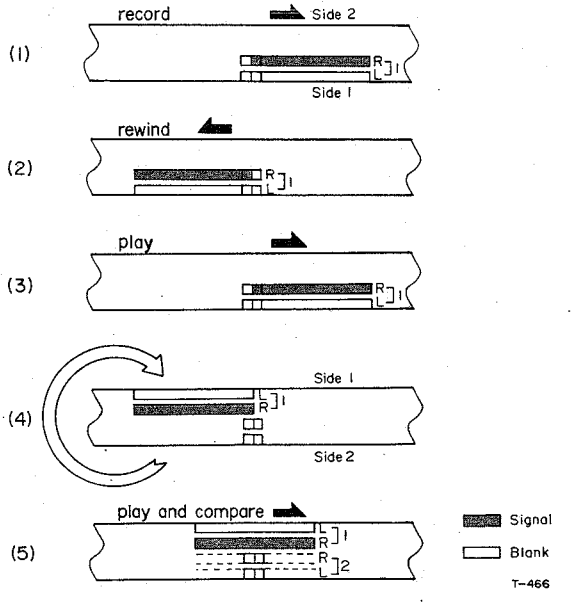


Fig. 6-20 Adjacent Track Crosstalk Measurement Procedure

6-4-8 CHANNEL SEPARATION

Specification: 35 dB (min.)

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.

Numbers in parentheses correspond to steps in Fig. 6-22.

1. Load a TEAC MTT-506 test tape.
2. Apply a 1 kHz test-tone at –9 dB (274 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)

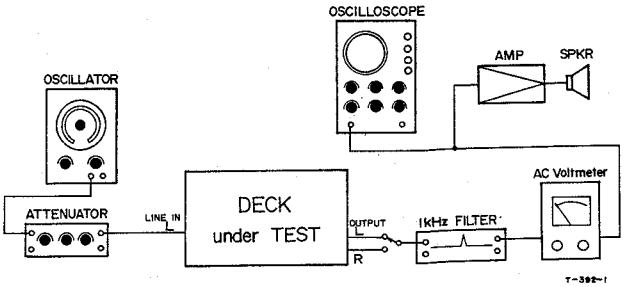


Fig. 6-21 Connection

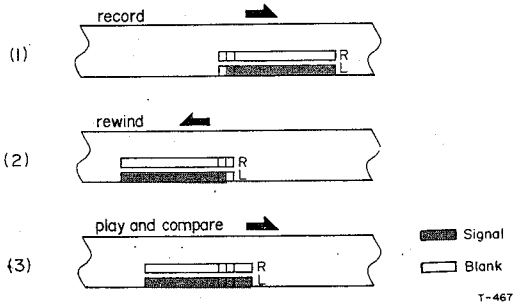


Fig. 6-22 Channel Separation Check Procedure

6-4-9 REC MUTE FUNCTION CHECK

Specification:

Difference between specific recorded portion and erased internal portion: 65 dB (min.)

NOTE: For this check, a 1 kHz narrow bandpass filter should be used. The test signal delivered from the AF oscillator should be turned to the filter used.

1. Connect the deck and the test equipment as shown in Fig. 6-8.
2. Load a TEAC MTT-506 test tape.
3. Apply and record a 1 kHz signal at –9 dB (274 mV) for several seconds.
4. Depress and lock down the REC MUTE Key so that it will cause the tape to run with no incoming signal recording for several seconds.
5. Depress again and release the REC MUTE Key to make a normal recording for a short duration.
6. Rewind the tape to the original starting point of the 1 kHz signal recorded portion.
7. Play the tape and obtain the output level of both the recorded portion and the created no signal portion.
8. Measure the output level difference between the portions.
9. A 65 dB difference or more is required.

6-4-10 DOLBY NR EFFECT MEASUREMENT

Specifications:

Variation from reference at 1 kHz: 4 dB to 7 dB
Variation from reference at 10 kHz: 8 dB to 12 dB

CrO_2 Tape

1. Connect the deck and the test equipment as shown in Fig. 6-8.
2. Load a TEAC MTT-506 test tape.
3. Apply and record a 1 kHz signal at –29 dB (27.5 mV). Record with Dolby switch OUT.
4. Rewind and play this recorded section.
5. While playing the 1 kHz signal, read the indication of the output level on the AC voltmeter with the DOLBY NR switch at IN and OUT positions.
6. The output level should vary 4 dB to 7 dB between the IN and OUT positions. (The output level in the IN position should be lower than the OUT position.)
7. Repeat the above procedure changing the applied test signal to 10 kHz at –39 dB (8.69 mV).
8. The variation should be 8 dB to 12 dB. (The output level in the IN position should be lower than in the OUT position.)

6-4-11 ERASE EFFICIENCY

Specification: 65 dB (min.)

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

Numbers in parentheses correspond to steps in Fig. 6-24.

1. Load a TEAC MTT-506 test tape.
2. Apply and record a 1 kHz signal at +1 dB (0.869 V, saturation level) 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 AC Voltmeter 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.

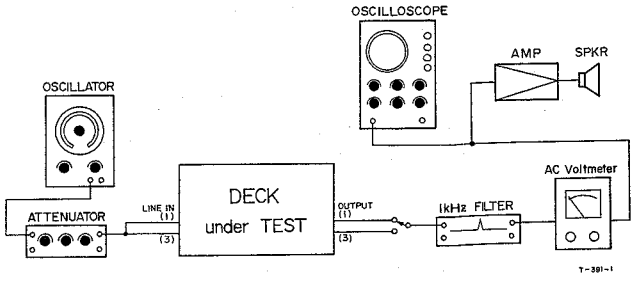


Fig. 6-23 Connection

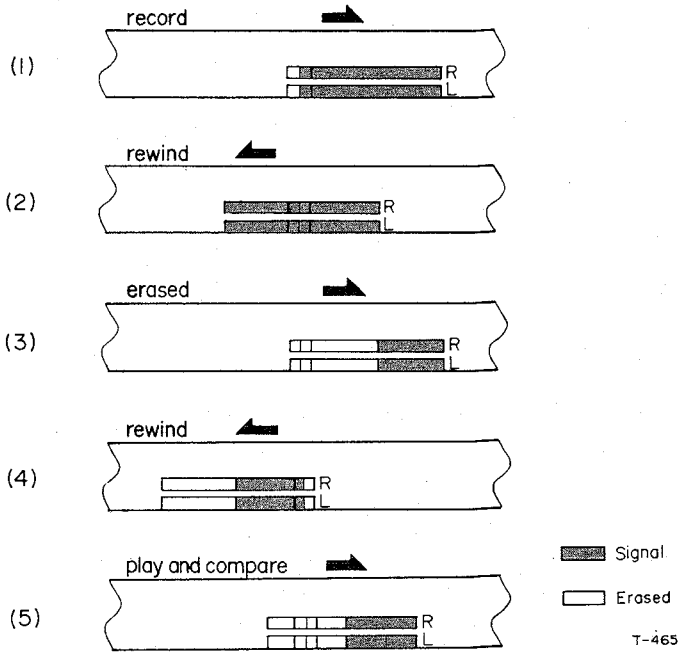


Fig. 6-24 Erase Efficiency Check Procedure

7. BLOCK DIAGRAM

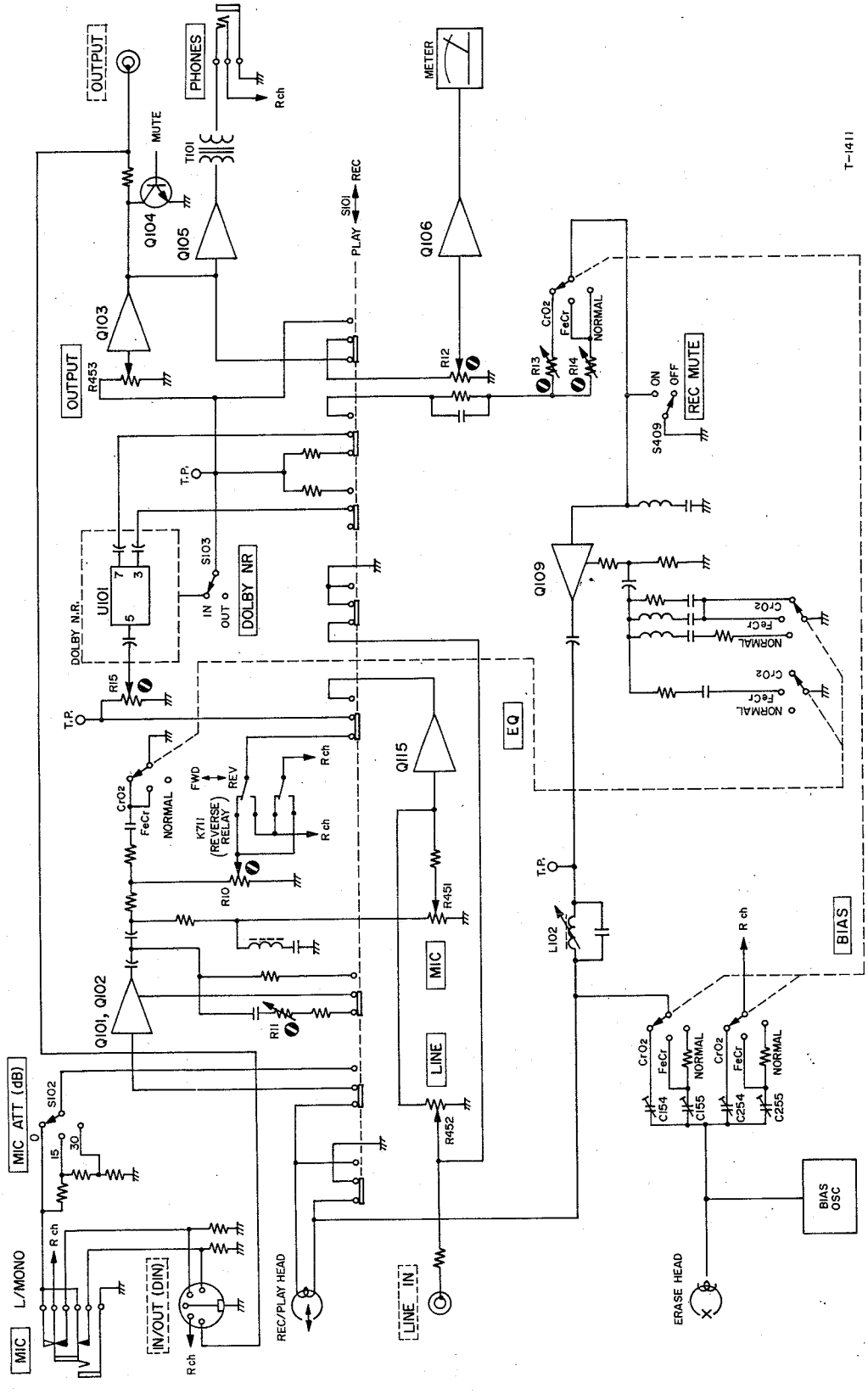
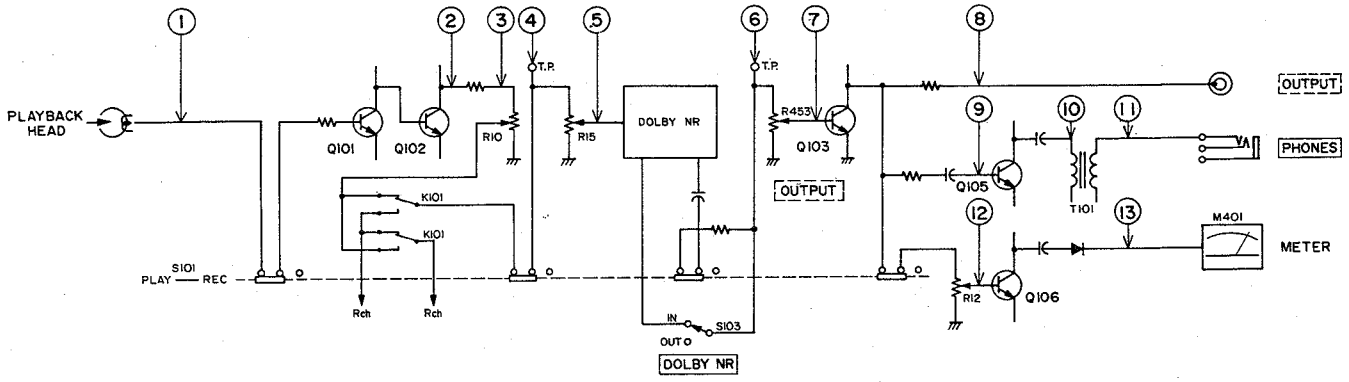


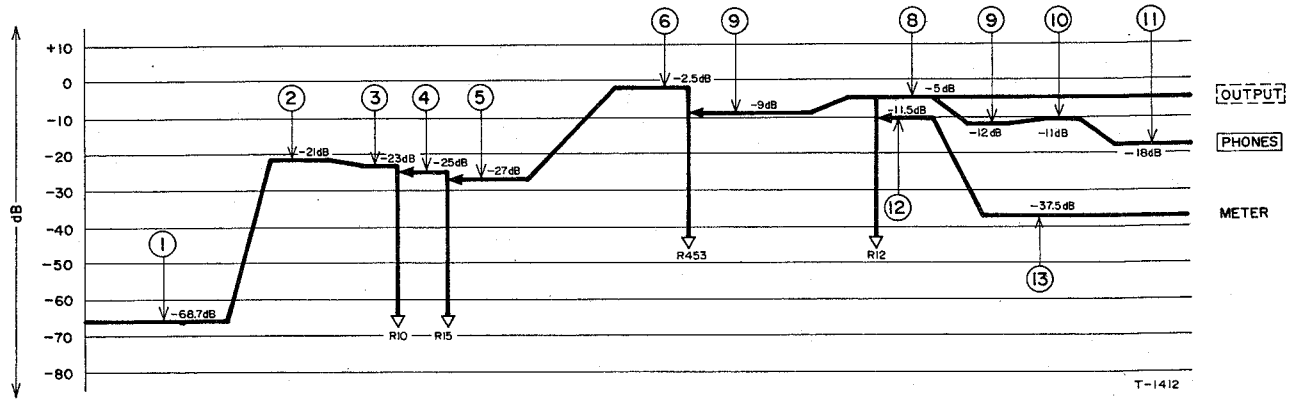
Fig. 7-1

NOTE: REF Nos. shown in the diagram relate only to the left channel.

8. LEVEL DIAGRAM

PLAYBACK SECTION

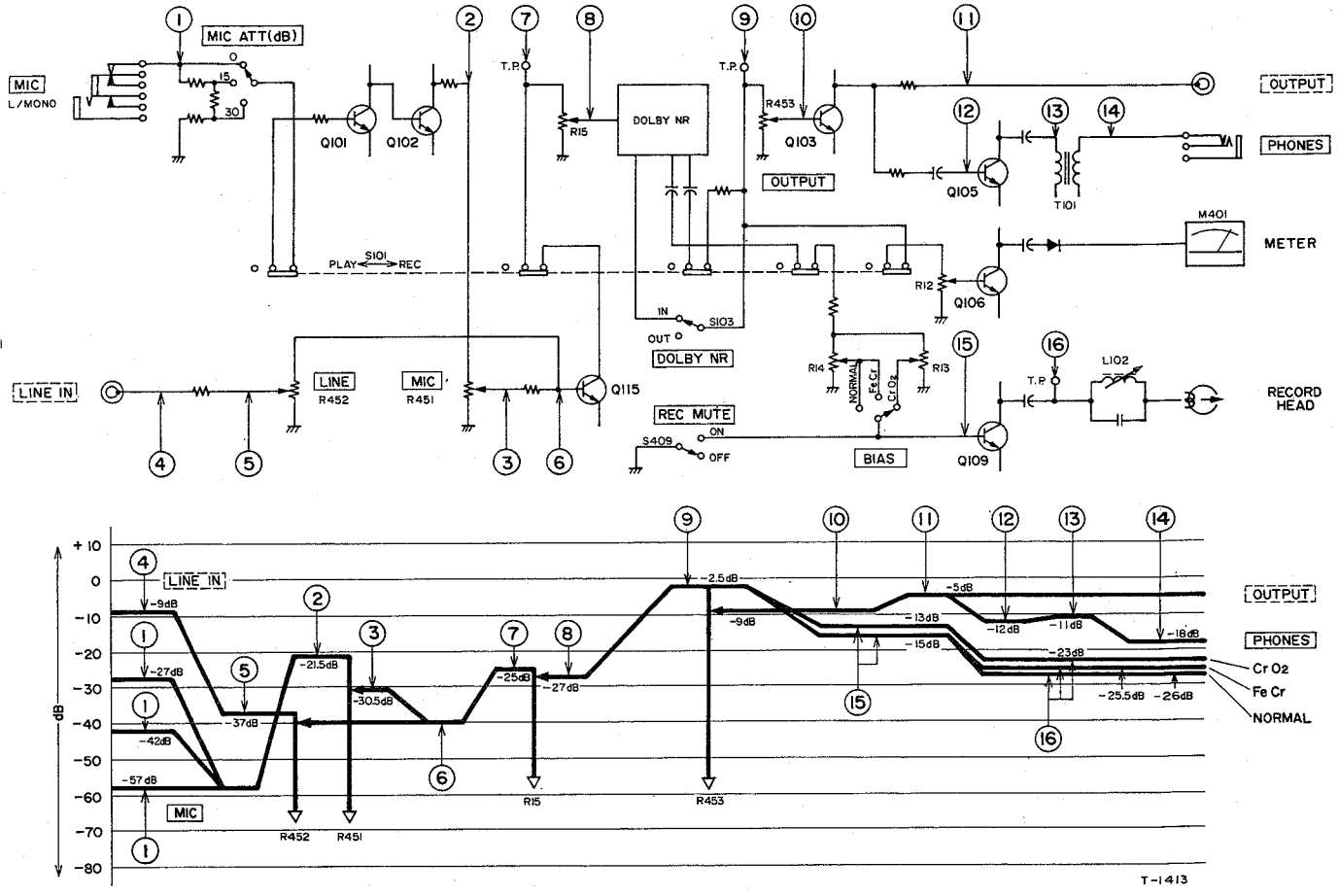




NOTE:
- REF. Nos. shown in the diagram relate only to the left channel.
- 0 dB = 0.775 V
- OUTPUT control (R453) is positioned at specified output level.
- Each level given in the diagram shows values during playback with MTT-150 Test Tape (Dolby tone).

Fig. 8-1

RECORDING SECTION



NOTE:
- REF Nos. shown in the diagram relate only to the left channel.
- 0 dB = 0.775 V
- OUTPUT control (R453) is positioned at specified output level.
- LINE (R452) and MIC (R451) controls are positined at specified input level.
- Each level given in the diagram shows values when a 400 Hz specified input level is applied.

Fig. 8-2

A-601R Stereo Cassette Deck with Automatic-Reverse

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 AUSTRALIA PTY., LTD. 165-167 GLADSTONE STREET SOUTH MELBOURNE VICTORIA 3205 PHONE 699-6000

PRINTED IN JAPAN 1178 KOS 2.0 D-2942A

REC/PLAY AMP PCB

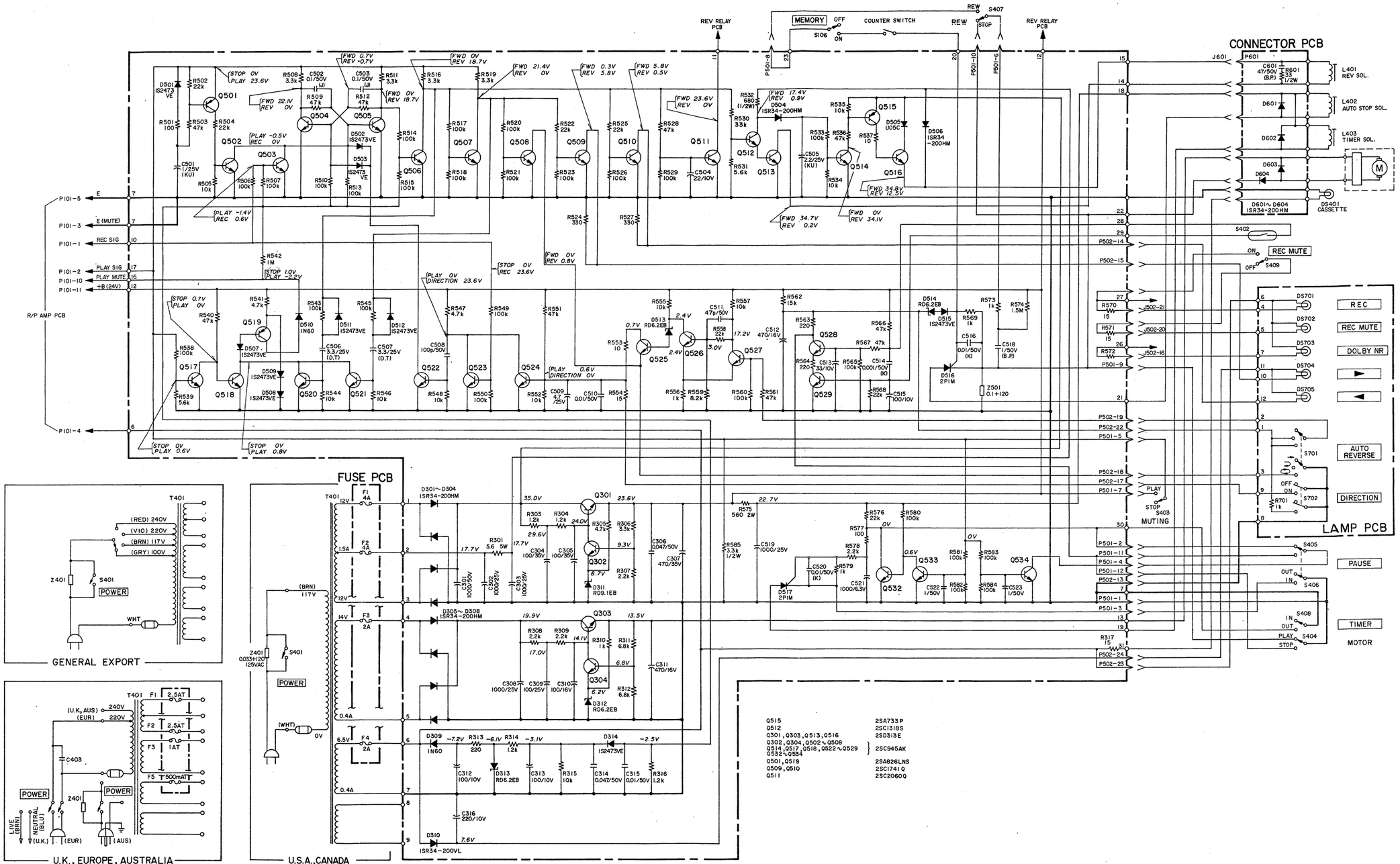
U101 DOLBY NR IC NE545B

Q101,Q102,Q201,Q202 ------ 2SC900UA
Q103,Q105,Q106,Q109,Q115 ---- 2SC2021LNFS
Q203,Q205,Q206,Q209,Q215
Q104,Q204 ---------- 2SC1636-2 or -1
Q111,Q112 ---------- 2SC1741Q
Q114 ---------- 2SC786LNFR

NOTES
1. ALL RESISTORS ARE ¼ WATT, 5% UNLESS MARKED OTHERWISE. RESISTOR VALUES ARE IN OHMS (k=1,000 OHMS, M=1,000,000 OHMS).
2. ALL CAPACITOR VALUES ARE IN MICROFARADS (p=PICOFARADS).
3. SCHEMATIC DIAGRAM SHOWN FOR LEFT CHANNEL EXCEPT FOR SOME OF THE COMPONENTS.

REVISION	DATE	CHANGE NO.
6	·	
5	·	
4	·	
3	·	
2	09·78	CG-008
1	04·78	

STEREO CASSETTE DECK
MODEL NO. A-601R
SHEET NO.
TEAC CORPORATION



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REVISION	DATE	CHANGE NO.
6	-	
5	-	
4	-	
3	-	
2	09-78	
1	04-78	

STEREO CASSETTE DECK
MODEL NO. A-601R
SHEET NO.
TEAC CORPORATION

TEAC®

PARTS LIST

A-601R

Stereo Cassette Deck with Automatic-Reverse

TABLE OF CONTENTS

PARTS ORDERING INFORMATION

Spare parts are available through your nearest TEAC Authorized Service Center or directly from the TEAC office, the address of which is written on the back cover. When ordering parts, always include the following information:

1. MODEL
2. REF. NO.
3. PARTS NO.
4. DESCRIPTION
5. UNIT SERIAL NO.
6. MANUAL CODE NO.

NOTICE REGARDING PARTS ORDERS

1. Do not order by REF. NO. only
2. In some instances, individual minor parts are not available. In such a case, the entire assembly including the part requested will be sent to you.
3. Parts are identical between the different models with the exceptions as coded by the designations in the REMARKS column.
4. PC Boards shown viewed from foil side.
5. Parts marked with *require longer delivery time than regular parts.
6. The f-600R is Japan Domestic model of the A-601R.

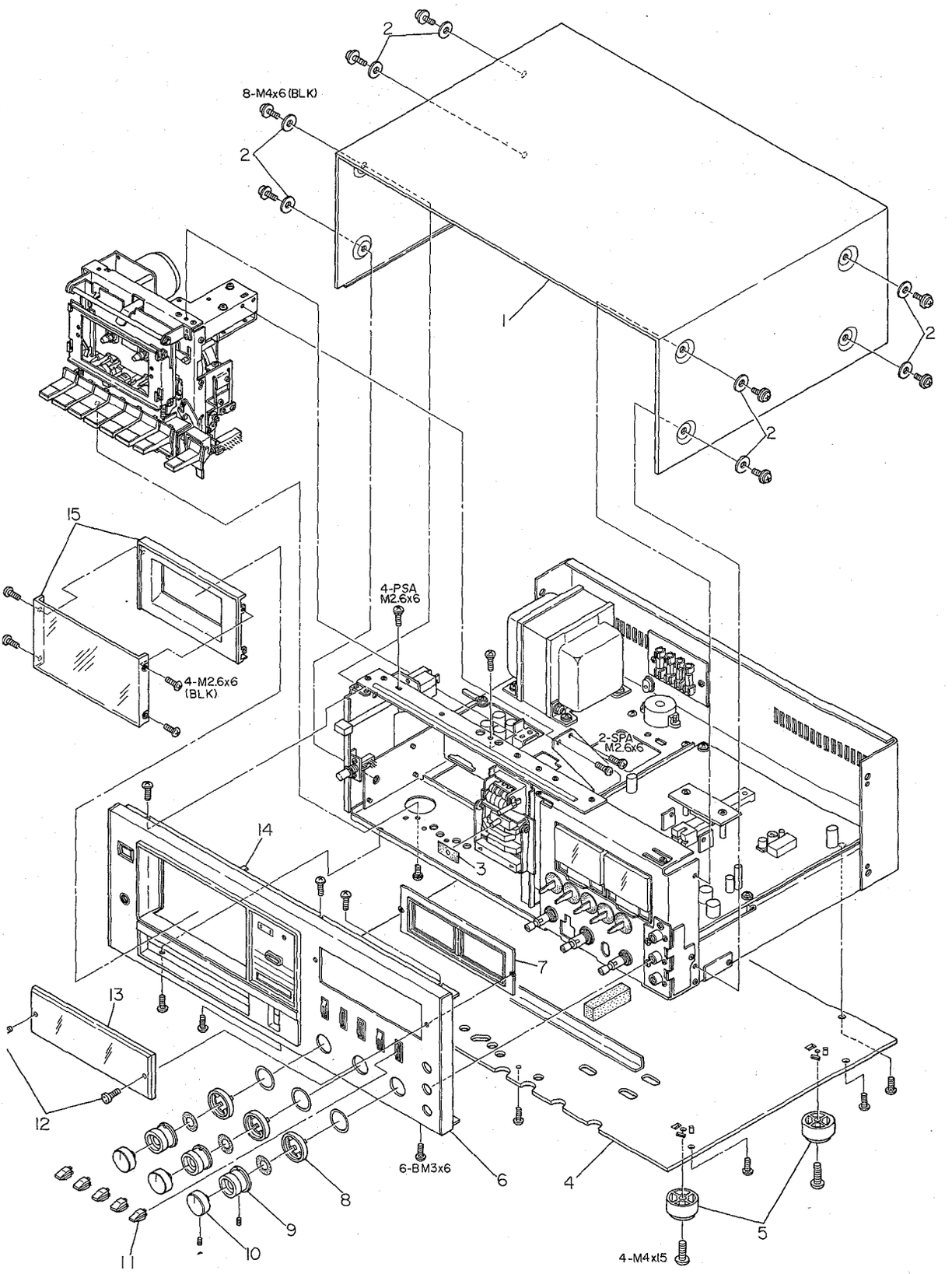
TEAC CORPORATION

Effective: August 1978 CG-008

51032340

1. EXPLODED VIEWS AND PARTS LIST SECTION

EXPLODED VIEW-1

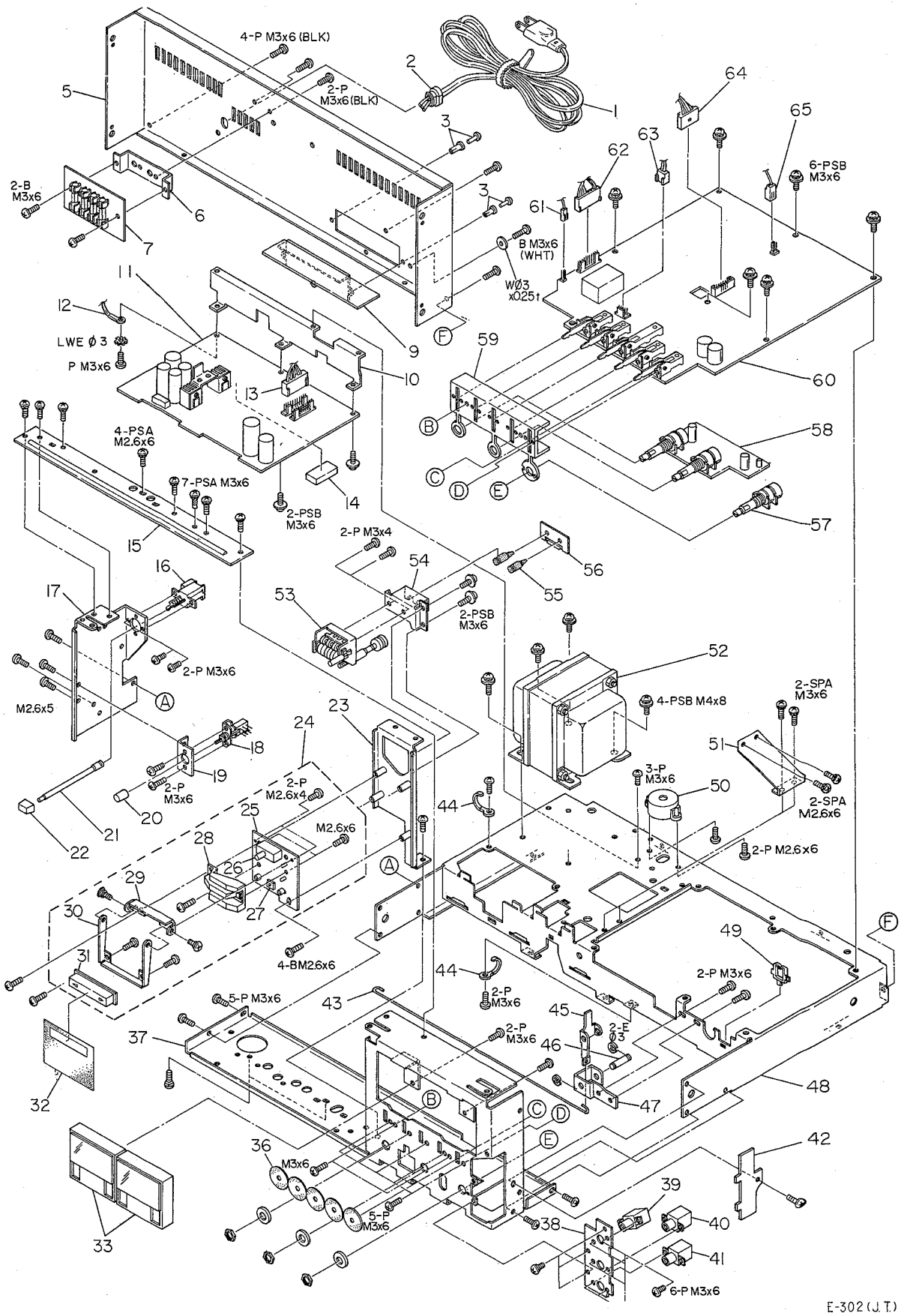


REF. NO.	PARTS NO.	DESCRIPTION	REMARKS
1- 1	*55522601	Cover Top	
1- 2	*55800050	Washer, Fiver	
1- 3	*55554850	Mask	
1- 4	*55031710	Cover Bottom	
1- 5	55345960	Foot	
1- 6	55010300	Panel Assy	JAPAN
	*55010280	Panel Assy	All except JAPAN
1- 7	*55331190	Escutcheon, Meter	
1- 8	55344531	Marked Knob	
1- 9	55045331	Knob (B)	
1-10	55447270	Knob (A)	
1-11	55331290	Knob, Lever Switch	
1-12	*55447290	Screw, Trim	
1-13	*55344850	Cover, Meter	
1-14	*55552690	Plate, Escutcheon	
1-15	55031740	Cover Assy, Cassette	

INCLUDED ACCESSORIES

REF. NO.	PARTS NO.	DESCRIPTION	REMARKS
	51280650	Cord Assy, Input-Output Connection	
	51015510	F-600R Owner's Manual	JAPAN
	51015520	A-601R Owner's Manual	U.S.A.
	55015530	A-601R Owner's Manual	GENERAL EXPORT
	51013450	Information Supplement	U.S.A.
	51014950	Information Supplement	GENERAL EXPORT
	51013690	Information Supplement	JAPAN

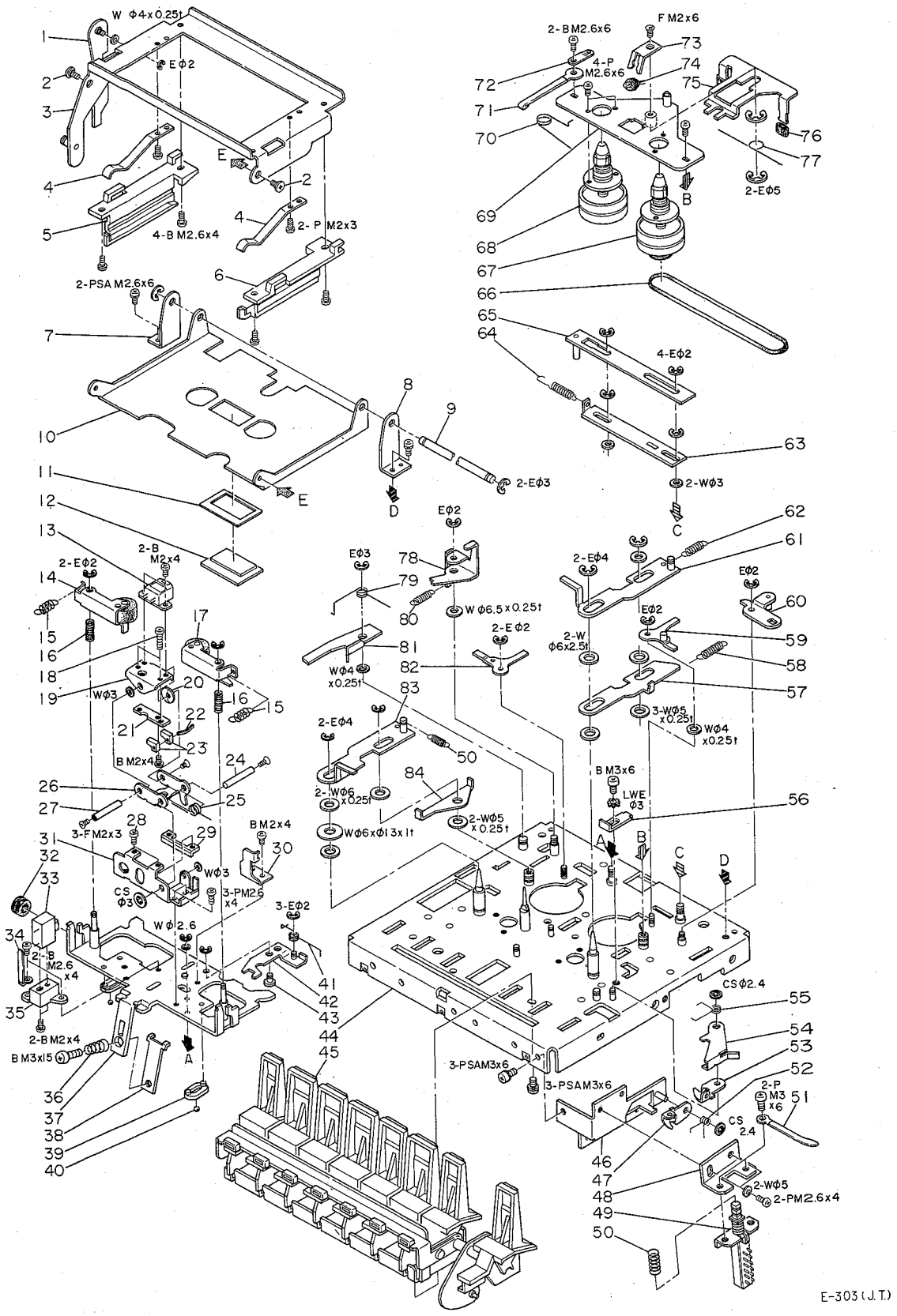
EXPLODED VIEW-2



REF. NO.	PARTS NO.	DESCRIPTION	REMARKS
2- 1	* 51280750	Cord, AC Power	U.S.A.
	* 51280340	Cord, AC Power	JAPAN, GENERAL EXPORT
2- 2	* 55300470	Strain Reilef, AC Cord	
2- 3	* 55341180	Push Rivet	
2- 4		(not used)	
2- 5	* 55522920	Panel, Rear	
2- 6	* 55552870	Plate, Fuse	
2- 7	* 51687150	P.C. Board Assy, Fuse	U.S.A.
2- 8		(not used)	
2- 9	* 51687120	P.C. Board Assy, Input/output	
2-10	* 55552850	Bracket, P.C. Board	
2-11	* 51687100	P.C. Board Assy, Power Supply	
2-12	* 55810380	Clamper	
2-13	* 51221740	Connector	
2-14	* 55345940	Rubber, Stoper	
2-15	* 55532220	Bracket	
2-16	* 51340370	Switch, Power	
2-17	* 55532240	Chassis, Side	
2-18	* 51340391	Switch, Timer	
2-19	* 55554070	Bracket, Switch	
2-20	55342960	Button, Push Switch	
2-21	* 55344221	Link, Power Switch	
2-22	55344620	Button, D	
2-23	* 55554030	Chassis, Sub	
2-24	* 55030470	Illumination Assy	
2-25	* 51687140	P.C. Board Assy	Part of 2-24
2-26	* 50447450	Switch	Part of 2-24
2-27	* 51380070	Switch	Part of 2-24
2-28	* 55345620	Prism	Part of 2-24
2-29	* 55554050	Bracket	Part of 2-24
2-30	* 55554060	Hing, Direction	Part of 2-24
2-31	* 55331510	Button, Direction	Part of 2-24
2-32	* 55345910	Mask	
2-33	* 51650410	Meter (VU)	
2-34		(not used)	
2-35		(not used)	
2-36	* 55545040	Mask	
2-37	* 55510230	Chassis, Front	
2-38	* 55555220	Bracket, Jack	
2-39	* 51240281	Jack	
2-40	* 51240230	Jack	
2-41	* 51240220	Jack	
2-42	* 55552870	Bracket, Fuse Holder	
2-43	* 55243570	Bar, REC	
2-44	* 55810380	Clamper, Cord	
2-45	* 55554081	Rever, REC (C)	
2-46	* 55448470	Shaft	
2-47	* 55554090	Rever, REC (D)	
2-48	* 55510220	Chassis, Amp	
2-49	* 55344940	Clamper, Cord	
2-50	* 51310070	Selector, Voltage	GENERAL EXPORT
2-51	* 55554100	Plate	
2-52	* 51520910	Transformer, Power	JAPAN
	* 51521050	Transformer, Power	U.S.A.
	* 51521070	Transformer, Power	GENERAL EXPORT
2-53	55046410	Counter Assy	
2-54	* 55554040	Bracket, Counter	
2-55	55344480	Cushion, Rubber	
2-56	* 51675490	P.C. Board, Read Switch	
2-57	* 51501130	Variable Resistor	
2-58	* 51686570	P.C. Board, Vol.	
2-59	* 55331310	Spacer, Parts	
2-60	* 51687090	P.C. Board Assy, REC/PLAY	

(Continued on page 15)

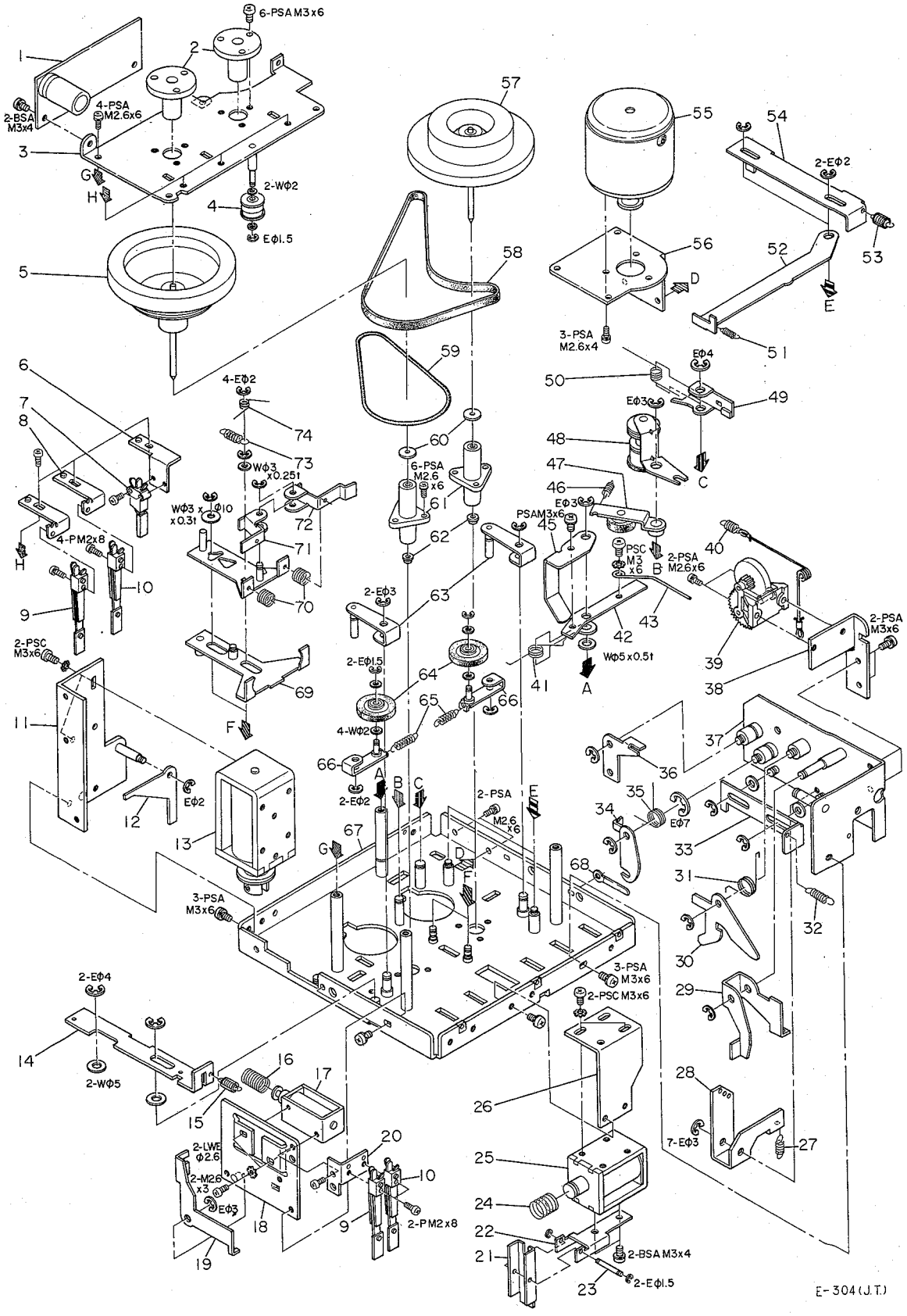
EXPLODED VIEW-3



REF. NO.	PARTS NO.	DESCRIPTION	REMARKS
3- 1	* 55045840	Holder Assy, Cassette	
3- 2	* 55810570	Screw, Cassette Holder	
3- 3	* 55045850	Lock Arm Assy	
3- 4	55548310	Spring, Cassette Push	
3- 5	55331490	Guide L, Cassette	
3- 6	55331480	Guide R, Cassette	
3- 7	* 55553640	Bracket L, Cassette Holder	
3- 8	* 55553630	Bracket R, Cassette Holder	
3- 9	* 55444770	Shaft, Cassette Holder	
3-10	* 55532440	Plate, Cassette Holder	
3-11	* 55546920	Escutcheon, Lamp	
3-12	* 55342460	Lens, Lamp	
3-13	55696080	Head, REC/PLAY	
3-14	55045730	Pinch Roller Ass'y L	
3-15	55241650	Spring, Pinch Roller	
3-16	55241900	Spring, Pinch Lever	
3-17	55045740	Pinch Roller Assy, R	
3-18	* 55810610	Adjust Screw B	
3-19	* 55553500	Plate, Head Base	
3-20	* 55553520	Wave Washer	
3-21	* 55346020	Nut, Plastic B	
3-22	* 55555150	Spring, Head Shaft	
3-23	* 55346040	Spacer, Head	
3-24	* 55448110	Shaft, Head	
3-25	* 55241440	Spring, Head	
3-26	* 55553510	Plate, Head	
3-27	* 55448120	Shaft, Head	
3-28	* 55810600	Adjust Screw A	
3-29	* 55346010	Nut, Plastic A	
3-30	55553531	Tape Guide	
3-31	* 55553490	Plate, Head Base	
3-32	* 55345250	Rubber Bush	
3-33	55696070	Head, Erase	
3-34	* 55279870	Retainer, Cord D	
3-35	* 55345260	Bracket, Erase Head	
3-36	* 55241640	Spring, Head Base	
3-37	55031561	Head Base Assy	
3-38	* 55553480	Plate, Head Base	
3-39	* 55345240	Ball Guide	
3-40	* 55400560	Ball Bearing	
3-41	* 55241461	Spring, Reverse Drive	
3-42	* 55045750	Lever, Head Assy	
3-43	* 55448130	Boss, Head Change	
3-44	* 55021920	Chassis Assy, Mechanism	
3-45	55021930	Button Assy	
3-46	* 55046080	Bracket	
3-47	* 55553920	Lock Plate B	
3-48	* 55553930	Bracket, REC/MUTE SW	
3-49	* 51340480	Push Switch	
3-50	* 55241840	Spring, Push Switch	
3-51	* 55810380	Clamper, Cord	
3-52	* 55241780	Spring, Rock B	
3-53	* 50846632	Lock Plate A	
3-54	* 55553790	Lever	
3-55	* 55241800	Lock Spring A	
3-56	* 55500070	Stoper, Sub-Chassis	
3-57	* 55553850	Lever, Reverse C	
3-58	* 55241810	Spring, REC MUTE Button	
3-59	* 55046020	Lever Assy, Pause	
3-60	* 55046010	Lever Assy,	
3-61	* 55046040	Plate Assy, Pause R	
3-62	* 55241790	Spring	
3-63	* 55553860	Lever, Reverse A	
3-64	* 55241820	Main Spring, Reverse	
3-65	* 55046050	Lever, Reverse B Assy	

(Continued on page 15)

EXPLODED VIEW-4

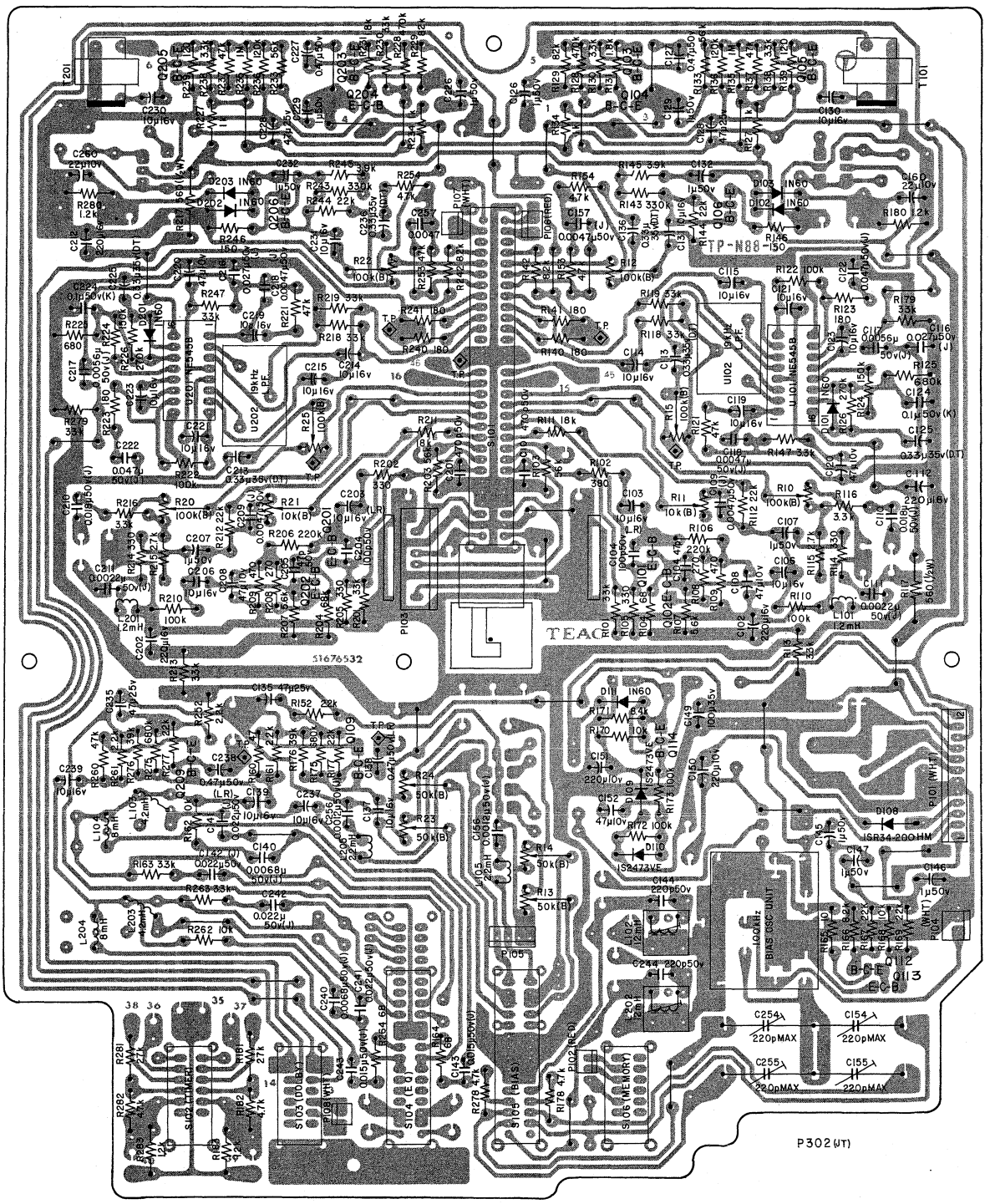


REF. NO.	PARTS NO.	DESCRIPTION	REMARKS
4- 1	* 51687130	P.C. Board Assy	
4- 2	* 55045820	Bearing Assy, Flywheel	
4- 3	* 55031570	Base Assy, Flywheel Base	
4- 4	55043650	Pulley Assy	
4- 5	55045790	Flywheel Assy, R	
4- 6	* 55554880	Bracket, Switch	
4- 7	* 50446530	Switch, Micro	
4- 8	* 55554010	Bracket, Leaf Switch	
4- 9	* 51350010	Switch, Leaf	
4-10	* 51350020	Switch, Leaf	
4-11	* 55046060	P.C. Board, Reverse Solenoid	
4-12	* 55553890	Lever, Solenoid	
4-13	51630130	Solenoid	
4-14	* 55046000	Lever Assy, Pause	
4-15	* 55240110	Spring, Rever	
4-16	* 55240910	Spring, Timer Solenoid	
4-17	51630300	Solenoid	
4-18	* 55046070	P. C. Board Assy, Timer	
4-19	* 55553910	Lever, Timer	
4-20	* 55554020	Bracket, Leaf Switch B	
4-21	* 55553950	Lever, Auto Stop	
4-22	* 55542410	Board, Auto-Stop	
4-23	* 50845211	Shaft, Auto-Stop Lever	
4-24	* 50846200	Spring, Solenoid	
4-25	51630070	Solenoid	
4-26	* 55553940	Bracket, Solenoid	
4-27	* 55241770	Spring, REC Switch	
4-28	* 55553590	Lever, REC B	
4-29	* 55553580	Lever, REC A	
4-30	* 55555170	Plate, Holder Lock	
4-31	* 55241670	Spring, Holder Lock	
4-32	* 55240110	Spring, Lever	
4-33	* 55553600	Lever, Eject	
4-34	* 55553610	Arm, Holder	
4-35	* 55241470	Spring, Holder-Up	
4-36	* 55548381	Lever, Cassette	
4-37	* 55045830	Holder Assy	
4-38	* 55553960	Bracket, Damper	
4-39	* 55044940	Holder Assy, Damper B	
4-40	55241740	Spring, Damper	
4-41	* 55241680	Spring, Cassette	
4-42	* 55553620	Arm, Cassette Retainer A	
4-43	* 55241690	Wire	
4-44		(not used)	
4-45	* 55555160	Arm, Cassette Retainer B	
4-46	* 55241710	Spring, Idler B	
4-47	55045970	Idler Assy, B	
4-48	55045950	Idler Assy, A	
4-49	* 55046500	Plate Assy, Back Tension	
4-50	* 55241730	Spring, Back Tension	
4-51	* 55241830	Spring, Motor SW Lever	
4-52	* 55554000	Lever, Motor Switch	
4-53	* 55241910	Spring	
4-54	* 55553990	Lever, REC	
4-55	71051300	Motor Assy, Capstan	
4-56	* 55554300	Base, Motor	
4-57	55045781	Flywheel Assy L	
4-58	55345281	Belt, Capstan Drive	
4-59	55345680	Belt, Fast Wind	
4-60	55500310	Washer	
4-61	55045800	Housing Assy	
4-62	55341300	Cap, Oil	
4-63	* 55045900	Lever Assy, Idler A	
4-64	55001040	Idler Assy	
4-65	* 55241720	Spring, Idler PLAY	

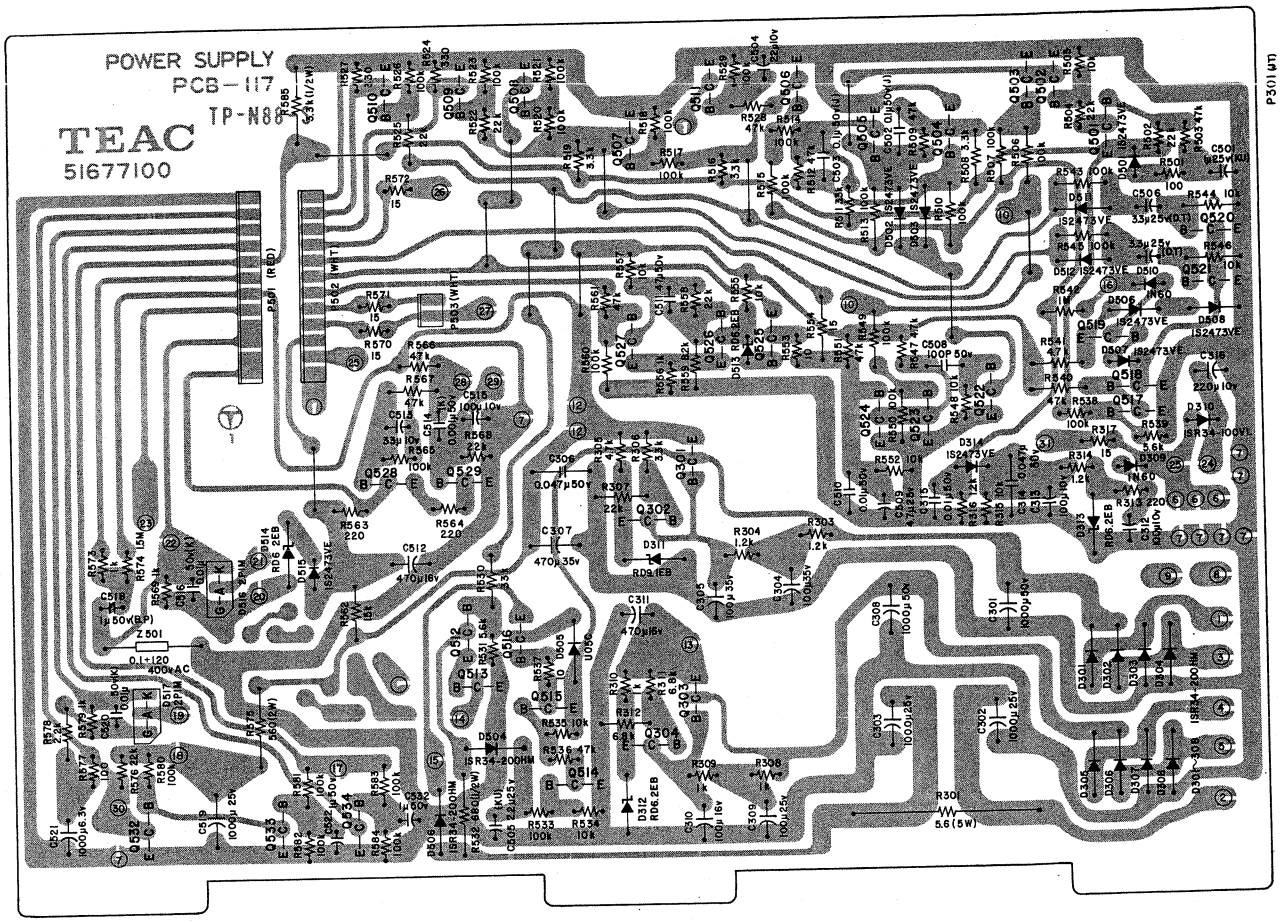
(Countinued on page 15)

2. PC BOARD SECTION (Diagrm)

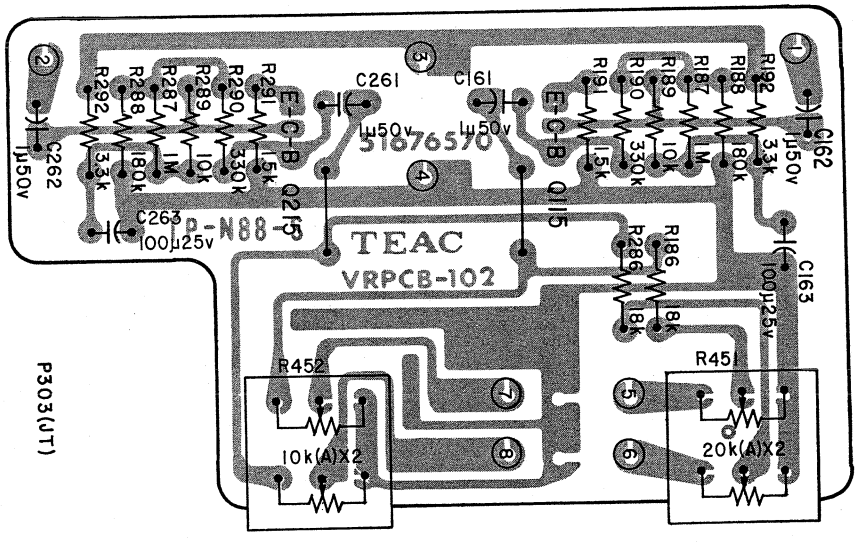
1. RECORD/PLAYBACK AMPL PC BOARD



2. POWER SUPPLY PC BOARD



3. VARI. RESISTOR PC BOARD



2. PC BOARD SECTION(Parts List)

1. RECORD/PLAYBACK AMPL

REF. NO.	PARTS NO.	DESCRIPTION
	51687091	PC Board Assy
	51676532	PC Board
	IC's	
U101	50427280	NE545B, Dolby
	TRANSISTORS	
Q101, Q201	50450340	2SC900UA
Q102, Q202	50450340	2SC900UA
Q103, Q203	51451220	2SC2021LNFC
Q104, Q204	50425490	2SC1636-1
Q105, Q205	51451220	2SC2021LNFS
Q106, Q206	51451220	2SC2021LNFS
Q109, Q209	51451220	2SC2021LNFS
Q112, Q113	51450980	2SC1741Q
Q114	51451230	2SA786LNFR
	DIODES	
D101, D201	50422130	1N60
D102, D202	50422130	1N60
D103, D202	50422130	1N60
D108	51431130	1SR34-200HM
D109, D110	50245170	1S2473VE
D111	50422130	1N60
	VARIABLE RESISTORS	
R10, R20	51500960	Semi-fixed 100k ohm B
R11, R21	51500920	Semi-fixed 10k ohm B
R12, R22	51500960	Semi-fixed 100k ohm B
R13, R23	51500940	Semi-fixed 50k ohm B
R14, R24	51500940	Semi-fixed 50k ohm B
R15, R25	51500960	Semi-fixed 100k ohm B
	RESISTORS	
	All resistors are rated ±5% tolerance, ¼ watt and of carbon type unless otherwise noted.	
R101, R201	51831180	33k ohm
R102, R202	51830700	330 ohm
R103, R203	51831240	56k ohm
R104, R204	51831260	68k ohm
R105, R205	51830700	330 ohm
R106, R206	51831380	220k ohm
R107, R207	51831000	5.6k ohm
R108, R208	51830680	270 ohm
R109, R209	51830740	470 ohm
R110, R210	51831300	100k ohm
R111, R211	51831120	18k ohm
R112, R212	51831140	22k ohm
R113, R213	51830940	3.3k ohm
R114, R214	51830700	330 ohm
R115, R215	51830920	2.7k ohm
R116, R216	51830940	3.3k ohm
R117, R217	50574760	560 ohm ½W
R118, R218	51831180	33k ohm
R119, R219	51831180	33k ohm
R121, R221	51831220	47k ohm
R122, R222	51831300	100k ohm
R123, R223	51830060	180 ohm

REF. NO.	PARTS NO.	DESCRIPTION
R124, R224	51831340	150k ohm
R125, R225	51831500	680k ohm
R126, R226	51831400	270k ohm
R127, R227	51830820	1k ohm
R128, R228	51831460	470k ohm
R129, R229	51831280	82k ohm
R130, R230	51830940	3.3k ohm
R131, R231	51830880	1.8k ohm
R133, R233	51831240	56k ohm
R134, R234	51830820	1k ohm
R135, R235	51831540	1M ohm
R136, R236	51831320	120k ohm
R137, R237	51831220	47k ohm
R138, R238	51830940	3.3k ohm
R139, R239	51830600	120 ohm
R140, R240	51830640	180 ohm
R141, R241	51830640	180 ohm
R142, R242	51831040	8.2k ohm
R143, R243	51831420	330k ohm
R144, R244	51831140	22k ohm
R145, R245	51830960	3.9k ohm
R146, R246	51830900	150 ohm
R147, R247	51831980	3.3k ohm
R152, R252	51830900	2.2k ohm
R153, R253	51830980	4.7k ohm
R154, R254	51830980	4.7k ohm
R160, R260	51830500	47 ohm
R161, R261	51830900	2.2k ohm
R162, R262	51831060	10k ohm
R163, R263	51830940	3.3k ohm
R164, R264	51830540	68 ohm
R165	51830340	10 ohm
R166	51831040	8.2k ohm
R167, R169	51831140	22k ohm
R168, R170	51831060	10k ohm
R171	51831040	8.2 ohm
R172, R173	51831300	100k ohm
R175, R275	51831500	680k ohm
R176, R276	51831220	39k ohm
R177, R277	51831140	22k ohm
R178, R278	51830980	4.7k ohm
R179, R279	51831180	33k ohm
R180, R280	51830840	1.2k ohm
R181, R281	51831160	27k ohm
R182, R282	51830980	4.7k ohm
R183, R283	51830840	1.2k ohm
	CAPACITORS	
C101, C201	51723440	Celamic 470pfd 50V
C102, C202	50554390	Elec. 220 mfd 16V
C103, C203	51700770	Elec. 10 mfd 16V (LR)
C104, C204	51723120	Ceramic 100 pfd 50V
C105, C205	51723080	Ceramic 47 pfd 50V
C106, C206	50554050	Elec. 10 mfd 16V
C107, C207	50554540	Elec. 1 mfd 50V
C108, C208	50555540	Elec. 47 mfd 10V
C109, C209	50548910	Mylar 0.0047 mfd 50V
C110, C210	50548970	Mylar 0.018 mfd 50V
C111, C211	50548760	Mylar 0.0022 mfd 50V
C112, C212	50554390	Elec. 220 mfd 16V
C113, C213	51703000	Dip. Tant. 0.33 mfd 35V
C114, C214	50554050	Elec. 10 mfd 16V

REF. NO.	PARTS NO.	DESCRIPTION		
C115, C215	50554050	Elec.	10 mfd	
C116, C216	50548990	Mylar	0.027 mfd	50V
C117, C217	50548920	Mylar	0.0056 mfd	50V
C118, C218	50548910	Mylar	0.0047 mfd	50V
C119, C219	50554050	Elec.	10 mfd	16V
C120, C220	50555540	Elec.	47 mfd	10V
C121, C221	50554050	Elec.	10 mfd	16V
C112, C222	50547380	Mylar	0.047 mfd	50V
C123, C223	50554050	Elec.	10 mfd	16V
C124, C224	50548040	Mylar	0.1 mfd	50V
C125, C225	51703000	Dip. Tant.	0.33 mfd	35V
C126, C226	50554540	Elec.	1 mfd	50V
C127, C227	50554970	Elec.	0.47 mfd	50V
C128, C228	50554490	Elec.	47 mfd	25V
C129, C229	50554540	Elec.	1 mfd	50V
C130, C230	50554050	Elec.	10 mfd	16V
C131, C231	50554050	Elec.	10 mfd	16V
C132, C232	50554540	Elec.	1 mfd	50V
C135, C235	50554490	Elec.	47 mfd	25V
C136, C236	51703000	Dip. Tant.	0.33 mfd	35V
C137, C237	50554050	Elec.	10 mfd	16V
C138, C238	51700850	Elec.	0.47 mfd	50V (LR)
C139, C239	50554050	Elec.	10 mfd	16V
C140, C240	50548930	Mylar	0.0068 mfd	50V
C141, C241	50548980	Mylar	0.022 mfd	50V
C142, C242	50548980	Mylar	0.022 mfd	50V
C143, C243	50548870	Mylar	0.015 mfd	50V
C144, C244	50547450	Dip. Mica	220 pfd	50V
C145 ~ C147	50554540	Elec.	1 mfd	50V
C149	50554630	Elec.	100 mfd	35V
C150, C151	50554910	Elec.	220 mfd	10V
C152	50555540	Elec.	47 mfd	10V
C154, C254	50547050	Trimmer	220 pfd max.	
C155, C255	50547050	Trimmer	220 pfd max.	
C156, C256	50548861	Mylar	0.0012 mfd	50V
C157, C257	50548910	Mylar	0.0012 mfd	50V
C160	50554720	Elec.	22 mfd	10V
	TRANSFORMERS			
T101, T201	51520740	Output, 3k ohm: 8 ohm		
	MISCELLANEOUS			
S101	51310410	Switch, Slide		
S102	51320350	Switch, Lever		
S103	51320390	Switch, Lever		
S104, S105	51320380	Switch, Lever		
S106	51320370	Switch, Lever		
	51600400	Filter, Low-pass, 19 kHz		
P101	51221360	Connector, Plug 12P		
P105	51221280	Connector, Plug 4P		
P104, P107. P108	51221260	Connector, Plug 2P		
P103	51220100	Connector, Plug 6P		
P102, P106	51222990	Connector, Plug 2P		
	50400940	OSC Unit, 100 kHz		
L101, L201	50566611	Chork	1.2 mH	
L102, L202	50566550	Trap.	12 mH	
L103, L203	50566370	Record EQ	4.2 mH	
L104, L204	50566350	Record EQ	8 mH	
L105, L205	50566720	Chork	2.2 mH	

2. POWER SUPPLY PC BOARD

REF. NO.	PARTS NO.	DESCRIPTION
	51687100	PC Board Assy
	51677100	PC Board
	TRANSISTORS	
Q301, Q303	51450870	2SD313E
Q303, Q304	51450910	2SC945AK
Q501	51450950	2SA826LNS
Q502 ~ Q508	51450910	2SC945AK
Q509, Q510	51450980	2SC1741Q
Q511	51450820	2SC2060Q
Q512	50426250	2SC1318S
Q513	51450870	2SD313E
Q514	51450910	2SC945AK
Q515	50425530	2SA733P
Q516	51450870	2SD313E
Q517, Q518	51450910	2SC945AK
Q519	51450950	2SA826LNS
Q520 ~ Q529	51450910	2SC945AK
Q532 ~ Q534	51450910	2SC945AK
	SCR's	
D516, D517	51430900	2P1M
	DIODES	
D301 ~ D308	51431130	1SR-34-200HM
D309	50422130	1N60
D310	51431160	1SR-34-200VL
D311	51430580	Zener, RD9.1EB
D312, D313	50425540	Zener, RD6.2EB
D314	50425170	1S2473VE
D501 ~ D503	50425170	1S2473VE
D504, D506	51431130	1SR-34-200HM
D505	51430170	U05C
D507 ~ D509	50425170	1S2473VE
D510	50422130	1N60
D511, D512	50425170	1S2473VE
D513, D514	50425540	Zener, RD6.2EB
D515	50425170	1S2473VE
	RESISTORS	
	All resistors are rated ±5% tolerance, ¼ watt and of carbon type unless otherwise noted.	
R301	50520610	5.6 ohm 5W Cement
R303, R304	50570840	1.2k ohm
R305	50570980	4.7k ohm
R306	50570940	3.3k ohm
R307	50570900	2.2k ohm
R308 ~ R310	50570880	1k ohm
R311, R312	50571020	6.8k ohm
R313	50570660	220 ohm
R314	50570840	1.2k ohm
R315	50571060	10k ohm
R316	50570840	1.2k ohm
R317	51818280	15 ohm Non Flammable
R501	50570580	100 ohm
R502, R504	50571140	22k ohm
R503	50571220	47k ohm
R505	50571060	10k ohm

REF. NO.	PARTS NO.	DESCRIPTION
R506, R507	50571300	100k ohm
R508, R511	50570940	3.3k ohm
R509, R512	50571220	47k ohm
R510, R513	50571300	100k ohm
R514, R515	50571300	100k ohm
R516, R519	50570940	3.3k ohm
R517, R518	50571300	100k ohm
R520, R521	50571300	100k ohm
R522	50571140	22k ohm
R523, R526	50571300	100k ohm
R524, R527	50570700	330 ohm
R525	50571140	22k ohm
R528	50571220	47k ohm
R529	50571300	100k ohm
R530	50571180	33k ohm
R531	50571000	5.6k ohm
R532	51802780	680 ohm ½W
R533	50571300	100k ohm
R534, R535	50571060	10k ohm
R536	50571220	47k ohm
R537	50570340	10k ohm
R538	50571300	100k ohm
R539	50571000	5.6k ohm
R540	50571220	47k ohm
R541	50570980	4.7k ohm
R542	50571540	1M ohm
R543, R545	50571300	100k ohm
R544, R546	50571060	10k ohm
R547	50570980	4.7k ohm
R548	50571060	10k ohm
R549, R550	50571300	100k ohm
R551	50571220	47k ohm
R552	50571060	10k ohm
R553	50570340	10 ohm
R554	50570380	15 ohm
R555, R557	50571060	10k ohm
R556	50570820	1k ohm
R558	50571140	22k ohm
R559	50571040	8.2k ohm
R560	50571300	100k ohm
R561	50571220	47k ohm
R562	50571100	15k ohm
R563, R564	50570660	220 ohm
R565	50571300	100k ohm
R566, R567	50571220	47k ohm
R568	50571140	22k ohm
R569	50570820	1k ohm
R570 ~ 572	51818280	15 ohm Non Flammable
R573	50570820	1k ohm
R574	50571580	1.5M ohm
R575	50518970	560 ohm 2W Metal Film
R576	50571140	22k ohm
R577	50570580	100k ohm
R578	50570900	2.2k ohm
R579	50570820	1k ohm
R580 ~ R584	50571300	100k ohm
R585	51800940	3.3k ohm ½W

CAPACITORS

C301	50555850	Elec.	1000 mfd	50V
C302, C303	50555580	Elec.	1000 mfd	25V
C304, C305	50554630	Elec.	100 mfd	35V
C306	50542300	Ceramic	0.047 mfd	50V
C307	50554620	Elec.	470 mfd	35V
C308	50555580	Elec.	1000 mfd	25V
C309	50554170	Elec.	100 mfd	25V
C310	50554200	Elec.	100 mfd	16V
C311	50554400	Elec.	470 mfd	16V
C312, C313	50554570	Elec.	100 mfd	10V
C314	50542300	Ceramic	0.047 mfd	50V
C315	50542040	Ceramic	0.01 mfd	50V
C316	50554910	Elec.	220 mfd	10V
C501	50549660	Elec.	1 mfd	25V (KU)
C502, C503	50549280	Mylar	0.1 mfd	50V
C504	50554720	Elec.	22 mfd	10V
C505	50549670	Elec.	2.2 mfd	25V (KU)
C506, C507	50546601	Dip. Tant.	3.3 mfd	25V
C508	50547440	Dip. Mica	100 pfd	50V
C509	50554530	Elec.	4.7 mfd	25V
C510	50542040	Ceramic	0.01 mfd	50V
C511	50547420	Dip. Mica	47 pfd	50V
C512	50554400	Elec.	470 mfd	16V
C513	50554240	Elec.	30 mfd	10V
C514	50548320	Mylar	0.001 mfd	50V
C515	50554570	Elec.	100 mfd	10V
C516	50548020	Mylar	0.01 mfd	50V
C518	50559420		1 mfd	50V
C519	50555580	Elec.	1000 mfd	25V
C520	50548020	Mylar	0.01 mfd	50V
C521	50554870	Elec.	1000 mfd	6.3V
C522, C523	50554540	Elec.	1 mfd	50V
Z501	50529050	Spark Killer 0.1 mfd + 120 ohm 400V AC		

MISCELLANEOUS

P501	51223090	Connector, Plug 12P
P502	51221360	Connector, Plug 12P
P503	51221260	Connector, Plug 2P

3. VARI. RESISTOR PC BOARD

REF. NO.	PARTS NO.	DESCRIPTION
	51686570	PC Board Assy
	51676570	PC Board

TRANSISTORS

Q115, Q215	51541220	2SC2021 LNFS

VARIABLE RESISTORS

R451	51501960	20k ohm (A) x 2
R452	51502080	10k ohm (A) x 2

REF. NO.	PARTS NO.	DESCRIPTION
		CARBON RESISTORS
		All resistors are rated ±5% tolerance and 1/4 watt
R186, R286	51815120	18k ohm
R187, R287	51815540	1M ohm
R188, R288	51815360	180k ohm
R189, R289	51815060	10k ohm
R190, R290	51815420	330k ohm
R191, R291	51814860	1.5k ohm
R192, R292	51814940	3.3k ohm

REF. NO.	PARTS NO.	DESCRIPTION
		CAPASITORS
C161, C261	50554540	Elec. 1 mfd 50V
C162, C262	50554540	Elec. 1 mfd 50V
C163, C263	50554170	Elec. 100 mfd 25V

(Continued from page 5)

REF. NO.	PARTS NO.	DESCRIPTION	REMARKS
2-61	*51221640	Connector	
2-62	*51221740	Connector	
2-63	*51221660	Connector	
2-64	*50438480	Connector	
2-65	*51221640	Connector	

(Continued from page 7)

REF. NO.	PARTS NO.	DESCRIPTION	REMARKS
3-66	55345300	Belt, Counter	
3-67	55045870	Reel Table Assy R	
3-68	55046490	Reel Table Assy L	
3-69	*55045860	Reel Base Assy	
3-70	55241660	Spring, Head Base Return	
3-71	*55810380	Clamper, Coad	
3-72		Washer	
3-73	*55553680	Bracket, Lamp	
3-74	*51420890	Lamp Assy	
3-75	*55553670	Plate, Brake	
3-76	55341160	Brake Shoe	
3-77	*55241700	Spring, Brake	
3-78	*55553980	Stopper, REC	
3-79	*55241750	Spring, Eject Stopper	
3-80	*55241760	Spring, REC Stopper	
3-81	*55553970	Stopper, Eject	
3-82	*55553810	Lever, Pause Actuating	
3-83	*55046030	Plate Assy, Pause L	
3-84	*55553940	Plate, Eject Preventing	

(Continued from page 9)

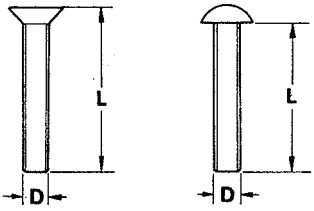
REF. NO.	PARTS NO.	DESCRIPTION	REMARKS
4-66	*55045910	Lever Assy, Idler B	
4-67	*55021930	Chassis Assy, Mechanism	
4-68	*55810380	Clamper, Cord	
4-69	*55045940	Plate Assy, Switch Actuating	
4-70	*55202570	Spring, Fast Wind	
4-71	*55542170	Plate, Fast Wind Actuating	
4-72	*55553740	Plate, Fast Wind Actuating B	
4-73	*55202610	Spring	
4-74	*55202602	Spring	

ASSEMBLING HARDWARE CODING LIST

All screws conform to ISO standards, and have crossrecessed heads, unless otherwise noted.
ISO screws have the head inscribed with a point as in the figure to the right.

FOR EXAMPLE:

B M 3 x 6
- Length in mm (L)
- Diameter in mm (D) *
- Metric System
- Nomenclature



* Inner dia. for washers and nuts

	Code	Name	Type
MACHINE SCREW	R	Round Head Screw	
	P	Pan Head Screw	
	T	Stove Head Screw (Truss)	
	B	Binding Head Screw	
	F	Flat Countersunk Head Screw	
	O	Oval Countersunk Head Screw	
WOOD SCREW	RW	Round Head Wood Screw	
	FW	Flat Countersunk Wood Screw	
	OW	Oval Countersunk Wood Screw	
SEMS SCREW	BSA	Binding Head SEMS Screw(A Type)	
	BSB	Binding Head SEMS Screw(B Type)	
	BSF	Binding Head SEMS Screw(F Type)	
	PSA	Pan Head SEMS Screw(A Type)	
	PSB	Pan Head SEMS Screw(B Type)	

	Code	Name	Type
TAPPING SCREW	BTA	Binding Head Tapping Screw(A Type)	
	BTB	Binding Head Tapping Screw(B Type)	
	RTA	Round Head Tapping Screw(A Type)	
	RTB	Round Head Tapping Screw(B Type)	
SETSCREW	SF	Hex Socket Setscrew(Flat Point)	
	SC	Hex Socket Setscrew(Cup Point)	
	SS	Slotted Socket Setscrew(Flat Point)	
WASHER	E	E-Ring (Retaining Washer)	
	W	Flat Washer (Plain)	
	SW	Lock Washer (Spring)	
	LWI	Lock Washer (Internal Teeth)	
	LWE	Lock Washer (External Teeth)	
	TW	Trim Washer (Countersunk)	
NUT	N	Hex Nut	

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