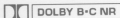


Service Manual

Cassette Deck
dbx/Dolby B • C NR-Equipped
Stereo Cassette Deck
RS-M234X
(Silver Face)



RS-M24 MECHANISM SERIES

Specifications

Track system:	4-track 2-channel stereo recording and playback	Fast forward and	rewind time: Approx. 90 seconds with C-60 cassette tape
Tape speed:	4.8 cm/s (1-7/8 ips)	Inputs:	MIC: sensitivity 0.25 mV, applicable microphone impedance 400Ω—10kΩ
Wow and flutter:	0.045% (WRMS)	Outputs:	LINE: sensitivity 60mV, input impedance 47kΩ or more
Frequency response:	Metal tape: 20—19,000 Hz 50—17,000 Hz ±3dB CrO ₂ tape: 20—18,000 Hz 50—16,000 Hz ±3dB Normal tape: 20—17,000 Hz 50—15,000 Hz ±3dB		LINE: output level 400mV, output impedance 1.5kΩ or less
Dynamic range:	110dB (at 1kHz) with dbx in		HEADPHONES: output level 80mV (at 8Ω) applicable headphone impedance 8Ω—600Ω
Max. input level	Improvement: 10dB or more improved with dbx in (at 1kHz)	Bias frequency:	80kHz
Signal-to-noise ratio:	dbx in: 92dB Dolby C NR in: 75dB (CCIR) Dolby B NR in: 67dB (CCIR) NR out: 57dB (Signal level = max. input level A weighted, CrO ₂ type tape)	Heads:	2-head system 1-MX head for record/playback 1-double-gap ferrite head for erasure
		Motor:	1-motor system
		Power requirements:	AC: 120V, 50-60Hz
		Power consumption:	18W
		Dimensions:	43cm(W)×10.9cm(H)×23.5cm(D) [16-7/8"(W)×4-5/16"(H)×9-1/4"(D)]
		Weight:	4.4kg (9 lbs 11 oz)

Design and specifications are subject to change without notice.

*The term dbx is a registered trademark of dbx Inc.

*"Dolby" and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

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DOLBY B-C NR

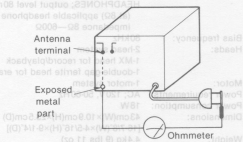
SAFETY PRECAUTIONS

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

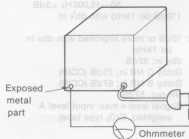
INSULATION RESISTANCE TEST

1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads, antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between $3M\Omega$ and $5.2M\Omega$ to all exposed parts. (Fig. 1) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. 2)

***Note:** Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. 1)

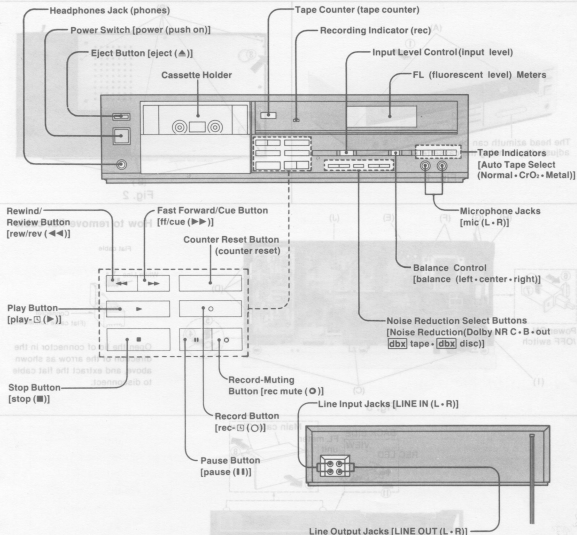
Resistance = $3M\Omega - 5.2M\Omega$ 

(Fig. 2)

Resistance = Approx ∞

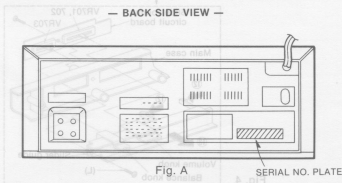
4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

LOCATION OF CONTROLS AND COMPONENTS



* Serial No. Indication.

The serial number plate of this product is attached to the main case (shown in Fig. A).



DISASSEMBLY INSTRUCTIONS

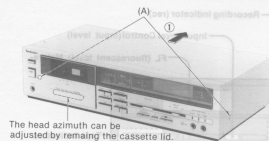


Fig. 1

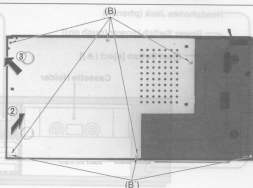
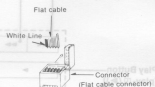


Fig. 2

How to remove flat cable



Open the lid of connector in the direction of the arrow as shown above, and extract the flat cable to disconnect.

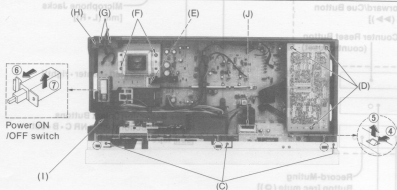


Fig. 3

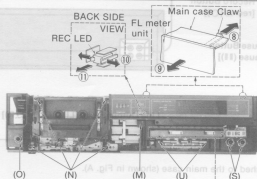
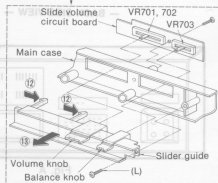


Fig. 4



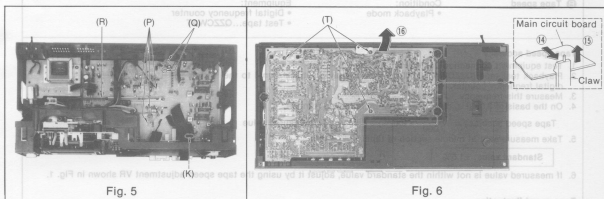


Fig. 5

Fig. 6

Ref No.	Procedure	To remove —	Remove —	Shown in fig. —
1	1	Main case	• 2 ornament screws(A) • As shown in fig. 1, pull the case cover in the direction of arrow ①.	1
2	2	Bottom cover	• 5 screws(B) • Raise the bottom cover in the direction indicated by arrow ②, then pull the bottom cover in the direction indicated by arrow ③.	2
3	1 → 3	Front panel assembly	• 3 screws(B') • 3 screws(C) • As shown in fig. 3, push the claw in the direction of arrow ④ lift the front panel in the direction of arrow ⑤.	3
4	1 → 4	dbx circuit board	• 3 red screws(D)	3
5	1 → 5	Power supply circuit board	• Connector (P)(E) • 2 red screws(F) • 2 screws(G) • Cord clammer(H) • Pull out the power switch rod(I) • As shown in fig. 3, push the claw in the direction of arrow ⑥, lift the power ON/OFF switch in the direction of arrow ⑦.	3
6	1 → 3 → 6	FL meter unit	• Connector (M)(J) • As shown in fig. 4, push the claw in the direction of arrow ⑧, pull the FL meter unit in the direction of arrow ⑨.	4
7	1 → 3 → 6 → 7	REC LED	• As shown in fig. 4, push the claw in the direction of arrow ⑩, pull the REC LED in the direction of arrow ⑪.	4
8	1 → 8	Slider guide	• Connector (V)(K) • Screw(L) • As shown in fig. 4, push the claw in the direction of arrow ⑫, pull the slider guide in the direction of arrow ⑬.	5
9	1 → 3 → 6 → 9	Mechanism unit	• Reset Lever(M) • 4 screws(N)	4
10	1 → 3 → 10	Headphones circuit board	• One Nut(O)	4
11	1 → 2 → 6 → 7 → 7 → 10 → 11	Main circuit board	• Pull out the connectors (A) (B) (C) (E)(P) • Connector (P)(E) • 3 screws(Q) • Connector (V)(K) • Pull out the connect pin(Q) • Record/playback connection wire(R) • 2 Nuts(S) • 3 red screws(T) • 2 screws(U) • As shown in fig. 6, push the claw in the direction of arrow ⑭, raise the main circuit board in the direction of arrow ⑮, then pull it in the direction of arrow ⑯.	6

Motor Unit Disassembly

1. Remove screw (A) and connection plate retainer (M107). Then remove fast forward connection plate (M104), rewind connection plate (M105) and record connection plate (M106) (see Fig. 1).
2. Remove three screws (B) and remove operation button unit (see Fig. 2).
3. Remove two screws (C) and hook at section (D) to dismount flywheel retainer (M44) (see Fig. 2).
4. Remove hook at section (E) and cord clasper (M48) (see Fig. 2), and then remove two screws (F) (see Fig. 3) to dismount motor unit.

Precautions for Mechanism Unit Assembly

Before installing the operation button unit in the mechanism unit, pull the play driving lever (M102) of the mechanism unit in the direction of the arrow until it is locked, and set the pause, F.F. and rewind buttons of the operation button unit to OFF. At this time, check that all parts are installed at their proper positions at sections (G), (H) and (I) (see Fig. 2).

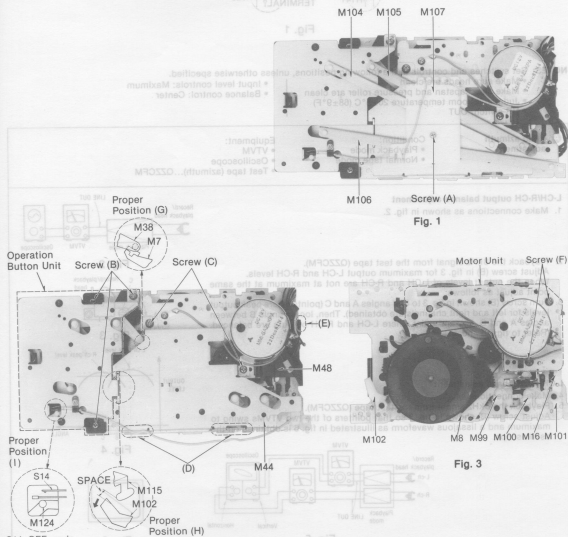


Fig. 2

Fig. 3

MEASUREMENT AND ADJUSTMENT METHODS

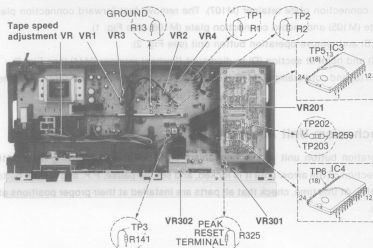


Fig. 1

NOTES: 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 $20 \pm 5^\circ\text{C}$ ($68 \pm 9^\circ\text{F}$)
- NR switch: OUT
- Input level controls: Maximum
- Balance control: Center

A Head azimuth adjustment

Condition:
• Playback mode
• Normal tape mode

Equipment:
• VTVM
• Oscilloscope
• Test tape (azimuth)...QZZCFM

L-CH/R-CH output balance adjustment

1. Make connections as shown in fig. 2.
2. Playback the 8kHz signal from the test tape (QZZCFM). Adjust screw (B) in fig. 3 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 point adjust as follows.
3. Turn screw (B) shown in fig. 3 to find angles A and C (points where peak output levels for left and right channels are obtained). Then, locate angle B between angles A and C, i.e., and point where L-CH and R-CH outputs are balanced. (Refer to figs. 3 and 4.)

L-CH/R-CH phase adjustment

4. Make connections as shown in fig. 5.
5. Playback the 8kHz signal from the test tape (QZZCFM). Adjust screw (B) shown in fig. 3 so that pointers of the two VTVMs swing to maximum and a lissajous waveform as illustrated in fig. 6 is obtained on the oscilloscope.

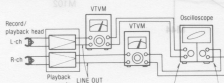


Fig. 5

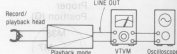


Fig. 2



Fig. 3

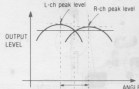


Fig. 4



Fig. 6

⑧ Tape speed

Condition:
• Playback mode

Equipment:
• Digital frequency counter
• Test tape...QZZCWAT

Tape speed accuracy

1. Test equipment connection is shown in fig. 7.
2. Playback test tape (QZZCWAT 3,000Hz), and supply playback signal to the digital frequency counter.
3. Measure this frequency.
4. On the basis of 3,000Hz, determine value by following formula:

$$\text{Tape speed accuracy} = \frac{f - 3,000}{3,000} \times 100(\%) \quad \text{where, } f = \text{measured value}$$
5. Take measurement at middle section of tape.

Standard value: $\pm 1.5\%$

6. If measured value is not within the standard value, adjust it by using the tape speed adjustment VR shown in Fig. 1.

Tape speed fluctuation

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:

$$\text{Tape speed fluctuation} = \frac{f_1 - f_2}{3,000} \times 100(\%) \quad f_1 = \text{maximum value, } f_2 = \text{minimum value}$$

Standard value: Less than 1%

NOTE:

Please use non metal type screwdriver when you adjust tape speed on this unit.

Do not use a metal type screwdriver. If used, the IC protector (ICP501) may be damaged, and the capstan motor may not be driven.

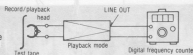


Fig. 7

⑨ Playback frequency response

Condition:
• Playback mode
• Normal tape mode

Equipment:
• VTVM
• Oscilloscope
• Test tape...QZZCFM

1. Test equipment connection is shown in fig. 2.
2. Playback the frequency response portion of test tape (QZZCFM).
3. 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.
4. Make measurements for both channels.
5. Make sure that the measured values are within the range specified in the frequency response chart. (Shown in fig. 8).

Playback frequency response

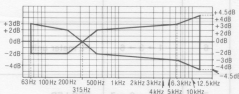


Fig. 8

⑩ Playback gain

Condition:
• Playback mode
• Normal tape mode

Equipment:
• VTVM
• Oscilloscope
• Test tape...QZZCFM

1. Test equipment connection is shown in fig. 2.
2. Playback standard recording level portion on test tape (QZZCFM 315Hz) and, using VTVM, measure the output level at test points (TP5 (L-CH), TP6 (R-CH)).
3. Make measurements for both channels.

Standard value: 0.28V [0.38 $\pm$ 0.05V: at LINE OUT jack]

Adjustment

1. If the measured value is not within standard the adjust VR1 (L-CH) or VR2 (R-CH) (See fig. 1).
2. After adjustment, check "Playback frequency response" again.

Erase current

- Condition:
- Record mode
 - Metal tape mode

Equipment:

- VTVM
- Oscilloscope

1. Test equipment connection is shown in fig. 9.
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:

$$\text{Erase current (A)} = \frac{\text{Voltage across resistor R131}}{1 (\Omega)}$$

Standard value: $155 \pm 15 \text{ mA (Metal)}$

5. If measured value is not within standard, adjust as follows.
- Adjustment**
1. Short the point (A) and open the point (B) on the main circuit board diagram (see page 19).
 2. Make measurement for erase current.
 3. Make sure that the measured value is within the erase current of 140mA to 170mA.
 4. If measured value is not within standard, short or open connection points (A) and (B) for adjustment (see table 1).

Reference value: around 70mA (Normal position)
around 90mA (CrO₂ position)

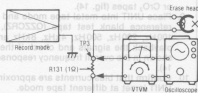


Fig. 9

		Connection point (A)	
		Open	Short
Connection point (B)	Open	+0.5dB	0dB
	Short	-0.3dB	-1.0dB

Table 1

Overall frequency response

- Condition:
- Record/playback mode
 - Normal tape mode
 - CrO₂ tape mode
 - Metal tape mode
 - Input level controls...MAX
 - Balance control...Center

Equipment:

- VTVM
- ATT
- AF oscillator
- Oscilloscope
- Resistor (600Ω)

- Test tape
(reference blank tape)
- ...QZCRA for Normal
 - ...QZCRX for CrO₂
 - ...QZCRZ for Metal

Note:

Before measuring and adjusting, the overall frequency response make sure of the playback frequency response (For the method of measurement, please refer to the playback frequency response).

(Recording equalizer is fixed)

1. Make connections as shown in fig. 10.
 2. Place UNIT into normal tape mode and insert the normal reference blank test tape (QZCRA).
 3. Supply a 1kHz signal from the AF oscillator through ATT to LINE IN.
 4. Adjust ATT so that input level is -20dB below standard recording level (standard recording level = 0 VU).
 5. Adjust the AF oscillator frequency to 1kHz, 50Hz, 100Hz, 200Hz, 500Hz, 4kHz, 8kHz and 10kHz signals, and record these signals on the test tape.
 6. 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 7, 8 and 9.)
- If the curve is not within the charted specifications, adjust as follows:

Adjustment (A):

When the curve exceeds the overall specified frequency response chart (fig. 11) as shown in fig. 12:

- 1) Increase bias current by turning VR101 (L-CH) and VR102 (R-CH). (See fig. 1 on page 7.)
- 2) Repeat steps 5 and 6 for confirmation. (Proceed to steps 7, 8 and 9 if the curve is now within the charted specifications as shown in fig. 11.)
- 3) If the curve still exceeds the specifications (fig. 11), increase bias current further and repeat steps 5 and 6.



Fig. 12

Adjustment (B):

When the curve falls below the overall specified frequency response chart (fig. 11) as shown in fig. 13:

- 1) Reduce bias current by turning VR101 (L-CH) and VR102 (R-CH).
- 2) Repeat steps 5 and 6 for confirmation. (Proceed to steps 7, 8 and 9 if the curve is now within the charted specifications as shown in fig. 11.)
- 3) If the curve still falls below the charted specifications (fig. 11), reduce bias current further and repeat steps 5 and 6.

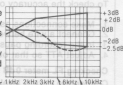


Fig. 13

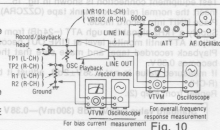


Fig. 10

Overall frequency response chart (Normal)

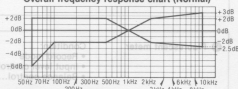


Fig. 11

• Adjustment for FL meter

1. Make connections as shown (See fig. 16).
2. Connect a wire between peak reset terminal and ground (see fig. 17).
3. In the recording pause mode, apply 1kHz (-24dB) to LINE IN.
4. Adjust ATT so that output level at LINE OUT is 0.38V.

-40dB adjustment

5. Adjust ATT so that the level adjusted at step 4 is reduced by 40dB.
6. At this time, check that -40dB indicator is dimmed (intermediate brightness between full brightness and light-out: See fig. 18).
7. If the indicator is not lighted halfway as described in step 6, adjust VR301.

0dB adjustment

8. Restore the condition of step 4 (set output level to 0.38V at LINE OUT).
9. At this time, check that 0dB indicator is dimmed (intermediate brightness between full brightness and light-out: See fig. 19).
10. If improper, adjust VR302.
11. Repeat adjustments at steps 4, 5, 6, 7, 8, 9 and 10 two or three times.
12. Disconnect the wire between peak reset terminal and ground, which had been connected at step 2.



Fig. 18



Fig. 19

① Dolby NR circuit

Condition:

- Record mode
- Dolby NR switch...IN/OUT
- Dolby NR select switch...B/C
- Input level controls...MAX

Equipment:

- VTVM
- ATT
- Resistor (600Ω)
- Balance control...Center

Record side

• Check of the Dolby-B type encoder characteristics

1. Make connections as shown in fig. 20.
2. Set the unit to the record mode. (NR select switch is OUT.)
3. Apply a 1kHz signal to LINE IN.
4. Adjust the ATT so that the output level at TP5 (L-CH) and TP6 (R-CH) is 12.3mV.
5. The output level at pin 14 should be 0dB.
6. Set the NR select switch to B, and make sure that the output signal level at pin 14 of IC3 (L-CH) and IC4 (R-CH) is $+6\text{dB} \pm 2.5\text{dB}$.
7. Set the NR select switch to OUT, and adjust the frequency to 5kHz. The output signal level at pin 14 should be 0dB.
8. Set the NR select switch to B and make sure that the output signal level at pin 14 of IC3 (L-CH) and IC4 (R-CH) is $+8\text{dB} \pm 2.5\text{dB}$.

• Check of Dolby-C type encoder characteristics

9. Repeat steps 1-5 above.
10. Set the NR select switch to C and make sure that the output signal level at pin 14 of IC3 (L-CH) and IC4 (R-CH) is $+11.5\text{dB} \pm 2.5\text{dB}$.
11. Set the NR select switch to OUT and adjust the frequency to 5kHz. The output signal at pin 14 should be 0dB.
12. Set the NR select switch to C and make sure that the output signal level at pin 14 of IC3 (L-CH) and IC4 (R-CH) is $+8.5\text{dB} \pm 2.5\text{dB}$.

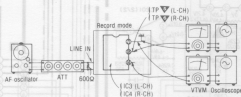


Fig. 20

② Attack recovery time adjustment (dbx circuit)

Condition:

- Record mode
- Input level control...MAX
- Balance control...Center

Equipment:

- VTVM
- ATT
- AF oscillator
- DC voltmeter
- Noise reduction selector ...dbx tape

1. Make the connections as shown in fig. 21 and apply 1kHz -27dB signal from LINE IN, and set the noise reduction selector to dbx tape position.
2. Set the unit to record mode, adjust ATT so that the signal level at C235 (L-CH) and C236 (R-CH) is 300mV.
3. Read voltage on DC voltmeter.

Reference value: 15±0.5mV

4. If measured values is not within reference, adjust VR201 (shown in fig. 1).

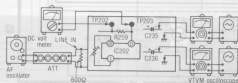
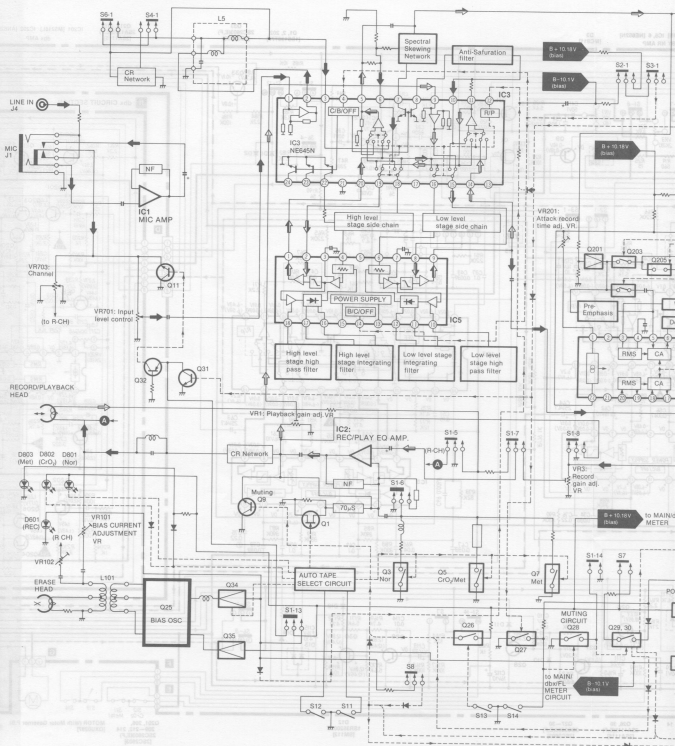
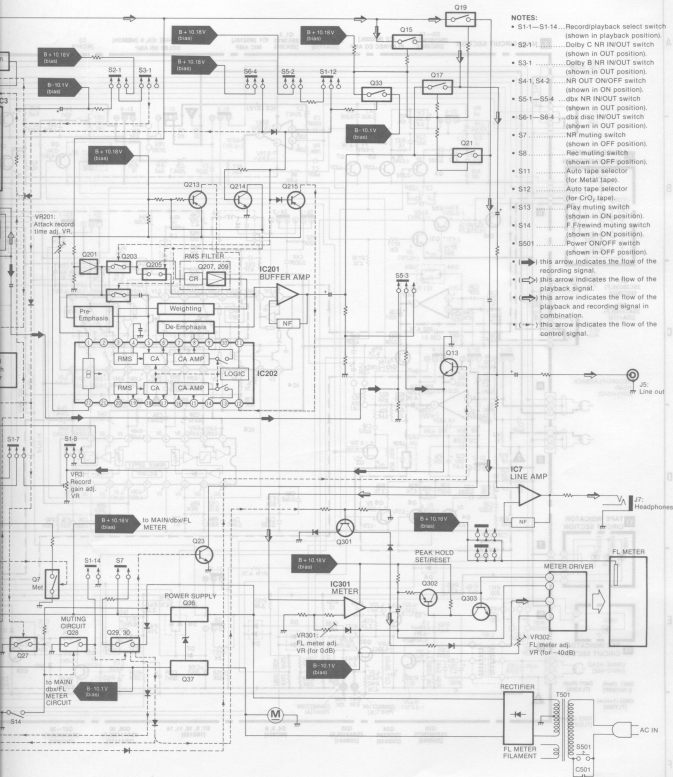


Fig. 21

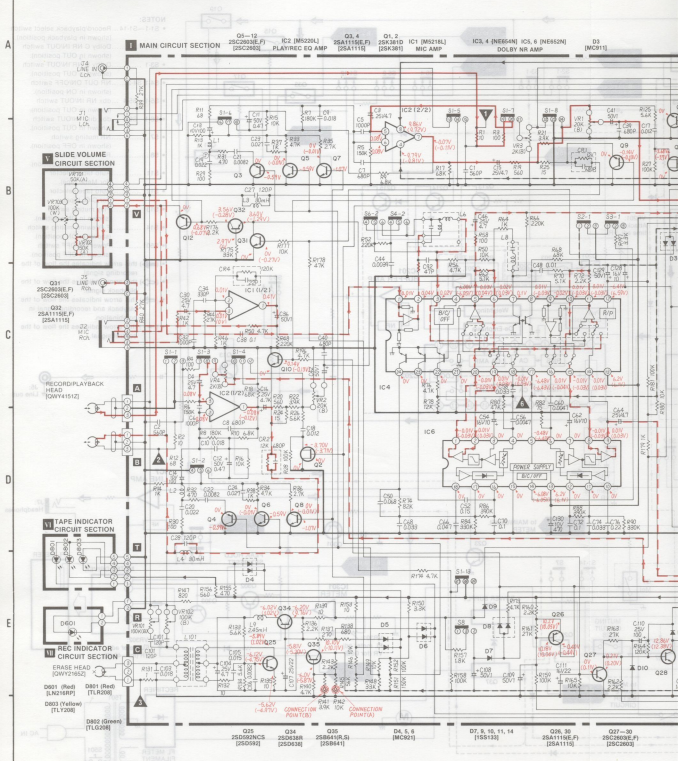
BLOCK DIAGRAM (L-CH only)

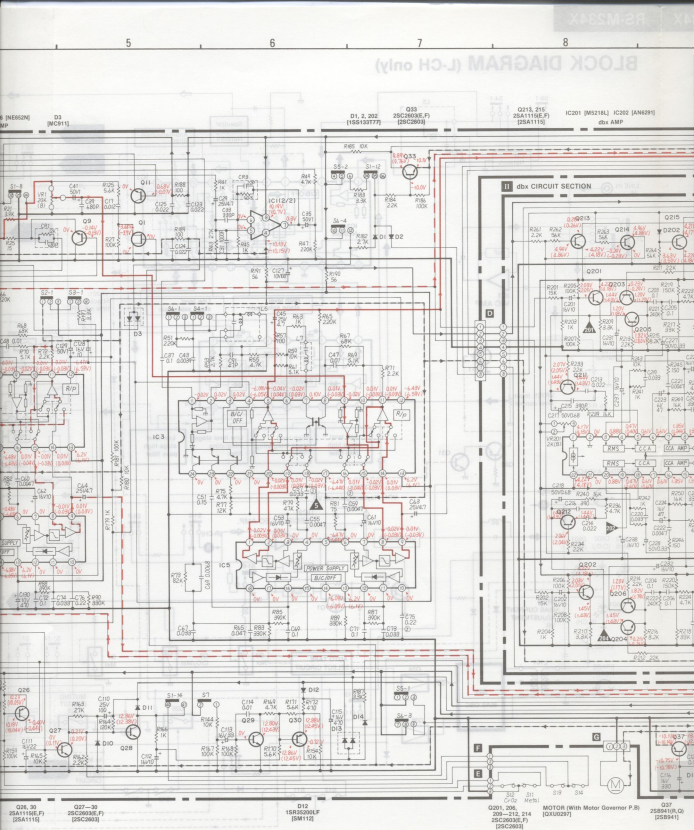


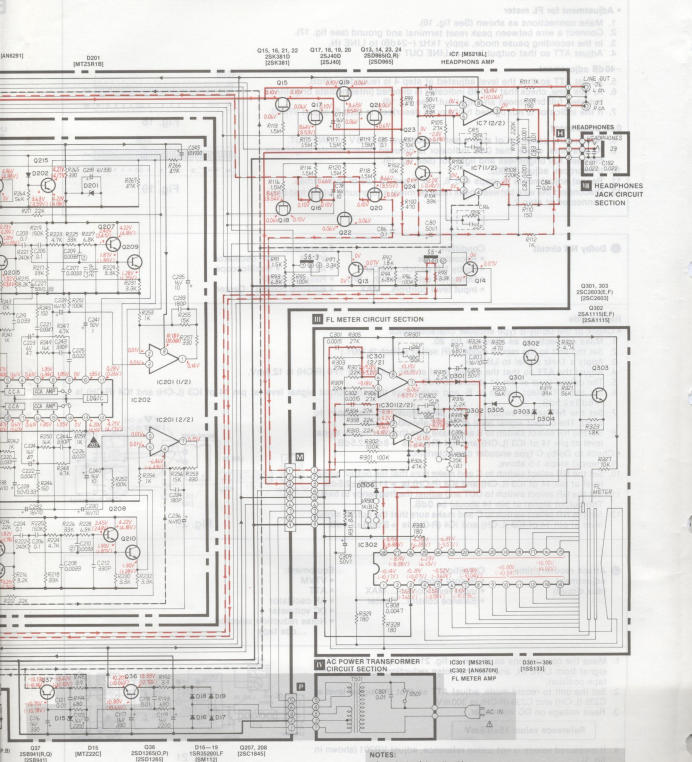
SCHEMATIC DIAGRAM



SCHEMATIC DIAGRAM







ELECTRICAL PARTS LIST

NOTES: RESISTORS

ERGCarbon
ERDMetal-oxide
ERSMetal-oxide
EROMetal-film
ERXMetal-film
ERQFuse type metallic
ERFSolid
ERFCement

CAPACITORS

ECBACeramic
ECGCCeramic
ECKDCeramic
ECDDCeramic
ECDFCeramic
ECFEPolyester film
ECOEPolymer film
ECOFPolypropylene

ECECElectrolytic
ECECNNon polar electrolytic
ECOSPolystyrene
ECSTTantalum
OCSTantalum
PSCPolyester film
PSCOEPolyester film
PSCOFPolypropylene

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.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.		
RESISTORS													
R 1, 2	ERD25FJ100	R 145	ERD25TJ563	R 259	ERD25FJ102	C 77, 78	ECBA1H100	Q 13, 14	25D965	DIODES & RECTIFIERS			
R 3, 4	ERD25TJ101	R 146	ERD25TJ562	R 261	ERD25TJ222	C 79, 80	ECEA5021	Q 15, 16	25K381				
R 5, 6	ERD25TJ154	R 147	ERD25TJ821	R 262, 263, 264	ERD25TJ222	C 81, 82	ECKD1H102KB	Q 17, 18, 19, 20	25J40				
R 7, 8	ERD25TJ184	R 148	ERD25TJ333	R 265	ERD25TJ563	C 83, 84	ECOE1H103FZ	Q 21, 22	25K381				
R 9, 10	ERD25TJ682	R 149	ERD25TJ333	R 266	ERD25TJ472	C 85, 86	ECOV05104JZ	Q 23, 24	25D965				
R 11, 12	ERD25TJ680	R 150	ERD25TJ154	R 267	ERD25TJ473	C 91, 92	ECOD1H470K	Q 25	25D962				
R 13	ERD25FJ102	R 152	ERD25TJ104	R 301, 302	ERD25TJ104	C 101, 102	ECKD1H121KB	Q 26	25A1115				
R 14	ERD25TJ102	R 153, 154	ERD25TJ103	R 303, 304, 305, 306	ERD25TJ104	C 103	ECQF1H83JZ	Q 27, 28, 29	25C2603E				
R 15, 16	ERD25TJ103	R 155	ERD25TJ471	R 307, 308, 309, 310	ERD25TJ273	C 104	ECEA1H121KB	Q 30	25A1115				
R 17, 18	ERD25TJ683	R 156	ERD25TJ561	R 311	ERD25TJ822	C 105	ECOM1H153JZ	Q 31	25A1115				
R 19, 20	ERD25TJ561	R 157	ERD25TJ182	R 312	ERD25TJ822	C 106	ECOM1H822JZ	Q 32	25C2603E				
R 21, 22	ERD25TJ392	R 158, 159	ERD25TJ104	R 313	ERD25TJ822	C 107	ECEA1E5220	Q 33	25A1115				
R 23, 24	ERD25TJ150	R 160	ERD25TJ273	R 315, 316	ERD25TJ222	C 108, 109	ECOE1H5220	Q 34	25D938				
R 25, 26	ERD25TJ562	R 161	ERD25TJ273	R 317, 318	ERD25TJ684	C 110	ECEA1E5101	Q 35	25B861				
R 27, 28	ERD25TJ102	R 162	ERD25TJ222	R 319	ERD25TJ380	C 111	ECEA1E5220	Q 36	25D1285C				
R 29, 30	ERD25TJ101	R 163	ERD25TJ173	R 320, 321	ERD25TJ683	C 112	ECEA1H5100	Q 37	25B841P				
R 31, 32	ERD25TJ471	R 164	ERD25TJ124	R 322	ERD25TJ1472	C 113	ECEA1E5330	Q 201, 202, 203, 204, 205, 206	25C2603E				
R 33, 34	ERD25TJ471	R 165	ERD25TJ103	R 323	ERD25TJ182	C 114	ECKD1H103FZ	Q 207, 208	25C1845				
R 35, 36	ERD25TJ472	R 166	ERD25TJ102	R 324	ERD25TJ684	C 115	ECEA1C5471	Q 209, 210, 211, 212	25C2603E				
R 37, 38	ERD25TJ102	R 167, 168	ERD25TJ104	R 325	ERD25FJ471	C 116, 117	ECOE1E5331	Q 209, 210, 211, 212	25C2603E				
R 39, 40	ERD25TJ273	R 169	ERD25TJ472	R 326	ERD25TJ473	C 118	ECBA1H103FZ	Q 213	25C2603E				
R 41, 42	ERD25TJ102	R 170, 171	ERD25TJ682	R 327	ERD25TJ103	C 119, 120	ECEA1H103FZ	Q 214	25C2603E				
R 43, 44	ERD25TJ273	R 172	ERD25TJ471	R 328, 329, 330	ERD25TJ181	C 121	ECOE1E5322	Q 215	25C2603E				
R 45, 46	ERD25TJ102	R 173, 174	ERD25TJ472	R 329	ERD25TJ333	C 123, 124	ECEA1H103FZ	Q 302	25A1115				
R 47, 48	ERD25TJ222	R 175	ERD25TJ222	VARIABLE RESISTORS									
R 49, 50	ERD25TJ472	R 176	ERD25TJ222	VR 1, 2	QVNB3A008223	C 127	ECEA1S101	Q 303	25C2603E				
R 51, 52	ERD25TJ224	R 177	ERD25TJ103	VR 3, 4	QVNB3A008104	C 128	ECEA1H5100	Q 304	25C2603E				
R 53, 54	ERD25TJ472	R 178	ERD25TJ473	VR 101, 102	QVNB3A009104	C 129	ECEA5021	Q 305	25C2603E				
R 55, 56	ERD25TJ472	R 179	ERD25TJ102	VR 201	EVNMA0A00823	C 130	ECEA1S471	Q 306	25C2603E				
R 57, 58	ERD25TJ101	R 180	ERD25TJ103	VR 301	QVNB3A008102	C 131, 132	ECKD1H103FZ	Q 307	25A1115				
R 59, 60	ERD25TJ103	R 181	ERD25TJ104	VR 302	QVNB3A008223	C 203, 204, 205, 206	ECOE1H104JZ	Q 308	25C2603E				
R 61, 62	ERD25TJ512	R 183	ERD25TJ332	VR 701, 702	QVBP1PU544	C 207, 208, 209, 210	ECOV05104JZ	Q 309	25C2603E				
R 63, 64	ERD25TJ102	R 184	ERD25TJ223	VR 703	QVALKRGU15								
R 65, 66	ERD25TJ224	R 185	ERD25TJ103	CAPACITORS									
R 67, 68	ERD25TJ683	R 186	ERD25TJ104	C 1, 2	ECKD1H561KB	C 211, 212	ECOD1H103FZ	L 1, 2	GLQX0332KWA			Peaking Coil	
R 69, 70	ERD25TJ512	R 187	ERD25TJ332	C 3, 4	ECEA25A47R	C 213, 214	ECOV05223JZ	L 3	GLQX03433KA			Blas Trap Coil	
R 71, 72	ERD25TJ222	R 188, 189	ERD25T101	C 5, 6	ECEA25A47R	C 215, 216	ECOD1H391JZ	L 6	GLQX03433KA			Multiplier Filter	
R 73, 74	ERD25TJ683	R 190, 191	ERG12S150P	C 7, 8	ECKD1H81KB	C 217, 218	ECEA1H0R6R	L 7	ELMT7306A			Steering Network	
R 75, 76	ERD25TJ472	R 192	ERX12S3J3R	C 9, 10	ECOM1H183JZ	C 219, 220	ECOV05333JZ	L 8	ELMT7306A			Steering Network	
R 77, 78	ERD25TJ123	R 193, 194	ERX12S3J3R	C 11, 12	ECEA502R47	C 221, 222	ECOM1H742JZ	L 9	GLQX0421Y			Peaking Coil	
R 79, 80	ERD25TJ473	R 195	Δ ERX12S3J3R	C 13, 14	ECEA1A5101	C 223, 224	ECEA1A5470	L 10	GLQX0421Y			Peaking Coil	
R 81, 82	ERD25TJ553	R 196	ERD25TJ472	C 15, 16	ECEA25A47R	C 225, 226	ECOV05223JZ	TRANSFORMER					
R 83, 84	ERD25TJ334	R 197	ERD25TJ472	C 17, 18	ECEA1H123JZ	C 227, 228	ECEA50M3R3J					T 501	QLPW26EKC
R 85, 86, 87, 88	ERD25TJ394	R 201, 202	ERD25S153	C 19, 20	ECOV05223JZ	C 229, 230, 231, 232	ECEA1H100	SWITCHES					
R 89, 90	ERD25TJ334	R 203, 204	ERD25TJ102	C 21, 22	ECOM1H822JZ	C 233, 234	ECOD1H181J					S 1	OSQ5203T
R 91, 92	ERD25TJ152	R 205, 206, 207, 208	ERD25T104	C 23, 24	ECOM1H273JZ	C 235, 236	ECEA1H5100	S 2, 3, 4, 5, 6, 7	GSW5X06			Combination Switch (Dolby C, Dolby B, NR Out, disc, disc & Disc Mixing)	
R 93, 94	ERD25TJ682	R 208, 209	ERD25F3332	C 25, 26	ECOD1H121KB	C 237, 238	ECEA1S101	S 8, 9, 10, 11, 12, 13, 14	GSW2236			Push Switch (REC Mu Switch)	
R 95, 96	ERD25TJ104	R 210, 211, 212, 213, 214	ERD25TJ223	C 27, 28	ECEA25A47R	C 239	ECEA1S331	JACKS					
R 97, 98	ERD25TJ332	R 215, 216	ERD25TJ382	C 29, 30	ECKD1H102KB	C 241	ECEA1S101					J 1, 2	QJAO268H
R 99, 100	ERD25TJ471	R 217, 218	ERD25TJ333	C 31, 32	ECKD1H331KB	C 243, 244	ECEA1S101	J 3	QJAO267			Headphones Jack	
R 101, 102	ERD25TJ103	R 219, 220	ERD25TJ273	C 33, 34	ECEA5021	C 245	ECEA1S101	J 4, 5, 6, 7, 8, 9, 10, 11, 12	JE5033			LINE IN/OUT Jack	
R 103, 104	ERD25TJ333	R 221, 222	ERD25TJ474	C 35, 36	ECEA5021	C 247	ECOM1H15JZ	CONNECTORS					
R 105, 106	ERD25TJ151	R 223, 224	ERD25TJ242	C 37, 38	ECOV05104JZ	C 249	ECEA1S101					CN 1	QJT0053
R 107, 108	ERD25TJ224	R 225, 226	ERD25TJ103	C 39, 40	ECEA1H103JZ	C 251	ECEA1S101	J 1, 2	QJAO268H			Microphone Jack	
R 109, 110	ERD25TJ101	R 227, 228	ERD25TJ682	C 41, 42	ECEA5021	C 253	ECEA1S101	J 3	QJAO267			Headphones Jack	
R 111, 112	ERD25TJ102	R 229, 230, 231, 232	ERD25TJ103	C 43, 44	ECOM1H392JZ	C 255	ECOV05154JZ	J 4, 5, 6, 7, 8, 9, 10, 11, 12	JE5033			LINE IN/OUT Jack	
R 113, 114, 115, 116, 117, 118, 119, 120	ERD25TJ155	R 233, 234	ERD25TJ332	C 45, 46	ECEA25A47R	C 257	ECEA1H100	CN 1	QJT0053			Pin Terminal	
R 121	ERD25FJ100	R 235, 236	ERD25TJ472	C 47, 48	ECEA1H103JZ	C 259	ECEA1H100	J 1, 2	QJAO268H			Microphone Jack	
R 122	ERD25TJ100	R 237, 238	ERD25TJ332	C 49, 50	ECOM1H683JZ	C 261	ECEA1H100	J 3	QJAO267			Headphones Jack	
R 123, 134	ERD25TJ562	R 239, 240	ERD25TJ163	C 51, 52	ECOV05154JZ	C 263	ECEA1H100	J 4, 5, 6, 7, 8, 9, 10, 11, 12	JE5033			LINE IN/OUT Jack	
R 135	ERD25TJ100	R 241, 242	ERD25TJ102	C 53, 54	ECEA1H5100	C 265	ECEA1H100	CN 1	QJT0053			Pin Terminal	
R 136	ERD25TJ222	R 243, 244	ERD25TJ103	C 55, 56	ECOM1H472JZ	C 267	ECEA1H100	J 1, 2	QJAO268H			Microphone Jack	
R 137	ERD25TJ271	R 245, 246	ERD25TJ151	C 57, 58	ECOM1H472JZ	C 269	ECEA1H100	J 3	QJAO267			Headphones Jack	
R 138	ERD25TJ681	R 247, 248	ERD25TJ151	C 59, 60	ECEA1H103JZ	C 271	ECEA1H100	J 4, 5, 6, 7, 8, 9, 10, 11, 12	JE5033			LINE IN/OUT Jack	
R 139	ERD25TJ100	R 249, 250	ERD25TJ151	C 61, 62	ECEA1H100	C 273	ECEA1H100	CN 1	QJT0053			Pin Terminal	
R 140	ERD25TJ472	R 251, 252	ERD25TJ104	C 63, 64	ECEA25A47R	C 275	ECEA1H100	J 1, 2	QJAO268H			Microphone Jack	
R 141	ERD25TJ382	R 253, 254	ERD25TJ102	C 65, 66	ECOV05473JZ	C 277	ECEA1H100	J 3	QJAO267			Headphones Jack	
R 142	ERD25TJ103	R 255, 256	ERD25TJ103	C 67, 68	ECEA1H103JZ	C 279	ECEA1H100	J 4, 5, 6, 7, 8, 9, 10, 11, 12	JE5033			LINE IN/OUT Jack	
R 143	ERD25TJ103	R 257, 258	ERD25TJ331	C 69, 70, 71, 72	ECOV05104JZ	C 281	ECEA1H100	CN 1	QJT0053			Pin Terminal	
R 144	ERD25TJ103	R 259, 260	ERD25TJ331	C 73, 74	ECEA1H103JZ	C 283	ECEA1H100	J 1, 2	QJAO268H	Microphone Jack			
R 145	ERD25TJ103	R 261, 262	ERD25TJ331	C 75, 76	ECOV05224JZ	C 285	ECEA1H100	J 3	QJAO267	Headphones Jack			
R 146	ERD25TJ103	R 263, 264	ERD25TJ331	C 77, 78	ECOV05333JZ	C 287	ECEA1H100	J 4, 5, 6, 7, 8, 9, 10, 11, 12	JE5033	LINE IN/OUT Jack			
R 147	ERD25TJ103	R 265, 266	ERD25TJ331	C 79, 80	ECOV05473JZ	C 289	ECEA1H100	CN 1	QJT0053	Pin Terminal			
R 148	ERD25TJ103	R 267, 268	ERD25TJ331	C 81, 82	ECEA1H103JZ	C 291	ECEA1H100	J 1, 2	QJAO268H	Microphone Jack			
R 149	ERD25TJ103	R 269, 270	ERD25TJ331	C 83, 84	ECOV05104JZ	C 293	ECEA1H100	J 3	QJAO267	Headphones Jack			
R 150	ERD25TJ103	R 271, 272	ERD25TJ331	C 85, 86	ECOV05224JZ	C 295	ECEA1H100	J 4, 5, 6, 7, 8, 9, 10, 11, 12	JE5033	LINE IN/OUT Jack			
R 151	ERD25TJ103	R 273, 274	ERD25TJ331	C 87, 88	ECOV05333JZ	C 297	ECEA1H100	CN 1	QJT0053	Pin Terminal			
R 152	ERD25TJ103	R 275, 276	ERD25TJ331	C 89, 90	ECOV05473JZ	C 299	ECEA1H100	J 1, 2	QJAO268H	Microphone Jack			
R 153	ERD25TJ103	R 277, 278	ERD25TJ331	C 91, 92	ECEA1H103JZ	C 301	ECEA1H100	J 3	QJAO267	Headphones Jack			
R 154	ERD25TJ103	R 279, 280	ERD25TJ331	C 93, 94	ECOV05104JZ	C 303	ECEA1H100	J 4, 5, 6, 7, 8, 9, 10, 11, 12	JE5033	LINE IN/OUT Jack			
R 155	ERD25TJ103	R 281, 282	ERD25TJ331	C 95, 96	ECOV05224JZ	C 305	ECEA1H100	CN 1	QJT0053	Pin Terminal			
R 156	ERD25TJ103	R 283, 284	ERD25TJ331	C 97, 98	ECOV05333JZ	C 307	ECEA1H100	J 1, 2	QJAO268H	Microphone Jack			
R 157	ERD25TJ103	R 285, 286	ERD25TJ331	C 99, 100	ECOV05473JZ	C 309	ECEA1H100	J 3	QJAO267	Headphones Jack			
R 158	ERD25TJ103	R 287, 288	ERD25TJ331	C 101, 102	ECEA1H103JZ	C 311	ECEA1H100	J 4, 5, 6, 7, 8, 9, 10, 11, 12	JE5033	LINE IN/OUT Jack			
R 159	ERD25TJ103	R 289, 290	ERD25TJ331	C 103, 104	ECOV05104JZ	C 313	ECEA1H100	CN 1	QJT0053	Pin Terminal			
R 160	ERD25TJ103	R 291, 292	ERD25TJ331	C 105, 106	ECOV05224JZ	C 315	ECEA1H100	J 1, 2	QJAO268H	Microphone Jack			
R 161	ERD25TJ103	R 293, 294	ERD25TJ331	C 107, 108	ECOV05333JZ	C 317	ECEA1H100	J 3	QJAO267	Headphones Jack			
R 162	ERD25TJ103	R 295, 296	ERD25TJ331	C 109, 110	ECOV05473JZ	C 319	ECEA1H100	J 4, 5, 6, 7, 8, 9, 10, 11, 12	JE5033	LINE IN/OUT Jack			
R 163	ERD25TJ103	R 297, 298	ERD25TJ331	C 111, 112	ECEA1H103JZ	C 321	ECEA1H100	CN 1	QJT0053	Pin Terminal			
R 164	ERD25TJ103	R 299, 300	ERD25TJ331	C 113, 114	ECOV05104JZ	C 323	ECEA1H100	J 1, 2	QJAO268H	Microphone Jack			
R 165	ERD25TJ103	R 301, 302	ERD25TJ331	C 115, 116	ECOV05224JZ	C 325	ECEA1H100	J 3	QJAO267	Headphones Jack			
R 166	ERD25TJ103	R 303, 304	ERD25TJ331	C 117, 118	ECOV05333JZ	C 327	ECEA1H100	J 4, 5, 6, 7, 8, 9, 10, 11, 12	JE5033	LINE IN/OUT Jack			

CIRCUIT BOARDS (for Main/dbx/FL Meter circuit boards)

I MAIN CIRCUIT BOARD

CONNECTOR I (to HEADPHONES JACK)

- 1 SIGNAL OUT (R-CH)
- 2 GROUND
- 3 SIGNAL OUT (L-CH)

CONNECTION POINT (B)

CONNECTION POINT (A)

LINE IN LINE OUT
(L-CH) (R-CH) (R-CH) (L-CH)

CONNECTOR II (to dbx CIRCUIT)

- 1 SIGNAL OUT (L-CH)
- 2 B + 6.18V (Bias)
- 3 SIGNAL OUT (R-CH)
- 4 GROUND
- 5 SIGNAL IN (L-CH)
- 6 B + 6.47V (Bias)
- 7 SIGNAL IN (R-CH)
- 8 DISC COMMAND SIGNAL OUT

CONNECTOR V (to SLIDE VOLUME CIRCUIT)

- 1 INPUT SIGNAL IN (R-CH)
- 2 INPUT SIGNAL OUT (R-CH)
- 3 GROUND
- 4 INPUT SIGNAL IN (L-CH)
- 5 INPUT SIGNAL OUT (L-CH)

CONNECTOR I (to TAPE INDICATOR CIRCUIT)

- 1 Normal COMMAND SIGNAL OUT
- 2 B + bias
- 3 C.O. COMMAND SIGNAL OUT
- 4 B + bias
- 5 GROUND

CONNECTOR II (to FL METER)

- 1 SIGNAL OUT
- 2 B + 10.15V (Bias)
- 3 SIGNAL OUT
- 4 B + 10.20V (Bias)
- 5 B + 10.20V (Bias)
- 6 METER MUTI
- 7 AC (50/60Hz)
- 8 AC (50/60Hz)
- 9 GROUND

CONNECTOR B (to REC/PLAY HEAD)

- 1 REC SIGNAL OUT (R-CH)
- 2 GROUND
- 3 REC SIGNAL OUT (L-CH)

CONNECTOR A (to REC/PLAY HEAD)

- 1 PLAY SIGNAL IN (R-CH)
- 2 GROUND
- 3 PLAY SIGNAL IN (L-CH)

CONNECTOR C (to ERASE HEAD)

- 1 ERASE CURR OUT
- 2 GROUND
- 3 ERASE CURR IN

CONNECTOR D (to LEAF SW (S13 & 14))

- 1 LEAF MUTE PULSE IN
- 2 GROUND
- 3 CUE/REV MUTE PULSE IN

CONNECTOR E (to LEAF SW (S11 & 12))

- 1 METAL COMMAND SIGNAL IN
- 2 C/O COMMAND SIGNAL IN
- 3 GROUND

CONNECTOR G (to MOTOR)

- 1 AC (50/60 Hz) bias
- 2 AC (50/60 Hz) bias
- 3 AC (50/60 Hz) bias

CONNECTOR R (to REC LED)

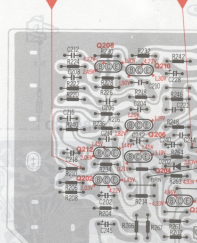
- 1 B+ bias
- 2 GROUND

CONNECTOR M (to FL METER CIRCUIT)

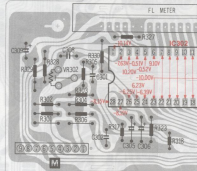
- 1 SIGNAL OUT (R-CH)
- 2 B+ 10.13V (bias)
- 3 SIGNAL OUT (L-CH)
- 4 B+ 10.20V (bias & dbx mode)
- 5 B+ 10.20V (bias)
- 6 METER MUTE SIGNAL OUT
- 7 AC (50/60 Hz) BIAS
- 8 AC (50/60 Hz) BIAS
- 9 GROUND

II dbx CIRCUIT BOARD

GROUND PLATE (to Case)

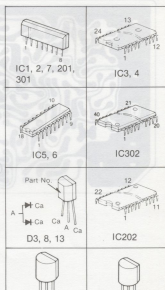


III FL METER CIRCUIT BOARD



NOTES:

- This circuit shown in the circuit on the back side of the printed circuit board.
- All voltage values shown in circuitry are under no signal playback mode with volume control at minimum position. For measurement, use YTVM.
- This circuit board diagram may be modified at any time with the development of new technology.



Q13, 14, 23—25,
207, 208



Q36. 37

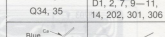
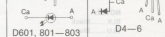


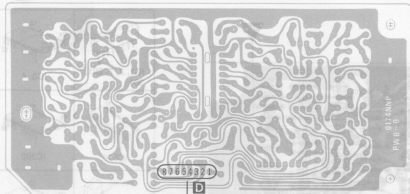
Diagram of the cable assembly showing the cable, connector, and part number.



	L5-8	L1-4
Blue	1.25	
White	THW	
Yellow	J2Y	

WIRING CONNECTION DIAGRAM

II dbx CIRCUIT BOARD



LUG TERMINAL
(to Mechanism Unit)



BLK

I MAIN CIRCUIT BOARD

VII HEADPHONES JACK
CIRCUIT BOARD

V SLIDE VOLUME CIRCUIT BOARD

VII TAPE INDICATOR
CIRCUIT BOARD

NOTES:

BLKBlack
BLUBlue
BRNBrown
GRYGray
GRNGreen
L BLULight Blue
NILNo Color Mark
ORGOrange
PNKPink
REDRed
SLDShield Wire
VLTViolet
WHTWhite
YELYellow

5
6
7
8

TERMINAL
chanism Unit)

EARTH PLATE-2
(to Main Case)

MAIN CIRCUIT BOARD

T
54321
D803 D802 D801
VI TAPE INDICATOR
CIRCUIT BOARD

WHT PNK
SLD
1 2 3
B

WHT PNK
SLD
1 2 3
A

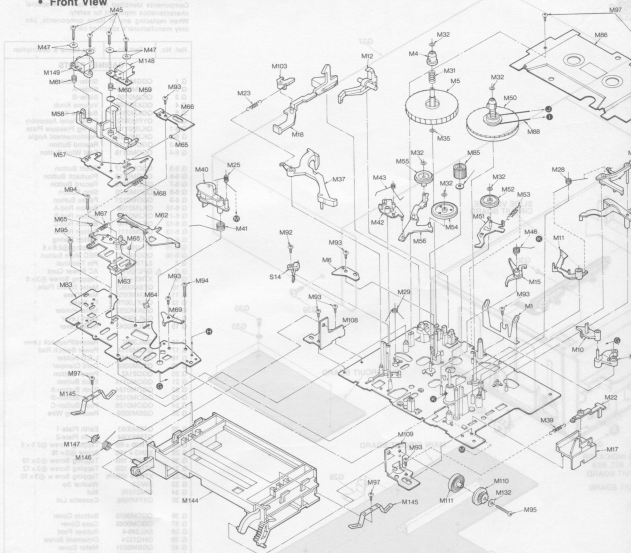
S12: CrO₂
DETECTION
SWITCH

III FL METER CIRCUIT BOARD

M 087654321

MECHANICAL PARTS LOCATION

• Front View



REPLACEMENT PARTS LIST

Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
MECHANICAL PARTS											
M 1	QBP1874	Cassette Pressure Spring	M 19	QMR2012	Control Rod	M 38	QML3882	Pause Change Lever	M 55	QX0112	
M 2	QDG1201	Main Gear	M 20	QMZ1283	Flywheel Thrust Retainer	M 39	QBT1682	Lock Retainer Spring	M 56	QXL1383	
M 3	QDG1202	Sub Gear	M 21	QBC1357	Lock Pin Pressure Spring	M 40	QXL1381	Pressure Roller Assembly	M 57	QMK1840	
M 4	QMB1336	Supply Reel Table Hub	M 22	QML3896	Auto-Stop Selection Lever	M 41	QBN1743	Pressure Roller Spring	M 58	QKM1247	
M 5	QDR1139	Supply Reel Table	M 23	QBT1962	Main Lever Spring	M 42	QML3558	Fast Forward Lever			
M 6	QMF2118	Fast Forward Arm Bracket	M 24	QBN1739	Selection Lever Spring	M 43	QBN1748	Fast Forward Spring	M 59	QBN1740	
M 7	QML3899	Sub Control Lever	M 25	QBN1742	Pressure Roller Release Spring	M 44	QMA4410	Flywheel Retainer	M 60	QBC1278	
M 8	QML3898	Main Control Lever	M 26	QBN1744	Sub Gear Spring	M 45	XSN2 + 10	Screw (2 x 10)	M 61	QBCA000	
M 9	QML3900	Record Operation Lever	M 27	QBN1897	Main Gear Spring	M 46	QBN1741	Change Lever Spring	M 62	QML3591	
M 10	QML3586	Head Base Plate Lift Lever	M 28	QBN1746	Auto-Stop Lever Spring	M 47	XW32	Washer 2ø	M 63	QNZ1240	
			M 29	QBN1747	Connection Spring	M 48	QMZ1254	Cord Clamper	M 64	QMN2550	
			M 30	QBS1137	Pause Lock Pin	M 49	QXF0199	Flywheel Assembly	M 65	QDK1017	
						M 49-1	GBW2049	Poly Washer	M 66	QBP1873	
M 11	QML3594	Auto-Stop Release Arm	M 31	QBC1372	Reel Table Spring	M 49-2	GBW2026	Snap Ring	M 67	QBT1597	
M 12	QML3603	Erase Safety Lever	M 32	QBW2008	Poly Washer	M 50	QXD1143	Takeup Reel Table Assembly	M 68	QBT1892	
M 13	QML3604	Auto-Stop Driving Lever	M 33	QBT1961	Operating Change Lever Spring						
M 14	QML3605	Auto-Stop Detection Lever				M 51	QXL1382	Idle Lever Assembly	M 69	QMA3858	
M 15	QML3592	Change Lever	M 34	XUB3FT	Stop Ring 3ø	M 52	QX0111	Takeup Idler Assembly	M 70	QZX0241	
M 16	QMR2013	Record Rod	M 35	QBW2012	Poly Washer	M 53	QBT1893	Takeup Idler Spring	M 71	QXU0297	
M 17	QMR2011	Auto-Stop Connection Rod	M 36	QXL1354	Sub Lever Assembly	M 54	QX0113	Fast Forward Idler Assembly	M 72	QXK2386	
M 18	QMR2014	Eject Rod	M 37	QXL1355	Main Lever Assembly				M 73	QDG1199	