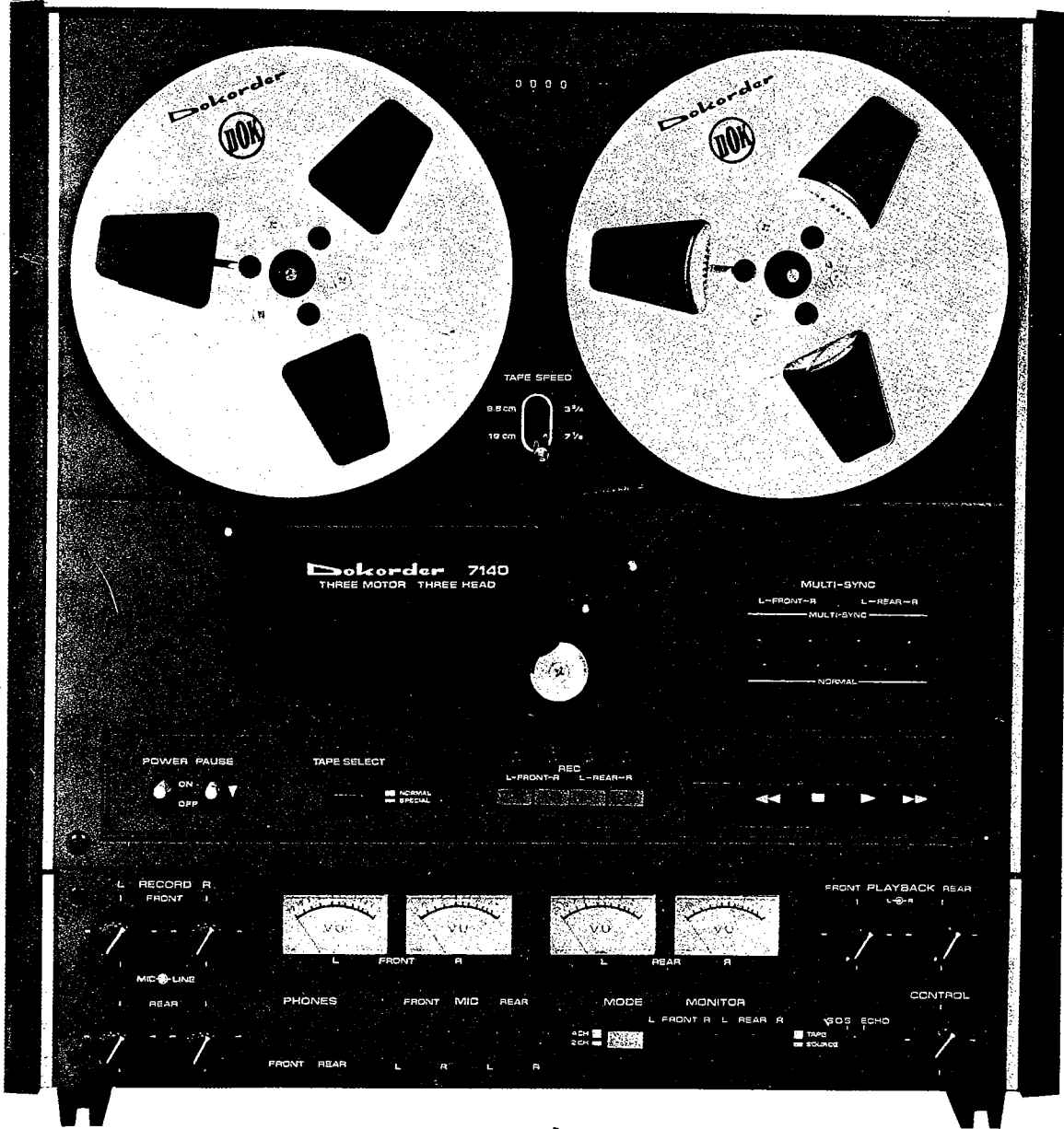


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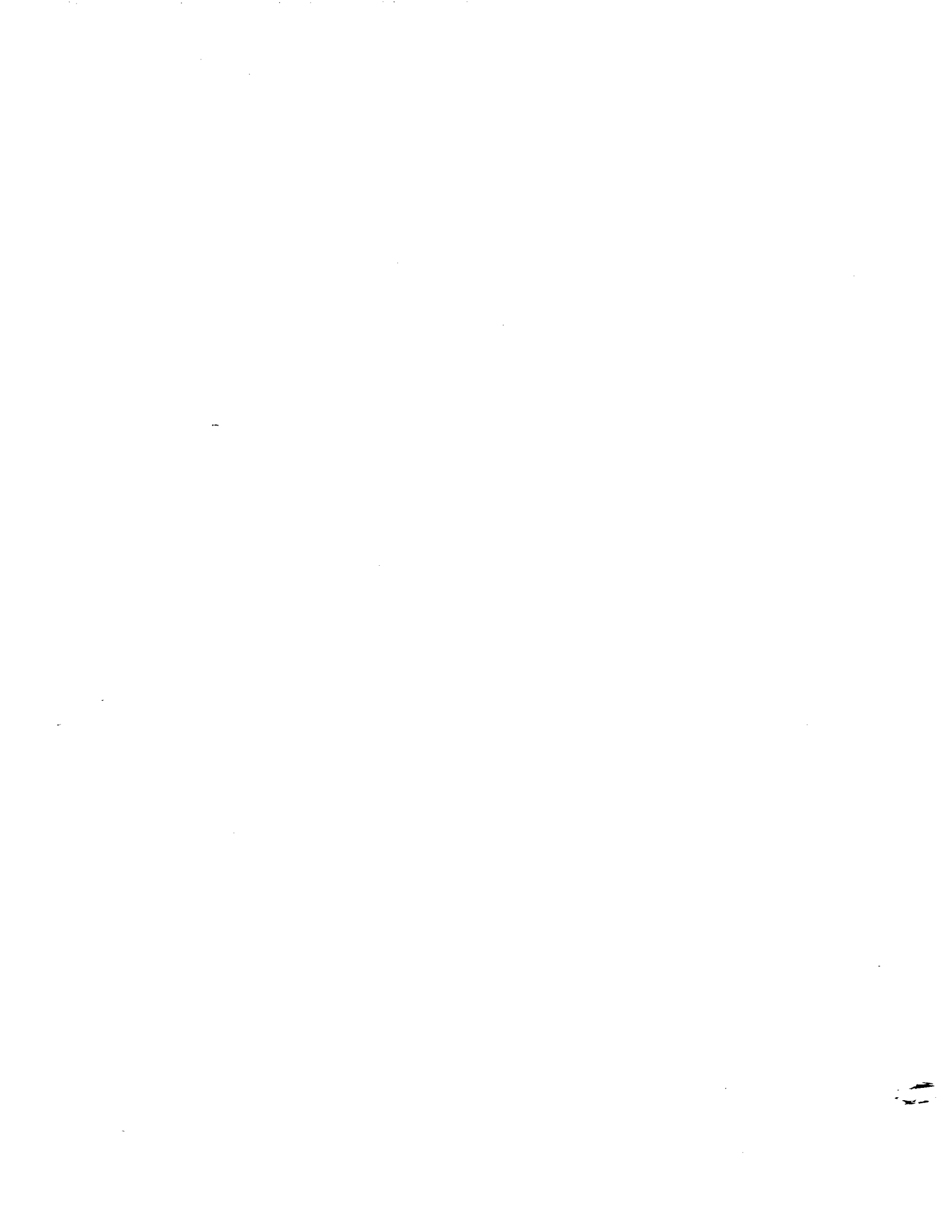


4-TRACK 4/2 CHANNEL STEREO/MONO TAPE DECK

Dokorder®
model 7140

DOKORDER 7140

SERVICE MANIA I



SERVICE MANUAL

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SERVICE DATA

MECHANICAL

Recording/Playback System:	4-track 4-channel 4-track 2-channel recording and playback
Tape width:	Standard 1/4 inch tape
Reel capacity:	7" or smaller
Motor:	Three (one 4-pole synchronous for capstan drive) (two 6-pole eddy-current for reel drive)
Tape speeds:	7-1/2 ips (19 cm) and 3-3/4 ips (9.5 cm)
Monitoring:	Full tape/source
Level indication:	4 illuminated VU meters
Operation position:	Vertical
Fast winding time:	120 seconds for 7" reel (1800 feet/60 Hz)
Wow and flutter:	Playback (RMS) 0.15% for 7-1/2 ips (19 cm) 0.20% for 3-3/4 ips (9.5 cm)
Heads:	Three (1 erase, 1 record, 1 playback)
Power requirements:	U.S.A. type 117V (60 Hz) Universal type 110, 117, 125, 200, 220, or 240 V (50/60)
Power consumption:	120 W
Weight:	40.7 lbs. net
Dimensions:	17-3/4 inch (H) X 16-7/8 inch (W) X 6-3/4 inch (D)

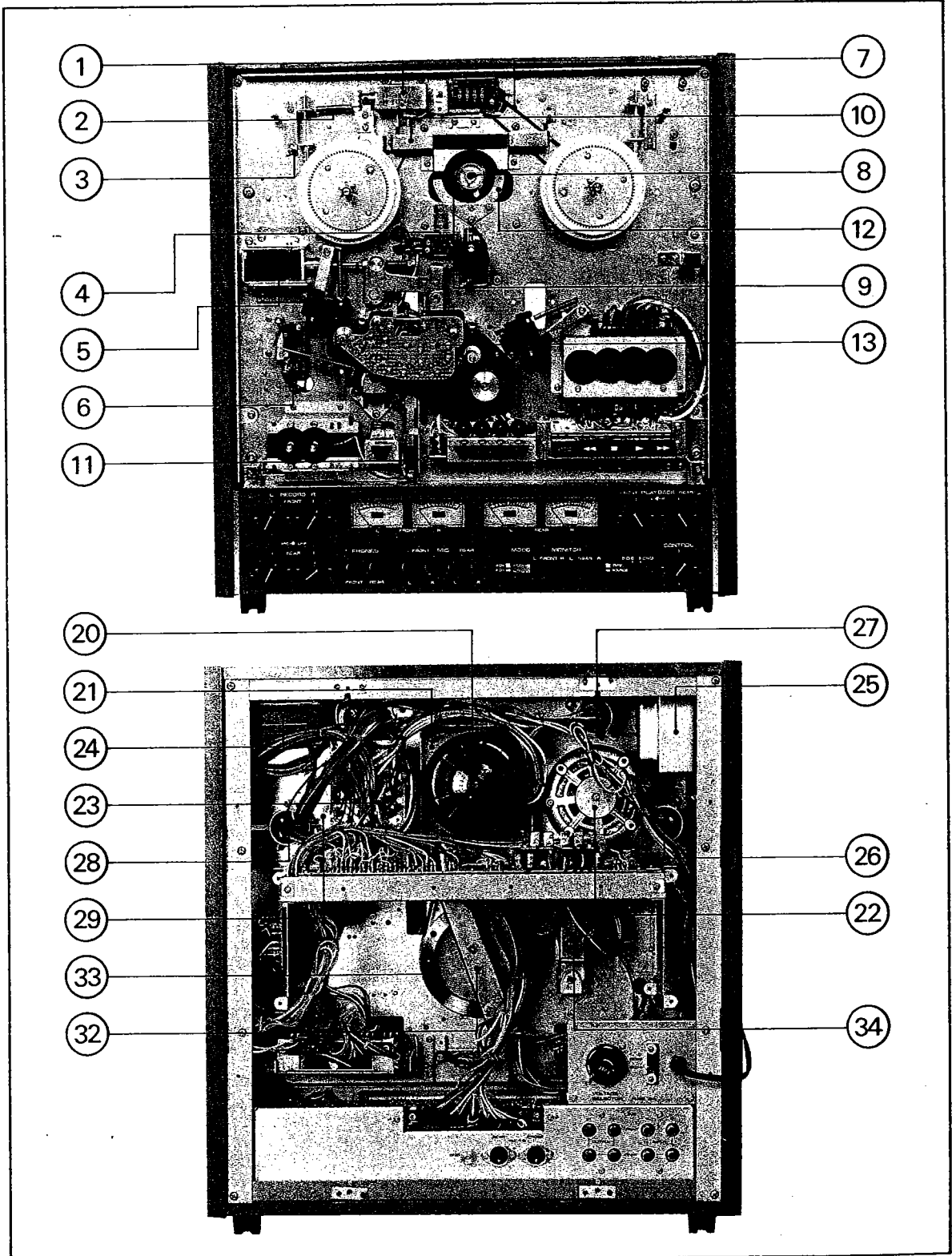
ELECTRICAL

Transistors:	2SC-693 (G)..... 4	2SC-971 2
	2SD-313 (E) or (F)-3	2SC-693 (F) or (G)-12
	2SC-945 (P, Q) or (R)-2	2SC-536 (F) or (G)- 8
Diodes:	IS 2473 44	IS 188 10
	SIB 01-02..... 7	
Equalization:	NAB	
Bias frequency:	130 KHz \pm 10 KHz Push-pull oscillator	
Frequency response:	7-1/2 ips 50 Hz \sim 20KHz \pm 3 dB	
Signal to noise ratio:	Over all (RMS) 45 dB Playback (RMS) 48 dB 45 dB adjacent track at 1 KHz	
Channel separation:	40 dB channel to channel at 1 KHz	
Input, per channel:	Microphone sensitivity..... 0.775 mV impedance 15 K ohms Line sensitivity..... 77.5 mV impedance 150 K ohms	
Output, per channel:	Line sensitivity..... 0.775 mV impedance 20 K ohms Headphones output level 2.0 mW impedance 8 ohms	
Rec/PB connector:	DIN (German standard)	

Note: Specification are subject to change without notice for purpose of improvement.



PARTS LOCATION





2

REMOVAL OF OUTER PARTS

CAUTIONS

1. Before attempting to remove the outer parts, be sure to unplug the power cable.
2. Do not try to separate each assembly into its elements.
3. Do not try to separate each part into its elements; the replacement and repair parts are integral by themselves as the parts illustrations show.
4. Whenever a screw or some part accidentally drops inside the tape deck, be sure to remove it; if it is not, damage may occur due to short circuits, etc., when the power is turned on.

1. REMOVAL OF FRONT PANEL FOR MECHANICAL ASSEMBLY

1. Pull the HEAD COVER (6) toward you.
2. When the HEAD COVER is removed, turn all the lever switches upward (TAPE SPEED SWITCH (4), four MULTI-SYNC SWITCHES (35) (36) (37) (38), PAUSE SWITCH (9) and POWER SWITCH (8)).
3. Remove the two banana plugs that hold the HEAD COVER by turning them counterclockwise with pliers or a box driver.
4. When the banana plugs are removed, loosen the screws ($\oplus M 4 \times 8 \times 4$ and $\oplus M 3 \times 20 \times 2$) that fasten the FRONT PANEL FOR AMPLIFIER ASSEMBLY, and remove the screws ($\oplus M 4 \times 8 \times 4$) that fasten the FRONT PANEL FOR MECHANICAL ASSEMBLY by turning them counterclockwise with a cross-headed screwdriver.
5. When the screws are removed, remove the FRONT PANEL FOR MECHANICAL ASSEMBLY.

2. REMOVAL OF FRONT PANEL FOR AMPLIFIER ASSEMBLY

1. Remove the knobs on the controls (four MIC RECORD LEVEL CONTROLS (17) (18) (21) (22), four LINE RECORD LEVEL CONTROLS (19) (20) (23) (24), four PLAYBACK LEVEL CONTROLS (50) (51) (52) (53) and SOUND-ON-SOUND/ECHO RECORD LEVEL CONTROL (60)).
2. When the knobs are removed, remove the front panel-fastening screws ($\oplus M 4 \times 8 \times 4$ and $\oplus M 3 \times 20 \times 2$) by turning them counterclockwise with a cross-headed screwdriver.

3. REMOVAL OF TOP AND BOTTOM BOARDS

1. Remove the top board-fastening screws ($\oplus M 3 \times 6 \times 6$) with a cross-headed screwdriver.
2. Remove the bottom board-fastening screws ($\oplus M 3 \times 18 \times 4$) with a cross-headed screwdriver.
3. When two legs are detached, remove the bottom board-fastening screws ($\oplus M 3 \times 6 \times 2$) at the center of the board with a cross-headed screwdriver.

NOTE

The top board-fastening screws are plated black, while the bottom board-fastening screws are not.

4. REMOVAL OF REAR PANEL

1. Set the protruding bar of the flywheel-locking screw in line with the slot in the rear panel.
2. Remove the rear panel-fastening screws ($\oplus M 3 \times 10 \times 8$) with a cross-headed screwdriver.
3. Before removing the rear panel, pull out the power cable through the hole in the rear panel.



NOTE

There are washers below the screws (\oplus M 3 \times 10 \times 8) to protect the panel; be careful not to lose them.

5. REMOVAL OF SIDE BOARDS

Twelve tapping screws (\oplus 4 \times 12) fasten both side boards; two are located on the upper and lower side of each of the boards, and four more on each of the front and rear panels. To remove them, turn the tapping screws counterclockwise.

NOTE

The tapping screws are fastened more strongly than other screws. So, in trying to remove the side boards while the front and rear panels and the top and bottom boards are in place, be careful not to damage the heads of the screws by undue force.



REPLACEMENT OF WORN PARTS

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-



1. REPLACEMENT OF HEADS

CAUTION

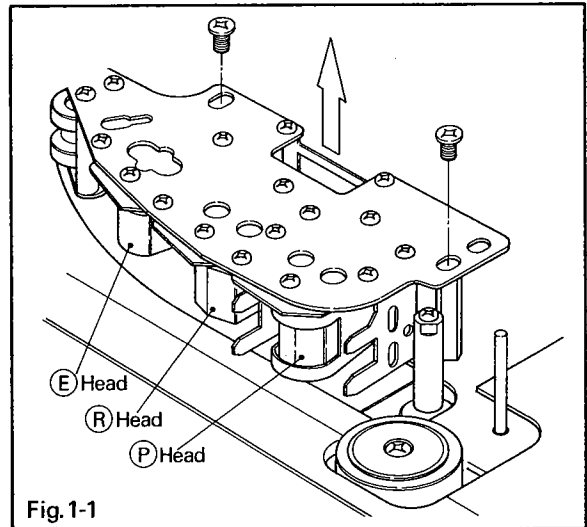
Before attempting to replace the head assembly or one of the heads of the tape deck with a new one, be sure to set the POWER SWITCH (8) to the off position or unplug the power cable from the AC outlet. And before installing the replacement part, make notes of the color coding and connections of the leads that run from the heads to the connectors. When the replacement procedure is finished, it is imperative to demagnetize the heads.

1-1. REPLACEMENT OF HEAD ASSEMBLY

1. Remove the HEAD COVER (6) on the front panel, then the head assembly can be seen.
2. Remove the two head assembly-fastening screws (+ M 4 X 8) by turning them counterclockwise, and pull out the head assembly in the direction of the arrow in Figure 1-1.

NOTE: When removing the head assembly, hold the hexagonal bar on the head base with a spanner or pliers. Also be careful to select the screwdriver that securely fits the cross heads of the screws, otherwise the heads may be permanently damaged.

3. Mount the new head assembly on the head base and retighten the screws holding the hexagonal bar with a spanner or pliers.
4. When the replacement procedure is finished, paint-lock the heads of the head assembly-fastening screws.
5. Load a tape on the tape deck and set the tape deck to the play mode; examine the position of the heads and tape guides in relation to the running tape, reel flanges, etc.



When the above-mentioned procedures are completed

1. Adjust the height of the heads and their horizontal and vertical angles to the tape. For adjustment, refer to "HEAD ALIGNMENT PROCEDURE."
2. Adjust the levels by turning the pre-set potentiometers. For adjustment refer to "ELECTRICAL ADJUSTMENT CHART."

1-2. REPLACEMENT OF HEADS

For equipment necessary for replacement of heads, refer to the section "EQUIPMENT NECESSARY FOR ADJUSTMENT AND REPLACEMENT."

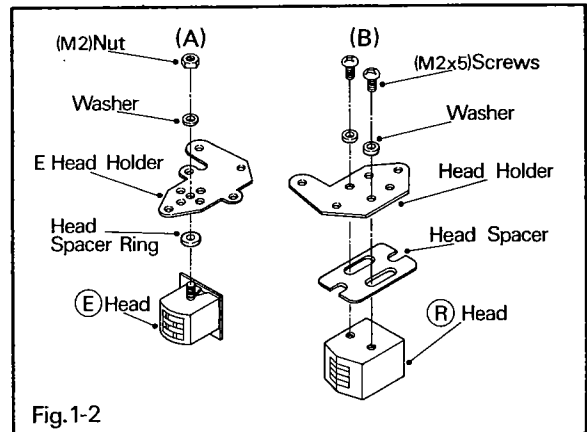
For replacement of a head a 2mm box driver, a 2mm cross-headed driver and a 2mm minus-headed driver are necessary.

First pull off the head assembly from the head base before attempting to replace the head. The heads are located as the Figure 1-1 shows.



—REPLACEMENT OF ERASE HEAD—

1. The erase head is located to the left in the head assembly.
2. To remove the erase head, insert the 2mm box driver through a hole on the left side of the head base and remove the 2mm nut by turning it counterclockwise.
3. The removal procedure is as described in the Figure 1-2 (A).
4. When the erase head is removed, disconnect the leads on the opposite side of the head mount by a soldering iron. **NOTE:** Don't apply the soldering iron to the leads too long, as the leads insulation may be damaged.
5. Connect the leads to the new erase head by the soldering iron. Mount the erase head referring to the Figure 1-2 (A). Be careful not to mistake the top of the head spacer ring for its bottom. (Don't forget to check the soldered parts and connections.)
6. Insert the erase head into the head holder hole (E). Fit the washer and the 2mm nut, and then tighten it by turning the 2mm box driver clockwise.



—NOTE—

Since the screw protruding from the erase head is thin, be careful not to strip the thread when tightening the nut with the box driver.

7. When the replacement is finished follow step 5 of the preceding section 1-1. "REPLACEMENT OF HEAD ASSEMBLY" for adjustment.
8. When the above-mentioned procedures are completed, paint-lock the heads of the 2mm nut.

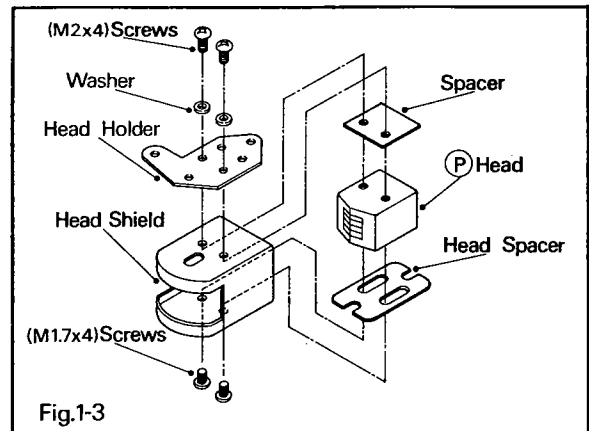
—REPLACEMENT OF RECORD HEAD—

1. The record head is located at the center of the head assembly.
2. To remove the record head, insert the 2mm cross-headed driver through a round hole at the center of the head base, and remove the head-fixing screws (\oplus M 2 X 5) by turning them counterclockwise.
3. When the head-fixing screws have been removed, the head spacer board will come off; be sure not to lose it.
4. The removal sequence is as shown in the Figure 1-2 (B).
5. When the record head is removed, follow step 4 in the preceding paragraph "REPLACEMENT OF ERASE HEAD."
6. Mount the new record head and connect the leads by the soldering iron. (Don't forget to check the soldered part and connections.)
7. Then mount the record head on the head assembly referring to the Figure 1-2 (B); insert the screws through the head holder hole and turn them clockwise by the 2mm cross-headed driver.
8. Mount the head assembly on the head base. When the replacement is finished, follow step 5 of the preceding section 1-1. "REPLACEMENT OF HEAD ASSEMBLY" for adjustment.



—REPLACEMENT OF PLAY HEAD—

1. The play head is located to the right in the head assembly.
2. To remove the play head, insert the 2mm minus-headed driver through a round hole on the right side of the head base, and remove the head-fixing screws (\ominus M 1.7 \times 4) by turning them counterclockwise.
3. The removal sequence is as shown in the Figure 1-3. When the head-fixing screws have been removed, the head holder and the head swing free. Then remove the head by turning the screws (\oplus M 2 \times 4), which hold the head shield and the head, counterclockwise by the 2mm cross-headed driver.
4. Follow steps 5 and 6 in the preceding paragraph "REPLACEMENT OF RECORD HEAD" for disconnecting and connecting the leads.
5. Re-mount the head on the head assembly referring to the Figure 1-3. Follow the specified sequence in the order given.
6. When the replacement is finished, follow step 5 of the preceding section 1-1. "REPLACEMENT OF HEAD ASSEMBLY" for adjustment.





2. REPLACEMENT OF CAPSTAN SLEEVE AND PINCH ROLLER

CAUTION

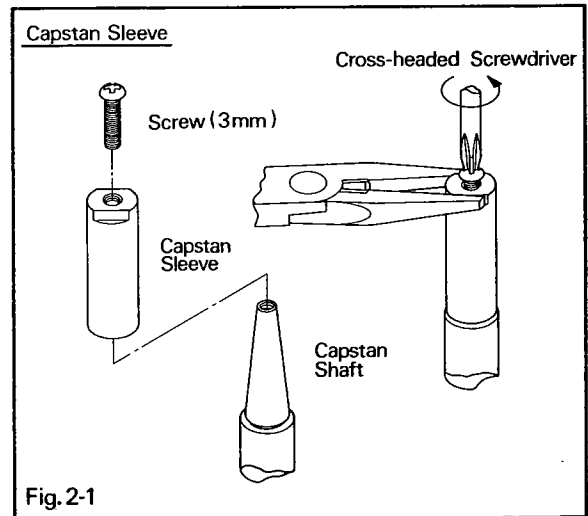
Before attempting to replace the capstan sleeve or pinch roller of the tape deck with a new one, be sure to set the POWER SWITCH (8) to the off position or unplug the power cable from the AC outlet.

2-1. REPLACEMENT OF CAPSTAN SLEEVE

1. Remove the HEAD COVER (6) on the front panel by pulling it toward you.
2. Remove the capstan sleeve-fixing screws (⊕ M 3 × 12) by turning them counter-clockwise with a cross-headed driver.
NOTE: If the capstan sleeve turns with the screw when loosened with the driver, the fixing screws are tightened too strongly; pinch the upper flat part of the capstan sleeve with radio pliers as Figure 2-1 shows. Then the screws can be removed easily.

3. Take out the screws (⊕ M 4 × 15) that are necessary for removal of the capstan sleeve. With a tape recorder of the Universal Type, the screws are supplied as accessories for cycle change; remove them from the vinyl bag.

4. Insert the screws (⊕ M 4 × 15) into the hole on the upper end of the capstan sleeve. When the cross-headed driver is turned clockwise while the upper flat part of the capstan sleeve is pinched by radio pliers, the capstan sleeve moves up.
5. When the capstan sleeve is freed from the capstan shaft, set the POWER SWITCH (8) to the ON position or plug the power cable into the AC outlet. When the capstan shaft begins to rotate, set the TAPE SPEED SWITCH (4) to the 9.5cm (3¾ips) position.
6. Insert the new capstan sleeve into the rotating capstan shaft and push it gently with your finger until the capstan sleeve begins to rotate together with the capstan shaft. Then the contact of the capstan sleeve with the capstan shaft is appropriate.
7. Then set the POWER SWITCH (8) to the off position, remount the screws (⊕ M 3 × 12) that were removed previously, and tighten them by turning them clockwise, while holding the upper flat part of the capstan sleeve with radio pliers.
8. Load the test tape*, depress the PLAY BUTTON and let the test tape run.



When the above-mentioned procedures are completed

Perform wow/flutter and speed variation measurements with the loaded test tape* for the respective measurements. For the detailed procedure, refer to the section "WOW/FLUTTER AND SPEED VARIATION MEASUREMENT."

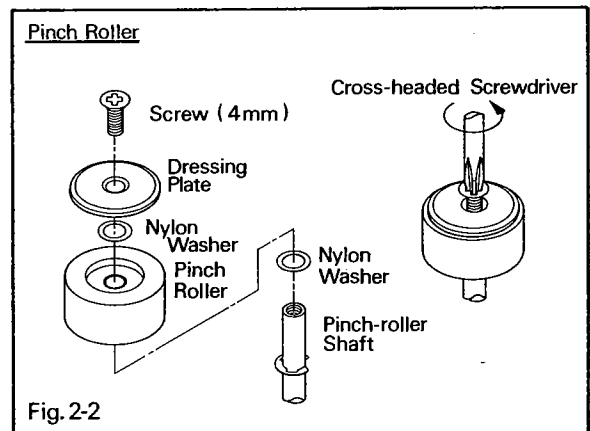


—2-2. REPLACEMENT OF PINCH ROLLER

1. Remove the pinch roller-fixing screws (⊕ M 4 X 8) by turning them counter-clockwise with a cross-headed driver.
2. Remove the dressing plate and nylon washer, extract the pinch roller and fit a new pinch roller from the pinch roller shaft.

NOTE: The pinch roller, when extracted, may be tainted with oil from the nylon washer below the pinch roller. Therefore, when the pinch roller is extracted, remove the nylon washer from it and fit it onto the pinch roller shaft before fitting the new pinch roller. (See Figure 2-2.)

3. After the new pinch roller is fitted, apply a drop of oil to the pinch roller shaft. Then mount the upper nylon washer and dressing plate, then remount the pinch roller-fixing screws and turn them clockwise until they are securely tightened.
4. When the replacement procedure is completed, follow step 8 in the preceding paragraph "REPLACEMENT OF CAPSTAN SLEEVE".





3. REPLACEMENT OF MOTORS

When about to replace a motor, first remove the FRONT and REAR PANELS, referring to the section "REMOVAL OF OUTER PARTS." Also be sure to unplug the power cable from the AC outlet.

For equipment necessary for replacement of the capstan motor and the reel motors, refer to the section "EQUIPMENT NECESSARY FOR ADJUSTMENT AND REPLACEMENT."

—3-1. REPLACEMENT OF CAPSTAN MOTOR—

1. Remove motor pulley (8) hooked belt (9) through a hole located at the center of the front deck chassis.
2. Reverse the tape deck so that the front faces to the rear. Remove the four motor chassis (21) fastening screws (⊕ M 4 × 8), then the motor assembly will be detached in the manner as shown in Figure 3-1.
3. Remove the capstan motor (20) fastening screws (⊕ M 4 × 8) of the motor assembly by turning them counterclockwise, and remove the capstan motor from the motor chassis.
4. Remove the motor pulley from the capstan motor shaft by turning the Allen driver counterclockwise.
5. Mount the motor pulley on the new capstan motor shaft. And trying to maintain the distance, noted in step 4 above, tighten the motor pulley-fastening screws by the Allen driver.
6. When the motor pulley is mounted, mount the new capstan motor on the motor chassis by the capstan motor-fastening screws, and screw-lock the heads of these screws.
7. When the above procedures are finished, the motor chassis looks as shown in Figure 3-1. Remount the motor assembly at its original location, and screw-lock the heads of the screws. Then turn the deck forward to face the front, and hook the belt onto the motor pulley.
8. The figure 3-2 shows the sequence in which the capstan motor should be separated into its elements.

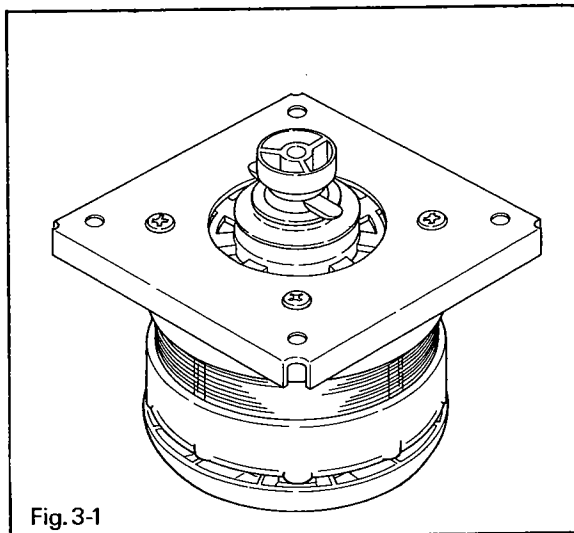


Fig. 3-1

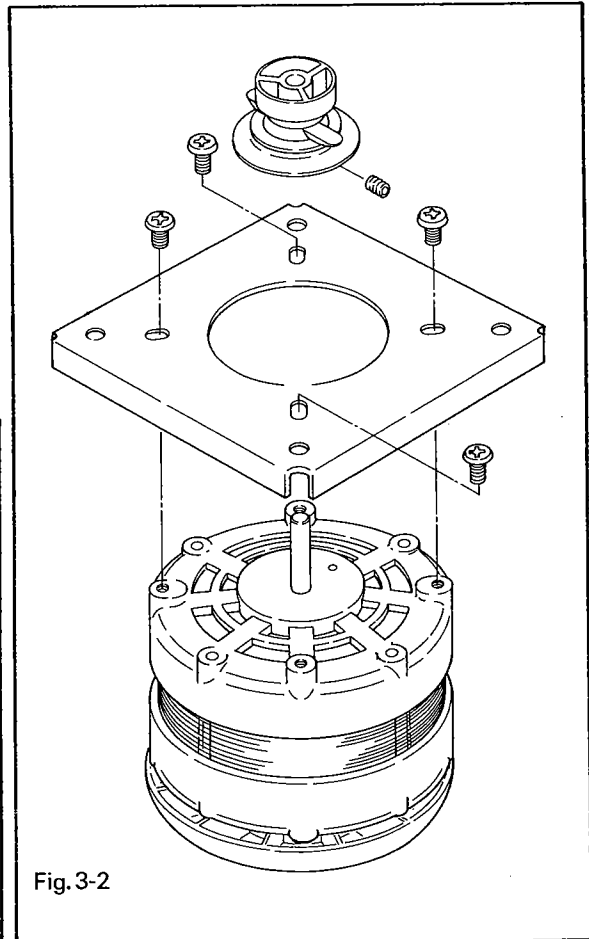


Fig. 3-2



When the above-mentioned procedures are completed

Perform the wow/flutter and speed variation measurements. For the detailed procedures, refer to the appropriate section.

3-2. REPLACEMENT OF REEL MOTORS

Two reel motors can be seen on the left and right of the tape deck when the panels are removed. The following steps show how to replace the right reel motor (viewed from front).

1. Remove the top board referring to the section "REMOVAL OF OUTER PARTS."
2. Turn the deck backwards to face the rear, and remove PC board (23), mounted on the reel motor.
3. When the PC board is removed, remove the four screws (\oplus M 4 X 8) that secure PC board holder (29), and remove the PC board holder from the reel motor.
4. Turn the deck forward to face the front and remove the reel table, mounted on the right reel motor. For removal of the reel table, refer to the section "REMOVAL OF COUNTER BELT."
5. When the reel table is removed, the heads of four screws (\oplus M 4 X 8) securing the reel motor can be seen.
6. Remove the reel motor-fixing screws and pull out the reel motor by hand. To remount the reel motor, perform the reverse procedure given above.

When the replacement procedure is finished

1. Adjust the reel table height. Refer to the section "ADJUSTMENT OF TAPE TRAVEL PATH."
2. When the reel table height is adjusted, perform the wow/flutter and speed variation measurements. For detailed procedures, refer to the appropriate section.



4. REPLACEMENT OF BELTS

When about to replace belts, first remove the FRONT and REAR PANELS, referring to the section "REMOVAL OF OUTER PARTS." For equipment necessary for replacement of the counter belt and capstan belt, refer to the section "EQUIPMENT NECESSARY FOR ADJUSTMENT AND REPLACEMENT."

—4.1. REPLACEMENT OF COUNTER BELT—

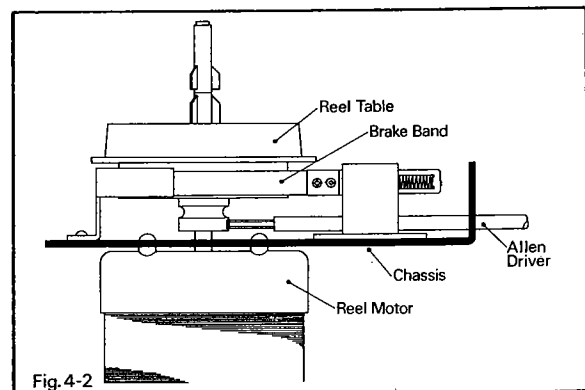
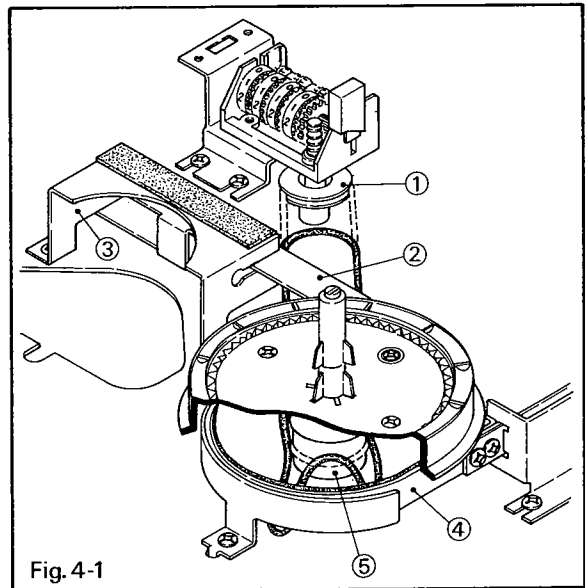
1. Remove one end of the belt that is hooked to the counter pulley (indicated ① in the Figure 4-1).
2. When the belt is unhooked, it unstretches to its original size. Then pass that end of the belt below the brake connector board and the brake connector board guide.
3. Pull out the belt by passing it between the brake band ④ and the brake drum ⑤.
4. Pass the new counter belt between the brake band and the brake band guide, and hook it into the belt slot on the reel table.

NOTE: To prevent damage to the belt, take care not to scrape the belt against any possible rough edges of the brake band and/or brake band guide.

5. Holding the end of the belt hooked on the belt slot on the reel table, pass the other end under the brake connector board ② and the brake connector board guide ③.
6. Hook that end onto the counter pulley ①.
7. When both ends of the belt are hooked, turn the reel table slowly counterclockwise and check that the digits in the counter move from lower to higher numbers.

- During the above procedure, when the distance between the brake band and brake band guide is too small to allow the belt to pass through, remove the reel table first. To do so, follow the steps indicated as follows.

1. Remove the top board referring to the section "REMOVAL OF OUTER PARTS".
2. Insert the Allen driver through the hole on the deck chassis, turn the reel table-fastening screws counterclockwise and detach the reel table from the motor shaft. (See Figure 4-2.)
3. Hook one end of the new belt on the counter pulley first, then pass the other end below the brake connector board and brake connector board guide, and hook it into the belt slot on the reel





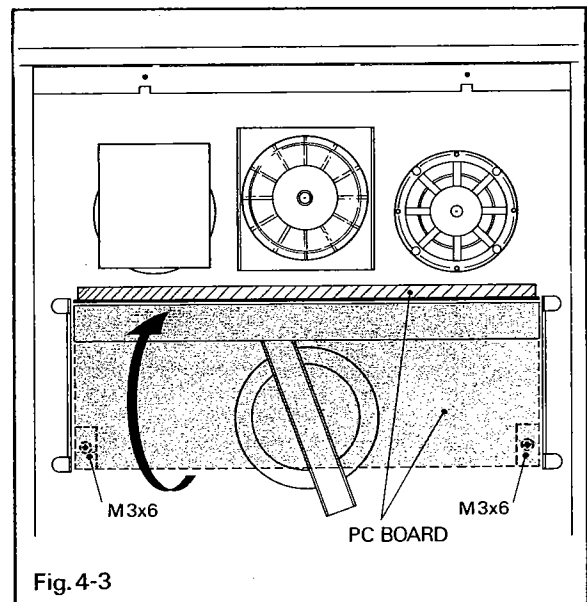
- table. Taking care not to let the hooked end of the belt loose, insert the reel table on the motor shaft and fasten the screws that secure the reel table.
- When both ends of the belts are hooked in position, turn the reel table slowly counterclockwise and check that the digits in the counter move from high to lower number.

—When the replacement procedure is finished—

- Adjust the reel table height. Refer to the section "ADJUSTMENT OF TAPE TRAVEL PATH".
- When the reel table height is adjusted, perform the wow/flutter and speed variation measurements. For the detailed procedures, refer to the appropriate section.

—4.2. REPLACEMENT OF CAPSTAN BELT—

- Remove the four screws (\oplus 3 X 10) that secure the punched shield board (30)*, located on the control PC board, by turning them counterclockwise with the cross-headed screwdriver, and then remove the shield board (30).
- Remove the two screws (\oplus M 3 X 6) that secure the control PC board and turn the board upward as shown in Figure 4-3. Fix the control PC board there with adhesive tape not to let it drop down.
- Unhook one end of the belt, hooked to the motor pulley, through the hole at the center of the front deck chassis and pass it below the fork-shaped fitting.
- Now turn the tape deck to face the rear.
- Disconnect the 4-p connector, plugged to the equalizer change-over PC board (31), and lift the belt.
- Remove two screws (\oplus M 4 X 8) that secure the flywheel-fastening holder (32), and pull out the belt.
- Pass the new belt through the hole at the center of the deck chassis and hook one of its ends round the motor pulley, and pass it between the fork-shaped fitting.
- Pass the belt over the equalizer PC board, then connect the 4-p connector to the equalizer change-over PC board. Stretch the other end of the belt slowly toward the flywheel and hook it round the flywheel.
- When the belt is hooked round the flywheel, mount the flywheel holder and fasten it by turning the screws clockwise. Then paint-lock the heads of the two screws.
- When the belt is mounted, turn the capstan fan and check that both the capstan sleeve and the flywheel turn accordingly. Also check that the belt is not in contact with the fork-shaped fitting.



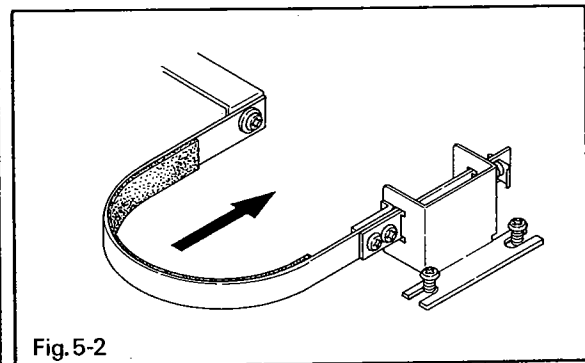
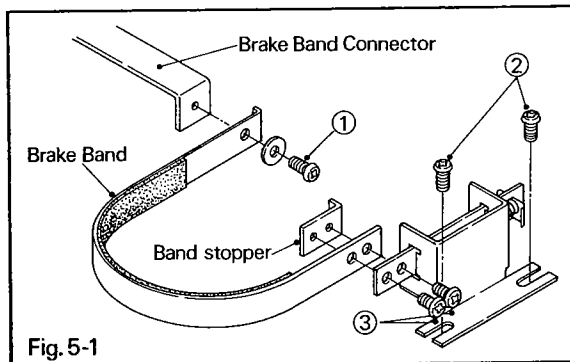
—When the replacement procedure is finished—

- Change the tape speeds and check that the speed of the belt changes accordingly. There are cases where the speed does not change properly due, for example, to excessive vibrations of the belt itself.
- Perform the wow/flutter and speed variation measurements. For the detailed procedures, refer to the appropriate section.



5. REPLACEMENT OF BRAKE BANDS

1. First remove the top board referring to the section "REMOVAL OF OUTER PARTS."
2. For equipment necessary for replacement of the brake bands, refer to the section "EQUIPMENT NECESSARY FOR ADJUSTMENT AND REPLACEMENT."
3. Insert the Allen driver through the hole on the deck chassis and turn the screw on the reel table counterclockwise, then separate the reel table from the motor shaft.
4. Remove screw ① on the brake connector board by turning it counterclockwise (see Figure 5-1), and remove screw ② that secures the brake band holder. Then the brake band comes free of the brake band assembly.
5. When screw ③, that secures the brake band of the removed brake band assembly, is unscrewed, the brake band comes off. Then replace it by the new brake band, mount the new brake band between the brake control board and the brake band stopper, and tighten screw ③ to mount the brake band assembly.
6. To mount the brake band assembly on the deck chassis, first tighten screw ② and then ①.
NOTE: 1. To mount the brake band holder on the deck chassis, first push up the brake band holder in the direction of the arrow in the Figure 5-2 and then tighten screw ②.
2. When about to tighten the screw ①, do not forget to mount the 3mm washer first.
7. Following step 3 above, mount the reel table by turning the reel table-securing screw clockwise.

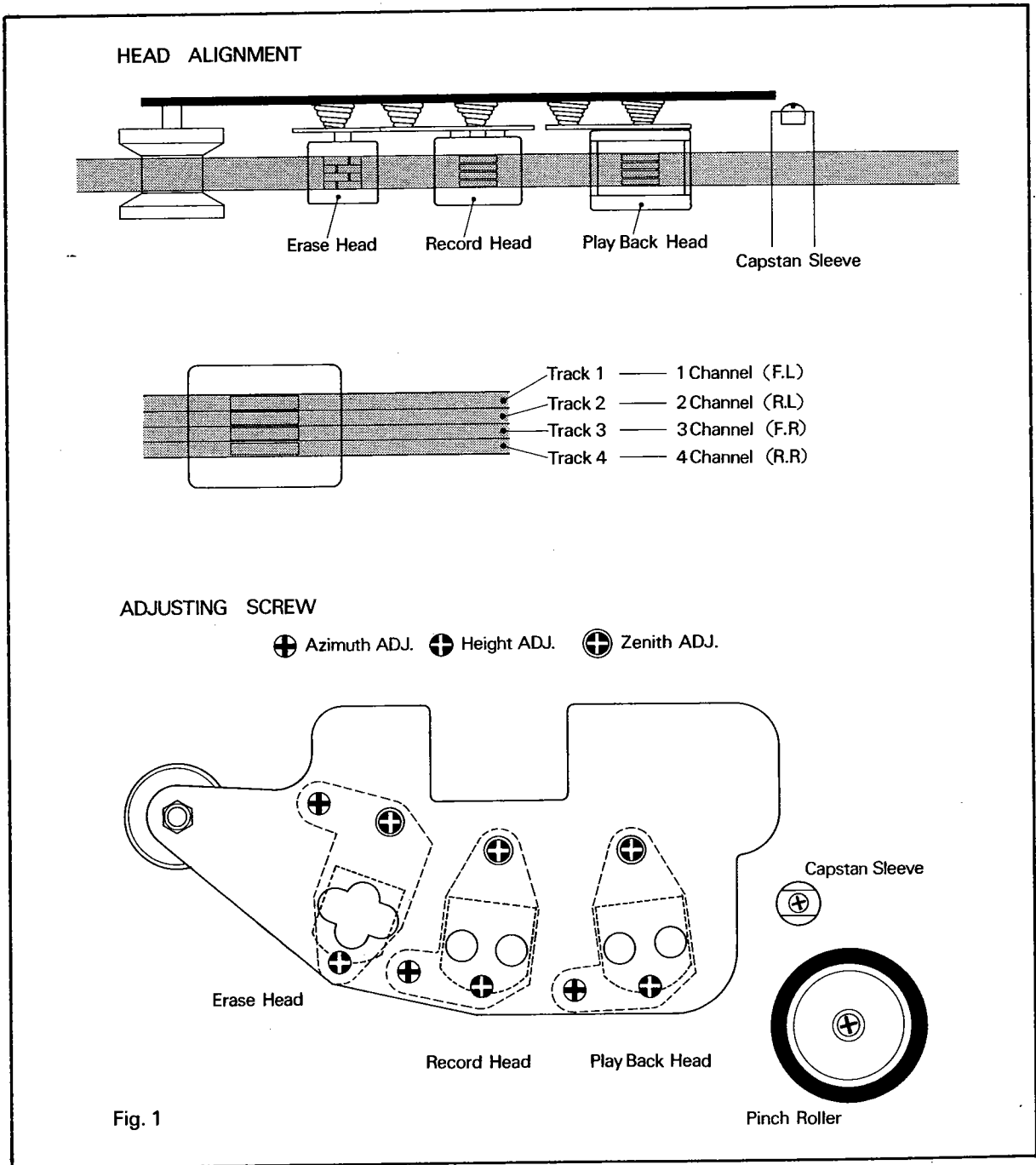


—When the replacement procedure is finished—

1. Adjust the reel table height. Refer to the section "ADJUSTMENT OF TAPE TRAVEL PATH."
2. Adjust the braking mechanism. Refer to the section "ADJUSTMENT OF BRAKE MECHANISM."



HEAD ALIGNMENT — MECHANICAL —





MEASUREMENT, ADJUSTMENT AND CHECKING PROCEDURES — MECHANICAL —

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1. ADJUSTMENT OF AUTO SHUT-OFF SWITCH

1. Remove the front panel. (For the procedure, refer to the section "Removal of Outer Outfits.")
2. With the front panel removed, you will see the auto shut-off mechanism near the LEFT TENSION ARM (5). (See Figure 1-1.)
3. Check that the TAPE CONTACT BAR (7) of the AUTO SHUT-OFF ARM (2), when pushed upward by a finger, stays between the OUTER TAPE GUIDE (4) and the ERASE HEAD (5).
4. Push the AUTO SHUT-OFF ARM upward by a finger again and release it to check the point where the auto shut-off mechanism is activated. You will hear a click sound when the mechanism is activated. See that the point is 5 to 7mm away from the AUTO SHUT-OFF ARM STOPPER (3). (See Figure 1-2.) If the position is not within the specified tolerance, loosen the AUTO SHUT-OFF SWITCH SCREWS (1) and adjust the AUTO SHUT-OFF SWITCH and AUTO SHUT-OFF ARM accordingly. When the adjustment is finished, push the AUTO SHUT-OFF ARM upward again and see that the ARM does not touch the OUTER TAPE GUIDE or the ERASE HEAD MOUNT.
5. Push the AUTO SHUT-OFF ARM upward again and check that the auto shut-off mechanism is activated when the TAPE CONTACT BAR is outside the TAPE PATH. (See Figure 1-3.) When you hear a click sound, the mechanism is activated.
6. The AUTO SHUT-OFF ARM does not go further when the AUTO SHUT-OFF ARM KNEE (6) hits the AUTO SHUT-OFF SWITCH or when the AUTO SHUT-OFF ARM hits the AUTO SHUT-OFF ARM STOPPER. (See Figure 1-4.) See that the TAPE CONTACT BAR of the AUTO SHUT-OFF ARM is inside the TAPE PATH before the AUTO SHUT-OFF ARM KNEE hits the AUTO SHUT-OFF SWITCH. If not, loosen the AUTO SHUT-OFF SWITCH SCREWS and adjust the AUTO SHUT-OFF SWITCH and AUTO SHUT-OFF ARM again, or bend the AUTO SHUT-OFF ARM,

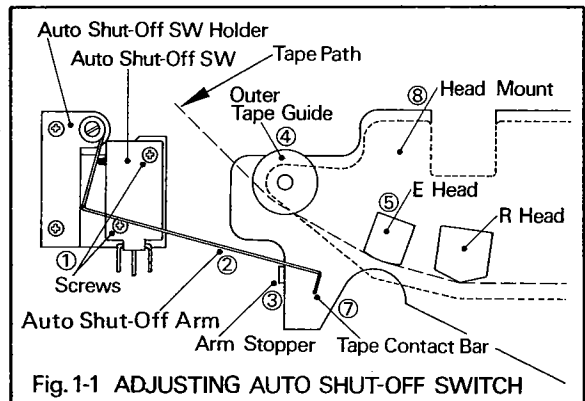


Fig. 1-1 ADJUSTING AUTO SHUT-OFF SWITCH

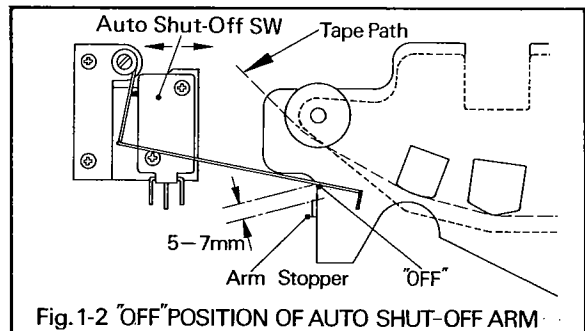


Fig. 1-2 "OFF" POSITION OF AUTO SHUT-OFF ARM

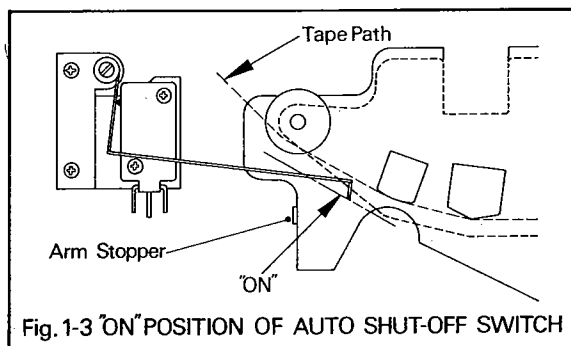


Fig. 1-3 "ON" POSITION OF AUTO SHUT-OFF SWITCH

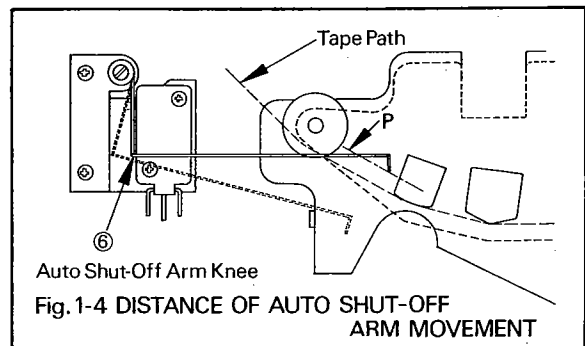


Fig. 1-4 DISTANCE OF AUTO SHUT-OFF ARM MOVEMENT



