

# 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.

- ☐ ..... For all European areas except United Kingdom.  
☒ ..... 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 $\Omega$ or less, load impedance 22 k $\Omega$ over HEADPHONE; output level 85 mV (at 8 $\Omega$ ), load impedance 8 – 125 $\Omega$
Tape speed:	4.8 cm/s	Rec/pb connection:	5 pin DIN type; input sensitivity 0.25 mV, input impedance 6.8 k $\Omega$ output level 700 mV, output impedance 4.7 k $\Omega$
Wow and flutter:	0.04% (WRMS), $\pm 0.13\%$ (DIN)	Bias frequency:	85 kHz
Frequency response:	Metal tape; 20 – 20,000 Hz 30 – 18,000 Hz (DIN) 30 – 17,000 Hz $\pm 3$ dB CrO <sub>2</sub> /Fe-Cr tape; 20 – 18,000 Hz 30 – 18,000 Hz (DIN) 30 – 16,000 Hz $\pm 3$ dB Normal tape; 20 – 17,000 Hz 30 – 16,000 Hz (DIN) 30 – 15,000 Hz $\pm 3$ dB	Motor:	2-motor system; 1-Electrical DC governor motor, 1-DC motor
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 <sub>2</sub> type tape)	Heads:	2-head system; SX head for record/playback Ferrite double-gap head for erasure
Fast forward and rewind time:	Approx. 80 seconds with C-60 cassette tape	Power requirement:	AC; 110/125/220/240 V, 50-60 Hz
Inputs:	MIC; sensitivity 0.25 mV, input impedance 50 k $\Omega$ applicable microphone impedance 400 $\Omega$ – 10 k $\Omega$ LINE; sensitivity 60 mV, input impedance 47 k $\Omega$	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.

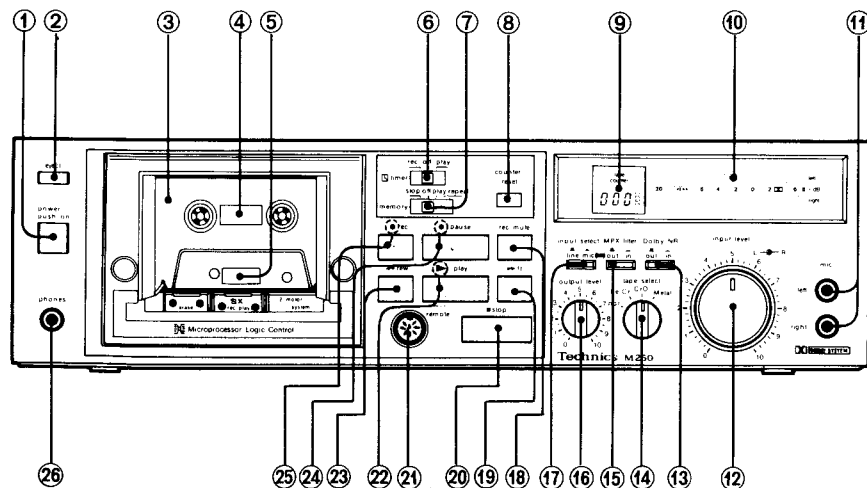
# Technics

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

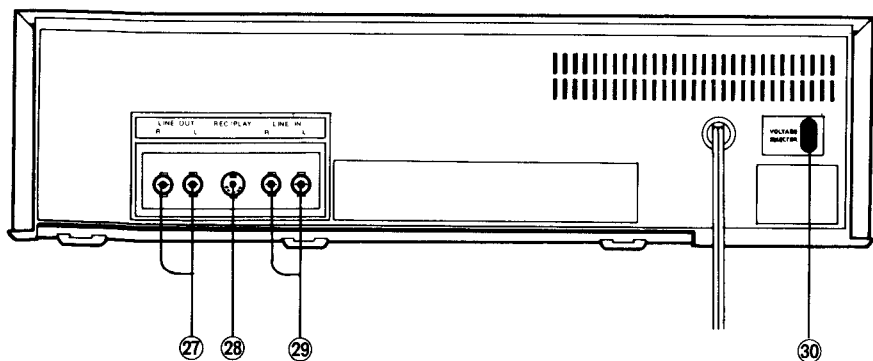
# CONTENTS

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

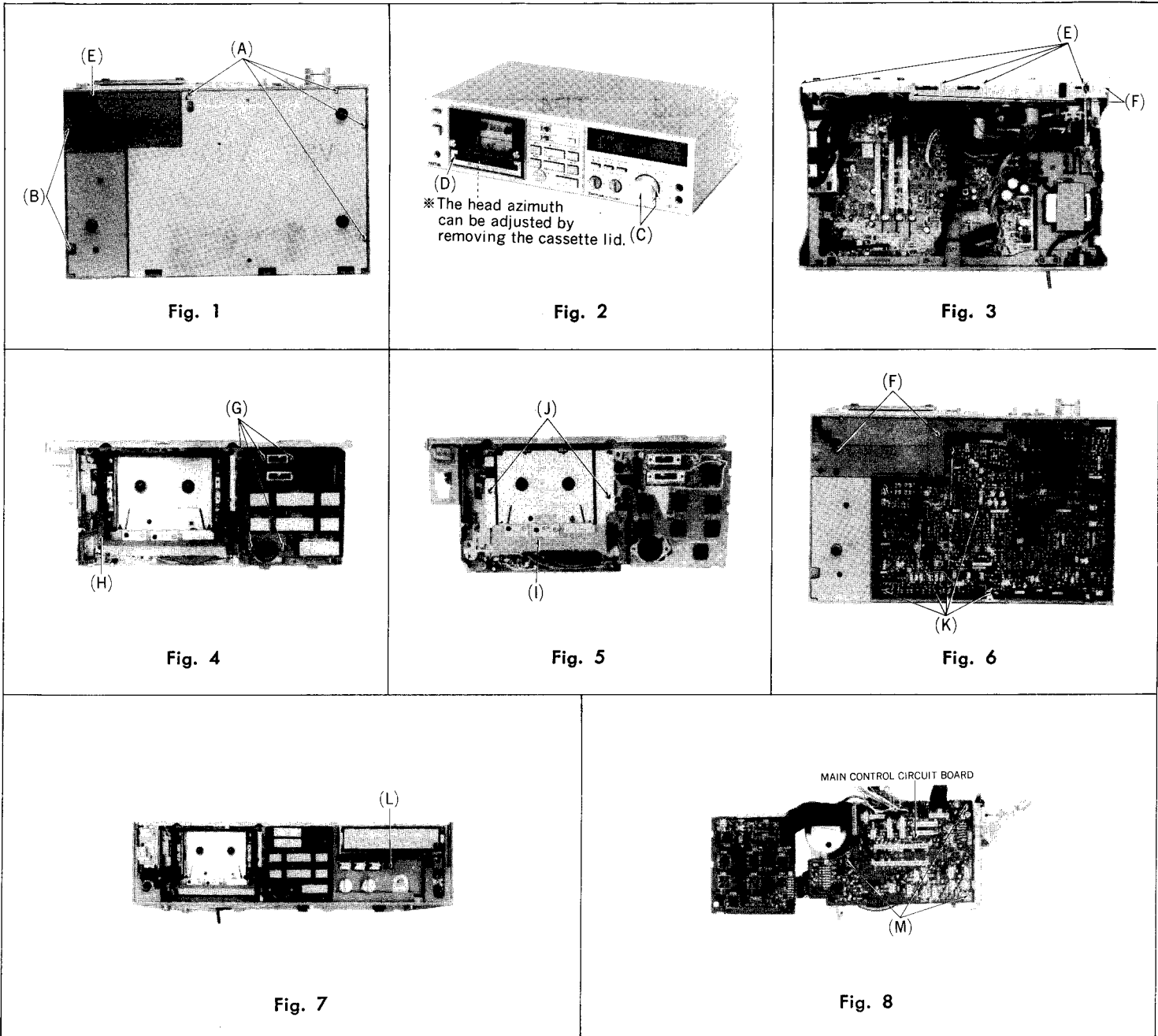
## LOCATION OF CONTROLS AND COMPONENTS



- 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-CrO<sub>2</sub>-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



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

RESET TERMINAL  
(refer to FL Meter  
adjustment)

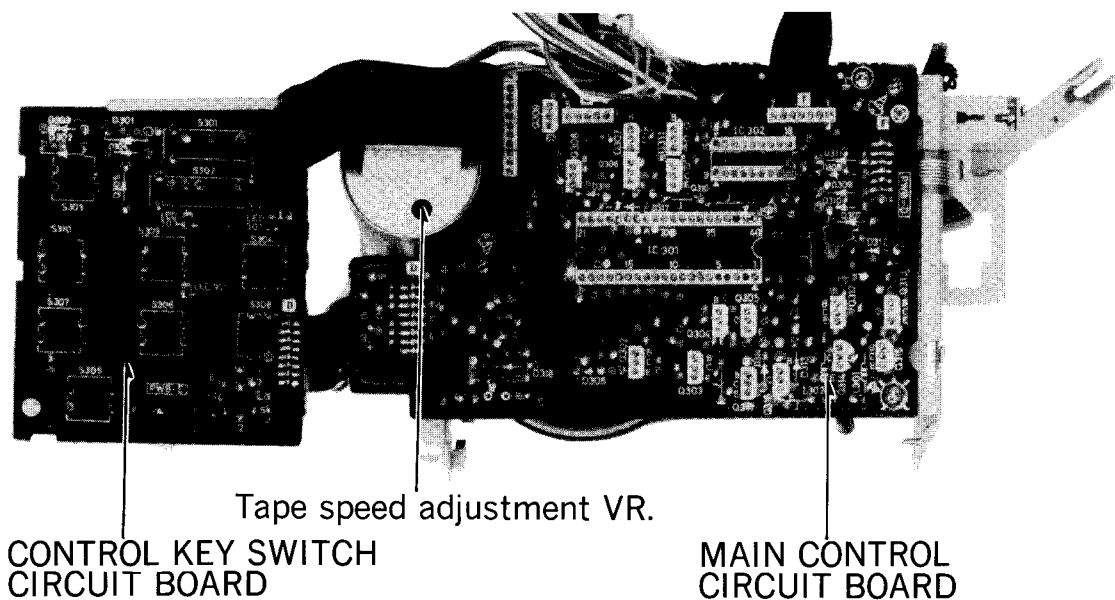
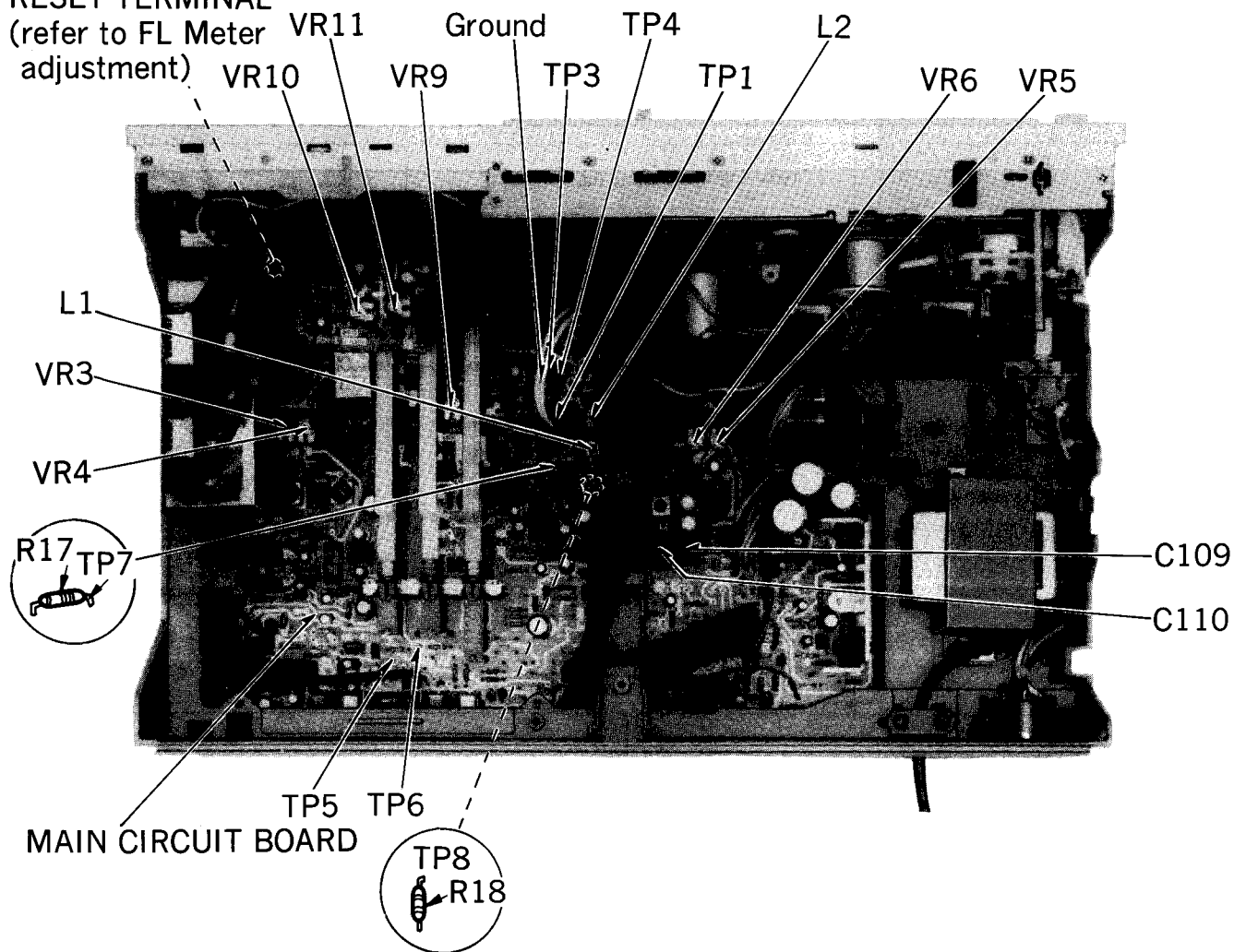
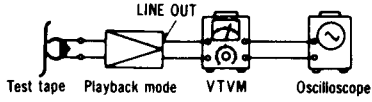
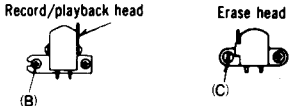
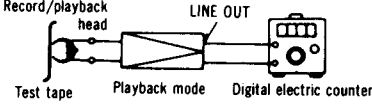
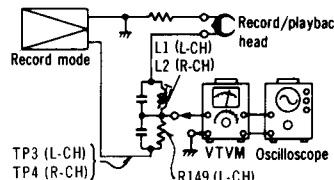
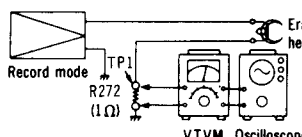
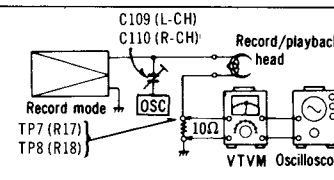
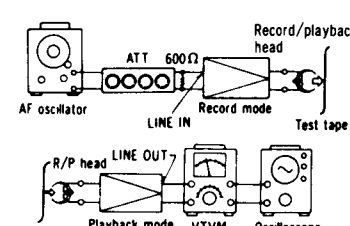


Fig. 1

**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
<p><b>A Head azimuth adjustment</b></p> <p>Condition:</p> <ul style="list-style-type: none"> <li>* Playback mode</li> </ul> <p>Equipment:</p> <ul style="list-style-type: none"> <li>* VTVM</li> <li>* Oscilloscope</li> <li>* Test tape (azimuth)                             <ul style="list-style-type: none"> <li>... QZZCFM</li> </ul> </li> <li>* Tape path viewer                             <ul style="list-style-type: none"> <li>... QZZCRD</li> </ul> </li> </ul>	<p><b>Record/playback head adjustment</b></p> <ol style="list-style-type: none"> <li>1. Test equipment connection is shown in fig. 2.</li> <li>2. Playback azimuth tape (QZZCFM 8kHz).</li> <li>3. Adjust record/playback head angle adjustment screw (B) in fig. 3 so that output level at LINE OUT becomes maximum.</li> <li>4. Measure both channels, and adjust levels for equal output.</li> <li>5. After adjustment lock head adjustment screw with lacquer.</li> </ol>  <p style="text-align: center;"><b>Fig. 2</b></p> <p><b>Erase head adjustment</b></p> <ol style="list-style-type: none"> <li>1. Test equipment connection is the same above but use the tape path viewer (QZZCRD) instead of test tape (QZZCFM).</li> <li>2. Playback this tape.</li> <li>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.</li> <li>4. After adjustment, lock head adjust screw with lacquer.</li> </ol>  <p style="text-align: center;"><b>Fig. 3</b>                      <b>Fig. 4</b></p>
<p><b>E Tape speed</b></p> <p>Condition:</p> <ul style="list-style-type: none"> <li>* Playback mode</li> <li>* Tape selector                             <ul style="list-style-type: none"> <li>... Normal position</li> </ul> </li> </ul> <p>Equipment:</p> <ul style="list-style-type: none"> <li>* Digital electronic counter</li> <li>* Test tape ... QZZCWAT</li> </ul>	<p><b>Tape speed accuracy</b></p> <ol style="list-style-type: none"> <li>1. Test equipment connection is shown in fig. 5.</li> <li>2. Playback test tape (QZZCWAT 3,000Hz), and supply playback signal to frequency counter.</li> <li>3. Measure this frequency.</li> <li>4. On the basis of 3,000 Hz, determine value by following formula:</li> </ol> $\text{Tape speed accuracy} = \frac{f - 3,000}{3,000} \times 100 (\%)$ <p style="text-align: center;">where, f = measured value</p> <ol style="list-style-type: none"> <li>5. Take measurement at middle section of tape.</li> </ol> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p><b>Standard value: <math>\pm 1.5\%</math></b></p> </div> <p><b>Adjustment method</b></p> <ol style="list-style-type: none"> <li>1. Playback the test tape (middle).</li> <li>2. Adjust so that frequency becomes 3,000 Hz.</li> <li>3. Tape speed adjustment VR shown in fig. 1.</li> </ol> <p><b>Tape speed fluctuation</b></p> <p>Make measurements in same manner as above (beginning, middle and end of tape), and determine the difference between maximum and minimum values and calculate as follows:</p> $\text{Tape speed fluctuation} = \frac{f_1 - f_2}{3,000} \times 100 (\%)$ <p style="text-align: center;"><math>f_1</math> = maximum value, <math>f_2</math> = minimum value</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p><b>Standard value: Less than 1.0%</b></p> </div>  <p style="text-align: center;"><b>Fig. 5</b></p>
<p><b>G Playback frequency response</b></p> <p>Condition:</p> <ul style="list-style-type: none"> <li>* Tape selector                             <ul style="list-style-type: none"> <li>... Normal position</li> </ul> </li> <li>* Playback mode</li> </ul> <p>Equipment:</p> <ul style="list-style-type: none"> <li>* VTVM</li> <li>* Oscilloscope</li> <li>* Test tape ... QZZCFM</li> </ul>	<ol style="list-style-type: none"> <li>1. Test equipment connection is shown in fig. 2.</li> <li>2. Place UNIT into playback mode.</li> <li>3. Playback the frequency response test tape (QZZCFM).</li> <li>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.</li> <li>5. Make measurement for both channels.</li> <li>6. Make sure that the measured value is within the range specified in the frequency response chart. (shown in fig. 6).</li> </ol> <p style="text-align: center;"><b>Playback frequency response chart</b></p> <p style="text-align: center;"><b>Fig. 6</b></p>

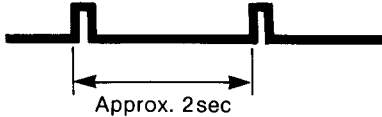
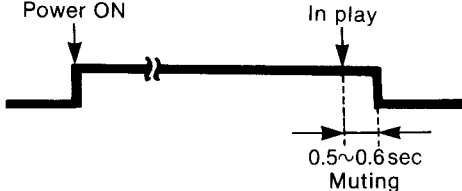
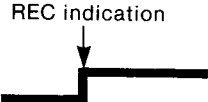
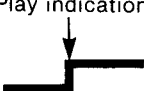
ITEM	MEASUREMENT & ADJUSTMENT
<p><b>Ⓧ Playback gain</b></p> <p>Condition:</p> <ul style="list-style-type: none"> <li>* Tape selector                             <ul style="list-style-type: none"> <li>... Normal position</li> </ul> </li> <li>* Playback mode</li> </ul> <p>Equipment:</p> <ul style="list-style-type: none"> <li>* VTVM</li> <li>* Oscilloscope</li> <li>* Test tape ... QZZCFM</li> </ul>	<ol style="list-style-type: none"> <li>1. Test equipment connection is shown in fig. 2.</li> <li>2. Playback standard recording level portion on test tape (QZZCFM 315Hz, 0 dB), and using VTVM measure the output level at LINE OUT jack.</li> <li>3. Make measurement for both channels.</li> </ol> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p><b>Standard value: 0.7V ± 1.5 dB</b></p> </div> <p><b>Adjustment</b></p> <ol style="list-style-type: none"> <li>1. If measured value is not within standard, adjust VR3 (L-CH), VR4 (R-CH) (shown in fig. 1).</li> <li>2. After adjustment, check "Playback frequency response" again.</li> </ol>
<p><b>Ⓧ Bias leakage</b></p> <p>Condition:</p> <ul style="list-style-type: none"> <li>* Record mode</li> <li>* Input level controls ... MAX</li> <li>* Output level control ... MAX</li> <li>* Tape selector                             <ul style="list-style-type: none"> <li>... Metal position</li> </ul> </li> </ul> <p>Equipment:</p> <ul style="list-style-type: none"> <li>* VTVM</li> <li>* Oscilloscope</li> </ul>	<ol style="list-style-type: none"> <li>1. Test equipment connection is shown in fig. 7.</li> <li>2. Place UNIT into record mode.</li> <li>3. Adjust trap coils L1 (L-CH), L2 (R-CH), so that measured value becomes minimum.</li> <li>4. Make adjustment for both channels.</li> </ol>  <p style="text-align: center;"><b>Fig. 7</b></p>
<p><b>Ⓧ Erase current</b></p> <p>Condition:</p> <ul style="list-style-type: none"> <li>* Tape selector                             <ul style="list-style-type: none"> <li>... Metal position</li> </ul> </li> <li>* Record mode</li> </ul> <p>Equipment:</p> <ul style="list-style-type: none"> <li>* VTVM</li> <li>* Oscilloscope</li> </ul>	<ol style="list-style-type: none"> <li>1. Test equipment connection is shown in fig. 8.</li> <li>2. Place UNIT into record mode and measure voltage at test point 1.</li> <li>3. Determine erase current with the following formula:</li> </ol> $\text{Erase current (A)} = \frac{\text{Voltage across both ends of R272}}{1 (\Omega)}$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p><b>Standard value: 145 ± 5 mA (Tape selector ... Metal)</b></p> </div> <ol style="list-style-type: none"> <li>4. If measured value is not within standard, adjust VR9.</li> </ol>  <p style="text-align: center;"><b>Fig. 8</b></p>
<p><b>Ⓧ Bias current</b></p> <p>Condition:</p> <ul style="list-style-type: none"> <li>* Record mode</li> <li>* Tape selector                             <ul style="list-style-type: none"> <li>... Normal position</li> <li>... Fe-Cr position</li> <li>... CrO<sub>2</sub> position</li> <li>... Metal position</li> </ul> </li> </ul> <p>Equipment:</p> <ul style="list-style-type: none"> <li>* VTVM</li> <li>* Oscilloscope</li> </ul>	<ol style="list-style-type: none"> <li>1. Test equipment connection is shown in fig. 9.</li> <li>2. Place UNIT into record mode, and tape selector to normal position.</li> <li>3. Read voltage on VTVM and calculate bias current by following formula:</li> </ol> $\text{Bias current (A)} = \frac{\text{Value read on VTVM (V)}}{10\Omega}$ <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p><b>Standard value: around 330 μA (Normal position)</b></p> </div> <ol style="list-style-type: none"> <li>4. Adjust C109 (L-CH) and C110 (R-CH) (shown in fig. 1).</li> <li>5. Set the tape selector to each position.</li> <li>6. Make sure that the measured value is within standard.</li> </ol> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p><b>Standard value: around 370 μA (Fe-Cr position)</b>  <b>around 415 μA (CrO<sub>2</sub> position)</b>  <b>around 700 μA (Metal position)</b></p> </div>  <p style="text-align: center;"><b>Fig. 9</b></p>
<p><b>Ⓧ Overall gain</b></p> <p>Condition:</p> <ul style="list-style-type: none"> <li>* Record/playback mode</li> <li>* Normal position</li> <li>* Input level controls ... MAX</li> <li>* Output level control ... MAX</li> <li>* Standard input level;                             <ul style="list-style-type: none"> <li>MIC ... -72 ± 3.5 dB</li> <li>LINE IN ... -24 ± 3.5 dB</li> </ul> </li> </ul> <p>Equipment:</p> <ul style="list-style-type: none"> <li>* VTVM</li> <li>* AF oscillator</li> <li>* ATT</li> <li>* Oscilloscope</li> <li>* Resistor (600Ω)</li> <li>* Test tape (reference blank tape)                             <ul style="list-style-type: none"> <li>... QZZCRA for Normal</li> </ul> </li> </ul>	<ol style="list-style-type: none"> <li>1. Test equipment connection is shown in fig. 10.</li> <li>2. Place UNIT into record mode, and normal tape mode.</li> <li>3. Supply 1 kHz signal (-24 dB) from AF oscillator, through ATT to LINE IN.</li> <li>4. Adjust ATT until monitor level at LINE OUT becomes 0.7 V.</li> <li>5. Using test tape, make recording.</li> <li>6. Playback recorded tape, and make sure the value at LINE OUT on VTVM becomes 0.7 V.</li> <li>7. If measured value is not 0.7 V, adjust VR5 (L-CH), VR6 (R-CH).</li> <li>8. Repeat from step 2.</li> </ol>  <p style="text-align: center;"><b>Fig. 10</b></p>


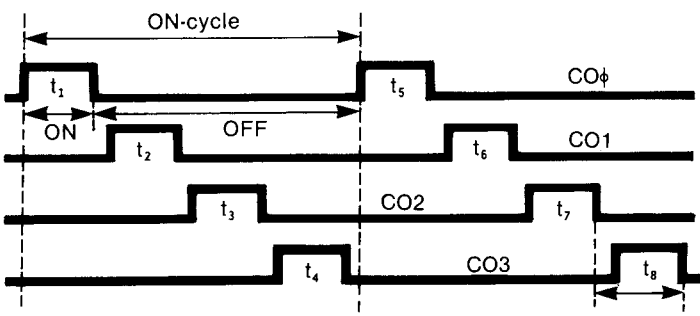

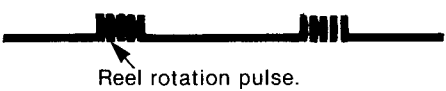

ITEM	MEASUREMENT & ADJUSTMENT
<p><b>① Fluorescent meter</b></p> <p>Condition:</p> <ul style="list-style-type: none"> <li>* Record mode</li> <li>* Input level controls ... MAX</li> <li>* Output level control ... MAX</li> <li>* Tape selector ... Normal position</li> </ul> <p>Equipment:</p> <ul style="list-style-type: none"> <li>* VTVM</li> <li>* AF oscillator</li> <li>* ATT</li> </ul>	<ol style="list-style-type: none"> <li>Test equipment connection is shown in fig. 10.</li> <li>As shown in fig. 11, connect the collector of Q206 and ground.</li> <li>Supply 1 kHz signal (-24 dB) to the LINE IN jack, then press the record button.</li> <li>Adjust the ATT so that the output level at LINE OUT jack becomes 0.7V (The input level at this condition is termed the standard input level).</li> <li>Adjustment at "-20 dB".             <ol style="list-style-type: none"> <li>Adjust the ATT so that input level is -20 dB below standard recording level.</li> <li>Adjust VR11 so that the -20 dB segment lights up in the <math>-20 \text{ dB} \pm 0.8 \text{ dB}</math> range (L-CH ONLY) (See fig. 12).</li> </ol> </li> <li>Adjustment at "0 dB".             <ol style="list-style-type: none"> <li>Adjust the ATT so that the output level at LINE OUT jack becomes 0.7V. (The input level at this condition is termed the standard input level.)</li> <li>Adjust VR10 so that the +1 dB segment lights up in the <math>0 \pm 0.2 \text{ dB}</math> range of the standard input level (See fig. 13).</li> </ol> </li> <li>Repeat twice between steps 5 and 6 above.</li> <li>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).</li> </ol> <div data-bbox="986 353 1441 622" data-label="Diagram"> </div> <div data-bbox="938 674 1361 815" data-label="Figure"> </div> <div data-bbox="938 831 1361 972" data-label="Figure"> </div> <div data-bbox="938 972 1361 1113" data-label="Figure"> </div>
<p><b>② Overall frequency response</b></p> <p>Condition:</p> <ul style="list-style-type: none"> <li>* Record/playback mode</li> <li>* Tape selector ... Normal position</li> <li>... Fe-Cr position</li> <li>... CrO<sub>2</sub> position</li> <li>... Metal position</li> <li>* Input level controls ... MAX</li> <li>* Output level control ... MAX</li> </ul> <p>Equipment:</p> <ul style="list-style-type: none"> <li>* VTVM</li> <li>* AF oscillator</li> <li>* ATT</li> <li>* Resistor (600 Ω)</li> <li>* Test tape (reference blank tape)             <ul style="list-style-type: none"> <li>... QZZCRA for Normal</li> <li>... QZZCRX for CrO<sub>2</sub></li> <li>... QZZCRY for Fe-Cr</li> <li>... QZZCRZ for Metal</li> </ul> </li> </ul>	<p><b>Note: 1</b> Before measuring and adjusting, make sure of the playback frequency response (For the method of measurement, please refer to the playback frequency response).</p> <p><b>Note: 2</b> Test tape QZZCRA to be supplied after July 1980 has higher recording sensitivity in the middle and high frequency range.</p> <div data-bbox="496 1429 1396 1532" data-label="List-Group"> <ul style="list-style-type: none"> <li>*  This chart indicates the standard values for the new type of QZZCRA when in use.</li> <li>*  This chart indicates the standard values for the former type of QZZCRA when in use.</li> </ul> </div> <p>The new type of QZZCRA is marked as shown in fig. 16.</p> <div data-bbox="536 1570 1369 1742" data-label="Diagram"> </div> <ol style="list-style-type: none"> <li>Test equipment connection is shown in fig. 10.</li> <li>Place the test tape (QZZCRA) in the cassette holder.</li> <li>Place UNIT into record mode, and tape selector to normal position.</li> <li>Supply 1 kHz signal from AF oscillator through ATT to LINE IN.</li> <li>Adjust ATT so that input level is -20 dB below standard recording level (standard recording level = 0 VU).</li> </ol> <div data-bbox="922 1144 1406 1420" data-label="Figure"> </div> <div data-bbox="895 1756 1410 2031" data-label="Figure"> </div>

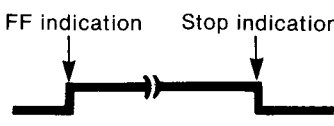
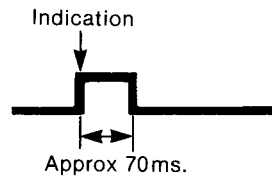
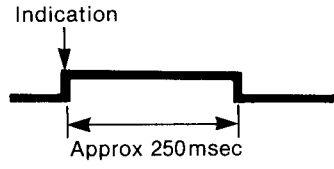
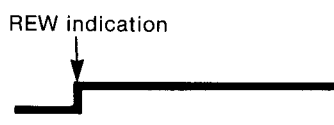
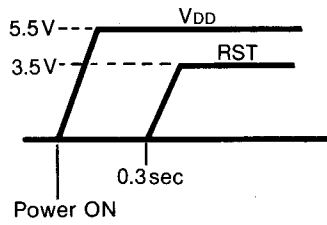
ITEM	MEASUREMENT & ADJUSTMENT																						
	<p>6. At this time, LINE OUT level indicates 0.07V.</p> <p>7. Record each frequency 30Hz, 100Hz, 1kHz, 4kHz, 8kHz, 10kHz, 12kHz, and 13kHz (14kHz for CrO<sub>2</sub> and Fe-Cr, 16kHz for Metal).</p> <p>8. Playback and express in dB the difference between playback output level of each frequency based on playback output level of 1kHz.</p> <p>9. Make sure that the measured value is within the range specified in the overall frequency response chart (shown in fig. 15).</p> <p>10. Change test tape to Metal (QZZCRZ), CrO<sub>2</sub> (QZZCRX) and Fe-Cr (QZZCRY).</p> <p>11. Set the tape selector to each position.</p> <p>12. Measure as same as manner above.</p> <p>13. Make sure that the measured value is within the range specified in the overall frequency response chart for Fe-Cr, CrO<sub>2</sub> and Metal tape shown in fig. 17 and 18.</p> <p>14. If measured value is not within standard, adjust C109 (L-CH), C110 (R-CH).</p> <div data-bbox="853 387 1364 638"> <p>Overall frequency response chart (Fe-Cr)</p> <table border="1"> <caption>Data points for Fig. 18</caption> <thead> <tr> <th>Frequency</th> <th>Gain (dB)</th> </tr> </thead> <tbody> <tr><td>30 Hz</td><td>-7 dB</td></tr> <tr><td>50 Hz</td><td>-2 dB</td></tr> <tr><td>100 Hz</td><td>0 dB</td></tr> <tr><td>300 Hz</td><td>0 dB</td></tr> <tr><td>800 Hz</td><td>0 dB</td></tr> <tr><td>1 kHz</td><td>0 dB</td></tr> <tr><td>1.5 kHz</td><td>-2 dB</td></tr> <tr><td>5 kHz</td><td>-2.5 dB</td></tr> <tr><td>10 kHz</td><td>-3.5 dB</td></tr> <tr><td>14 kHz</td><td>+4.5 dB</td></tr> </tbody> </table> </div>	Frequency	Gain (dB)	30 Hz	-7 dB	50 Hz	-2 dB	100 Hz	0 dB	300 Hz	0 dB	800 Hz	0 dB	1 kHz	0 dB	1.5 kHz	-2 dB	5 kHz	-2.5 dB	10 kHz	-3.5 dB	14 kHz	+4.5 dB
Frequency	Gain (dB)																						
30 Hz	-7 dB																						
50 Hz	-2 dB																						
100 Hz	0 dB																						
300 Hz	0 dB																						
800 Hz	0 dB																						
1 kHz	0 dB																						
1.5 kHz	-2 dB																						
5 kHz	-2.5 dB																						
10 kHz	-3.5 dB																						
14 kHz	+4.5 dB																						

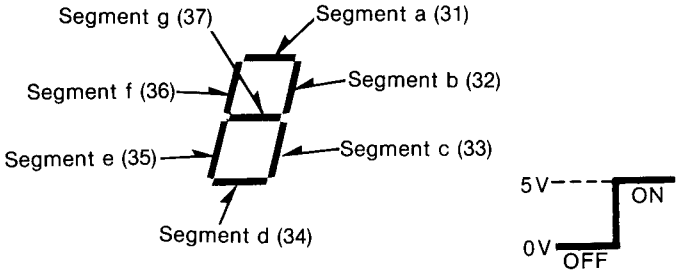
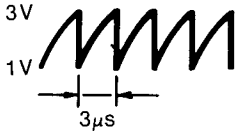


# MN1400RS: EACH TERMINAL FUNCTION AND WAVEFORM

Terminal No.	Symbol	Name	Function/operation
1.	VSS	GND	
2.	CO11	No connection	Not used.
3.	CO10	FL meter reset	 <p>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.</p>
4.	CO9	No connection	Not used.
5.	CO8	No connection	Not used.
6.	CO7	Muting	 <p>"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.</p>
7.	CO6	REC indication	 <p>"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.</p>
8.	CO5	PLAY indication	 <p>"H" level simultaneously with PLAY indication. Same as the above for TIMER PLAY and STOP AUTO RESET.</p>

Terminal No.	Symbol	Name	Function/operation
9.	CO4	PAUSE indication	<p>Pause indication</p>  <p>"H" level simultaneously with PAUSE indication.</p>
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	<p>Each switch is read in accordance with the scans of COφ to 3.</p> <p>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;</p>  <p>1.6msec With TIMER REC mode.</p> <p>HALF SW and HALL IC output are connected to Ai3. The waveforms during FF or REW operation are as follows;</p>  <p>Reel rotation pulse.</p>
15.	Ai2	Input SW read	
16.	Ai1	Input SW read	
17.	Aiφ	Input SW read	
18.	Bi3	REW key	<p>Push the switch.</p>  <p>"H" in the normal case, "L" when the switch is pushed.</p>
19.	Bi2	FF key	
20.	Bi1	PLAY key	
21.	Biφ	STOP key	
29.	SNSφ	REC key	
30.	SNS1	PAUSE key	

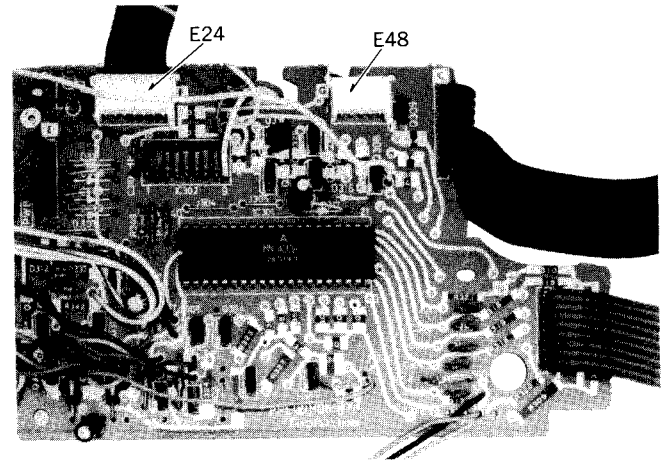
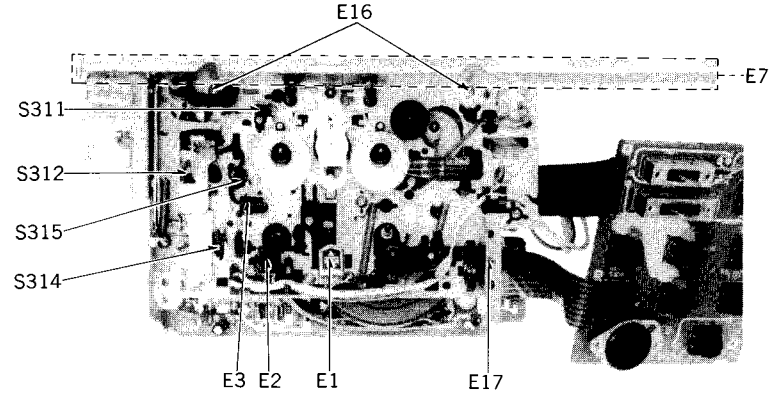
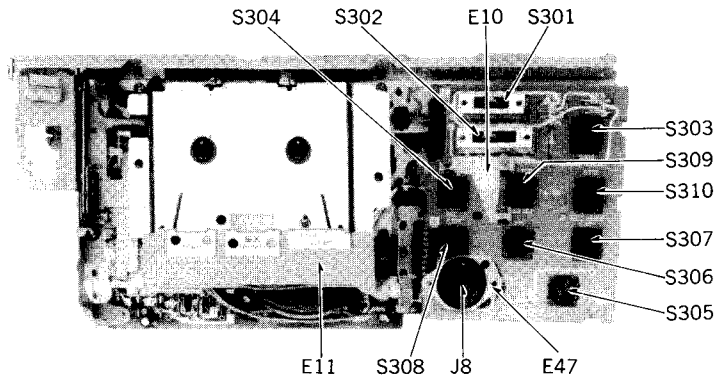
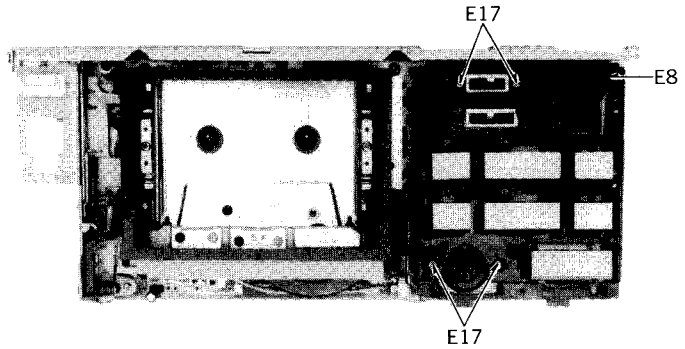
Terminal No.	Symbol	Name	Function/operation
22.	EOφ	Brake plunger	 <p>FF indication      Stop indication</p> <p>"H" during FF/REW operations.</p>
23.	EO1	Trigger plunger	 <p>Indication</p> <p>Approx 70ms.</p> <p>"H" until MODE SW is closed after the input to switch the mechanism, such as PLAY, PAUSE,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

Terminal No.	Symbol	Name	Function/operation
28.	CSLCT	CSLCT	Connected to VDD.
31.	DO $\phi$	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	 <p>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 CO<math>\phi</math> to 3 in measuring the computer's velocity; Approx. 155Hz in STOP condition.</p>

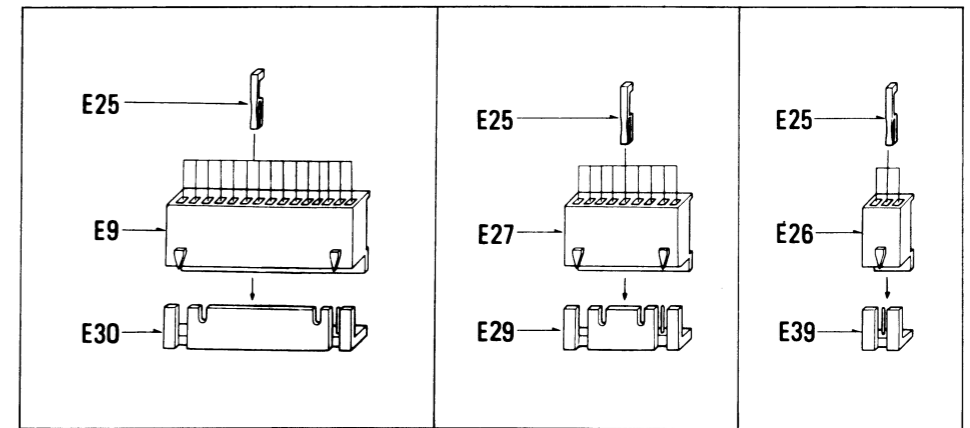
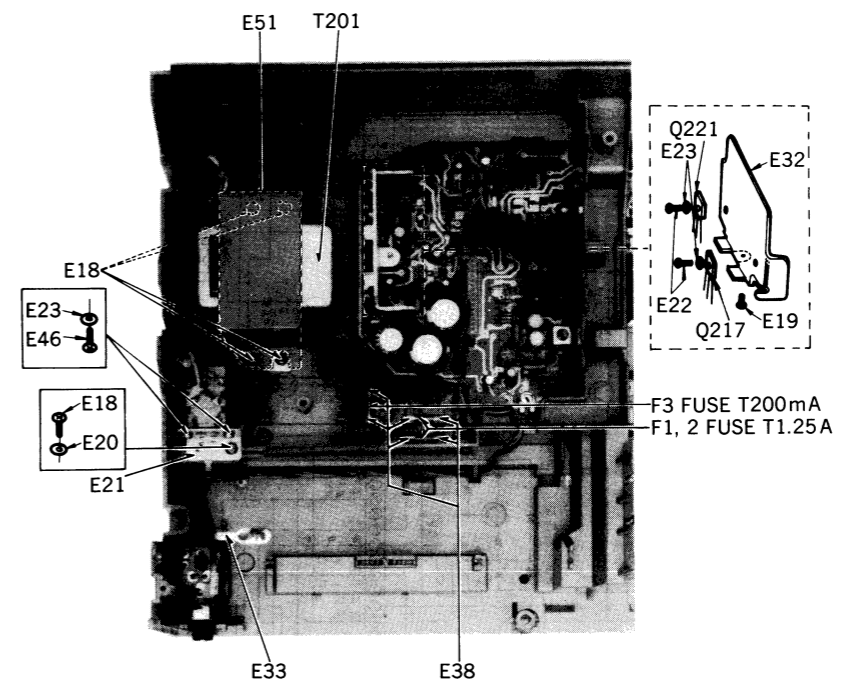
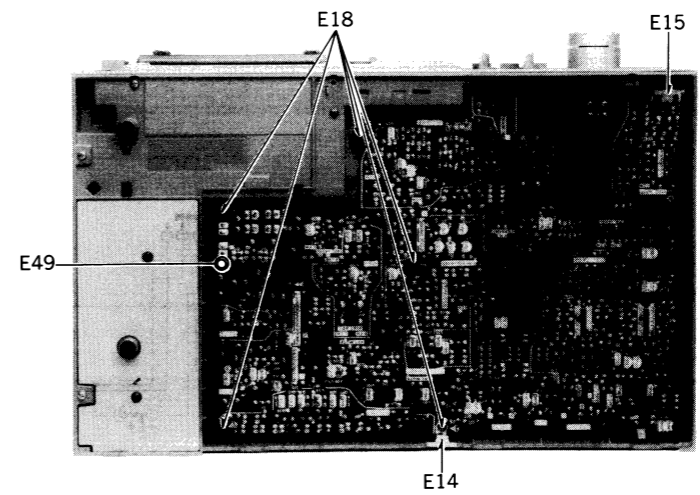
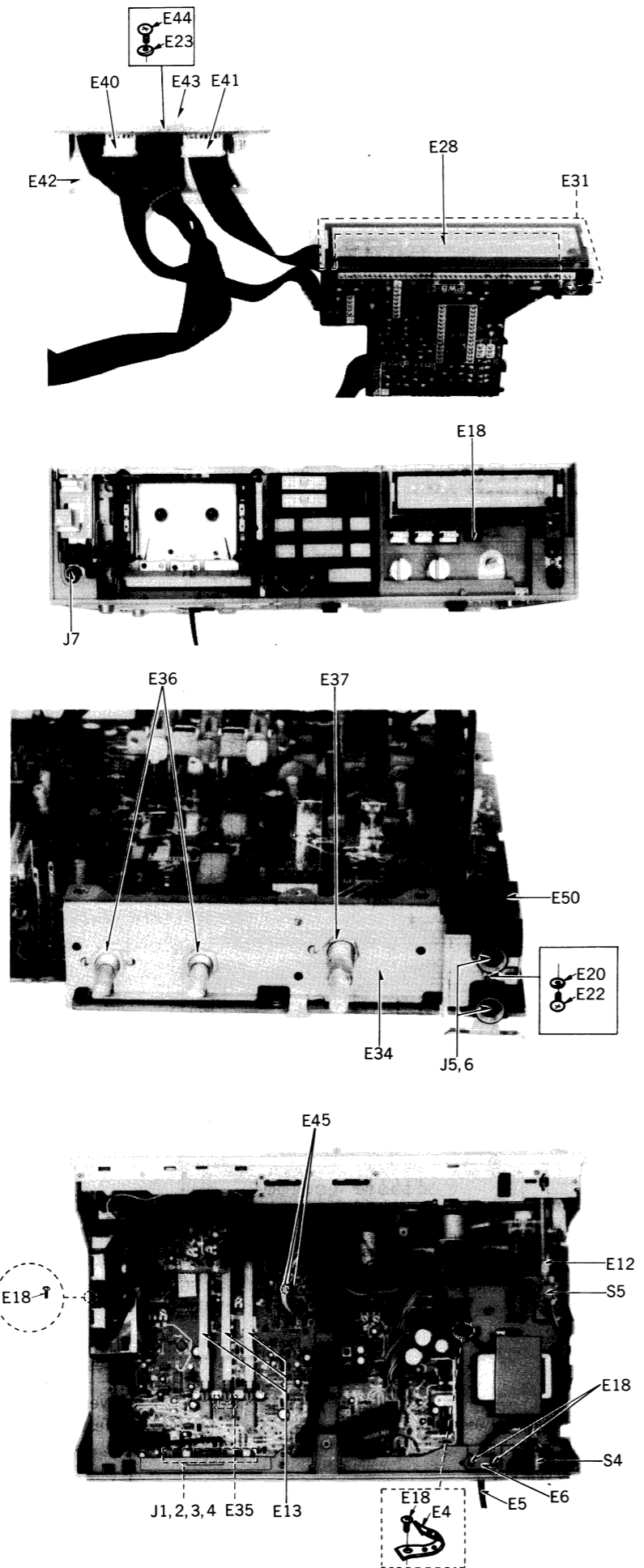
# TROUBLESHOOTING

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

# ELECTRICAL PARTS LOCATION



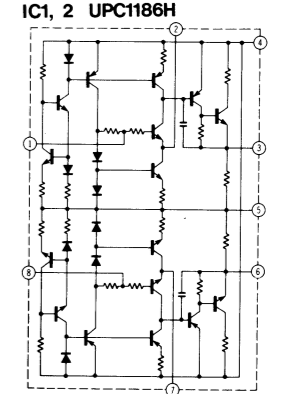
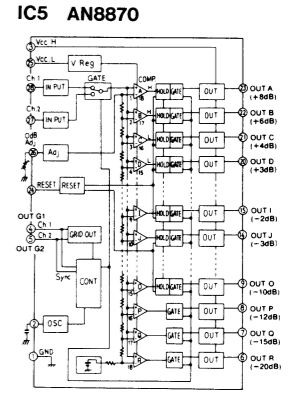
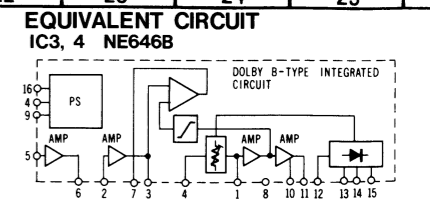
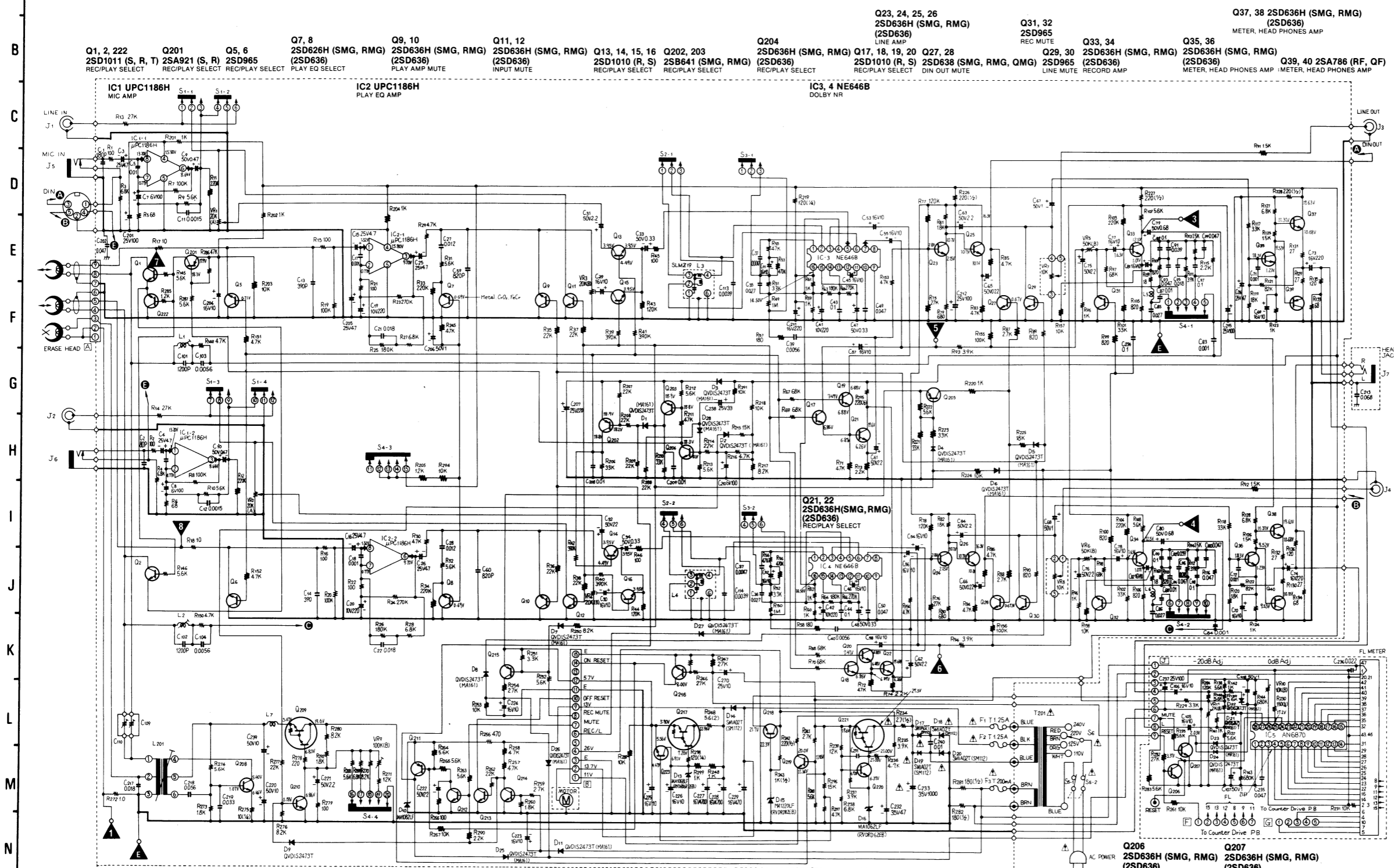
# RS-M250 RS-M250



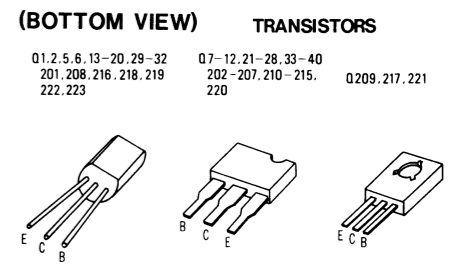
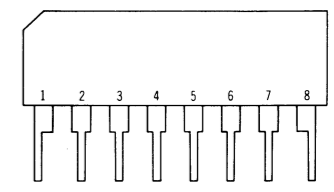
NOTE:  $\Delta$  indicates that only parts specified by the manufacturer be used for safety.

Ref. No.	Part No.	Part Name & Description
<b>ELECTRICAL PARTS</b>		
E1	QWY4123Z	Record/Playback Head
E2	QWY2138Z	Erase Head
E3	XAMQ44S200	Mechanism Pilot Lamp
E4	RME144ZA	Cord Clamper
E5	$\Delta$ SJA88	AC Power Cord
*For all European areas except United Kingdom.		
	$\Delta$ 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	QSFM001F	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	$\Delta$ 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



TERMINATION (SIDE VIEW)  
IC1, 2 UPC1186H



**SPECIFICATIONS**

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

<b>Playback S/N ratio</b> Test tape... QZZCFM	Greater than 45 dB
<b>Overall distortion</b> Test tape ... QZZCRA for Normal ... QZZCRX for CrO <sub>2</sub> ... QZZCRY for Fe-Cr ... QZZCRZ for Metal	Less than 3.5 %
<b>Overall S/N ratio</b> 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 kΩ.
- Resistors indicated thickly show printed type resistor.
- Capacity are in microfarads (μF) unless specified otherwise. P = Pico-farads.
- The mark (▼) shows test point. e.g. ▼ = test point 1.
- All voltage values shown in circuitry are under no signal condition and record mode with volume control at minimum position. For measurement, use VTVM.



CIRCUIT BOARDS MAIN AMP CIRCUIT BOARD

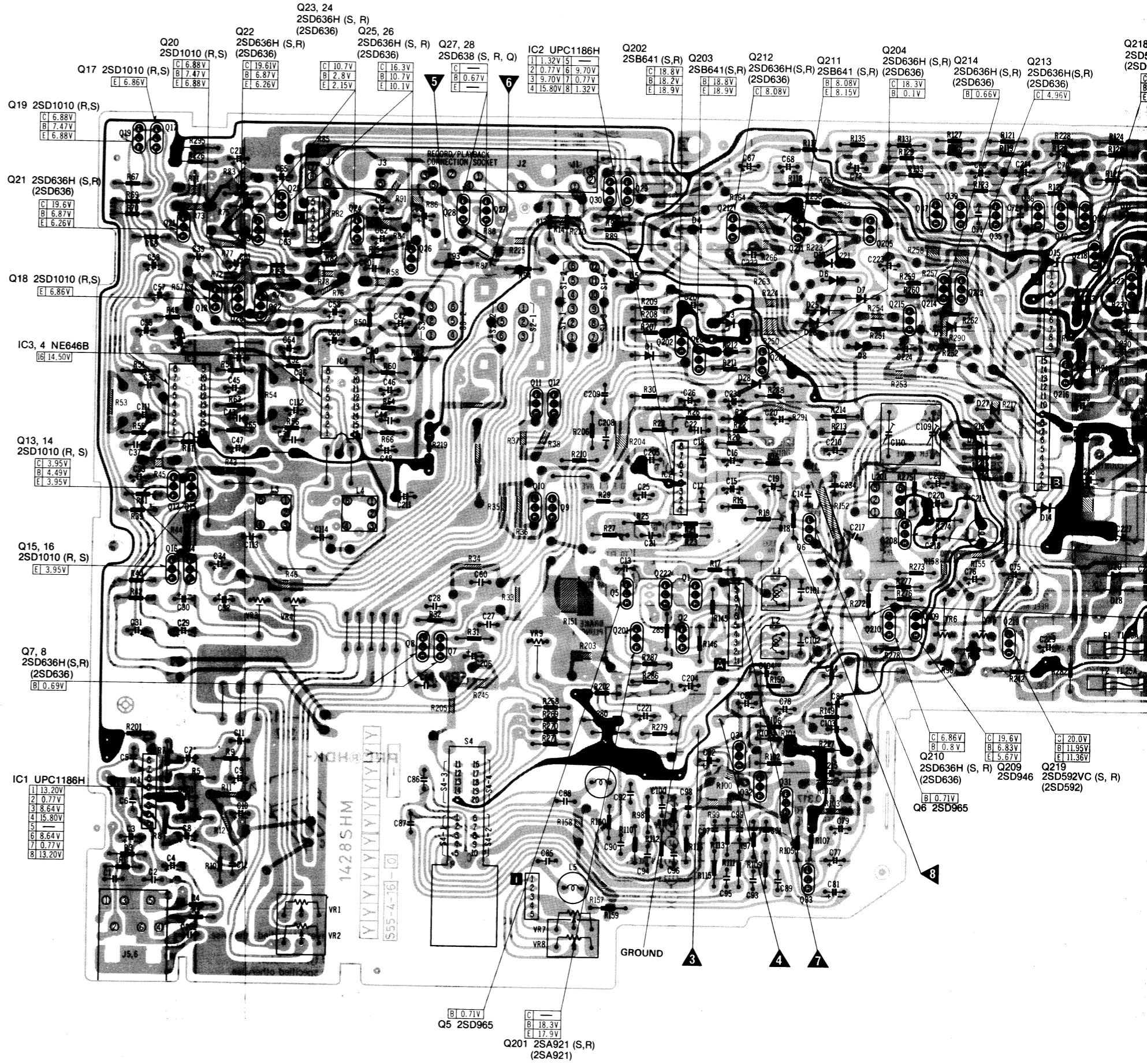
NOTES: RESISTORS ERD... Carbon ERG... Metal-oxide ERO... Metal-film ERX... Metal-film ERQ... Fuse type metallic ERC... Solid ERF... Cement

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

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

Table with columns: Ref. No., Part No., Ref. No., Part No., Ref. No., Part No., Ref. No., Part No. Includes sections for RESISTORS, VARIABLE CAPACITORS, TRANSISTORS, DIODES & RECTIFIERS, LIGHT EMITTING DIODES, INTEGRATED CIRCUITS, and CAPACITORS.

Table with columns: Ref. No., Part No., Part Name & Description. Includes sections for TRANSFORMER, COILS, SWITCHES, FUSES, and JACKS.



CIRCUIT BOARDS  
MAIN AMP CIRCUIT BOARD

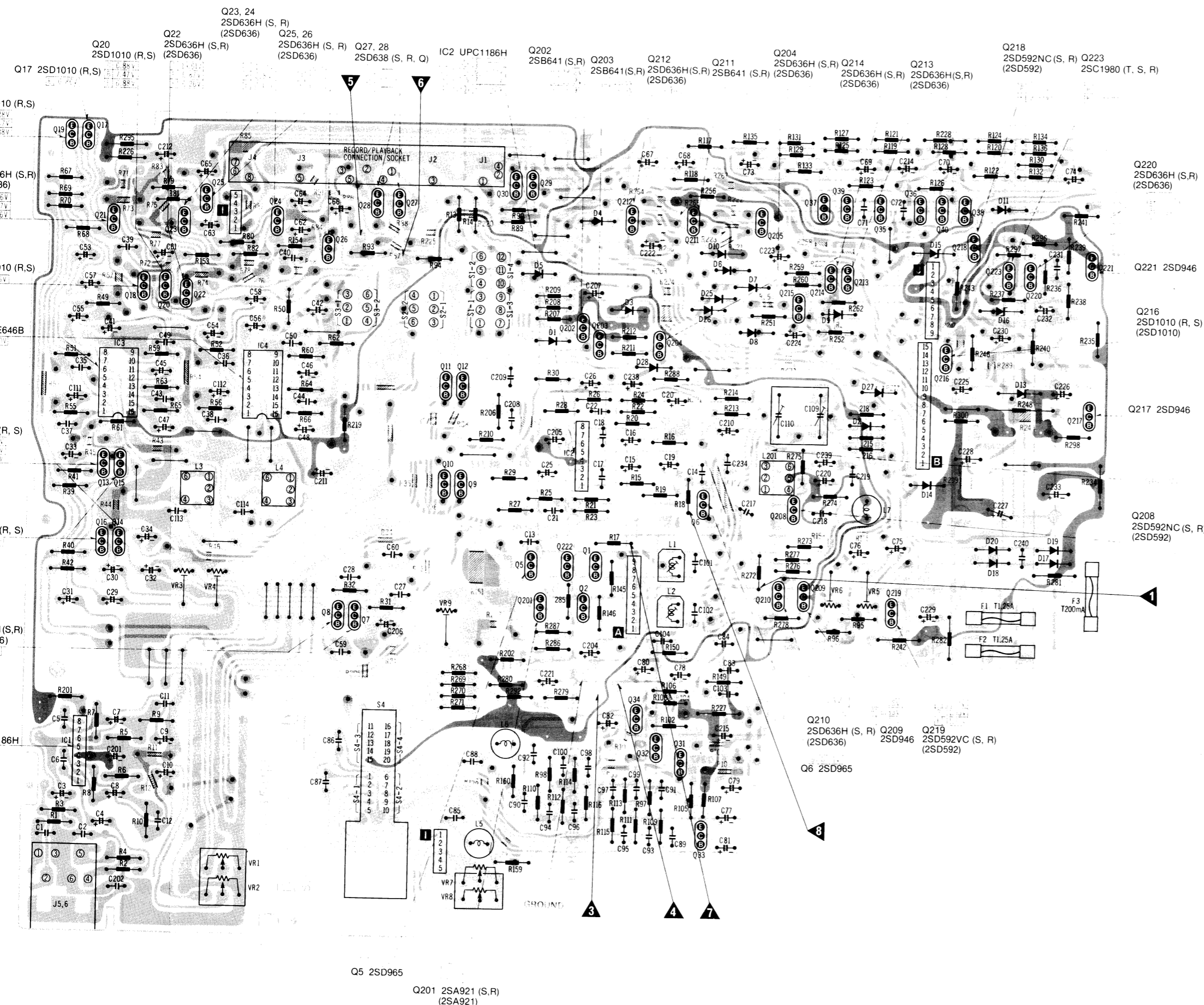
NOTES: RESISTORS  
 ERD --- Carbon  
 ERG --- Metal-oxide  
 ERO --- Metal-film  
 ERX --- Metal-film  
 ERQ --- Fuse type metallic  
 ERC --- Solid  
 ERF --- Cement  
 CAPACITORS  
 ECG --- Ceramic  
 ECK --- Ceramic  
 ECC --- Ceramic  
 ECF --- Ceramic  
 ECQM --- Polyester film  
 ECQE --- Polyester film  
 ECQF --- Polypropylene  
 ECE --- Electrolytic  
 ECEN --- Non polar electrolytic  
 ECQS --- Polystyrene  
 ECS --- Tantalum

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

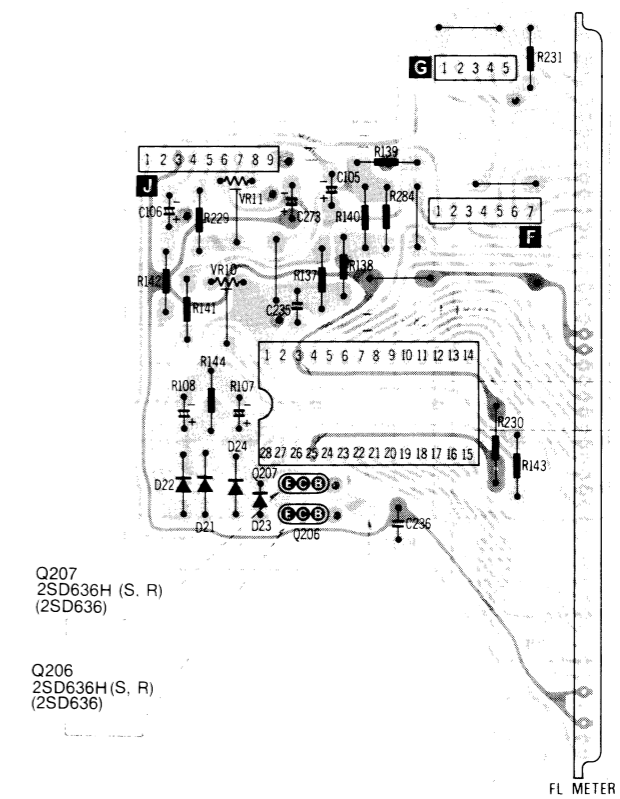
Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.				
<b>RESISTORS</b>													
R1. 2	ERD25FJ101	R237	ERD25FJ392	R238	ERD25FJ682	R239	ERD25J123	R240	ERD25FJ562	R241	ERD25FJ272		
R3. 4	ERD25FJ682	R242	ERG12ANJ221	R243	ERG12ANJ102	R244	ERD25J1273	R245	ERD25FJ101	R246	ERD25J1273	R247	ERD25FJ100
R5. 6	ERD25FJ682	R248	ERX2ANJ5R6	R249	ERD25FJ332	R250	ERD25FJ332	R251	ERD25FJ101	R252	ERD25FJ562	R253	ERD25FJ100
R7. 8	ERD25J1104	R254	ERD25FJ472	R255	ERD25FJ472	R256	ERD25FJ471	R257	ERD25FJ272	R258	ERD25J1104	R259	ERD25FJ182
R9. 10	ERD25FJ562	R260	ERD25J182	R261	ERD25J182	R262	ERD25J1273	R263	ERD25FJ682	R264	ERD25FJ472	R265	ERD25FJ682
R13. 14	ERD25J1273	R266	ERD25J223	R267	ERD25FJ682	R268	ERD25FJ682	R269	ERD25FJ682	R270	ERD25J153	R271	ERD25J1273
R15. 16	ERD25FJ101	R272	ERD25J1100	R273	ERD25FJ182	R274	ERD25FJ562	R275	ERQ14AJ100P	R276	ERD25FJ822	R277	ERD25J1273
R17. 18	ERD25FJ100	R278	ERD25FJ221	R279	ERD25FJ101	R280	ERD25FJ822	R281. 282	Δ ERG12ANJ181	R284	ERD25J124	R285	ERD25FJ122
R19. 20	ERD25J101	R286	ERD25FJ122	R287	ERD25FJ473	R288	ERD25FJ562	R289. 90	ERD25FJ821	R290	ERD25FJ392	R291	ERD25FJ102
R21. 22	ERD25FJ104	R292	ERD25J153	R293	ERD25FJ102	R294	ERD25FJ821	R295. 96	ERD25FJ392	R297. 98	ERD25FJ683	R102	ERD25J1333
R23. 24	ERD25J1274	R296	ERD25J153	R297	ERD25FJ472	R298	ERD25A1J21P	R105. 106	ERD25FJ821	R107. 108	ERD25FJ562	R109. 110	ERD25J100
R25. 26	ERD25J1104	R300	ERD25FJ182	R301	ERD25J153	R302	ERD25FJ102	R111. 112	ERD25FJ392	R113. 114	ERD25J153	R115. 116	ERD25J222
R27. 28	ERD25FJ682	R303	ERD25FJ182	R304	ERD25J183	R305	ERD25J183	R117. 118	ERD25J333	R119. 120	ERD25J183	R121. 122	ERD25J823
R29. 30	ERD25FJ472	R306	ERD25J182	R307	ERD25J182	R308	ERD25J182	R123. 124	ERD25J102	R125. 126	ERD25FJ152	R127. 128	ERD25FJ682
R31. 32	ERD25FJ562	R309	ERD25F180	R310	ERD25FJ102	R311	ERD25F102	R129. 130. 131. 132	ERD25FJ270	R133. 134	ERD25FJ680	R135. 136	ERD25FJ121
R39. 40. 41. 42	ERD25J1394	R312	ERD25FJ102	R313	ERD25F102	R314	ERD25F102	R137. 138. 139. 140	ERD25FJ562	R141. 142	ERD25FJ102	R143. 144	ERD25J182
R49. 50	ERD25J105	R315	ERD25FJ102	R316	ERD25F102	R317	ERD25F102	R145. 146	ERD25FJ562	R149. 150	ERD25FJ472	R153. 154	ERD25FJ472
R51. 52	ERD25FJ332	R318	ERD25FJ102	R319	ERD25F102	R320	ERD25F102	R155. 156	ERD25FJ180	R201. 202	ERD25J102	R206	ERD25J1333
R55. 56	ERD25J1473	R321	ERD25FJ102	R322	ERD25F102	R323	ERD25F102	R159. 160	ERD25FJ180	R207. 208. 209	ERD25J223	R210	ERD25J333
R59. 60. 61. 62	ERD25FJ102	R324	ERD25FJ102	R325	ERD25F102	R326	ERD25F102	R161. 162	ERD25J152	R214	ERD25J102	R215	ERD25J153
R63. 64	ERD25J1104	R327	ERD25FJ102	R328	ERD25F102	R329	ERD25F102	R171. 172	ERD25FJ102	R219	ERD25J100	R220	ERD25J100
R65. 66	ERD25J1274	R330	ERD25FJ102	R331	ERD25F102	R332	ERD25F102	R175. 176	ERD25FJ102	R221	ERD25J100	R222	ERD25J100
R67. 68. 69. 70	ERD25FJ683	R333	ERD25FJ102	R334	ERD25F102	R335	ERD25F102	R181. 182	ERD25FJ102	R223	ERD25J100	R224	ERD25J100
R79. 80	ERD25FJ681	R336	ERD25FJ102	R337	ERD25F102	R338	ERD25F102	R185. 186	ERD25FJ102	R225	ERD25J100	R226	ERD25J100
R81. 82	ERD25FJ182	R339	ERD25FJ102	R340	ERD25F102	R341	ERD25F102	R189. 190	ERD25FJ102	R227	ERD25J100	R228	ERD25J100
R89. 90	ERD25FJ821	R342	ERD25FJ102	R343	ERD25F102	R344	ERD25F102	R193. 194	ERD25FJ102	R229	ERD25J100	R230	ERD25J100
R93. 94	ERD25FJ392	R345	ERD25FJ102	R346	ERD25F102	R347	ERD25F102	R197. 198	ERD25FJ102	R231	ERD25J100	R232	ERD25J100
R95. 96	ERD25FJ102	R348	ERD25FJ102	R349	ERD25F102	R350	ERD25F102	R199. 98	ERD25FJ683	R233	ERD25J100	R234	ERD25J100
R97. 98	ERD25FJ683	R351	ERD25FJ102	R352	ERD25F102	R353	ERD25F102	R201. 202	ERD25J102	R235	ERD25J100	R236	ERD25FJ472
R102	ERD25J1333	R354	ERD25FJ102	R355	ERD25F102	R356	ERD25F102	R206	ERD25J1333	R237	ERD25J100	R238	ERD25J100
R105. 106	ERD25FJ821	R356. 357. 358. 359. 360. 361. 362. 363	ERD10TJ473	R357	ERD25F102	R358	ERD25F102	R207. 208. 209	ERD25J223	R239	ERD25J100	R240	ERD25J100
R107. 108	ERD25FJ562	R361	ERD10TJ473	R359	ERD25F102	R360	ERD25F102	R214	ERD25J102	R241	ERD25J100	R242	ERD25J100
R109. 110	ERD25J100	R362. 363	ERD10TJ473	R361	ERD25F102	R362	ERD25F102	R219. 130. 131. 132	ERD25FJ270	R243	ERD25J100	R244	ERD25J100
R111. 112	ERD25FJ392	R401. 402. 403. 404. 405. 406. 407. 408. 409. 410. 411. 412. 413. 414. 415. 416. 417. 418. 419. 420. 421. 422. 423. 424	ERD25FJ270	R363	ERD25F102	R364	ERD25F102	R133. 134	ERD25FJ680	R245	ERD25J100	R246	ERD25J100
R113. 114	ERD25FJ392	R402	ERD25FJ270	R365	ERD25F102	R366	ERD25F102	R135. 136	ERD25FJ121	R247	ERD25J100	R248	ERD25J100
R115. 116	ERD25FJ222	R403	ERD25FJ270	R367	ERD25F102	R368	ERD25F102	R137. 138. 139. 140	ERD25FJ562	R249	ERD25J100	R250	ERD25J100
R117. 118	ERD25J333	R404	ERD25FJ270	R369	ERD25F102	R370	ERD25F102	R145. 146	ERD25FJ562	R251	ERD25J100	R252	ERD25J100
R119. 120	ERD25J183	R405	ERD25FJ270	R371	ERD25F102	R372	ERD25F102	R149. 150	ERD25FJ472	R253	ERD25J100	R254	ERD25J100
R121. 122	ERD25J823	R406	ERD25FJ270	R373	ERD25F102	R374	ERD25F102	R153. 154	ERD25FJ472	R255	ERD25J100	R256	ERD25J100
R123. 124	ERD25J102	R407	ERD25FJ270	R375	ERD25F102	R376	ERD25F102	R155. 156	ERD25FJ180	R257	ERD25J100	R258	ERD25J100
R125. 126	ERD25FJ152	R408	ERD25FJ270	R377	ERD25F102	R378	ERD25F102	R159. 160	ERD25FJ180	R259	ERD25J100	R260	ERD25J100
R127. 128	ERD25FJ682	R409	ERD25FJ270	R379	ERD25F102	R380	ERD25F102	R161. 162	ERD25J152	R261	ERD25J100	R262	ERD25J100
R129. 130. 131. 132	ERD25FJ270	R410	ERD25FJ270	R381	ERD25F102	R382	ERD25F102	R165. 166	ERD25J1274	R263	ERD25J100	R264	ERD25J100
R133. 134	ERD25FJ680	R411	ERD25FJ270	R383	ERD25F102	R384	ERD25F102	R167. 68. 69. 70	ERD25FJ683	R265	ERD25J100	R266	ERD25J100
R135. 136	ERD25FJ121	R412	ERD25FJ270	R385	ERD25F102	R386	ERD25F102	R175. 176	ERD25FJ102	R267	ERD25J100	R268	ERD25J100
R137. 138. 139. 140	ERD25FJ562	R413	ERD25FJ270	R387	ERD25F102	R388	ERD25F102	R181. 182	ERD25FJ102	R269	ERD25J100	R270	ERD25J100
R141. 142	ERD25FJ102	R414	ERD25FJ270	R389	ERD25F102	R390	ERD25F102	R185. 186	ERD25FJ102	R271	ERD25J100	R272	ERD25J100
R143. 144	ERD25J182	R415	ERD25FJ270	R391	ERD25F102	R392	ERD25F102	R189. 190	ERD25FJ102	R273	ERD25J100	R274	ERD25J100
R145. 146	ERD25FJ562	R416	ERD25FJ270	R393	ERD25F102	R394	ERD25F102	R193. 194	ERD25FJ102	R275	ERD25J100	R276	ERD25J100
R149. 150	ERD25FJ472	R417	ERD25FJ270	R395	ERD25F102	R396	ERD25F102	R197. 198	ERD25FJ683	R277	ERD25J100	R278	ERD25J100
R153. 154	ERD25FJ472	R418	ERD25FJ270	R397	ERD25F102	R398	ERD25F102	R199. 98	ERD25FJ683	R279	ERD25J100	R280	ERD25J100
R155. 156	ERD25FJ180	R419	ERD25FJ270	R399	ERD25F102	R400	ERD25F102	R201. 202	ERD25J102	R281	ERD25J100	R282	ERD25J100
R201. 202	ERD25J102	R420	ERD25FJ270	R401	ERD25F102	R402	ERD25F102	R206	ERD25J1333	R283	ERD25J100	R284	ERD25J100
R206	ERD25J1333	R421	ERD25FJ270	R403	ERD25F102	R404	ERD25F102	R207. 208. 209	ERD25J223	R285	ERD25J100	R286	ERD25J100
R207. 208. 209	ERD25J223	R422	ERD25FJ270	R405	ERD25F102	R406	ERD25F102	R214	ERD25J102	R287	ERD25J100	R288	ERD25J100
R210	ERD25J333	R423	ERD25FJ270	R407	ERD25F102	R408	ERD25F102	R219. 130. 131. 132	ERD25FJ270	R289	ERD25J100	R290	ERD25J100
R211	ERD25J473	R424	ERD25FJ270	R409	ERD25F102	R410	ERD25F102	R219. 130. 131. 132	ERD25FJ270	R291	ERD25J100	R292	ERD25J100
R212. 213	ERD25FJ562	R425	ERD25FJ270	R411	ERD25F102	R412	ERD25F102	R219. 130. 131. 132	ERD25FJ270	R293	ERD25J100	R294	ERD25J100
R214	ERD25J223	R426	ERD25FJ270	R413	ERD25F102	R414	ERD25F102	R219. 130. 131. 132	ERD25FJ270	R295	ERD25J100	R296	ERD25J100
R215	ERD25J153	R427	ERD25FJ270	R415	ERD25F102	R416	ERD25F102	R219. 130. 131. 132	ERD25FJ270	R297	ERD25J100	R298	ERD25J100
R216	ERD25FJ472	R428	ERD25FJ270	R417	ERD25F102	R418	ERD25F102	R219. 130. 131. 132	ERD25FJ270	R299	ERD25J100	R300	ERD25J100
R218	ERD25FJ103	R429	ERD25FJ270	R419	ERD25F102	R420	ERD25F102	R219. 130. 131. 132	ERD25FJ270	R301	ERD25J100	R302	ERD25J100
R219	ERQ14AJ121P	R430	ERD25FJ270	R421	ERD25F102	R422	ERD25F102	R219. 130. 131. 132	ERD25FJ270	R303	ERD25J100	R304	ERD25J100
R226. 227. 228	ERG12ANJ221	R431	ERD25FJ270	R423	ERD25F102	R424	ERD25F102	R219. 130. 131. 132	ERD25FJ270	R305	ERD25J100	R306	ERD25J100
R229	ERD25FJ332	R432	ERD25FJ270	R425	ERD25F102	R426	ERD25F102	R219. 130. 131. 132	ERD25FJ270	R307	ERD25J100	R308	ERD25J100
R230	ERQ14AJ151P	R433	ERD25FJ270	R427	ERD25F102	R428	ERD25F102	R219. 130. 131. 132	ERD25FJ270	R309	ERD25J100	R310	

# CIRCUIT BOARDS

## AMP CIRCUIT BOARD



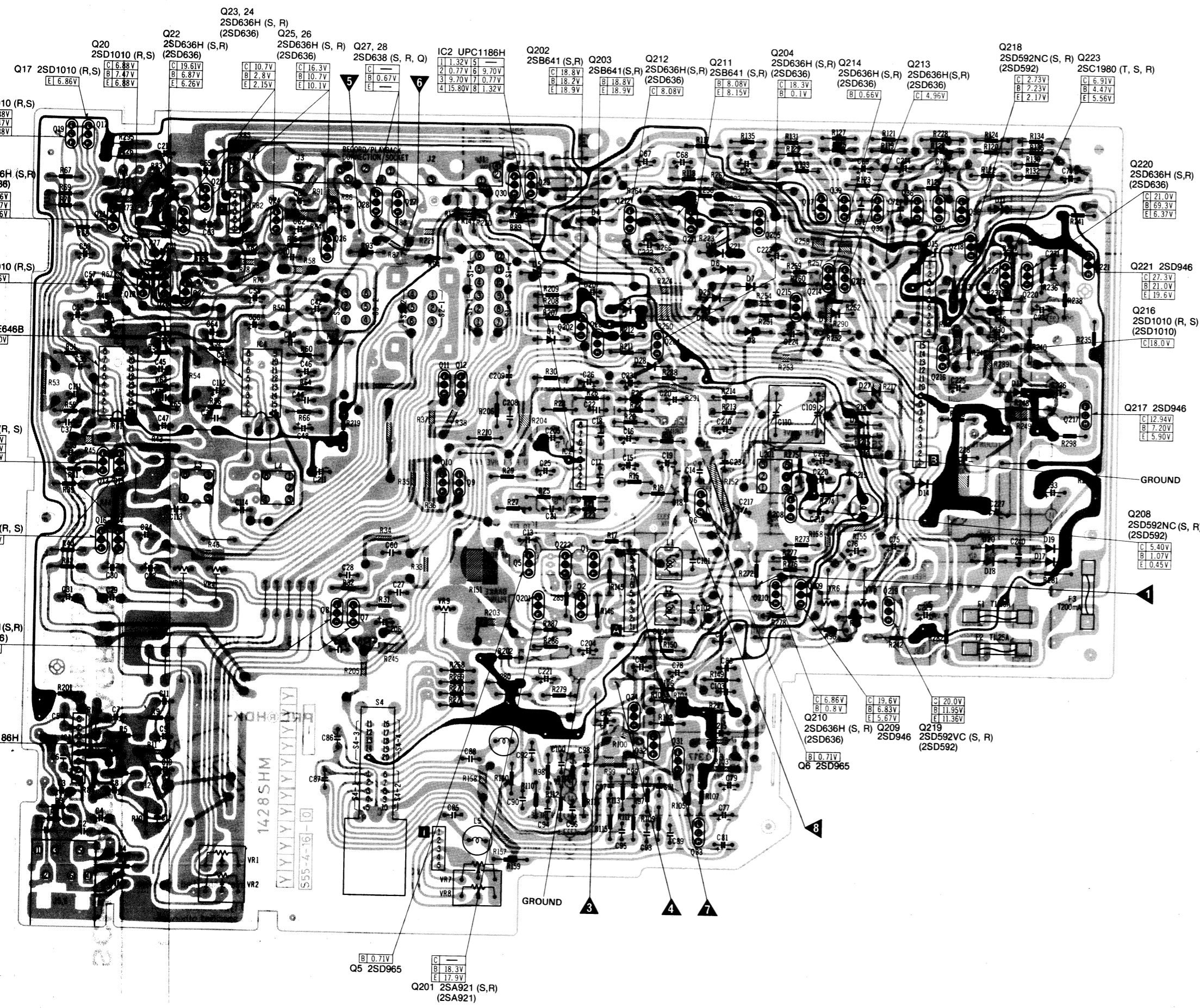
## FL METER CIRCUIT BOARD



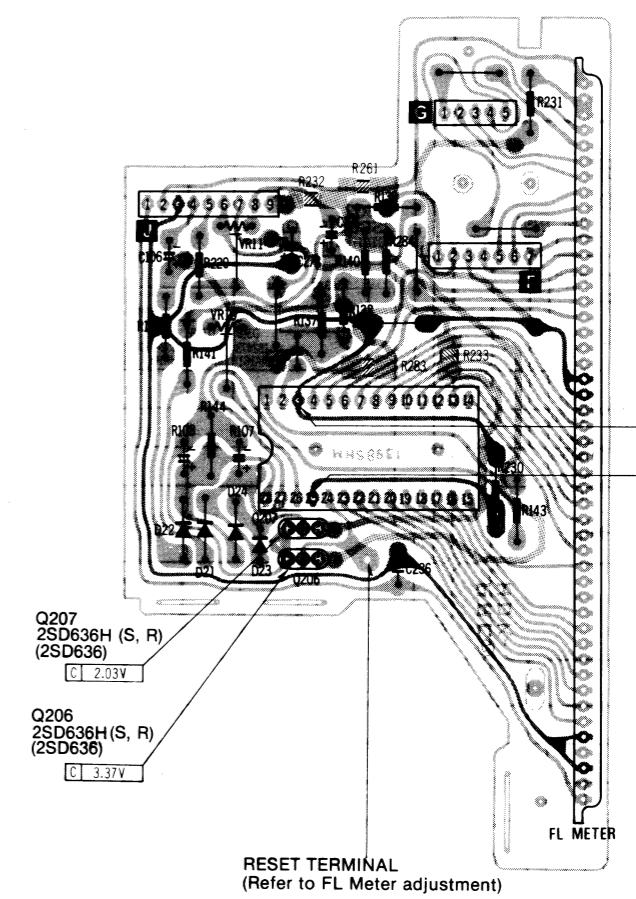
- NOTES:**
- The circuit shown in [shaded area] on the conductor is +B (bias) circuit.
  - The circuit shown in [dotted area] on the conductor indicates printed circuit, which is included printed type resistors.
  - The circuit shown in [dashed area] on the conductor indicates printed circuit on the 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 [circled numbers] are DC voltage between the ground and electrical parts.





# CIRCUIT BOARDS

## AMP CIRCUIT BOARD

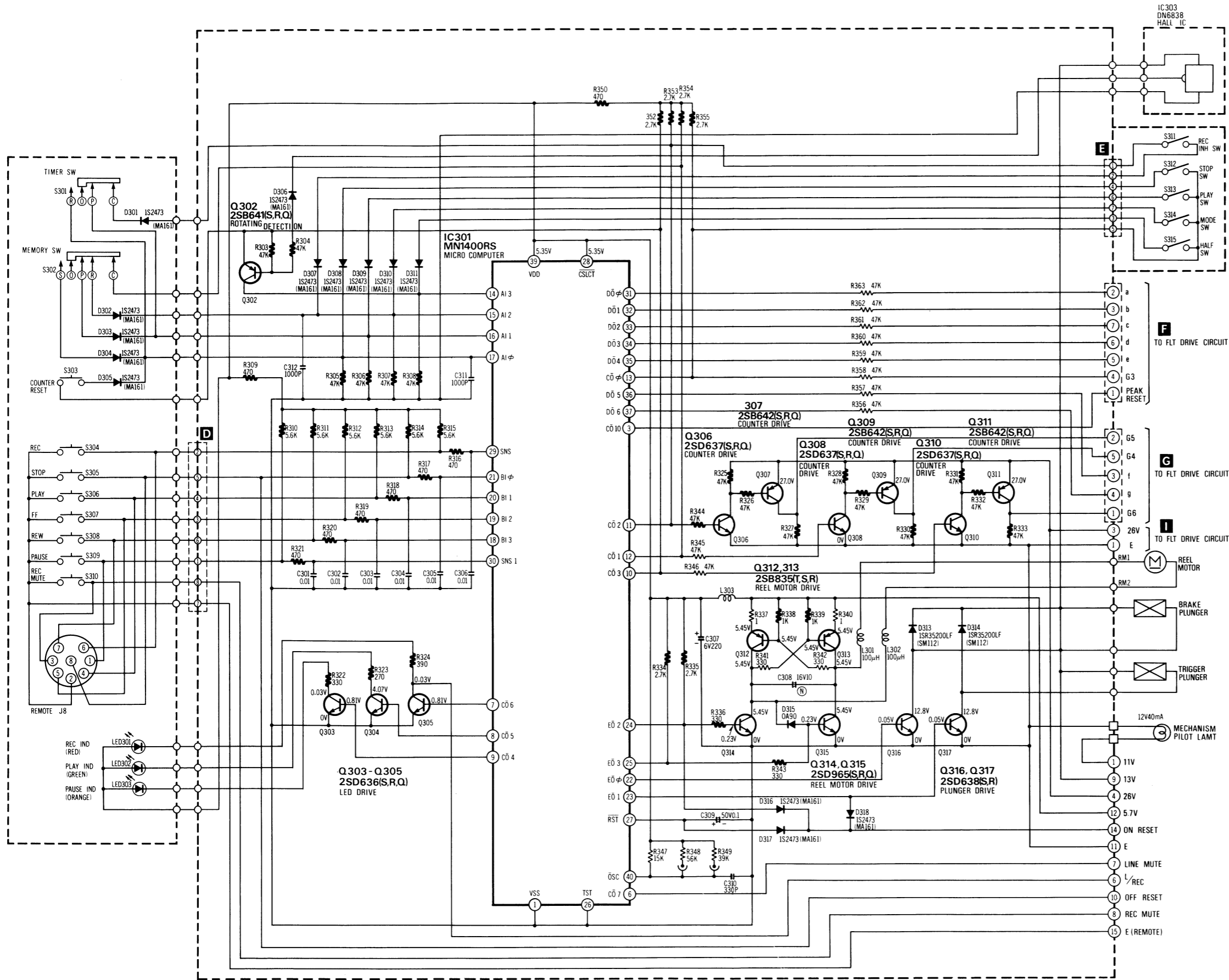


## FL METER CIRCUIT BOARD

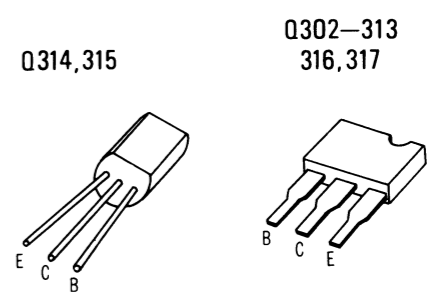


- NOTES:**
- The circuit shown in  on the conductor is +B (bias) circuit.
  - The circuit shown in  on the conductor indicates printed circuit, which is included printed type resistors.
  - The circuit shown in  on the conductor indicates printed circuit on the back side of the printed circuit board.
  - 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



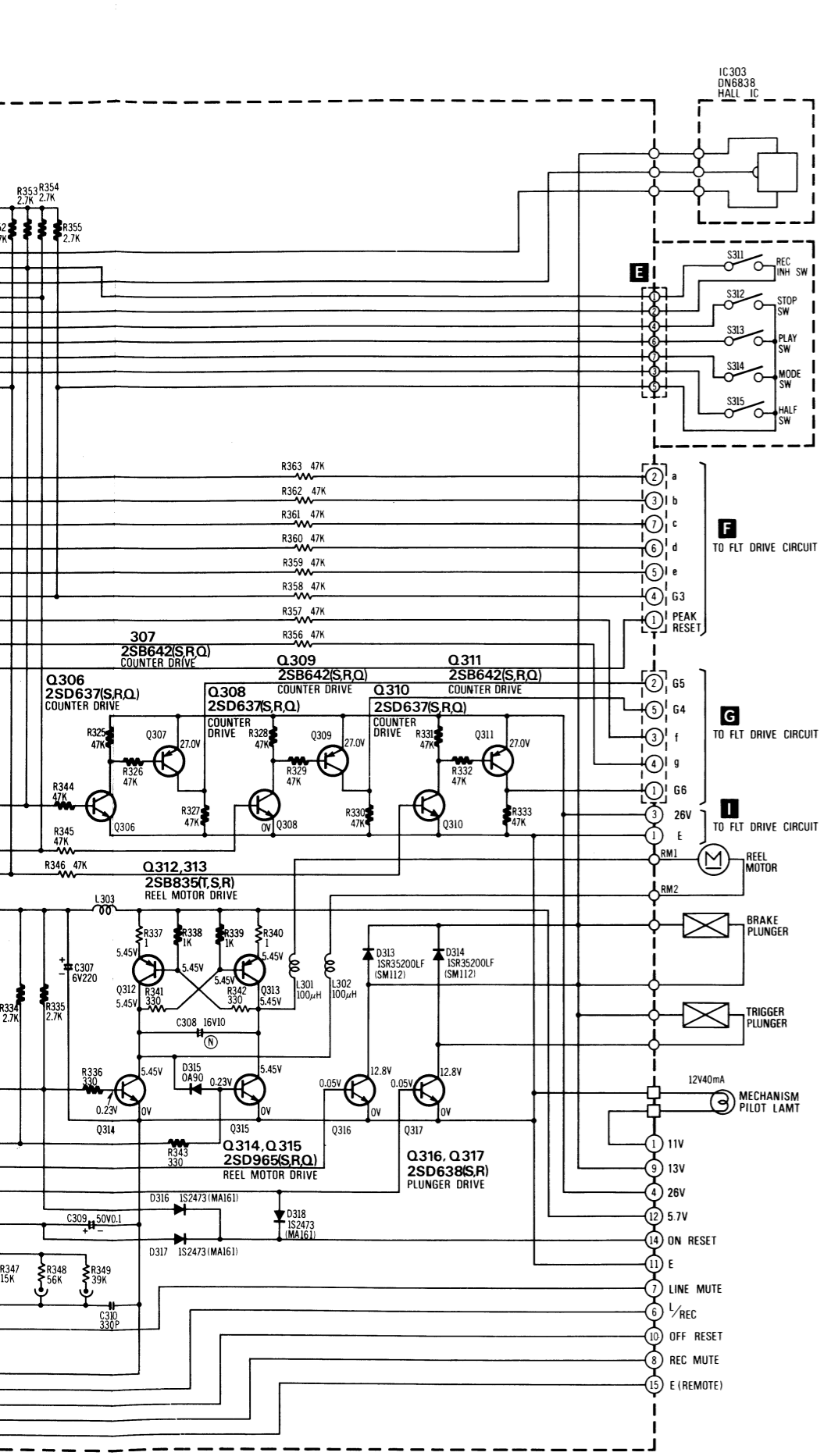
### TERMINATIONS (SIDE VIEW)



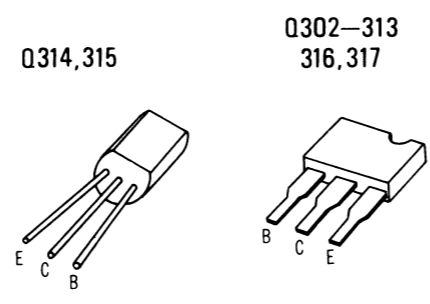
- NOTES:**
- Resistance are in ohms ( $\Omega$ ), 1/4 watt unless specified otherwise. K=1,000  $\Omega$ , M=1,000 k $\Omega$ .
  - Capacity are in microfarads ( $\mu$ F) unless specified otherwise. P=Pico-farads.
  - All voltage values shown in circuitry are under record mode.

# SCHEMATIC DIAGRAM DIGITAL TAPE COUNTER DRIVE SECTION

**F** From Meter. Counter Circuit Board  
**G** From Meter. Counter Circuit Board



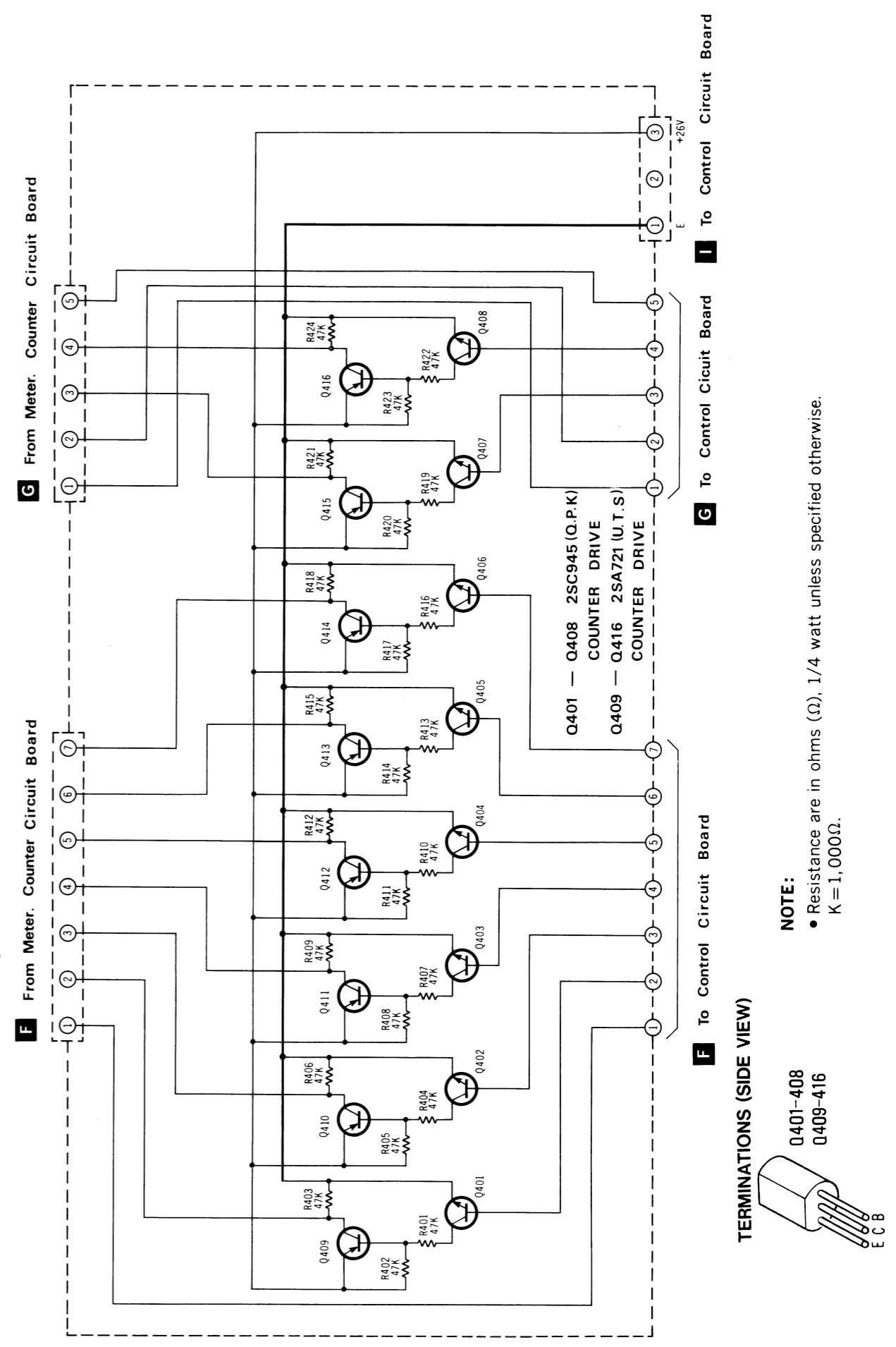
TERMINATIONS (SIDE VIEW)



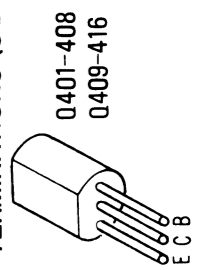
**NOTES:**

- Resistance are in ohms ( $\Omega$ ), 1/4 watt unless specified otherwise. K = 1,000 $\Omega$ , M = 1,000k $\Omega$ .
- Capacity are in microfarads ( $\mu$ F) unless specified otherwise. P = Pico-farads.
- All voltage values shown in circuitry are under record mode.

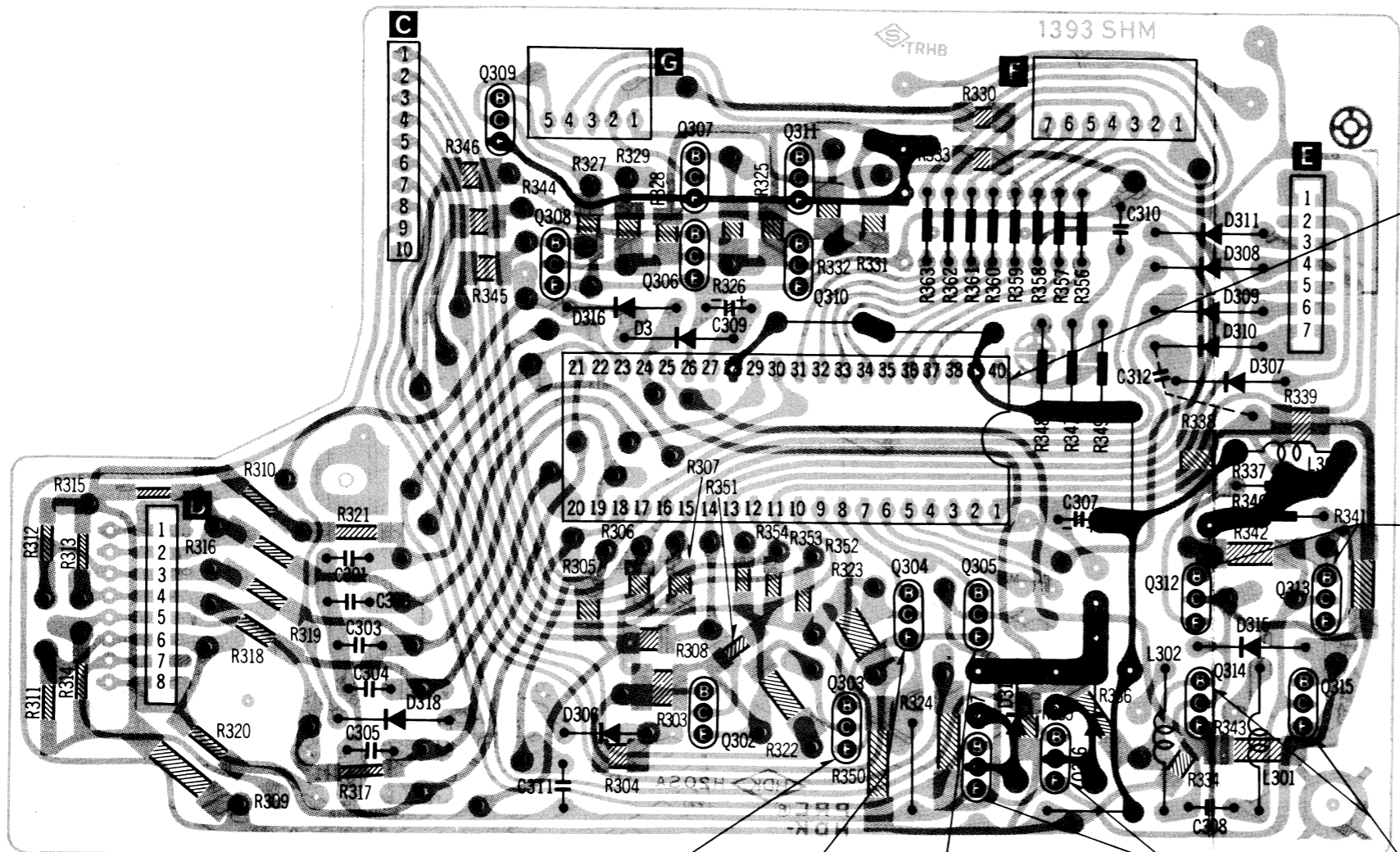
**SCHEMATIC DIAGRAM**  
DIGITAL TAPE COUNTER DRIVE SECTION



TERMINATIONS (SIDE VIEW)



# CIRCUIT BOARD MAIN CONTROL CIRCUIT BOARD



IC301  
MN1400RS

1	0V
6	0.02V
18-21	5.35V
26	0V
27	5.1V
28-30	5.35V
39	5.35V

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

C	5.45V
B	5.45V
E	5.45V

Q303  
2SD636(S, R, Q)

C	0.03V
B	0.81V
E	0V

Q304  
2SD636(S, R, Q)

C	4.07V
B	0.02V
E	0V

Q305  
2SD636(S, R, Q)

C	0.03V
B	0.81V
E	0V

Q316, 317  
2SD638 (S, R)

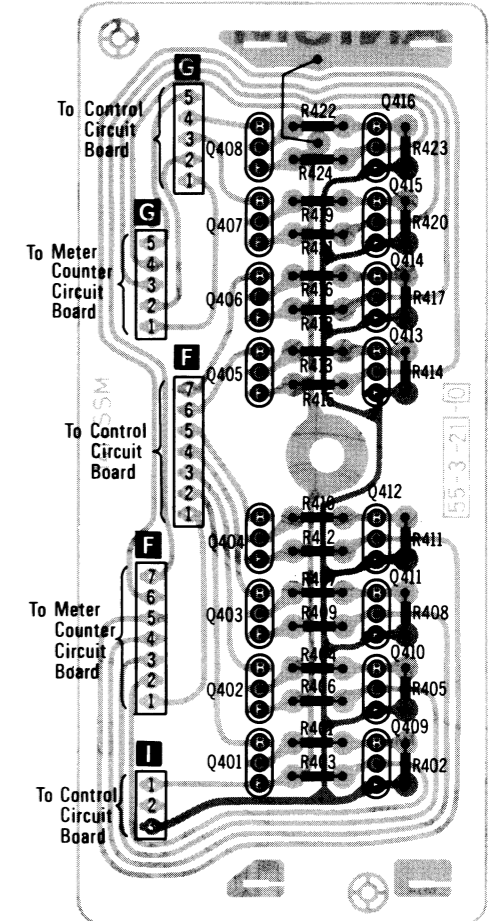
C	12.8V
B	0.05V
E	0V

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

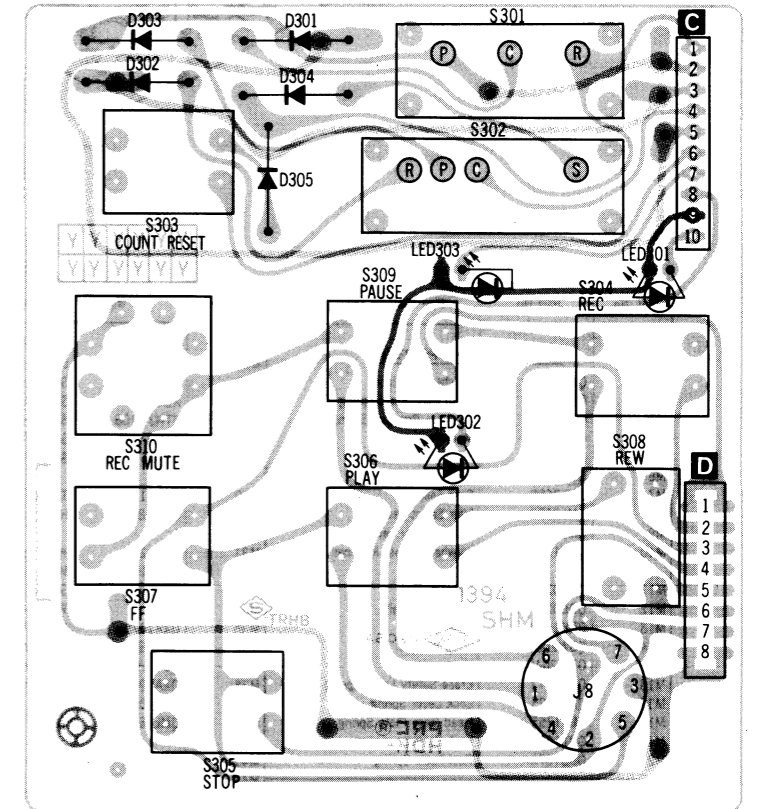
C	5.45V
B	0.23V
E	0V

- 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.

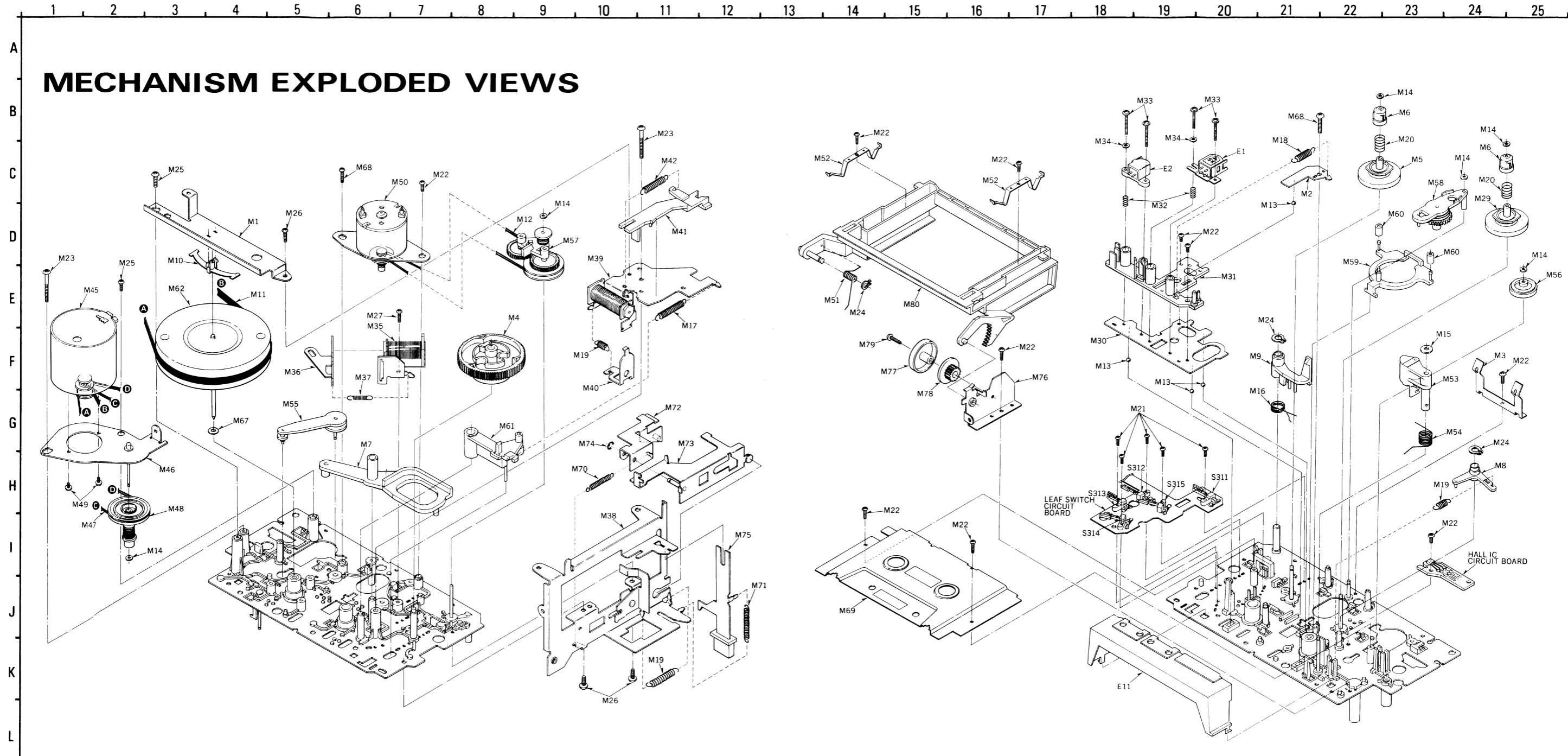
# DIGITAL TAPE COUNTER DRIVE CIRCUIT BOARD



# 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
<b>MECHANICAL PARTS</b>											
M1	QMA3951	Flywheel Retainer	M21	XTN2+6B	Screw $\phi 2 \times 6$	M45	QXU0194	Capstan Motor Assembly	M71	QBT1566	Intermediate Lever Spring
M2	QBP1894	Head Base Plate Spring	M22	XTN26+6B	Screw $\phi 2.6 \times 6$	M46	QXA1077	Motor Retainer Assembly	M72	QXL1414	Lock Lever-A
M3	QBP1895	Cassette Pressure Spring	M23	XTN3+24B	Screw $\phi 3 \times 24$	M47	QDB0286	Takeup Belt	M73	QXL1415	Lock Lever-B
M4	QDG1214	Main Gear	M24	XUB4FT	Stop Ring	M48	QXP0621	Takeup Pulley	M74	XUC25FT	Stop Ring
M5	QDR1146	Supply Reel Table	M25	XTN3+10B	Screw $\phi 3 \times 10$	M49	XSN26+3	Screw $\phi 2.6 \times 3$	M75	QXR0678	Eject Button Assembly
M6	QMB1336	Reel Table Hub	M26	XTN3+6B	Screw $\phi 3 \times 6$	M50	QXU0193	Reel Motor Assembly		QXR0693	"Silver Type"
M7	QML3655	Cam Follower	M27	XTN26+8B	Screw $\phi 2.6 \times 8$	M51	QBN1781	Eject Spring		QMA3981	"Black Type"
M8	QML3660	Idler Select Lever				M52	QBP1771	Holder Spring	M76		Cassette Holder Angle
M9	QML3661	Erase Safety Lever	M29	QXD0120	Takeup Reel Table Assembly	M53	QXL1406	Pressure Roller Lever	M77	QKJ0419	Dumper Gear Holder
M10	QMZ1253	Flywheel Thrust Retainer	M30	QMK1867	Head Base Plate	M54	QBN1771	Pressure Roller Spring	M78	QDG1219	Dumper Gear
M11	QDB0291	Capstan Belt	M31	QMZ1252	Head Spacer	M55	QXL1423	Idler Lever Assembly	M79	XTN26+8B	Screw $\phi 2.6 \times 8$
M12	QDB0287	Reel Motor Belt	M32	QBC1103	Head Spring	M56	QXI0116	Takeup Idler	M80	QKF2084H	Cassette Holder
M13	QDK1012	Steel Ball	M33	XSN2+16	Screw $\phi 2 \times 16$	M57	QXL1408	Swing Gear Lever Assembly			
M14	QBW2008	Snap Washer	M34	XWG2	Washer	M58	QXL1409	Fast Wind Arm Assembly			
M15	QBW2046	"	M35	QXA1075	Brake Plunger Assembly	M59	QML3659	Brake Lever			
M16	QBN1772	Erase Safety Lever Spring	M36	QML3650	Plunger Lever	M60	QBG1132	Brake Rubber			
M17	QBT1725	Lock Lever Spring	M37	QBT1199	Plunger Spring	M61	QXL1411	Lock Lever Assembly			
M18	QBT1755	Head Base Plate Spring	M38	QXA1073	Side Angle Assembly	M62	QXF0172	Flywheel Assembly			
M19	QBT1605	Lock Spring	M39	QXA1076	Trigger Plunger Assembly	M67	QBW2049	Washer			
M20	QBC1373	Reel Table Spring	M40	QML3651	Trigger Plunger Lever	M68	XTN26+10B	Screw $\phi 2.6 \times 10$			
			M41	QML3653	Control Lever	M69	QXH0346	Mechanism Cover			
			M42	QBT1278	Record Lock Lever Spring	M70	QBT1691	Lamp Lever Spring			

## SPECIFICATIONS

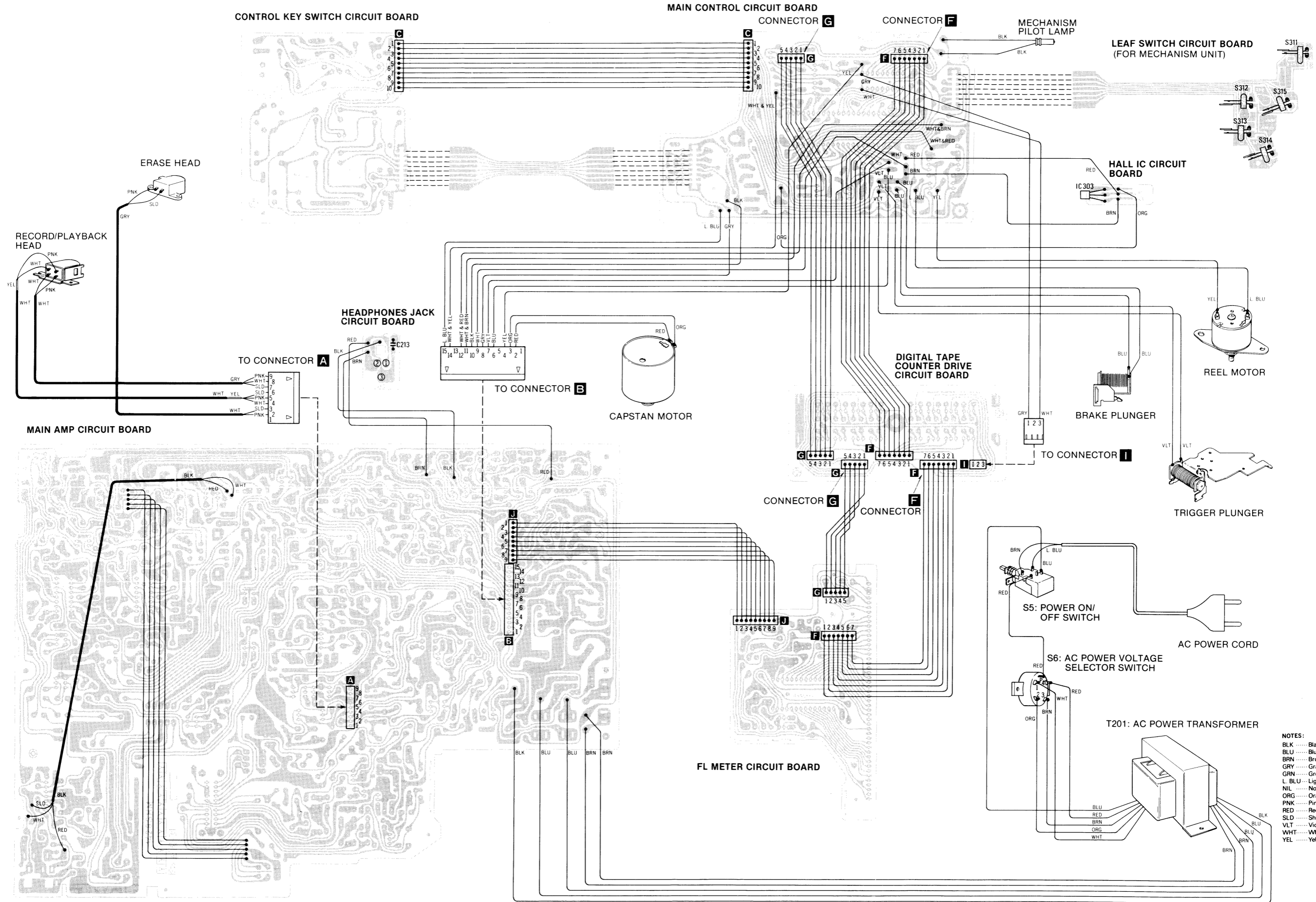
Pressure of pressure roller	350 ± 10 g
Wow and flutter (JIS) Test tape... QZZCWAT	Less than 0.055% (WRMS)



26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

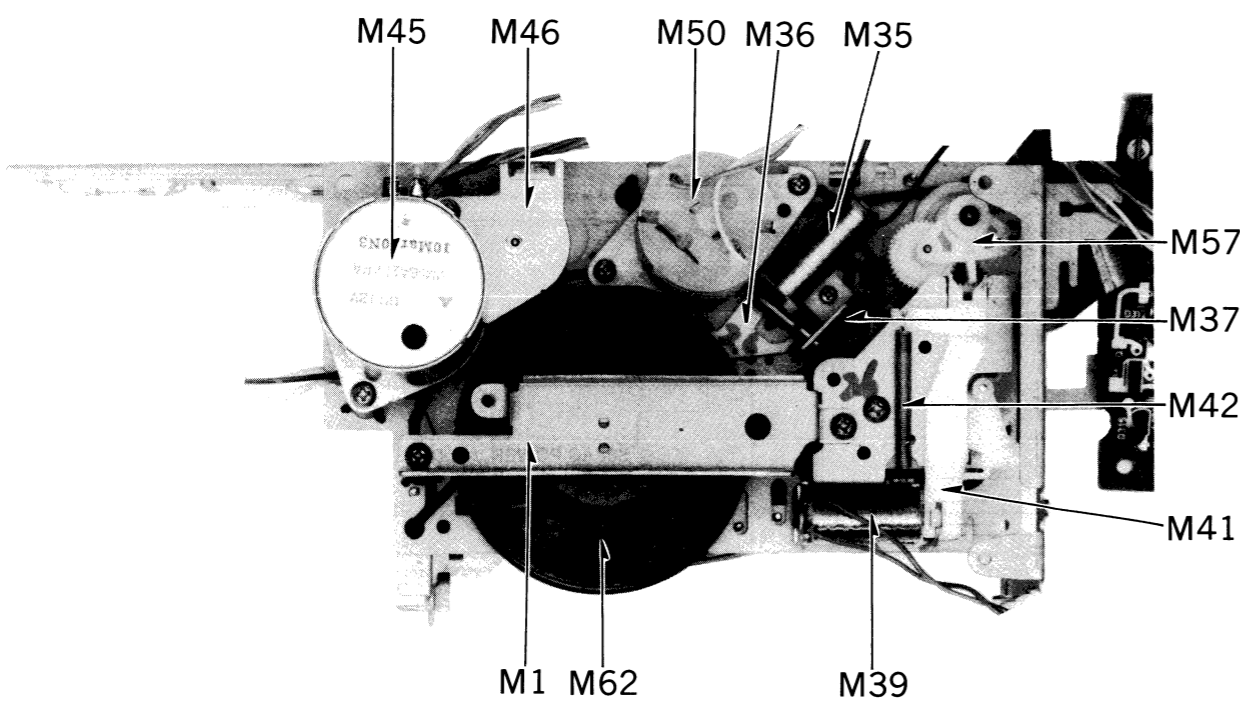
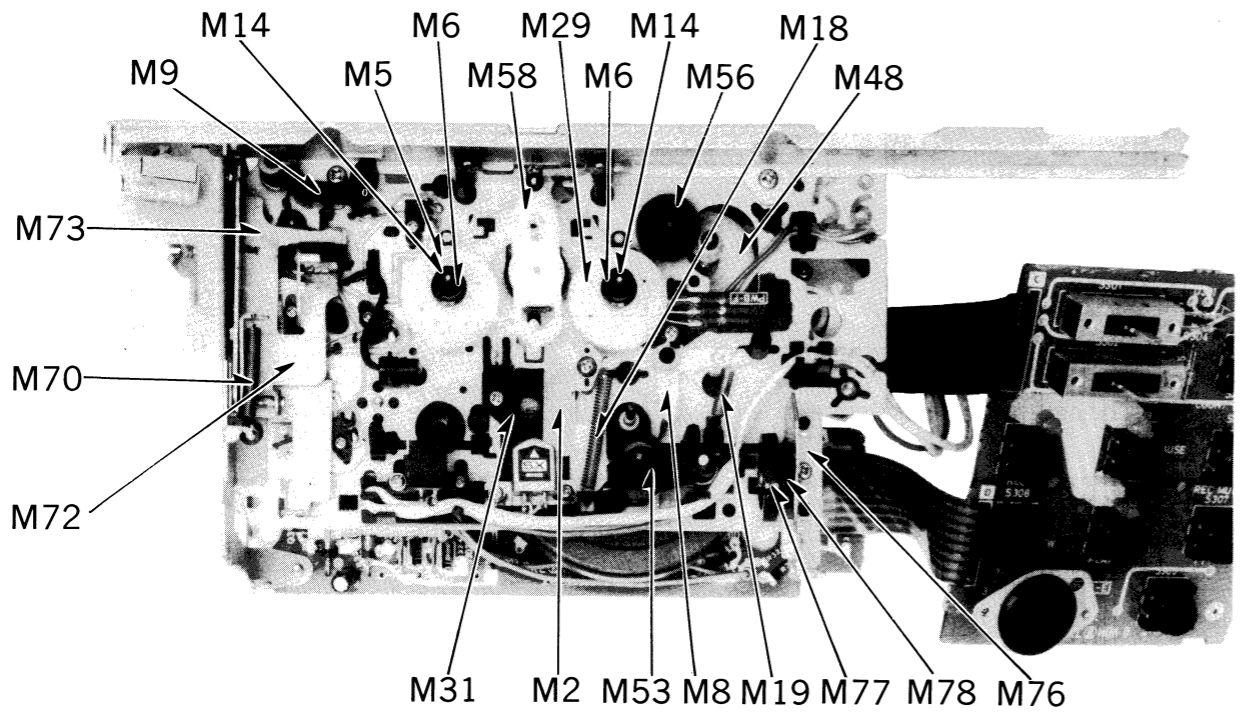
# WIRING CONNECTION DIAGRAM

A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M  
N  
O  
P  
Q

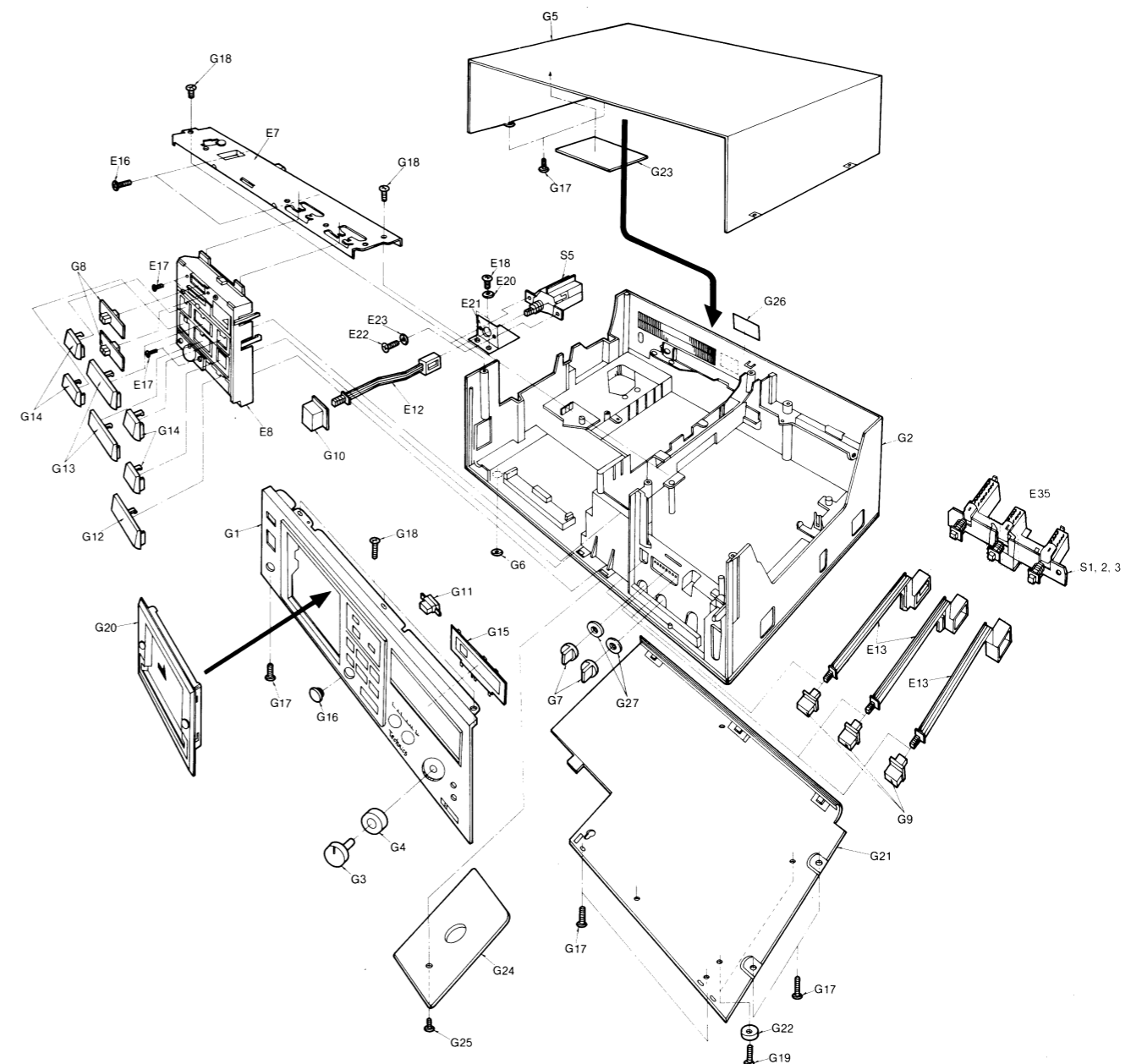


- NOTES:**
- BLK ..... Black
  - BLU ..... Blue
  - BRN ..... Brown
  - GRY ..... Gray
  - GRN ..... Green
  - L. BLU ..... Light Blue
  - NIL ..... No Color Mark
  - ORG ..... Orange
  - PNK ..... Pink
  - RED ..... Red
  - SLD ..... Shield Wire
  - VLT ..... Violet
  - WHT ..... White
  - YEL ..... 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
<b>CABINET PARTS</b>								
G1	QYP0983 "Silver Type" QYP0983K "Black Type"	Front Panel Assembly	G9	QGO1694N "Silver Type" QGO1694K "Black Type"	Push Button	G20	QYF0459 "Silver Type" QYF0459K "Black Type"	Cassette Lid Assembly
G2	QKM1448H "Silver Type" QKM1448K "Black Type"	Main Case	G10	QGO1763 "Silver Type" QGO1763K "Black Type"	Push Button (Power Switch)	G21	QGC1196	Bottom Case
G3	QYT0586 "Silver Type" QYT0586K "Black Type"	Volume Knob-A	G11	QGO1764 "Silver Type" QGO1764K "Black Type"	Push Button (Counter Reset)	G22	QKA1083	Rubber Foot
G4	QYT0587 "Silver Type" QYT0587K "Black Type"	Volume Knob-B	G12	QGO1765	Operation Button (Stop)	G23	QEQ1546	Shield Plate Assembly
G5	QGC1195 "Silver Type" QGC1195K "Black Type"	Case Cover	G13	QGO1766	Operation Button (Play, Pause)	G24	QGC1204	Sub Bottom Case
G6	QKA1081	Rubber Foot	G14	QGO1767	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	<b>ACCESSORIES</b>		
			G18	XTS3+10B	"	A1	RP023A	Connection Cord
			G19	QH01299	Screw	A2	QQT2891	Instruction Book
						* For all European areas except United Kingdom.		
							QQT2890	"
						* For United Kingdom.		
						<b>PACKINGS</b>		
						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