

Service Manual

Cassette Deck

RS-M250

 (Silver Face)
 (Black Face)

 Microprocessor-Controlled Stereo Cassette Deck
 with Electronic Digital Tape Counter


This is the Service Manual for the following areas.

- [D] For all European areas except United Kingdom.
 [B] For United Kingdom.

RS-M250 MECHANISM SERIES

Specifications

Track system:	4-track 2-channel stereo recording and playback	Outputs:	LINE; output level 700 mV, output impedance 3 k Ω or less, load impedance 22 k Ω over
Tape speed:	4.8 cm/s		HEADPHONE; output level 85 mV (at 8 Ω), load impedance 8 – 125 Ω
Wow and flutter:	0.04% (WRMS), $\pm 0.13\%$ (DIN)	Rec/pb connection:	5 pin DIN type; input sensitivity 0.25 mV, input impedance 6.8 k Ω output level 700 mV, output impedance 4.7 k Ω
Frequency response:	Metal tape; 20–20,000 Hz 30–18,000 Hz (DIN) 30–17,000 Hz ± 3 dB CrO ₂ /Fe-Cr tape; 20–18,000 Hz 30–18,000 Hz (DIN) 30–16,000 Hz ± 3 dB Normal tape; 20–17,000 Hz 30–16,000 Hz (DIN) 30–15,000 Hz ± 3 dB	Bias frequency:	85 kHz
Signal-to-noise ratio:	Dolby [*] NR in; 67 dB (above 5 kHz) Dolby NR out; 57 dB (Signal level = max. recording level, Fe-Cr/CrO ₂ type tape)	Motor:	2-motor system; 1-Electrical DC governor motor, 1-DC motor
Fast forward and rewind time:	Approx. 80 seconds with C-60 cassette tape	Heads:	2-head system; SX head for record/playback Ferrite double-gap head for erasure
Inputs:	MIC; sensitivity 0.25 mV, input impedance 50 k Ω applicable microphone impedance 400 Ω –10 k Ω LINE; sensitivity 60 mV, input impedance 47 k Ω	Power requirement:	AC; 110/125/220/240 V, 50-60 Hz
		Power consumption:	20 W
		Remote:	For PLAY/REC/FF/REW/PAUSE/REC-MUTE/ STOP with optional remote control RP-9645
		Dimensions:	43.0 cm (W) $\times$ 11.9 cm (H) $\times$ 29.3 cm (D)
		Weight:	5.3 kg

Specifications are subject to change without notice.

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

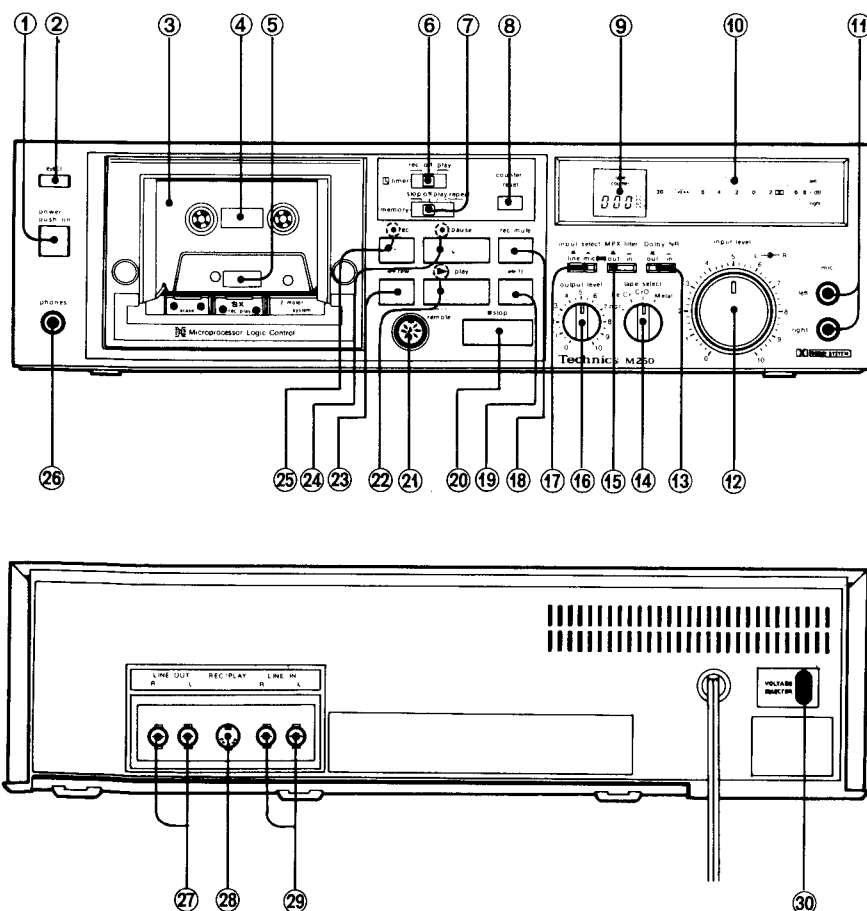
Technics

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LOCATION OF CONTROLS AND COMPONENTS



- ① Power switch [power (push on)]
- ② Eject button (eject)
- ③ Cassette holder
- ④ Remaining tape display light
- ⑤ Head light
- ⑥ Timer start switch [timer (rec-off-play)]
- ⑦ Memory switch [memory (stop-off-play-repeat)]
- ⑧ Reset button (counter reset)
- ⑨ Digital tape counter (tape counter)
- ⑩ FL (fluorescent level) meters
- ⑪ Microphone jacks [mic (left-right)]
- ⑫ Input level controls [input level (L-R)]
- ⑬ Dolby noise reduction switch [Dolby NR (out-in)]
- ⑭ Tape selector [tape select (nor-Fe-Cr-CrO₂-Metal)]
- ⑮ Multiplex filter switch [MPX filter (out-in)]
- ⑯ Output level control (output level)
- ⑰ Input selector [input select (line-mic) (DIN)]
- ⑱ Record-muting button (rec mute)
- ⑲ Fast forward button (ff)
- ⑳ Stop button (stop)
- ㉑ Remote-control connector (remote)
- ㉒ Play button/Playback-indication lamp (play)
- ㉓ Rewind button (rew)
- ㉔ Pause button/Pause-indication lamp (pause)
- ㉕ Record button/Record-indication lamp (rec)
- ㉖ Headphones jack (phones)
- ㉗ Line output jacks (LINE OUT) (R, L)
- ㉘ Record/Playback connection socket (REC/PB)
- ㉙ Line input jacks (LINE IN) (R, L)
- ㉚ Voltage selector (VOLTAGE SELECTOR)

DISASSEMBLY INSTRUCTIONS

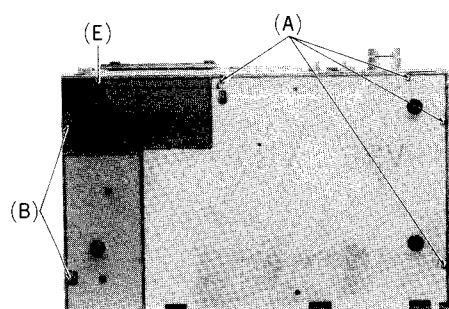


Fig. 1

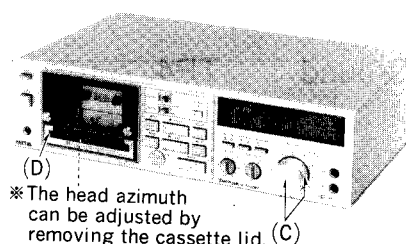


Fig. 2

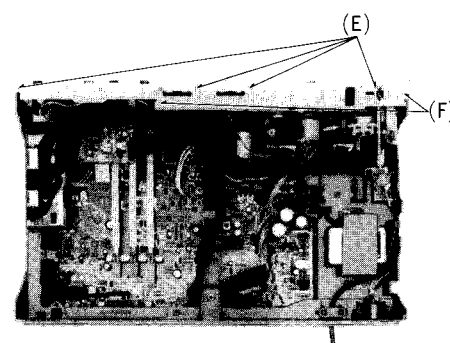


Fig. 3

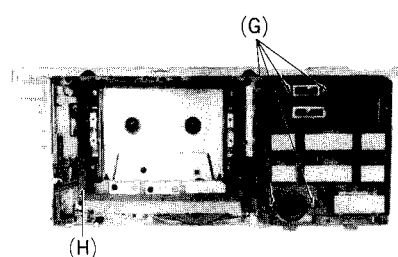


Fig. 4

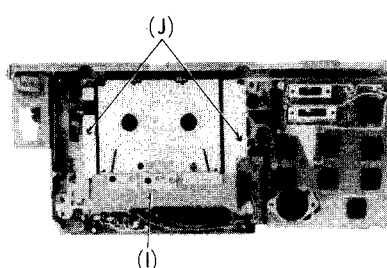


Fig. 5

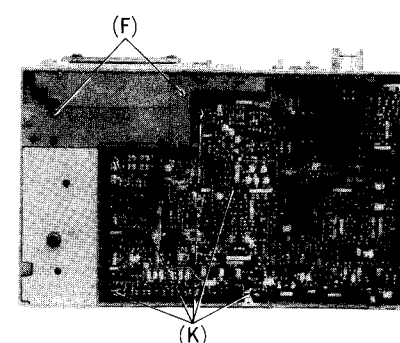


Fig. 6

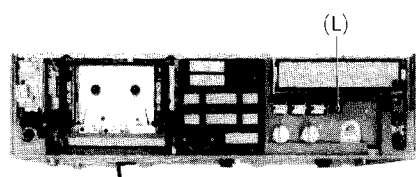


Fig. 7

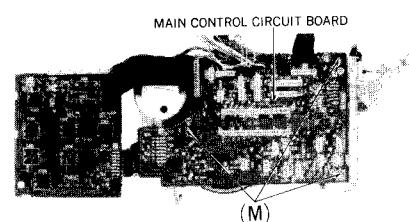


Fig. 8

Ref. No.	Procedure	To remove ———	Remove ———	Shown in fig ———
1	1	Bottom cover	• 4 screws (A)	1
2	1→2	Case cover	• 2 screws (B)	1
3	1→2→3	Front panel	• 2 control knobs (C) • Cassette lid (D) • 5 screws (E)	2 2 1, 3
4	1→2→3→4	Mechanism unit	• 4 screws (F)	3, 6
5	1→2→3→4→5	Operation button unit	• 4 screws (G)	4
6	1→2→3→4→6	Chassis cover assembly	• Cassette holder (H) • Head cover (I) • 2 screws (J)	4 5 5
7	1→2→3→7	Main circuit board	• 5 screws (K) • Screw (L)	6 7
8	1→2→3→4→8	Control circuit board	• 3 screws (M)	8

MEASUREMENT AND ADJUSTMENT METHODS

CIRCUIT BOARDS AND ADJUSTMENT PARTS LOCATION

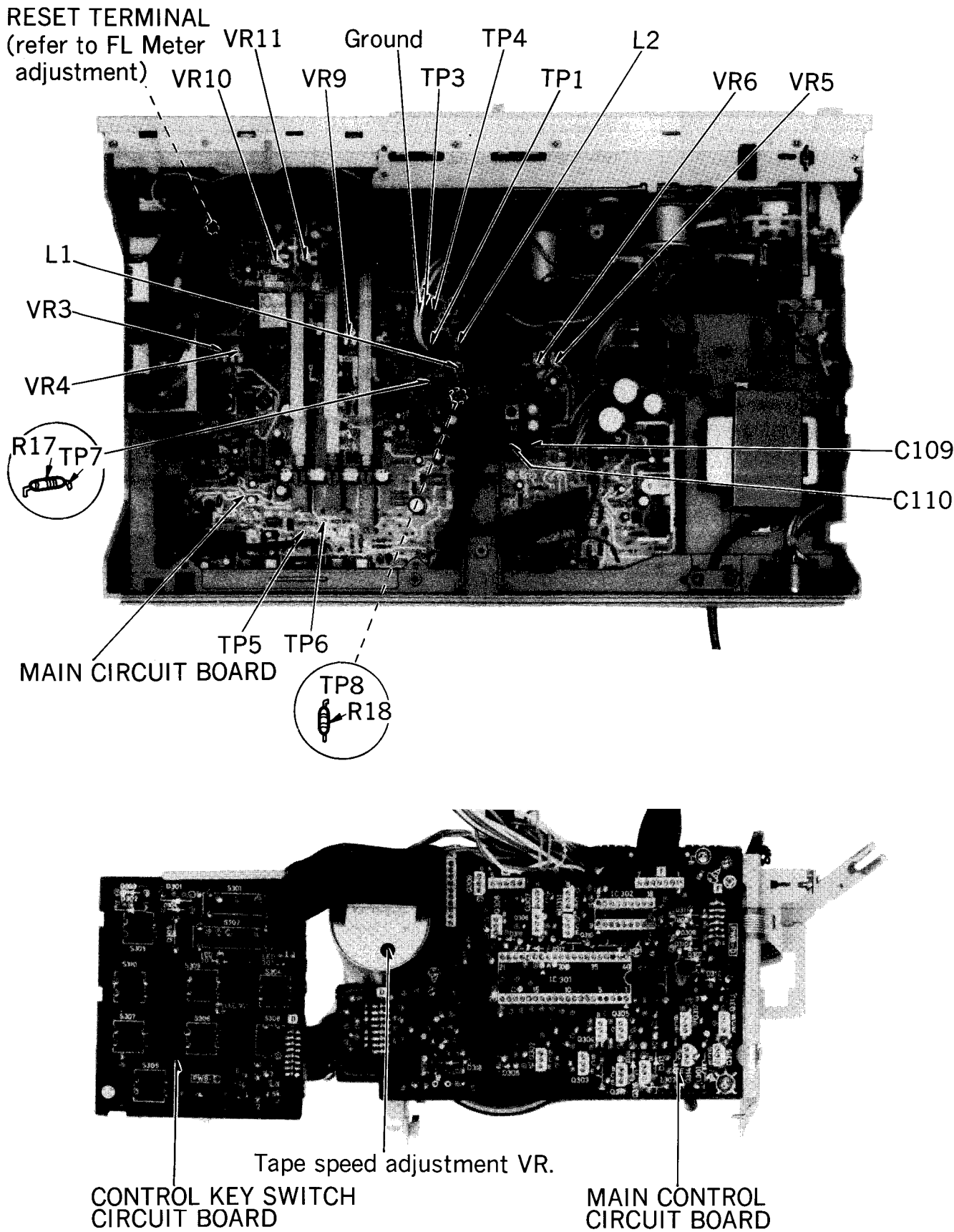
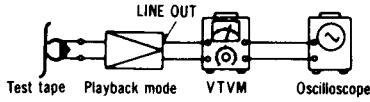
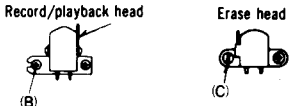
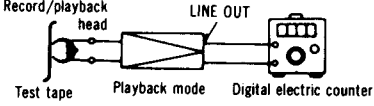
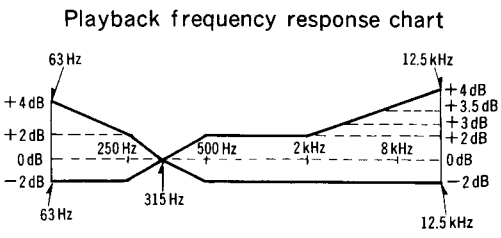


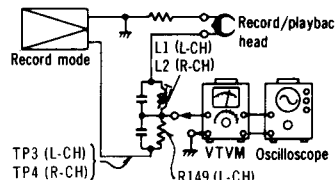
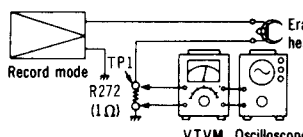
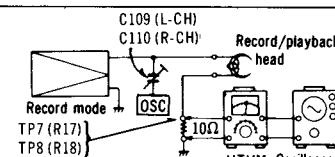
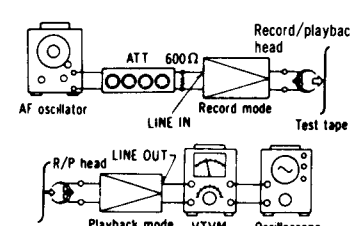
Fig. 1

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
- Tape selector: Normal
- Input selector: Line in

- Timer start switch: OFF
- Memory switch: OFF
- Multiplex filter switch: OUT
- Input level controls: Maximum
- Output level control: Maximum

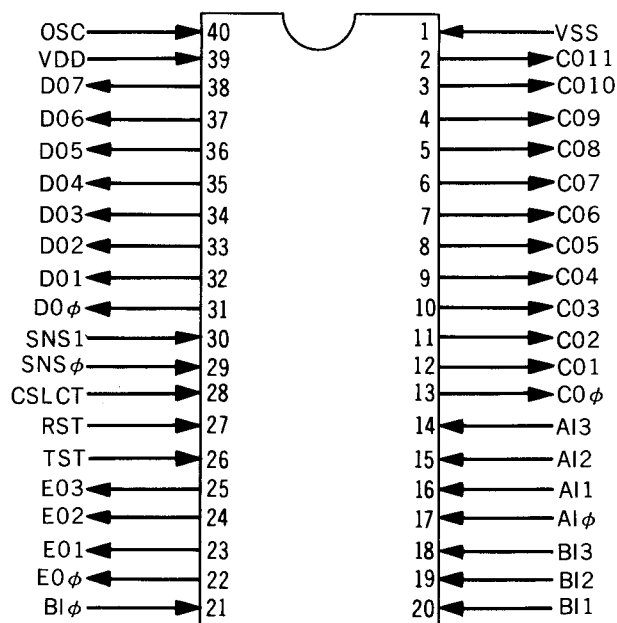
ITEM	MEASUREMENT & ADJUSTMENT
A Head azimuth adjustment Condition: • Playback mode Equipment: • VTVM • Oscilloscope • Test tape (azimuth) ... QZZCFM • Tape path viewer ... QZZCRD	Record/playback head adjustment 1. Test equipment connection is shown in fig. 2. 2. Playback azimuth tape (QZZCFM 8kHz). 3. Adjust record/playback head angle adjustment screw (B) in fig. 3 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.  Fig. 2 Erase head adjustment 1. Test equipment connection is the same above but use the tape path viewer (QZZCRD) instead of test tape (QZZCFM). 2. Playback this tape. 3. Adjust screw (C) shown in fig. 4 so that the tape may not get curled or malformed by tape guide of the erase head. 4. After adjustment, lock head adjust screw with lacquer.  Fig. 3 Fig. 4
B Tape speed Condition: • Playback mode • Tape selector ... Normal position Equipment: • Digital electronic counter • Test tape ... QZZCWAT	Tape speed accuracy 1. Test equipment connection is shown in fig. 5. 2. Playback 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. Playback the test tape (middle). 2. Adjust so that frequency becomes 3,000Hz. 3. 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: $\text{Tape speed fluctuation} = \frac{f_1 - f_2}{3,000} \times 100 (\%)$ f_1 = maximum value, f_2 = minimum value Standard value: Less than 1.0%  Fig. 5
C Playback frequency response Condition: • Tape selector ... Normal position • Playback mode Equipment: • VTVM • Oscilloscope • Test tape ... QZZCFM	1. Test equipment connection is shown in fig. 2. 2. Place UNIT into playback mode. 3. Playback the frequency response test tape (QZZCFM). 4. Measure output level at 12.5kHz, 8kHz, 4kHz, 1kHz, 250Hz, 125Hz and 63Hz, and compare each output level with the standard frequency 315Hz, 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. 6).  Fig. 6

ITEM	MEASUREMENT & ADJUSTMENT
㊦ Playback gain Condition: * Tape selector ... Normal position * Playback 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, 0 dB), and using VTVM measure the output level at LINE OUT jack. 3. Make measurement for both channels. Standard value: $0.7V \pm 1.5\text{ dB}$ Adjustment 1. If measured value is not within standard, adjust VR3 (L-CH), VR4 (R-CH) (shown in fig. 1). 2. After adjustment, check "Playback frequency response" again.
㊦ Bias leakage Condition: * Record mode * Input level controls ... MAX * Output level control ... MAX * Tape selector ... Metal position Equipment: * VTVM * Oscilloscope	1. Test equipment connection is shown in fig. 7. 2. Place UNIT into record mode. 3. Adjust trap coils L1 (L-CH), L2 (R-CH), so that measured value becomes minimum. 4. Make adjustment for both channels.  Fig. 7
㊦ Erase current Condition: * Tape selector ... Metal position * Record mode Equipment: * VTVM * Oscilloscope	1. Test equipment connection is shown in fig. 8. 2. Place UNIT into record mode and measure voltage at test point 1. 3. Determine erase current with the following formula: $\text{Erase current (A)} = \frac{\text{Voltage across both ends of R272}}{1 (\Omega)}$ Standard value: $145 \pm 5\text{ mA}$ (Tape selector ... Metal) 4. If measured value is not within standard, adjust VR9.  Fig. 8
㊦ Bias current Condition: * Record mode * Tape selector ... Normal position ... Fe-Cr position ... CrO₂ position ... Metal position Equipment: * VTVM * Oscilloscope	1. Test equipment connection is shown in fig. 9. 2. Place UNIT into record mode, and tape selector to normal position. 3. 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: around $330\mu\text{A}$ (Normal position) 4. Adjust C109 (L-CH) and C110 (R-CH) (shown in fig. 1). 5. Set the tape selector to each position. 6. Make sure that the measured value is within standard. Standard value: around $370\mu\text{A}$ (Fe-Cr position) around $415\mu\text{A}$ (CrO₂ position) around $700\mu\text{A}$ (Metal position)  Fig. 9
㊦ Overall gain Condition: * Record/playback mode * Normal position * Input level controls ... MAX * Output level control ... MAX * Standard input level; MIC ... $-72 \pm 3.5\text{ dB}$ LINE IN ... $-24 \pm 3.5\text{ dB}$ Equipment: * VTVM * AF oscillator * ATT * Oscilloscope * Resistor (600Ω) * Test tape (reference blank tape) ... QZZCRA for Normal	1. Test equipment connection is shown in fig. 10. 2. Place UNIT into record mode, and normal tape mode. 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 0.7 V. 5. Using test tape, make recording. 6. Playback recorded tape, and make sure the value at LINE OUT on VTVM becomes 0.7 V. 7. If measured value is not 0.7 V, adjust VR5 (L-CH), VR6 (R-CH). 8. Repeat from step 2.  Fig. 10

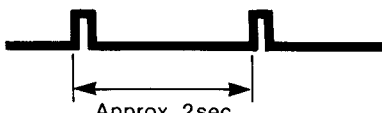
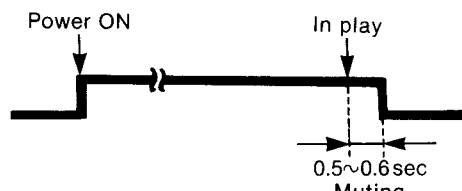
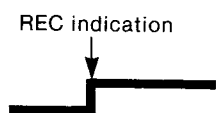
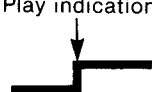
ITEM	MEASUREMENT & ADJUSTMENT
① Fluorescent meter Condition: * Record mode * Input level controls ... MAX * Output level control ... MAX * Tape selector ... Normal position Equipment: * VTVM * AF oscillator * ATT	- Test equipment connection is shown in fig. 10. - As shown in fig. 11, connect the collector of Q206 and ground. - Supply 1 kHz signal (−24 dB) to the LINE IN jack, then press the record button. - Adjust the ATT so that the output level at LINE OUT jack becomes 0.7 V (The input level at this condition is termed the standard input level). - Adjustment at “−20 dB”. - Adjust the ATT so that input level is −20 dB below standard recording level. - Adjust VR11 so that the −20 dB segment lights up in the $-20 \text{ dB} \pm 0.8 \text{ dB}$ range (L-CH ONLY) (See fig. 12). - Adjustment at “0 dB”. - Adjust the ATT so that the output level at LINE OUT jack becomes 0.7 V. (The input level at this condition is termed the standard input level.) - Adjust VR10 so that the +1 dB segment lights up in the $0 \pm 0.2 \text{ dB}$ range of the standard input level (See fig. 13). - Repeat twice between steps 5 and 6 above. - Adjust ATT and check that all segments light up when an input signal level is increased to 10 dB higher than the standard input level (See fig. 14). Fig. 11 Fig. 12 Fig. 13 Fig. 14
② Overall frequency response Condition: * Record/playback mode * Tape selector ... Normal position ... Fe-Cr position ... CrO₂ position ... Metal position * Input level controls ... MAX * Output level control ... MAX Equipment: * VTVM * AF oscillator * ATT * Resistor (600 Ω) * Test tape (reference blank tape) ... QZZCRA for Normal ... QZZCRX for CrO₂ ... QZZCRY for Fe-Cr ... QZZCRZ for Metal	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). Note: 2 Test tape QZZCRA to be supplied after July 1980 has higher recording sensitivity in the middle and high frequency range. - This chart indicates the standard values for the new type of QZZCRA when in use. - This chart indicates the standard values for the former type of QZZCRA when in use. The new type of QZZCRA is marked as shown in fig. 16. Fig. 16 - Test equipment connection is shown in fig. 10. - Place the test tape (QZZCRA) in the cassette holder. - Place UNIT into record mode, and tape selector to normal position. - Supply 1 kHz signal from AF oscillator through ATT to LINE IN. - Adjust ATT so that input level is −20 dB below standard recording level (standard recording level = 0 VU). Overall frequency response chart (Normal) Fig. 15 Overall frequency response chart (Metal, CrO₂) Fig. 17

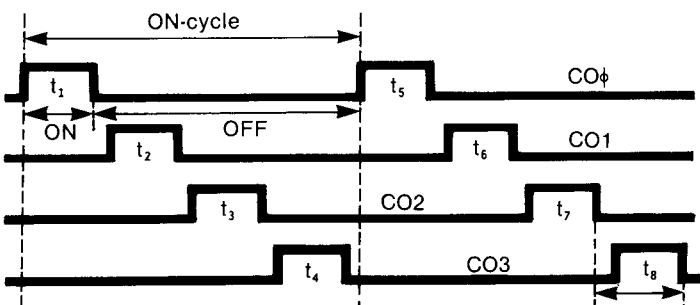
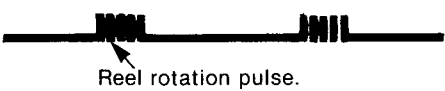
ITEM	MEASUREMENT & ADJUSTMENT
	6. At this time, LINE OUT level indicates 0.07V. 7. Record each frequency 30Hz, 100Hz, 1kHz, 4kHz, 8kHz, 10kHz, 12kHz, and 13kHz (14kHz for CrO₂ and Fe-Cr, 16kHz for Metal). 8. Playback and express in dB the difference between playback output level of each frequency based on playback output level of 1 kHz. 9. Make sure that the measured value is within the range specified in the overall frequency response chart (shown infig. 15). 10. Change test tape to Metal (QZZCRZ), CrO₂ (QZZCRX) and Fe-Cr (QZZCRY). 11. Set the tape selector to each position. 12. Measure as same as manner above. 13. Make sure that the measured value is within the range specified in the overall frequency response chart for Fe-Cr, CrO₂ and Metal tape shown in fig. 17 and 18. 14. If measured value is not within standard, adjust C109 (L-CH), C110 (R-CH). Overall frequency response chart (Fe-Cr) Fig. 18
K Dolby NR circuit Condition: * Record mode * Input level controls... MAX * Output level control... MAX Equipment: * VTVM * AF oscillator * ATT * Oscilloscope * Resistor (600Ω)	1. Test equipment connection is shown in fig. 19. 2. Place UNIT into record mode, set the Dolby NR switch to OUT position and supply to LINE IN to obtain -34.5 dB at TP5 (L-CH), TP6 (R-CH) (frequency 5 kHz). 3. Confirm that the value at IN position is $8 (\pm 2.5)$ dB greater than the value at OUT position of Dolby NR switch. Fig. 19

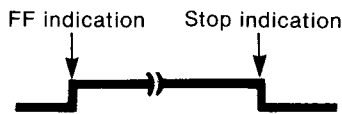
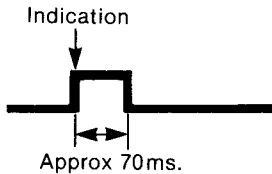
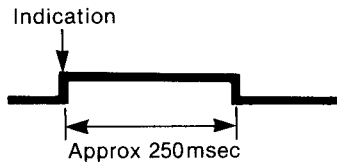
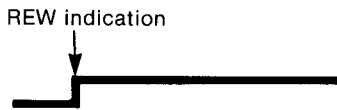
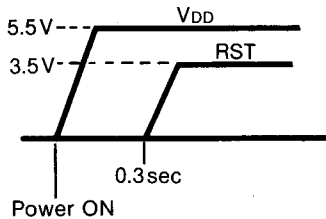
MN1400RS: TERMINATION (BOTTOM VIEW)



MN1400RS: EACH TERMINAL FUNCTION AND WAVEFORM

Terminal No.	Symbol	Name	Function/operation
1.	VSS	GND	
2.	CO11	No connection	Not used.
3.	CO10	FL meter reset	 Approx. 2sec This output is for resetting the Peak Hold of the FL Meter. The pulse 2.5msec. width is transmitted in approx. 2-second cycles, regardless of the mechanism operation.
4.	CO9	No connection	Not used.
5.	CO8	No connection	Not used.
6.	CO7	Muting	 Power ON In play 0.5~0.6sec Muting "L" level 0.5 to 0.6 second after "PLAY" finish. "H" level in PAUSE, FF, REW STOP. "L" level approx. 0.3 second after "REC PAUSE" is switched to REC. "L" level approx. 0.3 second after command in case PAUSE mode is set to REC command.
7.	CO6	REC indication	 REC indication "H" level simultaneously with REC indication. "H" level immediately after power is ON in TIMER REC mode. "H" level held if in TIMER REC position, when STOP AUTO RESET mechanism operates.
8.	CO5	PLAY indication	 Play indication "H" level simultaneously with PLAY indication. Same as the above for TIMER PLAY and STOP AUTO RESET.

Terminal No.	Symbol	Name	Function/operation
9.	CO4	PAUSE indication	Pause indication  "H" level simultaneously with PAUSE indication.
10.	CO3	FL grid & input SW. scan	
11.	CO2	FL grid & input SW. scan	
12.	CO1	FL grid & input SW. scan	
13.	COφ	FL grid & input SW. scan	
14.	Ai3	Input SW read	Each switch is read in accordance with the scans of COφ to 3. STOP SW, MEMORY STOP, TIMER REC and COUNTER RESET are connected to Aiφ. If only STOP SW and MEMORY STOP are closed, their waveforms are as follows;  1.6msec With TIMER REC mode. HALF SW and HALL IC output are connected to Ai3. The waveforms during FF or REW operation are as follows;  Reel rotation pulse.
15.	Ai2	Input SW read	
16.	Ai1	Input SW read	
17.	Aiφ	Input SW read	
18.	Bi3	REW key	Push the switch.  "H" in the normal case, "L" when the switch is pushed.
19.	Bi2	FF key	
20.	Bi1	PLAY key	
21.	Biφ	STOP key	
29.	SNSφ	REC key	
30.	SNS1	PAUSE key	

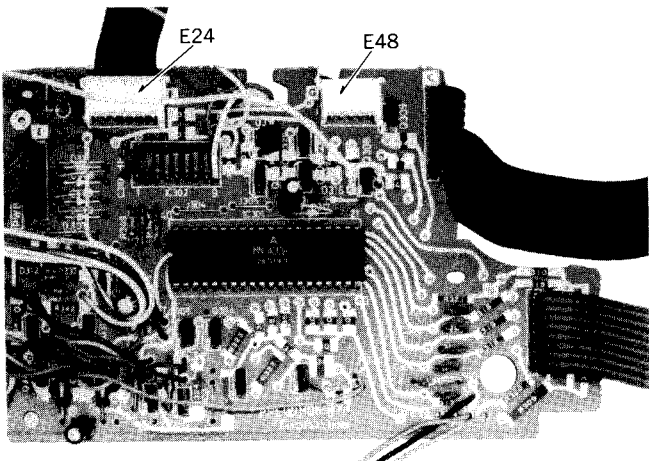
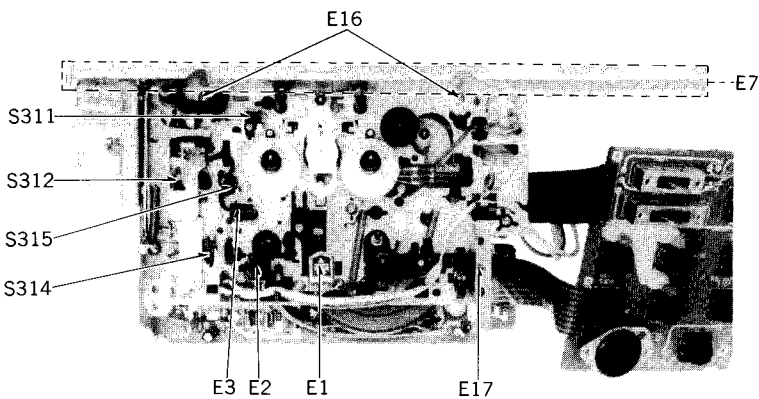
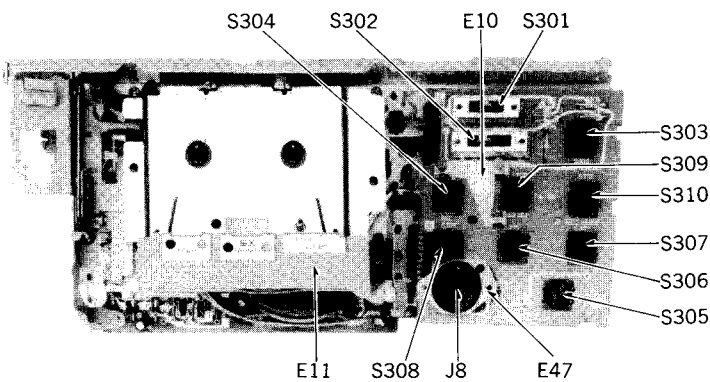
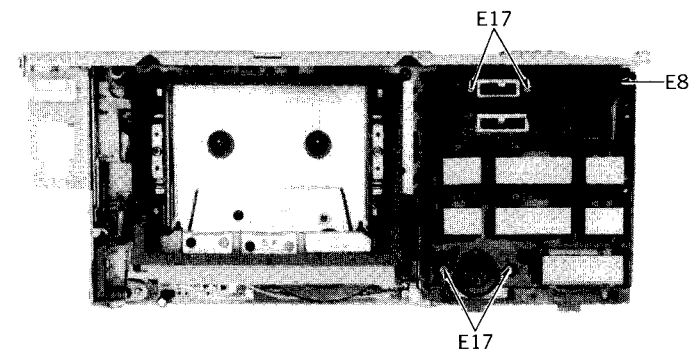
Terminal No.	Symbol	Name	Function/operation
22.	EO ϕ	Brake plunger	 FF indication Stop indication "H" during FF/REW operations.
23.	EO1	Trigger plunger	 Indication Approx 70ms. "H" until MODE SW is closed after the input to switch the mechanism, such as PLAY, PAUSE, STOP, etc. has been applied. (Approx. 70ms. depending on the mechanism condition.)
24.	EO2	Motor CL	 Indication Approx 250msec "H" until MODE SW is changed from "close" to "open" following the indication that the mechanism mode has been changed.  REW indication "H" in REW operation.
25.	EO3	Motor UNCL	Same as the above in MODE conversion. "H" during FF.
26.	TST	Chip test	Connected to GND.
27.	RST	RESET	Computer's RESET terminal. Reset is less than 0.8V.  5.5V --- VDD 3.5V --- RST 0.3sec Power ON

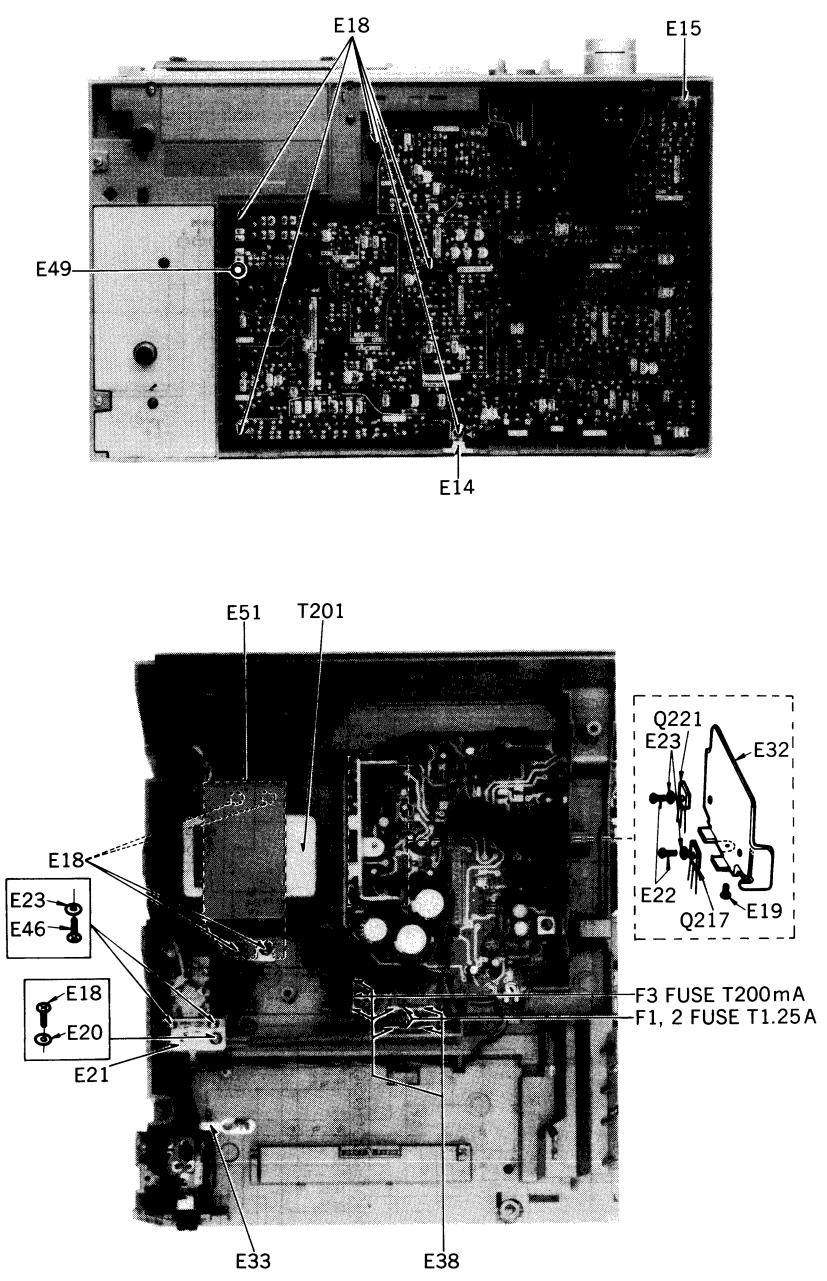
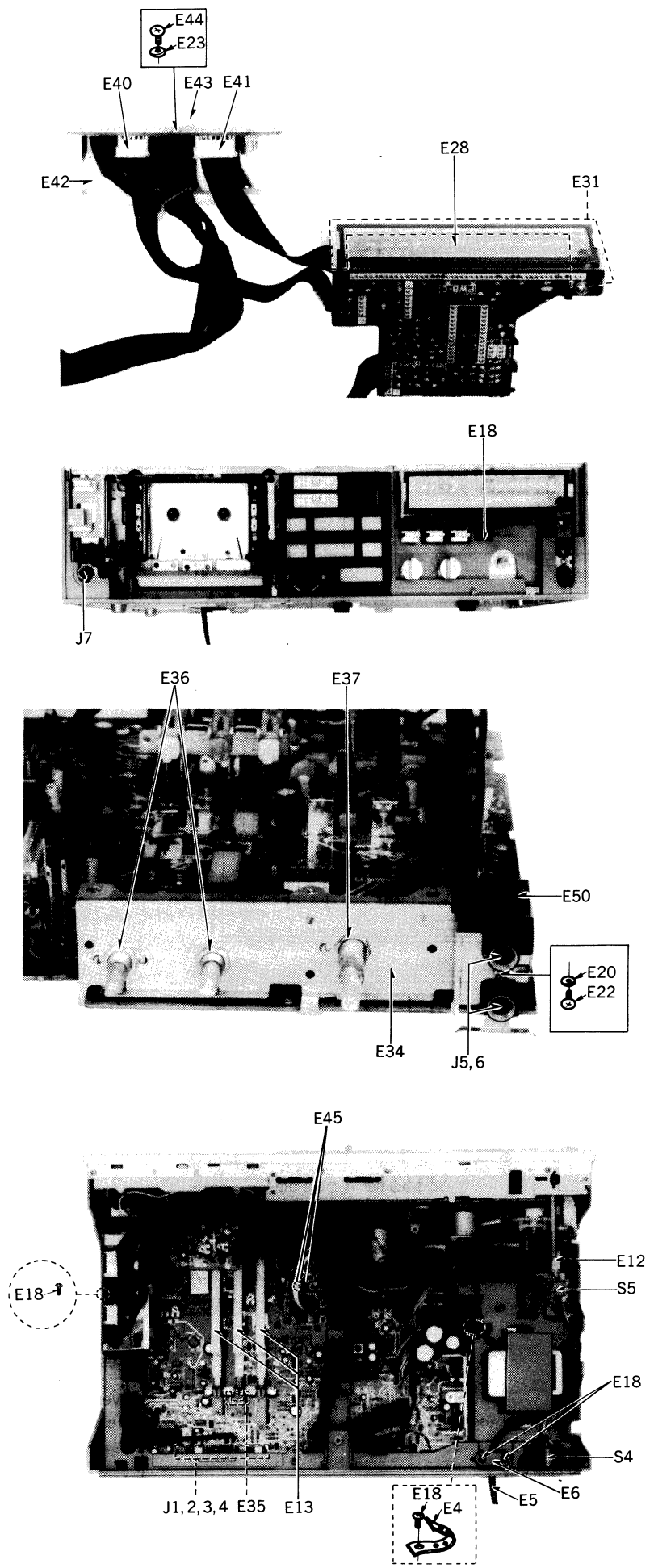
Terminal No.	Symbol	Name	Function/operation
28.	CSLCT	CSLCT	Connected to VDD.
31.	DO ϕ	FL counter Segment a	Segment g (37) Segment a (31) Segment f (36) Segment b (32) Segment e (35) Segment c (33) Segment d (34) 5V ON 0V OFF
32.	DO1	FL counter Segment b	
33.	DO2	FL counter Segment c	
34.	DO3	FL counter Segment d	
35.	DO4	FL counter Segment e	
36.	DO5	FL counter Segment f	
37.	DO6	FL counter Segment g	
38.	DO7	No connection	Not used.
39.	VDD	Power source	Operated at 4.5V to 6.0V.
40.	OSC	Oscillation terminal	3V 1V 3μs Oscillation is approx. 300kHz. Because the connection of a probe affects the terminal, nothing should be connected to this terminal for any other measurements. Use COϕ to 3 in measuring the computer's velocity; Approx. 155Hz in STOP condition.

TROUBLESHOOTING

Fault	Probable cause	Microcomputer terminal to check	Relevant mechanism parts	Relevant external parts
Mechanism does not operate at all. FL not lighting FL lighting OK. (MODE LED not lighting.) MODE indicator lighting OK.	Microcomputer not operating Power not supplied. Clock not oscillating. Reset locked. Microcomputer normal. (Scan normal) Connection to FL Driver. Half SW. closed. Motor circuit faulty.	 39 (VDD) 40 (OSC) 10 to 13 27 (RST) 10 to 13 31 to 37 14 (Ai3) 24, 25	 Half SW. Motor connection	 C310, R347 C309, D317 D311 Q312 to 315
Mechanism defective. FF/REW reverse rotation. FF/REW motor rotating, reel not rotating. CAM continuous rotation in PLAY. Motor rotating in PLAY, but CAM's not switched. Motor rotates in reverse and does not stop after switching to PLAY or PAUSE.	Reverse connection of motor. Brake plunger not being with drawn. MODE SW. defective. Trigger plunger not operating PLAY or STOP SW, defective.	24, 25 22 (EO ϕ) 15 (Ai2) 23 (EO1) 16 (Ai1) 17 (Ai ϕ)	Motor connection Brake plunger disconnection, etc. MODE SW. Trigger plunger STOP PLAY Leaf SW.	 Q313 D310 Q317 D308 D309
REC IND. due not light up. (Operation is normal) PLAY IND. does not light up. PAUSE IND. does not light up. Not counting.	LED or drive transistor defective. -do- -do- Hall IC faulty, buffer circuit faulty.	7 (CO6) 8 (CO5) 9 (CO4) 14 (Ai3)	 Reel magnet	Q305, R324 Q304, R323 Q303, R322 IC303 (Hall IC) Q302, D306
AUTO STOP functioning soon after operation begins. No muting. No peak-resetting. Accidental erase prevention mechanisms not functioning. Operating during EJECT.	Same as the above. (Not counting) Muting output connection etc. Connection Leaf SW Half detection SW.	 6 (CO7) 3 (CO10) 15 (Ai2) 14 (Ai3)	 Accidental erasure Leaf SW Half detection SW.	 D307 D311

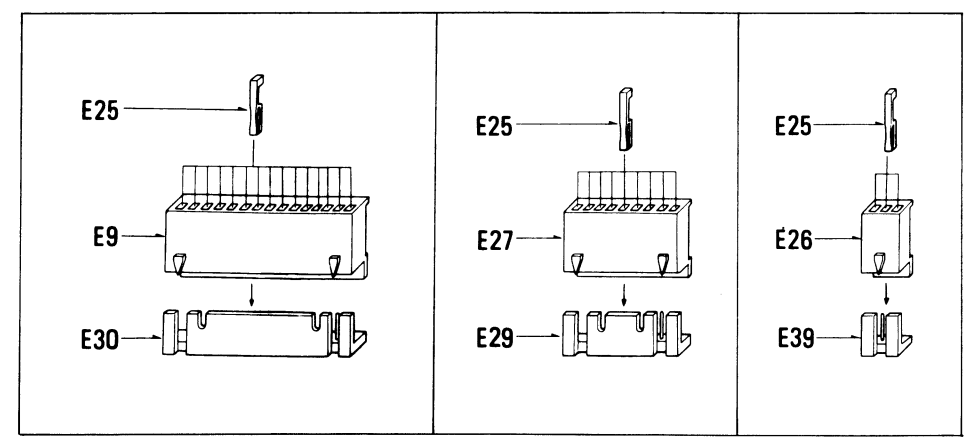
ELECTRICAL PARTS LOCATION





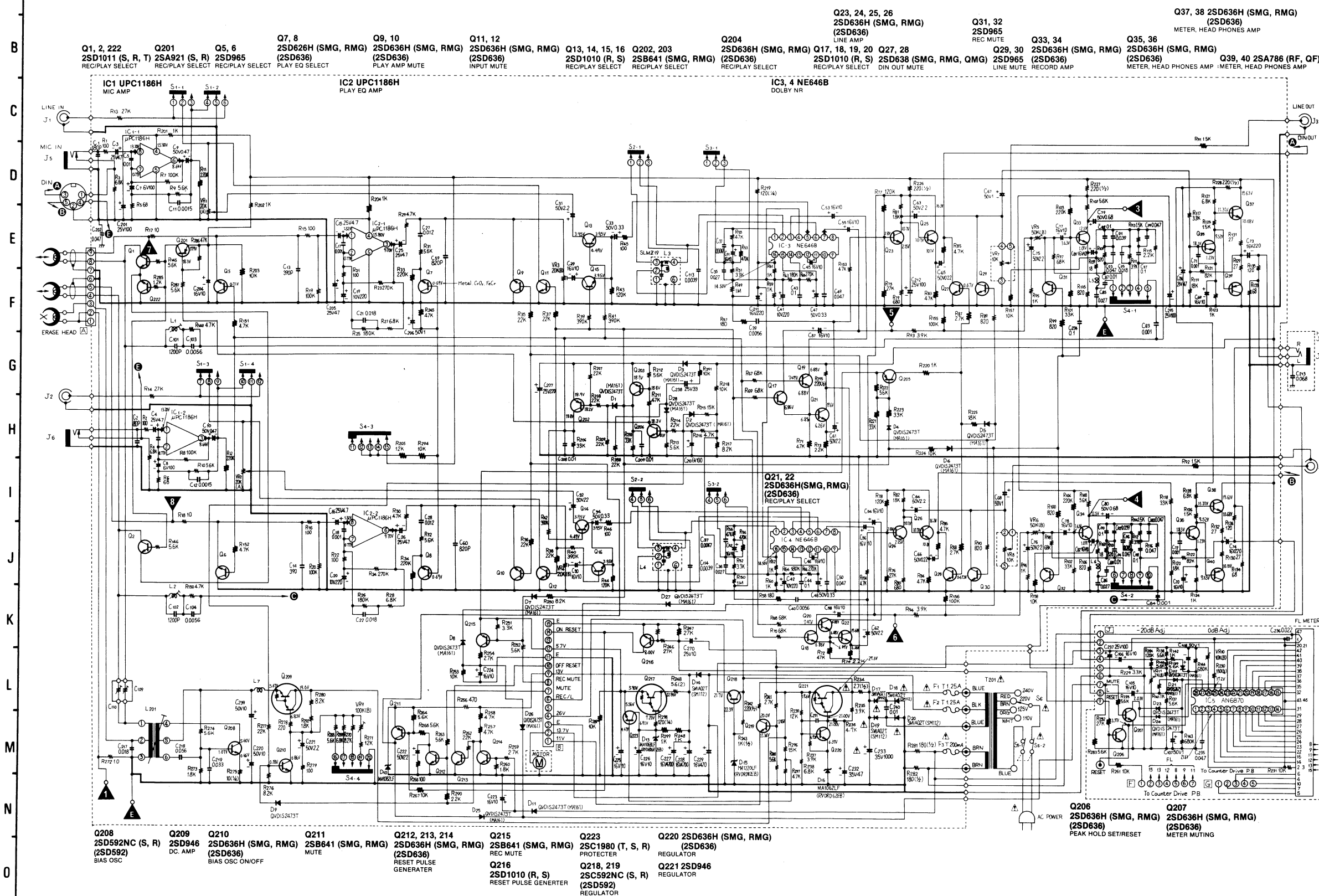
NOTE: Δ indicates that only parts specified by the manufacturer be used for safety.

Ref. No.	Part No.	Part Name & Description
ELECTRICAL PARTS		
E1	QWY4123Z	Record/Playback Head
E2	QWY2138Z	Erase Head
E3	XAMQ44S200	Mechanism Pilot Lamp
E4	RME144ZA	Cord Clamper
E5	Δ SJA88	AC Power Cord
*For all European areas except United Kingdom.		
Δ RJA45ZCK		
*For United Kingdom.		
E6	QTD1164	Cord Bushing
E7	QMA3980	Reinforcement Angle
E8	QMA1880	Button Chassis
E9	QJS1925TN	15 Pin Socket
E10	QKJ0418	LED Holder
E11	QGH1091	Head Cover
E12	QMR1888	Power Switch Rod
E13	QMR1889	Switch Rod
E14	QJC0035	Earth Plate-A
E15	QJC0036	Earth Plate-B
E16	XTN3+8B	Screw $\oplus 3 \times 8$
E17	XTN26+6B	Screw $\oplus 2.6 \times 6$
E18	XTN3+12B	Screw $\oplus 3 \times 12$
E19	XTS3+10B	"
E20	XWG3	Washer
E21	QMA3979	Switch Angle
E22	XSN3+8S	Screw $\oplus 3 \times 8$
E23	XWA3B	Washer
E24	QJS1959S	7 Pin Jumper Socket
E25	QJT1054	Contact
E26	QJS1921TN	3 Pin Socket
E27	QJS1923TN	9 Pin Socket
E28	QSIFM001F	FL Meter
E29	QJP1923TN	9 Pin Post
E30	QJP1925TN	15 Pin Post
E31	QKJ0417	Meter Holder
E32	QTH1153	Heat Sink
E33	QMF1816	Earth Terminal
E34	QMA3978	Volume Angle
E35	QMA3847	Power Switch Angle
E36	XNS8	Nut
E37	XNS9	"
E38	Δ QTF1054	Fuse Holder
E39	QJP1921TN	3 Pin Post
E40	QJS1961S	5 Pin Jumper Connector
E41	QJS1962S	7 Pin Jumper Connector
E42	QTS1519	Shield Plate
E43	QMA4019	Circuit Board Angle
E44	XSN3+6S	Screw $\oplus 3 \times 6$
E45	QJT1041	Check Pin
E46	XSN3+6S	Screw $\oplus 3 \times 6$
E47	QMF2136	Socket Holder
E48	QJS1958S	5 Pin Jumper Socket
E49	QBK7143	Washer
E50	QTS1523	Microphone Shield Plate
E51	QTS1524	Transformer Shield Plate



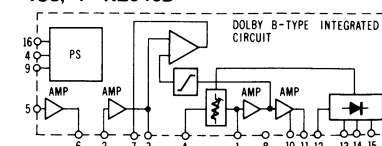
SCHEMATIC DIAGRAM

MAIN AMP CIRCUIT

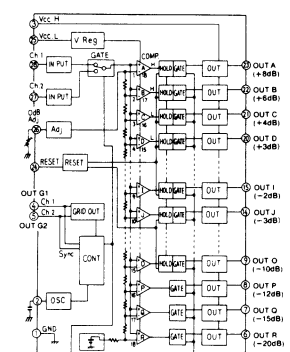


EQUIVALENT CIRCUIT

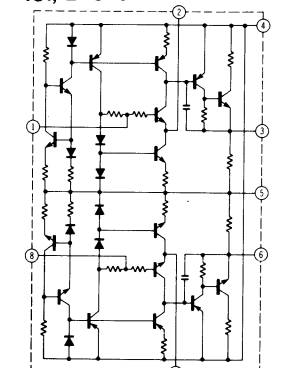
IC3, 4 NE646B



IC5 AN8870

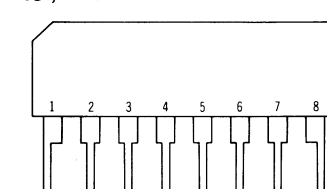


IC1, 2 UPC1186H



TERMINATION (SIDE VIEW)

IC1, 2 UPC1186H

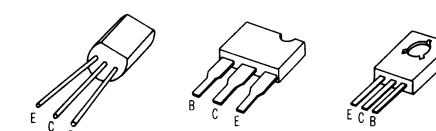


(BOTTOM VIEW) TRANSISTORS

Q1, 2, 5, 6, 13-20, 29-32
201, 208, 216, 218, 219
222, 223

Q7-12, 21-28, 33-40
202-207, 210-215, 220

Q209, 217, 221



SPECIFICATIONS

- * Input level controls... MAX
- * Output level control... MAX

Playback S/N ratio Test tape... QZZCFM	Greater than 45 dB
Overall distortion Test tape ... QZZCRA for Normal ... QZZCRX for CrO ₂ ... QZZCRY for Fe-Cr ... QZZCRZ for Metal	Less than 3.5 %
Overall S/N ratio Test tape... QZZCRA	Greater than 43 dB (without NAB filter)

NOTES:

- S1-1—S1-4 Input select switch (shown in line position).
- S2-1, S2-2 Multiplex filter in/out switch (shown in out position).
- S3-1, S3-2 Dolby in/out select switch (shown in out position).
- S4-1—S4-4 Tape select switch (shown in normal position).
- S5 Power on/off switch (shown in on position).
- S6 AC power voltage select switch.
- VR1, VR2 Input level controls.
- VR3, VR4 Playback gain adjustment VR.
- VR5, VR6 Recording gain adjustment VR.
- VR7, VR8 Output level controls.
- VR9 Erase current adjustment VR.
- VR10 FL meter adjustment VR (for 0dB indication).
- VR11 FL meter adjustment VR (for -20dB indication).
- L1, L2 Bias leakage adjustment coil.
- C109, C110 Bias current adjustment VC.

- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
K = 1,000 Ω , M = 1,000 k Ω .
- Resistors indicated thickly show printed type resistor.
- Capacity 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 and record mode with volume control at minimum position.
- For measurement, use VTVM.

CIRCUIT BOARDS

MAIN AMP CIRCUIT BOARD

NOTES: RESISTORS

ERD ... Carbon
ERG ... Metal-oxide
ERO ... Metal-film
ERX ... Metal-film
ERQ ... Fuse type metallic
ERC ... Solid
ERF ... Cement

CAPACITORS

ECG ... Ceramic
ECK ... Ceramic
ECC ... Ceramic
ECF ... Ceramic
ECQM ... Polyester film
ECQE ... Polyester film
ECQF ... Polypropylene
ECE ... Electrolytic
ECEN ... Non polar electrolytic
ECQS ... Polystyrene
ECS ... Tantalum

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

Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.
RESISTORS				VARIABLE CAPACITORS			
R1, 2	ERD25FJ101	R237	ERD25FJ392	C37, 38	ECQM1H472JZ	C109, 110	QVCC2121
R3, 4	ERD25FJ682	R238	ERD25FJ682	C39, 40	ECQM1H562JZ	TRANSISTORS	
R5, 6	ERD25FJ680	R239	ERD25TJ123	C41, 42	ECEA1AS221	Q1, 2	2SD1011
R7, 8	ERD25TJ104	R240	ERD25FJ562	C43, 44	ECFDD104KXY	Q5, 6	2SD965
R9, 10	ERD25FJ562	R241	ERD25FJ272	C45, 46	ECEA1HS100	Q7, 8, 9, 10, 11, 12	2SD636
R13, 14	ERD25TJ273	R242	ERG12ANJ221	C47, 48	ECEA50Z8R33	Q13, 14, 15, 16, 17, 18, 19, 20	2SD1010
R15, 16	ERD25FJ101	R243	ERG12ANJ102	C49, 50	ECQM1H473JZ	Q21, 22, 23, 24, 25, 26	2SD636
R17, 18	ERD25FJ100	R246	ERD25TJ273	C53, 54, 55, 56, 57, 58	ECEA1HS100	Q27, 28	2SD638
R19, 20	ERD25FJ100	R248	ERX2ANJ586	C59, 60	ECKD1H821KB	Q29, 30, 31, 32	2SD965
R21, 22	ERD25TJ104	R251	ERD25FJ332	C61, 62, 63, 64	ECEA2AS2R2	Q33, 34, 35, 36, 37, 38	2SD636
R23, 24	ERD25TJ274	R252	ERD25FJ562	C65, 66	ECEA50Z8R22	Q39, 40	2SA786
R25, 26	ERD25TJ104	R256	ERD25FJ471	C67, 68	ECEA2AS010	Q201	2SA921
R27, 28	ERD25FJ682	R259	ERD25FJ272	C69, 70	ECEA1HS100	Q202, 203	2SB641
R29, 30	ERD25FJ472	R260	ERD25FJ182	C71, 72	ECKD1H102MD	Q204	2SD636
R31, 32	ERD25FJ562	R262	ERD25TJ223	C73, 74	ECEA1CS221	Q205	2SB641
R39, 40, 41, 42	ERD25FJ102	R268	ERD25FJ562	C75, 76	ECEA50Z8R2	Q206, 207	2SD636
R49, 50	ERD25TJ394	R269	ERD25FJ682	C77, 78	ECEA1HS100	Q208	2SD592NCS
R51, 52	ERD25TJ105	R270	ERD25TJ153	C79, 80	ECEA50Z8R68	Q209	2SD946
R55, 56	ERD25TJ473	R271	ERD25TJ123	C81, 82	ECEA1HS100	Q210	2SD636
R59, 60, 61, 62	ERD25FJ102	R272	ERD25FJ180	C83, 84	ECKD1H102MD	Q211	2SB641
R63, 64	ERD25TJ104	R273	ERD25FJ182	C85, 86	ECEA1HS100	Q212, 213, 214	2SD636
R65, 66	ERD25TJ274	R274	ERD25FJ562	C87, 88	ECKD1H102MD	Q215	2SB641
R67, 68, 69, 70	ERD25TJ683	R275	ERQ14AJ100P	C89, 90	ECFDD273KXY	Q216	2SD1010
R79, 80	ERD25FJ681	R276	ERD25FJ822	C91, 92	ECFDD104KXY	Q217	2SD946
R81, 82	ERD25FJ182	R277	ERD25TJ223	C93, 94	ECFDD473KXY	Q218, 219	2SD592NCS
R89, 90	ERD25FJ821	R278	ERD25FJ221	C95, 96	ECFDD183KXY	Q220	2SD636
R93, 94	ERD25FJ392	R280	ERD25FJ822	C97, 98	ECFDD104KXY	Q221	2SD946
R95, 96	ERD25FJ102	R281, 282	ERG12ANJ181	C99, 100	ECFDD473KXY	Q222	2SD1011
R97, 98	ERD25TJ683	R284	ERD25TJ124	C101, 102	ECQP1122JZ	Q223	25C1980
R102	ERD25TJ333	R285	ERD25FJ122	C103, 104	ECFDD562KXY	Q302	2SB641
R105, 106	ERD25FJ821	R286	ERD25TJ473	C105, 106	ECEA1HS100	Q303, 304, 305	2SD636
R107, 108	ERD25FJ562	R287	ERD25FJ562	C107, 108	ECEA2AS010	Q306	2SD637
R109, 110	ERD25FJ821	R288	ERD25TJ223	C111, 112	ECEA1HS100	Q307	2SB642
R111, 112	ERD25FJ392	R292	ERD25FJ182	C113, 114	ECQM1H392JZ	Q308	2SD637
R113, 114	ERD25FJ152	R295	ERG12ANJ221	C201	ECEA1ES101	TRANSFORMER	
R115, 116	ERD25FJ222	R296	ERD25TJ153	C202	ECQM1H473KZ		
R117, 118	ERD25TJ333	R297	ERD25FJ472	C203	ECEA1HS100	T201	Δ QLPD49ELC
R119, 120	ERD25TJ183	R298	ERD25AJ121P	C204	ECEA1HS100	COILS	
R121, 122	ERD25TJ823	R337	ERD25FJ180	C205	ECEA1ES470	L1, 2	QLQM0333
R123, 124	ERD25FJ102	R340	ERD25FJ180	C206	ECEA2AS010	L3, 4	SLM1Z19
R125, 126	ERD25FJ152	R347	ERD25TJ153	C207	ECEA1ES221	L5, 6, 7	QLQX0332K
R127, 128	ERD25FJ682	R348	ERD25TJ273	C208, 209	ECKD1H103ZF	L201	QLB0198K
R129, 130, 131, 132	ERD25FJ680	R349	ERD25FJ563	C210	ECEA1AS101	L301, 302	QLQZ1014D
R133, 134	ERD25FJ270	R356, 357, 358, 359, 360, 361, 362, 363	ERD10TJ473	C211	ECEA1CS221	L303	ELEH101KA
R135, 136	ERD25FJ121	R401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424	ERD25TJ473	C212	ECEA1ES101	SWITCHES	
R137, 138, 139, 140	ERD25FJ562	R422	ERD25FJ472	C213	ECEA1H683KZ	S1, 2, 3	QSWY304
R141, 142	ERD25FJ102	R423	ERD25FJ472	C214	ECEA1ES470	S4	QSR4404
R143, 144	ERD25TJ684	R424	ERD25FJ472	C215	ECEA1ES101	S5	Δ QSW2214
R145, 146	ERD25FJ562	R425	ERD25FJ472	C216	ECEA1ES101	S6	Δ QSR1407H
R149, 150	ERD25FJ472	R426	ERD25FJ472	C217	ECQP1183JZ	S301	QSS1302
R153, 154	ERD25FJ472	R427	ERD25FJ472	C218	ECQM1H563KZ	S302	QSS1401
R159, 160	ERD25FJ180	R428	ERD25FJ472	C219	ECQM1H333KZ	S303, 304, 305, 306, 307, 308, 309, 310	EVQPAR11K
R201, 202	ERD25FJ102	R429	ERD25FJ472	C220	ECEA1HF100	S311	QSB0260
R206	ERD25TJ333	R430	ERD25FJ472	C221	ECEA50ZR22	S312	QSB0261
R207, 208, 209	ERD25TJ223	R431	ERD25FJ472	C222	ECEA2AS2R2	S313, 314	QSB0260
R210	ERD25TJ333	R432	ERD25FJ472	C223	ECEA1HS100	S315	QSB0261
R211	ERD25TJ473	R433	ERD25FJ472	C224	ECKD1H103ZF	FUSES	
R212, 213	ERD25FJ562	R434	ERD25FJ472	C225	ECEA1HS470	F1, 2	Δ XBAQ125028
R214	ERD25TJ223	R435	ERD25FJ472	C226	ECEA1VS102	F3	Δ XBAQ0013
R215	ERD25TJ153	R436	ERD25FJ472	C227, 228	ECFDD104KXY	JACKS	
R216	ERD25FJ472	R437	ERD25FJ472	C229	ECFDD473KXY	J1, 2, 3, 4	QEJ5002S
R218	ERD25FJ103	R438	ERD25FJ472	C230	ECKD1H1223ZF	J5, 6	QJA0257H
R219	ERQ14AJ121P	R439	ERD25FJ472	C231	ECEA1ES101	J7	QJA0249H
R226, 227, 228	ERG12ANJ221	R440	ERD25FJ472	C232	ECEA1VS330	J8	QJS1960S
R229	ERD25FJ332	R441	ERD25FJ472	C233	ECFS16E10	TRANSFORMERS	
R230	ERQ14AJ151P	R442	ERD25FJ472	C234	ECKD1H103ZF	COILS	
R231	ERD25FJ103	R443	ERD25FJ472	C235	ECKD1H103ZF	SWITCHES	
R234	Δ ERQ12AJ2R7P	R444	ERD25FJ472	C236	ECEA1HS100	FUSES	
R235	Δ ERD25FJ392	R445	ERD25FJ472	C237	ECEA1HS100	JACKS	
R236	Δ ERD25FJ472	R446	ERD25FJ472	C238	ECEA1G6N10	J1, 2, 3, 4	QJ5002S
		R447	ERD25FJ472	C239	ECEA1HSR1	J5, 6	QJA0257H
		R448	ERD25FJ472	C240	ECKD1H331KD	J7	QJA0249H
		R449	ERD25FJ472	C241	ECKD1H102MD	J8	QJS1960S
		R450	ERD25FJ472	C242	ECKD1H103ZF	TRANSFORMERS	
		R451	ERD25FJ472	C243	ECEA0JS221	COILS	
		R452	ERD25FJ472	C244	ECEA1G6N10	SWITCHES	
		R453	ERD25FJ472	C245	ECEA1HSR1	FUSES	
		R454	ERD25FJ472	C246	ECKD1H331KD	JACKS	
		R455	ERD25FJ472	C247	ECKD1H102MD	TRANSFORMERS	
		R456	ERD25FJ472	C248	ECKD1H103ZF	COILS	
		R457	ERD25FJ472	C249	ECEA0JS221	SWITCHES	
		R458	ERD25FJ472	C250	ECEA1G6N10	FUSES	
		R459	ERD25FJ472	C251	ECEA1HSR1	JACKS	
		R460	ERD25FJ472	C252	ECKD1H331KD	TRANSFORMERS	
		R461	ERD25FJ472	C253	ECKD1H102MD	COILS	
		R462	ERD25FJ472	C254	ECKD1H103ZF	SWITCHES	
		R463	ERD25FJ472	C255	ECEA0JS221	FUSES	
		R464	ERD25FJ472	C256	ECEA1G6N10	JACKS	
		R465	ERD25FJ472	C257	ECEA1HSR1	TRANSFORMERS	
		R466	ERD25FJ472	C258	ECKD1H331KD	COILS	
		R467	ERD25FJ472	C259	ECKD1H102MD	SWITCHES	
		R468	ERD25FJ472	C260	ECKD1H103ZF	FUSES	
		R469	ERD25FJ472	C261	ECEA0JS221	JACKS	
		R470	ERD25FJ472	C262	ECEA1G6N10	TRANSFORMERS	
		R471	ERD25FJ472	C263	ECEA1HSR1	COILS	
		R472	ERD25FJ472	C264	ECKD1H331KD	SWITCHES	
		R473	ERD25FJ472	C265	ECKD1H102MD	FUSES	
		R474	ERD25FJ472	C266	ECKD1H103ZF	JACKS	
		R475	ERD25FJ472	C267	ECEA0JS221	TRANSFORMERS	
		R476	ERD25FJ472	C268	ECEA1G6N10	COILS	
		R477	ERD25FJ472	C269	ECEA1HSR1	SWITCHES	
		R478	ERD25FJ472	C270	ECKD1H331KD	FUSES	
		R479	ERD25FJ472	C271	ECKD1H102MD	JACKS	
		R480	ERD25FJ472	C272	ECKD1H103ZF	TRANSFORMERS	
		R481	ERD25FJ472	C273	ECEA0JS221	COILS	
		R482	ERD25FJ472	C274	ECEA1G6N10	SWITCHES	
		R483	ERD25FJ472	C275	ECEA1HSR1	FUSES	
		R484	ERD25FJ472	C276	ECKD1H331KD	JACKS	
		R485	ERD25FJ472	C277	ECKD1H102MD	TRANSFORMERS	
		R486	ERD25FJ472	C278	ECKD1H103ZF	COILS	
		R487	ERD25FJ472	C279	ECEA0JS221	SWITCHES	
		R488	ERD25FJ472	C280	ECEA1G6N10	FUSES	
		R489	ERD25FJ472	C281	ECEA1HSR1	JACKS	
		R490	ERD25FJ472	C282	ECKD1H331KD	TRANSFORMERS	
		R491	ERD25FJ472	C283	ECKD1H102MD	COILS	
		R492	ERD25FJ472	C284	ECKD1H103ZF	SWITCHES	
		R493	ERD25FJ472	C285	ECEA0JS221	FUSES	
		R494	ERD25FJ472	C286	ECEA1G6N10	JACKS	
		R495	ERD25FJ472	C287	ECEA1HSR1	TRANSFORMERS	
		R496	ERD25FJ472	C288	ECKD1H331KD	COILS	
		R497	ERD25FJ472	C289	ECKD1H102MD	SWITCHES	
		R498	ERD25FJ472	C290	ECKD1H103ZF	FUSES	
		R499	ERD25FJ472	C291	ECEA0JS221	JACKS	
		R500	ERD25FJ472	C292	ECEA1G6N10	TRANSFORMERS	
		R501	ERD25FJ472	C293	ECEA1HSR1	COILS	
		R502	ERD25FJ472	C294	ECKD1H331KD	SWITCHES	
		R503	ERD25FJ472	C295	ECKD1H102MD	FUSES	
		R504	ERD25FJ472	C296	ECKD1H103ZF	JACKS	
		R505	ERD25FJ472	C297	ECEA0JS221	TRANSFORMERS	
		R506	ERD25FJ472	C298	ECEA1G6N10	COILS	
		R507	ERD25FJ472	C299	ECEA1HSR1	SWITCHES	
		R508	ERD25FJ472	C300	ECKD1H331KD	FUSES	
		R509	ERD25FJ472	C301, 302, 303, 304, 305, 306	ECKD1H102MD	JACKS	
		R510	ERD25FJ472	C307	ECEA0JS221	TRANSFORMERS	
		R511	ERD25FJ472	C308	ECEA1G6N10	COILS	
		R512	ERD25FJ472	C309	ECEA1HSR1	SWITCHES	
		R513	ERD25FJ472	C310	ECKD1H331KD	FUSES	
		R514	ERD25FJ472	C311, 312	ECKD1H102MD	JACKS	
		R515	ERD25FJ472	C312	ECKD1H103ZF	TRANSFORMERS	
		R516	ERD25FJ472	C313	ECEA0JS221	COILS	
		R517	ERD25FJ472	C314	ECEA1G6N10	SWITCHES	
		R518	ERD25FJ472	C315	ECEA1HSR1	FUSES	
		R519	ERD25FJ472	C316	ECKD1H331KD	JACKS	
		R520	ERD25FJ472	C317	ECKD1H102MD	TRANSFORMERS	
		R521	ERD25FJ472	C318	ECKD1H103ZF	COILS	
		R522	ERD25FJ472	C319	ECEA0JS221	SWITCHES	
		R523	ERD25FJ472	C320	ECEA1G6N10	FUSES	
		R524	ERD25FJ472	C321	ECEA1HSR1	JACKS	

CIRCUIT BOARDS

MAIN AMP CIRCUIT BOARD

NOTES: RESISTORS

ERD ... Carbon
ERG ... Metal-oxide
ERO ... Metal-film
ERX ... Metal-film
ERQ ... Fuse type metallic
ERC ... Solid
ERF ... Cement

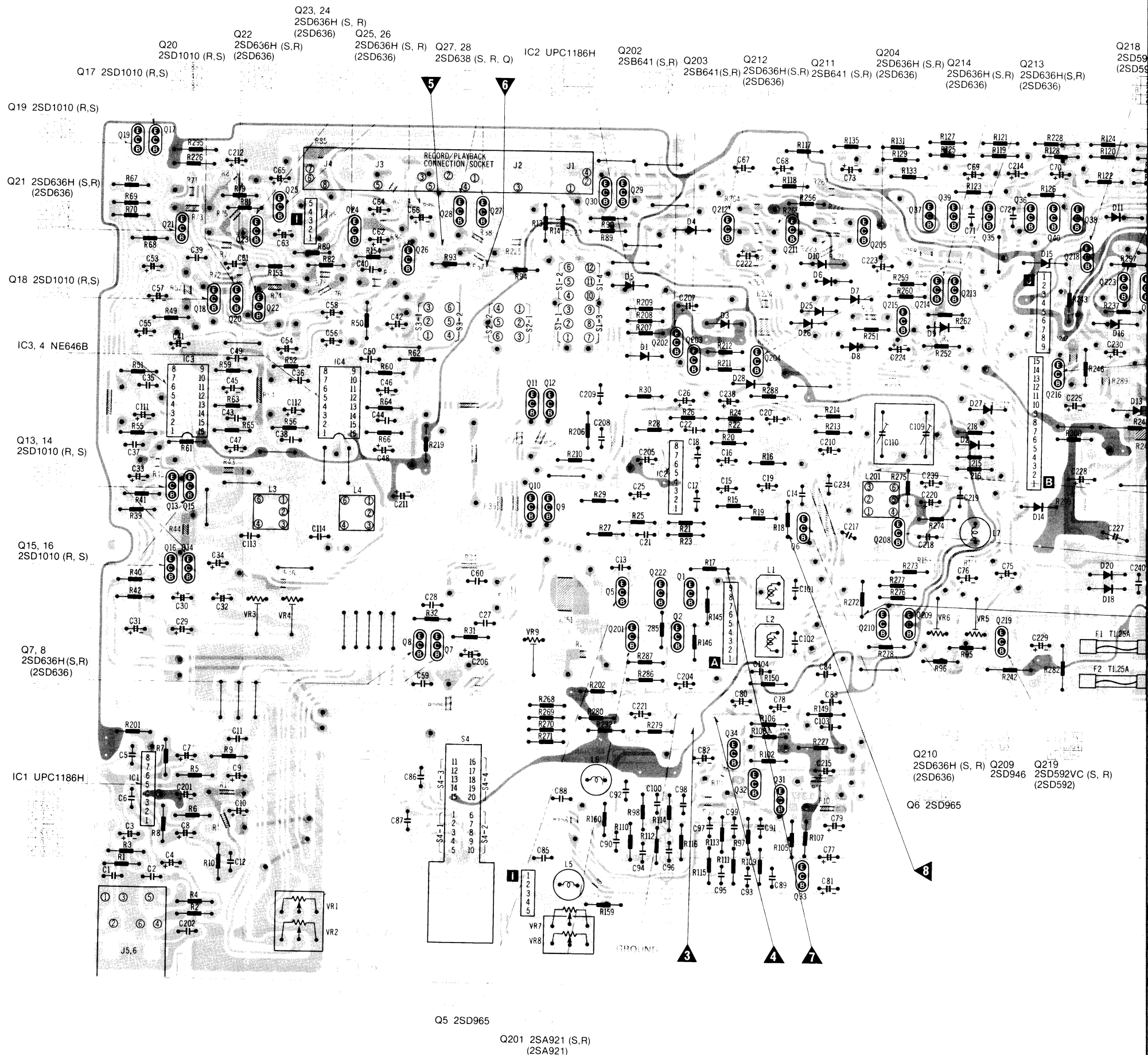
CAPACITORS

ECG ... Ceramic
ECK ... Ceramic
ECC ... Ceramic
ECF ... Ceramic
ECQM ... Polyester film
ECQE ... Polyester film
ECQF ... Polypropylene
ECE ... Electrolytic
ECEN ... Non polar electrolytic
EQS ... Polystyrene
ECS ... Tantalum

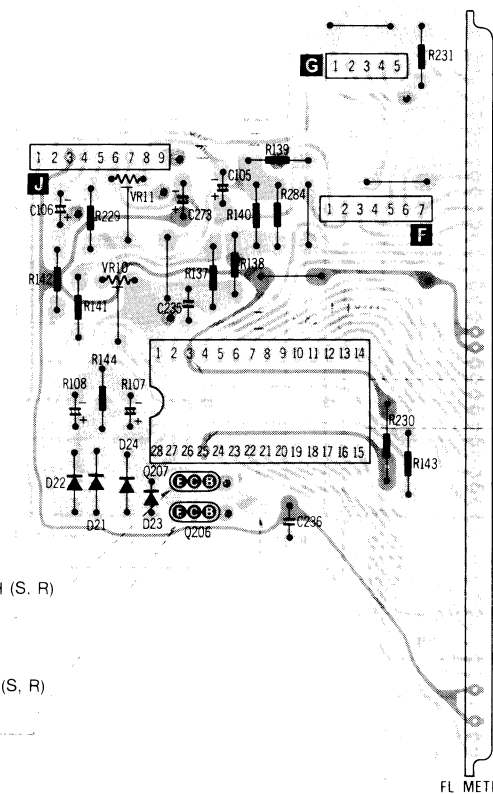
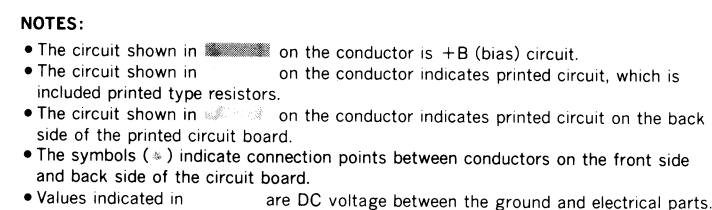
NOTE: Δ indicates that only parts specified by the manufacturer be used for safety.

Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.
RESISTORS				VARIABLE CAPACITORS			
R1. 2	ERD25FJ101	R237	ERD25FJ392	C37. 38	ECQM1H472JZ	Q309	2SB642
R3. 4	ERD25FJ682	R238	ERD25FJ682	C39. 40	ECQM1H562JZ	Q310	2SD637
R5. 6	ERD25FJ680	R239	ERD25FJ123	C41. 42	ECEA1AS221	Q311	2SB642
R7. 8	ERD25FJ104	R240	ERD25FJ562	C43. 44	ECFDD104KXY	Q312. 313	2SB835
R9. 10	ERD25FJ562	R241	ERD25FJ272	C45. 46	ECEA1HS100	Q314. 315	2SD965
R13. 14	ERD25FJ273	R242	ERG12ANJ221	C47. 48	ECEA50Z833	Q316. 317	2SD638
R15. 16	ERD25FJ101	R243	ERG12ANJ102	C49. 50	ECQM1H473JZ	Q401. 402. 403. 404. 405. 406.	2SD965
R17. 18	ERD25FJ100	R244	ERD25FJ273	C53. 54. 55. 56. 57. 58	ECEA1HS100	Q407. 408	2SC945
R19. 20	ERD25FJ101	R245	ERX2ANJ586	C59. 60	ECEA1HS100	Q409. 410. 411. 412. 413. 414.	2SA721
R21. 22	ERD25FJ104	R246	ERD25FJ332	C61. 62. 63. 64	ECKD1H821KB	Q415. 416	2SA721
R23. 24	ERD25TJ274	R252	ERD25FJ562	C65. 66	ECEA2AS2R2	D10	MA161
R25. 26	ERD25TJ104	R256	ERD25FJ471	C67. 68	ECEA50Z822	D11	MA161
R27. 28	ERD25FJ682	R259	ERD25FJ272	C69. 70	ECEA2AS100	D13	RVDR082EB
R29. 30	ERD25FJ472	R260	ERD25FJ182	C71. 72	ECEA1HS100	D14	SM112
R31. 32	ERD25FJ562	R262	ERD25TJ223	C73. 74	ECEA1CS221	D15	RVDR082EB
R39. 40. 41. 42	ERD25TJ394	R268	ERD25FJ562	C75. 76	ECEA50Z822	D16	RVDR082EB
R49. 50	ERD25TJ105	R269	ERD25FJ682	C77. 78	ECEA1HS100	D17. 18. 19. 20	SM112
R51. 52	ERD25FJ332	R270	ERD25TJ153	C79. 80	ECEA50Z868	D21. 22	MA161
R55. 56	ERD25TJ473	R271	ERD25TJ123	C81. 82	ECEA1HS100	D23	RVDR082EB
R59. 60. 61. 62	ERD25FJ102	R272	ERD25FJ182	C83. 84	ECKD1H102MD	D24. 25. 26. 27. 28	MA161
R63. 64	ERD25TJ104	R273	ERD25FJ182	C85. 86	ECFDD273KXY	D301. 302. 303. 304. 305. 306.	MA161
R65. 66	ERD25TJ274	R274	ERD25FJ562	C87. 88	ECFDD103KXY	D307. 308. 309. 310. 311. 312	MA161
R67. 68. 69. 70	ERD25TJ683	R275	ERQ14AJ100P	C89. 90	ECFDD104KXY	D313. 314	MA161
R79. 80	ERD25FJ681	R276	ERD25FJ822	C91. 92	ECFDD393KXY	D315	20A90
R81. 82	ERD25FJ182	R277	ERD25TJ223	C93. 94	ECFDD473KXY	D316. 317. 318	MA161
R89. 90	ERD25FJ821	R278	ERD25FJ221	C95. 96	ECFDD183KXY		
R93. 94	ERD25FJ392	R279	ERD25FJ101	C97. 98	ECFDD104KXY		
R95. 96	ERD25FJ102	R280	ERD25FJ822	C99. 100	ECFDD473KXY		
R97. 98	ERD25TJ683	R281. 282	Δ ERG12ANJ181	C101. 102	ECQPI122JZ		
R102	ERD25TJ333	R284	ERD25TJ124	C103. 104	ECFDD562KXY		
R105. 106	ERD25FJ821	R285	ERD25FJ122	C105. 106	ECEA1HS100		
R107. 108	ERD25FJ562	R286	ERD25TJ473	C107. 108	ECEA2AS100		
R109. 110	ERD25FJ821	R287	ERD25FJ562	C111. 112	ECEA1HS100		
R111. 112	ERD25FJ392	R288	ERD25TJ223				
R113. 114	ERD25FJ152	R292	ERD25FJ182				
R115. 116	ERD25FJ222	R295	ERG12ANJ221				
R117. 118	ERD25TJ333	R296	ERD25TJ153				
R119. 120	ERD25TJ183	R297	ERD25FJ472				
R121. 122	ERD25TJ823	R298	ERD25AJ121P				
R123. 124	ERD25FJ102	R337	ERD25FJ180				
R125. 126	ERD25FJ152	R340	ERD25FJ180				
R127. 128	ERD25FJ682	R347	ERD25TJ153				
R129. 130. 131. 132	ERD25FJ270	R348	ERD25TJ273				
R133. 134	ERD25FJ680	R349	ERD25TJ563				
R135. 136	ERD25FJ121	R356. 357. 358. 359. 360. 361.	362. 363				
R137. 138. 139. 140	ERD25FJ562	R362. 363	ERD10TJ473				
R141. 142	ERD25FJ102	R401. 402. 403. 404. 405. 406.	407. 408. 409. 410. 411. 412.				
R143. 144	ERD25TJ684	413. 414. 415. 416. 417. 418.	419. 420. 421. 422. 423. 424				
R145. 146	ERD25FJ562						
R149. 150	ERD25FJ472						
R153. 154	ERD25FJ472						
R159. 160	ERD25FJ180						
R201. 202	ERD25FJ102						
R206	ERD25TJ333						
R207. 208. 209	ERD25TJ223						
R210	ERD25TJ333						
R211	ERD25TJ473						
R212. 213	ERD25FJ562						
R214	ERD25TJ223						
R215	ERD25TJ153						
R216	ERD25FJ472						
R218	ERD25FJ103						
R219	ERQ14AJ121P						
R226. 227. 228	ERG12ANJ221						
R229	ERD25FJ332						
R230	ERQ14AJ151P						
R231	ERD25FJ103						
R234	Δ ERQ12AJ27P						
R235	Δ ERD25FJ392						
R236	Δ ERD25FJ472						

Ref. No.	Part No.	Part Name & Description
TRANSFORMER		
T201	Δ QLDP49ELC	AC Power Transformer
COILS		
L1. 2	QLQM0333	Bias Trap Coil
L3. 4	SLM1Z19	MPX Filter
L5. 6. 7	QLQX0332K	Peaking Coil
L201	QLB0198K	Bias Oscillation Coil
L301. 302	QLQZ1014D	Choke Coil
L303	ELH101KA	Choke Coil
SWITCHES		
S1. 2. 3	QSWY304	Push Switch
S4	QSR4404	Rotary Switch
S5	Δ QSW2214	Push Switch (Power ON/OFF)
S6	Δ QSR1407H	Rotary Switch (Voltage Selector)
S301	QSS1302	Slide Switch (Timer Switch)
S302	QSS1401	Slide Switch (Memory Switch)
S303. 304. 305. 306. 307. 308. 309. 310.	EVQPAR11K	Key Board Switch
S311	QSB0260	Leaf Switch (Erase Safety Switch)
S312	QSB0261	Leaf Switch (Stop Switch)
S313. 314	QSB0260	Leaf Switch (Playback Switch)
S315	QSB0261	Leaf Switch (Cassette Half Detector)
FUSES		
F1. 2	Δ XBAQ125028	Fuse (T 1.25A)
F3	Δ XBAQ0013	Fuse (T 200mA)
JACKS		
J1. 2. 3. 4	QEJ5002S	Jack Board Assembly
J5. 6	QJA0257H	Microphone Jack
J7	QJA0249H	Headphones Jack
J8	QJS1960S	8 Pin Socket



FL METER CIRCUIT BOARD



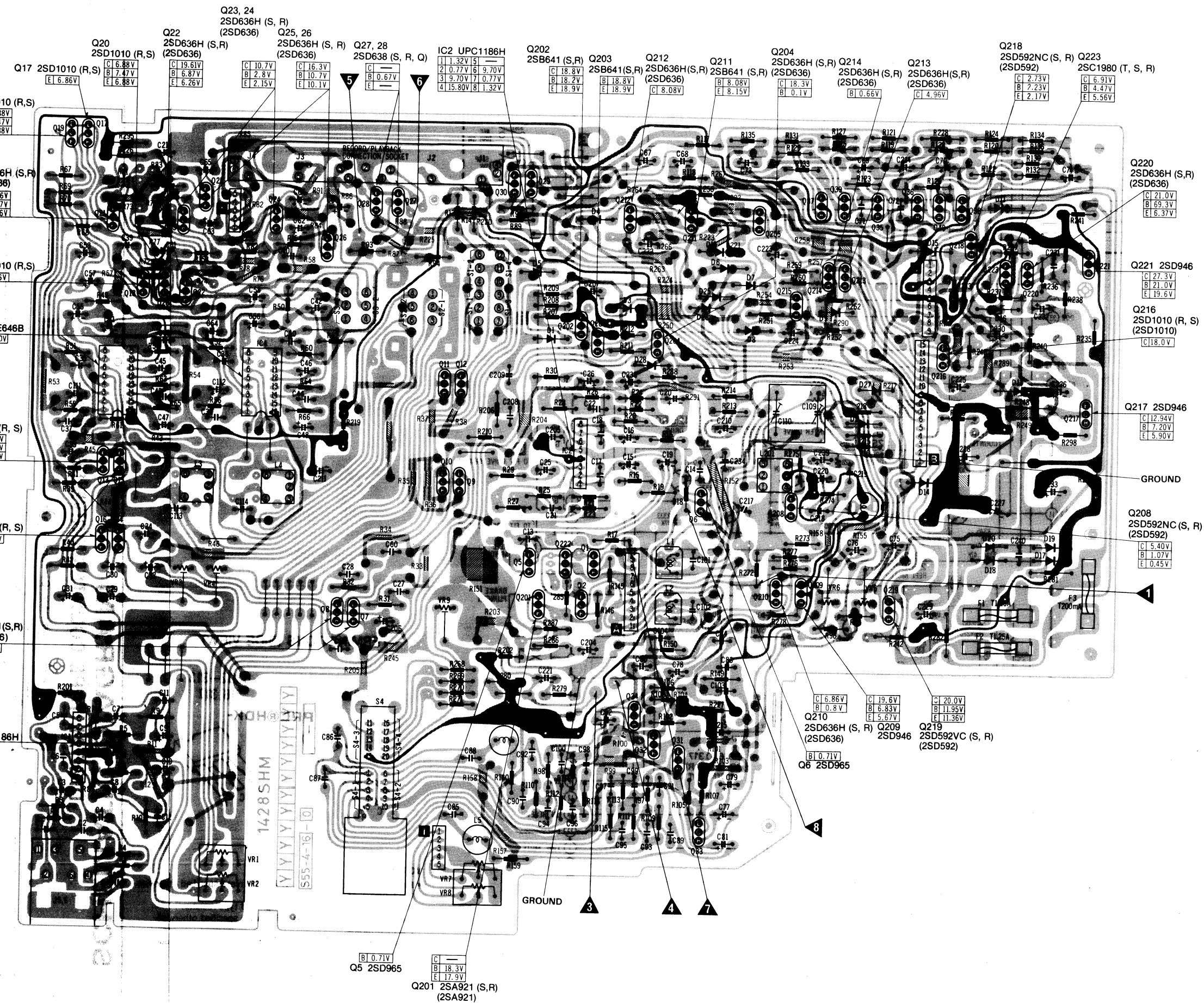
RESET TERMINAL
(Refer to FL Meter adjustment)

NOTES:

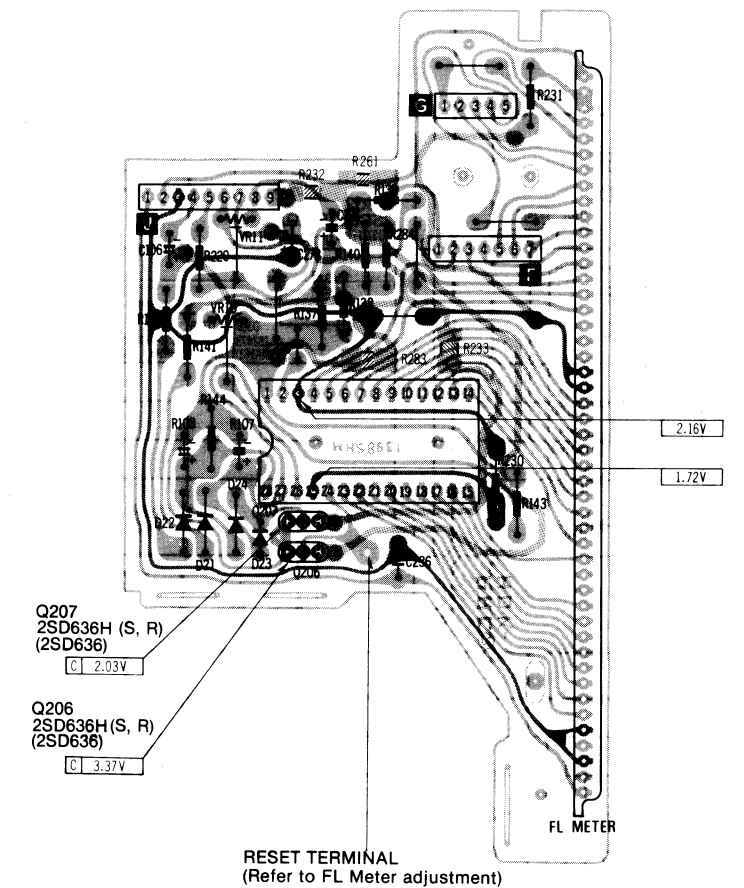
- The circuit shown in  on the conductor is +B (bias) circuit.
- The circuit shown in  on the conductor indicates printed circuit, which is included printed type resistors.
- The circuit shown in  on the conductor indicates printed circuit on the back side of the printed circuit board.
- The symbols (•) indicate connection points between conductors on the front side and back side of the circuit board.
- Values indicated in  are DC voltage between the ground and electrical parts.

CIRCUIT BOARDS

1 AMP CIRCUIT BOARD



FL METER CIRCUIT BOARD

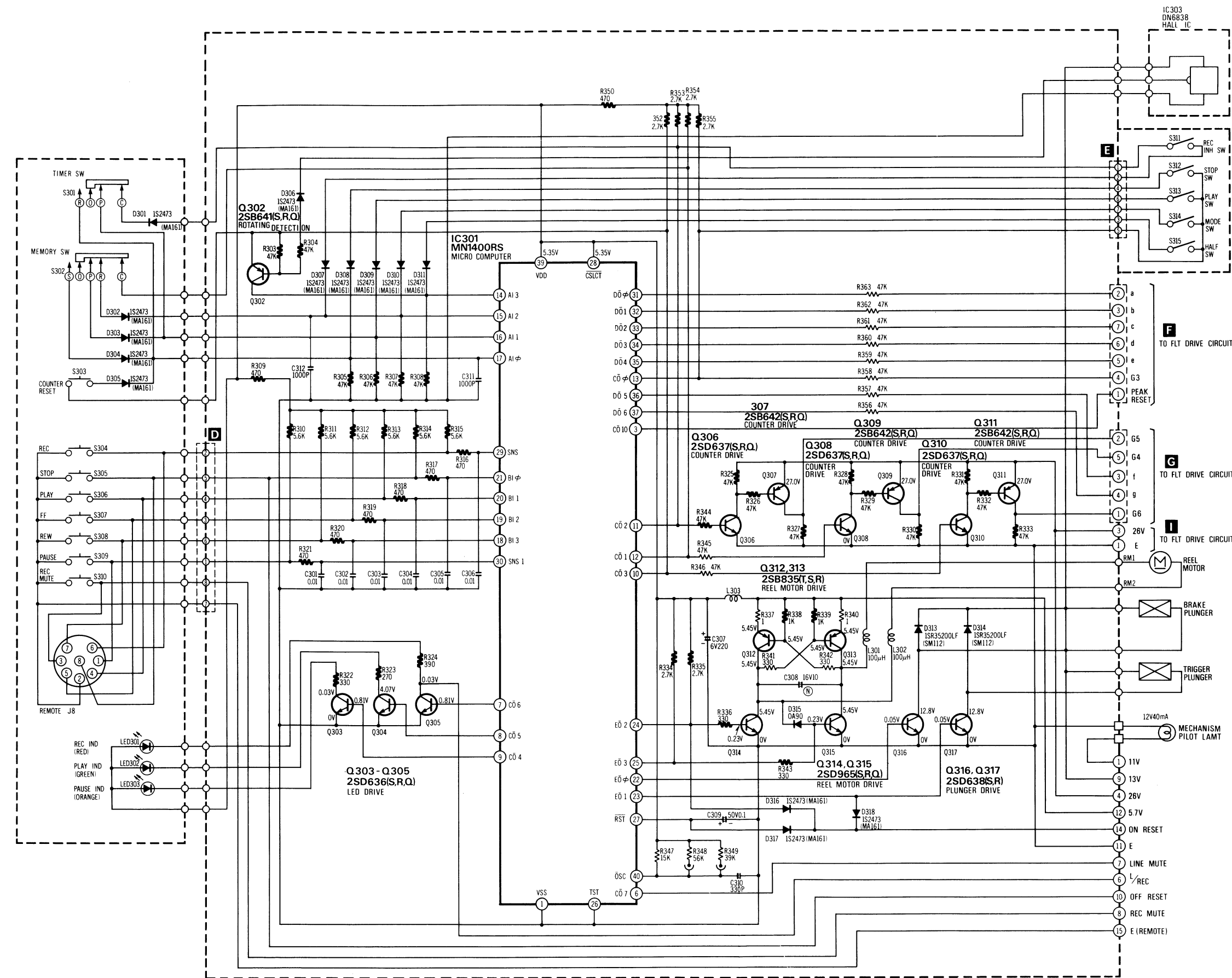


NOTES:

- The circuit shown in  on the conductor is +B (bias) circuit.
- The circuit shown in  on the conductor indicates printed circuit, which is included printed type resistors.
- The circuit shown in  on the conductor indicates printed circuit on the back side of the printed circuit board.
- The symbols (●) indicate connection points between conductors on the front side and back side of the circuit board.
- Values indicated in  are DC voltage between the ground and electrical parts.

SCHEMATIC DIAGRAM

MAIN CONTROL SECTION



SCHEMATIC DIAGRAM

DIGITAL TAPE COUNTER DRIVE SECTION

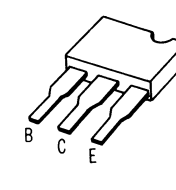
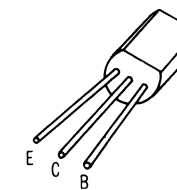
G From Meter. Counter Circuit Board

F From Meter. Counter Circuit Board

TERMINATIONS (SIDE VIEW)

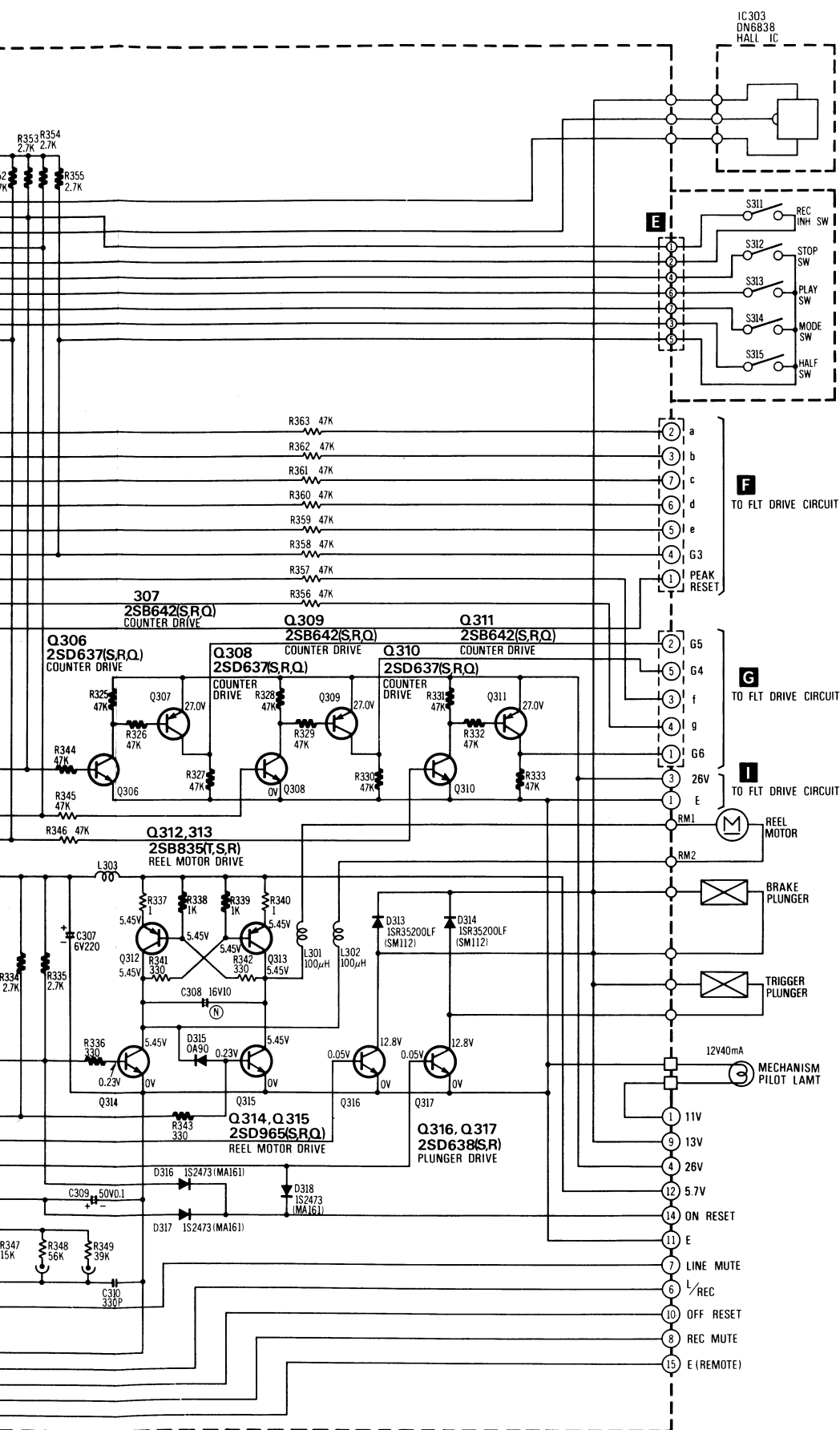
Q314,315

Q302—313
316, 317



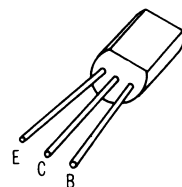
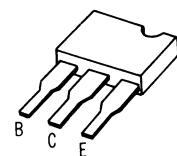
NOTES:

- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
K = 1,000.0, M = 1,000k Ω .
Resistors indicated thickly show printed type resistor.
- Capacity are in microfarads (μF) unless specified otherwise.
P = Pico-farads.
- All voltage values shown in circuitry are under record mode.



TERMINATIONS (SIDE VIEW)

Q314, 315

Q302-313
316, 317

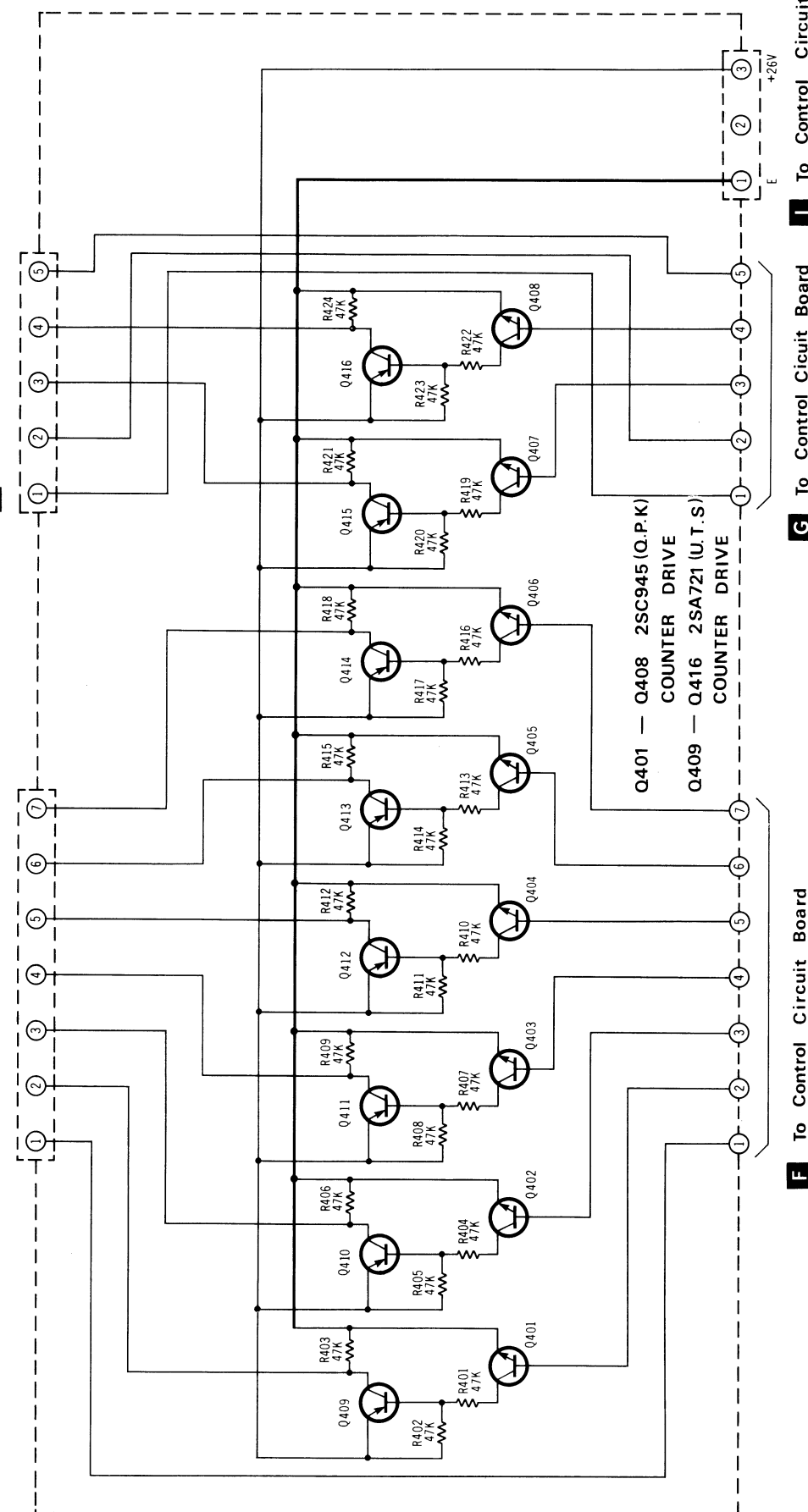
NOTES:

- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise. K = 1,000 Ω , M = 1,000 k Ω . Resistors indicated thickly show printed type resistor.
- Capacity are in microfarads (μ F) unless specified otherwise. P = Pico-farads.
- All voltage values shown in circuitry are under record mode.

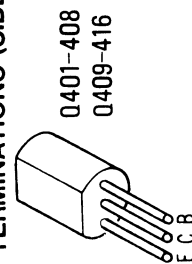
SCHEMATIC DIAGRAM
DIGITAL TAPE COUNTER DRIVE SECTION

F From Meter. Counter Circuit Board

G From Meter. Counter Circuit Board



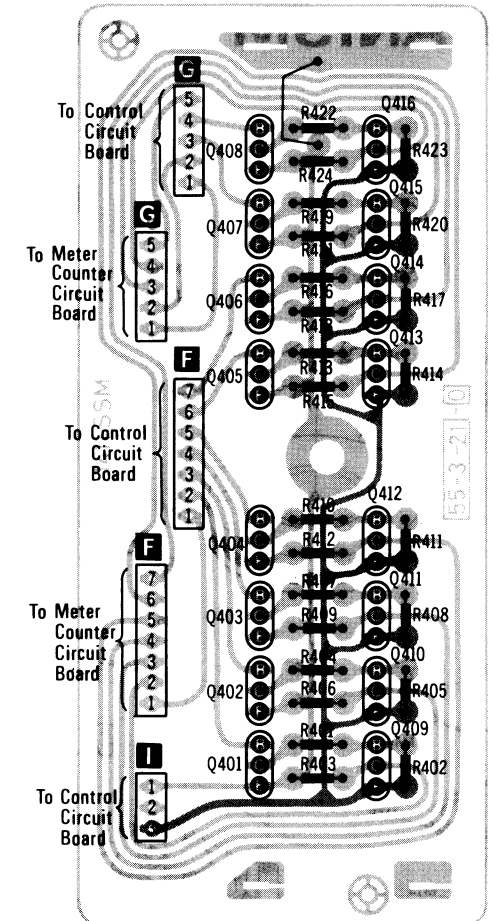
TERMINATIONS (SIDE VIEW)



NOTE:

- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise. K = 1,000 Ω .

DIGITAL TAPE COUNTER DRIVE CIRCUIT BOARD



Q312, 313
2SB835 (T, S, R)

C	5.45V
B	5.45V
E	5.45V

Q314, 315
2SD965 (S, R, Q)

C	5.45V
B	0.23V
E	0V

C	0.03V
B	0.81V
E	0V

C	12.8V
B	0.05V
E	0V

Q316, 317
2SD638 (S, R)

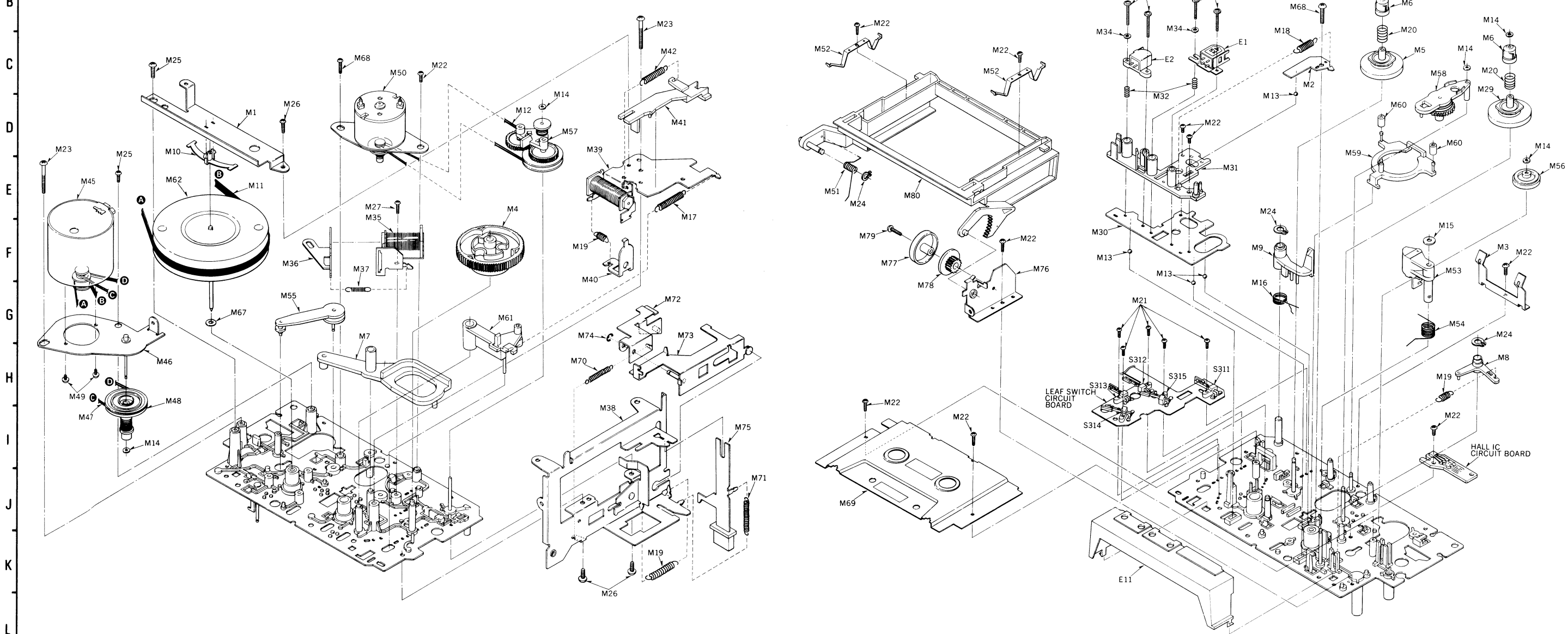
The diagram illustrates the internal circuitry of a cassette deck. Key components include:

- Diodes:** D301, D302, D303, D304, and D305 are shown in various positions.
- Capacitors:** C301, C302, C303, and C304 are labeled.
- Resistors:** R301, R302, R303, and R304 are indicated.
- Integrated Circuits:** S301, S302, S303 (COUNT RESET), S304 (REC), S305 (STOP), S306 (PLAY), S307 (FF), S308 (REW), and S309 (PAUSE) are shown in their respective functional blocks.
- Display:** A 7-segment display (S303) is used for the COUNT RESET function.
- Connectors:** J8 is a multi-pin connector, and J9 is a 4-pin connector.
- Other Components:** LED301, LED302, LED303, and LED304 are light-emitting diodes for status indication.

A circular inset provides a magnified view of the J8 connector area, showing pins 1 through 8.

- The circuit shown in [redacted] on the conductor is +B (bias) circuit.
- The circuit shown in [redacted] on the conductor indicates printed circuit, which is included printed type resistors.
- The circuit shown in [redacted] on the conductor indicates printed circuit on the back side of the printed circuit board.
- The symbols (●) indicate connection points between conductors on the front side and back side of the circuit board.
- Values indicated in [redacted] are DC voltage between the ground and electrical parts.

MECHANISM EXPLODED VIEWS

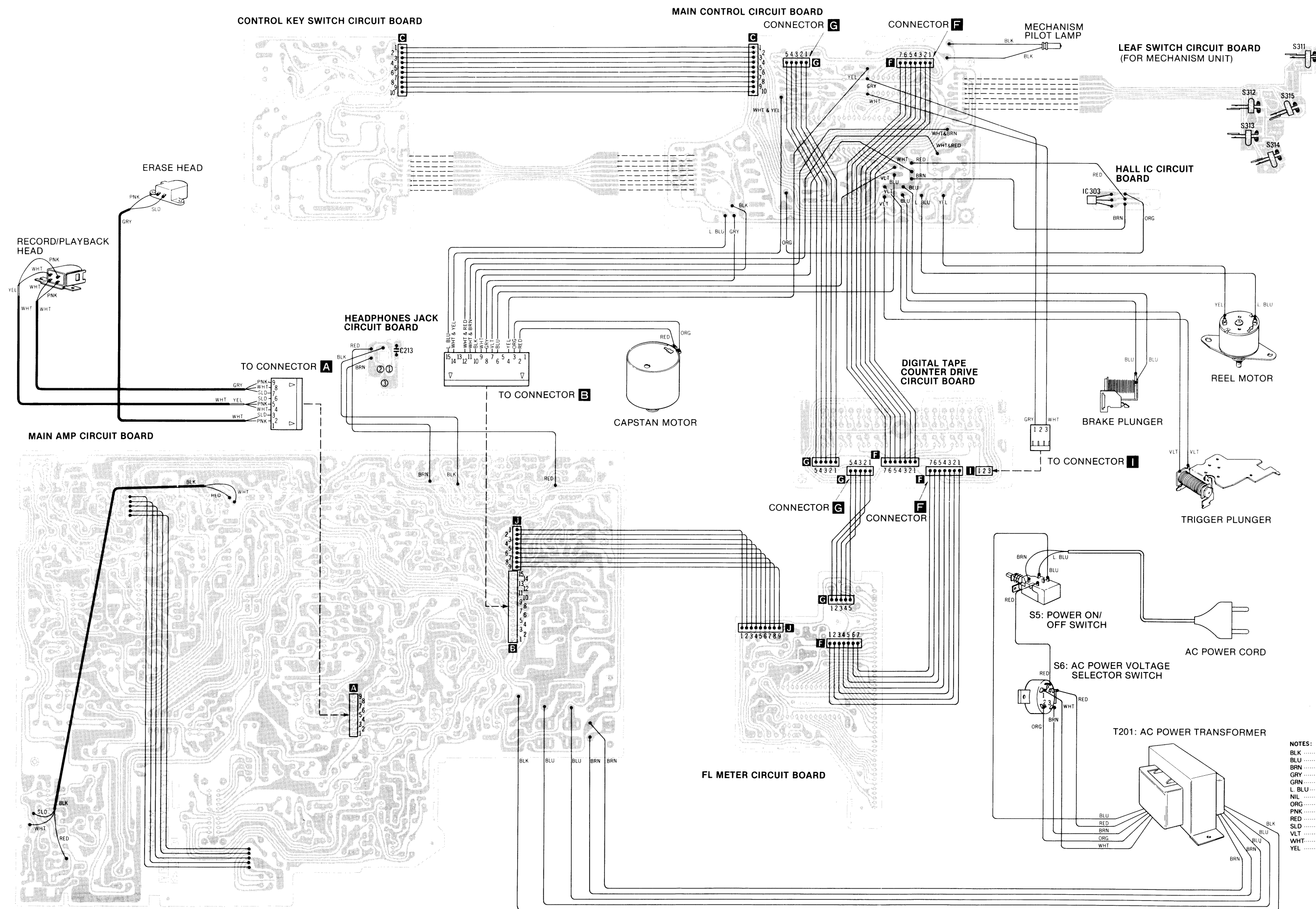


Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
MECHANICAL PARTS			M21	XTN2+6B	Screw $\pm 2 \times 6$	M45	QXU0194	Capstan Motor Assembly	M71	QBT1566	Intermediate Lever Spring
M1	QMA3951	Flywheel Retainer	M22	XTN26+6B	Screw $\pm 2.6 \times 6$	M46	QXA1077	Motor Retainer Assembly	M72	QXL1414	Lock Lever-A
M2	QBP1894	Head Base Plate Spring	M23	XTN3+24B	Screw $\pm 3 \times 24$	M47	QDB0286	Takeup Belt	M73	QXL1415	Lock Lever-B
M3	QBP1895	Cassette Pressure Spring	M24	XUB4FT	Stop Ring	M48	QXP0621	Takeup Pulley	M74	XUC25FT	Stop Ring
M4	QDG1214	Main Gear	M25	XTN3+10B	Screw $\pm 3 \times 10$	M49	XSN26+3	Screw $\pm 2.6 \times 3$	M75	QXR0678	Eject Button Assembly
M5	QDR1146	Supply Reel Table	M26	XTN3+6B	Screw $\pm 3 \times 6$	M50	QXU0193	Reel Motor Assembly			
M6	QMB1336	Reel Table Hub	M27	XTN26+8B	Screw $\pm 2.6 \times 8$	M51	QBN1781	Eject Spring			
M7	QML3655	Cam Follower				M52	QBP1771	Holder Spring			
M8	QML3660	Idler Select Lever	M29	QXD0120	Takeup Reel Table Assembly				M76	QMA3981	Cassette Holder Angle
M9	QML3661	Erase Safety Lever	M30	QMK1867	Head Base Plate						
M10	QMZ1253	Flywheel Thrust Retainer				M53	QXL1406	Pressure Roller Lever			
M11	QDB0291	Capstan Belt	M31	QMZ1252	Head Spacer	M54	QBN1771	Pressure Roller Spring	M77	QKJ0419	Dumper Gear Holder
M12	QDB0287	Reel Motor Belt	M32	QBC1103	Head Spring	M55	QXL1423	Idler Lever Assembly	M78	QDG1219	Dumper Gear
M13	QDK1012	Steel Ball	M33	XSN2+16	Screw $\pm 2 \times 16$	M56	QXI0116	Takeup Idler	M79	XTN26+8B	Screw $\pm 2.6 \times 8$
M14	QBW2008	Snap Washer	M34	XWG2	Washer	M57	QXL1408	Swing Gear Lever Assembly	M80	QKF2084H	Cassette Holder
M15	QBW2046	"	M35	QXA1075	Brake Plunger Assembly	M58	QXL1409	Fast Wind Arm Assembly			
M16	QBN1772	Erase Safety Lever Spring	M36	QML3650	Plunger Lever	M59	QML3659	Brake Lever			
M17	QBT1725	Lock Lever Spring	M37	QBT1199	Plunger Spring	M60	QBG1132	Brake Rubber			
M18	QBT1755	Head Base Plate Spring	M38	QXA1073	Side Angle Assembly	M61	QXL1411	Lock Lever Assembly			
M19	QBT1605	Lock Spring	M39	QXA1076	Trigger Plunger Assembly	M62	QXF0172	Flywheel Assembly			
M20	QBC1373	Reel Table Spring	M40	QML3651	Trigger Plunger Lever						
			M41	QML3653	Control Lever	M67	QBW2049	Washer			
			M42	QBT1278	Record Lock Lever Spring	M68	XTN26+10B	Screw $\pm 2.6 \times 10$			
						M69	QXH0346	Mechanism Cover			
						M70	QBT1691	Lamp Lever Spring			

SPECIFICATIONS

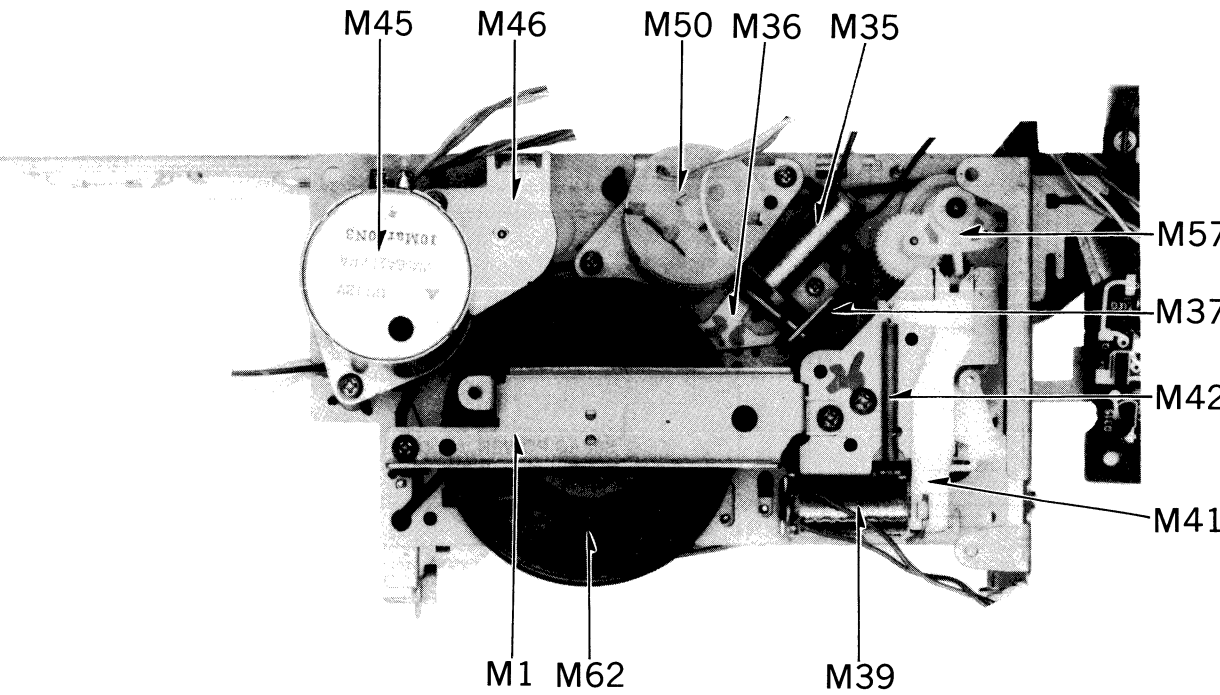
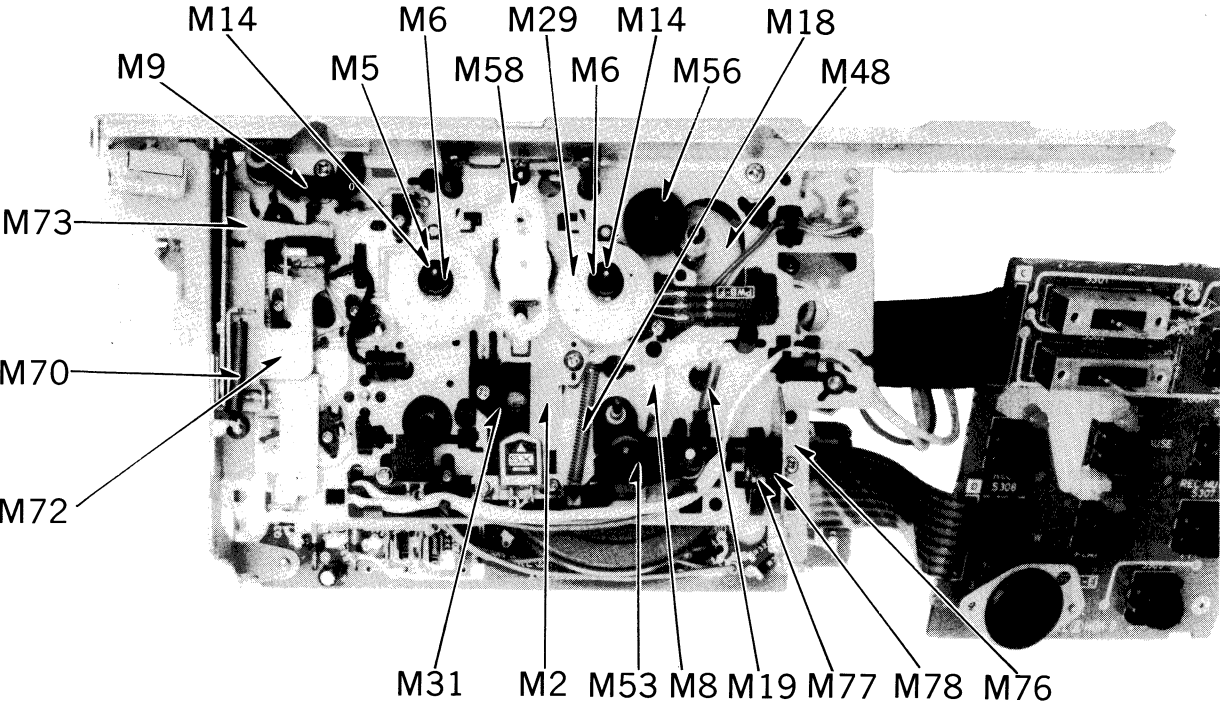
Pressure of pressure roller	350 $\pm$ 10 g
Wow and flutter (JIS) Test tape... QZZCWAT	Less than 0.055% (WRMS)

WIRING CONNECTION DIAGRAM

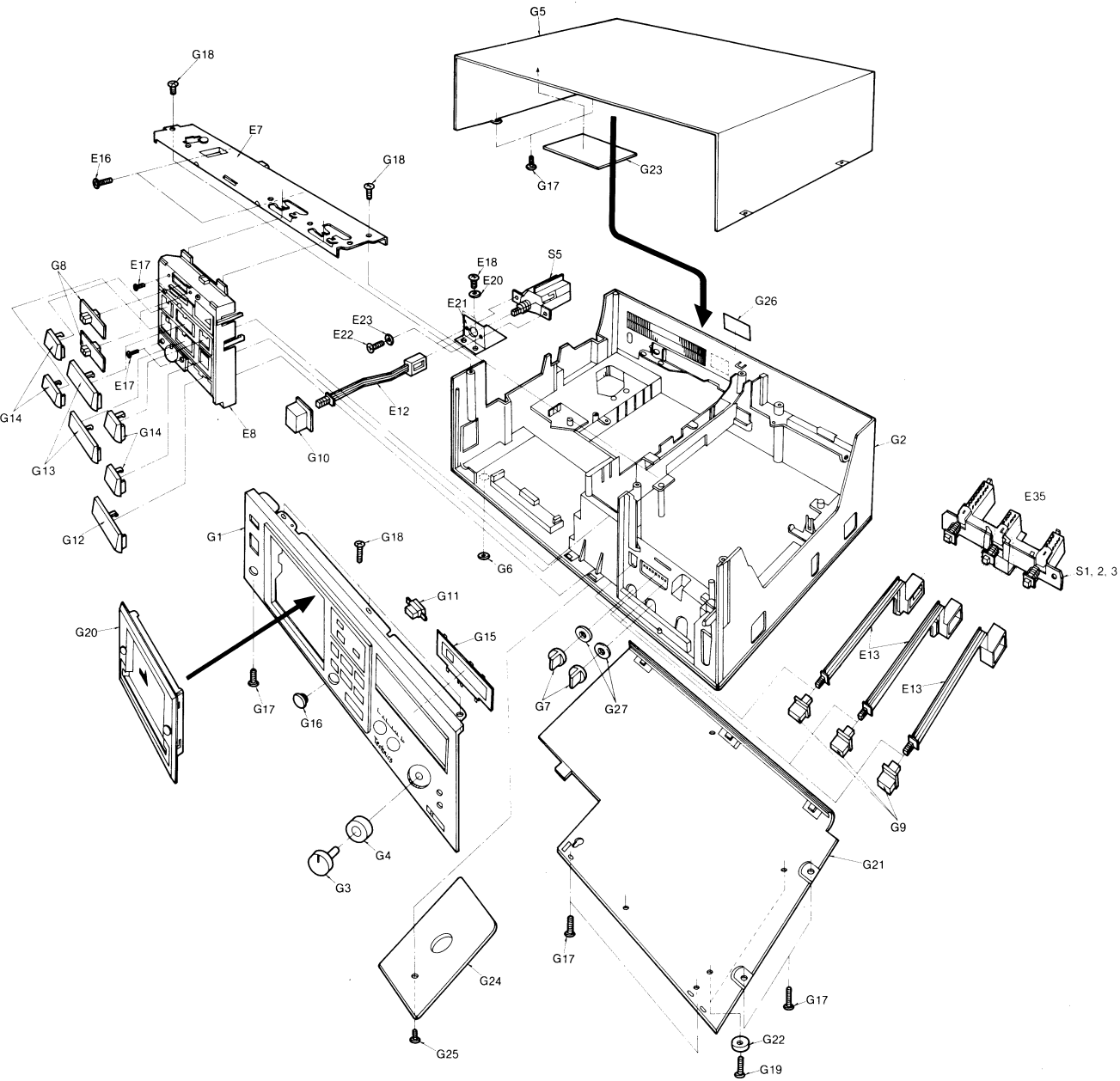


NOTES:
 BLK Black
 BLU Blue
 BRN Brown
 GRY Gray
 GRN Green
 NIL No Color Mark
 ORG Orange
 PNK Pink
 RED Red
 SLD Shield Wire
 VLT Violet
 WHT White
 YEL Yellow

MECHANISM PARTS LOCATION



CABINET PARTS



Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
CABINET PARTS								
G1	QYP0983 "Silver Type" QYP0983K "Black Type"	Front Panel Assembly	G9	QG01694N "Silver Type" QG01694K "Black Type"	Push Button	G20	QYF0459 "Silver Type" QYF0459K "Black Type"	Cassette Lid Assembly
G2	QKM1448H "Silver Type" QKM1448K "Black Type"	Main Case	G10	QG01763 "Silver Type" QG01763K "Black Type"	Push Button (Power Switch)	G21	QGC1196	Bottom Case
G3	QYT0586 "Silver Type" QYT0586K "Black Type"	Volume Knob-A	G11	QG01764 "Silver Type" QG01764K "Black Type"	Push Button (Counter Reset)	G22	QKA1083	Rubber Foot
G4	QYT0587 "Silver Type" QYT0587K "Black Type"	Volume Knob-B	G12	QG01765	Operation Button (Stop)	G23	QE1546	Shield Plate Assembly
G5	QGC1195 "Silver Type" QGC1195K "Black Type"	Case Cover	G13	QG01766	Operation Button (Play, Pause)	G24	QGC1204	Sub Bottom Case
G6	QKA1081	Rubber Foot	G14	QG01767	Operation Button (Rec, Rec-Mute, FF, Rew)	G25	XTN35+20BFB	Screw +3.5x20
G7	QGT1504 "Silver Type" QGT1504K "Black Type"	Control Knob-A	G15	QGL1146 "Silver Type" QGL1146Y "Black Type"	Meter Cover	G26	QGS2840	Main Name Plate
G8	QGT1505 "Silver Type" QGT1505K "Black Type"	Control Knob-B	G16	QKF9001 "Silver Type" QKF9001K "Black Type"	Remote Control Jack Cover	G27	QBH0125A	Volume Shelter
			G17	XTN3+10B	Screw +3x10	ACCESSORIES		
			G18	XTS3+10B	"	A1	RP023A	Connection Cord
			G19	QH01299	Screw	A2	QQT2891	Instruction Book
						PACKINGS		
						P1	QPN4064	Inside Carton
						P2	QPA0574	Cushion-A
						P3	QPA0575	Cushion-B
						P4	XZB50X65A02	Poly Bag
						P5	QPS0434	Pad
						P6	QPC0072	Sheet
						P7	QPA0585	Spacer

Parts Change Notice

(D)...For all European areas
except United Kingdom.
(B)...For United Kingdom.

(N)...For Asia, Latin America,
Middle East and Africa
areas.

(A)...For Australia.
(P)...For U.S.A.
(C)...For Canada.

Model No.

RS-M250X

Please revise the original parts list in the Service Manual to conform to the change(s) shown herein. If new part numbers are shown, be sure to use them when ordering parts.

Reason for Change		*The circled item indicates the reason. If no marking, see the Notes in the bottom column.			
1. Improve performance					
2. Change of material or dimension					
3. To meet approved specification					
4. Standardization					
5. Addition					
6. Deletion					
7. Correction					
8. Other					
Interchangeability Code		**The circled item indicates the interchangeability. If no marking, see the Notes in the bottom column.			
Parts		Set Production			
A	Original		Early	Original or new parts may be used in early or late production set.	
	New		Late	Use original parts until exhausted, then stock new parts.	
B	Original		Early	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts where possible, then stock new parts.	
	New		Late		
C	Original		Early	New parts only may be used in early or late production sets.	
	New		Late	Stock new parts.	
D	Original		Early	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.	
	New		Late		
E Other					
Part Number					
Model No.	Ref. No.	Original Part No.	New Part No.	Notes (* - **)	Part Name & Descriptions
RS-M250X	M52 (N/A/ P/C)	QBP1771	QBP1923	2-C	Holder Spring
"	M58	QXL1409	QXL1604	"	Fast Wind Arm Assembly
"	G6	QKA1081	QKA1093	"	Rubber Foot
"	G20	QYF0459H	QYF0459	7	Cassette lid Assembly

File this Parts Change Notice with your copy of the Service Manual.

Original Service Manual is Model No. RS-M250(D/B) Order No. ARD8007079C.

(N/A) Order No. ARD8010109C17.

(P/C) Order No. ARD8010108C17.

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