

Service Manual

Cassette Deck
RS-616

Front-Loading Vertical Hold High Fidelity Stereo
Cassette Deck with Rewind Auto Play System



RS-631 MECHANISM SERIES

Specifications (Catalog specifications for sales)

Power requirement: AC; 110/125/220/240V, 50/60Hz
Preset power voltage; 220V for Europe, 125V for Asia

Power consumption; 10W

Motor: Electronic control DC motor

Track system: 4-track 2-channel stereo recording and playback

Tape speed: 4.8 cm/s (1-7/8 ips.)

Wow and flutter: 0.07% (WRMS), 0.2% (DIN)

Frequency response: CrO₂/FeCr tape; 30 ~ 16,000Hz
30 ~ 14,000Hz (DIN)

Normal tape; 30 ~ 14,000Hz
30 ~ 13,000Hz (DIN)

Signal-to-noise ratio: Dolby* NR in; 66 dB (above 5 kHz)

Dolby NR out; 56 dB

(signal level = max. recording level, FeCr or CrO₂ type tape)

Fast forward and

rewind time: Approx. 90 seconds with C-60 cassette tape

Input: MIC; sensitivity 0.25 mV, input impedance 10 K Ω ,
applicable microphone impedance 400 Ω ~ 10 K Ω

LINE; sensitivity 60 mV, input impedance 56 K Ω

Output: LINE; output level 420 mV, load impedance
22 K Ω over

HEADPHONE; output level 65 mV, impedance 8 Ω

Rec/pb connection: 5 P DIN type; input level 8 mV, impedance 5.6 K Ω ,
output level 420 mV, impedance 1 K Ω

Bias frequency: 90 kHz

Head: 2-head system

1-LH head for record/playback

1-double-gap ferrite head for erasure

Dimensions: 46 cm(W) $\times$ 15 cm(H) $\times$ 27.1 cm(D)
[18"(W) $\times$ 6"(H) $\times$ 10-3/4"(D)]

Weight: 5.2 kg (11 lbs 8 oz)

Specifications are subject to change without notice.

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

Technics

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Matsushita Electric Industrial Co., Ltd.
17-15, 6-chome, Shinbashi, Minato-ku, Tokyo 105 Japan

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Chitral Osaka Japan

LOCATION OF CONTROLS AND COMPONENTS

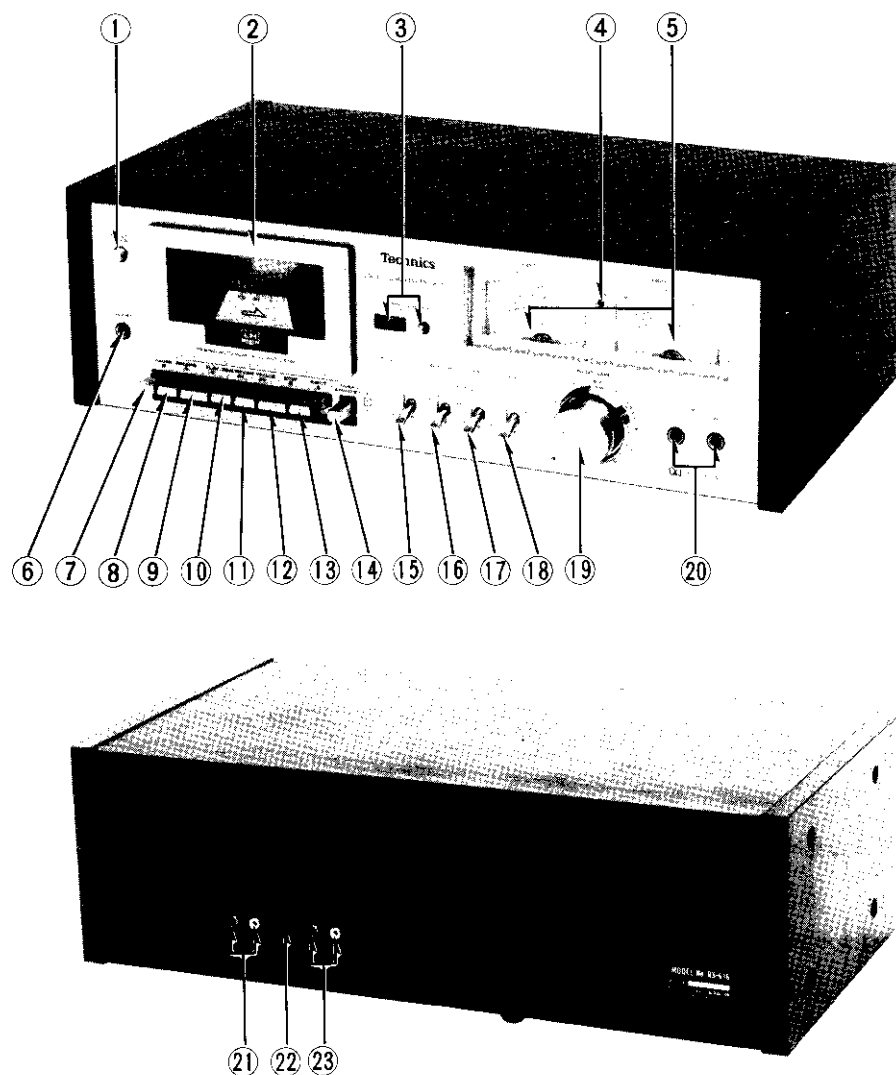


Fig. 1

- | | |
|---------------------------------|-------------------------------------|
| ① Power switch | ⑬ Eject button |
| ② Cassette compartment door | ⑭ Timer stand-by button |
| ③ Tape counter and reset button | ⑮ Input selector |
| ④ Recording indication lamp | ⑯ Dolby noise-reduction switch |
| ⑤ Level meters | ⑰ Bias selector |
| ⑥ Headphones jack | ⑱ Equalization selector |
| ⑦ Pause button | ⑲ Input level controls |
| ⑧ Record button | ⑳ Microphone jacks |
| ⑨ Play button | ㉑ Line output jacks |
| ⑩ Rewind/review button | ㉒ Record/playback connection socket |
| ⑪ Fast forward/cue button | ㉓ Line input jacks |
| ⑫ Stop button | |

DISASSEMBLY INSTRUCTIONS

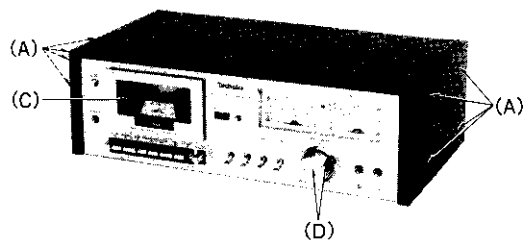


Fig. 2

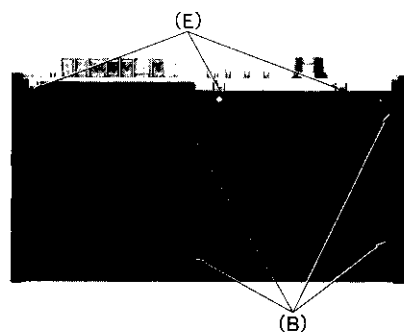


Fig. 3

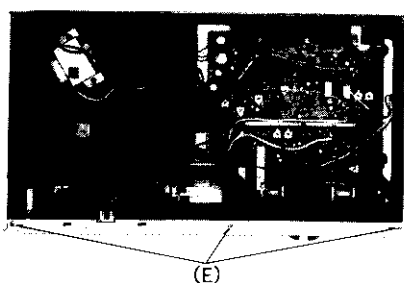


Fig. 4

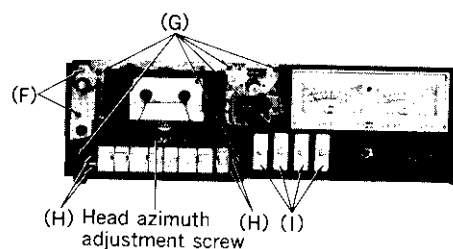


Fig. 5

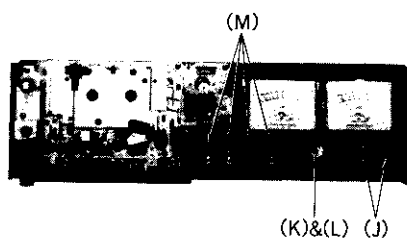


Fig. 6

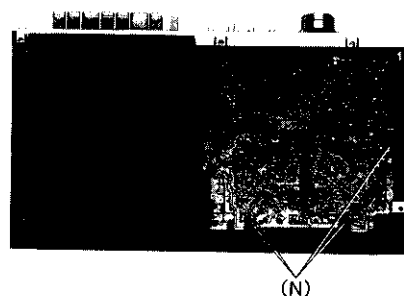


Fig. 7

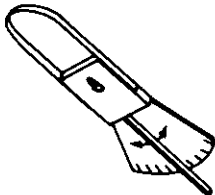
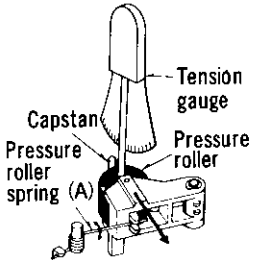
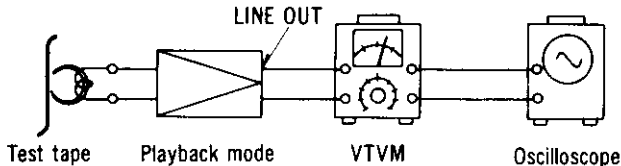
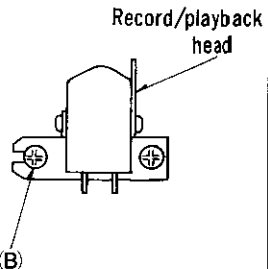
Procedure	To remove —	Remove —	Pcs.	Shown in fig. —
1	Case cover	• Screws (A)	8	2
2	Bottom cover	• Screws (B)	4	3
3	Front panel	• Cassette lid (C) ※ • Control knobs (D) • Screws (E)	1 2 6	2 2 3, 4
4	Mechanism	• Screws (F) • Red screws (G)	2 6	5 5
5	Operation button unit and cassette holder	• Screws (H)	4	5
6	Circuit board	• Switch shelters (I) • Nuts (J) • Nuts and washer (K), (L) • Screws (M) • Screws (N)	4 2 1, 1 4 4	5 6 6 6 7

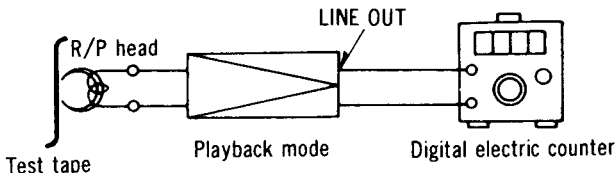
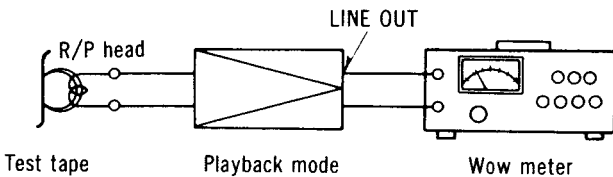
※The head azimuth can be adjusted by removing the cassette lid (C).

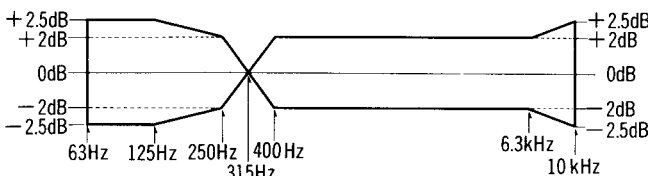
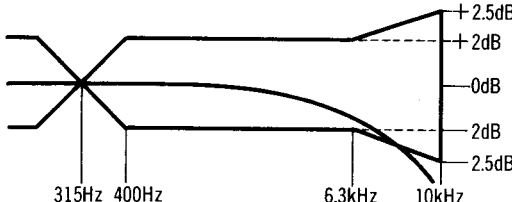
MEASUREMENT AND ADJUSTMENT METHOD

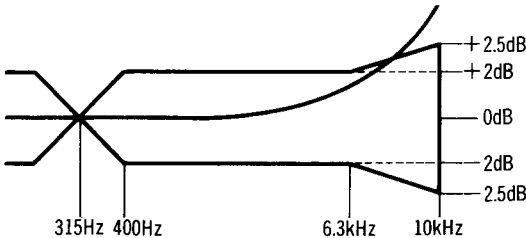
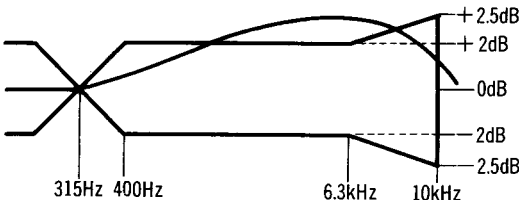
NOTE:

1. Make sure heads are clean.
2. Make sure capstan and pressure roller are clean.
3. Judgeable room temperature: $20 \pm 5^{\circ}\text{C}$ ($68 \pm 9^{\circ}\text{F}$).
4. Dolby NR switch: OUT.
5. Bias selector: LOW.
6. Equalizer selector: $120\mu\text{S}$.

ITEM	MEASUREMENT & ADJUSTMENT	REMARKS
Pressure of pressure roller Equipment: * Tension gauge (max. 500 gr)  Fig. 8	1. Place UNIT into playback mode. 2. Hook the tension gauge to pressure roller lever and pull it in the direction of the arrow as shown in fig. 9. 3. Measure the tension at the moment when the pressure roller moves away from the capstan. Standard value: 400 ± 50 gr Adjustment method Bend the part (A) of the pressure roller spring in either direction shown by the arrow until the correct pressure is attained.	* Playback mode  Fig. 9
Takeup tension Equipment: * Cassette torque meter ... QZZSRKCT	1. Mount cassette torque meter on UNIT. 2. Place UNIT into playback mode and read takeup torque. 3. Measure several times and determine the mean value. Standard value: 50 ± 20 gr-cm	* Playback mode
Head azimuth adjustment Equipment: * VTVM * Oscilloscope * Test tape (azimuth) ... QZZCFM	Record/playback head adjustment 1. Test equipment connection is shown below.  Fig. 10 2. Play azimuth tape (QZZCFM 8kHz). 3. Adjust record/playback head angle adjustment screw (B) in fig. 11 so that output level at LINE OUT becomes maximum. 4. Measure both channels, and adjust levels for equal output. 5. After adjustment lock head adjustment screw with lacquer.	* Playback mode  Fig. 11

ITEM	MEASUREMENT & ADJUSTMENT	REMARKS
Tape speed Equipment: * Digital electronic counter or frequency counter (RP8067) * Test tape ... QZZCWAT	Tape speed accuracy 1. Test equipment connection is shown below.  Fig. 12 2. Play test tape (QZZCWAT 3,000Hz), and supply playback signal to frequency counter. 3. Measure this frequency. 4. On the basis of 3,000Hz, determine value by following formula: $\text{Tape speed accuracy} = \frac{f - 3,000}{3,000} \times 100 (\%)$ where, f = measured value 5. Take measurement at middle section of tape. Standard value: $\pm 1.5\%$ Adjustment method 1. Play the test tape (middle). 2. Adjust so that frequency becomes 3,000Hz. 3. Tape speed adjustment VR shown in fig. 28. Tape speed fluctuation Make measurements in same manner as above (beginning, middle and end of tape), and determine difference between maximum and minimum values and calculate as follows: $\text{Tape speed fluctuation} = \frac{f_1 - f_2}{3,000} \times 100 (\%)$ f_1 = maximum value f_2 = minimum value Standard value: 1%	* Playback mode
Wow and flutter Equipment: * Wow meter * Test tape ... QZZCWAT	1. Test equipment connection is shown below.  Fig. 13 2. Use wow test tape (3,000Hz) and measure its playback signal on wow meter. 3. Wow and flutter is expressed in percentage and that measurement can be weighted by JIS network (WRMS). 4. Measure at middle section of test tape. Standard value: 0.07% (WRMS)	* Playback mode

ITEM	MEASUREMENT & ADJUSTMENT	REMARKS								
Playback frequency response Equipment: * VTVM * Oscilloscope * Test tape ... C-FH	1. Test equipment connection is as same as "Head azimuth adjustment" but use the test tape (QZZCFM) instead of head azimuth tape (See fig. 10). 2. Place UNIT into playback mode. 3. Play frequency response test tape. 4. Measure output level at 8 kHz, 4 kHz, 1 kHz, 315 Hz, 250 Hz, 125 Hz and 63 Hz and compare output level with 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. Playback frequency response chart  Fig. 14	* Playback mode								
Playback frequency response	Adjustment 1. If the measured value decreases at high frequency range, as shown in fig. 15, P.C.B. connection points (B) should be shorted to increase at high frequency range (See fig. 18 on page 7).  Fig. 15 The corrected value <table><tr><td>4 kHz</td><td>6 kHz</td><td>8 kHz</td><td>10 kHz</td></tr><tr><td>about +0.1 dB</td><td>about +0.4 dB</td><td>about +0.7 dB</td><td>about +1.2 dB</td></tr></table>	4 kHz	6 kHz	8 kHz	10 kHz	about +0.1 dB	about +0.4 dB	about +0.7 dB	about +1.2 dB	* Playback mode
4 kHz	6 kHz	8 kHz	10 kHz							
about +0.1 dB	about +0.4 dB	about +0.7 dB	about +1.2 dB							

ITEM	MEASUREMENT & ADJUSTMENT	REMARKS																
	2. If the measured value increases at high frequency range, as shown in fig. 16, P.C.B. connection points (A) should be unsoldered and connection points (B) should be shorted (See fig. 18 on page 7).  Fig. 16 The corrected value <table><tr><td>4 kHz</td><td>6 kHz</td><td>8 kHz</td><td>10 kHz</td></tr><tr><td>about -0 dB</td><td>about -0.2 dB</td><td>about -0.4 dB</td><td>about -0.8 dB</td></tr></table> Caution: Please do not unsolder both connection points (A), (B) to prevent oscillation. 3. If the measured value increases at middle frequency range, as shown in fig. 17, P.C.B. connection points (C) should be shorted (See fig. 18 on page 7).  Fig. 17 The corrected value <table><tr><td>1 kHz</td><td>2 kHz</td><td>4 kHz</td><td>6 kHz</td></tr><tr><td>about -0.3 dB</td><td>about -0.7 dB</td><td>about -0.8 dB</td><td>about -0.8 dB</td></tr></table>	4 kHz	6 kHz	8 kHz	10 kHz	about -0 dB	about -0.2 dB	about -0.4 dB	about -0.8 dB	1 kHz	2 kHz	4 kHz	6 kHz	about -0.3 dB	about -0.7 dB	about -0.8 dB	about -0.8 dB	
4 kHz	6 kHz	8 kHz	10 kHz															
about -0 dB	about -0.2 dB	about -0.4 dB	about -0.8 dB															
1 kHz	2 kHz	4 kHz	6 kHz															
about -0.3 dB	about -0.7 dB	about -0.8 dB	about -0.8 dB															
Playback gain Equipment: * VTVM * Oscilloscope * Test tape ... QZZCFM	1. Test equipment connection is shown in fig. 10. 2. Play standard recording level portion on test tape (QZZCFM 315 Hz), and using VTVM measure the output level at LINE OUT jack. 3. Make measurement for both channels. Standard value: 0.42V (-7 dB) Adjustment 1. If measured value is not standard, adjust VR1 (L-CH), VR2 (R-CH) (See fig. 28 on page 12). 2. After adjustment, check "Playback frequency response" again.	* Playback mode																

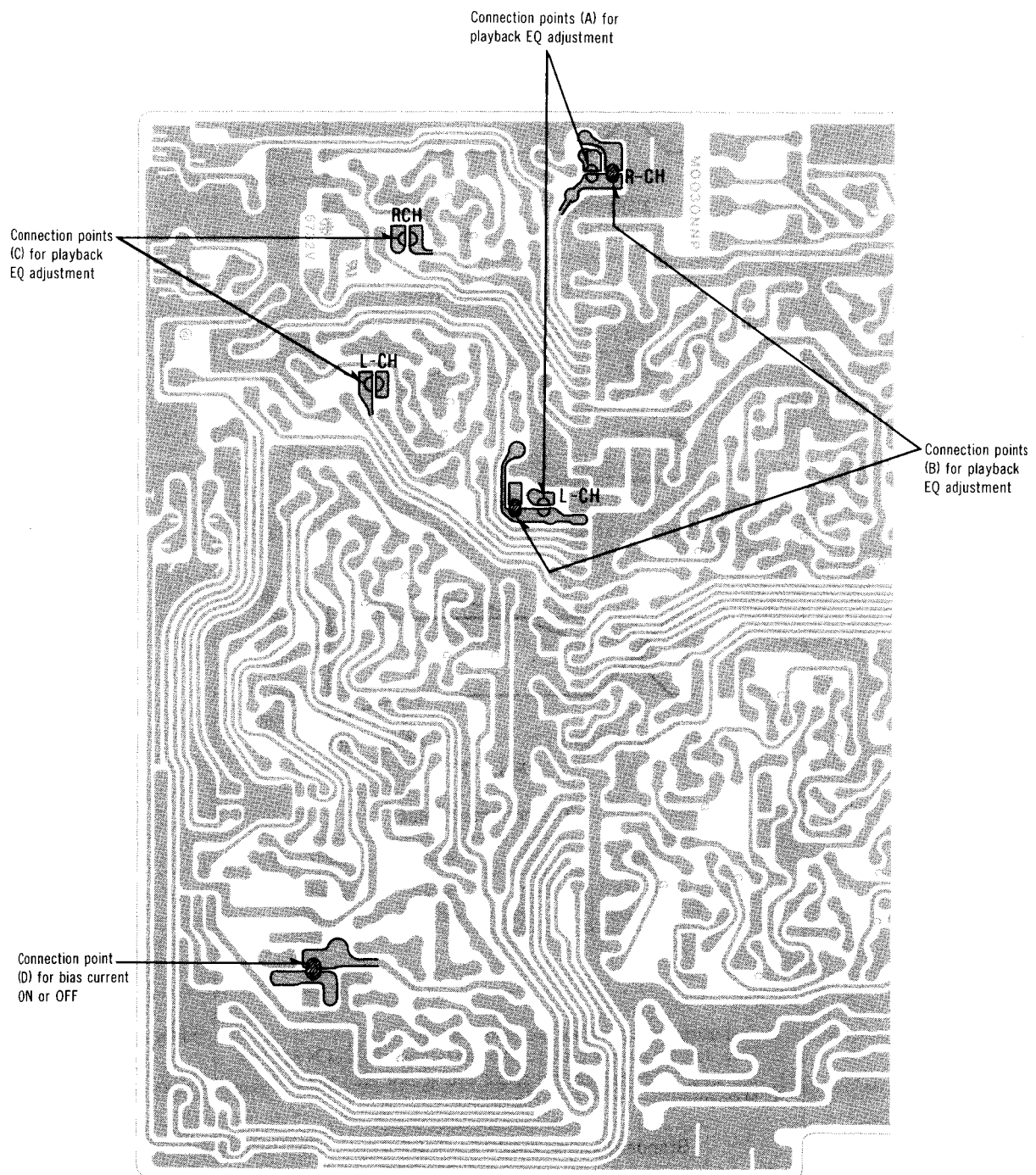
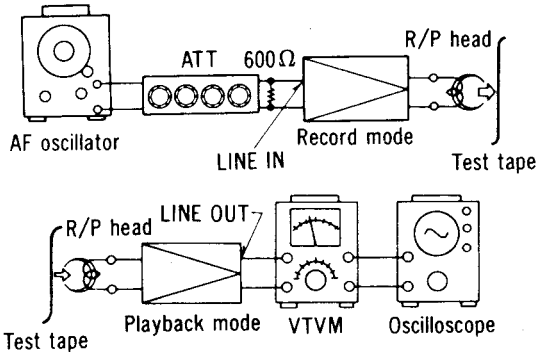
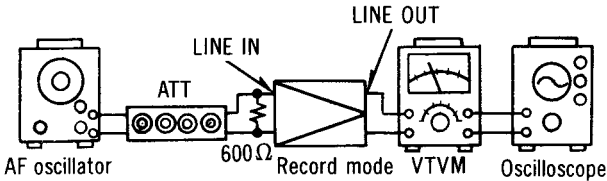
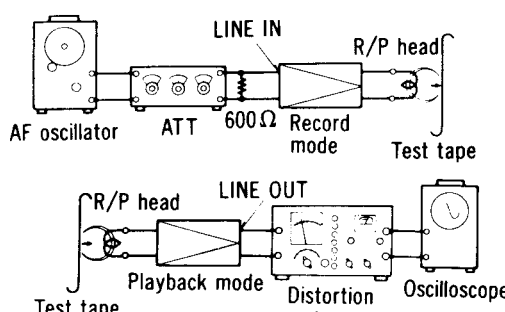
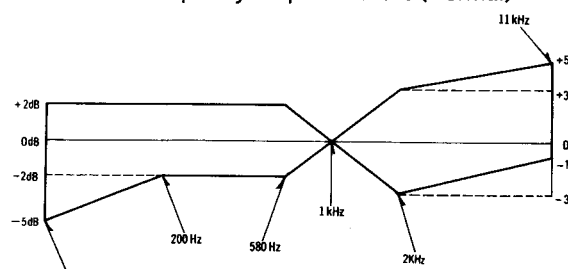
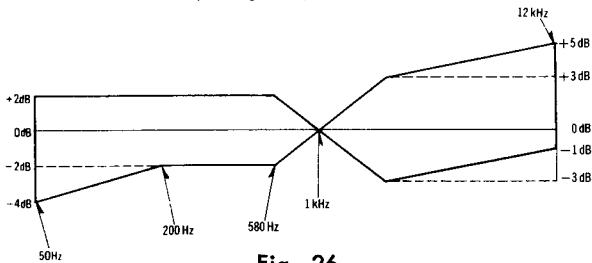
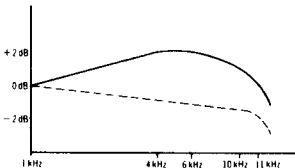


Fig. 18

ITEM	MEASUREMENT & ADJUSTMENT	REMARKS
Playback S/N ratio Equipment: * VTVM * Oscilloscope * Test tape ... QZZCFM * Empty cassette	- Test equipment connection is shown in fig. 10. - Play standard recording level test tape (QZZCFM 315Hz) and read output level on VTVM. Refer to "Playback gain adjustment". - Place empty cassette (which has been cut) and play again. - Measure noise level at this time using VTVM, and determine ratio of this level to test tape output signal voltage (315Hz). Standard value: Greater than 43 dB An example calculation is shown below. A: E_s = playback output signal voltage of test tape (315Hz) B: E_n = playback output noise level $E_s = 0.42\text{ V } (-7\text{ dB})$ $E_n = 0.003\text{ V } (-50\text{ dB})$ $\text{S/N ratio} = \frac{E_s}{E_n} = \frac{0.42\text{ V}}{0.003\text{ V}} = 140$ $20 \log_{10} 140 = 43\text{ dB}$ $\text{S/N ratio} = E_s(\text{dB}) - E_n(\text{dB}) = -7 - (-50) = 43\text{ dB}$	* Playback mode
Bias current Equipment: * VTVM * Oscilloscope	- Test equipment connection is shown below. Fig. 19 - Place UNIT into record mode, and bias selector to "LOW". - Read voltage on VTVM and calculate bias current by following formula: $\text{Bias current (A)} = \frac{\text{Value read on VTVM (V)}}{10 (\Omega)}$ Standard value: $250 \begin{matrix} +130\mu\text{A} \\ -80\mu\text{A} \end{matrix}$ (LOW position) $275 \begin{matrix} +130\mu\text{A} \\ -80\mu\text{A} \end{matrix}$ (MED position) $330 \begin{matrix} +130\mu\text{A} \\ -80\mu\text{A} \end{matrix}$ (HIGH position) - Adjust L5 (L-CH) and L6 (R-CH) (See adjustment part location on page 12).	* Record mode * When bias current is the adjusted on one channel only, note that bias current on the other channel may vary. * When L5 or L6 is the replaced, preset core position to bottom side of coil and then readjust optimum bias current.
Erase current Equipment: * VTVM * Oscilloscope * Resistor (0.1 Ω)	- Connect 0.1Ω resistor between ground side terminal of erase head ground lead wire removed (See fig. 21). - Connect VTVM to both ends of 0.1Ω resistor. Fig. 20 Fig. 21	* Record mode

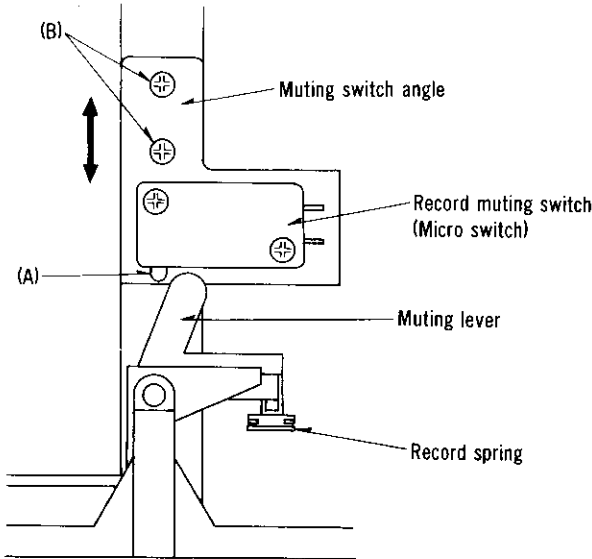
ITEM	MEASUREMENT & ADJUSTMENT	REMARKS
	3. Place UNIT into record mode, and measure voltage across the 0.1Ω resistor. 4. Determine erase current with the following formula: $\text{Erase current (A)} = \frac{\text{Voltage across both ends of } 0.1\Omega}{0.1\Omega}$ Standard value: 70 ± 33 mA (LOW position) 80 ± 33 mA (MED position) 90 ± 33 mA (HIGH position)	
Overall gain Equipment: * AF oscillator * VTVM * ATT * Oscilloscope * Test tape (reference blank tape) ... QZZCRA for Normal	1. Test equipment connection is shown in fig. 22.  Fig. 22 2. Place UNIT into record mode, and equalizer selector to 120μS, bias selector to LOW (for normal tape). 3. Supply 1 kHz signal (−24 dB) from AF oscillator, through ATT, to LINE IN. 4. Adjust ATT until monitor level at LINE OUT becomes 0.42 V (−7 dB). 5. Using test tape, make recording. 6. Playback recorded tape, and make sure the value at LINE OUT on VTVM becomes 0.42 V. 7. If measured value is not 0.42 V, adjust VR11 (L-CH), VR12 (R-CH) (See fig. 28 on page 12). 8. Repeat from step (2).	* Record/playback mode * LINE IN level control ... MAX * Standard input level: MIC... −72 ± 3 dB LINE IN ... −24 ± 3 dB DIN... −36 ± 3 dB
Level meter Equipment: * VTVM * Oscilloscope * AF oscillator * ATT	1. Test equipment connection is shown in fig. 23.  Fig. 23 2. Supply 1 kHz signal from the AF oscillator, through the ATT, to the LINE IN jack. 3. Adjust ATT so that the monitor level at LINE OUT becomes 0.42 V. 4. Adjust VR9 (L-CH) and VR10 (R-CH) so that the level meters indicate 0 dB.	* Record mode * LINE IN level control ... MAX

ITEM	MEASUREMENT & ADJUSTMENT	REMARKS
Overall distortion Equipment: * Distortion meter * AF oscillator * ATT * Oscilloscope * Test tape (reference blank tape) ... QZZCRA for Normal ... QZZCRX for CrO ₂	1. Test equipment connection is shown in fig. 24.  Fig. 24 2. Supply 1 kHz signal to LINE IN and adjust ATT so that output level at LINE OUT indicates 0.42 V (−7 dB). 3. Make recording. 4. Playback and measure distortion factor of output signal. 5. When the distortion factor does not satisfy the standard, check the bias current. When the bias current is lower than standard, distortion will increase. Care should be exercised in the adjustment because the bias current also has an influence on the overall frequency response. Refer to "The overall frequency response" and "The bias current adjustment". Standard value: Less than 2.3% (Normal) Less than 3.3% (CrO₂)	* Record/playback mode * LINE IN level control ... MAX
Overall frequency response Equipment: * VTVM * AF oscillator * ATT * Test tape (reference blank tape) ... QZZCRA for Normal ... QZZCRX for CrO ₂	Note: Before measuring, and adjusting, make sure of the playback frequency response (For the method of measurement, please refer to the playback frequency response). 1. Test equipment connection is shown in fig. 22. 2. Load reference blank test tape and place UNIT into record mode. 3. Supply 1 kHz signal from AF oscillator through ATT to LINE IN. 4. Adjust ATT so that input level is −20 dB below standard recording level (standard recording level = 0 VU). 6. Record each frequency 50 Hz, 100 Hz, 200 Hz, 1 kHz, 2 kHz, 4 kHz and 11 kHz (12 kHz for CrO₂ tape) at the same level. 7. Playback and express in dB the difference between playback output level of each frequency based on playback output level of 1 kHz. 8. Make sure that the measured value is within the range specified in the overall frequency response chart. Overall frequency response chart (Normal)  Fig. 25 9. Set the bias and equalizer selector to CrO₂ position. 10. Measure as same as manner above.	* Record/playback mode * LINE IN level control ... MAX

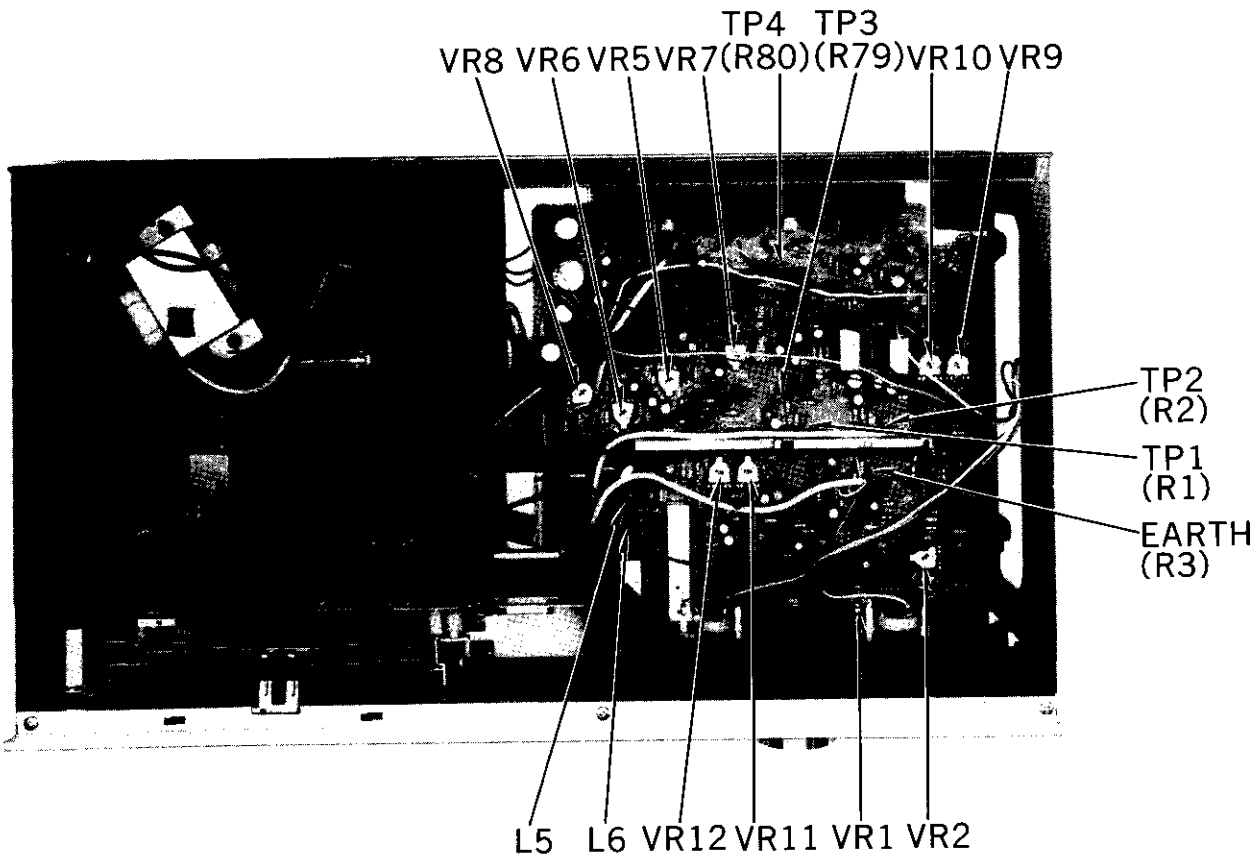
ITEM	MEASUREMENT & ADJUSTMENT	REMARKS
	11. Make sure that the measured value is within the range specified in the overall frequency response chart for CrO₂ tape below. Overall frequency response chart (CrO₂)  Fig. 26	
Overall frequency response adjustment (As a standard for adjustment)	1. When the frequency response between the middle and high-frequency range becomes higher than the standard value, as shown by the solid line in fig. 27, increase the bias current by turning L5 (L-CH), L6 (R-CH). 2. When it becomes lower, as shown by dotted line, reduce the bias current by turning L5 (L-CH), L6 (R-CH). Note: For the method of bias current measurement, refer to "Bias current adjustment" on page 8.  Fig. 27	
Dolby NR circuit Equipment: * VTVM * AF oscillator * ATT * Oscilloscope	- Place UNIT into record mode, set the Dolby NR switch to OUT position and supply to LINE IN to obtain -34.5dB at TP3 (L-CH), TP4 (R-CH) (frequency 5kHz). - Confirm that the value at IN position is 8dB greater than the value at OUT position of Dolby NR switch. - When it is not in condition above, adjust as follows. - Set VR5 (L-CH), VR6 (R-CH) to maximum. - Set the Dolby NR switch to IN position. - At this time adjust VR7 (L-CH), VR8 (R-CH) so that the reading of VTVM become 10dB greater than the value in step (1) above. - Adjusting VR5 (L-CH), VR6 (R-CH), make the reading of VTVM become 2dB smaller than the value obtained through the adjustment a in step (6) above.	* Record mode * LINE IN level control ...MAX * Stop the bias oscillation by unsoldering point (D) shown in adjustment parts location on page 7.
Overall S/N ratio Equipment: * VTVM * AF oscillator * ATT * Oscilloscope * Test tape (reference blank tape) ... QZZCRA	- Test equipment connection is shown in fig. 22. - Supply 1kHz signal to LINE IN and adjust ATT so that output level at LINE OUT indicates 0.42V (-7dB). - Make recording. - Make another recording without supplying signal (disconnect input plug to LINE IN). - Rewind to recorded part and playback. - Measure output signal level and no signal level (noise), and determine the ratio in decibels (dB). - The value is difference between "Playback S/N and overall S/N", but for decibel calculation refer to "Playback S/N measurement" on page 8. Standard value: Greater than 42dB (without NAB filter)	* Record/playback mode * LINE IN level control ...MAX * Erase the tape with a bulk tape eraser.

HOW TO INSTALL THE RECORD-MUTING SWITCH

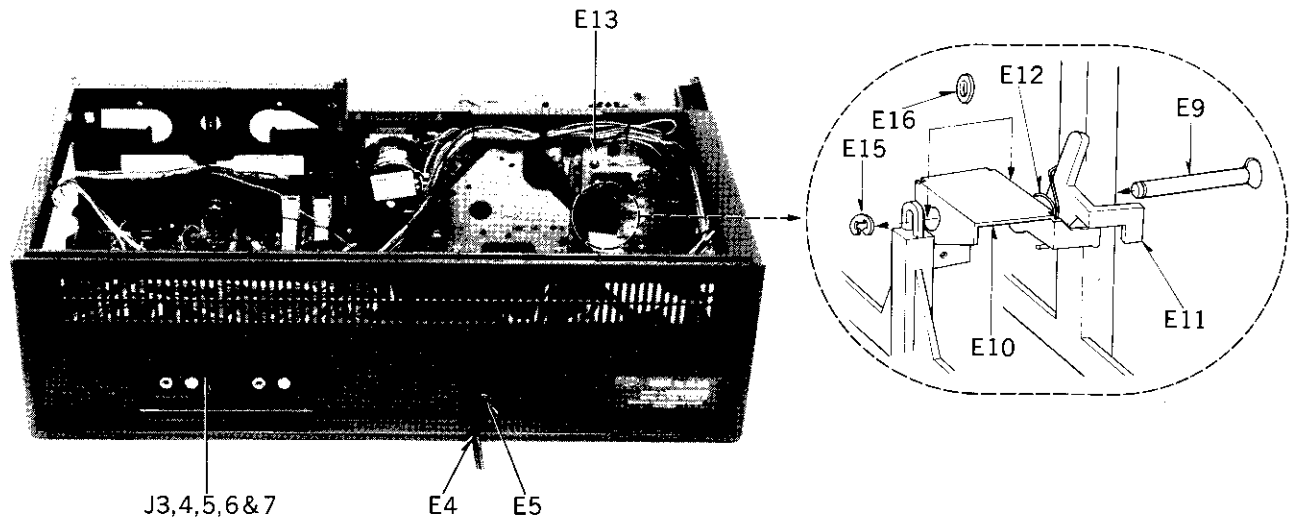
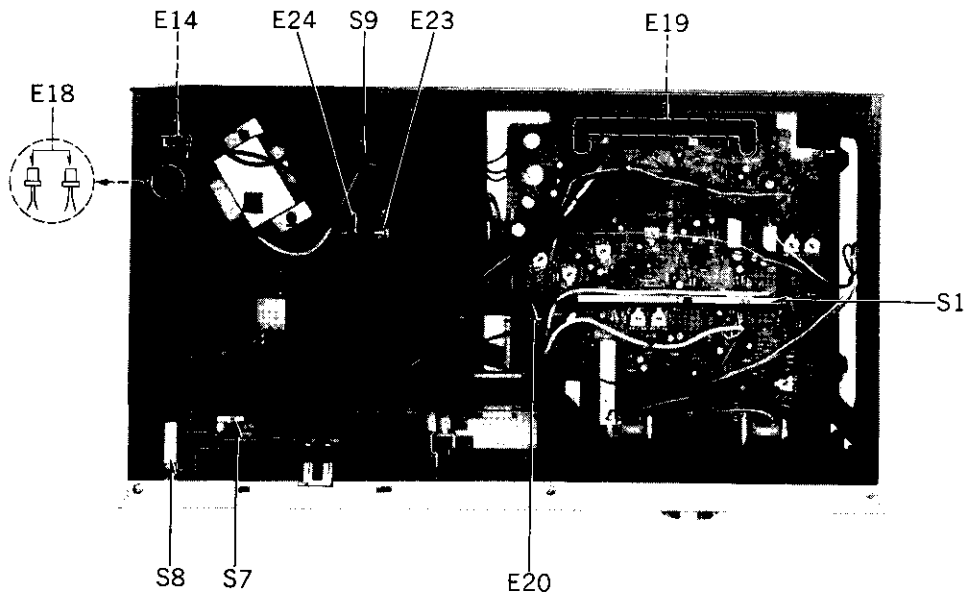
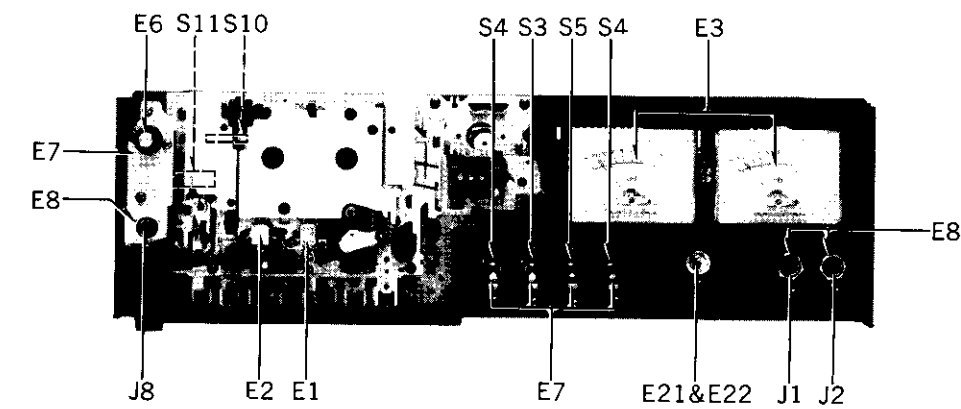
- 1. Lock the record button, and then mount it with screw (B) so that the cap and micro switch (A) do not contact each other.
- 2. Then play the music tape. During the playback, press the record button lightly several times, confirm whether the playback sound is interrupted or not.



ADJUSTMENT PARTS LOCATION



ELECTRICAL PARTS LOCATION



NOTE: **S** indicates that only parts specified by the manufacturer be used for safety.

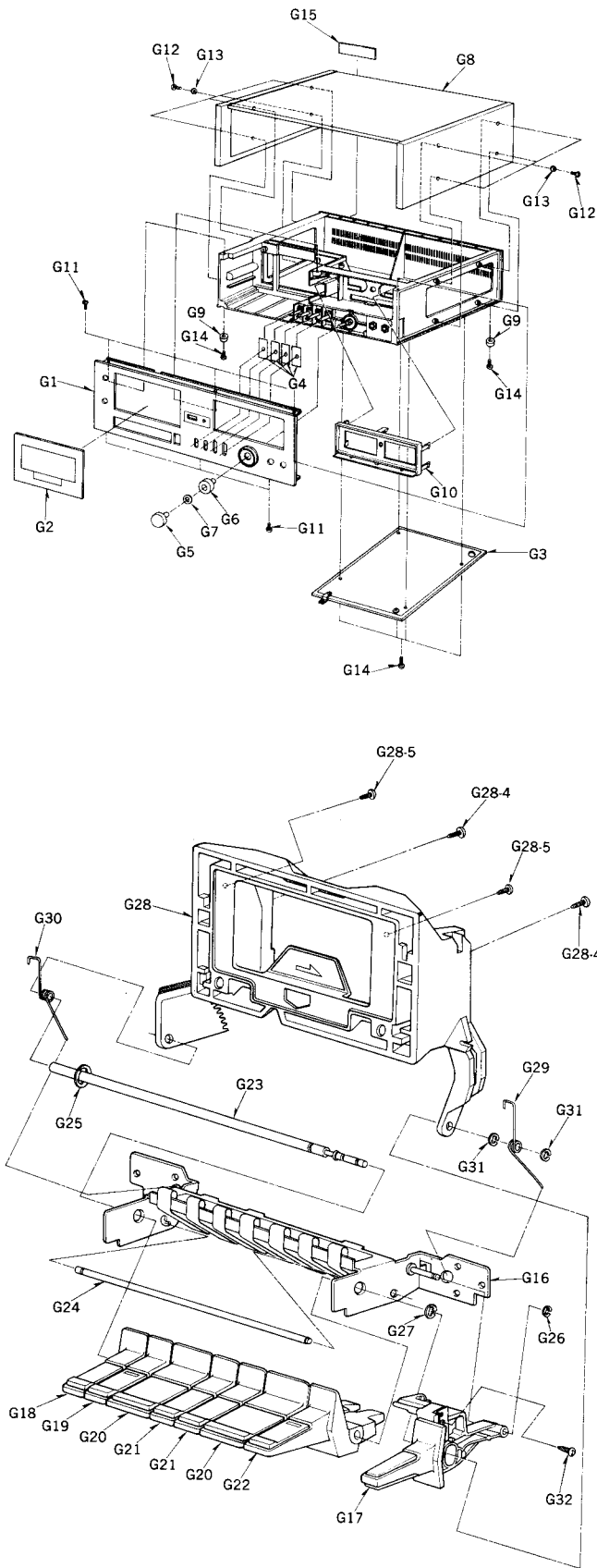
Ref. No.	Part No.	Part Name & Description
ELECTRICAL PARTS		
E1	QWY4113Z	Record/Playback Head
E2	QWY21222A	Erase Head
E3	QSL1092RNM	Level Meter with Pilot Lamp
E4	QFC1203M	AC Power Cord
E5	QTD1129	Power Cord Bushing
E6	QXBM0018	Push Button (Power Switch)
E7	QMAM0083	Power Switch Angle
E8	QNQ1070	Nut
E9	QMS1236	Record Lever Shaft
E10	QMLM0033	Record Lever
E11	QMLM0034	Muting Lever
E12	QBN1621	Muting Lever Spring
E13	QMF00007	Muting Switch Angle
E14	QTS00020	Earth Metal
E15	XUC3FT	Stop Ring d3
E16	QBK7005	Washer
E18	QJT1029	Connection Terminal
E19	QKJM0017	Jack Cover Plate
E20	QBSM0001	Recording Connection Wire
E21	XWG9D15AW	Washer for Volume
E22	QNQ1039	Nut for Volume
E23	QTF1056	Fuse Holder
E24	XBA2E03NS5	Fuse (0.3A)

H

1.

2.

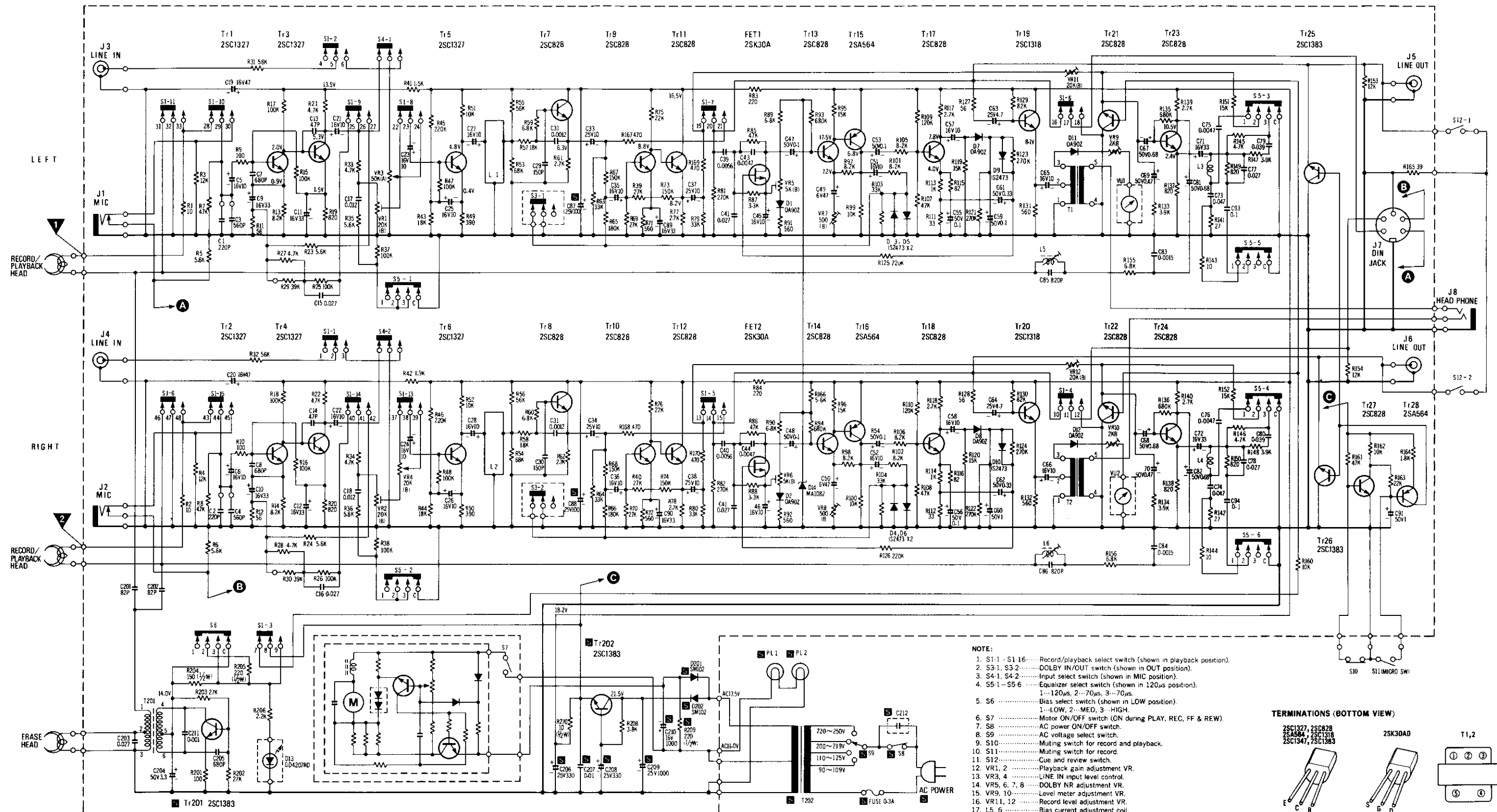
CABINET PARTS



NOTE: ■ indicates that only parts specified by the manufacturer be used for safety.

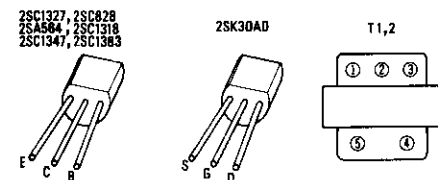
Ref. No.	Part No.	Part Name & Description
CABINET PARTS		
G1	QYPM0025	Front Panel Assembly
G2	QYFM0031	Cassette Lid Assembly
G3	QYCM0020	Bottom Board Assembly
G4	QBH2021S	Switch Shelter
G5	QYT0458	Volume Knob-1
G6	QYT0457	Volume Knob-2
G7	QBW2066	Volume Washer
G8	QYWM0010	Wooden Case Cover
G9	QKA1050	Rubber Foot
G10	QYKM0001	Level Meter Cover Assembly
G11	XTN3+8B	Tapping Screw $\varnothing 3 \times 8$
G12	XTN4+20B	Tapping Screw $\varnothing 4 \times 20$ (Black)
G13	XWG4E10FZ	Washer (Black)
G14	XTN3+10B	Tapping Screw $\varnothing 3 \times 10$
G15	QGSM0087	Name Plate
G16	QXA0669	Push Button Holding Angle
G17	QXB0556	Timer Button Assembly
G18	QGO1473	Pause Button
G19	QGO1474	Record Button
G20	QGO1476	Button (Playback, Stop)
G21	QGO1477	Button (FF, REW)
G22	QGO1475	Eject Button
G23	QMN2240	Bush Button Shaft-A
G24	QMN1861	Bush Button Shaft-B
G25	QNQ1080	Stop Ring
G26	XUC25FT	Stop Ring $\varnothing 2.5$
G27	XUC4FT	Stop Ring $\varnothing 4$
G28	QYFM0029	Cassette Holder Assembly
G28-4	XTN26+8B	Tapping Screw $\varnothing 2.6 \times 8$
G28-5	XTN26+6B	Tapping Screw $\varnothing 2.6 \times 6$
G29	QBN1622	Lid Spring 1
G30	QBN1623	Lid Spring 2
G31	XUC3FT	Stop Ring $\varnothing 3$
G32	XTN26+5B	Tapping Screw $\varnothing 2.6 \times 5$
G33	QYMM0047	Main Case Assembly
ACCESSORIES		
A1	RP023A	Connection Cord-G
A2	QFT1TCCPTRJZ	Demonstration Tape
A3	■ XBA2E03NS5	Fuse (0.3A)
A4	QQT2302	Instruction Book
PACKINGS		
P1	QPNM0120	Inside Carton
P2	QPAM0024	Inner Carton
P3	XZB50X65A02	Poly Bag

SCHEMATIC DIAGRAM MODEL RS-616

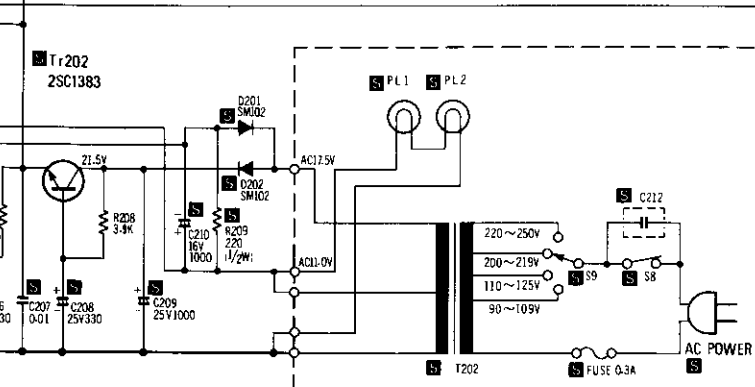
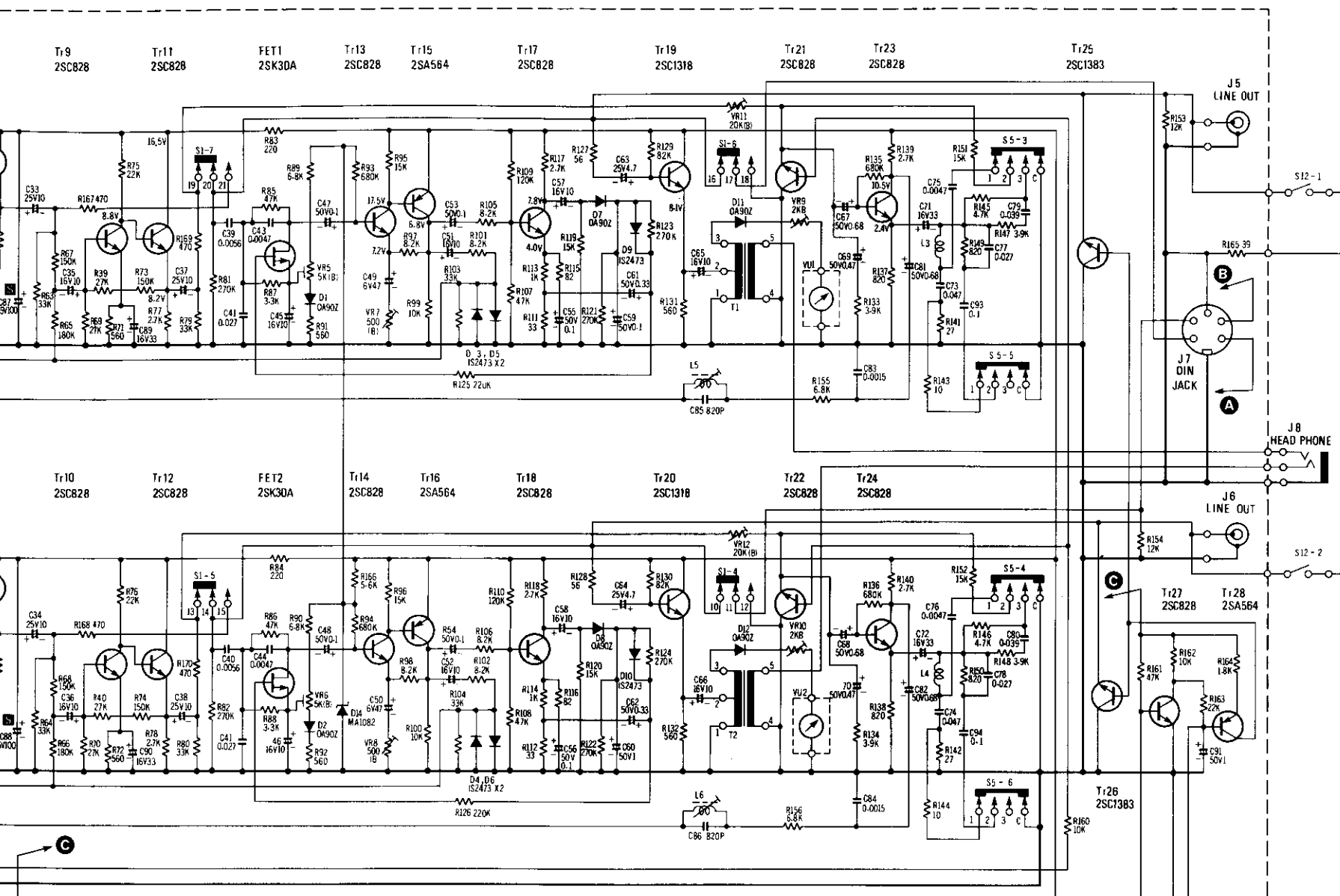


- NOTE:**
- S1-1 - S1-16.....Record/playback select switch (shown in playback position).
 - S3-1, S3-2.....DOLBY IN/OUT switch (shown in OUT position).
 - S4-1, S4-2.....Input select switch (shown in MIC position).
 - S5-1 - S5-6Equalizer select switch (shown in 120 μ s position).
1---120 μ s, 2---70 μ s, 3---70 μ s.
 - S6Bias select switch (shown in LOW position).
1---LOW, 2---MED, 3---HIGH.
 - S7Motor ON/OFF switch (ON during PLAY, REC, FF & REW).
 - S8AC power ON/OFF switch.
 - S9AC voltage select switch.
 - S10.....Muting switch for record and playback.
 - S11.....Muting switch for record.
 - S12.....Cue and review switch.
 - VR1, 2Playback gain adjustment VR.
 - VR3, 4LINE IN input level control.
 - VR5, 6, 7, 8DOLBY NR adjustment VR.
 - VR9, 10Level meter adjustment VR.
 - VR11, 12Record level adjustment VR.
 - L5, 6Bias current adjustment coil.
 - Resistor values are in ohms (Ω), 1/4 watt unless specified otherwise.
K=1,000 Ω .
 - Capacitor values are in microfarads (μ F) unless specified otherwise.
P=Pico-farads.
 - The mark (*) shows test point. e.g. * = test point 1.
 - All voltage values shown in circuitry are under no signal condition with volume control at minimum position.
For measurement, use VTVM.

TERMINATIONS (BOTTOM VIEW)

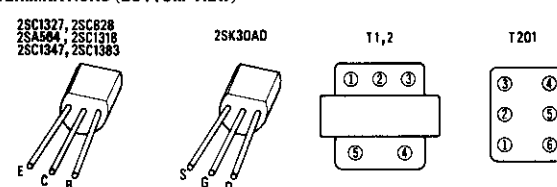


NOTE: RESISTORS ERDCarbon
ERGMetal oxide
CAPACITORS ECEAElectrolytic
ECCDCeramic
ECKDCeramic
EQOMPolyster
EQOSPolystyrene



- NOTE:
- S1-1 ~ S1-16Record/playback select switch (shown in playback position).
 - S3-1, S3-2DOLBY IN/OUT switch (shown in OUT position).
 - S4-1, S4-2Input select switch (shown in MIC position).
 - S5-1 ~ S5-6Equalizer select switch (shown in 120μs position).
 - S6Bias select switch (shown in LOW position).
 - S7Motor ON/OFF switch (ON during PLAY, REC, FF & REW).
 - S8AC power ON/OFF switch.
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 - L5, 6Bias current adjustment coil.
 - Resistor values are in ohms (Ω), 1/4 watt unless specified otherwise.
 - K = 1,000.
 - Capacitor values are in microfarads (μF) unless specified otherwise.
 - P = Pico-farads.
 - The mark (▼) shows test point. e.g. ▼ = test point 1.
 - All voltage values shown in circuitry are under no signal condition with volume control at minimum position.
 - For measurement, use VTVM.

TERMINATIONS (BOTTOM VIEW)

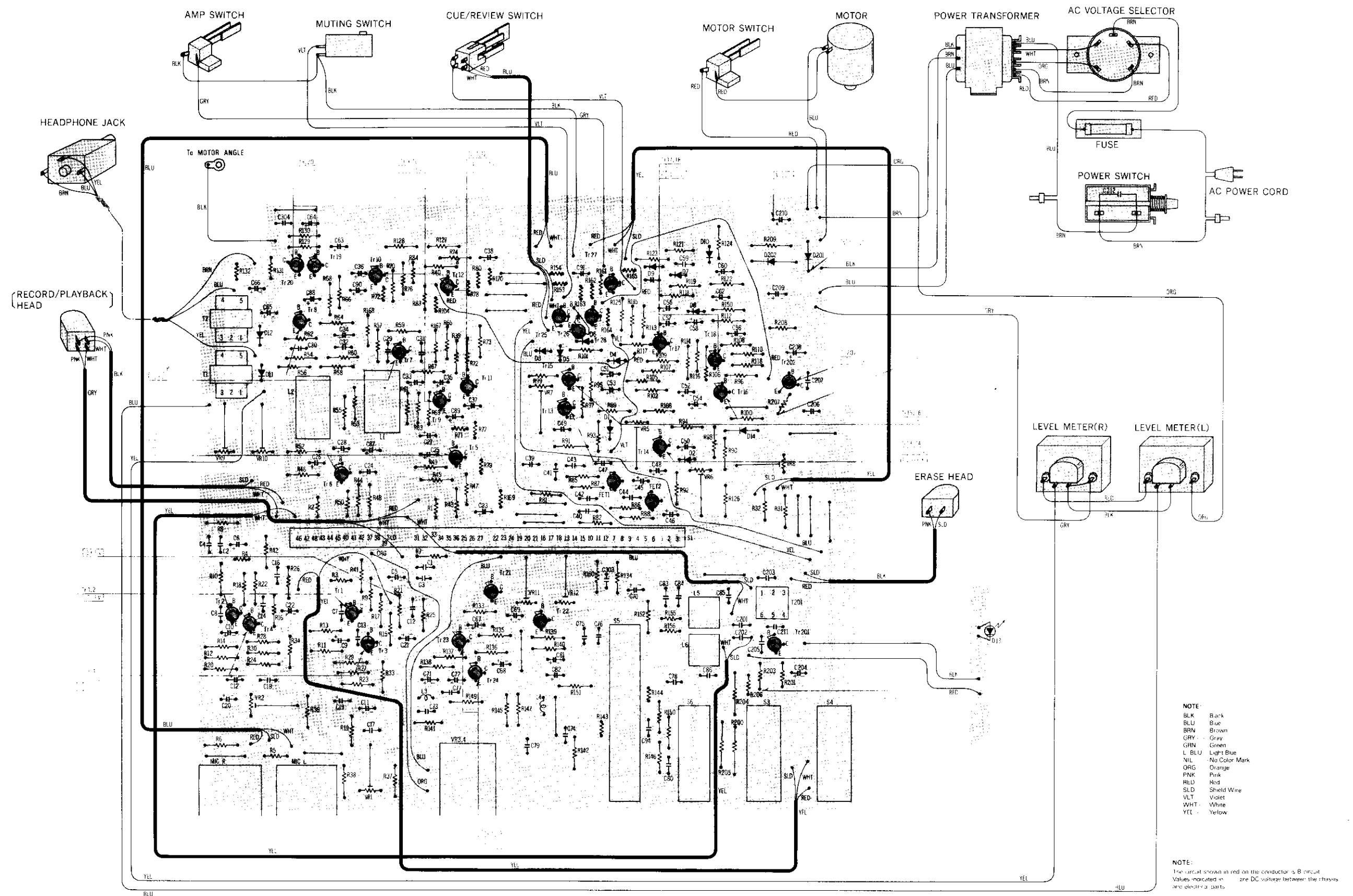


NOTE: ■ indicates that only parts specified by the manufacturer be used for safety.

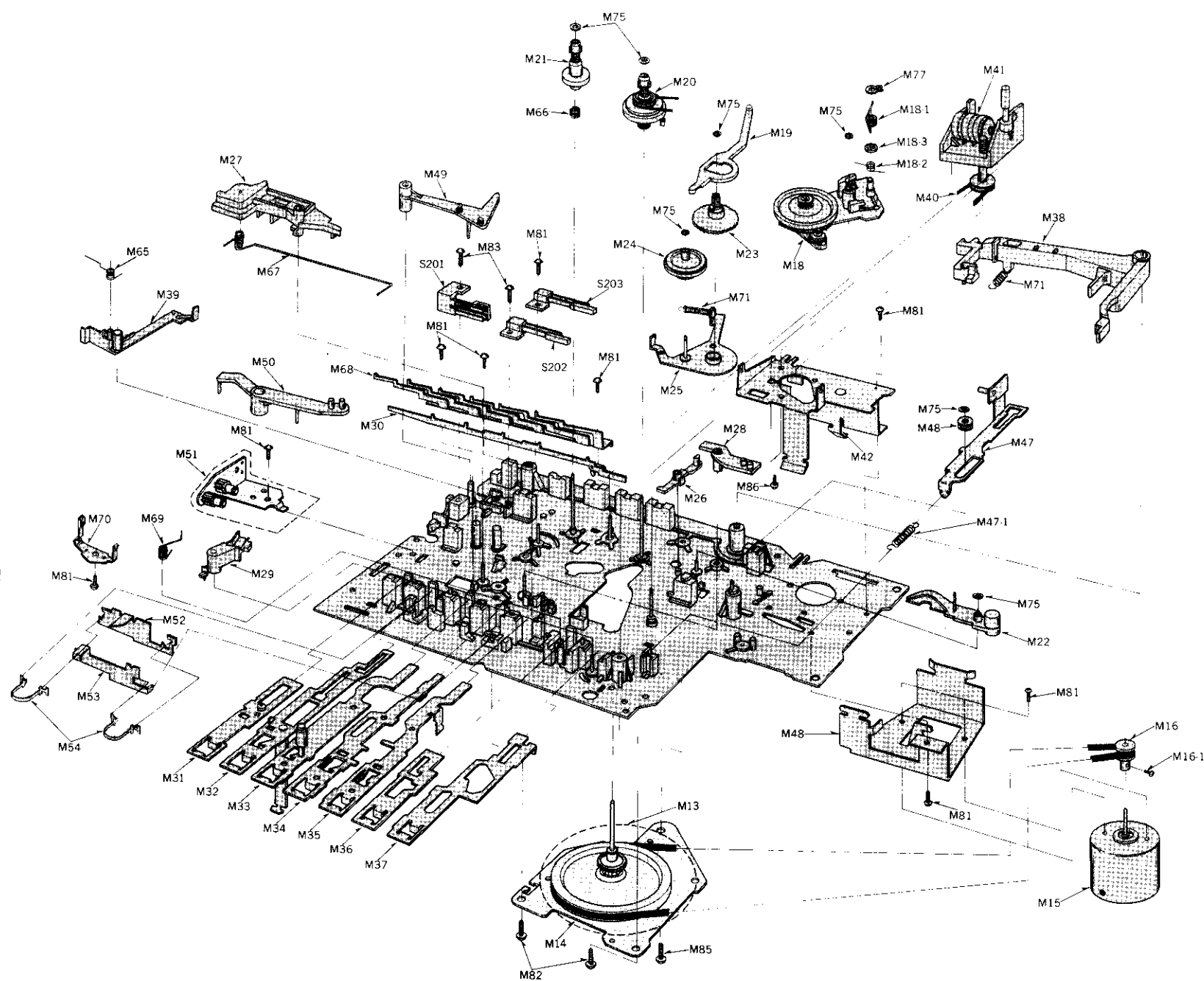
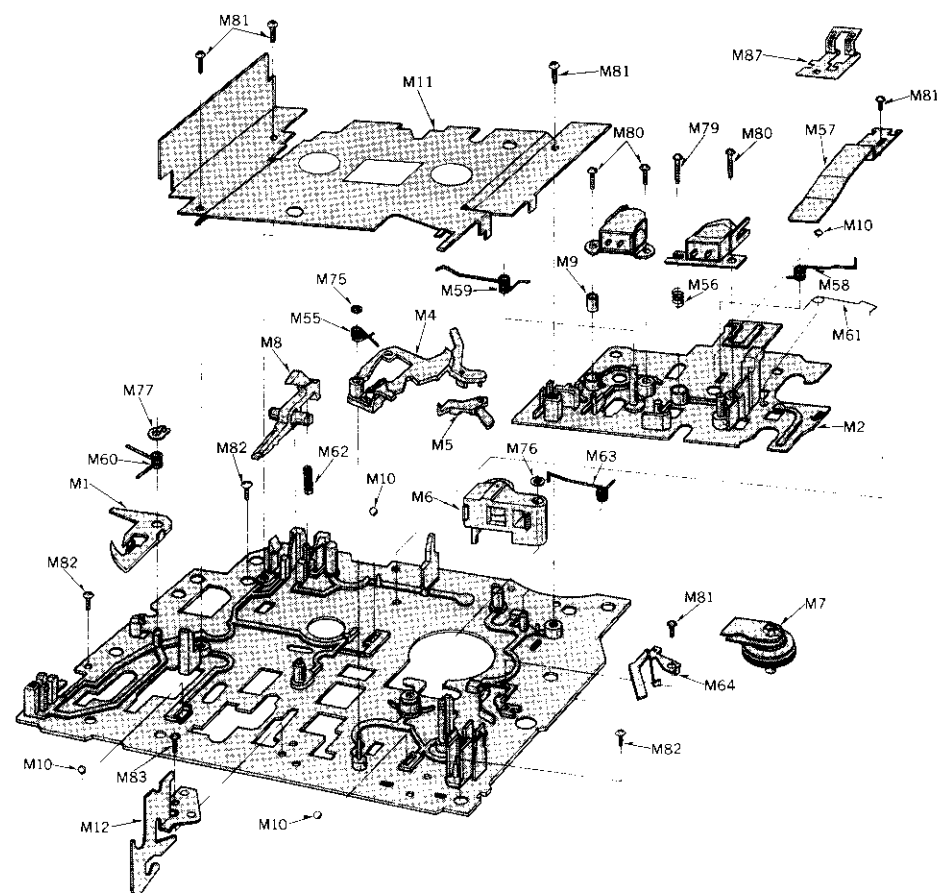
Ref. No.	Part No.	Part Name & Description
TRANSISTORS		
Tr1, 2, 3, 4, 5, 6	25C1327	Transistor
Tr7, 8, 9, 10, 11, 12, 13, 14	25C828	"
Tr15, 16	25A564	"
Tr17, 18	25C828	"
Tr19, 20	25C1318	Transistor
Tr21, 22, 23, 24	25C828	"
Tr25, 26	25C1383	"
Tr27	25C828	"
Tr28	25A564	"
Tr201, 202	25C1383	"
FET		
FET1, 2	25K30AD	FET
DIODES & RECTIFIERS		
D1, 2	0A90Z	Diode
D3, 4, 5, 6	1S2473	"
D7, 8	0A90Z	"
D9, 10	1S2473	"
D11, 12	0A90Z	"
D13	GD4207RD	Light Emitting Diode
D14	MA1082	Diode
D201, 202	SM102	Rectifier
TRANSFORMERS		
T1, 2	QLT2026X	Headphone Transformer
T201	QLB0158	Bias OSC Transformer
T202	QLP29ELX	Power Transformer
COILS		
L1, 2	QLM925K	MPX Filter
L3, 4	QLQX2421Y	Record EQ Coil
L5, 6	QLQX1032W	Bias Trap Coil
SWITCHES		
S1	QSSG206F	Slide Switch (Record/Playback Selector)
S3, 4	QES1383	Lever Switch (DOLBY IN/OUT, Input Select)
S5	QES1382	Lever Switch (EQ Select)
S6	QES1441H	Lever Switch (Bias Select)
S7	QSB0178	Leaf Switch (Motor ON/OFF)
S8	ESB70124	Push Switch (Power ON/OFF)
S9	QSR1407	Rotary Switch (AC Voltage Selector)
S10	QSB0178	Leaf Switch (Muting)
S11	QSM0070	Micro Switch (Muting)
S12	QSB0186	Leaf Switch (Cue and Review)
JACKS		
J1, 2	QJA0256H	TMS Jack (MIC)
J3, 4, 5, 6, 7	QEJ5002H	Line IN/OUT & DIN Jack Assembly
J8	QJA0255H	TMS Jack (PHONES)

Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.
RESISTORS					
R1, 2	ERD25TJ100	R121, 122, 123, 124	ERD25TJ274	C43, 44	EQQM05472JZ
R3, 4	ERD25TJ123	R125, 126	ERD25TJ224	C45, 46	ECEA1HS100
R5, 6	ERD25TJ562	R127, 128	ERD25TJ560	C47, 48	ECEA50MR1R
R7, 8	ERD25TJ473	R129, 130	ERD25TJ823	C49, 50	ECEA1AS470
R9, 10	ERD25TJ101	R131, 132	ERD25TJ561	C51, 52	ECEA1HS100
R11, 12	ERD25TJ560	R133, 134	ERD25TJ392	C53, 54	ECEA502R1
R13, 14	ERD25TJ822	R135, 136	ERD25TJ821	C57, 58	ECEA1HS100
R15, 16	ERD25TJ104	R137, 138	ERD25TJ821	C59, 60	ECEA502R1
R17, 18	ERD25TJ104	R139, 140	ERD25TJ272	C61, 62	ECEA502R33
R19, 20	ERD25TJ821	R141, 142	ERD25TJ270	C63, 64	ECEA1J54R7
R21, 22	ERD25TJ472	R143, 144	ERD25TJ100	C65, 66	ECEA1HS100
R23, 24	ERD25TJ562	R145, 146	ERD25TJ472	C67, 68	ECEA502R68
R25, 26	ERD25TJ104	R147, 148	ERD25TJ392	C69, 70	ECEA1CS330
R27, 28	ERD25TJ472	R149, 150	ERD25TJ821	C71, 72	EQQM05473KZ
R29, 30	ERD25TJ393	R151, 152	ERD25TJ153	C73, 74	EQQM05472KZ
R31, 32	ERD25TJ563	R153, 154	ERD25TJ123	C75, 76	EQQM05273KZ
R33, 34	ERD25TJ472	R155, 156	ERD25TJ682	C77, 78	EQQM05393KZ
R35, 36	ERD25TJ562	R160	ERD25TJ103	C79, 80	ECEA502R68
R37, 38	ERD25TJ104	R161	ERD25TJ473	C81, 82	ECKD1H152K
R39, 40	ERD25TJ273	R162	ERD25TJ103	C83, 84	EQQS1821KZ
R41, 42	ERD25TJ152	R163	ERD25TJ223	C85, 86	ECEA1ES101
R43, 44	ERD25TJ183	R164	ERD25TJ182	C87, 88	ECEA1CS330
R45, 46	ERD25TJ224	R165	ERD25TJ390	C89, 90	ECEA2AS010
R47, 48	ERD25TJ104	R166	ERD25TJ562	C91	EQQM05104KZ
R49, 50	ERD25TJ391	R167, 168	ERD25TJ471	C93, 94	ECCD1H820K
R51, 52	ERD25TJ103	R169, 170	ERD25TJ471	C201, 202	EQQM1273KZ
R53, 54	ERD25TJ683	R201	ERD25TJ101	C203	ECEA2AS33R
R55, 56	ERD25TJ563	R202, 203	ERD25TJ273	C204	EQQS1681KZ
R57, 58	ERD25TJ183	R204	ERD25TJ151	C205	ECEA1ES331
R59, 60	ERD25TJ682	R205	ERD25TJ221	C206	ECEA1ES331
R61, 62	ERD25TJ272	R206	ERD25TJ222	C207	ECEA1ES331
R63, 64	ERD25TJ333	R207	ERD25TJ100	C208	ECEA1ES331
R65, 66	ERD25TJ184	R208	ERD25TJ392	C209	ECEA1ES331
R67, 68	ERD25TJ154	R209	ERD25TJ221	C210	ECEA1ES331
R69, 70	ERD25TJ273	R210	ERD25TJ221	C211	ECKD1H102K
R71, 72	ERD25TJ561	R211	ERD25TJ221	C212	EQQM6223KZ
R73, 74	ERD25TJ154	R212	ERD25TJ154		
R75, 76	ERD25TJ223	R213	ERD25TJ223		
R77, 78	ERD25TJ272	R214	ERD25TJ272		
R79, 80	ERD25TJ333	R215	ERD25TJ333		
R81, 82	ERD25TJ274	R216	ERD25TJ274		
R83, 84	ERD25TJ221	R217	ERD25TJ221		
R85, 86	ERD25TJ473	R218	ERD25TJ473		
R87, 88	ERD25TJ332	R219	ERD25TJ332		
R89, 90	ERD25TJ682	R220	ERD25TJ682		
R91, 92	ERD25TJ561	R221	ERD25TJ561		
R93, 94	ERD25TJ684	R222	ERD25TJ684		
R95, 96	ERD25TJ153	R223	ERD25TJ153		
R97, 98	ERD25TJ822	R224	ERD25TJ822		
R99, 100	ERD25TJ103	R225	ERD25TJ103		
R101, 102	ERD25TJ822	R226	ERD25TJ822		
R103, 104	ERD25TJ333	R227	ERD25TJ333		
R105, 106	ERD25TJ822	R228	ERD25TJ822		
R107, 108	ERD25TJ473	R229	ERD25TJ473		
R109, 110	ERD25TJ124	R230	ERD25TJ124		
R111, 112	ERD25TJ330	R231	ERD25TJ330		
R113, 114	ERD25TJ102	R232	ERD25TJ102		
R115, 116	ERD25TJ820	R233	ERD25TJ820		
R117, 118	ERD25TJ272	R234	ERD25TJ272		
R119, 120	ERD25TJ153	R235	ERD25TJ153		

WIRING CONNECTION DIAGRAM MODEL RS-616



EXPLODED VIEWS



Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
MECHANICAL PARTS								
M1	QML2898	Pause Lock Plate	M25	QXL1037	Gear Lever Assembly	M55	QBN1515	Connection Spring
M2	QMK1612	Head Base Plate	M26	QML3042	Auto-Stop Obstruction Lever	M56	QBC1278	Head Spring
M4	QML3047	Obstruction Lever	M27	QML3217	Pause Lever	M57	QBP1773	Head Base Plate Pressure Spring
M5	QML3048	Driving Lever	M28	QML3049	Cue Lever	M58	QBN1488	Pressure Roller Spring
M6	QXL1057	Pressure Roller Lever Assembly	M29	QML3124	Lock Release Arm	M59	QBN1481	Playback Spring
M7	QXI0098	Takeup Idler Assembly	M30	QXR0275	Lock Rod Assembly	M60	QBN1480	Pause Lock Spring
M8	QML3051	Erase Safety Lever	M31	QXR0342	Pause Rod Assembly	M61	QBN1514	Timer Spring
M9	QMC0061	Erase Head Spacer	M32	QXR0343	Record Rod Assembly	M62	QBC1193	Safety Lever Spring
M10	QDK1012	Steel Ball 2.5φ	M33	QXR0344	Playback Rod Assembly	M63	QBN1513	Idler Spring
M11	QXH0289	Chassis Cover-A				M64	QBP1723	Click Spring
M12	QMA3169	Fulcrum Angle	M34	QMR1624	Rewind Rod A			
M13	QXF0131	Flywheel	M35	QMR1623	Fast Forward Rod A	M55	QBN1574	Brake Spring
M14	QXH0272	Flywheel Retainer Assembly	M36	QMR1622	Stop Rod A	M56	QBC1279	Back Tension Spring
M15	MHI5R9CHY	Motor	M37	QMR1621	Eject Rod A	M57	QBN1555	Pause Spring
M16	QXP0572	Motor Pulley Assembly	M38	QML3038	Switch Arm	M58	QBP1664	Operation Rod Spring
M16.1	XSN2+3	Screw +2×3	M39	QML3287	Brake Lever	M59	QBN1531	Lock Release Arm Spring
			M40	QDB0240	Counter Belt	M70	QBP1662	Lock Rod Spring
			M41*	QXC0017	Tape Counter	M71	QBT1682	Lock Holding Spring
			M41*	QXC0025	Tape Counter	M75	QBW2008	Snap Washer
			M42	QMA3171	Counter Angle	M76	QBW2046	
						M77	XUB4FT	Stop Ring C4φ
M17	QDB0241	Flywheel Belt	M47	QXR0403	Eject Rod B			
M18	QXL1136	Fast Forward Arm Assembly	M47.1	QBT1619	Idler Spring	M79	QH01225	Screw
M18.1	QBN1517	Fast Forward Spring				M80	XSN2+10	Screw +2×10
M18.2	QBN1559	Fast Forward Arm Spring	M48	QMA3414	Motor Angle	M81	XTN26-58	Tapping Screw +2.6×5
M18.3	QMC0080	Collar	M49	QML3206	Muting Arm	M82	XTN3+10B	Tapping Screw #3×10
M19	QML3040	Cam Lever	M50	QML3207	Muting Lever	M83	XTN26+8B	Tapping Screw +2.6×8
M20	QXD0067	Takeup Reel Table Assembly	M51	QXG1031	Damper Gear Assembly	M84	XSN26+3	Screw +2.6×3
M21	QXD0084	Supply Reel Table Assembly	M52	QMR1628	Obstruction Rod A	M85	XTN3+25B	Tapping Screw +3×20
M22	QXL1055	Auto-Stop Lever Assembly	M53	QMR1629	Obstruction Rod B	M86	XSN3+5S	Screw +3×5
M23	QDB1096	Cam Gear	M54	QBP1770	Obstruction Rod Spring	M87	QBP1807	Cassette Retainer Spring
M24	QXG1026	Auto-Stop Gear Assembly						

15 “※” in indicates that QXC0017 is used for the set with marking of black paint on the counter angle.