

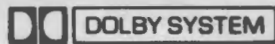
Service Manual

Cassette Deck

RS-M225

(Silver Face)

Cassette Deck with Peak Hold FL Meters,
Auto Tape Selector and Music Selector



RS-M24 MECHANISM SERIES

Specifications

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

Specifications are subject to change without notice.

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

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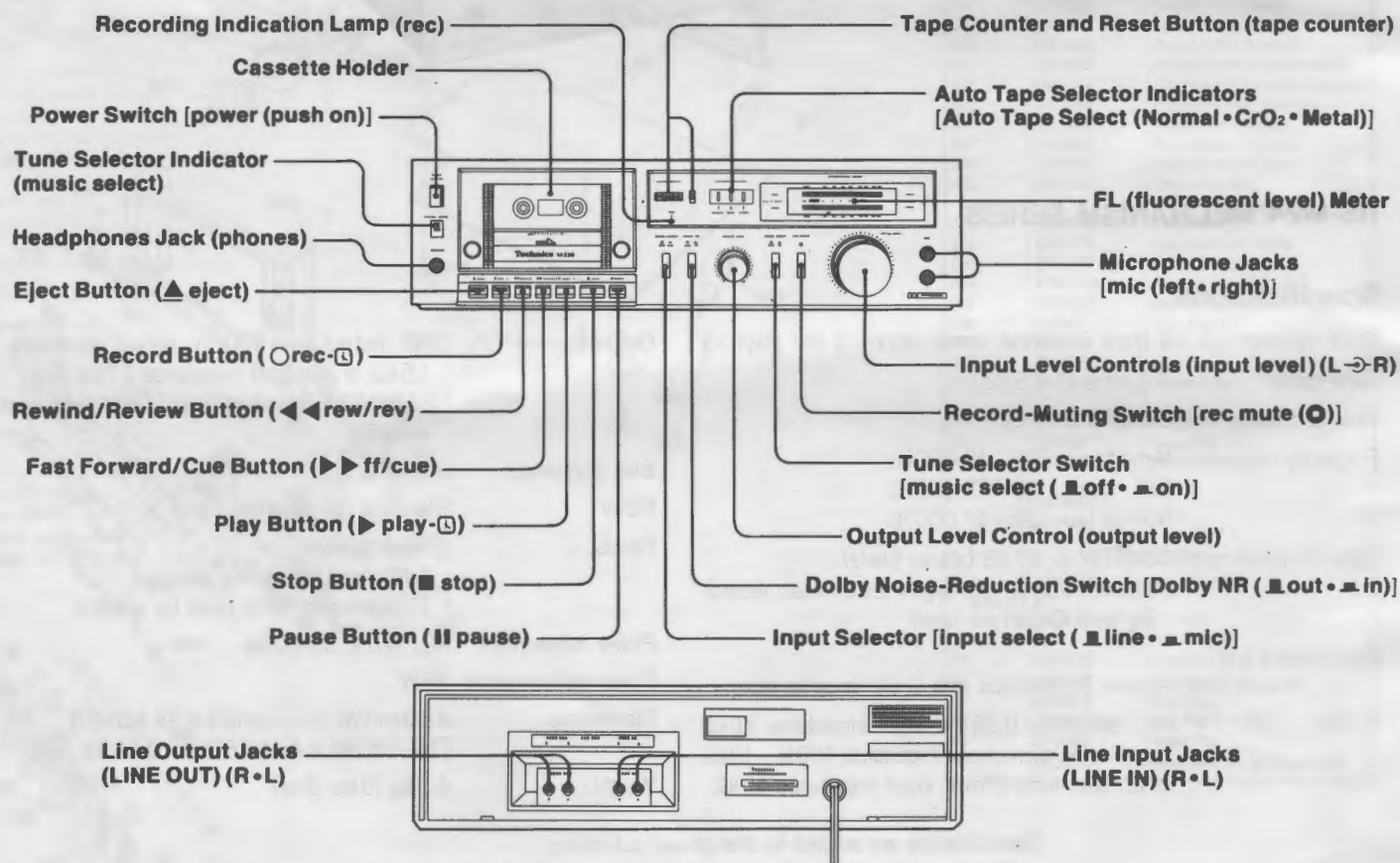
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LOCATION OF CONTROLS AND COMPONENTS



DISASSEMBLY INSTRUCTIONS

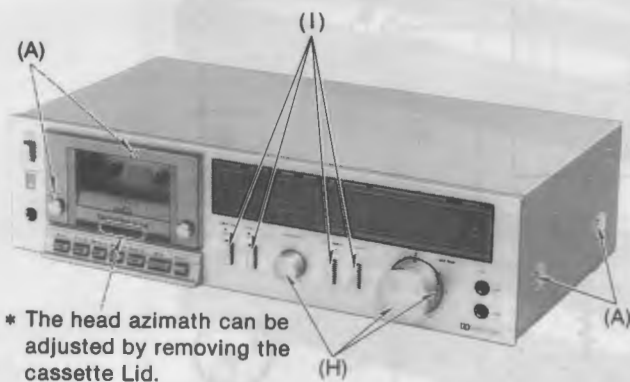


Fig. 1

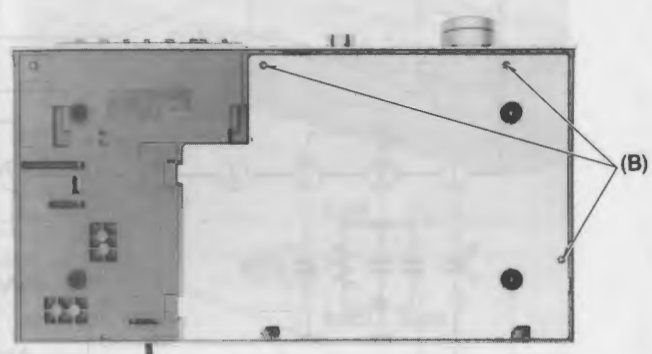


Fig. 2

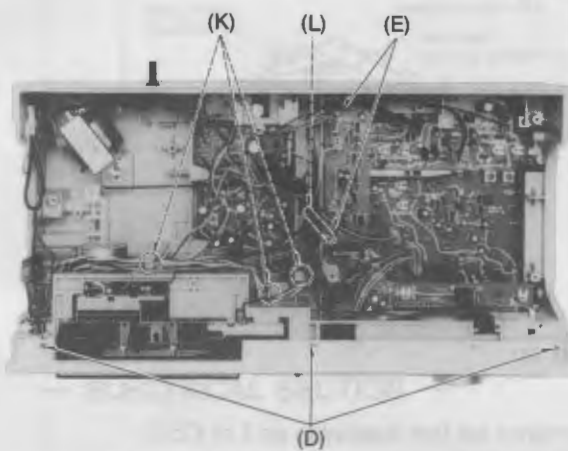


Fig. 3

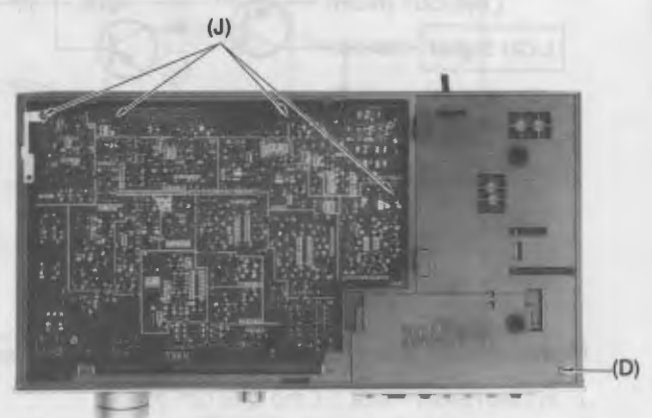


Fig. 4

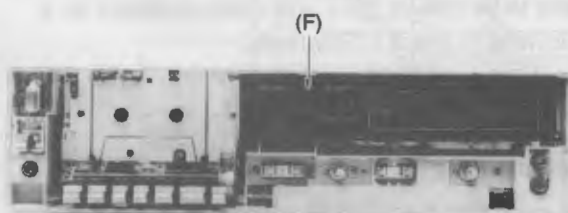


Fig. 5

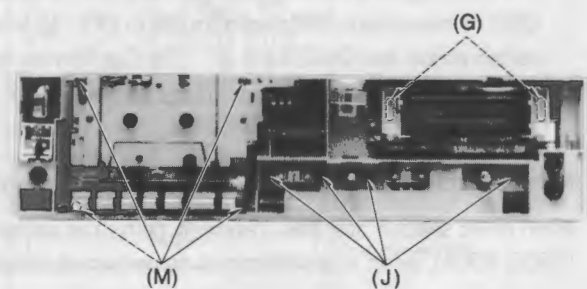
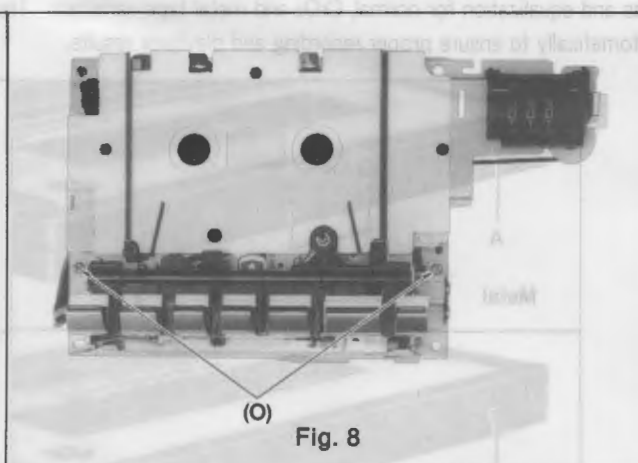
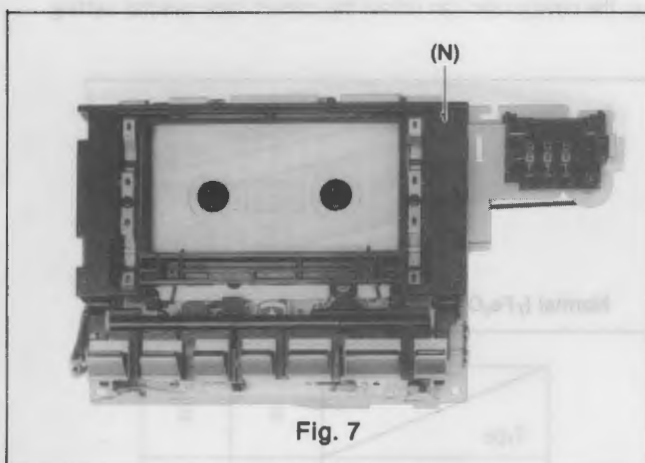


Fig. 6

EXPLANATION OF AUTO TAPE SELECTOR

— MECHANICAL SECTION —

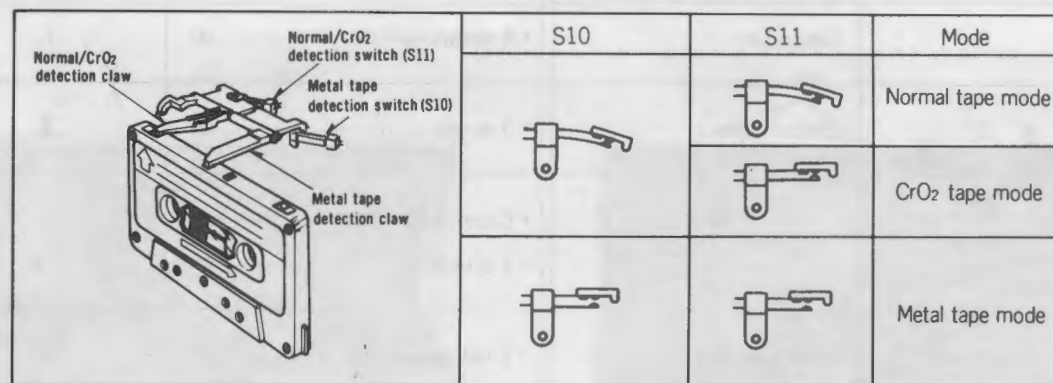
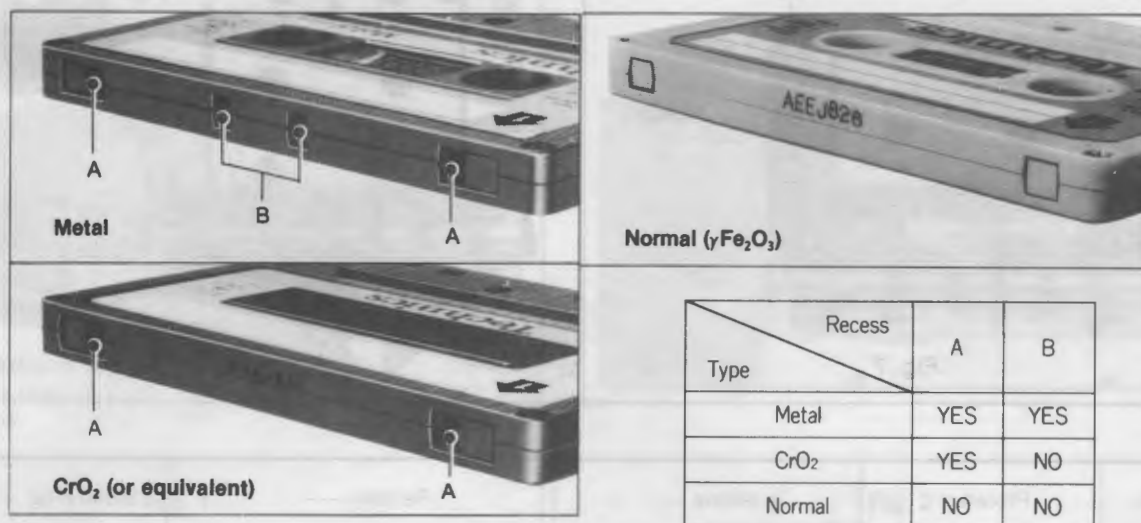


Ref. No.	Procedure	To remove — .	Remove — .	Shown in fig. — .
1	1	Case cover	• 4 screws (A)	1
2	2	Bottom cover	• 3 screws (B)	2
3	1→2→3	Front panel	• Cassette lid (C) • 4 screws (D)	1 3, 4
4	1→2→4	Music selector circuit board	• 2 red screws (E)	3
5	1→2→3→5	FL meter	• Meter cover (F) • 2 holders (G)	5 6
6	1→2→3→6	Main circuit board	• 3 volume knobs (H) • 4 push buttons (I) • 8 red screws (J) • 3 claspers (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

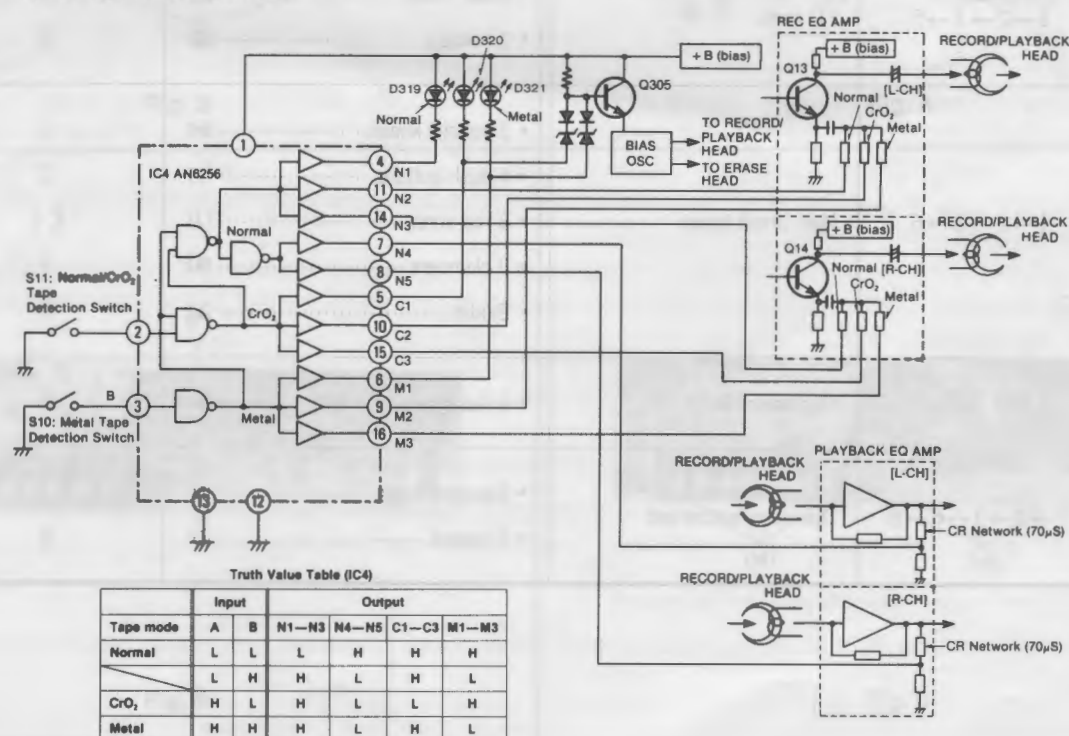
EXPLANATION OF AUTO TAPE SELECTOR

— 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, CrO₂ 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.

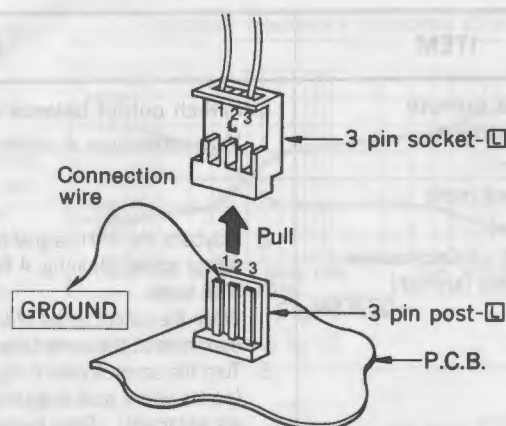
(For normal tape mode, just insert a normal tape into the cassette holder.)

• 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).

• CrO₂ 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

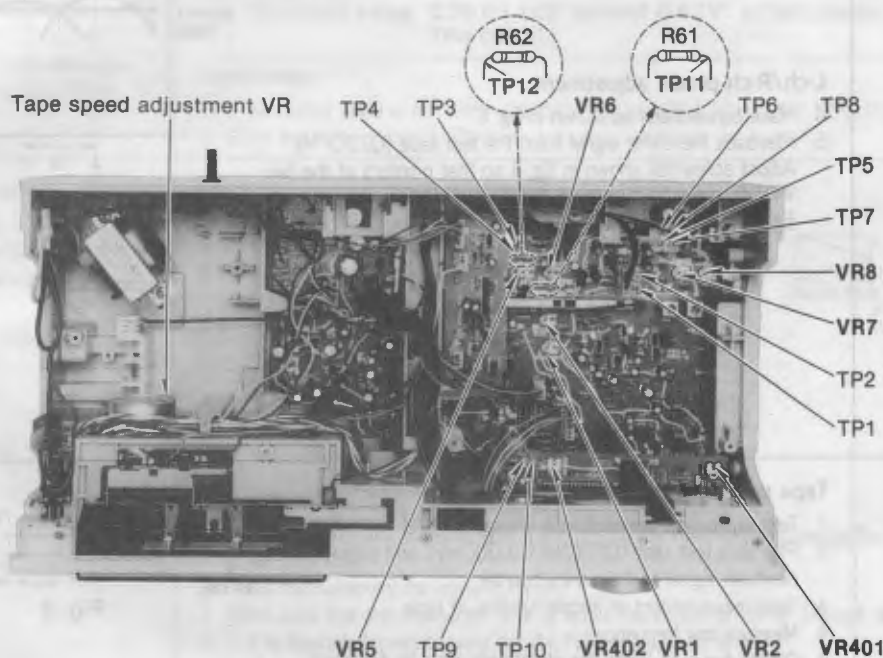


Fig. 1

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

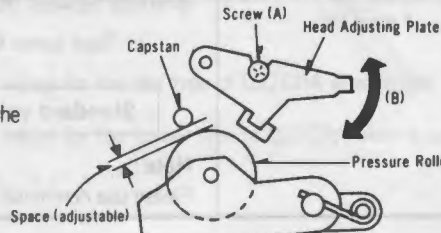
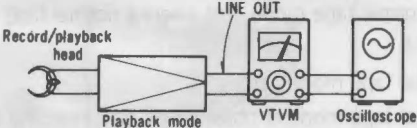
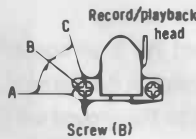
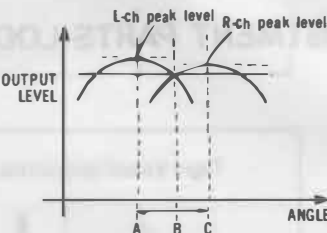
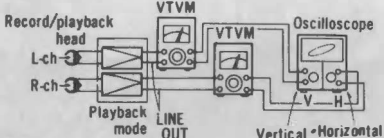

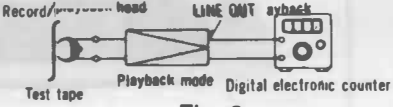
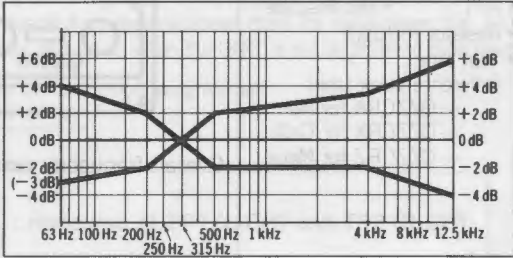
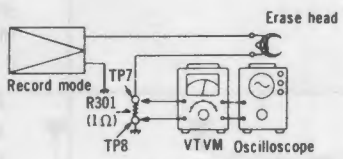
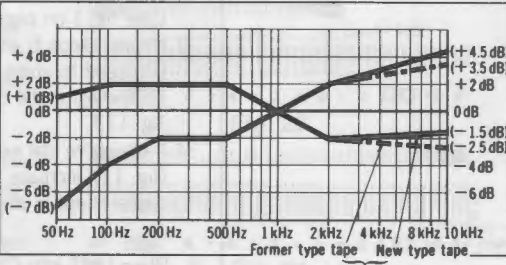
ITEM	MEASUREMENT & ADJUSTMENT
A Head position adjustment Condition: • Playback and pause mode	<p>(The head adjusting plate is provided to adjust the tape touch of the head in cue or review mode.)</p> <ol style="list-style-type: none"> Press the playback button and pause button. Measure the space between the pressure roller and the capstan. <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> Standard value: $0.5 \pm 0.3\text{mm}$ </div> <ol style="list-style-type: none"> 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. 

Fig. 2

ITEM	MEASUREMENT & ADJUSTMENT
<p>Ⓔ Head azimuth adjustment</p> <p>Condition:</p> <ul style="list-style-type: none"> • Playback mode <p>Equipment:</p> <ul style="list-style-type: none"> • VTVM • Oscilloscope • Test tape (azimuth) ... QZZCFM 	<p>L-ch/R-ch output balance adjustment</p> <ol style="list-style-type: none"> 1. Make connections as shown in fig. 3.  <p>Fig. 3</p> <ol style="list-style-type: none"> 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. <p>When the output levels of L-ch and R-ch are not at maximum at the same time, readjust as follows.</p> <ol style="list-style-type: none"> 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.)  <p>Fig. 4</p>  <p>Fig. 5</p> <p>L-ch/R-ch phase adjustment</p> <ol style="list-style-type: none"> 4. Make connections as shown in fig. 6. 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.  <p>Fig. 6</p>  <p>Fig. 7</p>
<p>Ⓒ Tape speed</p> <p>Condition:</p> <ul style="list-style-type: none"> • Playback mode <p>Equipment:</p> <ul style="list-style-type: none"> • Digital electronic counter or frequency counter • Test tape ... QZZCWAT 	<p>Tape speed accuracy</p> <ol style="list-style-type: none"> 1. Test equipment connection is shown in fig. 8. 2. Playback test tape (QZZCWAT 3,000Hz) and supply playback signal to frequency counter. 3. Take measurement at middle section of tape. 4. Measure this frequency. 5. On the basis of 3,000Hz, determine value by following formula: $\text{Tape speed accuracy} = \frac{f - 3,000}{3,000} \times 100 (\%) \quad \text{where, } f = \text{measured value}$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> Standard value: $\pm 1.5\%$ </div> <p>Adjustment method</p> <ol style="list-style-type: none"> 1. Playback the test tape (middle) 2. Adjust so that frequency becomes 3,000Hz. 3. Tape speed adjustment VR shown in fig. 1. <p>Tape speed fluctuation</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: 5px; width: fit-content; margin: 10px auto;"> Standard value: Less than 1% </div> <p>Note:</p> <p>Please use non metal type screwdriver when you adjust tape speed on this unit.</p>  <p>Fig. 8</p>

ITEM	MEASUREMENT & ADJUSTMENT
<p>Ⓓ Playback frequency response</p> <p>Condition:</p> <ul style="list-style-type: none"> • Playback mode • Normal tape mode • Output level control ... MAX <p>Equipment:</p> <ul style="list-style-type: none"> • VTVM • Oscilloscope • Test tape ... QZZCFM 	<ol style="list-style-type: none"> 1. Test equipment connection is shown in fig. 3. 2. Place UNIT into Normal tape mode. 3. Playback the frequency response test tape (QZZCFM). 4. Measure output level at 315 Hz, 12.5 kHz, 8 kHz, 4 kHz, 1 kHz, 250 Hz, 125 Hz and 63 Hz, and compare each output level with the standard frequency 315 Hz, at LINE OUT. 5. Make measurement for both channels. 6. Make sure that the measured value is within the range specified in the frequency response chart (shown in fig. 9). <p style="text-align: center;">Playback frequency response chart</p>  <p style="text-align: center;">Fig. 9</p>
<p>Ⓔ Playback gain</p> <p>Condition:</p> <ul style="list-style-type: none"> • Playback mode • Normal tape mode • Output level control ... MAX <p>Equipment:</p> <ul style="list-style-type: none"> • VTVM • Oscilloscope • Test tape ... QZZCFM 	<ol style="list-style-type: none"> 1. Test equipment connection is shown in fig. 3. 2. Playback standard recording level portion on test tape (QZZCFM 315 Hz, 0 V), and using VTVM measure the output level at LINE OUT. 3. Make measurement for both channels. <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>Standard value: 0.38 V ± 1 dB [around 0.42 V: at test points TP3 (L-CH) and TP4 (R-CH)]</p> </div> <p>Adjustment</p> <ol style="list-style-type: none"> 1. If measured value is not within standard, adjust VR1 (L-CH), VR2 (R-CH) (See fig. 1 on page 3). 2. After adjustment, check "Playback frequency response" again.
<p>Ⓕ Erase current</p> <p>Condition:</p> <ul style="list-style-type: none"> • Record mode • Metal tape mode <p>Equipment:</p> <ul style="list-style-type: none"> • VTVM • Oscilloscope 	<ol style="list-style-type: none"> 1. Test equipment connection is shown in fig. 10. 2. Place UNIT into Metal tape mode. 3. Press the record and pause buttons. 4. Read voltage on VTVM and calculate erase current by following formula: $\text{Erase current (A)} = \frac{\text{Voltage across both ends of R301}}{1 (\Omega)}$ <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>Standard value: 155 ± 15 mA (Metal position)</p> </div> <p>Adjustment</p> <ol style="list-style-type: none"> 5. If measured value is not within standard, adjust as follows. <p>Adjustment</p> <ol style="list-style-type: none"> 1. Open the point (A) and short the point (B) on the main circuit board in the circuit board diagram (See page 10). 2. Make measurement for erase current. 3. Make sure that the measured value is within the erase current of 140 mA to 170 mA. 4. If it is beyond the value, carry out the following adjustments: <ul style="list-style-type: none"> • If the erase current is less than 140 mA, short the point (A). • If the erase current is more than 170 mA, open the points (A) and (B). <p style="text-align: center;">Fig. 10</p> 
<p>Ⓖ Overall frequency response</p> <p>Condition:</p> <ul style="list-style-type: none"> • Record/playback mode • Normal tape mode • CrO₂ tape mode • Metal tape mode • Input level controls ... MAX • Output level control ... MAX 	<p>Note 1: 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>Note 2: 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;">Fig. 11</p> <p style="text-align: center;">Overall frequency response chart (Normal)</p>  <p style="text-align: center;">Former type tape New type tape Refer to note 2</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <p>✗</p> <p>✗</p> </div> <div> <p>This chart indicates the standard values for the new type of QZZCRA when in use.</p> <p>This chart indicates the standard values for the former type of QZZCRA when in use.</p> </div> </div> <p>The new type of QZZCRA is marked as shown in fig. 12.</p>

ITEM

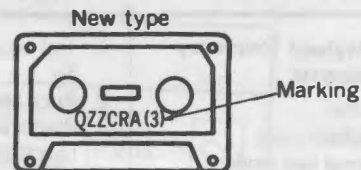
Equipment:

- VTVM
- AF oscillator
- AT T
- Oscilloscope
- Resistor (600Ω)
- Test tape (reference blank tape)
 - ...QZZCRA for Normal
 - ...QZZCRX for CrO₂
 - ...QZZCRZ for Metal

MEASUREMENT & 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 1 kHz, -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 ± 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, 1 kHz, 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 (A):

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

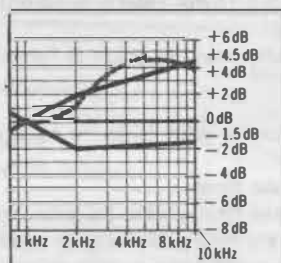


Fig. 14

- 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 CrO₂ tape mode.

9. Change test tape to QZZCRX, and record 50Hz, 100Hz, 200Hz, 500Hz, 1 kHz, 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 CrO₂ tapes (fig. 16).

Adjustment (B):

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

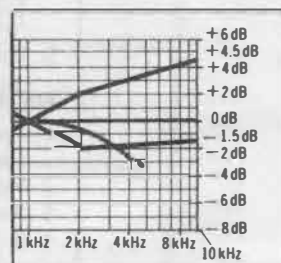


Fig. 15

- 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.

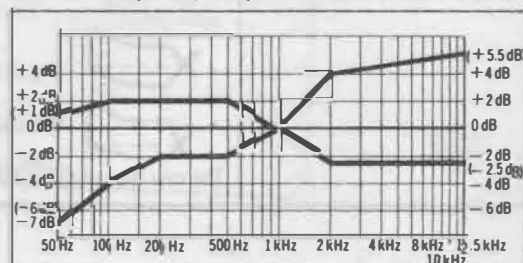
Overall frequency response chart (CrO₂, Metal)

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> <p>• Read voltage on VTVM and calculate bias current by following formula:</p> $\text{Bias current (A)} = \frac{\text{Value read on VTVM (V)}}{10 (\Omega)}$ <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>around 410μA (Normal position) around 545μA (CrO₂ position) around 800μA (Metal position) } : measured at TP1 (L-CH) and TP2 (R-CH)</p> </div>
<p>H Overall gain</p> <p>Condition:</p> <ul style="list-style-type: none"> • Record/playback mode • Normal tape mode • Input level controls ... MAX • Output level control ... MAX • Standard input level; MIC -72 \pm 4 dB LINE IN ... -24 \pm 4 dB <p>Equipment:</p> <ul style="list-style-type: none"> • VTVM • AF oscillator • ATT • Oscilloscope • Resistor (600Ω) • Test tape (reference blank tape) ... QZZCRA for Normal 	<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 1 kHz signal (-24 dB) from AF oscillator, through ATT to LINE IN.</p> <p>5. Adjust ATT until monitor level at LINE OUT becomes 0.4 V.</p> <p>6. Playback recorded tape, and make sure the value at LINE OUT on VTVM becomes 0.4 V.</p> <p>7. If measured value is not 0.4 V, adjust VR5 (L-CH), VR6 (R-CH) (See fig. 1 on page 4).</p> <p>8. Repeat from step (2).</p> <div data-bbox="985 588 1356 819"> </div> <p style="text-align: center;">Fig. 17</p>
<p>I Fluorescent meter</p> <p>Condition:</p> <ul style="list-style-type: none"> • Record mode • Input level controls ... MAX • Tape selector ... Normal position <p>Equipment:</p> <ul style="list-style-type: none"> • VTVM • AF oscillator • ATT • Resistor (600Ω) 	<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 1 kHz signal. (-24 dB) to the LINE IN then press the record button.</p> <p>4. Adjust the ATT so that the output level at LINE OUT becomes 0.4 V (The input level at this condition is termed the standard input level).</p> <p>5. Adjustment at "-20 dB":</p> <p>A. Adjust the ATT so that the input level is -20 dB below standard recording level.</p> <p>B. Adjust VR401 so that the -20 dB segment lights up in the -20 \pm 0.8 dB range (L-CH only) (See fig. 19).</p> <p>6. Adjustment at "0 dB":</p> <p>A. Adjust the ATT so that the output level at LINE OUT becomes 0.4 V. (The input level at this condition is termed the standard input level.)</p> <p>B. Adjust VR402 so that the +1 dB segment lights up in the 0 \pm 0.2 dB range of the standard input level (See fig. 20).</p> <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 10 dB higher than the standard input level (See fig. 21).</p> <div data-bbox="999 987 1342 1218"> </div>

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.)

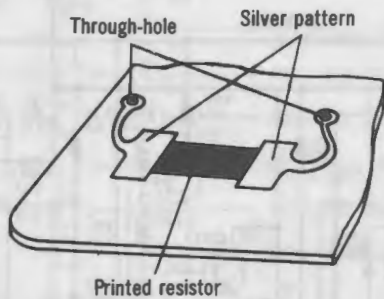


Fig. 1

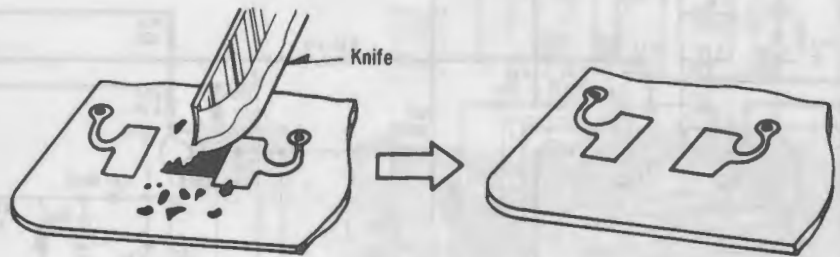


Fig. 2

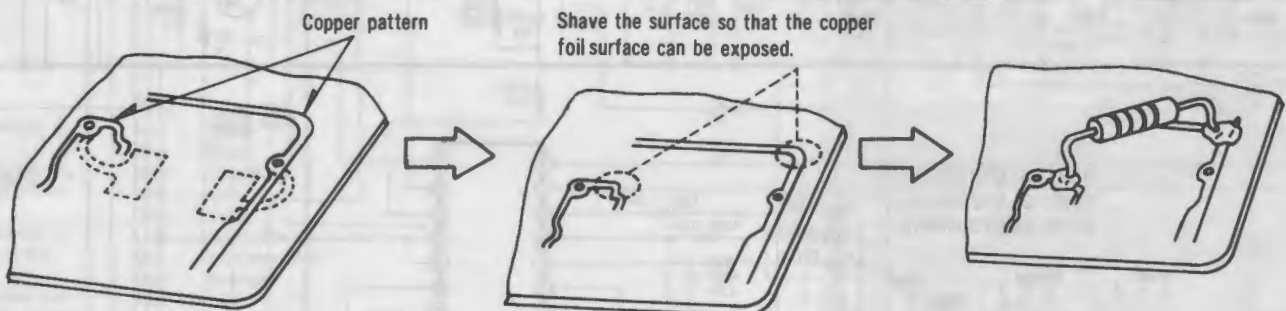
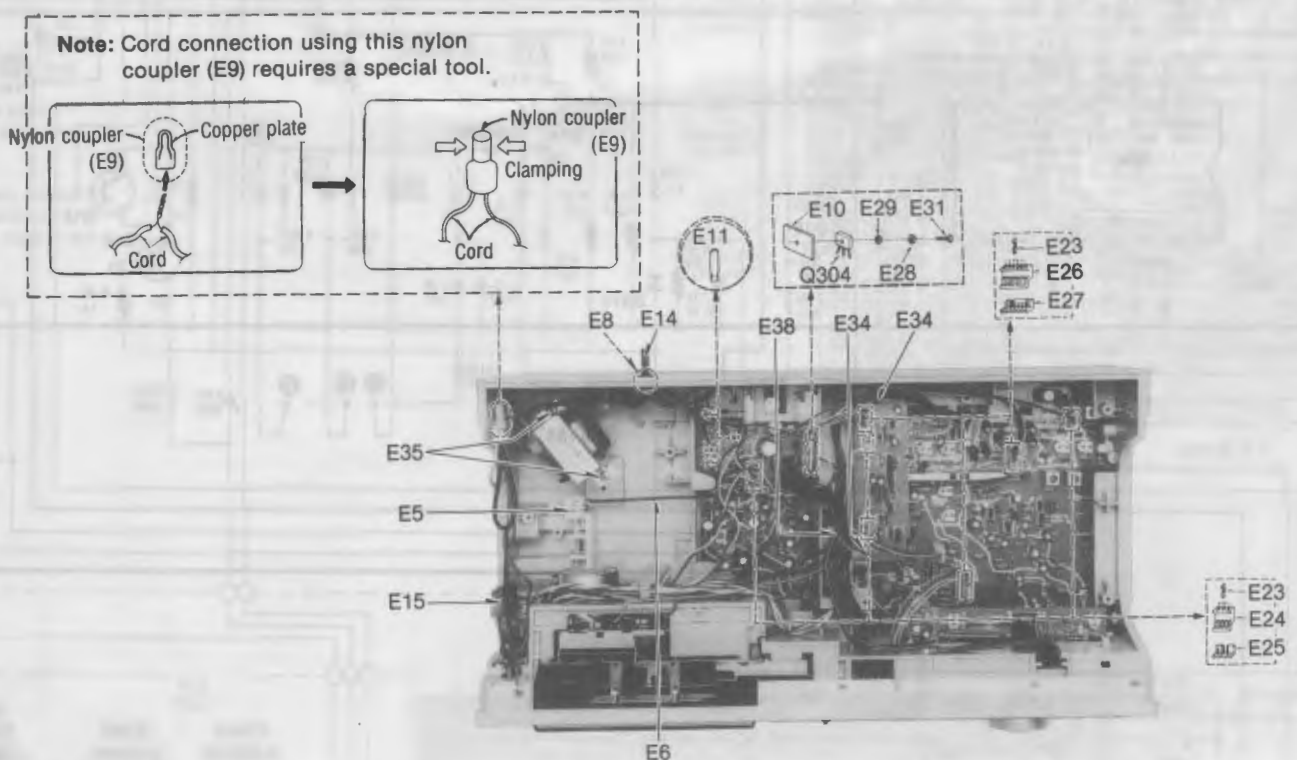
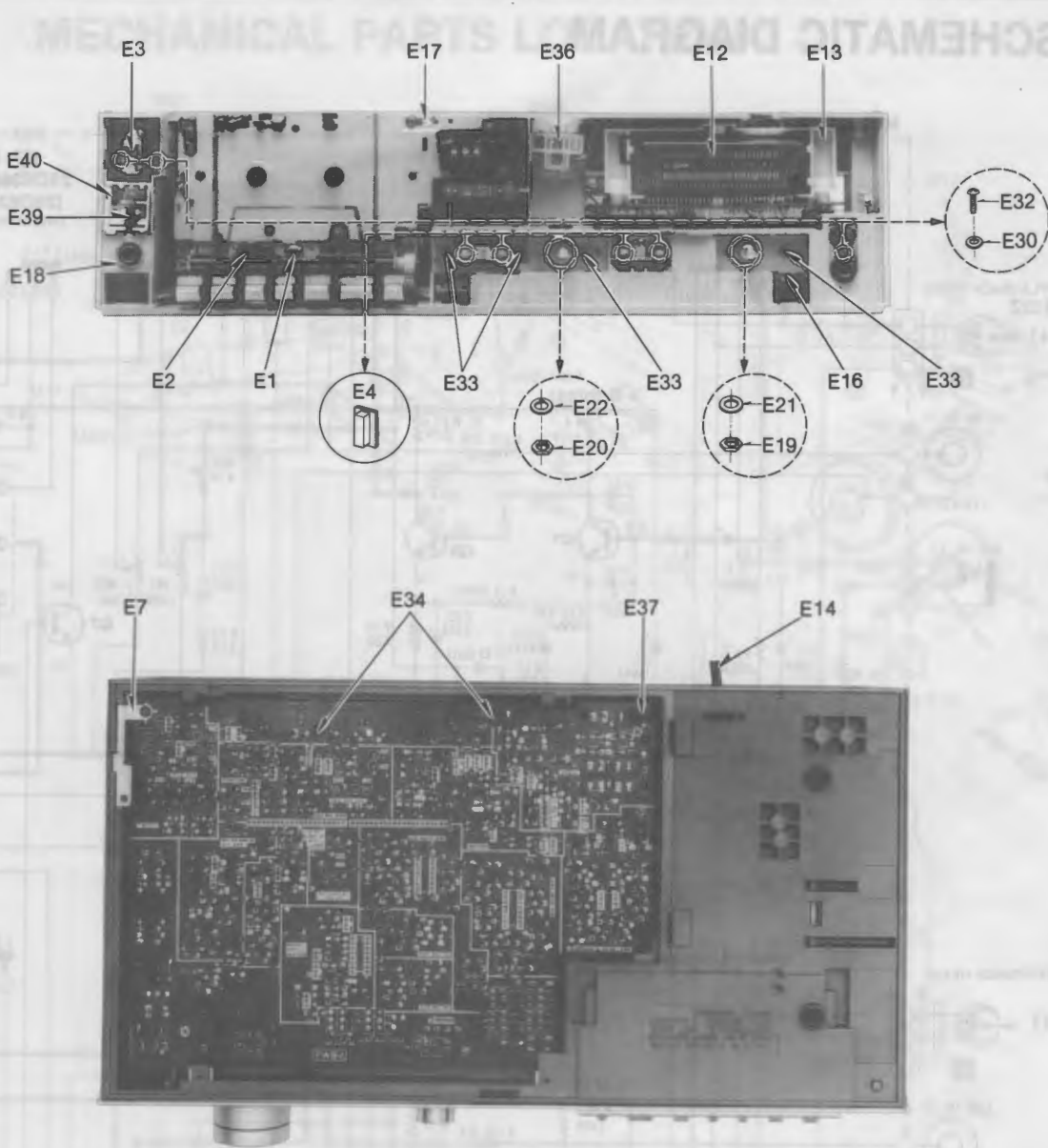


Fig. 3

ELECTRICAL PARTS LOCATION





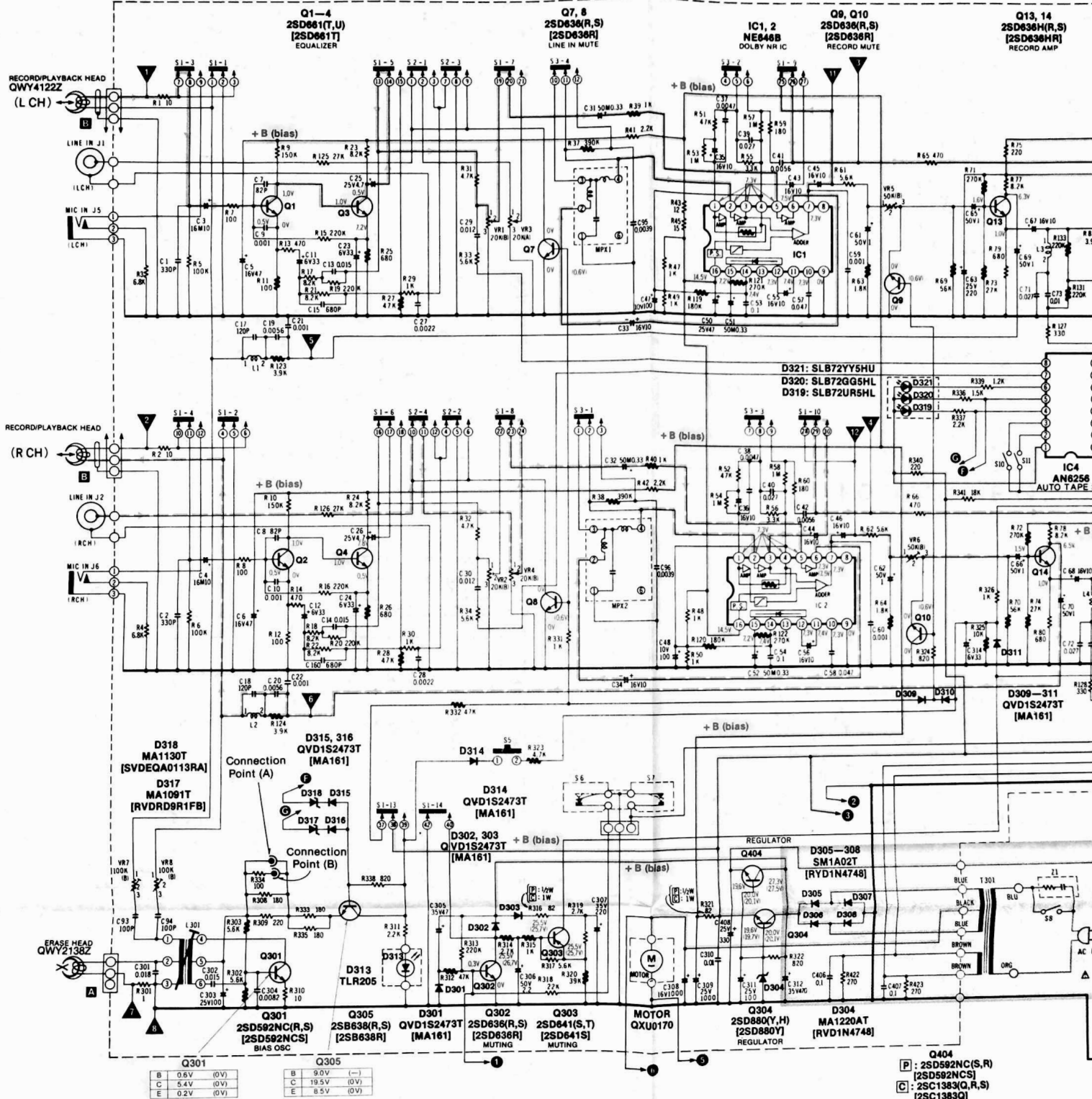
REPLACEMENT PARTS LIST

Important safety notice
Components identified by Δ 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
ELECTRICAL PARTS			E19	QNQ1039	Nut 9 ϕ
E1	QWY4122Z	Record/Playback Head	E20	QNQ1004	Nut 8 ϕ
E2	QWY2138Z	Erase Head	E21	QWQ1133	Washer 9 ϕ
E3	QGO1872	Push Button (Power ON/OFF)	E22	QWQ2002	Washer 8 ϕ
E4	QGO1727	Push Button (Input Select/Dolby NR/Rec Mute/Music Selector)	E23	QJT1054	Contact
E5	QML3664	Recording Lever	E24	QJS1921TN	3 Pin Socket
E6	QBS1130	Recording Wire	E25	QJP1921TN	3 Pin Post
E7	QJC0034	Earth Plate	E26	QJS1922TN	6 Pin Socket
E8	QTD1129	Cord Bushing	E27	QJP1922TN	6 Pin Post
E9	Δ QJT1029	Nylon Coupler	E28	XWA26B	Washer 2.6 ϕ
E10	QTH1156	Heat Sink (for Q304)	E29	XWG26	"
			E30	XWA3B	Washer 3 ϕ
E11	QJT1041	Check Pin	E31	XSN26+8	Screw \oplus 2.6 \times 8
E12	QSiFL001F	FL Meter	E32	XSN3+8S	Screw \oplus 3 \times 8
E13	QKJ0406	Meter Holder	E33	XTN3+8B	Tapping Screw \oplus 3 \times 8
E14	\boxtimes QFC1201MA	AC Power Cord	E34	XTN3+10B	Tapping Screw \oplus 3 \times 10
	\boxtimes For U.S.A.		E35	XTB4+10BFN	Screw \oplus 4 \times 10
	\boxtimes RJA9YA-K	AC Power Cord	E36	QKJ0473	LED Holder
	\boxtimes 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			(for Music Selector Illumination)
E18	QNQ1070	Nut 12 ϕ	E40	QKJ0440	Lamp Cover

SCHEMATIC DIAGRAM

MAIN AMP CIRCUIT BOARD



SPECIFICATIONS	
Playback S/N ratio Test tape ... QZZCFM	Greater than 45dB (without NAB filter)
Overall distortion Test tape ... QZZCRA for Normal ... QZZCRX for CrO ₂ ... QZZCRZ for Metal	Less than 4%
Overall S/N ratio Test tape ... QZZCRA	Greater than 43dB (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 OFF 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/GrO 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 controls, (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.

• 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 OFF 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/GrO 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 controls, (for normal tape mode).

• VR401: FL meter adjustment VR (for 20dB indication).

• VR402: FL meter adjustment VR (for 0 dB indication).

• VR403: FL meter adjustment VR (for 0 dB indication).

• VR404: FL meter adjustment VR (for 0 dB indication).

• VR405: FL meter adjustment VR (for 0 dB indication).

• VR406: FL meter adjustment VR (for 0 dB indication).

• VR407: FL meter adjustment VR (for 0 dB indication).

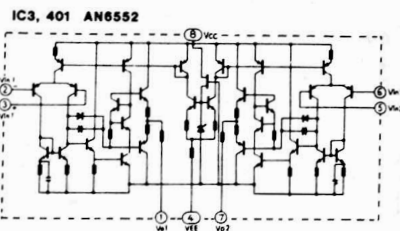
• VR408: FL meter adjustment VR (for 0 dB indication).

• VR409: FL meter adjustment VR (for 0 dB indication).

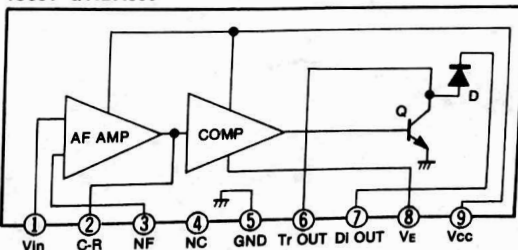
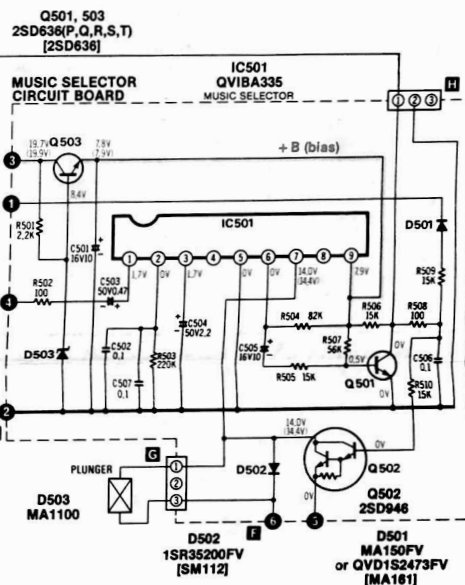
• VR410: FL meter adjustment VR (for 0 dB indication).

• All voltages are mode w/ However, from the For mea The circ Describe parts nu One type number e.g.

• The sup • P • Q



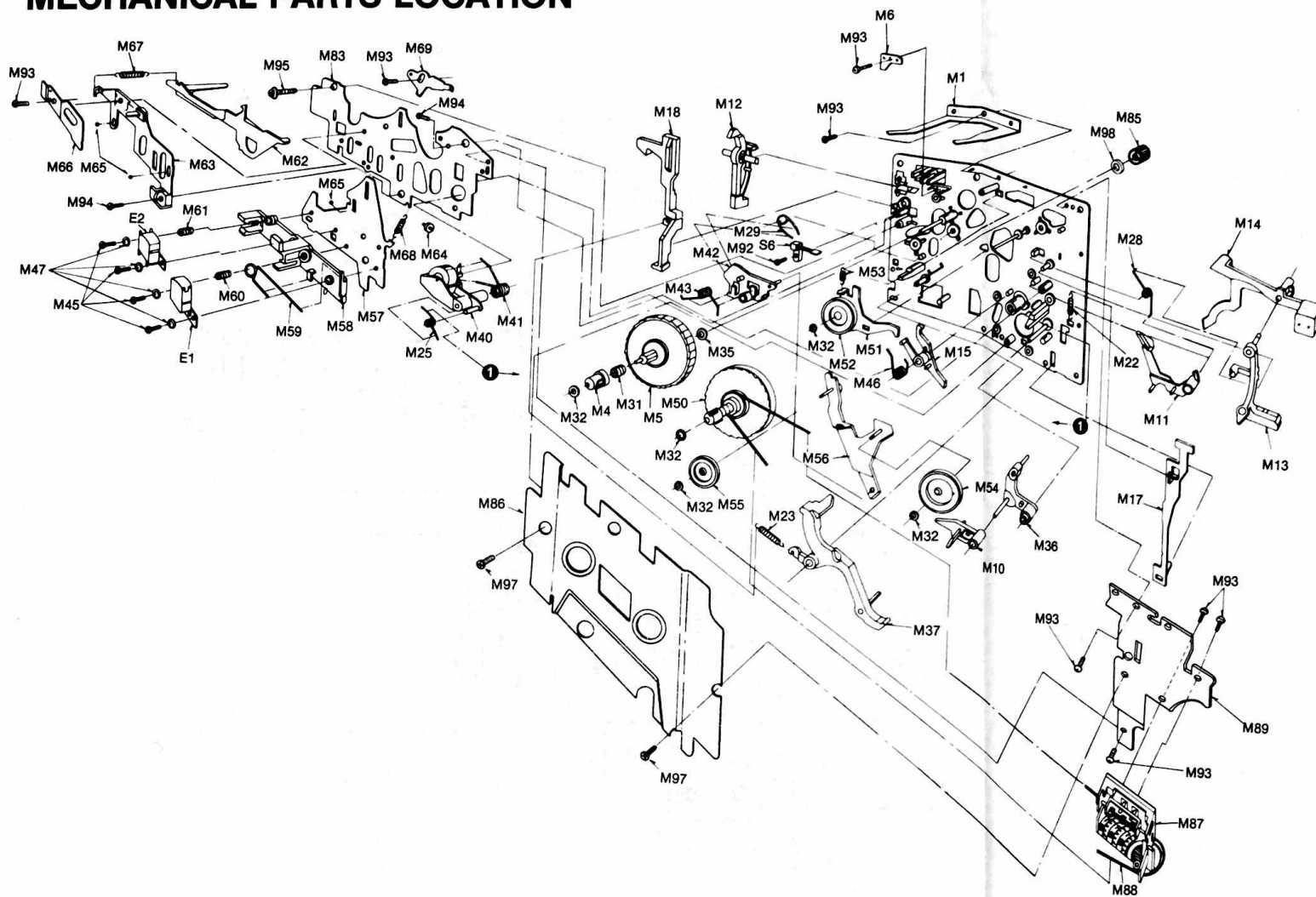
	Normal	CrO ₂	Metal
1	14.8 V (15.0 V)	14.3 V (14.4 V)	13.5 V (13.7 V)
2	0 V	1.9 V (2.3 V)	1.0 V
3	0 V	0 V	2.0 V (2.3 V)
4	0.2 V (0 V)	13.1 V (13.3 V)	12.3 V (12.5 V)
5	13.5 V (13.6 V)	0.1 V	12.2 V (12.3 V)
2	13.5 V (13.6 V)	13.0 V (13.2 V)	0.1 V
7	0 V	0 V	0 V
9	0.4 V	0 V	0 V
10	0.4 V	0 V	0 V
11	0 V	0.7 V	0.7 V
12	0 V	0 V	0 V
13	0 V	0 V	0 V
14	0 V	0.7 V	0.7 V
15	0.4 V	0 V	0 V
16	0.4 V	0 V	0 V



The diagrams show the following components and their pin configurations:

- Q15, 18, 301, 401:** A component with three pins labeled E, C, and B.
- Q304:** A component with three pins labeled E, C, and B.
- Q1-14, 17-19, 302, 303, 402-404:** A component with three pins labeled E, C, and B.
- D313, 319-321:** A component with two pins labeled A and C₂.

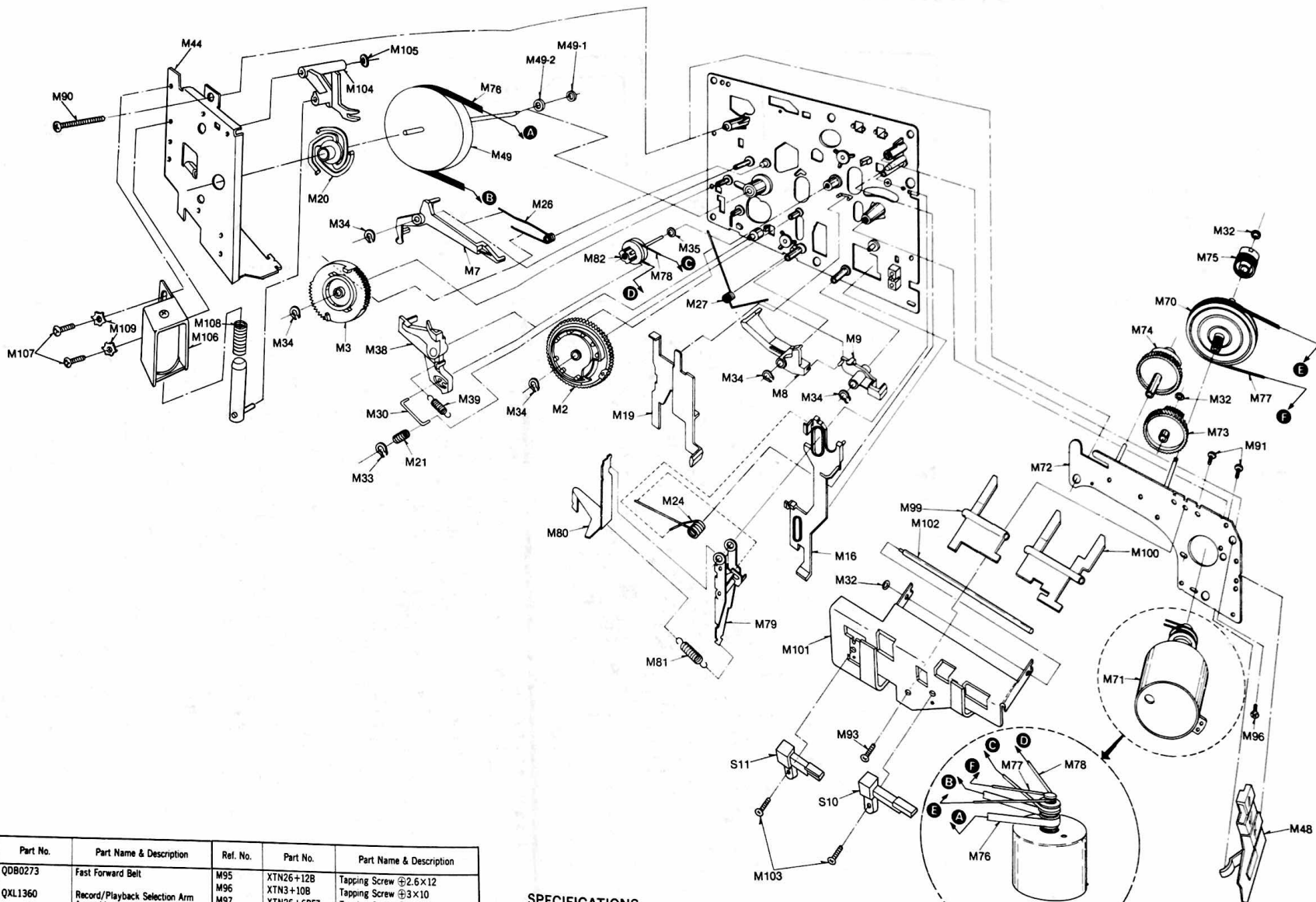
MECHANICAL PARTS LOCATION



REPLACEMENT PARTS LIST

Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
MECHANICAL PARTS					
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 4φ
M14	QML3605	Auto-Stop Detection Lever	M34	XUB3FT	Stop Ring 3φ
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	QML2139	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	QBCA0008	"
M45	XSN2+10	Screw ②×10	M62	QML3591	Brake Arm
M46	QBN1741	Change Lever Spring	M63	QML2140	Sub Head Base Plate
M47	XWG2	Washer 2φ	M64	QMN2550	Roller
M48	QMZ1254	Cord Clamper	M65	QDK1017	Steel Ball 2φ
M49	QXF0164	Flywheel Assembly	M66	QBP1873	Head Base Plate Pressure Spring
M49-1	QBW2049	Poly Washer	M67	QBT1597	Brake Arm Spring
M49-2	QBW2026	Snap Ring	M68	QBT1892	Head Release Spring
M50	QXD1143	Takeup Reel Table Assembly	M69	QMA3858	Head Adjustment Plate
M51	QXL1382	Idle Lever Assembly	M70	QXG1047	Takeup Gear Assembly
M52	QX10111	Takeup Idler Assembly	M71	QXU0170	Motor Assembly
M53	QBT1893	Takeup Idler Spring	M72	QXK2286	Sub Chassis Assembly
M54	QX10113	Fast Forward Idler Assembly	M73	QDG1199	Auto-Stop Gear
M55	QX10112	Reel Idler Assembly	M74	QDG1200	Cam Gear
M56	QXL1383	Fast Forward Arm Assembly	M75	QDP1823	Connection Pulley
M57	QMK1840	Head Base Plate	M76	QDB0281	Capstan Belt
M58	QMZ1241	Head Spacer	M77	QDB0274	Takeup Belt



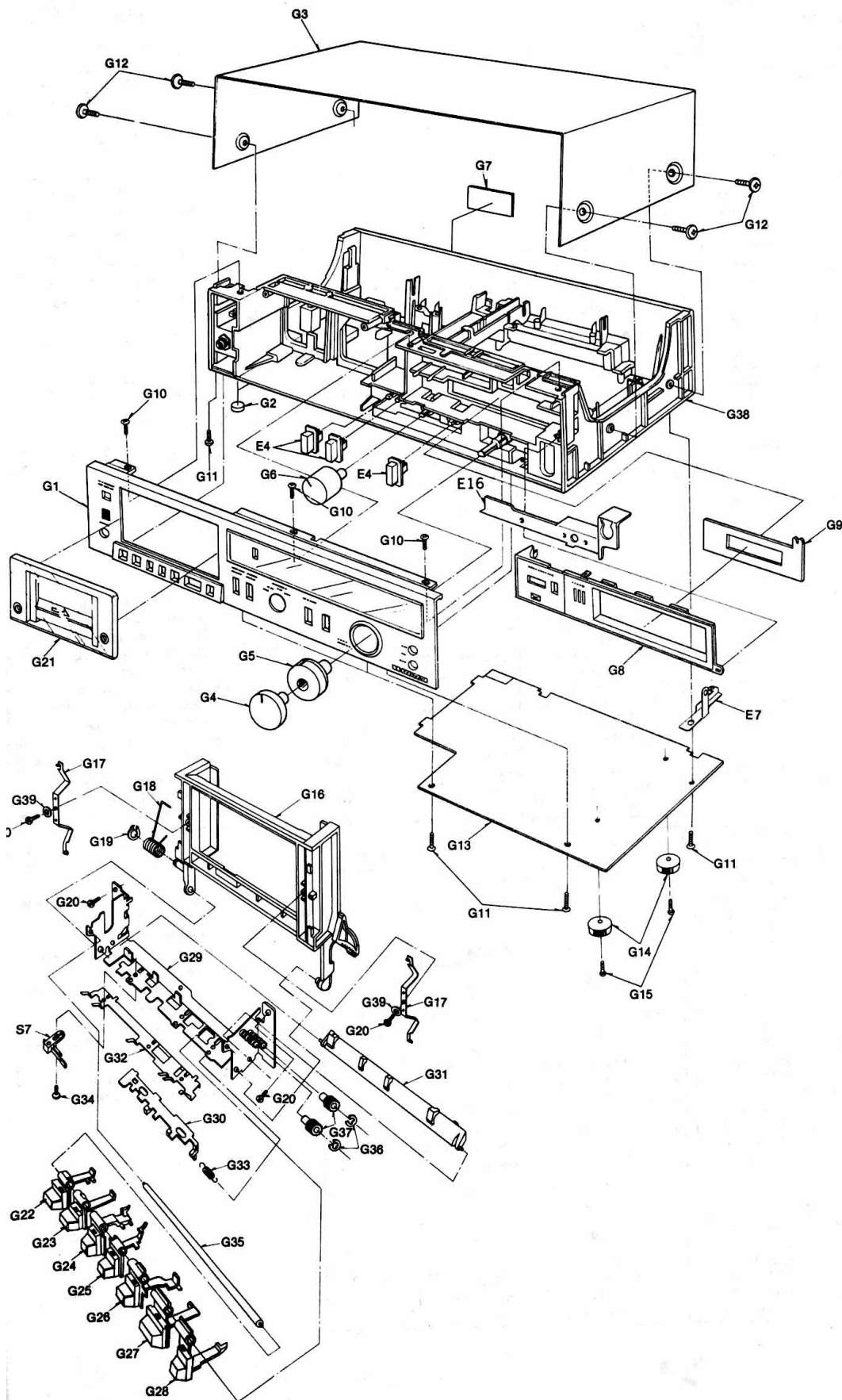
Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
QDB0273	Fast Forward Belt	M95	XTN26+12B	Tapping Screw $\varnothing 2.6 \times 12$
QXL1360	Record/Playback Selection Arm Assembly	M96	XTN3+10B	Tapping Screw $\varnothing 3 \times 10$
QML3580	Record/Playback Selection Lever	M97	XTN26+6BFZ	Tapping Screw $\varnothing 2.6 \times 6$
QBT1895	Record/Playback Selection Lever 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/CrO ₂ 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 $\varnothing 2 \times 5$
QDB0240	Counter Belt	M103	XSN2+5	Screw $\varnothing 2 \times 5$
QMA3860	Counter Angle	M104	QML3616	Lock Release Lever
XTN3+24B	Tapping Screw $\varnothing 3 \times 24$	M105	QBW2083	Washer
XSN26+3	Screw $\varnothing 2.6 \times 3$	M106	QME0157	Plunger
XTN2+6B	Tapping Screw $\varnothing 2 \times 6$	M107	XSN3+6S	Screw $\varnothing 3 \times 6$
XTN26+6B	Tapping Screw $\varnothing 2.6 \times 6$	M108	QBC1358	Plunger Spring
XTN26+10B	Tapping Screw $\varnothing 2.6 \times 10$	M109	XWC3B	Washer 3 ϕ

SPECIFICATIONS

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

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
CABINET PARTS		
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.		
G8	QGS2900	"
*For Canada.		
G8	QGK3154	Meter Cover
G9	QGL1159	Meter Filter
G10	XTS3+10B	Screw $\phi 3 \times 10$
G11	XTN3+10B	Tapping Screw $\phi 3 \times 10$
G12	XTB4+10BFN	Screw $\phi 4 \times 10$
G13	QGC1189	Bottom Cover
G14	QKA1083	Rubber Foot-B
G15	QH1299	Step Screw
G16	QKF6005K	Cassette Holder
G17	QBP1900	Holder Spring
G18	QBN7008	Eject Spring
G19	XUB5FT	Stop Ring 5ϕ
G20	XTN26+6BFZ	Tapping Screw $\phi 2.6 \times 6$
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 $\phi 2 \times 6$
G35	QMN2554	Operation Lever Shaft
G36	XUC4FT	Stop Ring 4ϕ
G37	QDG1102	Holder Gear
G38	QKM1454S	Main Case
G39	XWG26D6	Washer 2.6ϕ
ACCESSORIES		
A1	RP023A	Connection Cord
A2	QQT3061	Instruction Book
*For U.S.A.		
QQT3062		
*For Canada.		
PACKINGS		
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)

