

# Service Manual

Cassette Deck

**RS-M225**  
(Silver Face)

Cassette Deck with Peak Hold FL Meters,

Auto Tape Selector and Music Selector

**DOLBY SYSTEM**



## RS-M24 MECHANISM SERIES

### Specifications

Track system:	4-track 2-channel stereo recording and playback	Outputs:	LINE; output level 400mV, output impedance 1.5kΩ or less load impedance 22kΩ over HEADPHONES; output level 80mV, load impedance 8Ω
Tape speed:	4.8 cm/s (1-7/8 ips.)	Bias frequency:	80kHz
Wow and flutter:	0.048% (WRMS)	Motor:	Electrical DC governor motor
Frequency response:	Metal tape; 20-18,000Hz CrO <sub>2</sub> tape; 20-18,000Hz Normal tape; 20-17,000Hz	Heads:	2-head system; 1-MX head for record/playback 1-double-gap ferrite head for erasure
Signal-to-noise ratio:	Dolby NR in; 67dB (above 5kHz) Dolby NR out; 57dB (signal level = max. recording level, CrO <sub>2</sub> type tape)	Power requirement:	AC; 120V, 50-60Hz
Fast forward and rewind time:	Approx. 90 seconds with C-60 cassette tape	Power consumption:	28W
Inputs:	MIC; sensitivity 0.25mV, input impedance 70kΩ applicable microphone impedance 400Ω-10kΩ LINE; sensitivity 60mV, input impedance 40kΩ	Dimensions:	43.0cm(W) × 11.9cm(H) × 24.6cm(D) [16-7/8"(W) × 4-11/16"(H) × 9-11/16"(D)]
		Weight:	4.3kg (9lbs. 8oz)

Specifications are subject to change without notice.

\* 'Dolby' and the double-D symbol are trademarks of Dolby Laboratories.

# Technics

**Panasonic Company**  
Division of Matsushita Electric  
Corporation of America  
One Panasonic Way, Secaucus,  
New Jersey 07094

**Panasonic Hawaii, Inc.**  
320 Waikamilo Road, Honolulu,  
Hawaii 96817

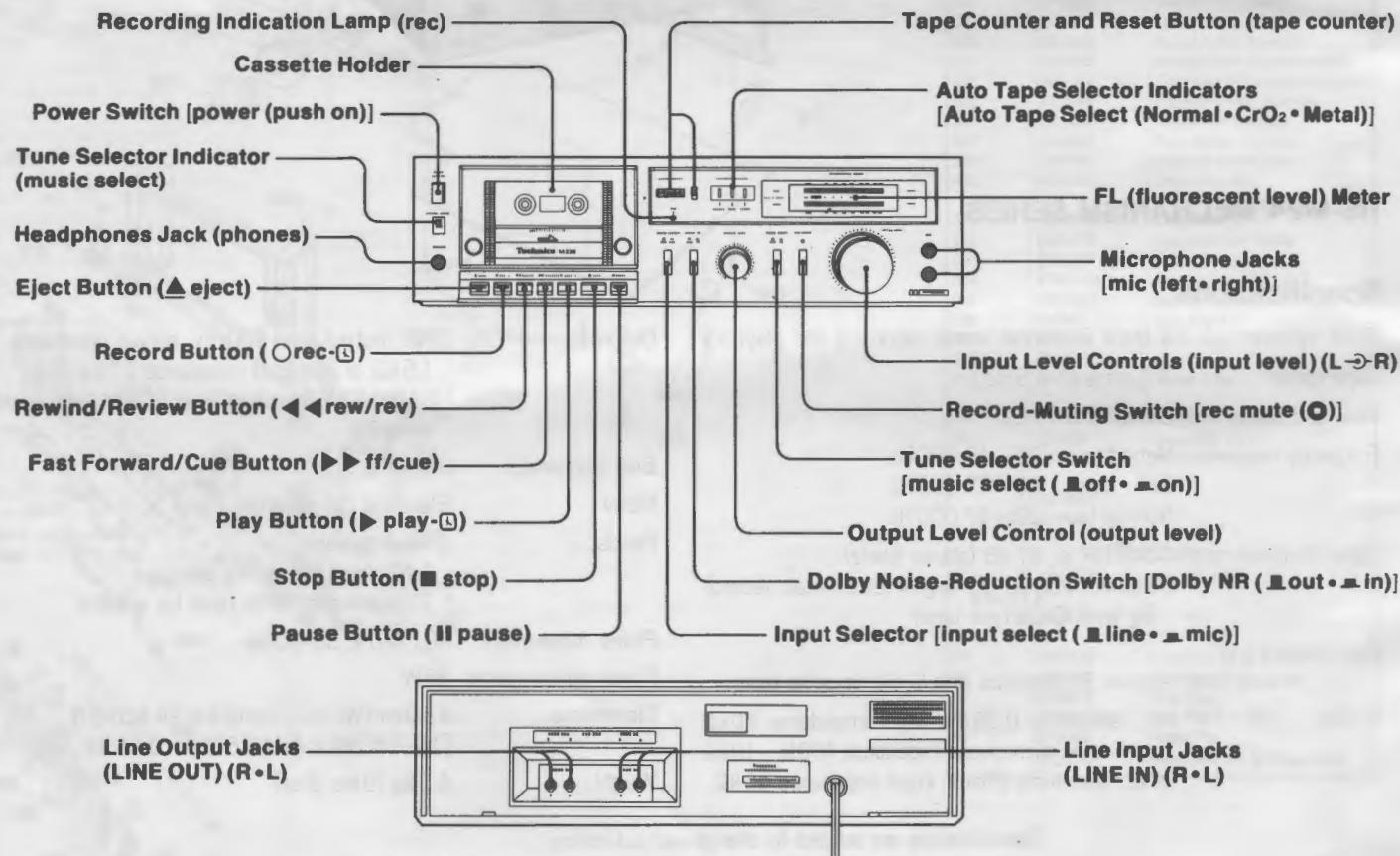
**Panasonic Canada**  
Division of Matsushita Electric  
of Canada Limited  
5770 Ambler Drive, Mississauga,  
Ontario, L4W 2T3

**Panasonic Sales Company,**  
Division of Matsushita Electric  
of Puerto Rico, Inc.  
Ave. 65 De Infanteria, KM 9.7  
Victoria Industrial Park  
Carolina, Puerto Rico 00630

## CONTENTS

ITEM	PAGE
LOCATION OF CONTROLS AND COMPONENTS .....	1
DISASSEMBLY INSTRUCTIONS .....	2
EXPLANATION OF AUTO TAPE SELECTOR .....	3
EXPLANATION OF MUSIC SELECTOR .....	3
MEASUREMENT AND ADJUSTMENT METHODS .....	4
HOW TO REPAIR PRINTED RESISTORS .....	8
ELECTRICAL PARTS LOCATION .....	8
SCHEMATIC DIAGRAM .....	9
CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM .....	10
MECHANISM PARTS LOCATION .....	11
CABINET PARTS LOCATION .....	11

## LOCATION OF CONTROLS AND COMPONENTS



# DISASSEMBLY INSTRUCTIONS

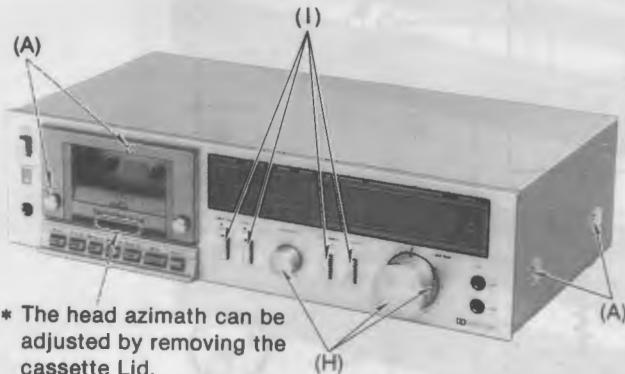


Fig. 1

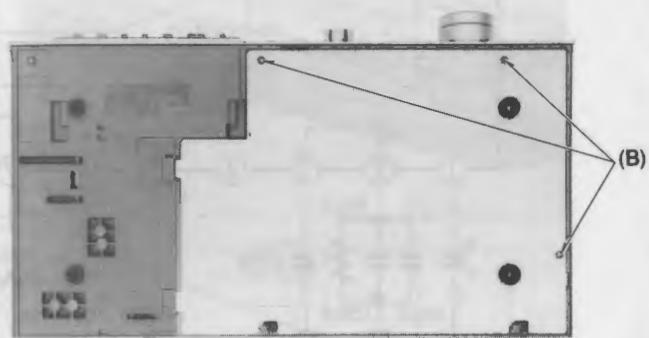


Fig. 2

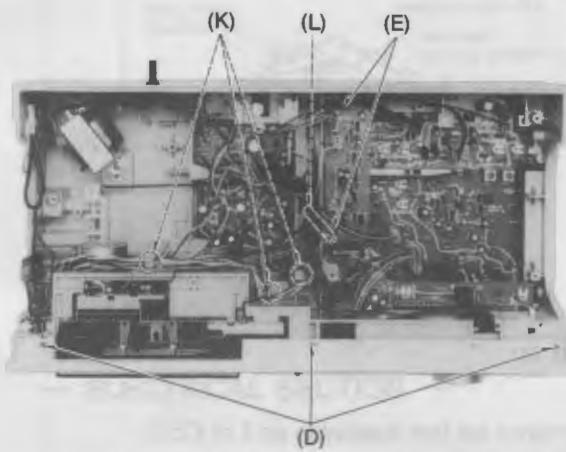


Fig. 3

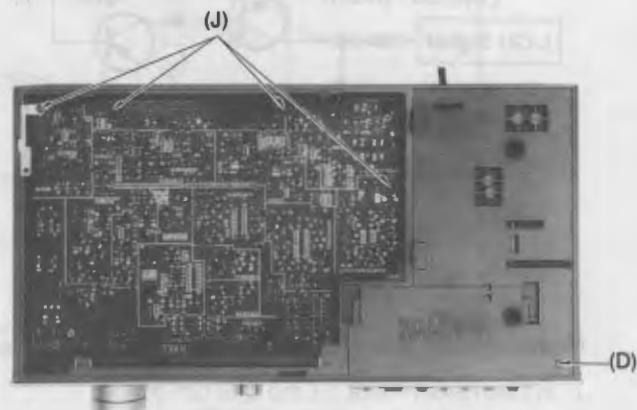


Fig. 4

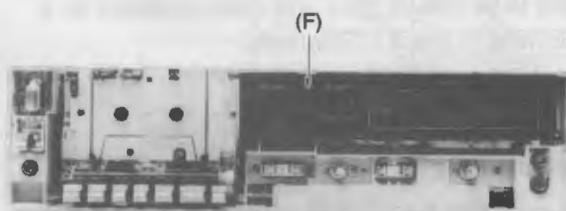


Fig. 5

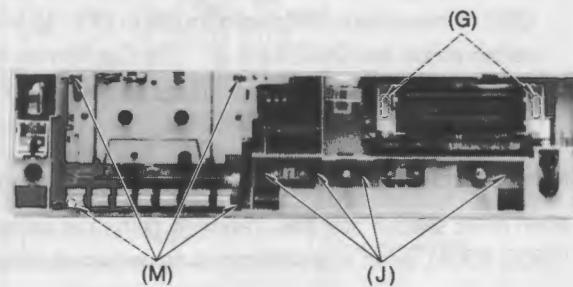


Fig. 6

## EXPLANATION OF AUTO TAPE SELECTOR

## — MECHANICAL SECTION —

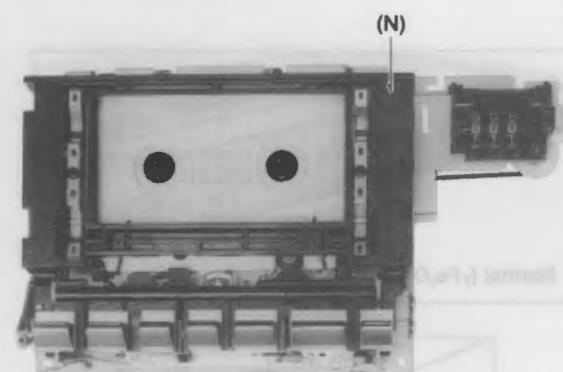


Fig. 7

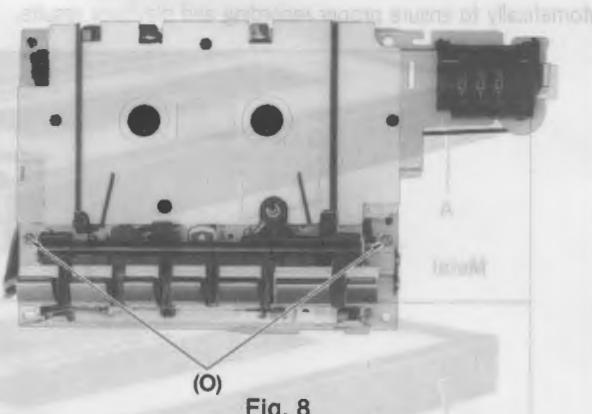


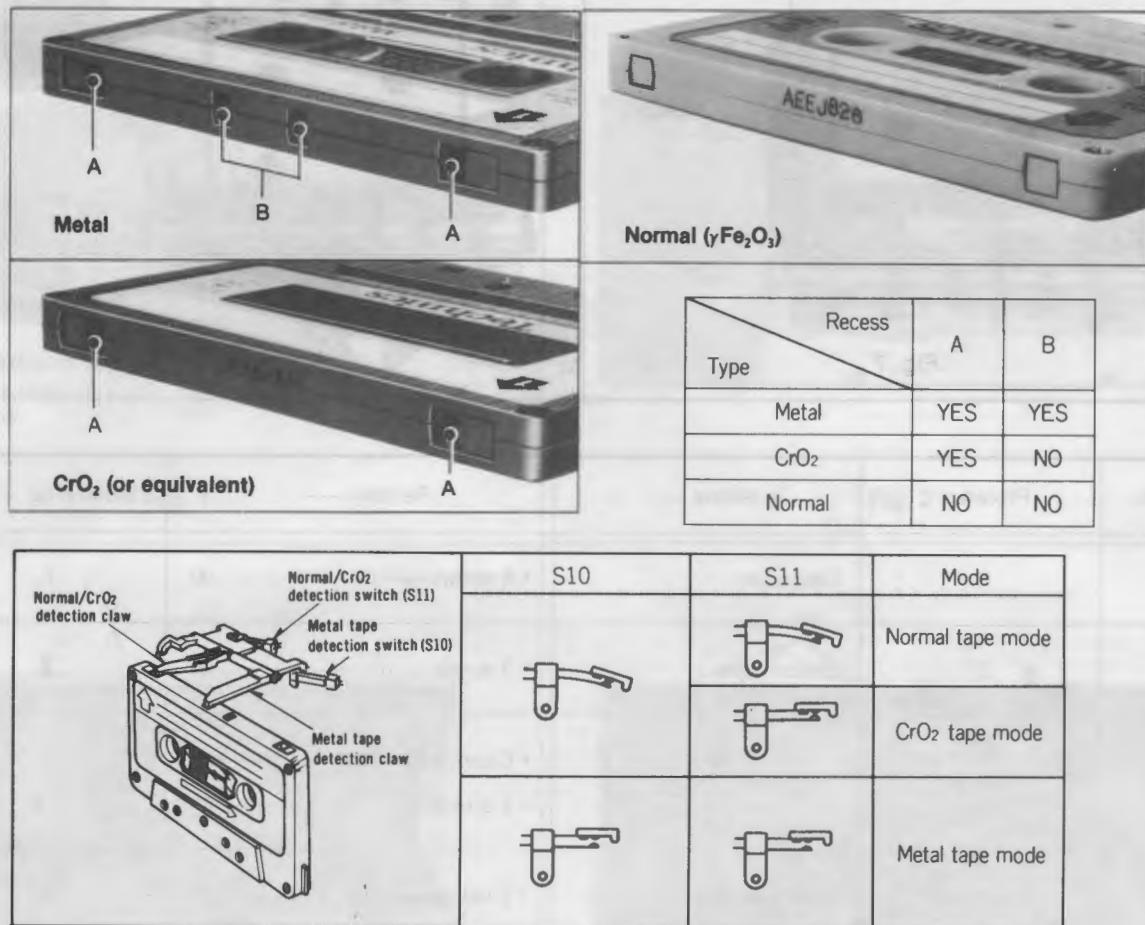
Fig. 8

Ref. No.	Procedure	To remove —— .	Remove —— .	Shown in fig. —— .
1	1	Case cover	• 4 screws ..... (A)	1
2	2	Bottom cover	• 3 screws ..... (B)	2
3	1→2→3	Front panel	• Cassette lid ..... (C) • 4 screws ..... (D)	1 3, 4
4	1→2→4	Music selector circuit board	• 2 red screws ..... (E)	3
5	1→2→3→5	FL meter	• Meter cover ..... (F) • 2 holders ..... (G)	5 6
6	1→2→3→6	Main circuit board	• 3 volume knobs ..... (H) • 4 push buttons ..... (I) • 8 red screws ..... (J) • 3 clampers ..... (K) • Binder ..... (L)	1 1 4, 6 3 3
7	1→2→3→7	Mechanism unit	• 4 red screws ..... (M)	6
8	1→2→3→6→8	Operation button unit	• Cassette holder ..... (N) • 2 screws ..... (O)	7 8

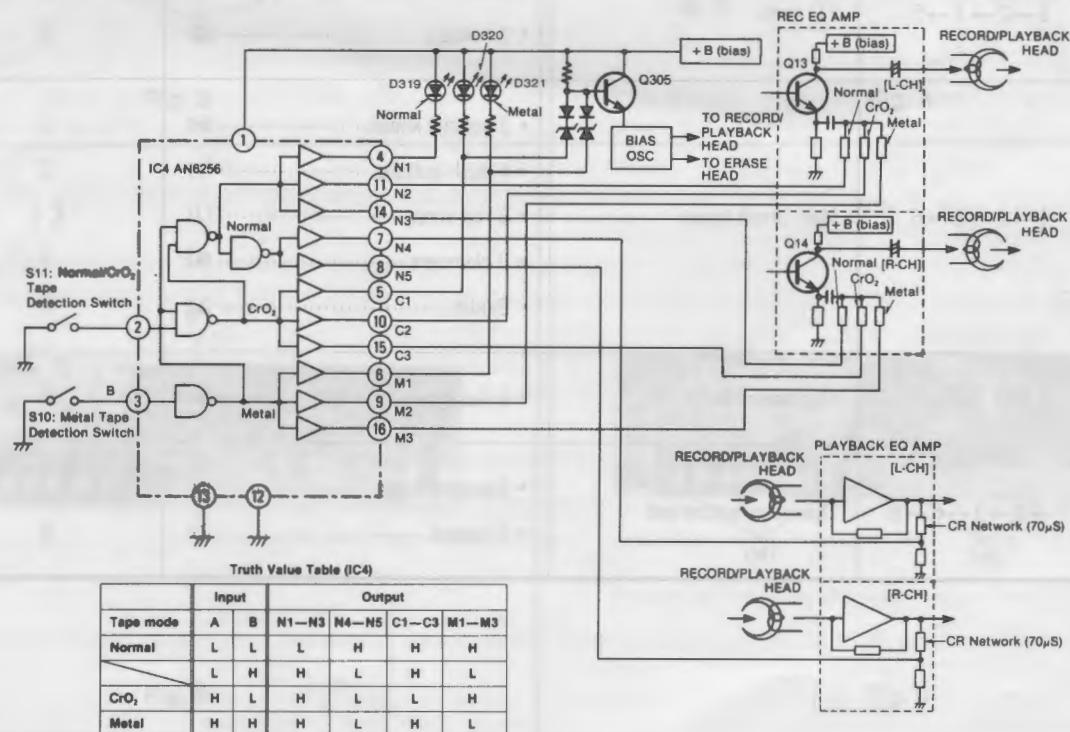
## EXPLANATION OF AUTO TAPE SELECTOR

## — MECHANICAL SECTION —

This unit is equipped with an auto-tape selector system that detects these identification recesses and automatically selects the correct bias and equalization for normal, CrO<sub>2</sub> and metal tape varieties. Thus, the novice user can obtain the correct tape selector setting automatically to ensure proper recording and playback results.



## — ELECTRICAL SECTION —



# MEASUREMENT AND ADJUSTMENT METHODS

## Tape Selector (Tape Mode Switching)

For measurement adjustment with test tapes without tape detection holes (A and B), switch tape modes as follows.

(For normal tape mode, just insert a normal tape into the cassette holder.)

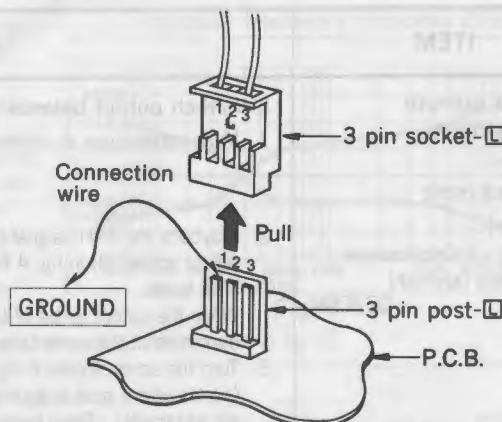
### \* Metal tape mode setting:

Metal tape mode is obtained by disconnecting the 3 pin socket  from the 3 pin post  on the P.C.B. (Printed Circuit Board).

### \* CrO<sub>2</sub> tape mode setting:

First, disconnect the 3 pin socket  in the same way as above.

Then, as illustrated in the figure right, connect the terminal-1 of the 3 pin post to the ground with a connection wire.



## ADJUSTMENT PARTS LOCATION

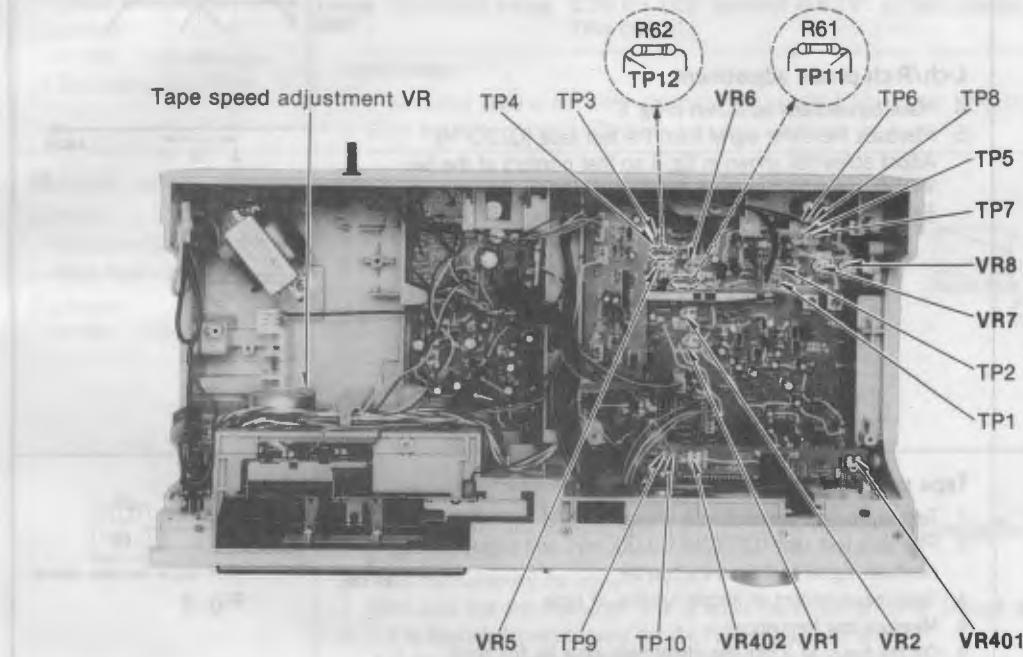


Fig. 1

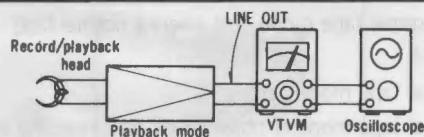
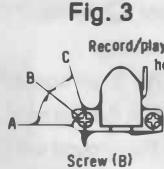
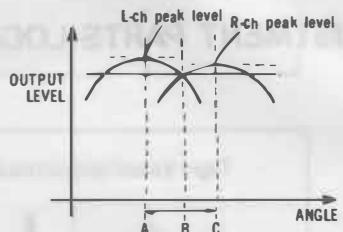
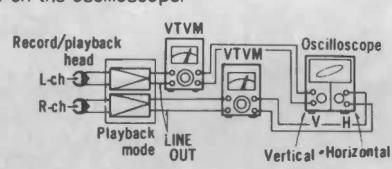
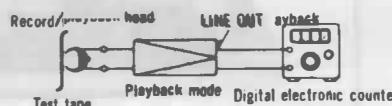
NOTES: Keep good condition, set switches and controls in the following positions, unless otherwise specified.

- Make sure heads are clean.
- Make sure capstan and pressure roller are clean.
- Judgeable room temperature:  $20 \pm 5^\circ\text{C}$  ( $68 \pm 9^\circ\text{F}$ )
- Dolby NR switch: OUT

- Input selector: Line in
- Input level controls: Maximum
- Output level control: Maximum

ITEM	MEASUREMENT & ADJUSTMENT
<b>A Head position adjustment</b> Condition: • Playback and pause mode	<p>(The head adjusting plate is provided to adjust the tape touch of the head in cue or review mode.)</p> <ol style="list-style-type: none"> <li>1 Press the playback button and pause button.</li> <li>2 Measure the space between the pressure roller and the capstan.</li> </ol> <p><b>Standard value: <math>0.5 \pm 0.3\text{mm}</math></b></p> <ol style="list-style-type: none"> <li>3 If the measured value is not within the standard value, untighten screw (A), and slide the head adjusting plate in the direction of arrow (B) for adjustment.</li> </ol>

Fig. 2

ITEM	MEASUREMENT & ADJUSTMENT
<p><b>B Head azimuth adjustment</b></p> <p>Condition:</p> <ul style="list-style-type: none"> <li>• Playback mode</li> </ul> <p>Equipment:</p> <ul style="list-style-type: none"> <li>• VTVM</li> <li>• Oscilloscope</li> <li>• Test tape (azimuth)</li> <li>... QZZCFM</li> </ul>	<p><b>L-ch/R-ch output balance adjustment</b></p> <ol style="list-style-type: none"> <li>1. Make connections as shown in fig. 3.</li> <li>2. Playback the 8kHz signal from the test tape (QZZCFM). Adjust screw (B) in fig. 4 for maximum output L-ch and R-ch levels. When the output levels of L-ch and R-ch are not at maximum at the same time, readjust as follows.</li> <li>3. Turn the screw shown in fig. 4 to find angles A and C (points where peak output levels for left and right channels are obtained). Then, locate the angle B between angles A and C, i.e., a point where L-ch and R-ch output levels come together at maximum. (Refer to figs. 4 and 5.)</li> </ol> <p><b>L-ch/R-ch phase adjustment</b></p> <ol style="list-style-type: none"> <li>4. Make connections as shown in fig. 6.</li> <li>5. Playback the 8kHz signal from the test tape (QZZCFM). Adjust screw (B) shown in fig. 4 so that pointers of the two VTVMs swing to maximum and a waveform as illustrated in fig. 7 is obtained on the oscilloscope.</li> </ol>      <p><b>Fig. 3</b></p> <p><b>Fig. 4</b></p> <p><b>Fig. 5</b></p> <p><b>Fig. 6</b></p> <p><b>Fig. 7</b></p>
<p><b>C Tape speed</b></p> <p>Condition:</p> <ul style="list-style-type: none"> <li>• Playback mode</li> </ul> <p>Equipment:</p> <ul style="list-style-type: none"> <li>• Digital electronic counter or frequency counter</li> <li>• Test tape ... QZZCWAT</li> </ul>	<p><b>Tape speed accuracy</b></p> <ol style="list-style-type: none"> <li>1. Test equipment connection is shown in fig. 8.</li> <li>2. Playback test tape (QZZCWAT 3.000Hz), and supply playback signal to frequency counter.</li> <li>3. Take measurement at middle section of tape.</li> <li>4. Measure this frequency.</li> <li>5. On the basis of 3.000Hz, determine value by following formula:</li> </ol> $\text{Tape speed accuracy} = \frac{f - 3.000}{3.000} \times 100 (\%) \quad \text{where, } f = \text{measured value}$ <div style="border: 1px solid black; padding: 2px; text-align: center;"> <b>Standard value: <math>\pm 1.5\%</math></b> </div> <p><b>Adjustment method</b></p> <ol style="list-style-type: none"> <li>1. Playback the test tape (middle)</li> <li>2. Adjust so that frequency becomes 3.000Hz.</li> <li>3. Tape speed adjustment VR shown in fig. 1.</li> </ol> <p><b>Tape speed fluctuation</b></p> <p>Make measurements in same manner as above (beginning, middle and end of tape), and determine the difference between maximum and minimum values and calculate as follows:</p> $\text{Tape speed fluctuation} = \frac{f_1 - f_2}{3,000} \times 100 (\%) \quad f_1 = \text{maximum value, } f_2 = \text{minimum value}$ <div style="border: 1px solid black; padding: 2px; text-align: center;"> <b>Standard value: Less than 1%</b> </div> <p><b>Note:</b> Please use non metal type screwdriver when you adjust tape speed on this unit.</p>  <p><b>Fig. 8</b></p>

ITEM	MEASUREMENT & ADJUSTMENT
<p><b>D</b> Playback frequency response</p> <p>Condition:</p> <ul style="list-style-type: none"> <li>• Playback mode</li> <li>• Normal tape mode</li> <li>• Output level control ... MAX</li> </ul> <p>Equipment:</p> <ul style="list-style-type: none"> <li>• VTVM</li> <li>• Oscilloscope</li> <li>• Test tape ... QZZCFM</li> </ul>	<ol style="list-style-type: none"> <li>1. Test equipment connection is shown in fig. 3.</li> <li>2. Place UNIT into Normal tape mode.</li> <li>3. Playback the frequency response test tape (QZZCFM).</li> <li>4. Measure output level at 315Hz, 12.5kHz, 8kHz, 4kHz, 1kHz, 250Hz, 125Hz and 63Hz, and compare each output level with the standard frequency 315Hz, at LINE OUT.</li> <li>5. Make measurement for both channels.</li> <li>6. Make sure that the measured value is within the range specified in the frequency response chart (shown in fig. 9).</li> </ol> <p style="text-align: center;"><b>Playback frequency response chart</b></p> <p style="text-align: center;"><b>Fig. 9</b></p>
<p><b>E</b> Playback gain</p> <p>Condition:</p> <ul style="list-style-type: none"> <li>• Playback mode</li> <li>• Normal tape mode</li> <li>• Output level control ... MAX</li> </ul> <p>Equipment:</p> <ul style="list-style-type: none"> <li>• VTVM</li> <li>• Oscilloscope</li> <li>• Test tape ... QZZCFM</li> </ul>	<ol style="list-style-type: none"> <li>1. Test equipment connection is shown in fig. 3.</li> <li>2. Playback standard recording level portion on test tape (QZZCFM 315Hz, 0V), and using VTVM measure the output level at LINE OUT.</li> <li>3. Make measurement for both channels.</li> </ol> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>Standard value: <math>0.38V \pm 1dB</math> [around <math>0.42V</math>: at test points TP3 (L-CH) and TP4 (R-CH)]</b> </div> <p><b>Adjustment</b></p> <ol style="list-style-type: none"> <li>1. If measured value is not within standard, adjust VR1 (L-CH), VR2 (R-CH) (See fig. 1 on page 3).</li> <li>2. After adjustment, check "Playback frequency response" again.</li> </ol>
<p><b>F</b> Erase current</p> <p>Condition:</p> <ul style="list-style-type: none"> <li>• Record mode</li> <li>• Metal tape mode</li> </ul> <p>Equipment:</p> <ul style="list-style-type: none"> <li>• VTVM</li> <li>• Oscilloscope</li> </ul>	<ol style="list-style-type: none"> <li>1. Test equipment connection is shown in fig. 10.</li> <li>2. Place UNIT into Metal tape mode.</li> <li>3. Press the record and pause buttons.</li> <li>4. Read voltage on VTVM and calculate erase current by following formula:</li> </ol> <div style="text-align: center;"> <math display="block">\text{Erase current (A)} = \frac{\text{Voltage across both ends of R301}}{1 (\Omega)}</math> </div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>Standard value: <math>155 \pm 15mA</math> (Metal position)</b> </div> <ol style="list-style-type: none"> <li>5. If measured value is not within standard, adjust as follows.</li> </ol> <p><b>Adjustment</b></p> <ol style="list-style-type: none"> <li>1. Open the point (A) and short the point (B) on the main circuit board in the circuit board diagram (See page 10).</li> <li>2. Make measurement for erase current.</li> <li>3. Make sure that the measured value is within the erase current of 140mA to 170mA.</li> <li>4. If it is beyond the value, carry out the following adjustments: <ul style="list-style-type: none"> <li>• If the erase current is less than 140mA, short the point (A).</li> <li>• If the erase current is more than 170mA, open the points (A) and (B).</li> </ul> </li> </ol>
<p><b>G</b> Overall frequency response</p> <p>Condition:</p> <ul style="list-style-type: none"> <li>• Record/playback mode</li> <li>• Normal tape mode</li> <li>• CrO<sub>2</sub> tape mode</li> <li>• Metal tape mode</li> <li>• Input level controls ... MAX</li> <li>• Output level control ... MAX</li> </ul>	<p><b>Note 1:</b> Before measuring and adjusting, make sure of the playback frequency response (For the method of measurement, please refer to the playback frequency response).</p> <p><b>Note 2:</b> Test tape QZZCRA to be supplied after July 1980 has higher recording sensitivity in the middle and high frequency range.</p> <p style="text-align: center;"><b>Overall frequency response chart (Normal)</b></p> <p style="text-align: center;">Refer to note 2</p> <p style="text-align: center;">Former type tape      New type tape</p> <p style="text-align: center;">50 Hz 100 Hz 200 Hz 500 Hz 1 kHz 2 kHz 4 kHz 8 kHz 10 kHz</p> <p style="text-align: center;"><b>Fig. 11</b></p> <p style="text-align: center;">•  This chart indicates the standard values for the new type of QZZCRA when in use.</p> <p style="text-align: center;">•  This chart indicates the standard values for the former type of QZZCRA when in use.</p> <p>The new type of QZZCRA is marked as shown in fig. 12.</p>

## ITEM

- Equipment:
- VTVM • AF oscillator
  - ATT • Oscilloscope
  - Resistor (600Ω)
  - Test tape (reference blank tape)
    - ... QZZCRA for Normal
    - ... QZZCRX for CrO<sub>2</sub>
    - ... QZZCRZ for Metal

## MEASUREMENT &amp; ADJUSTMENT



Fig. 12

## Overall frequency response adjustment by recording bias current

(Recording equalizer is fixed.)

1. Make connections as shown in fig. 13.
  2. Place UNIT into normal tape mode and load the test tape (QZZCRA).
  3. Input a 1kHz, -24 dB signal through LINE IN. Place the set in record mode.
  4. Fine adjust the attenuator to obtain 0.4 V LINE OUT output.
    - Make sure that the input signal level is  $-24 \pm 4$  dB with 0.4 V output voltage.
  5. Adjust the attenuator to reduce the input signal level by 20 dB.
  6. Adjust the AF oscillator to generate 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz and 10kHz signals, and record these signals on the test tape.
  7. Playback the signals recorded in step 6, and check if the frequency response curve is within the limits shown in the overall frequency response chart for normal tapes (fig. 11).
- (If the curve is within the charted specifications, proceed to steps 8, 9, 10 and 11.)  
 If the curve is not within the charted specifications, adjust as follows:

## Adjustment ①:

When the curve exceeds the overall frequency response chart specifications (fig. 11) as shown in fig. 14.

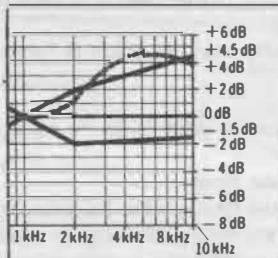


Fig. 14

- 1) Increase bias current by turning VR7 (L-CH) and VR8 (R-CH). (See fig. 1 on page 3.)
- 2) Repeat steps 6 and 7 to confirm. (Proceed to steps 8, 9 and 10 if the curve is now within the charted specifications in fig. 11.)
- 3) If the curve still exceeds the specifications (fig. 11), increase bias current further and repeat steps 6 and 7.
8. Place UNIT into CrO<sub>2</sub> tape mode.
9. Change test tape to QZZCRX, and record 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz, 10kHz and 12.5kHz signals. Then, playback the signals and check if the curve is within the limits shown in the overall frequency response chart for CrO<sub>2</sub> tapes (fig. 16).

## Adjustment ②:

When the curve falls below the overall frequency response chart specifications (fig. 11) as shown in fig. 15.

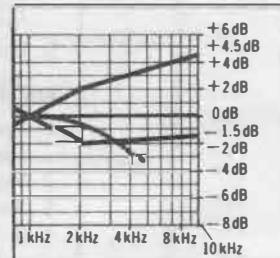


Fig. 15

- 1) Reduce bias current by turning VR7 (L-CH) and VR8 (R-CH).
- 2) Repeat steps 6 and 7 to confirm. (Proceed to steps 8, 9 and 10 if the curve is now within the charted specifications in fig. 11.)
- 3) If the curve still falls below the charted specifications (fig. 11), reduce bias current further and repeat steps 6 and 7.

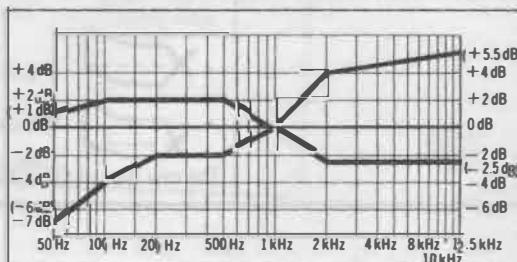
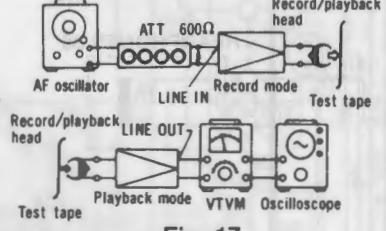
Overall frequency response chart (CrO<sub>2</sub>, Metal)

Fig. 16

ITEM	MEASUREMENT & ADJUSTMENT
	<p>10. Place UNIT into Metal tape mode change test tape to QZZCRZ, and record 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz, 10kHz and 12.5kHz signals. Then, playback the signals and check if the curve is within the limits shown in the overall frequency response chart for metal tapes (fig. 16).</p> <p>11. Confirm that bias currents are approximately as follows when the UNIT is set at different tape mode.</p> <ul style="list-style-type: none"> <li>• Read voltage on VTVM and calculate bias current by following formula:</li> </ul> $\text{Bias current (A)} = \frac{\text{Value read on VTVM (V)}}{10 (\Omega)}$ <div style="border: 1px solid black; padding: 5px; margin-left: 20px;">       around <math>410\mu\text{A}</math> (Normal position)        around <math>545\mu\text{A}</math> (CrO<sub>2</sub> position)        around <math>800\mu\text{A}</math> (Metal position)     </div> <p>} measured at TP1 (L-CH) and TP2 (R-CH)</p>
① Overall gain	<p>Condition:</p> <ul style="list-style-type: none"> <li>• Record/playback mode</li> <li>• Normal tape mode</li> <li>• Input level controls ... MAX</li> <li>• Output level control ... MAX</li> <li>• Standard input level: MIC ..... <math>-72 \pm 4</math> dB LINE IN ... <math>-24 \pm 4</math> dB</li> </ul> <p>Equipment:</p> <ul style="list-style-type: none"> <li>• VTVM • AF oscillator</li> <li>• ATT • Oscilloscope</li> <li>• Resistor (600Ω)</li> <li>• Test tape (reference blank tape) ... QZZCRA for Normal</li> </ul> <p>1. Test equipment connection is shown in fig. 17.</p> <p>2. Place UNIT into Normal tape mode, and load the test tape (QZZCRA).</p> <p>3. Place UNIT into record mode.</p> <p>4. Supply 1kHz signal (-24dB) from AF oscillator, through ATT to LINE IN.</p> <p>5. Adjust ATT until monitor level at LINE OUT becomes 0.4V.</p> <p>6. Playback recorded tape, and make sure the value at LINE OUT on VTVM becomes 0.4V.</p> <p>7. If measured value is not 0.4V, adjust VR5 (L-CH), VR6 (R-CH) (See fig. 1 on page 4).</p> <p>8. Repeat from step (2).</p>
	 <p>Fig. 17</p>
② Fluorescent meter	<p>Condition:</p> <ul style="list-style-type: none"> <li>• Record mode</li> <li>• Input level controls ... MAX</li> <li>• Tape selector</li> <li>... Normal position</li> </ul> <p>Equipment:</p> <ul style="list-style-type: none"> <li>• VTVM • AF oscillator</li> <li>• ATT • Resistor (600Ω)</li> </ul> <p>1. Test equipment connection is shown in fig. 17.</p> <p>2. As shown in fig. 18, connecting the collector of Q403 and ground stops the oscillation of the astable multivibrator comprising Q402 and Q403.</p> <p>3. Supply 1kHz signal (-24dB) to the LINE IN then press the record button.</p> <p>4. Adjust the ATT so that the output level at LINE OUT becomes 0.4V (The input level at this condition is termed the standard input level).</p> <p>5. Adjustment at "-20dB":</p> <ol style="list-style-type: none"> <li>Adjust the ATT so that the input level is -20dB below standard recording level.</li> <li>Adjust VR401 so that the -20dB segment lights up in the <math>-20 \pm 0.8</math> dB range (L-CH only) (See fig. 19).</li> </ol> <p>6. Adjustment at "0dB":</p> <ol style="list-style-type: none"> <li>Adjust the ATT so that the output level at LINE OUT becomes 0.4V. (The input level at this condition is termed the standard input level.)</li> <li>Adjust VR402 so that the +1dB segment lights up in the <math>0 \pm 0.2</math> dB range of the standard input level (See fig. 20).</li> </ol> <p>7. Repeat twice between steps (5) and (6) above.</p> <p>8. Adjust ATT and check that all segments lights up when an input signal level is increased to 10dB higher than the standard input level (See fig. 21).</p>
③ Dolby NR circuit	<p>Condition:</p> <ul style="list-style-type: none"> <li>• Record mode</li> <li>• Dolby NR switch ... IN/OUT</li> <li>• Input level controls ... MAX</li> <li>• Output level control ... MAX</li> </ul> <p>Equipment:</p> <ul style="list-style-type: none"> <li>• VTVM • AF oscillator</li> <li>• ATT • Oscilloscope</li> <li>• Resistor (600Ω)</li> </ul> <p>1. Test equipment connection is shown in fig. 22.</p> <p>2. Place UNIT into record mode, set the Dolby NR switch to OUT position and supply to LINE IN to obtain -34.5dB at TP11 (L-CH), TP12 (R-CH) (frequency 5kHz).</p> <p>3. Confirm that the value at IN position is <math>8 (\pm 2.5)</math> dB greater than the value at OUT position of Dolby NR switch.</p>

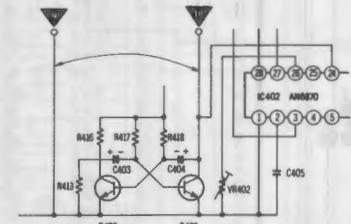


Fig. 18

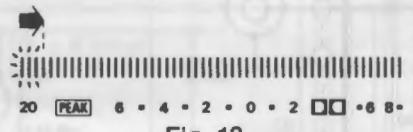


Fig. 19



Fig. 20

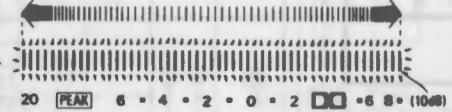


Fig. 21

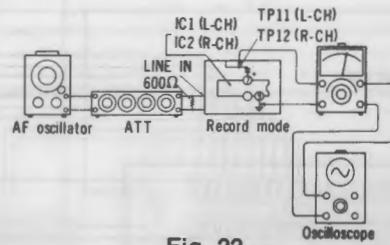
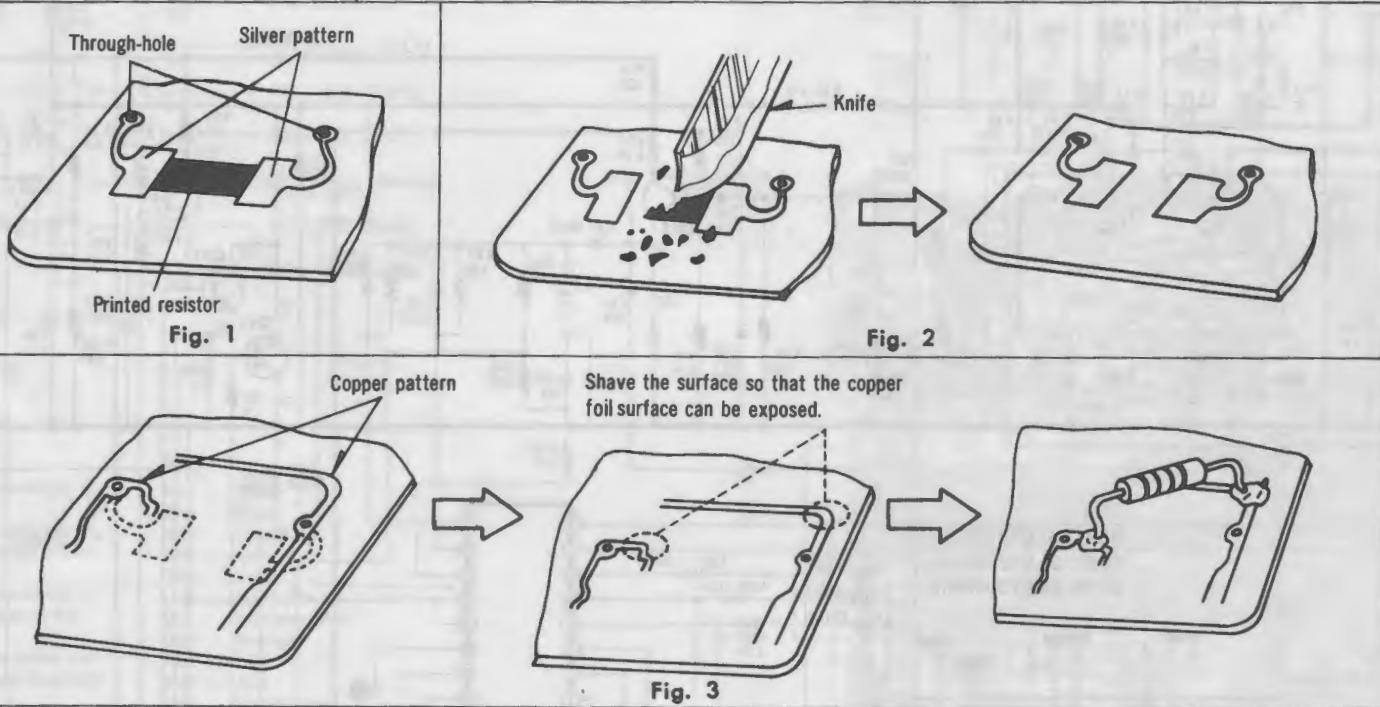


Fig. 22

# HOW TO REPAIR PRINTED RESISTORS

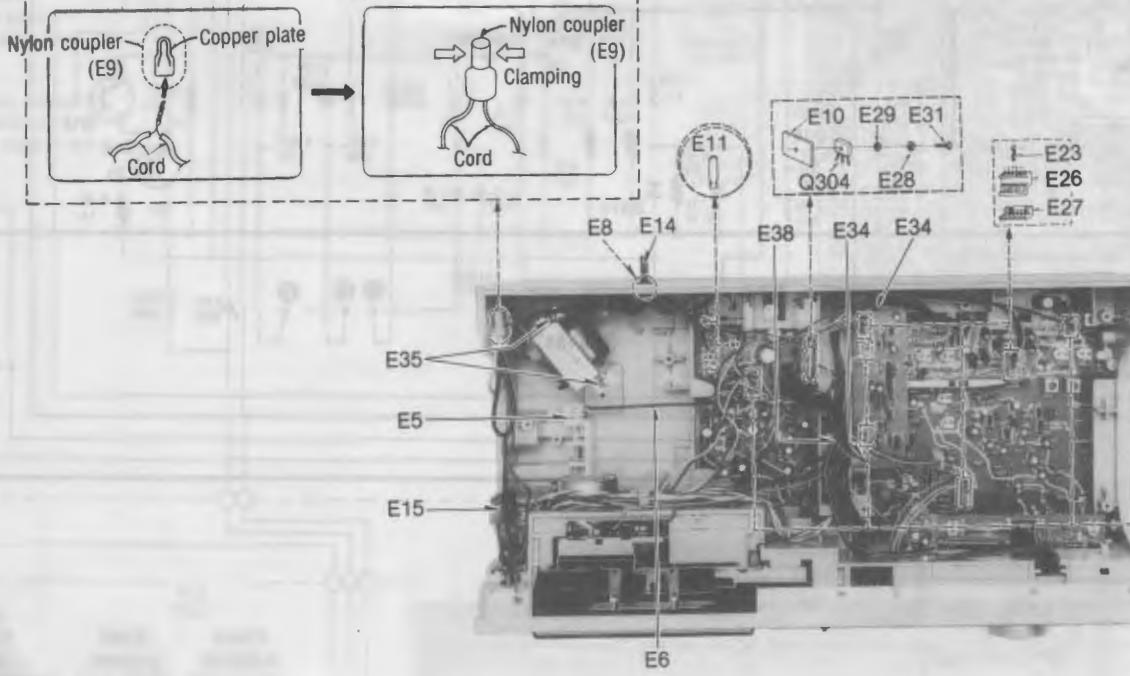
- The printed resistor is located on the printed circuit board as illustrated in Fig. 1.  
(The through-holes are the points that connect the silver pattern and the pattern on the rear of the printed circuit board.)
  - Repair the printed resistor, when disconnected, in the following procedure:
    1. Using a pointed screwdriver or knife, completely scrape the printed resistor as illustrated in Fig. 2, and remove its shavings.
    2. Turning the printed circuit board over as shown in Fig. 3, scrape the copper pattern surface near the through-holes until the copper foil surface can be exposed.
    3. Solder the carbon resistor, whose resistance value is identical to the removed printed resistor, to the exposed copper foil surface.  
(Refer to the schematic diagram of the Service Manual for the resistance values of printed resistors.)

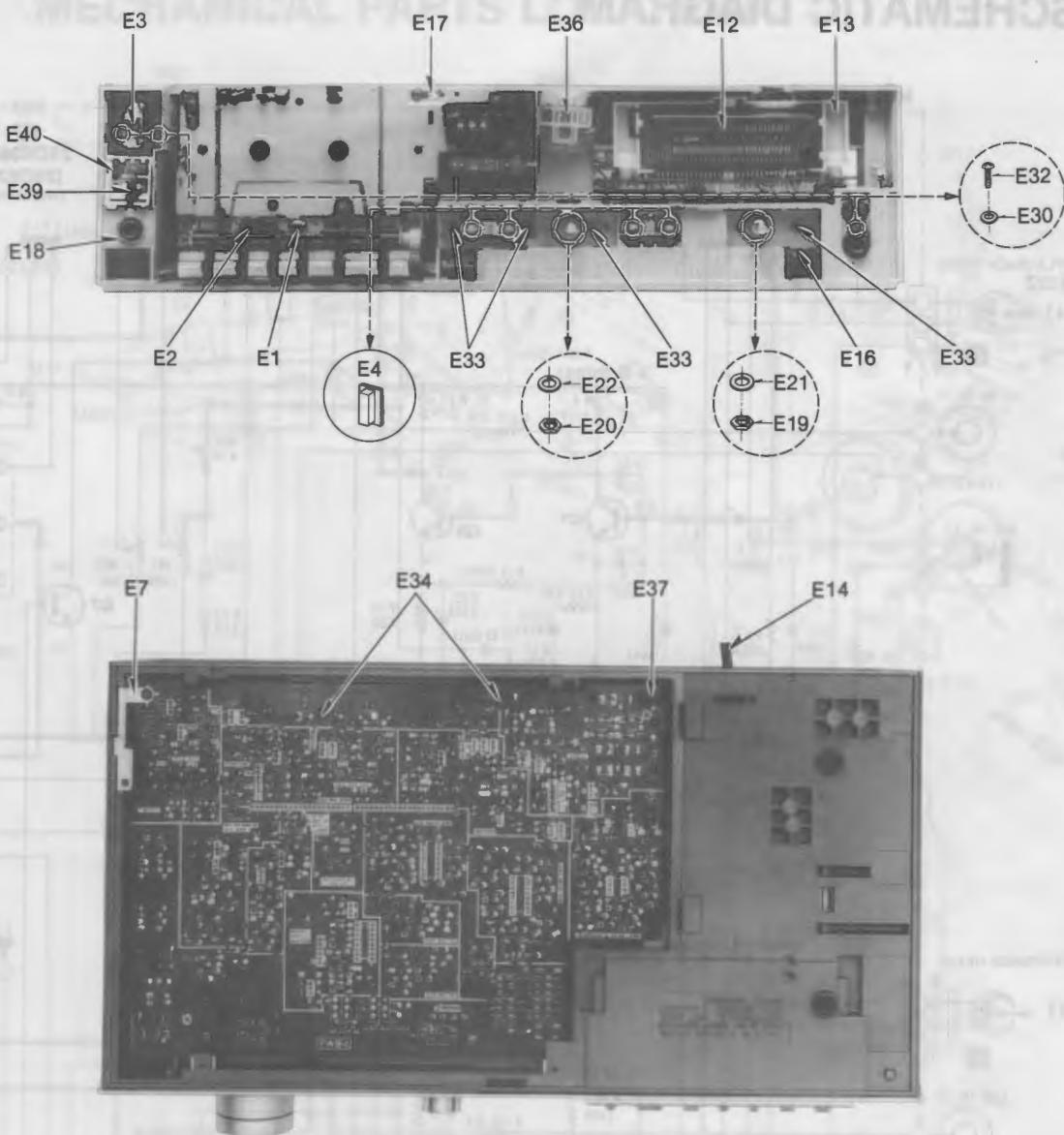
(Refer to the schematic diagram of the Service Manual for the resistance values of printed resistors.)



# ELECTRICAL PARTS LOCATION

**Note:** Cord connection using this nylon coupler (E9) requires a special tool.





### REPLACEMENT PARTS LIST

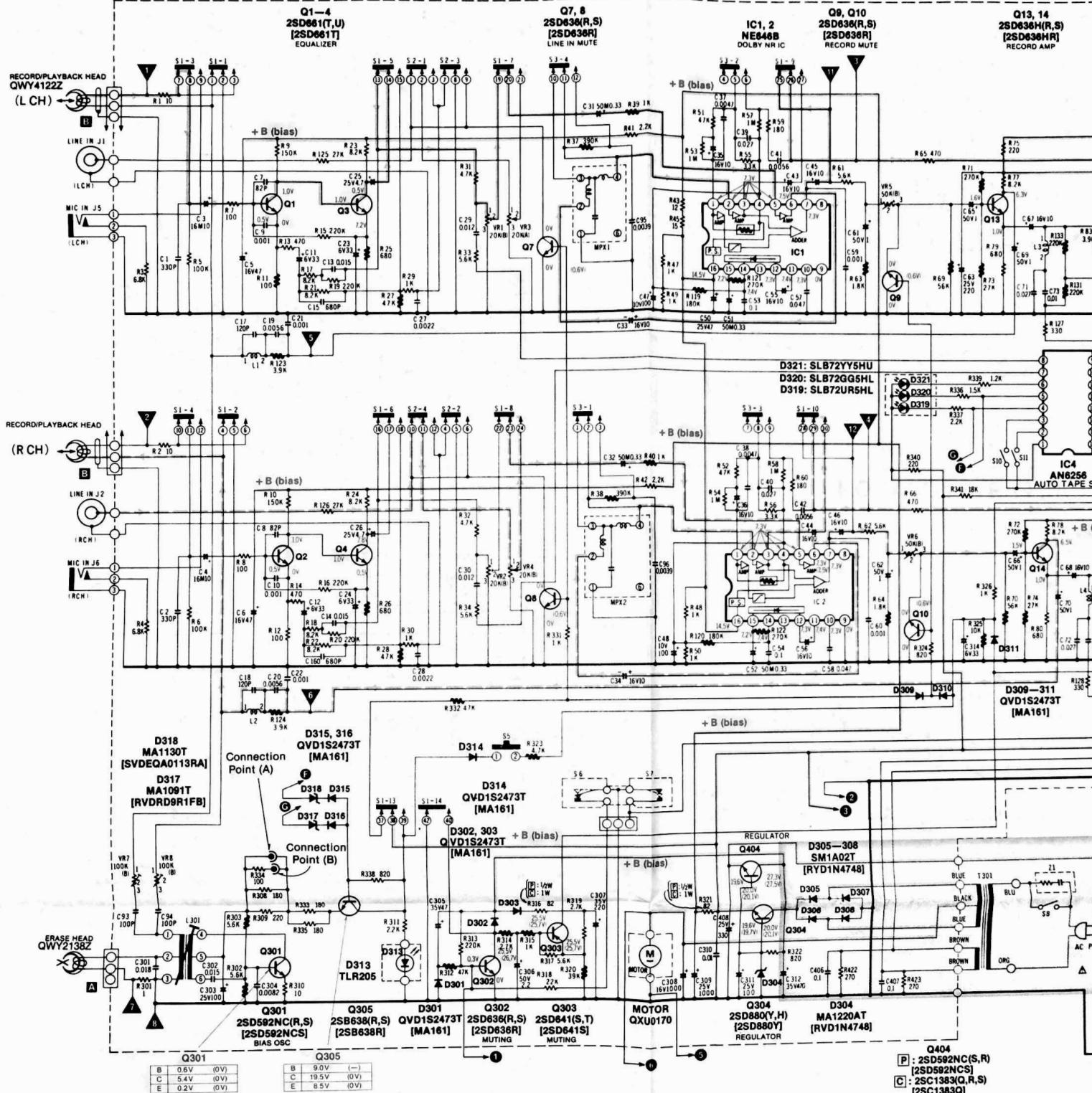
#### Important safety notice

Components identified by  $\Delta$  mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
<b>ELECTRICAL PARTS</b>					
E1	QWY41222	Record/Playback Head	E19	QNQ1039	Nut 9 $\phi$
E2	QWY2138Z	Erase Head	E20	QNQ1004	Nut 8 $\phi$
E3	QGO1872	Push Button (Power ON/OFF)	E21	QWQ1133	Washer 9 $\phi$
E4	QGO1727	Push Button (Input Select/Dolby NR/Rec Mute/Music Selector)	E22	QWQ2002	Washer 8 $\phi$
E5	QML3664	Recording Lever	E23	QJT1054	Contact
E6	QBS1130	Recording Wire	E24	QJS1921TN	3 Pin Socket
E7	QJC0034	Earth Plate	E25	QJP1921TN	3 Pin Post
E8	QTD1129	Cord Bushing	E26	QJS1922TN	6 Pin Socket
E9	$\Delta$ QJT1029	Nylon Coupler	E27	QJP1922TN	6 Pin Post
E10	QTH1156	Heat Sink (for Q304)	E28	XWA26B	Washer 2.6 $\phi$
			E29	XWG26	"
			E30	XWA3B	Washer 3 $\phi$
E11	QJT1041	Check Pin	E31	XSN26+8	Screw $\oplus$ 2.6 $\times$ 8
E12	QSF1L001F	FL Meter	E32	XSN3+8S	Screw $\oplus$ 3 $\times$ 8
E13	QKJ0406	Meter Holder	E33	XTN3+8B	Tapping Screw $\oplus$ 3 $\times$ 8
E14	$\square$ QFC1201MA	AC Power Cord	E34	XTN3+10B	Tapping Screw $\oplus$ 3 $\times$ 10
*For U.S.A.			E35	XTB4+10BFN	Screw $\oplus$ 4 $\times$ 10
$\square$ RJA9YA-K		AC Power Cord	E36	QKJ0473	LED Holder
*For Canada.			E37	QBG1691	Rubber Cushion
E15	QTW1118	Spark Killer Cover	E38	QTD1181	Nylon Binder
E16	QMA4247	Volume Angle	E39	XAMQ46P400	Pilot Lamp
E17	QJT0015	Lug Terminal	E40	QKJ0440	(for Music Selector Illumination)
E18	QNQ1070	Nut 12 $\phi$			Lamp Cover

## SCHEMATIC DIAGRAM

## MAIN AMP CIRCUIT BOARD



## SPECIFICATIONS

• Input level controls ... MAX

• Output level control ... MAX

Playback S/N ratio Test tape ... QZZCFM	Greater than 45 dB (without NAB filter)
--	--

Overall distortion Test tape ... QZZCRA for Normal ... QZZCRX for CrO <sub>2</sub> ... QZZCRZ for Metal	Less than 4%
---	--------------

Overall S/N ratio Test tape ... QZZCRA	Greater than 43 dB (without NAB filter)
---	--

## NOTES:

- S1-1-S1-14 ... Record/Playback select switch (shown in playback position).
- S2-1-S2-4 ... Input select switch (shown in LINE position).
- S3-1-S3-4 ... Dolby NR IN/OUT select switch (shown in OUT position).
- S5 ... Record muting switch (shown in OFF position).
- S6 ... Playback muting switch (close at playback or record mode).
- S8 ... Power ON/OFF switch.
- S9-1, S9-2 ... Music selector ON/OFF switch (shown in ON position).
- S10 ... Metal tape detection switch.
- S11 ... Normal/CrO<sub>2</sub> tape detection switch.
- VR1, 2 ... Playback gain adjustment VR.
- VR3, 4 ... Input level control.
- VR5, 6 ... Record gain adjustment VR.
- VR7, 8 ... Bias current adjustment VR.
- VR9, 10 ... Output level control, (for normal tape mode).
- VR401 ... FL meter adjustment VR (for 20dB indication).
- VR402 ... FL meter adjustment VR (for 0 dB indication).

- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.  
1K = 1000Ω, 1M = 1000kΩ.

• (---) indicates printed resistor.

A printed resistor is printed on the printed circuit board to be part of printed patterns for circuit configuration.

- Capacity are in microfarads (μF) unless specified otherwise.

• P = Pico-farads.

• The mark (→) test point, e.g. → = Test point 1.

• (→ →) this arrow indicates the flow of the playback signal.

• (→ ←) this arrow indicates the flow of the recording signal.

• Important safety notice (Δ)  
The shaded area on this schematic diagram incorporates special features important for protection from fire and electrical shock hazards.  
When servicing it is essential that only manufacturer's specified parts be used for the critical components in the shaded areas of the schematic.

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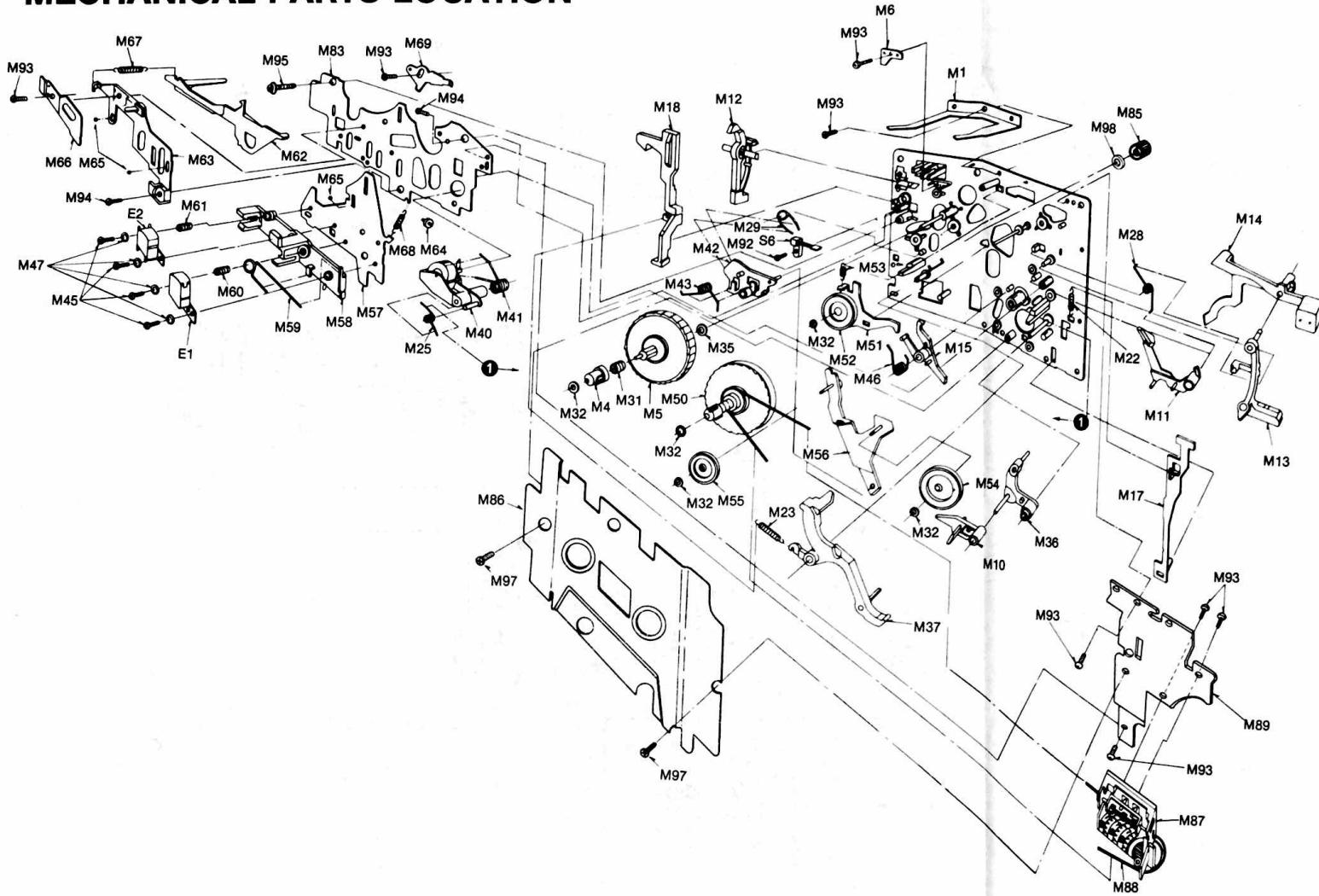
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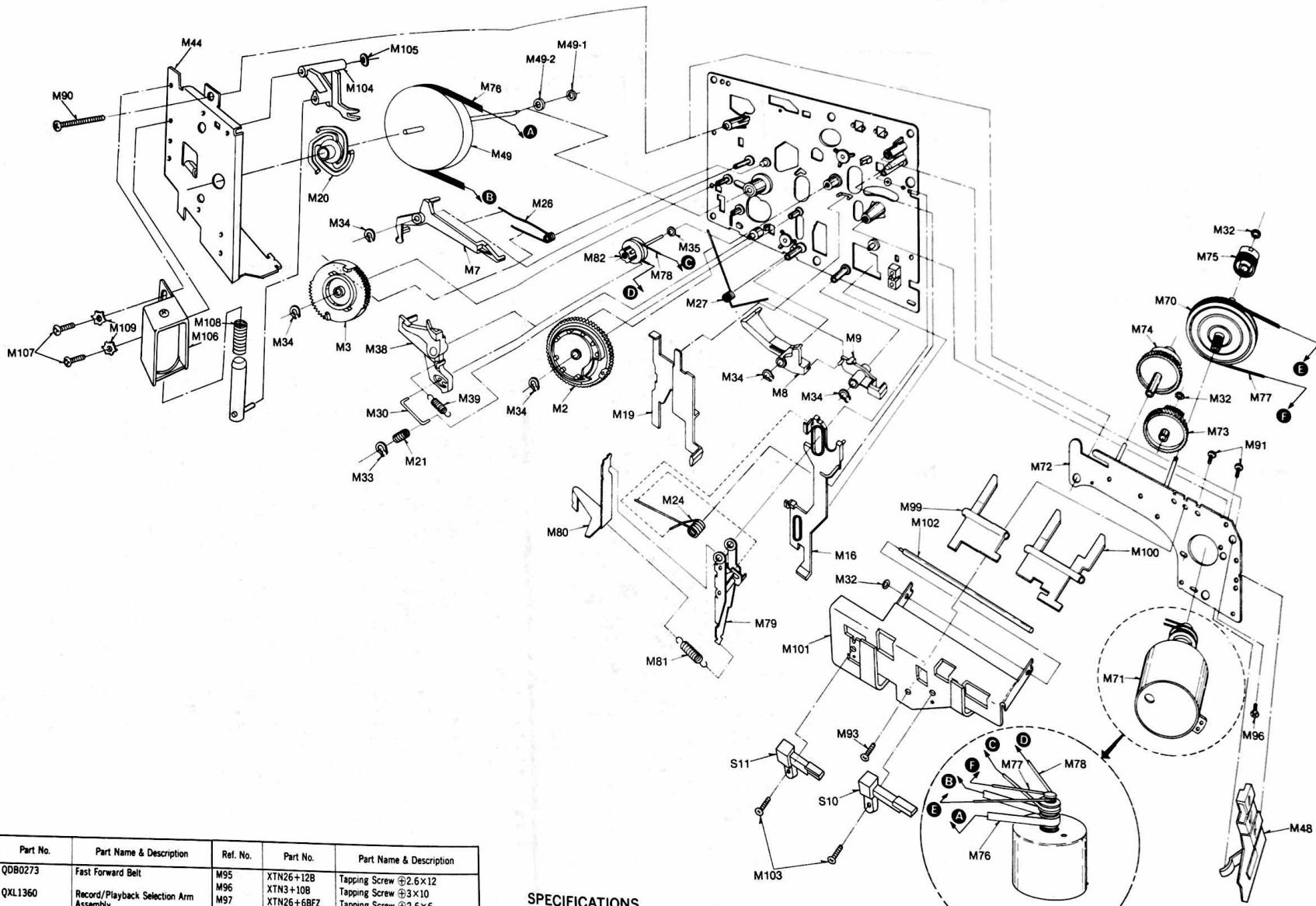
## MECHANICAL PARTS LOCATION



## **REPLACEMENT PARTS LIST**

Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
<b>MECHANICAL PARTS</b>					
M1	QBP1874	Cassette Pressure Spring	M21	QBC1357	Lock Pin Pressure Spring
M2	QDG1201	Main Gear	M22	QBT1682	Auto-Stop Connection Rod Spring
M3	QDG1202	Sub Gear	M23	QBT1894	Main Lever Spring
M4	QMB1336	Supply Reel Table Hub	M24	QBN1739	Selection Lever Spring
M5	QDR1139	Supply Reel Table	M25	QBN1742	Pressure Roller Release Spring
M6	QMF2118	Fast Forward Arm Bracket	M26	QBN1744	Sub Gear Spring
M7	QML3581	Sub Control Lever	M27	QBN1802	Main Gear Spring
M8	QML3583	Main Control Lever	M28	QBN1746	Auto-Stop Lever Spring
M9	QML3584	Record Operation Lever	M29	QBN1747	Connection Spring
M10	QML3586	Head Base Plate Lift Lever	M30	QBS1128	Lock Pin
M11	QML3594	Auto-Stop Release Arm	M31	QBC1372	Reel Table Spring
M12	QML3603	Erase Safety Lever	M32	QBW2008	Poly Washer
M13	QML3604	Auto-Stop Driving Lever	M33	XUB4FT	Stop Ring 4¢
M14	QML3605	Auto-Stop Detection Lever	M34	XUB3FT	Stop Ring 3¢
M15	QML3592	Change Lever	M35	QBW2012	Poly Washer
M16	QMR1820	Record Rod	M36	QXL1354	Sub Lever Assembly
M17	QMR1821	Auto-Stop Connection Rod	M37	QXL1355	Main Lever Assembly
M18	QMR1822	Eject Rod	M38	QML3582	Pause Lock Lever
M19	QMR1824	Control Rod	M39	QBT1896	Lever Release Spring
M20	QMZ1239	Flywheel Thrust Retainer	M40	QXL1381	Pressure Roller Assembly
			M41	QBN1743	Pressure Roller Spring

Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
M42	QML3588	Fast Forward Lever	M59	QBN1740	Head Pressure Spring
M43	QBN1748	Fast Forward Spring	M60	QBC1278	Head Spring
M44	QXA1042	Flywheel Retainer Assembly	M61	QCA0008	"
M45	XSN2-10	Screw $\oplus 2 \times 10$	M62	QML3591	Brake Arm
M46	QBN1741	Change Lever Spring	M63	QMZ1240	Sub Head Base Plate
M47	XWG2	Washer 2 $\oplus$	M64	QMN2550	Roller
M48	QMZ1254	Cord Clamper	M65	QDK1017	Steel Ball 2 $\oplus$
M49	QXF0164	Flywheel Assembly	M66	QPB1873	Head Base Plate Pressure Spring
M49-1	QBW2049	Poly Washer	M67	QBT1597	Brake Arm Spring
			M68	QBT1892	Head Release Spring
M49-2	QBW2026	Snap Ring			
M50	QXD1143	Takeup Reel Table Assembly	M69	QMA3858	Head Adjustment Plate
M51	QXL1382	Idler Lever Assembly	M70	QXG1047	Takeup Gear Assembly
M52	QX10111	Takeup Idler Assembly	M71	QXU0170	Motor Assembly
M53	QBT1893	Takeup Idler Assembly	M72	QXK2286	Sub Chassis Assembly
M54	QX10113	Fast Forward Idler Spring	M73	QDG1199	Auto-Stop Gear
M55	QX10112	Rewind Idler Assembly	M74	QDG1200	Cam Gear
M56	QXL1383	Fast Forward Arm Assembly	M75	QDP1823	Connection Pulley
M57	QMK1840	Head Base Plate	M76	QDB0281	Captstan Belt
M58	QMZ1241	Head Spacer	M77	QDB0274	Takeup Belt



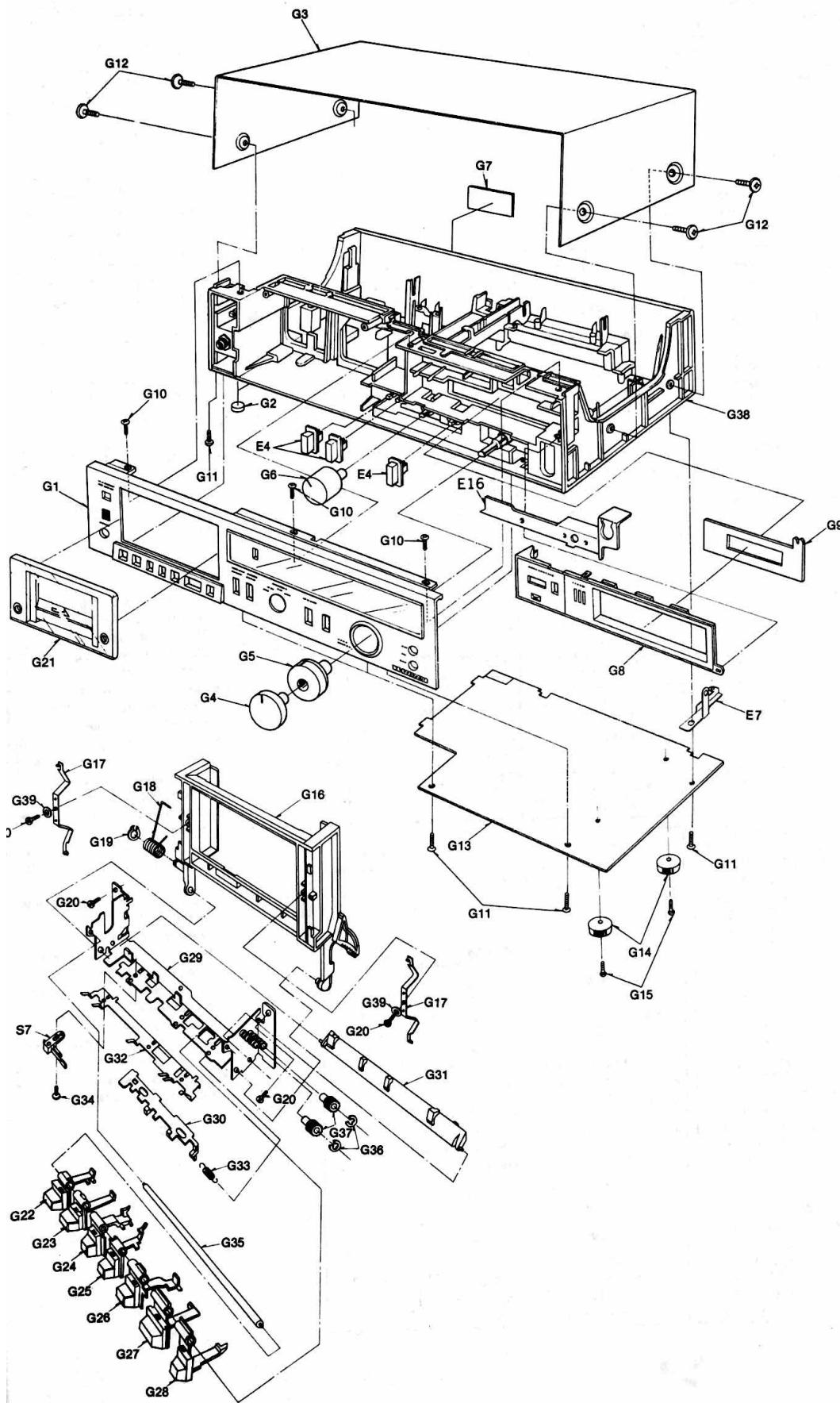
Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
QDB0273	Fast Forward Belt	M95	XTN26+12B	Tapping Screw $\oplus 2.6 \times 12$
QXL1360	Record/Playback Selection Arm Assembly	M96	XTN3+10B	Tapping Screw $\oplus 3 \times 10$
QML3580	Record/Playback Selection Lever	M97	XTN26+6BFZ	Tapping Screw $\oplus 2.6 \times 6$
QBT1895	Spring	M98	QBW2085	Poly Washer
QXP0607	Fast Forward Connection Pulley Assembly	M99	QML3644	Tape Detection Lever-A (for Metal Tape)
QMK1838	Upper Base Plate	M100	QML3645	Tape Detection Lever-B (for Normal/CrO2 Tape)
QDP1828	Fast Forward Pulley	M101	QMA4228	Detection Lever Angle
QXH0369	Chassis Cover Assembly	M102	QMS2546	Detection Lever Shaft
QXA1060	Tape Counter Assembly	M103	XSN2+5	Screw $\oplus 2 \times 5$
QDB0240	Counter Belt	M103	XSN2+5	Screw $\oplus 2 \times 5$
QMA3860	Counter Angle	M104	QML3616	Lock Release Lever
XTN3+24B	Tapping Screw $\oplus 3 \times 24$	M105	QBW2083	Washer
XSN2+3	Screw $\oplus 2.6 \times 3$	M106	QME0157	Plunger
XTN2+6B	Tapping Screw $\oplus 2 \times 6$	M107	XSN3+6S	Screw $\oplus 3 \times 6$
XTN26+6B	Tapping Screw $\oplus 2.6 \times 6$	M108	QBC1358	Plunger Spring
XTN26+10B	Tapping Screw $\oplus 2.6 \times 10$	M109	XWC3B	Washer $\oplus 4$

#### SPECIFICATIONS

Pressure of pressure roller	$350 \pm 50$ g
Takeup tension	$45 \pm 15$ g-cm
• Use cassette torque meter ... QZZSRKCT	$45 - 10$ g-cm
Wow and flutter; (JIS)	Less than 0.06% (WRMS)
• Use test tape ... QZZCWAT	

When servicing this mechanism unit, refer to the disassembly notes and assembly instructions described in the service manuals of RS-M51, RS-M13, RS-M14 and RS-M04 (RS-M24 mechanism series).

## **CABINET PARTS LOCATION**



## **REPLACEMENT PARTS LIST**

Ref. No.	Part No.	Part Name & Description
<b>CABINET PARTS</b>		
G1	QYP1034	Front Panel Assembly
G2	QKA1081	Rubber Foot-A
G3	QGC1188S	Case Cover
G4	QYT0623	Knob Assembly-A
G5	QYT0611	Knob Assembly-B
G6	QYT0626	Knob Assembly-C
G7	QGS2899	Main Name Plate
*For U.S.A.		
	QGS2900	"
*For Canada.		
G8	QGK3154	Meter Cover
G9	QGL1159	Meter Filter
G10	XTS3+10B	Screw $\oplus 3 \times 10$
G11	XTN3+10B	Tapping Screw $\oplus 3 \times 10$
G12	XTB4+10BFN	Screw $\oplus 4 \times 10$
G13	QGC1189	Bottom Cover
G14	QKA1083	Rubber Foot-B
G15	QHQ1299	Step Screw
G16	QKFM6005K	Cassette Holder
G17	QBP1900	Holder Spring
G18	QBN7008	Eject Spring
G19	XUB5FT	Stop Ring 5¢
G20	XTN26+6BFZ	Tapping Screw $\oplus 2.6 \times 6$
G21	QYF0494	Cassette Lid Assembly
G22	QXL1441	Eject Button Assembly
G23	QXL1442	Record Button Assembly
G24	QXL1443	Rewind/Review Button Assembly
G25	QXL1444	Fast Forward/Cue Button Assembly
G26	QXL1445	Playback Button Assembly
G27	QXL1446	Stop Button Assembly
G28	QXL1447	Pause Button Assembly
G29	QXA1044	Operation Button Angle
G30	QMR1823	Obstruction Rod
G31	QML3649	Lock Arm
G32	QBP1875	Operation Lever Spring
G33	QBT1597	Obstruction Rod Spring
G34	XTN2+6B	Tapping Screw $\oplus 2 \times 6$
G35	QMN2554	Operation Lever Shaft
G36	XUC4FT	Stop Ring 4¢
G37	QDG1102	Holder Gear
G38	QKM1454S	Main Case
G39	XWG26D6	Washer 2.6¢
<b>ACCESSORIES</b>		
A1	RP023A	Connection Cord
A2	QQT3061	Instruction Book
*For U.S.A.		
	QQT3062	"
*For Canada.		
<b>PACKINGS</b>		
P1	QPN4178	Inside Carton
*For U.S.A.		
	QPN4177	"
*For Canada.		
P2	QPA0558	Cushion-R
P3	QPA0559	Cushion-L
P4	QPC0078	Poly Sheet
P5	XZB40X60A02	Poly Bag (for UNIT)
P6	QPS0434	Upper Pad
P7	QPC0072	Poly Sheet (for AC Power Cord)

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## NOTES: RESISTORS

<b>CAPACITORS</b>				
ECBA	..... Ceramic	ECQF	.....	Polypropylene
ECG□	..... Ceramic	ECE□	.....	Electrolytic
ECK□	..... Ceramic	ECE□N	.....	Non polar electrolytic
ECC□	..... Ceramic	EQS	.....	Polystyrene
ECF□	..... Ceramic	ECS□	.....	Tantalum
ECQM	..... Polyester film	QCS	.....	Tantalum
ECQE	..... Polyester film			

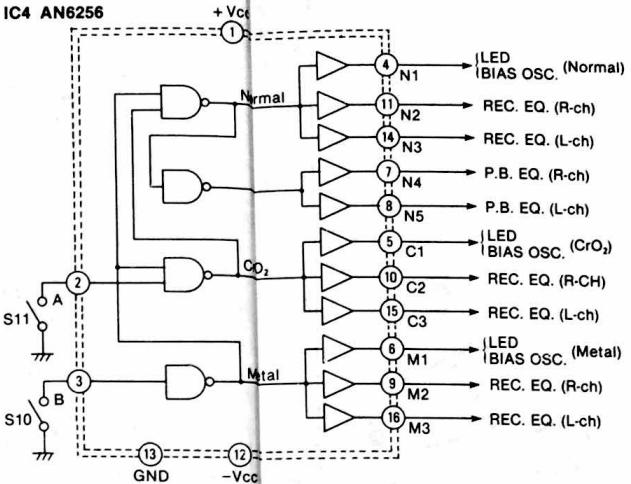
## **REPLACEMENT PARTS LIST**

#### **Important safety notice**

Components identified by  $\Delta$  mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.
<b>RESISTORS</b>									
R1, 2	ERD25FJ100	R331	ERD25FJ102	C29, 30	ECFDD123KXY	C505	ECEA1HS100	D309, 310, 311	
R3, 4	ERD25FJ561	R333	ERD25FJ181	C31, 32	ECEA50MR33R	C506, 507	ECFDD104KXY	MA161	
R5, 6	ERD25FJ104	R334	ERD25FJ101	C33, 34, 35, 36				D313, TBL205	
R7, 8	ERD25FJ101	R335	ERD25FJ181					D314, 315, 316	
R9, 10	ERD25FJ154	R336	ERD25FJ222	C37, 38	ECQM1H472JZ	Q1, 2, 3, 4	2SD661T	MA161	
R11, 12	ERD25FJ101	R337	ERD25FJ154	C39, 40	ECQM1H273JZ	Q7, 8, 9, 10	2SD636R	TRVDR9R1FB	
R13, 14	ERD25FJ471	R338	ERD25FJ821	C41, 42	ECQM1H562Z	Q13, 14	2SD636H	SVEQA0113RA	
R15, 16	ERD25TJ224	R340	ERD25FJ122	C43, 44, 45, 46		Q15, 16	2SD965	SLB72UR5GSH	
R17, 18	ERD25FJ822	R401, 402, 403, 404, 405, 406	ERD25TJ223	C47, 48	ECEA1HS100	Q17, 18	2SD636R	D320, SLB72GG5HL	
R19, 20	ERD25TJ224			C50	ECEA1AS101	Q19	2SB641S		
R21, 22, 23, 24	ERD25FJ822	R407, 408	ERD25TJ104	C51, 52	ECEA50MR33R	Q301	2SD592NCS	D221, SLB72Y5HSL	
R29, 30	ERD25FJ822	R409	ERD25FJ220	C53, 54	ECFD104KXY	Q302	2SD636R	D401, 402, MA161	
R31, 32	ERD25FJ472	R410	ERD25TJ183	C55, 56	ECEA1HS100	Q303	2SB641S	MD1, MV12	
R33, 34	ERD25FJ562	R411, 412	ERD25FJ331	C57, 58	ECFD0473KXY	Q304	2SD880Y	D404, 405, 406	
R41, 42	ERD25FJ222	R413, 414	ERD25TJ224	C59, 60	ECKD1H102MD				
R43	ERD25TJ210	R415	ERD25FJ102	C61, 62	ECEA50Z1				
R45	ERD25FJ150	R416	ERD25FJ392	C63	ECEA1ES221				
R47, 48, 49, 50	ERD25TJ102	R418	ERD25TJ1564	C65, 66	ECEA50Z1				
R51, 52	ERD25TJ1473	R420	ERD25FJ103	C67, 68	ECEA1HS100				
R53, 54	ERD25TJ105	R421	ERG12ANJ221	C69, 70	ECEA50Z1				
R55, 56	ERD25FJ332	R422, 423	ERD25FJ271	C71, 72	ECQM1H273JZ	Q305	2SB638R	D501, MA161	
R57, 58	ERD25TJ105	R425, 426	ERD25TJ104	C73, 74	ECFD103KXY	Q502	2SD965	MD2, SM112	
R59, 60	ERD25FJ181	R501	ERD25FJ222	C79, 80	ECFDD223KXY	Q503	2SD636S	D503, MA1100	
R61, 62	ERD25FJ562	R502	ERD25FJ101	C81, 82	ECFD0333KXY				
R63, 66	ERD25FJ471	R504	ERD25TJ224	C83, 84	ECEA50Z2R2				
R75	ERD25FJ221	R505, 506	ERD25FJ153	C85	ECEA50Z1				
R77, 78	ERD25FJ822	R507	ERD25FJ563	C87, 88	ECCD1H100KC				
R79, 80	ERD25FJ681	R508	ERD25FJ101						
R83, 84	ERD25FJ392	R509, 510	ERD25FJ153	C89, 90	ECEA1HS100				
R85, 86	ERD25FJ122			C91, 92	ECEA1ES101				
<b>VARIABLE RESISTORS</b>									
R101, 104	ERD25TJ333	VR1, 2	EVNM4AA00B24	C93, 94	ECCD1H101KD				
R105, 106	ERD25TJ124	VR3, 4	QVKDMS08RA24	C95, 96	ECFD0392KXY				
R117, 118	ERD25FJ121	VR5, 6	EVNM4AA00B54	C97, 98	ECQ1P1183JZ				
R125, 126	ERD25TJ273	VR7, 8	EVNM4AA00B15	C99, 100	ECQ1P1183JZ				
R127, 128	ERD25FJ331	VR9, 10	EWK9KA205A14	C101, 102	ECQ1P1183JZ				
R301	ERD25FJ1R0	VR9, 10	EVRO1	C103	ECQ1P1183JZ				
R308	ERD25FJ181	VR401	EVNM4AA00B13	C104	ECQ1P1183JZ				
R309	ERD25FJ221	VR402	EVNM4AA00B24	C105	ECQ1P1183JZ				
R310	ERD25FJ100			C106	ECQ1P1183JZ				
R311	ERD25FJ222			C107	ECQ1P1183JZ				
R313	ERD25TJ224	C1, 2	ECCD1H331KD	C108	ECQ1P1183JZ				
R316	ERD25FJ121	C3, 4	ECEA16M10R	C109	ECQ1P1183JZ				
# For U.S.A.									
# For Canada.									
# For U.S.A.									
# For Canada.									
<b>CAPACITORS</b>									
R313	ERD25TJ224	C1, 2	ECCD1H331KD	C11, 12	ECEA1CS330	C11	QSLQX0343K	COILS	
R316	ERD25FJ121	C3, 4	ECEA16M10R	C13	ECEA1ES470	C12	QSLQX0332K	Bias Trap Coil	
# For U.S.A.									
# For Canada.									
# For U.S.A.									
# For Canada.									
<b>TRANSISTORS</b>									
R1, 2	ERD25FJ100	R331	ERD25FJ181	C31, 32	ECEA50MR33R	C31	ECFDD104KXY	JACKS	
R3, 4	ERD25FJ561	R334	ERD25FJ101	C33, 34, 35, 36		C32	ECFDD123KXY	Jack Board Assembly	
R5, 6	ERD25FJ104	R335	ERD25FJ181			C33	ECFDD104KXY	Microphone Jack	
R7, 8	ERD25FJ101	R336	ERD25FJ222			C34	ECFDD104KXY	Headphones Jack	
R9, 10	ERD25FJ154	R337	ERD25FJ154			C35	ECFDD104KXY		
R11, 12	ERD25FJ101	R338	ERD25FJ821			C36	ECFDD104KXY		
R13, 14	ERD25FJ471	R339	ERD25FJ122			C37	ECFDD104KXY		
R15, 16	ERD25TJ224	R340	ERD25FJ222			C38	ECFDD104KXY		
R17, 18	ERD25FJ822	R401, 402, 403, 404, 405, 406	ERD25TJ223	C47, 48	ECEA1HS100	C39	ECFDD104KXY		
R19, 20	ERD25TJ224			C50	ECEA1AS101	C40	ECFDD104KXY		
R21, 22, 23, 24	ERD25FJ822	R407, 408	ERD25TJ104	C51, 52	ECEA50MR33R	C41	ECFDD104KXY		
R29, 30	ERD25FJ822	R409	ERD25FJ220	C53, 54	ECFD104KXY	C42	ECFDD104KXY		
R31, 32	ERD25FJ472	R410	ERD25TJ183	C55, 56	ECEA1HS100	C43	ECFDD104KXY		
R33, 34	ERD25FJ562	R411, 412	ERD25FJ331	C57, 58	ECFD0473KXY	C44	ECFDD104KXY		
R41, 42	ERD25FJ222	R413, 414	ERD25TJ224	C59, 60	ECKD1H102MD	C45	ECFDD104KXY		
R43	ERD25TJ210	R416	ERD25FJ392	C61, 62	ECEA50Z1	C46	ECFDD104KXY		
R45	ERD25FJ150	R417	ERD25TJ105	C63	ECEA1ES221	C47	ECFDD104KXY		
R47, 48, 49, 50	ERD25TJ102	R418	ERD25TJ1564	C65, 66	ECEA50Z1	C48	ECFDD104KXY		
R51, 52	ERD25TJ1473	R420	ERD25FJ103	C67, 68	ECEA1HS100	C49	ECFDD104KXY		
R53, 54	ERD25TJ105	R421	ERG12ANJ221	C69, 70	ECEA50Z1	C50	ECFDD104KXY		
R55, 56	ERD25FJ332	R422, 423	ERD25FJ271	C71, 72	ECQM1H273JZ	C51	ECFDD104KXY		
R57, 58	ERD25TJ105	R425, 426	ERD25TJ104	C73, 74	ECFD103KXY	C52	ECFDD104KXY		
R59, 60	ERD25FJ181	R501	ERD25FJ222	C79, 80	ECFDD223KXY	C53	ECFDD104KXY		
R61, 62	ERD25FJ562	R502	ERD25FJ101	C81, 82	ECFD0333KXY	C54	ECFDD104KXY		
R63, 66	ERD25FJ471	R504	ERD25TJ224	C83, 84	ECEA50Z2R2	C55	ECFDD104KXY		
R75	ERD25FJ221	R505, 506	ERD25FJ153	C85	ECEA50Z1	C56	ECFDD104KXY		
R77, 78	ERD25FJ822	R507	ERD25FJ563	C87, 88	ECCD1H100KC	C57	ECFDD104KXY		
R79, 80	ERD25FJ681	R508	ERD25FJ101			C58	ECFDD104KXY		
R83, 84	ERD25FJ392	R509, 510	ERD25FJ153	C91, 92	ECEA1ES101	C59	ECFDD104KXY		
R85, 86	ERD25FJ122			C93, 94	ECEA1ES101	C60	ECFDD104KXY		
<b>TRANSISTORS</b>									
R1, 2	ERD25FJ100	R331	ERD25FJ181	C95, 96	ECFD0392KXY	C61	ECFDD104KXY		
R3, 4	ERD25FJ561	R334	ERD25FJ101	C97, 98	ECQ1P1183JZ	C62	ECFDD104KXY		
R5, 6	ERD25FJ104	R335	ERD25FJ181	C99, 100	ECQ1P1183JZ	C63	ECFDD104KXY		
R7, 8	ERD25FJ101	R336	ERD25TJ222	C101, 102	ECQ1P1183JZ	C64	ECFDD104KXY		
R9, 10	ERD25FJ154	R337	ERD25FJ154	C103	ECQ1P1183JZ	C65	ECFDD104KXY		
R11, 12	ERD25FJ104	R338	ERD25FJ272	C104	ECQ1P1183JZ	C66	ECFDD104KXY		
R13, 14	ERD25FJ121	R339	ERD25FJ121	C105	ECQ1P1183JZ	C67	ECFDD104KXY		
R15, 16	ERD25FJ104	R340	ERD25FJ104	C106, 407	ECFDD104KXY	C68	ECFDD104KXY		
R17, 18	ERD25FJ154	R341	ERD25FJ154	C107, 408	ECFDD104KXY	C69	ECFDD104KXY		
R19, 20	ERD25FJ101	R342	ERD25FJ101	C109, 20	ECFDD0562KYY	C70	ECFDD104KXY		
R21, 22	ERG12ANJ221	C21, 22	ECFDD102KYY	C501	ECEA1HS100	C71	ECFDD104KXY		
R23, 24	ERD25FJ821	C23, 24	ECEA1CS330	C502	ECFDD104KXY	C72	ECFDD104KXY		
R25, 26	ERD25FJ821	C25, 26	ECEA2524R7	C503	ECEA50Z2R47	C73	ECFDD104KXY		
R27, 28	ERD25FJ102	C27, 28	ECFD0222KYY	C504	ECEA50Z2R2	C74	ECFDD104KXY		
<b>TRANSISTORS</b>									
R1, 2	ERD25FJ100	R331	ERD25FJ181	C31, 32	ECEA50MR33R	C75	ECFDD104KXY		
R3, 4	ERD25FJ561	R334	ERD25FJ101	C33, 34, 35, 36		C76	ECFDD104KXY		
R5, 6	ERD25FJ104	R335	ERD25FJ181			C77	ECFDD104KXY		
R7, 8	ERD25FJ101	R336	ERD25TJ222			C78	ECFDD104KXY		
R9, 10	ERD25FJ154	R337	ERD25FJ154			C79	ECFDD104KXY		
R11, 12	ERD25FJ101	R338	ERD25FJ101			C80	ECFDD104KXY		
R13, 14	ERD25FJ121	R339	ERD25FJ121			C81	ECFDD104KXY		
R15, 16	ERD25FJ104	R340	ERD25FJ104			C82	ECFDD104KXY		
R17, 18	ERD25FJ154	R341	ERD25FJ154			C83	ECFDD104KXY		
R19, 20	ERD25FJ101	R342	ERD25FJ101			C84	ECFDD104KXY		
R21, 22	ERG12ANJ221	C21, 22	ECFDD102KYY	C501	ECEA1HS100	C85	ECFDD104KXY		
R23, 24	ERD25FJ821	C23, 24	ECEA1CS330	C502	ECFDD104KXY	C86	ECFDD104KXY		
R25, 26	ERD25FJ821	C25, 26	ECEA2524R7	C503	ECEA50Z2R47	C87	ECFDD104KXY		
R27, 28	ERD25FJ102	C27, 28	ECFD0222KYY	C504	ECEA50Z2R2	C88	ECFDD104KXY		
<b>TRANSISTORS</b>									
R1, 2	ERD25FJ100	R331	ERD25FJ181	C31, 32	ECEA50MR33R	C89	ECFDD104KXY		
R3, 4	ERD25FJ561	R334	ERD25FJ101	C33, 34, 35, 36		C90	ECFDD104KXY		
R5, 6	ERD25FJ104	R335	ERD25FJ181			C91	ECFDD104KXY		
R7, 8	ERD25FJ101	R336	ERD25TJ222			C92	ECFDD104KXY		
R9, 10	ERD25FJ154	R337	ERD25FJ154			C93	ECFDD104KXY		
R11, 12	ERD25FJ101	R338	ERD25FJ101			C94	ECFDD104KXY		
R13, 14	ERD25FJ121	R339	ERD25FJ121			C95	ECFDD104KXY		
R15, 16	ERD25FJ104	R340	ERD25FJ104			C96	ECFDD104KXY		
R17, 18	ERD25FJ154	R341	ERD25FJ154			C97	ECFDD104KXY		
R19, 20	ERD25FJ101	R342	ERD25FJ101			C98</			

## **BLOCK DIAGRAM**



**NOTES:**

- The circuit shown in  on the conductor is +B (bias) circuit.
  - The circuit shown in  on the conductor indicates printed circuit, which is included printed type resistors.
  - The circuit shown in  on the conductor indicates printed circuit on the back side of the printed circuit board.
  - The symbols ( $\oplus$ ) indicate connection points between conductors on the front side and back side of the circuit board.
  - Values indicated in  are under no signal condition and record mode with volume control at minimum position.

However, the voltage in playback mode is indicated in ( ) when it differs from that in record mode.

For measurement, use VTVM.

- Described in the circuit board diagram are two types of numbers; the supply parts number and production parts number for transistors. One type of number is used for supply parts number and production parts number when they are identical.

- The supply parts number is desibed alone in the

### **replacement parts list.**

1. *What is the relationship between the two concepts of the state?*

**NOTE :**

BLK	.....	Black
BLU	.....	Blue
BRN	.....	Brown
GRY	.....	Gray
GRN	.....	Green
L BLU	.....	Light Blue
NIL	.....	No Color Mark
ORG	.....	Orange
PNK	.....	Pink
RED	.....	Red
SLD	.....	Shield Wire
VLT	.....	Violet
WHT	.....	White
YEL	.....	Yellow

## CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM

