

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.

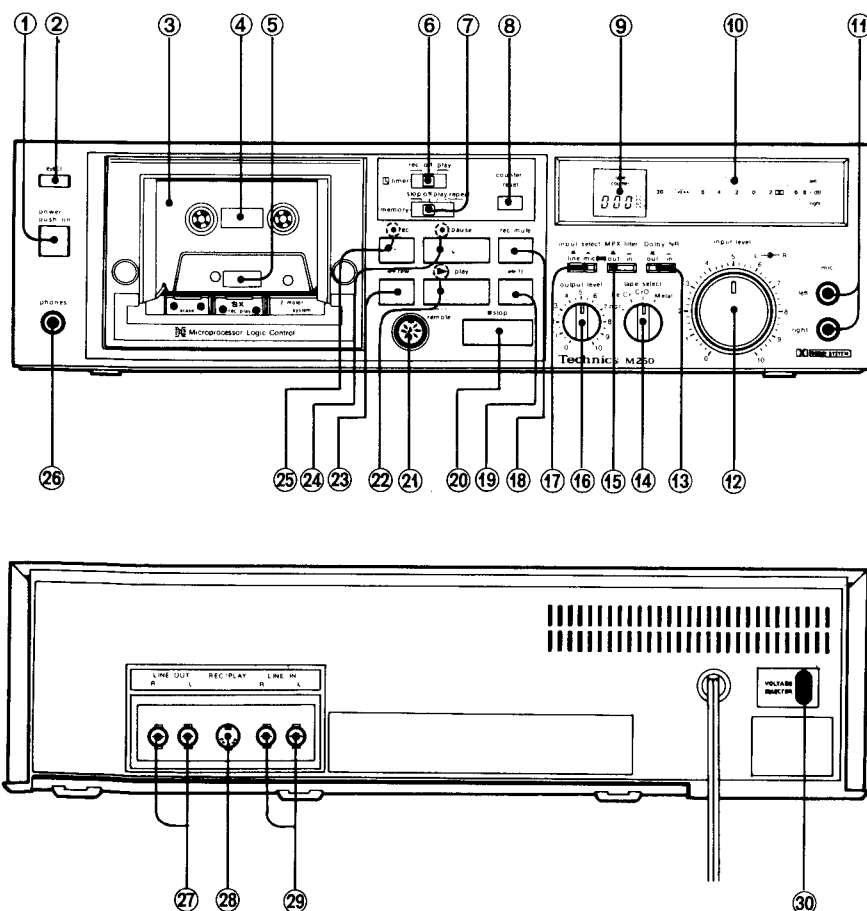
Technics

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CONTENTS

ITEM	PAGE
LOCATION OF CONTROLS AND COMPONENTS	1
DISASSEMBLY INSTRUCTIONS	2
MEASUREMENT AND ADJUSTMENT METHODS	3
MN1400RS: TERMINATION BOTTOM VIEW	7
MN1400RS: EACH TERMINAL FUNCTION AND WAVEFORM	8
TROUBLESHOOTING	12
ELECTRICAL PARTS LOCATION	13
SCHEMATIC DIAGRAM (MAIN AMP SECTION)	15
CIRCUIT BOARDS (MAIN AMP CIRCUIT BOARD, FL METER CIRCUIT BOARD)	16
SCHEMATIC DIAGRAM (MAIN CONTROL SECTION, DIGITAL TAPE COUNTER DRIVE SECTION)	17
CIRCUIT BOARDS (MAIN CONTROL CIRCUIT BOARD, DIGITAL TAPE COUNTER DRIVE CIRCUIT BOARD, CONTROL KEY SWITCH CIRCUIT BOARD)	18
MECHANISM EXPLODED VIEWS	19
WIRING CONNECTION DIAGRAM	20
MECHANISM PARTS LOCATION	21
CABINET PARTS	21

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

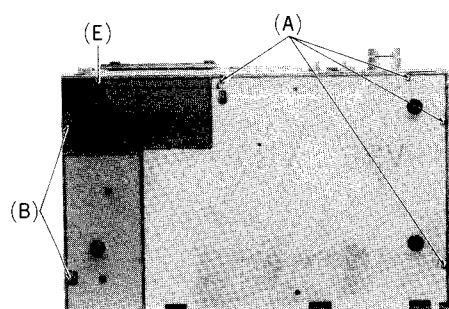


Fig. 1

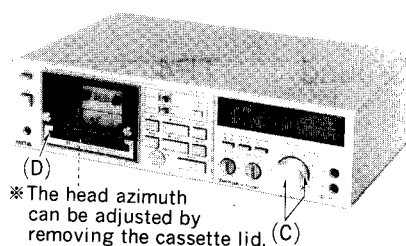


Fig. 2

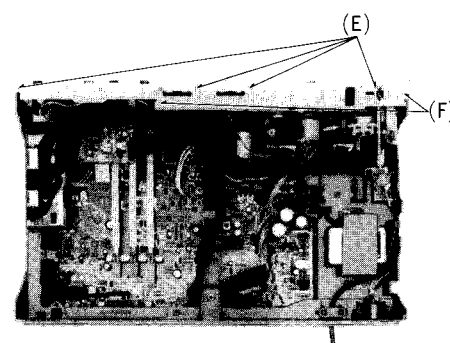


Fig. 3

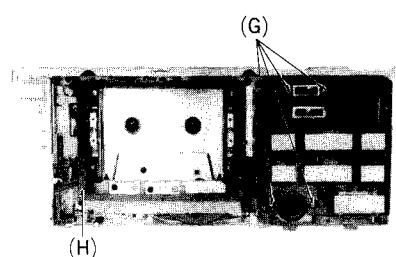


Fig. 4

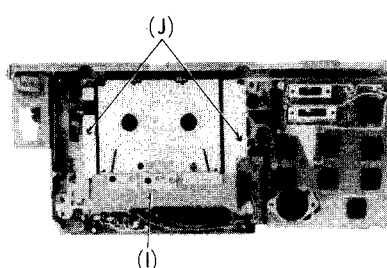


Fig. 5

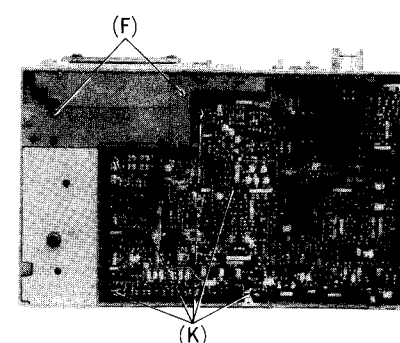


Fig. 6

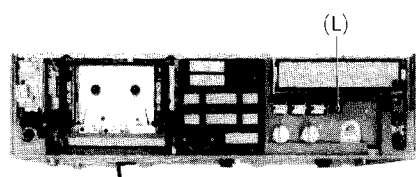


Fig. 7

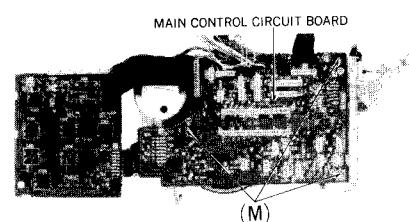


Fig. 8

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

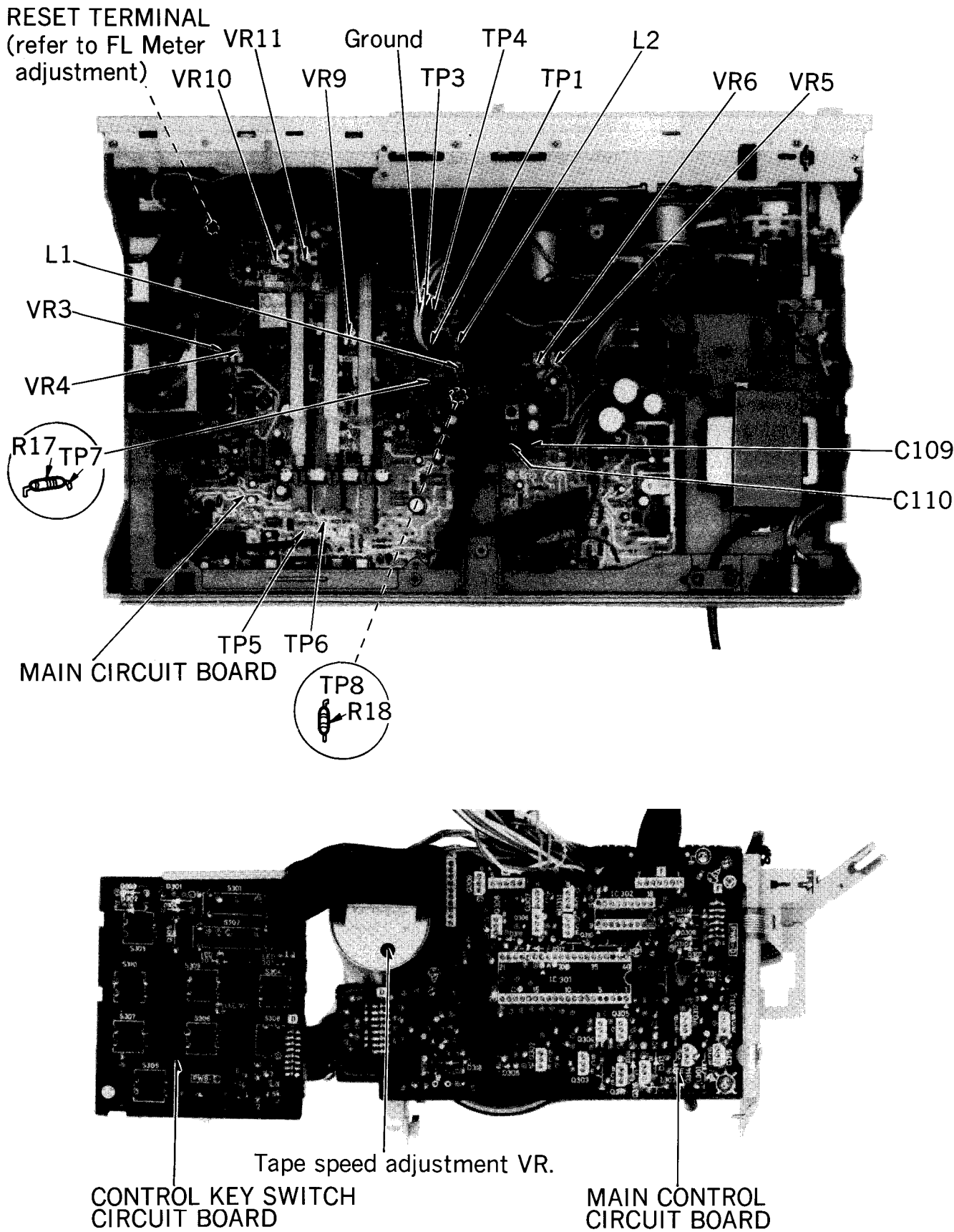
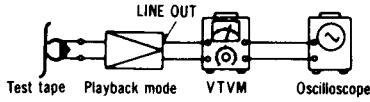
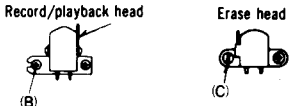
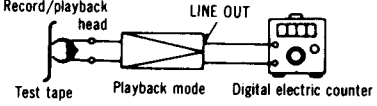
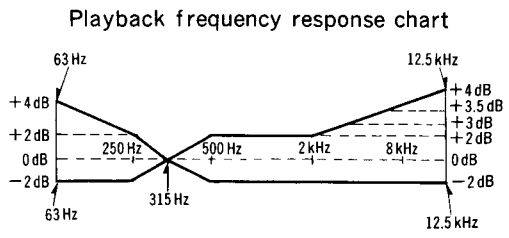


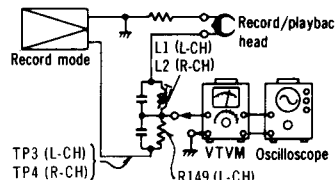
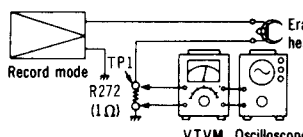
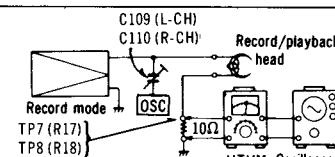
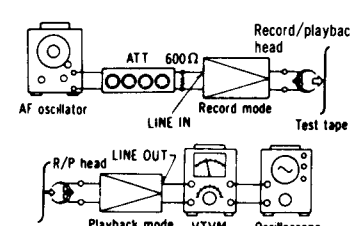
Fig. 1

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

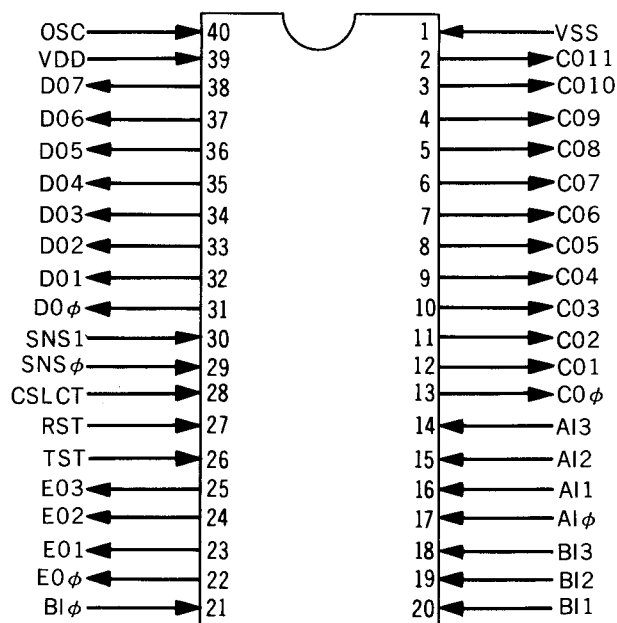
ITEM	MEASUREMENT & ADJUSTMENT
A Head azimuth adjustment Condition: • Playback mode Equipment: • VTVM • Oscilloscope • Test tape (azimuth) ... QZZCFM • Tape path viewer ... QZZCRD	Record/playback head adjustment 1. Test equipment connection is shown in fig. 2. 2. Playback azimuth tape (QZZCFM 8kHz). 3. 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 3,000 Hz, 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 3,000 Hz. 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 12.5 kHz, 8 kHz, 4 kHz, 1 kHz, 250 Hz, 125 Hz and 63 Hz, and compare each output level with the standard frequency 315 Hz, at LINE OUT. 5. Make measurement for both channels. 6. Make sure that the measured value is within the range specified in the frequency response chart. (shown in fig. 6).  Fig. 6

ITEM	MEASUREMENT & ADJUSTMENT
㊦ Playback gain Condition: * Tape selector ... Normal position * Playback mode Equipment: * VTVM * Oscilloscope * Test tape ... QZZCFM	- Test equipment connection is shown in fig. 2. - Playback standard recording level portion on test tape (QZZCFM 315Hz, 0 dB), and using VTVM measure the output level at LINE OUT jack. - Make measurement for both channels. Standard value: $0.7V \pm 1.5\text{ dB}$ Adjustment - If measured value is not within standard, adjust VR3 (L-CH), VR4 (R-CH) (shown in fig. 1). - 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	- Test equipment connection is shown in fig. 7. - Place UNIT into record mode. - Adjust trap coils L1 (L-CH), L2 (R-CH), so that measured value becomes minimum. - Make adjustment for both channels.  Fig. 7
㊨ Erase current Condition: * Tape selector ... Metal position * Record mode Equipment: * VTVM * Oscilloscope	- Test equipment connection is shown in fig. 8. - Place UNIT into record mode and measure voltage at test point 1. - 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) - If measured value is not within standard, adjust VR9.  Fig. 8
㊩ Bias current Condition: * Record mode * Tape selector ... Normal position ... Fe-Cr position ... CrO ₂ position ... Metal position Equipment: * VTVM * Oscilloscope	- Test equipment connection is shown in fig. 9. - Place UNIT into record mode, and tape selector to normal position. - 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) - Adjust C109 (L-CH) and C110 (R-CH) (shown in fig. 1). - Set the tape selector to each position. - 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	- Test equipment connection is shown in fig. 10. - Place UNIT into record mode, and normal tape mode. - Supply 1 kHz signal (-24 dB) from AF oscillator, through ATT to LINE IN. - Adjust ATT until monitor level at LINE OUT becomes 0.7 V. - Using test tape, make recording. - Playback recorded tape, and make sure the value at LINE OUT on VTVM becomes 0.7 V. - If measured value is not 0.7 V, adjust VR5 (L-CH), VR6 (R-CH). - Repeat from step 2.  Fig. 10

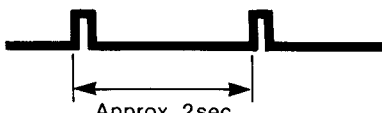
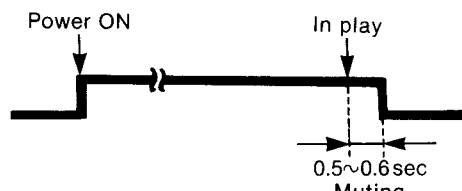
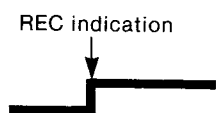
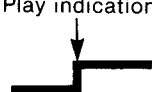
ITEM	MEASUREMENT & ADJUSTMENT
① Fluorescent meter Condition: * Record mode * Input level controls ... MAX * Output level control ... MAX * Tape selector ... Normal position Equipment: * VTVM * AF oscillator * ATT	- Test equipment connection is shown in fig. 10. - As shown in fig. 11, connect the collector 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 (600Ω) * 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

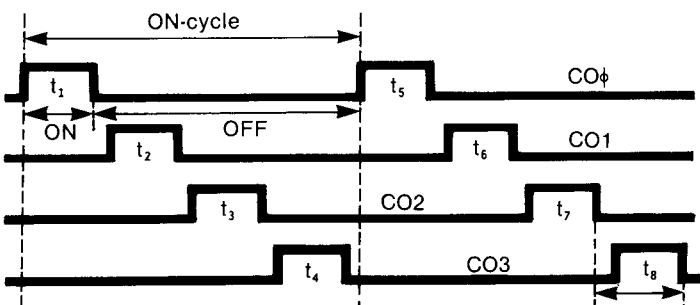
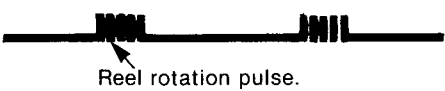
ITEM	MEASUREMENT & ADJUSTMENT
	6. At this time, LINE OUT level indicates 0.07V. 7. Record each frequency 30Hz, 100Hz, 1kHz, 4kHz, 8kHz, 10kHz, 12kHz, and 13kHz (14kHz for CrO₂ and Fe-Cr, 16kHz for Metal). 8. Playback and express in dB the difference between playback output level of each frequency based 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 (±2.5) dB greater than the value at OUT position of Dolby NR switch. Fig. 19

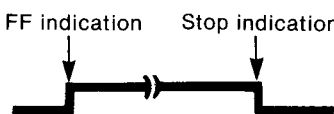
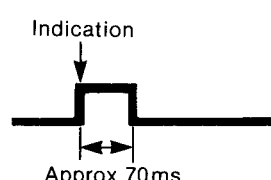
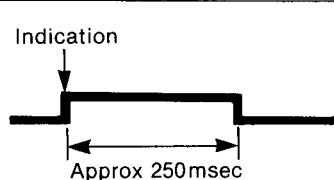
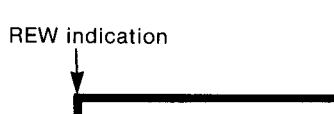
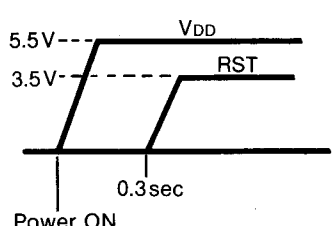
MN1400RS: TERMINATION (BOTTOM VIEW)

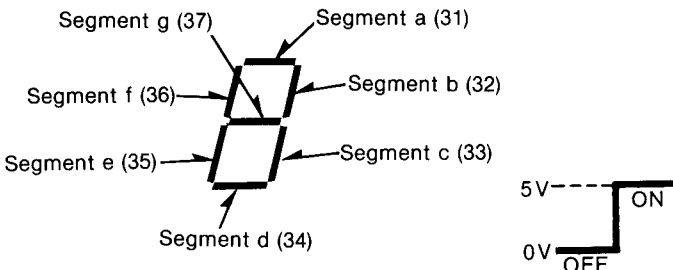
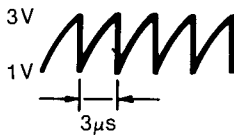


MN1400RS: EACH TERMINAL FUNCTION AND WAVEFORM

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	

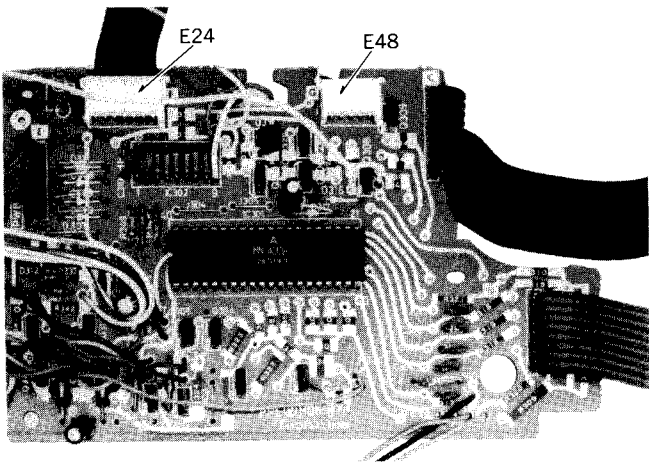
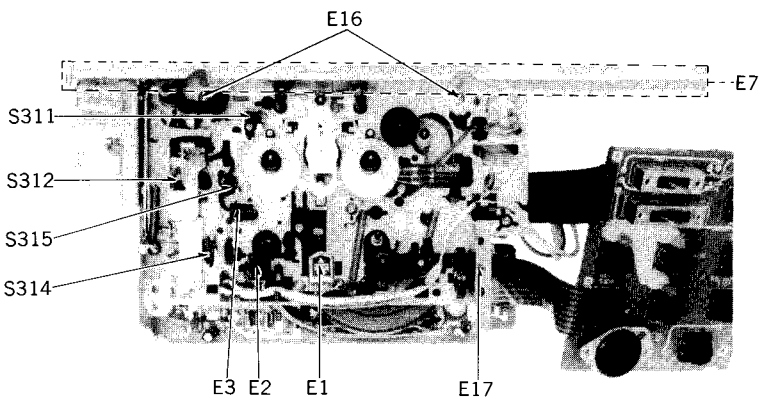
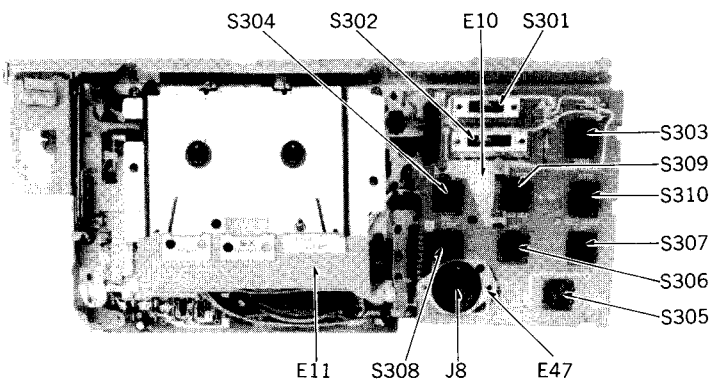
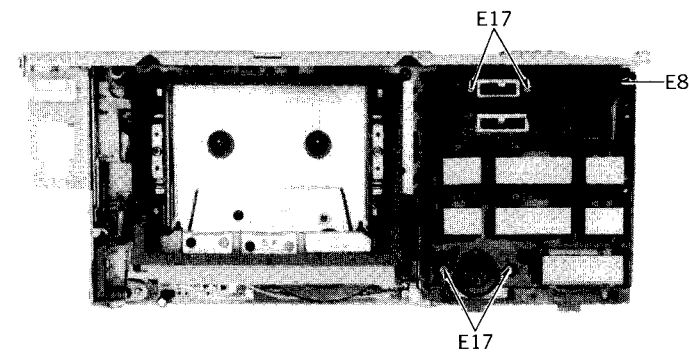
Terminal No.	Symbol	Name	Function/operation
22.	EO ϕ	Brake plunger	 “H” during FF/REW operations.
23.	EO1	Trigger plunger	 “H” until MODE SW is closed after the input to switch the mechanism, such as PLAY, PAUSE, STOP, etc. has been applied. (Approx. 70ms. depending on the mechanism condition.)
24.	EO2	Motor CL	 “H” until MODE SW is changed from “close” to “open” following the indication that the mechanism mode has been changed.  “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. 

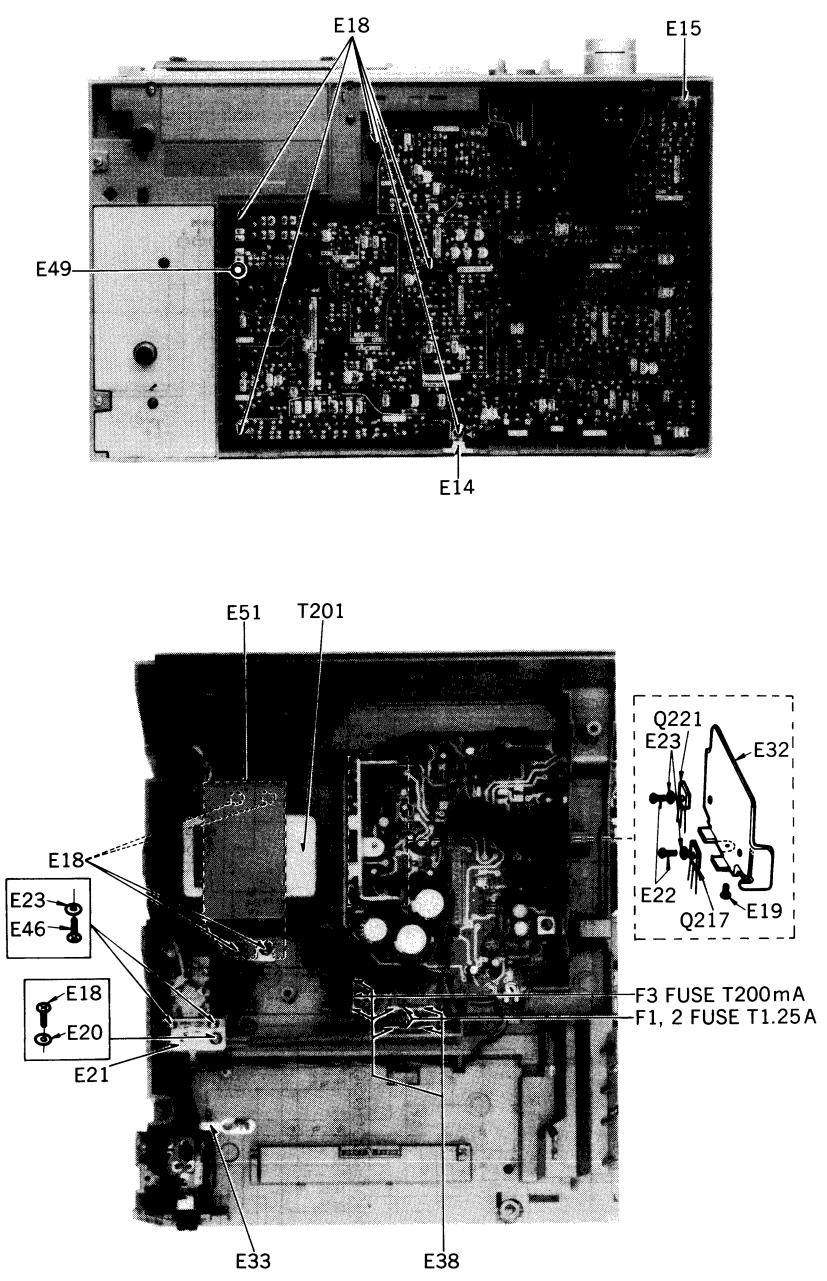
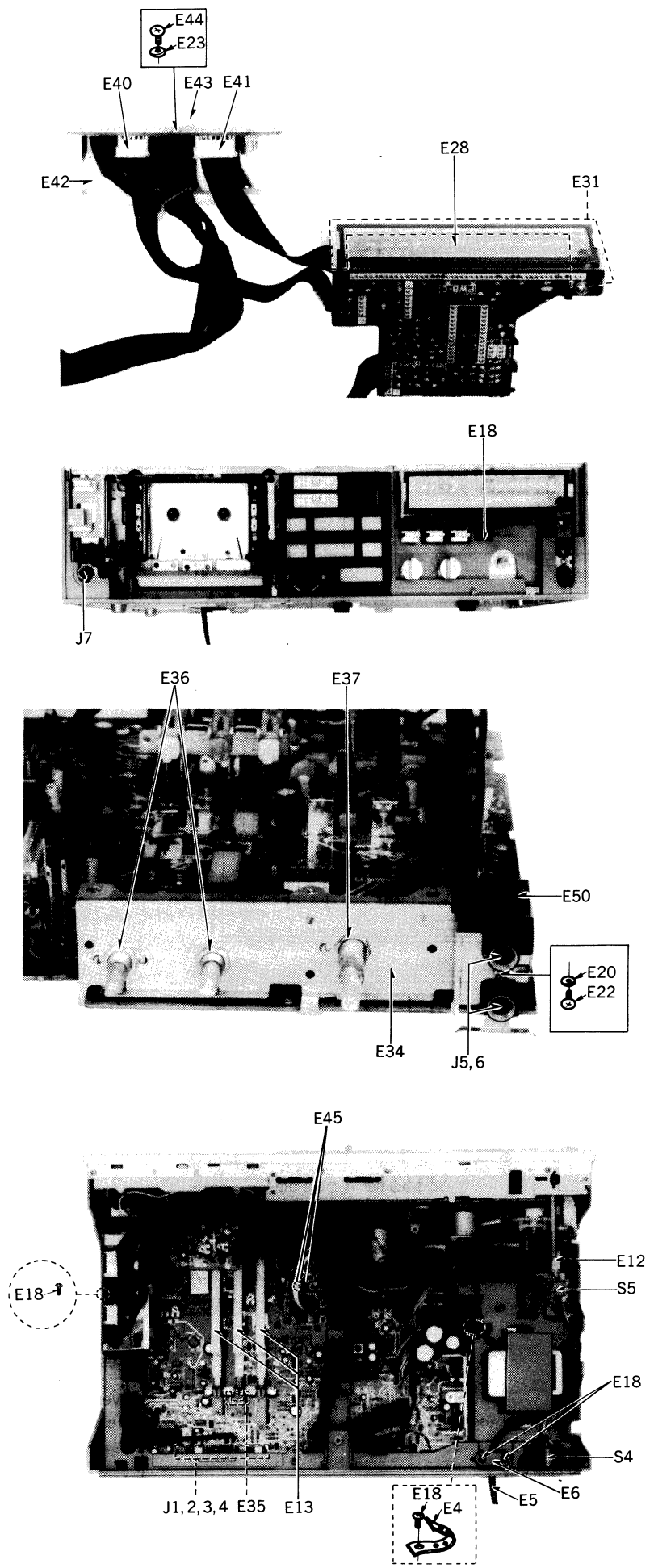
Terminal No.	Symbol	Name	Function/operation
28.	CSLCT	CSLCT	Connected to VDD.
31.	DO ϕ	FL counter Segment a	
32.	DO1	FL counter Segment b	
33.	DO2	FL counter Segment c	
34.	DO3	FL counter Segment d	
35.	DO4	FL counter Segment e	
36.	DO5	FL counter Segment f	
37.	DO6	FL counter Segment g	
38.	DO7	No connection	Not used.
39.	VDD	Power source	Operated at 4.5V to 6.0V.
40.	OSC	Oscillation terminal	 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

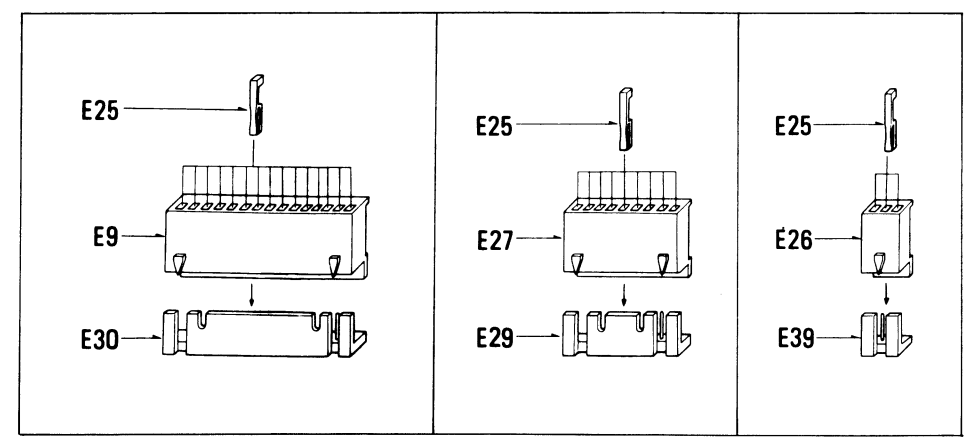
ELECTRICAL PARTS LOCATION





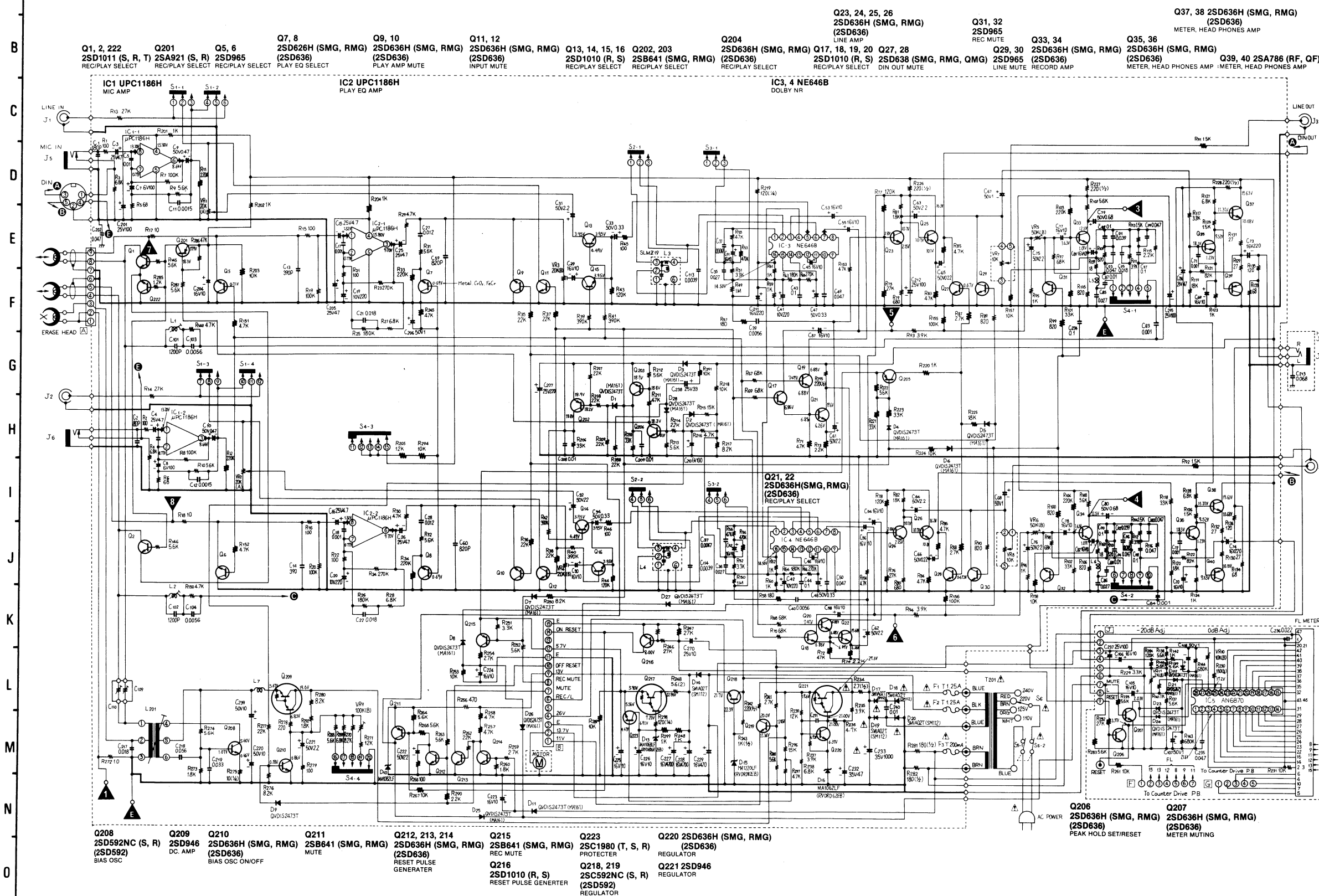
NOTE: Δ indicates that only parts specified by the manufacturer be used for safety.

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



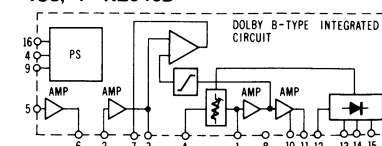
SCHEMATIC DIAGRAM

MAIN AMP CIRCUIT

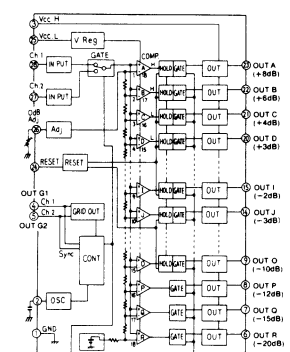


EQUIVALENT CIRCUIT

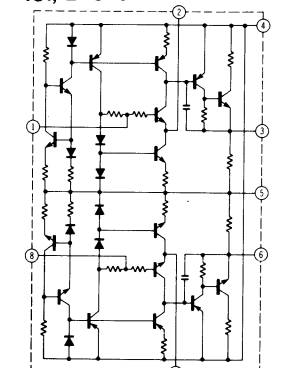
IC3, 4 NE646B



IC5 AN8870

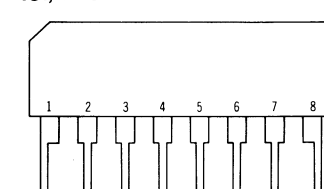


IC1, 2 UPC1186H



TERMINATION (SIDE VIEW)

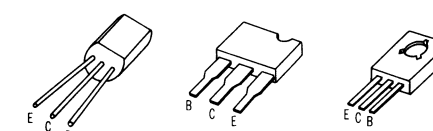
IC1, 2 UPC1186H



(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



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. $K = 1,000 \Omega$, $M = 1,000 k\Omega$.
- Resistors indicated thickly show printed type resistor.
- Capacity are in microfarads (μF) unless specified otherwise. $P = \text{Pico-farads}$.
- 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.

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)

CIRCUIT BOARDS

MAIN AMP CIRCUIT BOARD

NOTES: RESISTORS

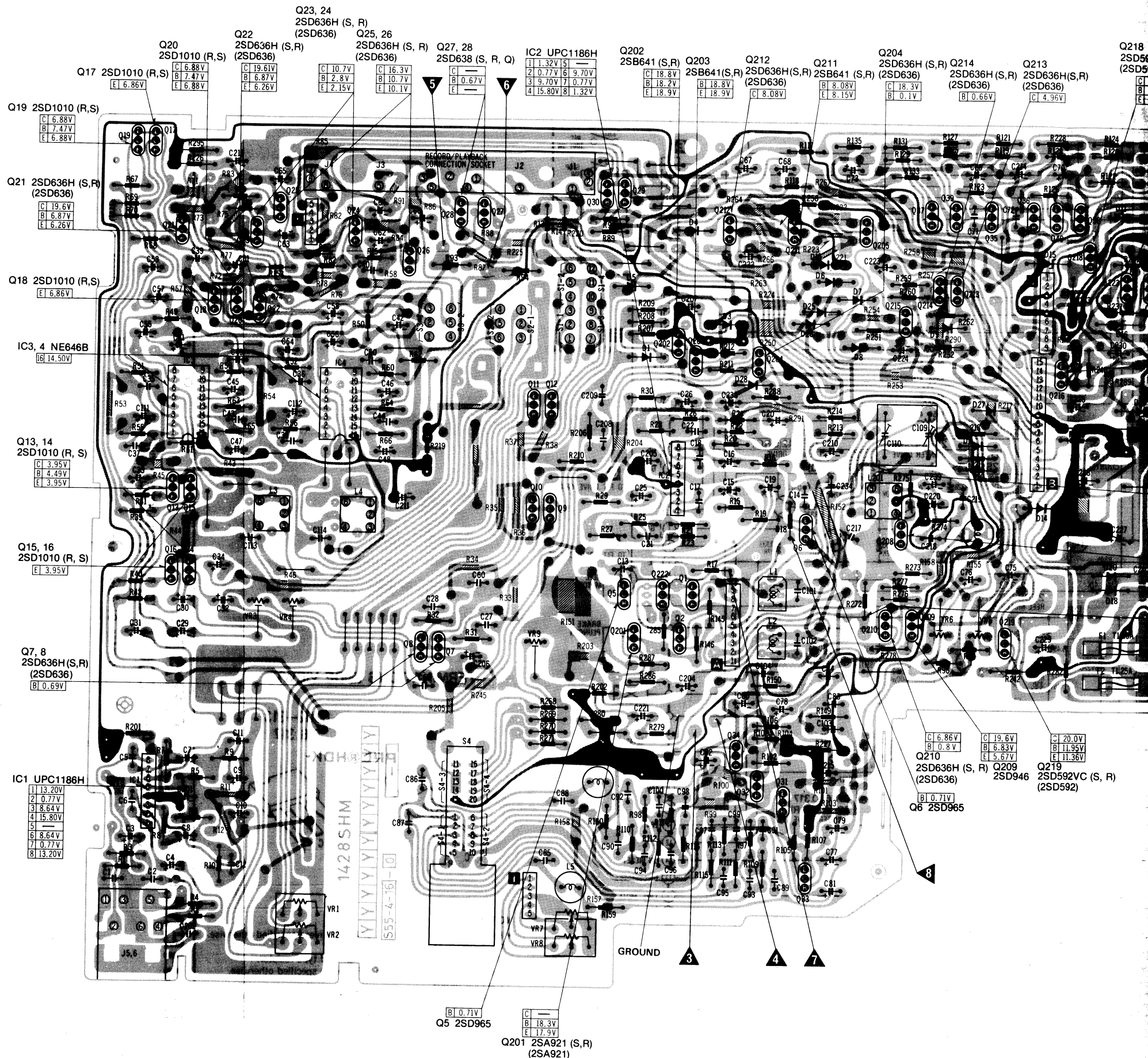
ERD ... Carbon
ERG ... Metal-oxide
ERO ... Metal-film
ERX ... Metal-film
ERQ ... Fuse type metallic
ERC ... Solid
ERF ... Cement

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	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	ECEA50Z8R33	Q316, 317	2SD638
R15, 16	ERD25FJ101	R243	ERG12ANJ102	C49, 50	ECQM1H473JZ	Q401, 402, 403, 404, 405, 406, 407, 408	2SC945
R17, 18	ERD25FJ100	R246	ERD25FJ273	C53, 54, 55	56, 57, 58	Q409, 410, 411, 412, 413, 414, 415, 416	2SA721
R19, 20	ERD25FJ100	R248	ERX2ANJ586	C59, 60	ECEA1HS100	DIODES & RECTIFIERS	
R21, 22	ERD25FJ104	R251	ERD25FJ332	C61, 62, 63, 64	ECKD1H821KB		
				C65, 66	ECEA2AS2R2	D1, 2, 3, 4, 5, 6, 7, 8, 9	
				C67, 68	ECEA2AS010	D10	MA161
R23, 24	ERD25TJ274	R256	ERD25FJ471	C69, 70	ECEA1HS100	D11	SVDRD8.2EB
R25, 26	ERD25TJ104	R259	ERD25FJ272	C71, 72	ECKD1H102MD	D12	MA161
R27, 28	ERD25FJ682	R260	ERD25FJ182	C73, 74	ECEA1CS221	D13	RVDRD6R8EB
R29, 30	ERD25FJ472	R262	ERD25TJ223	C75, 76	ECEA50Z8R2	D14	SM112
R31, 32	ERD25FJ562	R268	ERD25FJ562	C77, 78	ECEA1HS100	D15	RVDRD6R8EB
R39, 40, 41, 42	ERD25TJ394	R269	ERD25FJ682	C79, 80	ECEA50Z8R68	D16	RVDRD6R8EB
R49, 50	ERD25TJ105	R270	ERD25TJ153	C81, 82	ECEA1HS100	D17, 18, 19, 20	
R51, 52	ERD25FJ332	R271	ERD25TJ123	C83, 84	ECKD1H102MD	D21, 22	MA161
R55, 56	ERD25TJ473	R272	ERD25FJ180	C85, 86	ECFDD273KXY	D23	RVDRD6R8EB
R59, 60, 61, 62	ERD25FJ102	R276	ERD25FJ822	C87, 88	ECFDD103KXY	LIGHT EMITTING DIODES	
				C89, 90	ECFDD104KXY		
				C91, 92	ECFDD393KXY	LED301	TLR206
R63, 64	ERD25TJ104	R277	ERD25TJ223	C93, 94	ECFDD473KXY	LED302	SLT35GG
R65, 66	ERD25TJ274	R278	ERD25FJ101	C95, 96	ECFDD183KXY	LED303	TLY206
R67, 68, 69, 70	ERD25TJ683	R279	ERD25FJ101	C97, 98	ECFDD104KXY	INTEGRATED CIRCUITS	
				C99, 100	ECFDD473KXY		
				C101, 102	ECQF1122JZ	IC1, 2	UPC1186H
R79, 80	ERD25FJ681	R285	ERD25FJ122	C103, 104	ECFDD562KXY	IC3, 4	NE646B
R81, 82	ERD25FJ182	R286	ERD25TJ473	C105, 106	ECEA1HS100	IC5	AN6870
R89, 90	ERD25FJ821	R287	ERD25FJ562	C107, 108	ECEA2AS010	IC301	MM1400RS
R93, 94	ERD25FJ392	R288	ERD25TJ223	C111, 112	ECEA1HS100	IC303	DN6838
R95, 96	ERD25FJ102	R292	ERD25FJ182				
R97, 98	ERD25TJ683	R295	ERG12ANJ221				
R102	ERD25TJ333	R296	ERD25TJ153	C113, 114	ECQM1H392JZ	TRANSFORMER	
				C201	ECEA1ES101		
				C202	ECQM1H473KZ	T201	QLPD49ELC
R105, 106	ERD25FJ821	R298	ERD25AJ121P	C204	ECEA1HS100	COILS	
R107, 108	ERD25FJ562	R337	ERD25FJ180	C205	ECEA1ES470		
R109, 110	ERD25FJ821	R340	ERD25FJ180	C206	ECEA2AS010	L1, 2	QLQM0333
R111, 112	ERD25FJ392	R347	ERD25TJ153	C207	ECEA1ES221	L3, 4	SLM1Z19
R113, 114	ERD25FJ152	R348	ERD25TJ273	C208, 209	ECKD1H103ZF	L5, 6, 7	QLQX0332K
R115, 116	ERD25FJ222	R349	ERD25FJ563	C210	ECEA1AS101	L201	QLB0198K
R117, 118	ERD25TJ333	R356, 357, 358, 359, 360, 361, 362, 363	ERD10TJ473	C211	ECEA1CS221	L301, 302	QLQZ1014D
R119, 120	ERD25TJ183	R361, 363	ERD10TJ473	C212	ECEA1ES101	L303	ELH101KA
R121, 122	ERD25TJ823	R401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424		C213	ECQM1H683KZ	SWITCHES	
R123, 124	ERD25FJ102	R423, 224, 225, 226		C214	ECEA1ES470		
				C215	ECEA1ES101	S1, 2, 3	QSWY304
				C217	ECQF1183JZ	S4	QSR4404
R125, 126	ERD25FJ152	C218	ECQM1H563KZ	C219	ECQM1H333KZ	S5	QSW2214
R127, 128	ERD25FJ682	C220	ECEA1HF100	C221	ECEA1HS100	S6	QSR1407H
R129, 130, 131, 132	ERD25FJ270	C222	ECEA50Z8R22	C223	ECEA1HS100	S301	QSS1302
R133, 134	ERD25FJ680	C227, 228	ECEA1CS471	C229	ECEA1HS100	S302	QSS1401
R135, 136	ERD25FJ121	C230	ECEA1HS100	C231	ECKD1H103ZF	S303, 304, 305, 306, 307, 308, 309, 310	EVQPAR11K
R137, 138, 139, 140	ERD25FJ562	C232	ECEA1HS470	C232	ECEA1HS470	S311	QSB0260
R141, 142	ERD25FJ102	C233	ECEA1VS102	C233	ECEA1VS102	S312	QSB0261
R143, 144	ERD25TJ684	C234	ECFDD104KXY	C234	ECFDD104KXY	S313, 314	QSB0260
R145, 146	ERD25FJ562	C235	ECFDD104KXY	C235	ECFDD473KXY	S315	QSB0261
R149, 150	ERD25FJ472	C236	ECKD1H152MD	C236	ECKD1H152MD	FUSES	
				C237	ECEA1ES101		
				C238	ECEA1VS330	F1, 2	XBAQ125028
R153, 154	ERD25FJ472	C239	ECSF16E10	C239	ECSF16E10	F3	XBAQ0013
R159, 160	ERD25FJ180	C240	ECKD1H103ZF	C240	ECKD1H103ZF	JACKS	
R161, 162	ERD25FJ102	C301, 302, 303, 304, 305, 306	ECKD1H103ZF	C301, 302, 303, 304, 305, 306	ECKD1H103ZF		
R206	ERD25TJ333	C307	ECEA1JS47R	C307	ECEA1JS47R	J1, 2, 3, 4	QEJ5002S
R207, 208, 209	ERD25TJ223	C308	ECEA16N10	C308	ECEA16N10	J5, 6	QJA0257H
R210	ERD25TJ333	C309	ECEA1HSR1	C309	ECEA1HSR1	J7	QJA0249H
R211	ERD25TJ473	C310	ECCD1H331KD	C310	ECCD1H331KD	J8	QJS1960S
R212, 213	ERD25FJ562	C311, 312	ECKD1H102MD	C311, 312	ECKD1H102MD		
R214	ERD25TJ223						
R215	ERD25TJ153						
R216	ERD25FJ472						
R218	ERD25FJ103						
R219	ERQ14AJ121P						
R226, 227, 228	ERG12ANJ221						
R229	ERD25FJ332						
R230	ERQ14AJ151P						
R231	ERD25FJ103						
R234	ERQ12AJ27P						
R235	ERD25FJ392						
R236	ERD25FJ472						



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

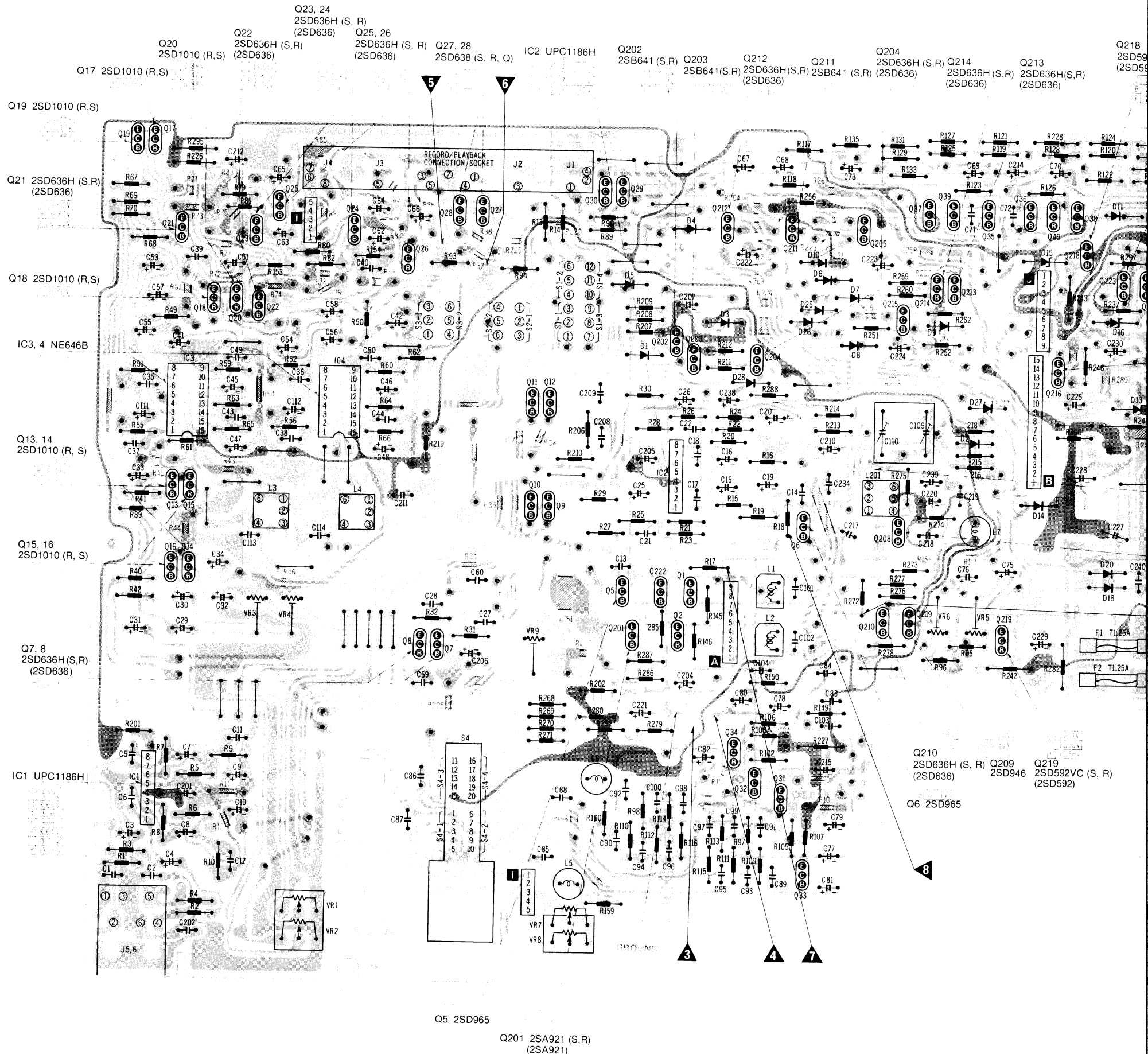
CAPACITORS

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

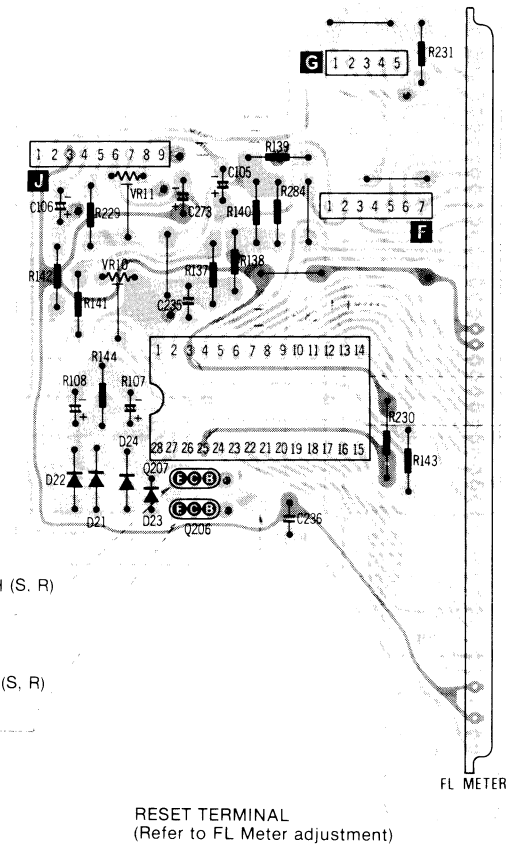
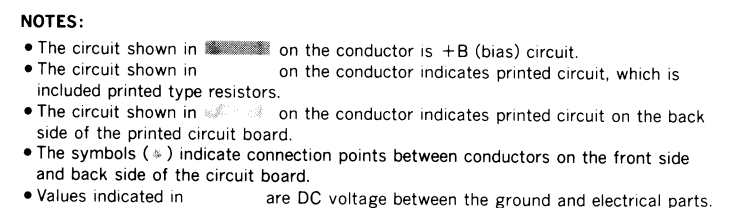
NOTE: Δ indicates that only parts specified by the manufacturer be used for safety.

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	ERD25TJ273	R242	ERG12ANJ221	C47, 48	ECEA50Z833	Q316, 317	2SD638
R15, 16	ERD25FJ101	R243	ERG12ANJ102	C49, 50	ECQM1H473JZ	Q401, 402, 403, 404, 405, 406, 407, 408	2SC945
R17, 18	ERD25FJ100	R246	ERD25TJ273	C53, 54, 55, 56, 57, 58	ECEA1HS100	Q409, 410, 411, 412, 413, 414, 415, 416	2SA721
R19, 20	ERD25FJ100	R248	ERX2ANJ586	C59, 60	ECKD1H821KB	DIODES & RECTIFIERS	
R21, 22	ERD25FJ101	R251	ERD25FJ332	C61, 62, 63, 64	ECEA2AS2R2	D1, 2, 3, 4, 5, 6, 7, 8, 9	
R23, 24	ERD25TJ274	R252	ERD25FJ562	C65, 66	ECEA50Z822	D10	MA161
R25, 26	ERD25TJ104	R256	ERD25FJ471	C67, 68	ECEA2AS010	D11	MA161
R27, 28	ERD25FJ682	R259	ERD25FJ272	C69, 70	ECEA1HS100	D13	RVDR08R8EB
R29, 30	ERD25FJ472	R260	ERD25FJ182	C71, 72	ECKD1H102MD	D14	SM112
R31, 32	ERD25FJ562	R262	ERD25TJ223	C73, 74	ECEA1CS221	D15	RVDR08R8EB
R39, 40, 41, 42	ERD25FJ102	R268	ERD25FJ562	C75, 76	ECEA50Z822	D16	RVDR08R8EB
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	RVDR08R8EB
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, 307, 308, 309, 310, 311, 312	MA161
R65, 66	ERD25TJ274	R274	ERD25FJ562	C87, 88	ECFDD103KXY	D313, 314	SM112
R67, 68, 69, 70	ERD25FJ683	R275	ERQ14AJ100P	C89, 90	ECFDD104KXY	D315	20A90
R79, 80	ERD25FJ681	R276	ERD25FJ822	C91, 92	ECFDD393KXY	D316, 317, 318	MA161
R81, 82	ERD25FJ182	R277	ERD25TJ223	C93, 94	ECFDD473KXY	LIGHT EMITTING DIODES	
R89, 90	ERD25FJ821	R278	ERD25FJ221	C95, 96	ECFDD183KXY	LED301	TLR206
R93, 94	ERD25FJ392	R279	ERD25FJ101	C97, 98	ECFDD104KXY	LED302	SLT35GG
R95, 96	ERD25FJ102	R280	ERD25FJ822	C99, 100	ECFDD473KXY	LED303	TLY206
R97, 98	ERD25FJ683	R281, 282	Δ ERG12ANJ181	C101, 102	ECQP1122JZ	INTEGRATED CIRCUITS	
R102	ERD25TJ333	R284	ERD25TJ124	C103, 104	ECFDD562KXY	IC1, 2	UPC1186H
R105, 106	ERD25FJ821	R285	ERD25FJ122	C105, 106	ECEA1HS100	IC3, 4	NE646B
R107, 108	ERD25FJ562	R286	ERD25TJ473	C107, 108	ECEA2AS010	IC5	AN6870
R109, 110	ERD25FJ821	R287	ERD25FJ562	C111, 112	ECEA1HS100	IC301	MM1400RS
R111, 112	ERD25FJ392	R288	ERD25TJ223	C113, 114	ECQM1H392JZ	IC303	DN6838
R113, 114	ERD25FJ152	R289	ERD25A1J21P	C201	ECEA1ES101	TRANSFORMER	
R115, 116	ERD25FJ222	R290	ERD25FJ182	C202	ECQM1H473KZ	T201	Δ QLPD49ELC
R117, 118	ERD25TJ333	R291	ERG12ANJ221	C204	ECEA1HS100	COILS	
R119, 120	ERD25TJ183	R292	ERD25FJ222	C205	ECEA1ES470	L1, 2	QLQM0333
R121, 122	ERD25TJ823	R293	ERD25FJ102	C206	ECEA2AS010	L3, 4	SLM1Z19
R123, 124	ERD25FJ102	R294	ERD25FJ182	C207	ECEA1ES221	L5, 6, 7	QLQX0332K
R125, 126	ERD25FJ152	R295	ERG12ANJ221	C208, 209	ECKD1H103ZF	L201	QLB0198K
R127, 128	ERD25FJ682	R296	ERD25TJ153	C210	ECEA1AS101	L301, 302	QLQZ1014D
R129, 130, 131, 132	ERD25FJ680	R297	ERD25FJ821	C211	ECEA1CS221	L303	ELH101KA
R133, 134	ERD25FJ680	R298	ERD25FJ152	C212	ECEA1ES101	SWITCHES	
R135, 136	ERD25FJ121	R299	ERD25FJ182	C213	ECQM1H683KZ	S1, 2, 3	QSWY304
R137, 138, 139, 140	ERD25FJ562	R300	ERD25FJ102	C214	ECEA1ES470	S4	QSR4404
R141, 142	ERD25FJ102	R301	ERD25FJ682	C215	ECEA1ES101	S5	Δ QSW2214
R143, 144	ERD25TJ684	R302	ERD25FJ562	C216	ECQM1H333KZ	S6	Δ QSR1407H
R145, 146	ERD25FJ562	R303	ERD25FJ472	C217	ECEA1HS100	S301	QSS1302
R149, 150	ERD25FJ472	R304	ERD25FJ182	C218	ECQM1H563KZ	S302	QSS1401
R153, 154	ERD25FJ472	R305	ERD25FJ102	C219	ECQM1H333KZ	S303, 304, 305, 306, 307, 308, 309, 310	EVQPAR11K
R159, 160	ERD25FJ180	R306	ERD25FJ102	C220	ECEA1HF100	S311	QSB0260
R201, 202	ERD25FJ102	R307	ERD25FJ332	C221	ECEA50Z822	S312	QSB0261
R206	ERD25TJ333	R308	ERD25FJ102	C222	ECEA2AS2R2	S313, 314	QSB0260
R207, 208, 209	ERD25TJ223	R309	ERD25FJ102	C223	ECEA1HS100	S315	QSB0261
R210	ERD25TJ333	R310	ERD25FJ102	C224	ECEA1HS100	FUSES	
R211	ERD25TJ473	R311, 312	ECQM1H273JZ	C225	ECEA1HS100	F1, 2	Δ XBAQ125028
R212, 213	ERD25FJ562	R313, 314	ECQM1H273JZ	C226	ECEA1HS100	F3	Δ XBAQ0013
R214	ERD25TJ223	R315, 316	ECQM1H273JZ	C227	ECEA1HS100	JACKS	
R215	ERD25TJ153	R317, 318	ECQM1H273JZ	C228	ECEA1HS100	J1, 2, 3, 4	QEJ5002S
R216	ERD25FJ472	R319, 320	ECQM1H273JZ	C229	ECEA1HS100	J5, 6	QJA0257H
R218	ERD25FJ103	R321, 322	ECQM1H273JZ	C230	ECEA1HS100	J7	QJA0249H
R219	ERQ14AJ121P	R323, 324	ECQM1H273JZ	C231	ECEA1HS100	J8	QJS1960S
R226, 227, 228	ERG12ANJ221	R325, 326	ECQM1H273JZ	C232	ECEA1HS100		
R229	ERD25FJ332	R327, 328	ECQM1H273JZ	C233	ECEA1HS100		
R230	ERQ14AJ151P	R329, 330	ECQM1H273JZ	C234	ECEA1HS100		
R231	ERD25FJ103	R331, 332	ECQM1H273JZ	C235	ECEA1HS100		
R234	Δ ERQ12AJ27P	R333, 334	ECQM1H273JZ	C236	ECEA1HS100		
R235	Δ ERD25FJ392	R335, 336	ECQM1H273JZ	C237	ECEA1HS100		
R236	Δ ERD25FJ472	R337, 338	ECQM1H273JZ	C238	ECEA1HS100		

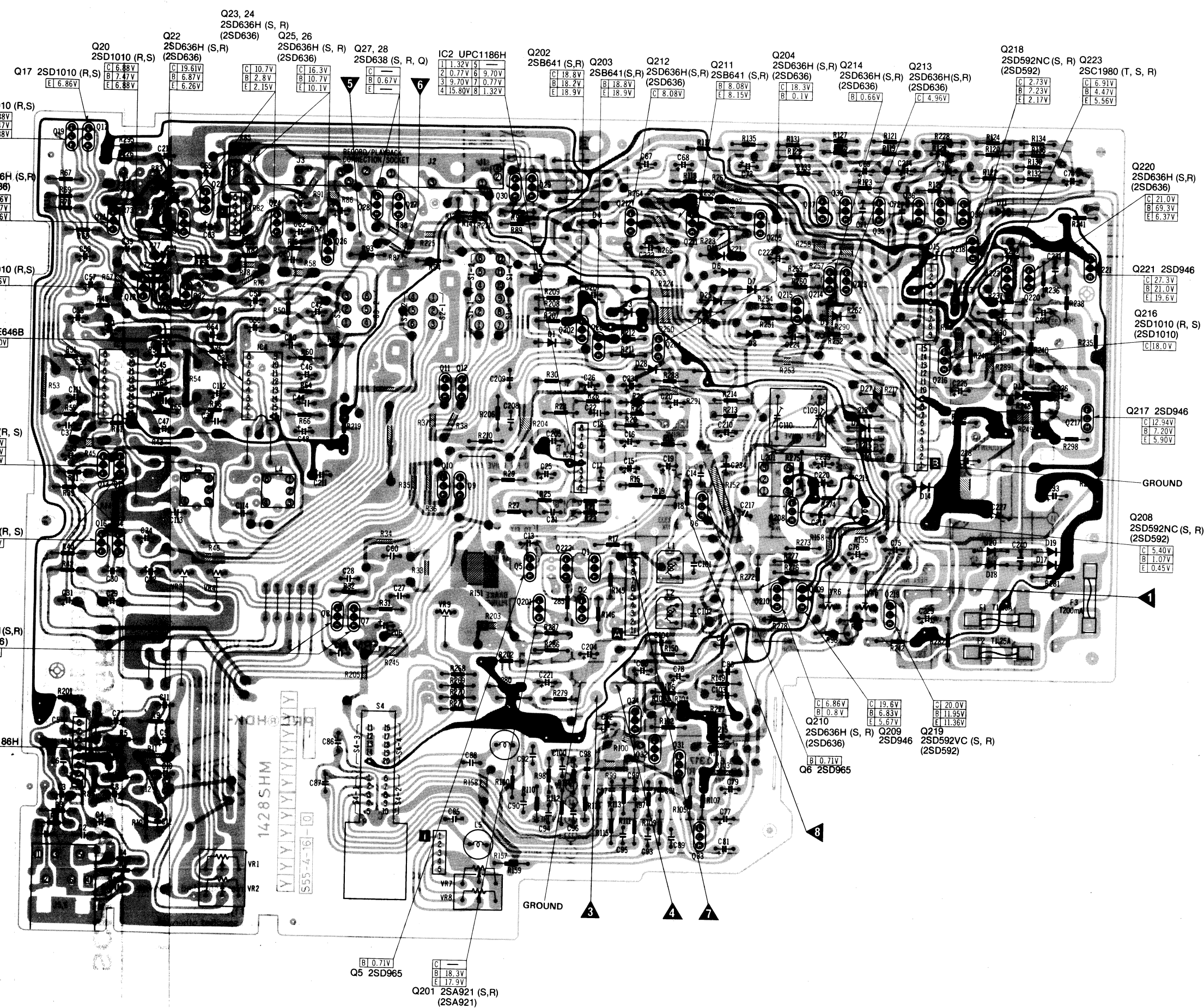
Ref. No.	Part No.	Part Name & Description
TRANSFORMER		
T201	Δ QLPD49ELC	AC Power Transformer
COILS		
L1, 2	QLQM0333	Bias Trap Coil
L3, 4	SLM1Z19	MPX Filter
L5, 6, 7	QLQX0332K	Peaking Coil
L201	QLB0198K	Bias Oscillation Coil
L301, 302	QLQZ1014D	Choke Coil
L303	ELH101KA	Choke Coil
SWITCHES		
S1, 2, 3	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



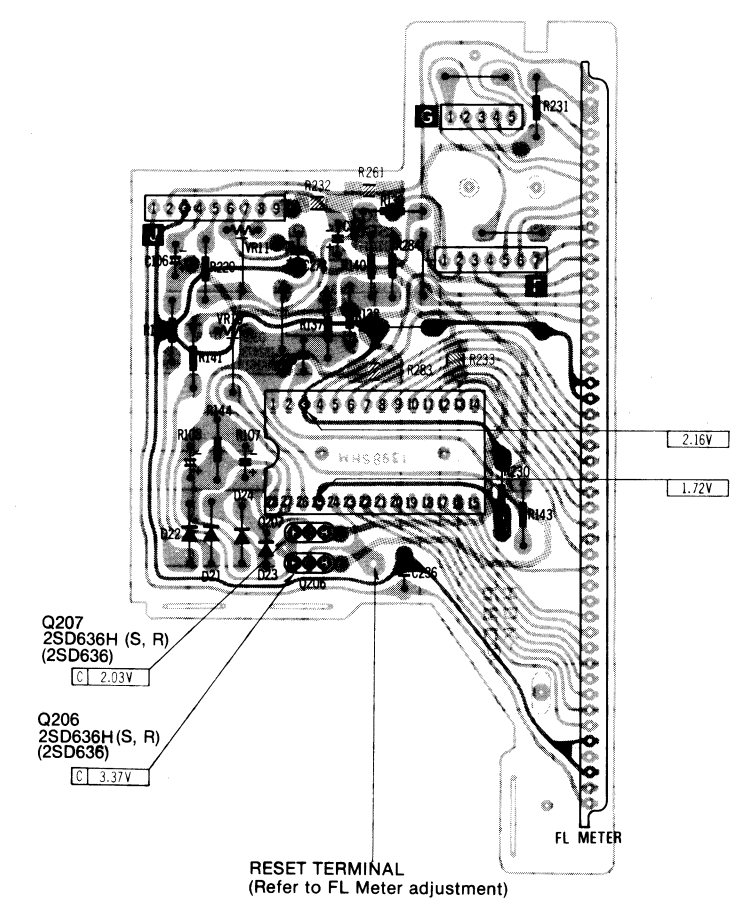
FL METER CIRCUIT BOARD



CIRCUIT BOARDS
N AMP CIRCUIT BOARD

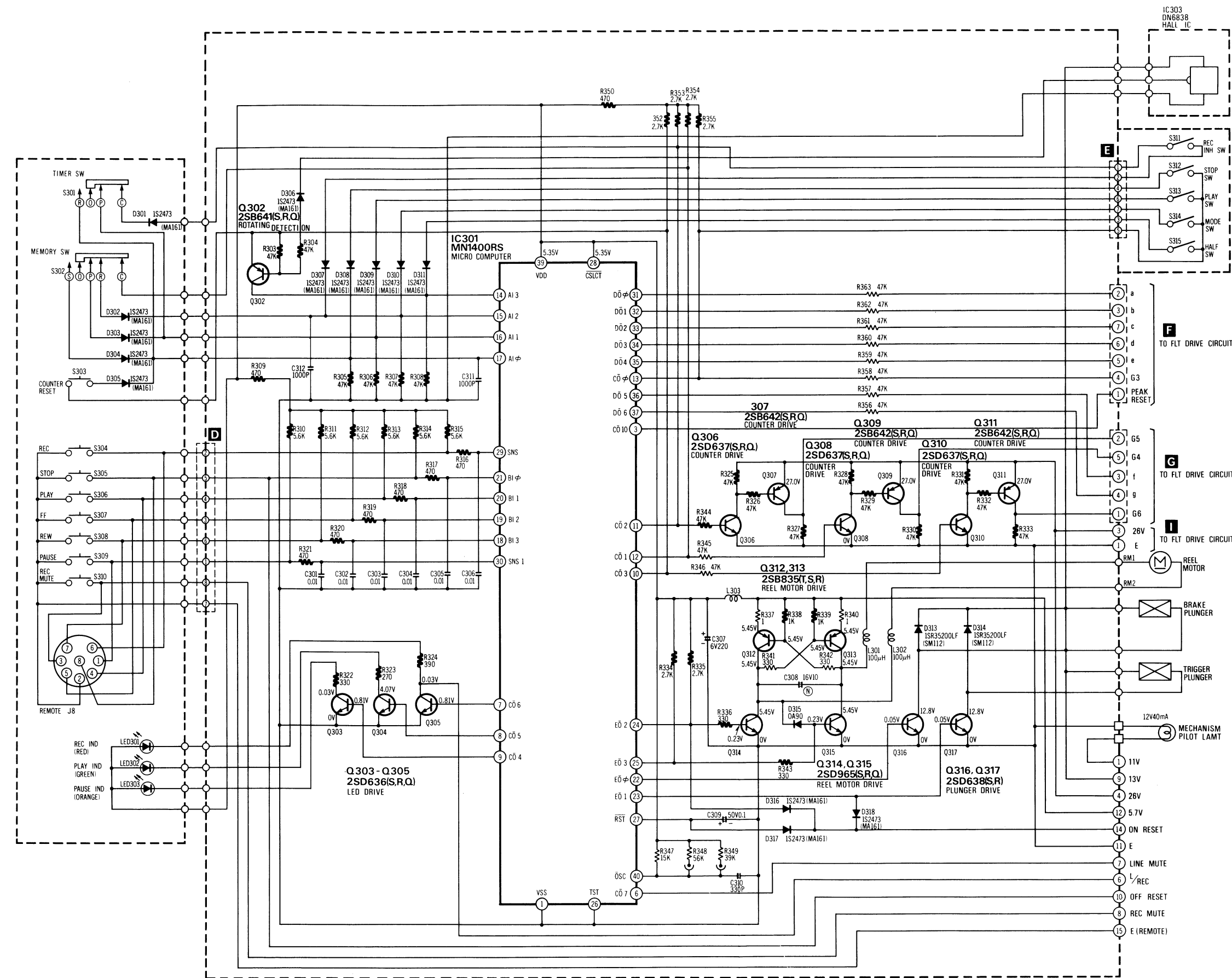


FL METER CIRCUIT BOARD



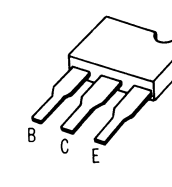
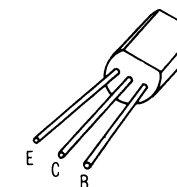
- NOTES:
- The circuit shown in [solid black] on the conductor is +B (bias) circuit.
 - The circuit shown in [stippled] on the conductor indicates printed circuit, which is included printed type resistors.
 - The circuit shown in [white] on the conductor indicates printed circuit on the back side of 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 [box] are DC voltage between the ground and electrical parts.

SCHEMATIC DIAGRAM MAIN CONTROL SECTION



TERMINATIONS (SIDE VIEW)

Q314, 315

Q302-313
316, 317

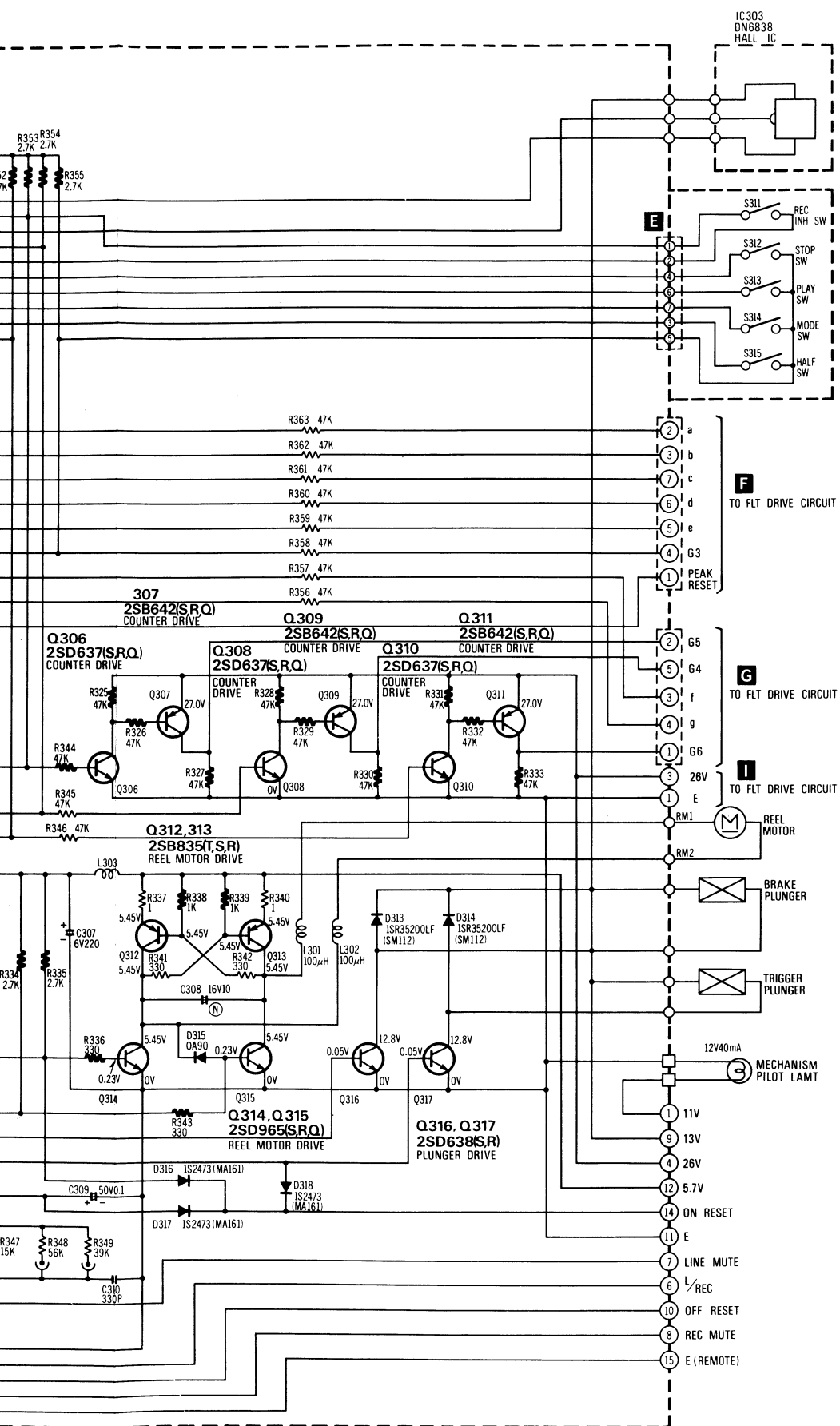
NOTES:

- 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

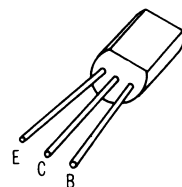
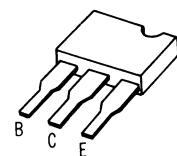
From Meter. Counter Circuit Board

From Meter. Counter Circuit Board



TERMINATIONS (SIDE VIEW)

Q314, 315

Q302-313
316, 317

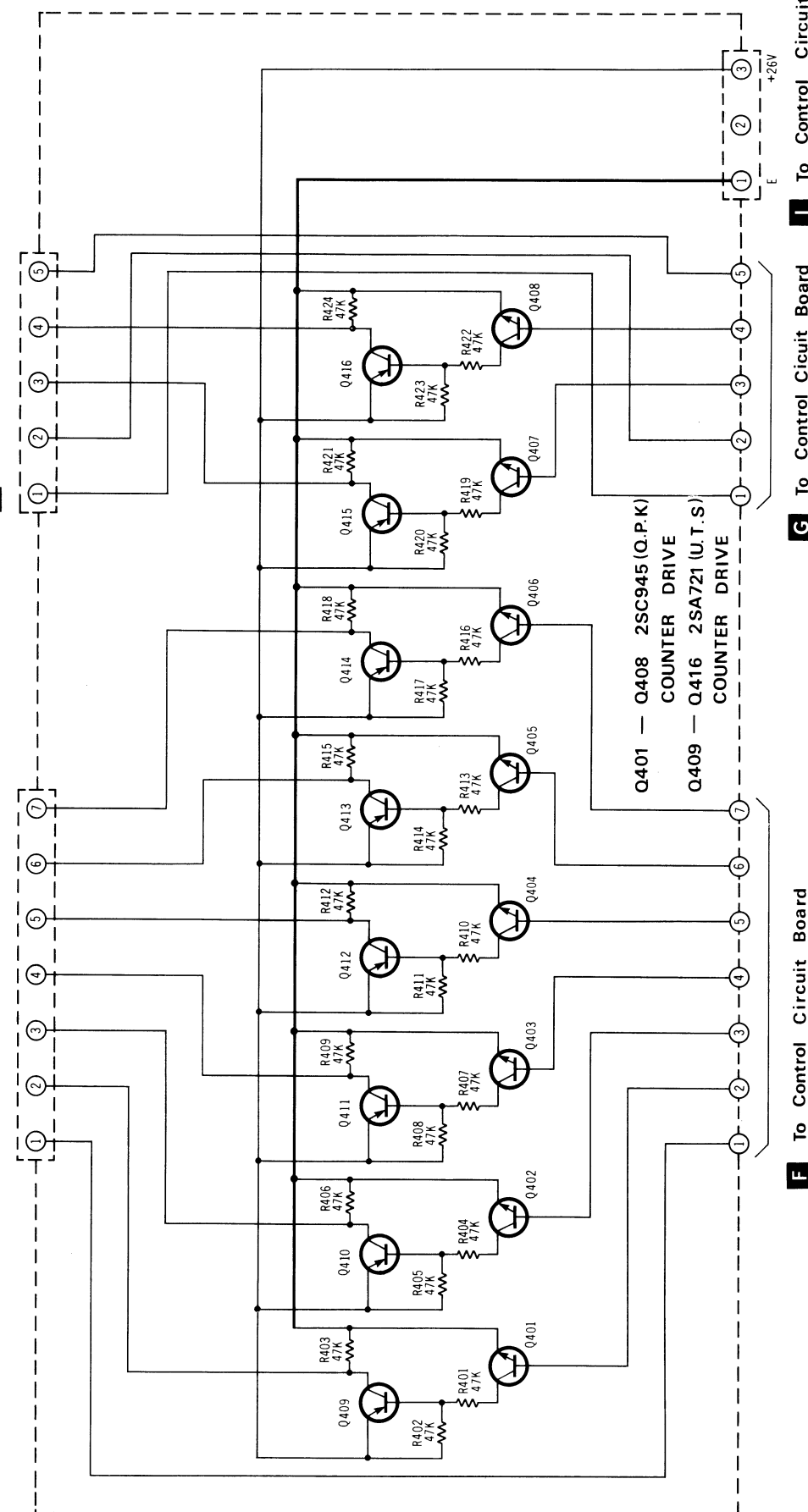
NOTES:

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

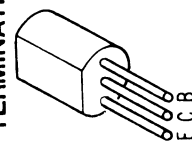
SCHEMATIC DIAGRAM
DIGITAL TAPE COUNTER DRIVE SECTION

F From Meter. Counter Circuit Board

G From Meter. Counter Circuit Board



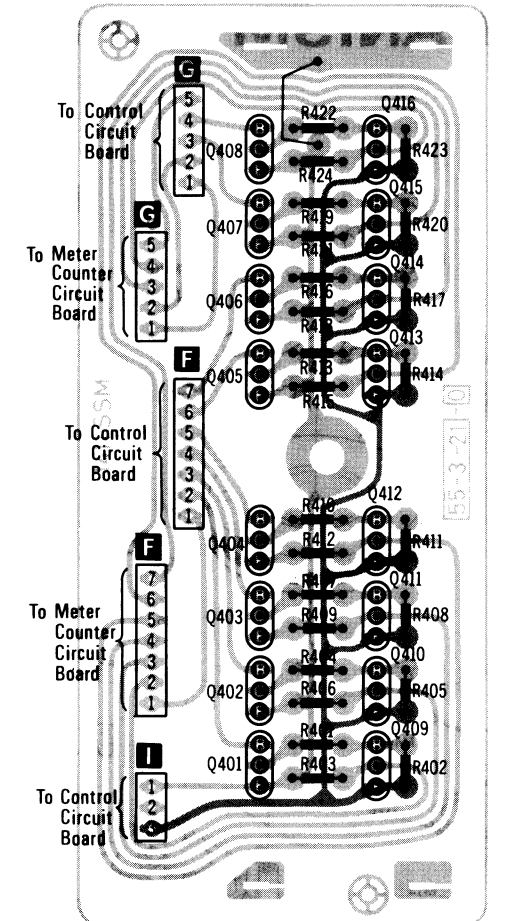
TERMINATIONS (SIDE VIEW)

Q401-408
Q409-416

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)

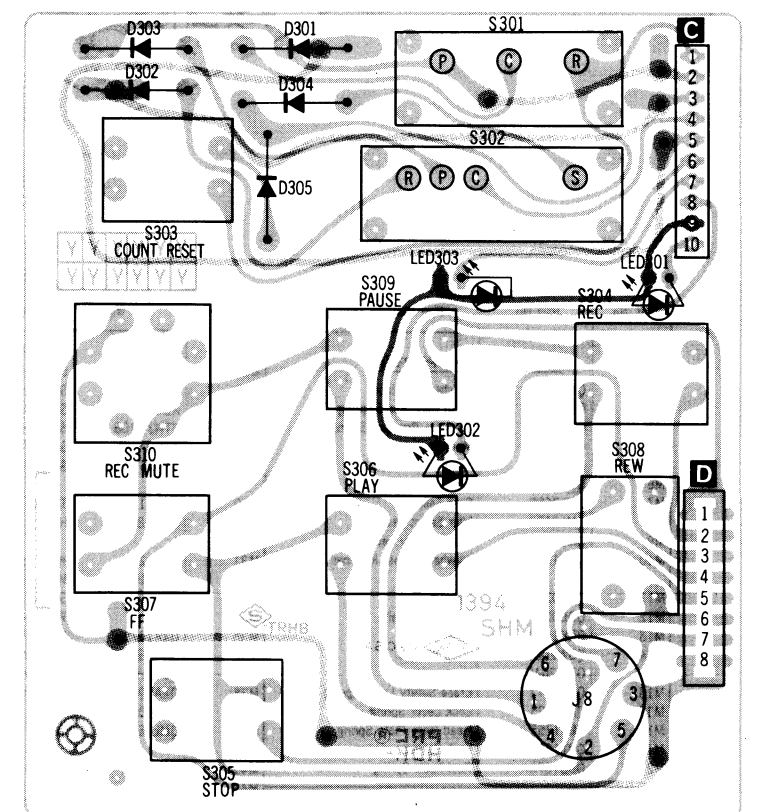
C	5.45V
B	0.23V
E	0V

C	0.03V
B	0.81V
E	0V

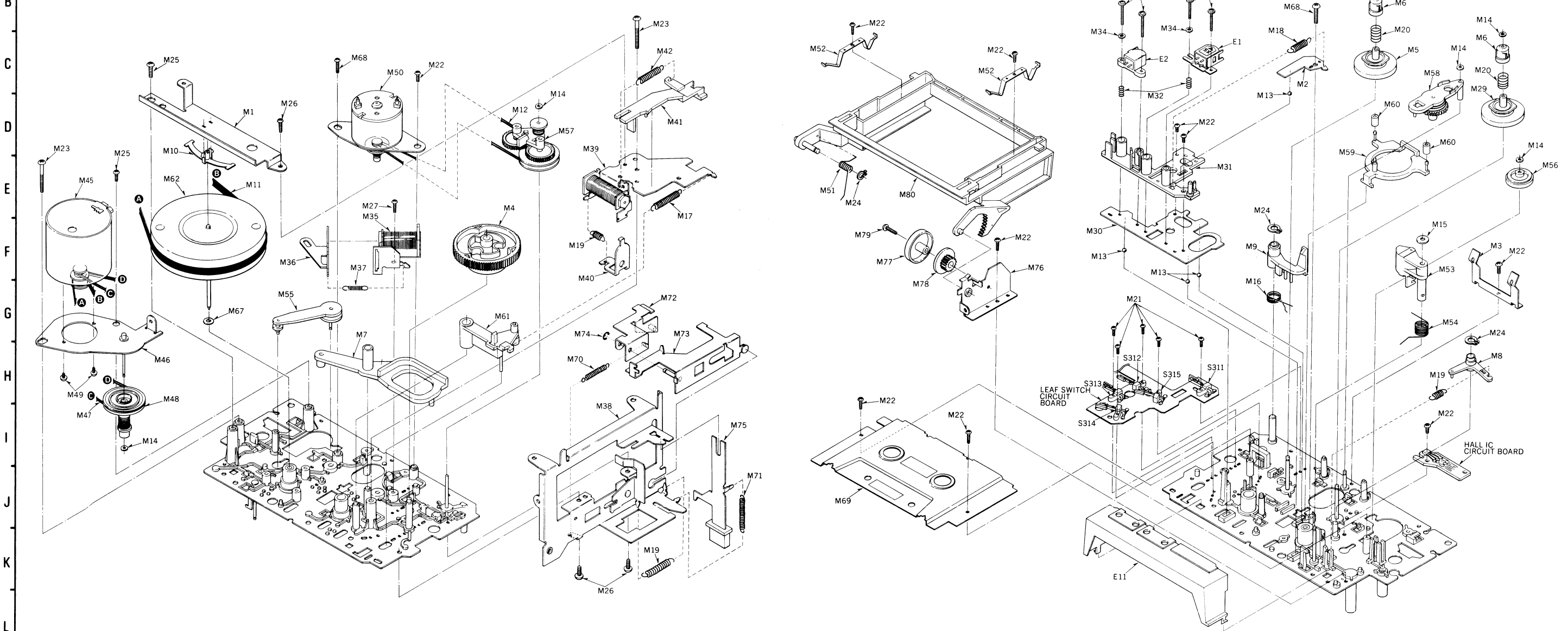
C	12.8V
B	0.05V
E	0V

Q316, 317
2SD638 (S, R)

CONTROL KEY SWITCH CIRCUIT BOARD



MECHANISM EXPLODED VIEWS

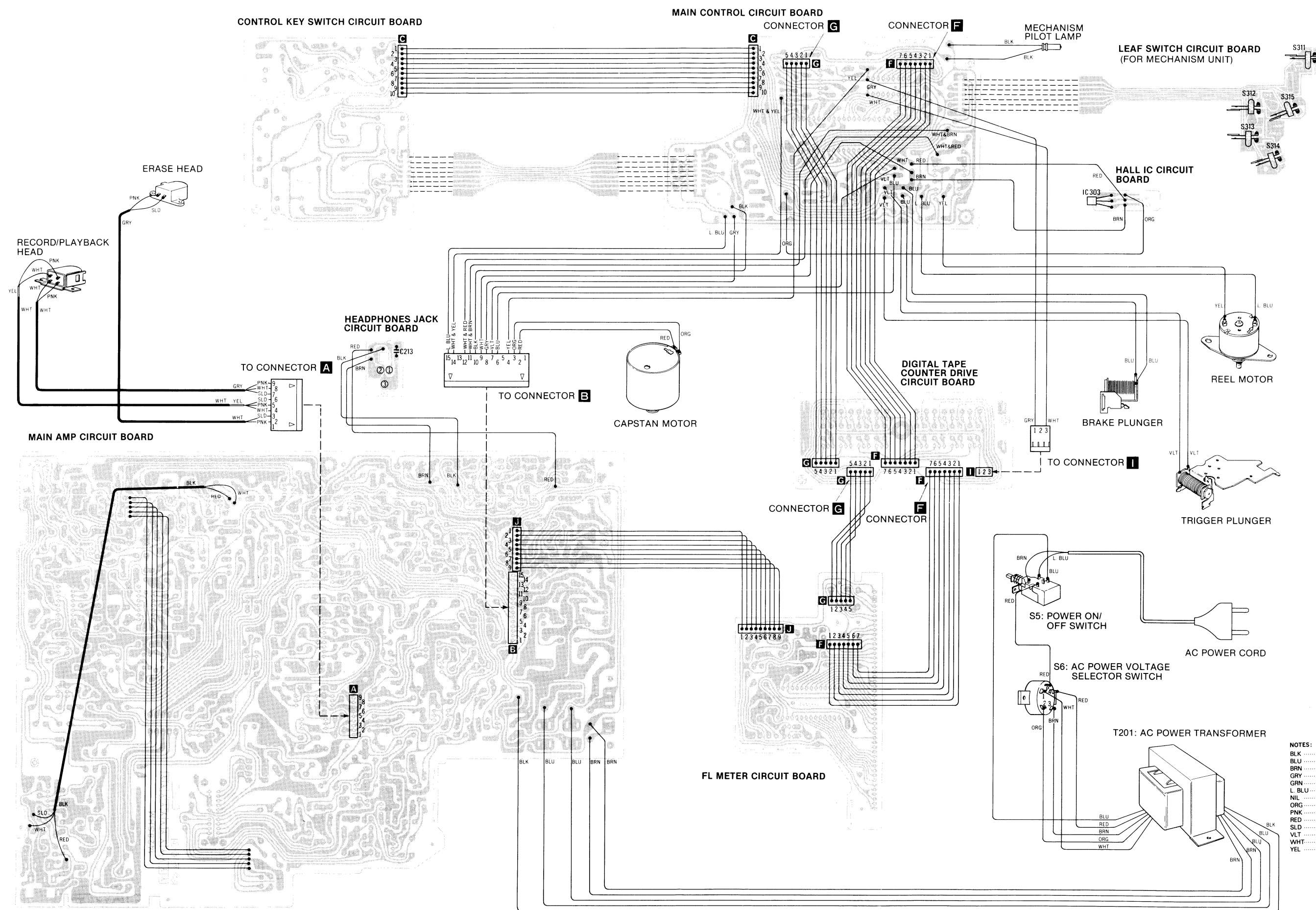


Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
MECHANICAL PARTS			M21	XTN2+6B	Screw $\pm 2 \times 6$	M45	QXU0194	Capstan Motor Assembly	M71	QBT1566	Intermediate Lever Spring
M1	QMA3951	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

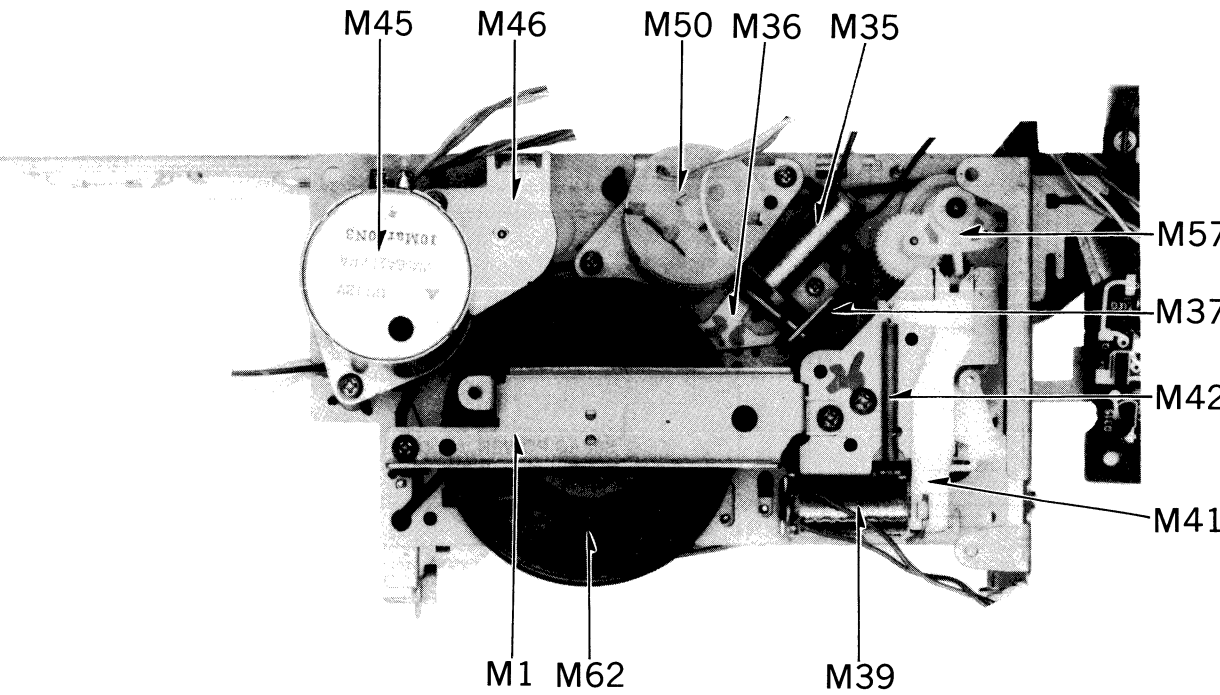
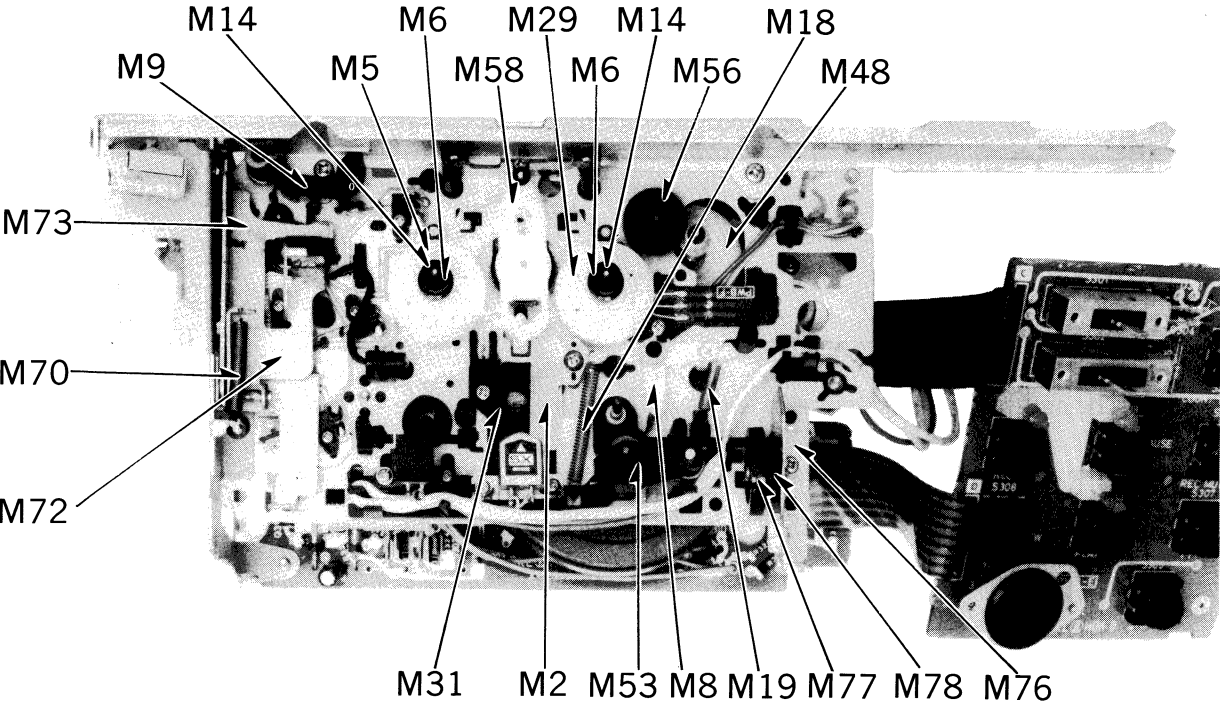
Pressure of pressure roller	350 $\pm$ 10 g
Wow and flutter (JIS) Test tape... QZZCWAT	Less than 0.055% (WRMS)

WIRING CONNECTION DIAGRAM

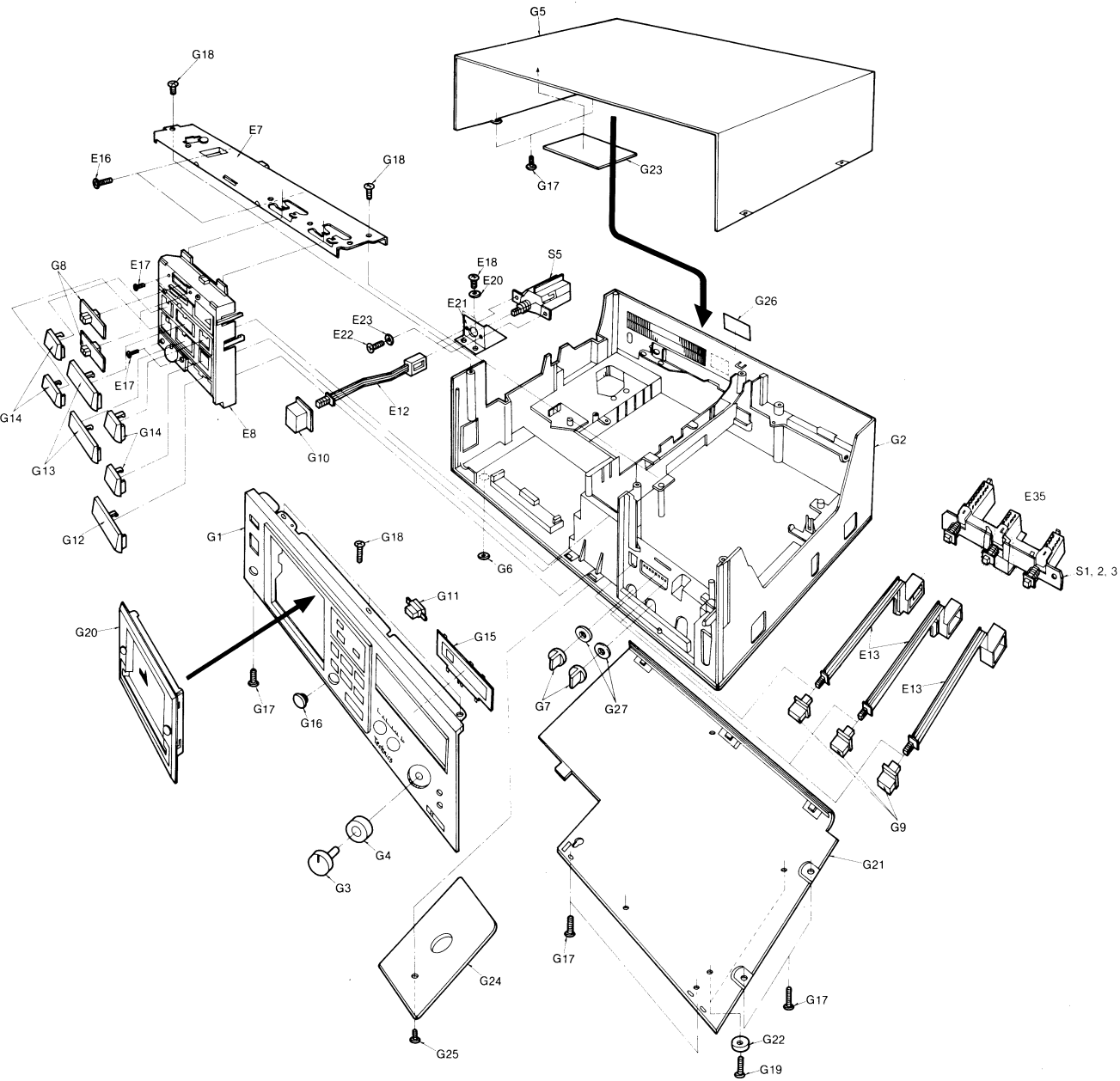


NOTES:
 BLK Black
 BLU Blue
 BRN Brown
 GRY Gray
 GRN Green
 NIL No Color Mark
 ORG Orange
 PNK Pink
 RED Red
 SLD Shield Wire
 VLT Violet
 WHT White
 YEL Yellow

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 New → Late	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.			
B	Original → Early New → Late	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.			
C	Original → Early New → Late	New parts only may be used in early or late production sets. Stock new parts.			
D	Original → Early New → Late	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.			
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.

Technics
■ National / Panasonic

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan
Printed in Japan