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KEY TO ILLUSTRATIONS
1 REVERSE BUTTON
2 FAST FORWARD/REWIND BUTTON
3 STOP BUTTON
4 DC IN 3V SOCKET
5 OPERATION /INDICATOR
6 HEADPHONES SOCKETS (A, B)
7 VOLUME CONTROL
8 TAPE SELECTOR
9 PLAY BUTTON

SPECIFICATIONS
Semiconductors : ICs : 2
Transistors : 9
Diodes : 3
LED : 1
Power Supply : DC : 3V [IEC R6("AA" cell)×2 or equivalent]
IEC R14("C" cell)×2 or equivalent...Use carrying case
AC : Use optional AC adaptor (3V)
Power Consumption : 145mA (with no signal)
Power Output : 50mW (25mW+25mW)...THD10%
Tape : Cassette tape
Track System : 4 track 2 channel stereo
Tape Speed : 4.75cm/s

Frequency Response : Normal : 40—12,000 Hz
Metal : 40—15,000 Hz
Signal to Noise Ratio : 50 dB
Wow and Flutter : 0.2% (WRMS)
Crosstalk : Between tracks : 70 dB
Output Load Impedance : Between channels : 50 dB
Headphone : 33 ohms (8—100 ohms suitable)
Distortion : 3%
Motor : Electronically controlled DC motor
Fast Forward or Rewind Time : 135 sec. (using C-60)
Dimensions : 108(W)×77(H)×28.5(D)mm
Weight : 290g (with batteries)

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

STEREO CASSETTE PLAYER

February 1983

TOKAI WORKS
1. Power circuit

S6 and S1 are turned on when the headphone plug is inserted into the PHONES-A jack and an operation button (PLAY, FF, REW) is pressed. +B is applied to the base of Q23 via R26 during play, so the base of Q21 becomes Lo potential and Q21 turns ON. This causes +B to be supplied to the motor and amplifier via Q21. When the unit enters the fast feed mode (forward or reverse direction), S2 is set to ON, Q23 is OPEN, instantaneous current flows to C21 and a Hi potential is applied to the base of Q22 to set Q22 and Q21 to ON to turn the motor. When the motor starts, Hi potential is output from IC2 pin 14 which is applied to the base of Q22 and the power supply mode continues.

2. Reverse circuit

- When the tape reaches the end with the auto-reverse function set, Lo potential is output from IC2 pin 14, so Q31 is set open, the positive pulse is applied to the base of Q32 by means of the differential circuit (R34, C32), solenoid SD1 is operated and auto-reverse is performed mechanically. The pulse at this time is applied to the base of Q37 to mute the track switching noise when reversing.

- For the manual reverse, S5 is turned ON to set the base of Q31 to Lo potential to perform the same operation as in the auto-reverse. By operating the reverse switch of the headphones, the branched voltage applied to the base of Q36 via R30L is made greater to set Q36 to ON. By this, the same state as when S5 is set to ON is obtained and the reverse operation is performed.

3. Pause circuit

By operating the pause switch of the headphones, the branched voltage applied to the base of Q41 via R30R gets greater, Q41 is set to ON, pin 5 of the motor servo is set to Lo potential and the motor stops. IC2 pin 15 is connected to the collector of Q41 via D24 to maintain the Hi potential of IC2 pin 14 so that the tape transport direction is not changed (reverse operation) during pause.

* C23 repeats charging and discharging and pin 14 outputs Hi potential while the magnet is turning. When the magnet stops rotating, the voltage at pin 16 gets higher (1.5V or more) and pin 14 outputs Lo potential.
1. Cassette lid
   Remove 3 fixing screws \textbf{A}.

2. Cassette support plate
   Remove 10 fixing screws \textbf{B} shown in Figs. 1, 3.

3. Rear case
   Remove 5 fixing screws \textbf{C} shown in Figs. 2, 4 and remove the volume control knob fixing special screw. Then push the knob stopper in the direction of the arrow as shown in Fig. 5 using tweezers to release it and remove the tape select knob.

4. Cassette holder
   Remove fixing screw \textbf{D} and pull the cassette holder in the direction of the arrow.
5. Main, motor PC Board
   Remove 5 fixing screws (E) and remove the PC Board in the direction of the arrow.
   Assemble the PC Board so that 3 leaf switches (F) do not touch the switch lever of the cassette chassis.
   * Cut off the electrolytic capacitor leads after replacing the electrolytic capacitor so that the rear case and the soldered leads of the electrolytic capacitor do not come into contact.

6. Flywheel supporter
   Remove 3 fixing screws (G).

   ![Diagram of Flywheel Supporter](image)

   **Fig. 7**

7. Cautions after replacing variable resistor (RV1) and reverse switch (S5)
   The gap between the soldered section and the mechanism chassis is too small after replacing the variable resistor and reverse switch, so grind off excess solder using a file (to set to approx. 0.5mm).

   ![Diagram of RV1 and Reverse Switch](image)

   **Fig. 8**

8. Playback head
   Remove the head plate ass'y fixing E ring and the pressure roller spring, lift the head plate ass'y towards you to remove it and then remove 2 head fixing screws (H). Apply the pressure roller spring to the head plate ass'y, arrange the wiring of the head as shown in the Fig. 10 and then install the head so that the wiring does not get caught between the rear case and cassette chassis.

   ![Diagram of Playback Head](image)

   **Fig. 9**

   ![Diagram of Rear Case and Cassette Chassis](image)

   **Fig. 10**
Fig. 11

P1.4 × 3
(Flywheel supporting plate)

Fig. 12

Washer
(FF idler gear 2)

Washer
(Rewind gear)

P1.7 × 2
(Magnet ass'y)

Washer
(Take-up gear)

Washer
(Power assist idler gear)
1. Main motive power transmission system
   Motor rotation is transmitted to the flywheel (forward),
   take-up gear ass’y and FF idler 1 via the flywheel belt.
   At the same time, it is transmitted to the flywheel
   (reverse) and the power assist idler gear.
2. Forward (►►) play mode

When the play button is pushed in, the switch lever and lock lever turn in the direction of the arrow as shown in Fig. 15 to set S2 to ON and the play button is locked by the lock lever. The play button presses section A of the play lever shown in Fig. 16, so the head plate is pushed up at section B.

The power assist gear is locked by the power assist lock lever in the forward play mode as shown in Fig. 17, so the reverse lever stops rotating in the direction of the arrow, pressure roller (forward) is depressed by section D and pressure roller (reverse) is compressed against the forward side capstan.

Locking of the coupling lever by the reverse lever is released, so FF idler gear 2 of take-up lever (forward) is compressed against reel base (reverse) and rotation is transmitted.
3. Reverse (►◄) play mode

The magnet lever shown in Fig. 18 is attracted by the solenoid (iron core is magnetized) during forward play, but power is supplied to the solenoid at the tape end, magnetism of the iron core is neutralized, the iron core turns in the direction of the arrow, and the power assist lock lever releases locking of the power assist gear.

The power assist gear is provided with torque in the direction of the arrow by means of the projection of the reverse lever shown in Fig. 19, the power assist gear shown in Fig. 18 is turned in the direction of the arrow by the torque when locking of the power assist gear is released, and then it is engaged with the power assist idler gear, and the projection of the continuously turning reverse lever is pushed up along the cam of the power assist gear, so the reverse lever turns in the direction of the arrow. By this, (1) the coupling lever is turned in the direction of the arrow to bring FF idler gear 1 away from reel base (reverse).

(2) Take-up lever (reverse) turns in the direction of the arrow, Rewind idler gear 1 and Rewind idler gear 2 engage with each other and the rotation is transmitted to reel base (forward). (3) Section C of pressure roller (reverse) is depressed, locking of the section D of pressure roller (forward) is released, and pressure roller (forward) is compressed against the capstan of flywheel (reverse). (4) The switch lever turns in the direction of the arrow to set S3 to ON and switches over the forward/reverse signals. The power assist gear is finally locked by section E shown in Fig. 18 to maintain the reverse mode.

The tape is changed over from the forward direction to the reverse direction via this series operation. To switch from the reverse direction to the forward direction, the locking of the power assist gear is released and the unit returns to the forward play mode.
4. Fast feed mode

1. Forward direction
   When reel base (reverse) shown in Fig. 20 is pushed in, (1) the lock lever and the switch lever turn in the direction of arrow 1 to release the locking of the play button and S1 (power switch) is set to ON. (2) Reel base (reverse) is locked by the lock lever. (3) The fast forward/rewind switch lever turns in the direction of arrow 2 to turn the take-up release lever in the direction of arrow 3 to bring the FF idler gear 2 of take-up lever (forward) shown in Figs. 20, 21 away from reel base (reverse). Next, the inner gear of reel base (reverse) engages with the take-up gear ass'y and the unit enters the fast feed mode in the forward tape running direction.

2. Reverse direction
   When reel base (forward) shown in Fig. 20 is pushed in, (1) the lock lever and the switch lever turn in the direction of arrow 1 to release the locking of the play button and S1 (power switch) is set to ON. (2) Reel base (forward) is locked by the lock lever. (3) The fast forward/rewind switch lever shown in Fig. 22 turns in the direction of the arrow, so rewind idler gear 1 of the take-up lever (reverse) is brought away from rewind idler gear 2 shown in Fig. 19. (4) The inner gear of reel base (forward) engages with the rewind gear and the unit enters the fast feed mode in the reverse tape running direction.
5. Stop mode
When the stop button is pressed, the stop lever turns in the direction of the arrow to release the lock lever in the direction of the arrow to release. Locking the play button and the switch lever sets S1 to OFF. Since the locking of the play button is released, the head plate shown in Fig. 24 descends and the pressure roller moves away from the capstan. When the unit enters the play mode in the stop mode, the same play mode (forward or reverse) as before, the unit enters the stop mode. This is because the power assist gear mechanically maintains the tape running direction (forward or reverse) just before the unit enters the stop mode. When the cassette lid is opened, the projection F of the cassette holder ass'y presses the lock lever in the direction of arrow G to release locking and the unit enters the stop mode.

Fig. 24

ADJUSTMENT
Perform the following adjustments in the sequence stated after cleaning the head, pressure roller, and capstan with a head cleaning stick moistened in alcohol.

### LUBRICATION
Lubricate one or two drops of oil to rotating point or lubricate grease to sliding point. Lubricate the respective parts listed once every 1000 hours or once a year under normal conditions of use. Avoid oiling them excessively, or rotation may become irregular because of oil splashes.

### INSPECTION OF MECHANISM

<table>
<thead>
<tr>
<th>Item</th>
<th>Checking item</th>
<th>Reference value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pressure of pressure roller</td>
<td>160~240g</td>
<td>Note 1</td>
</tr>
<tr>
<td>2</td>
<td>Tape driving force</td>
<td>80g cm or more</td>
<td>Fig. 25</td>
</tr>
<tr>
<td>3</td>
<td>Take-up torque</td>
<td>30~60g cm</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Fast forward torque</td>
<td>55g cm or more</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Rewind torque</td>
<td>55g cm or more</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Back tension torque</td>
<td>Take-up</td>
<td>4g cm or less</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Supply</td>
<td>4g cm or less</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Play button</td>
<td>1.0kg or less</td>
</tr>
<tr>
<td>7</td>
<td>Button operation force</td>
<td>Fast forward button</td>
<td>0.6kg or less</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rewind button</td>
<td>0.6kg or less</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stop button</td>
<td>0.5kg or less</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>During play to stop</td>
</tr>
</tbody>
</table>

Note 1: 1. Adjust within 30 sec after heat-running for more than 20 minutes.
2. When the maximum values of both channels are different, adjust to the maximum value of the L channel. In this case, the difference between the maximum values of both channels should be within 2 dB.

Note 2: 1. Set this unit in the playback mode and press the pressure roller in the direction of the arrow using a fan type tension gauge, and measure the pressure when the pressure roller is released from the capstan.

Fig. 25