ORDER NO. ARD8206016CC2-24

Service Manual

Cassette Deck

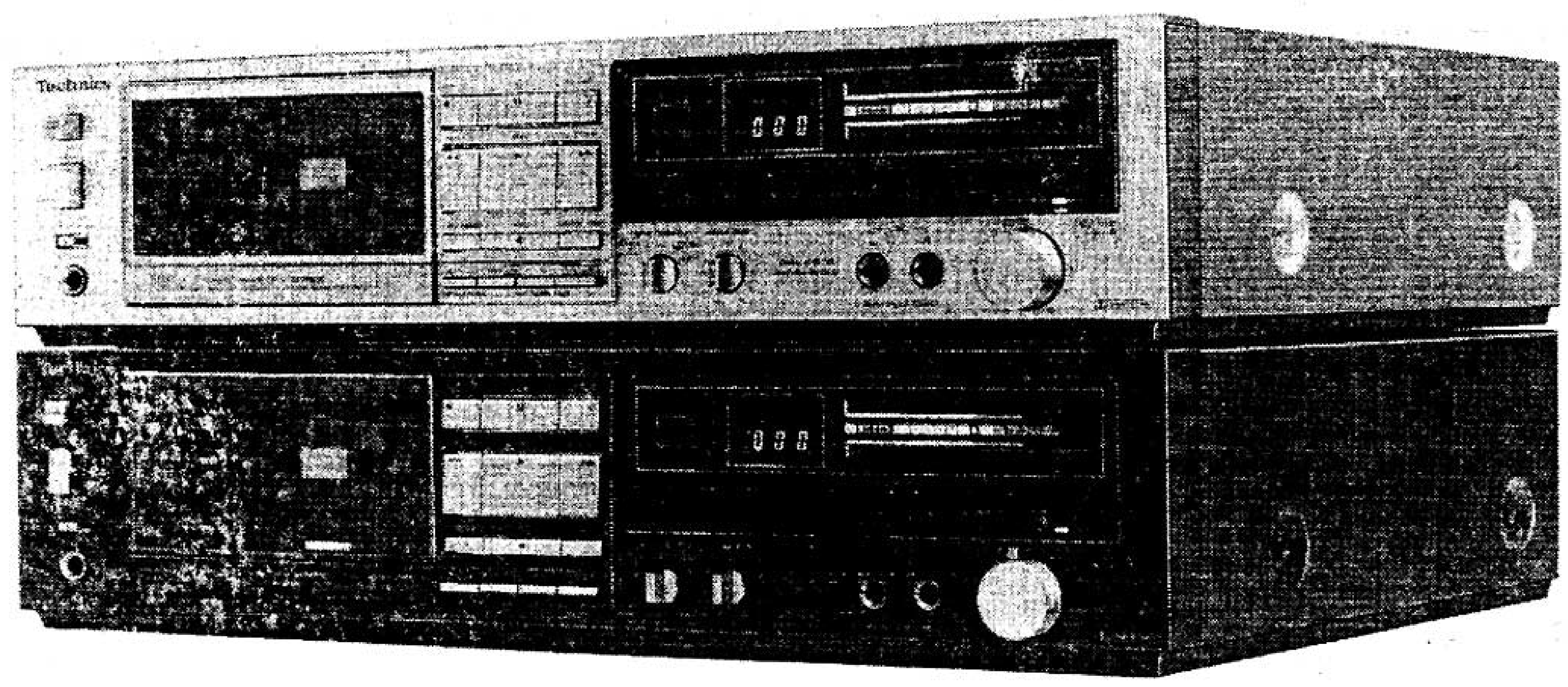
RS-M265X

(Silver Face
Black Face)

dbx -Equipped Microprocessor Controlled Cassette Deck

DOLBY B·C NR

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
Tape speed: 4.8 cm/s
Wow and flutter: 0.045% (WRMS), ±0.14% (DIN)
Frequency response: Metal tape; 20 — 20,000 Hz
25 — 19,000 Hz (DIN)
30 — 18,000 Hz ±3 dB
CrO_2 tape; 20 — 19,000 Hz
25 — 18,000 Hz (DIN)
30 — 17,000 Hz ±3 dB
Normal tape; 20 — 18,000 Hz
25 — 17,000 Hz (DIN)
30 — 16,000 Hz ±3 dB
Dynamic range: 110 dB (at 1 kHz), dbx in
Max. input level improvement: 10 dB or more improved with dbx in (at 1 kHz)
Signal-to-noise ratio: dbx in; 92 dB
Dolby C NR in; 76 dB (CCIR)
Dolby B NR in; 68 dB (CCIR)
NR off; 58 dB (signal level = max. input level A weighted, CrO_2 type tape)

Fast forward and rewind time: Approx. 90 seconds with C-60 cassette tape
Inputs: MIC; sensitivity 0.25 mV, applicable microphone impedance 400 Ω — 10 kΩ
LINE; sensitivity 60 mV, input impedance more than 47 kΩ
Outputs: LINE; output level 700 mV, output impedance 1.5 kΩ or less
HEADPHONES; output level 130 mV (8 Ω) applicable headphone impedance 8 Ω — 600 Ω
Bias frequency: 85 kHz
Motor: 2-motor system
Heads: 2-head system
1-AX (AMORPHOUS) head for record/playback
1-double-gap ferrite head for erasure
Power requirement: 110/125/220/240 V, 50-60 Hz
Pre-set power voltage; D ··· 220 V, B ··· 240 V
Power consumption: 37 W
Dimensions: 43 cm(W) × 9.8 cm(H) × 32.6 cm(D)
Weight: 6.3 kg

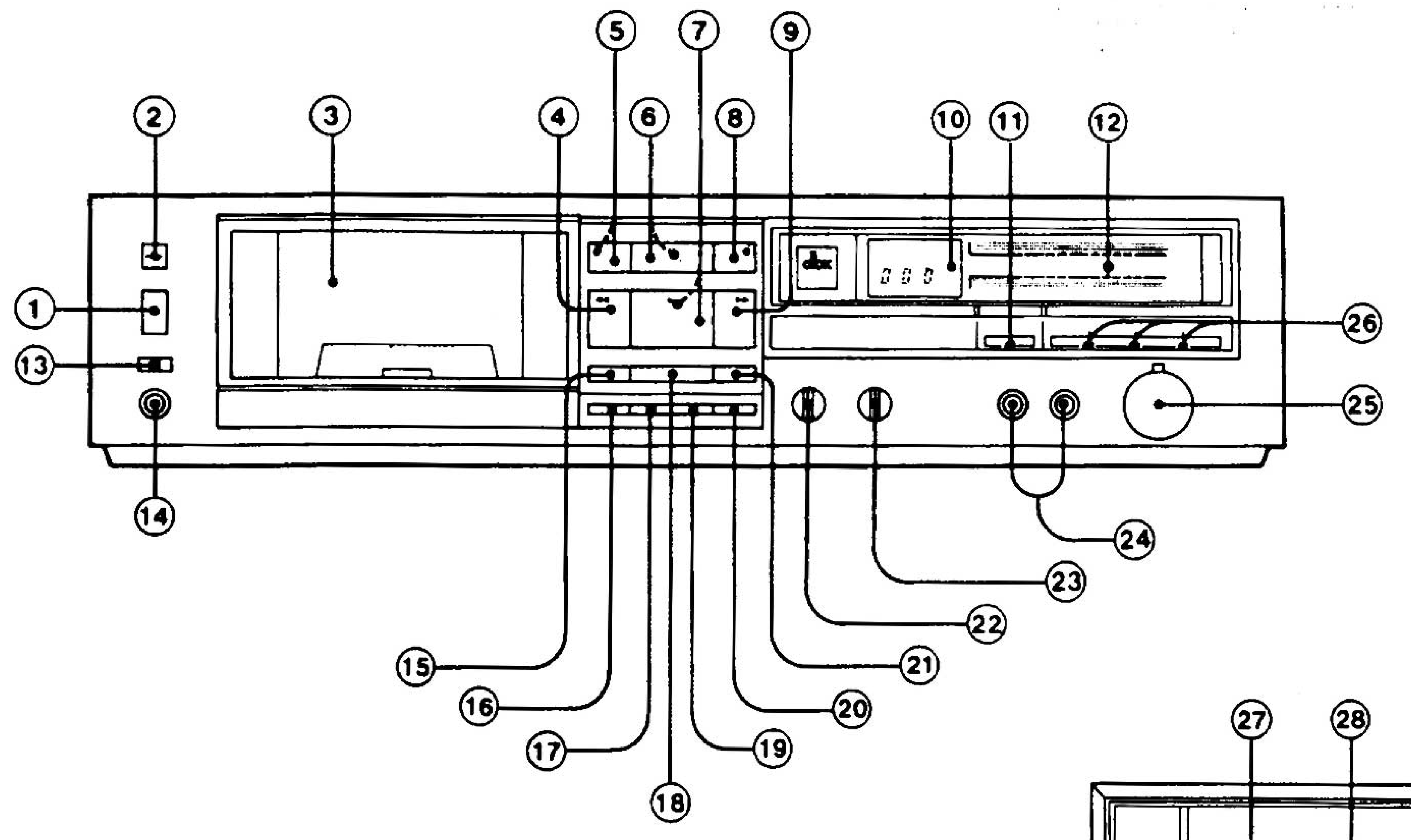
Specifications are subject to change without notice.

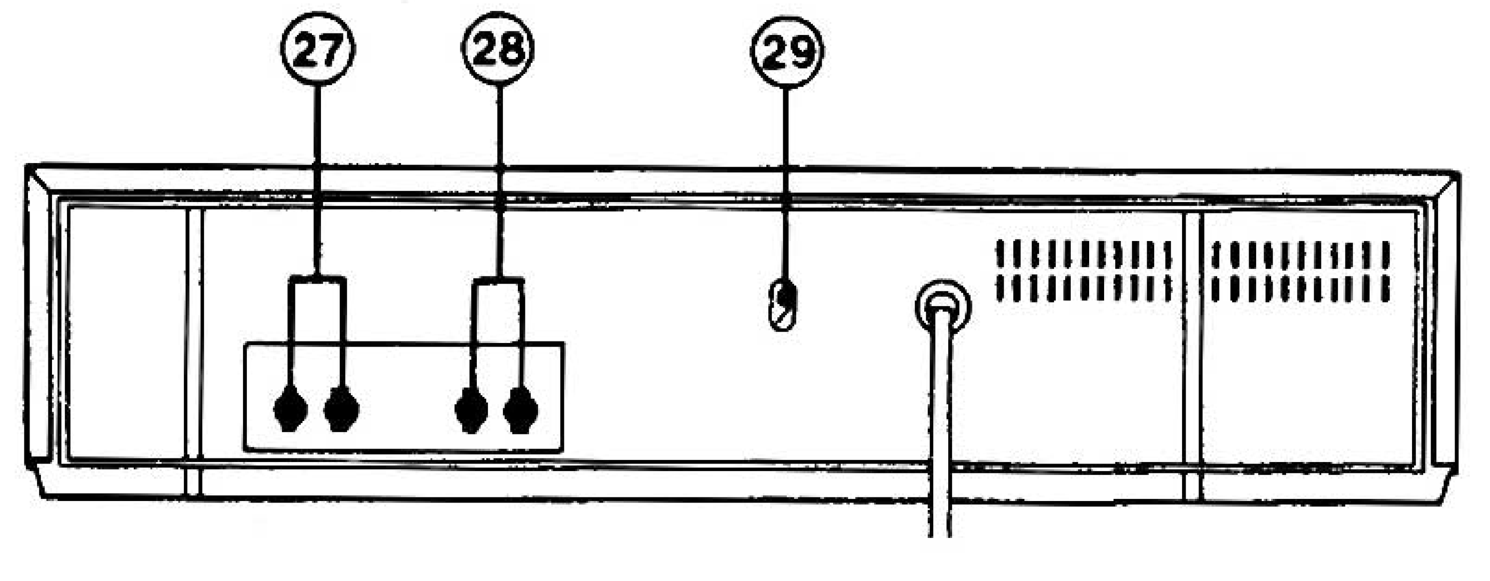
Technics

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

CONTENTS

LOCATION OF CONTROLS AND COMPONENTS





① Power Switch [power (push on)]
② Eject Button [eject]
③ Cassette Holder
④ Rewind Button [rew (M.S) (◀◀)]
⑤ Record Button and Indicator [rec (○)]
⑥ Pause Button and Indicator [pause (❚❚)]
⑦ Play Button and Indicator [play (▶)]
⑧ Record Muting Button [rec mute (◯)]
⑨ Fast Forward Button [ff (M.S) (▶▶)]
⑩ Digital Multi Counter [multi counter]
⑪ Intro Search Indicator [intro search • on]
⑫ FL (fluorescent lever) Meters
⑬ Timer Start Switch [◷ timer (rec • off • play)]
⑭ Headphones Jack [phones]
⑮ Intro Search Button [intro search]
⑯ Memory Repeat Button [memory repeat (▪ off • ▬ on)]
⑰ Tape/Time Select Button [tape/ $\boxed{\text{time}}$]
⑱ Stop Button [stop (■)]
⑲ Set Button [set]
⑳ Music Select Button [$\boxed{\text{music select}}$]
㉑ Counter Reset Button [counter reset]
㉒ Noise Reduction Select Switch [Noise Reduction ($\boxed{\text{Dolby NR}}$ C • B • out • $\boxed{\text{dbx}}$ tape • disc)]
㉓ Output Level Control [output level]
㉔ Microphone Jacks [mic (L • R)]
㉕ Input Level Controls [input level (L -◉- R)]
㉖ Tape Indicator [Auto Tape Select (Normal • CrO_2 • Metal)]
㉗ Line Output Jacks [LINE OUT (R • L)]
㉘ Line Input Jacks [LINE IN (R • L)]
㉙ Voltage Selector [VOLTAGE SELECTOR]

DISASSEMBLY INSTRUCTIONS

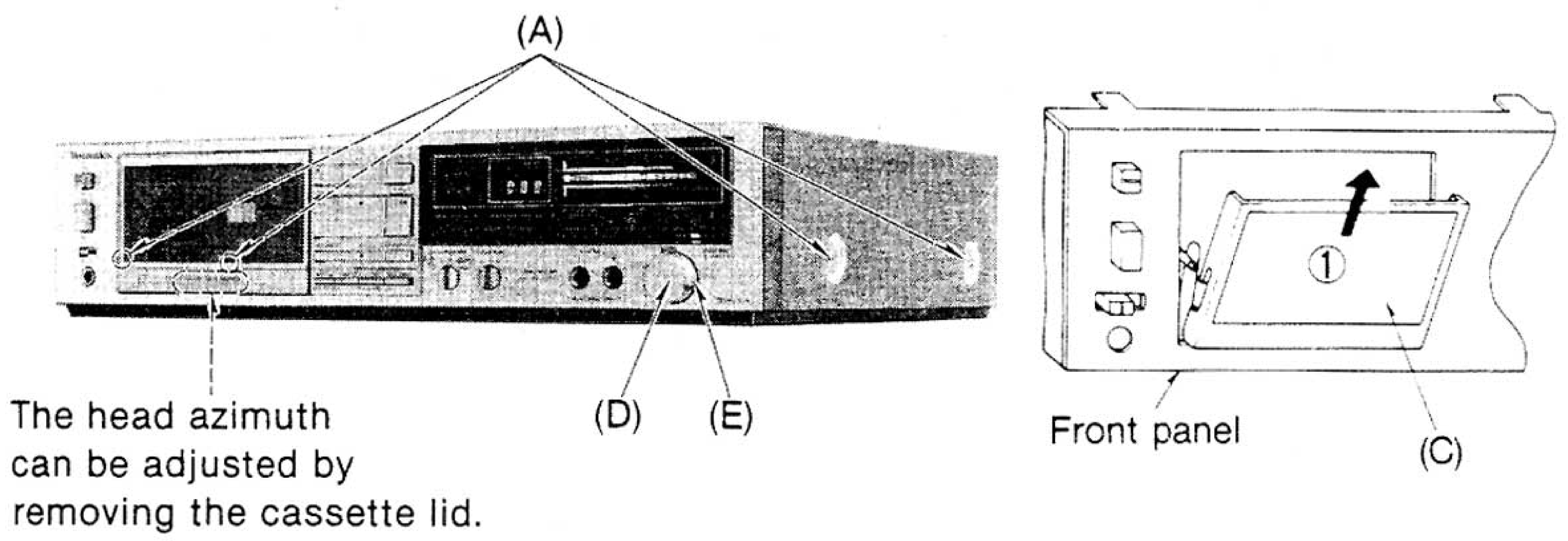


Fig. 1

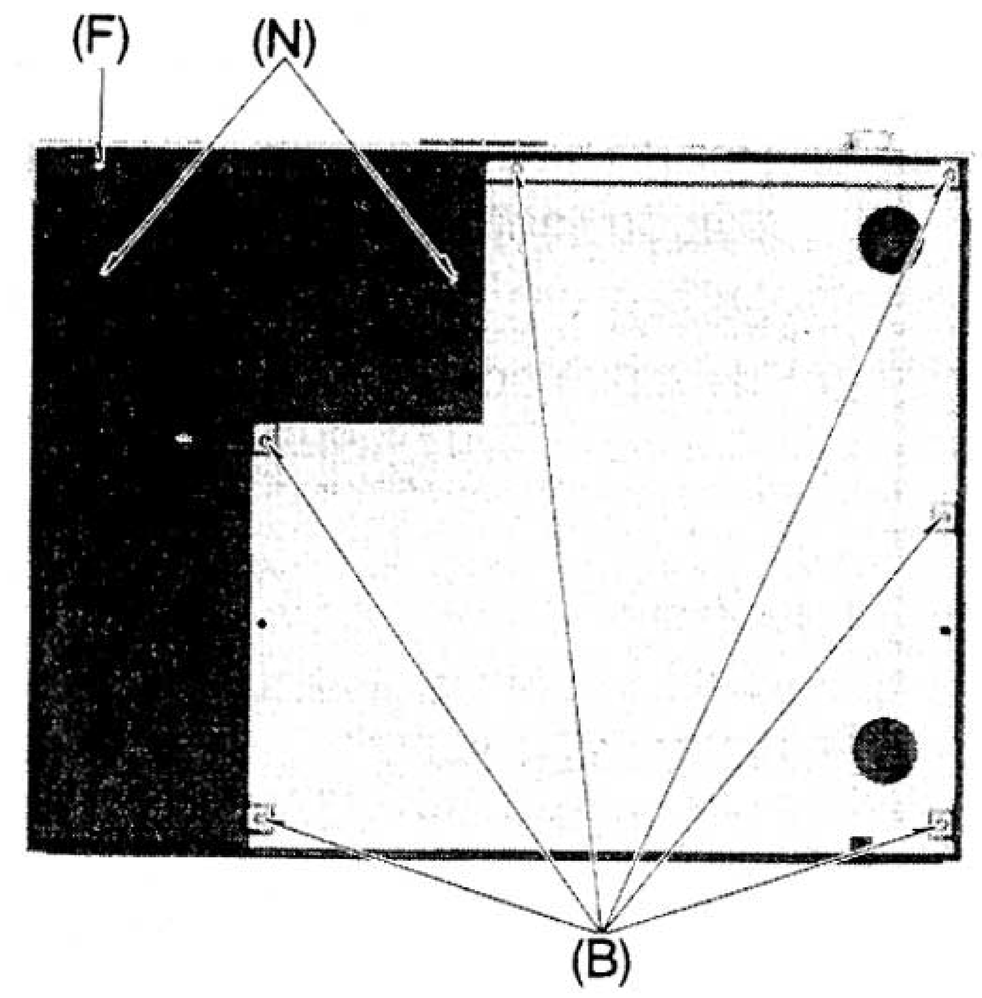


Fig. 2

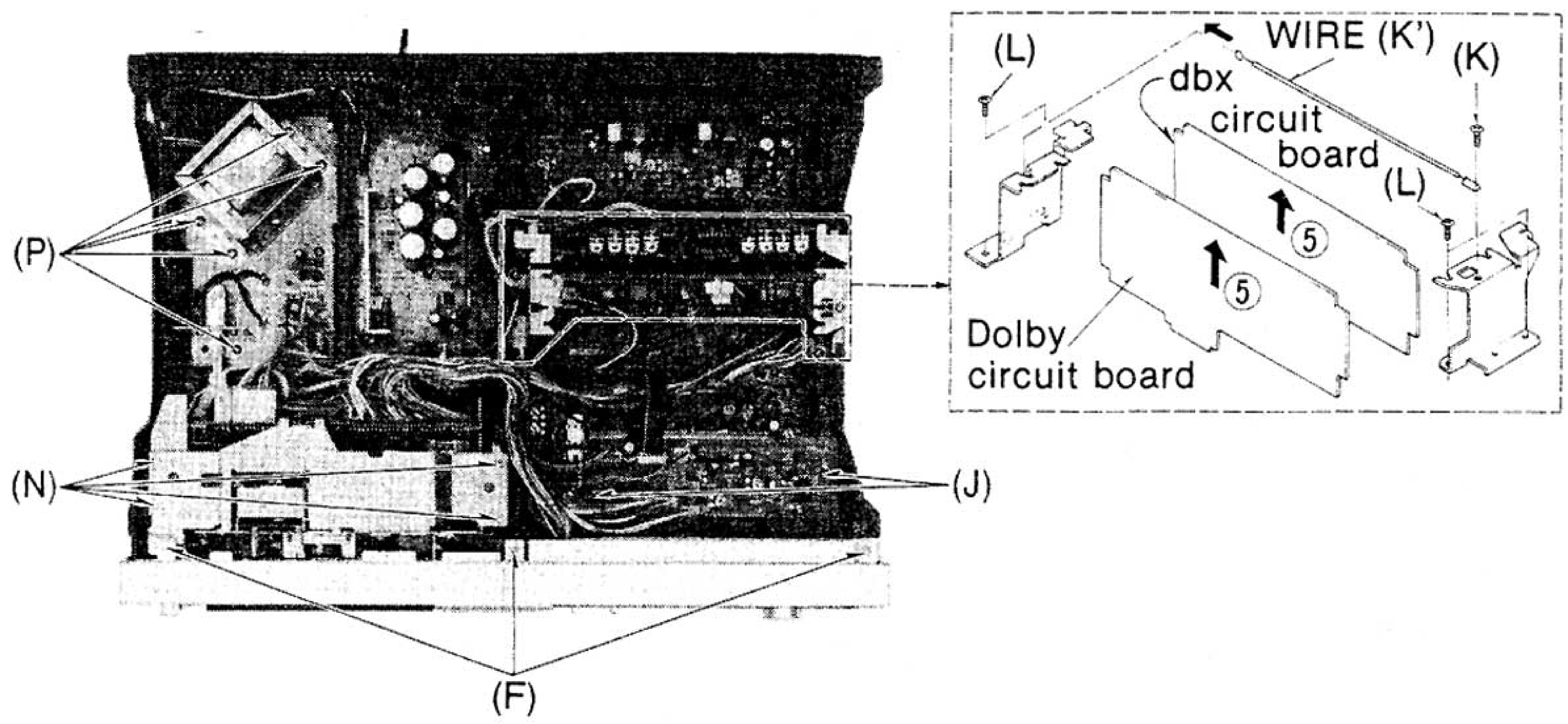


Fig. 3

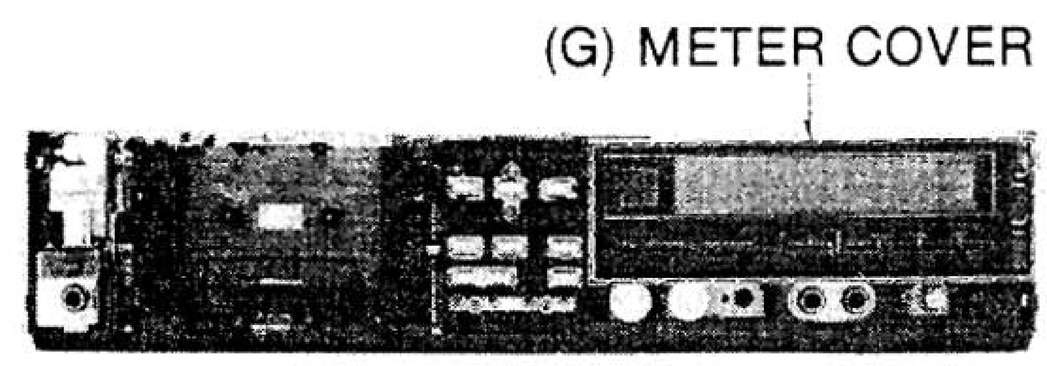


Fig. 4

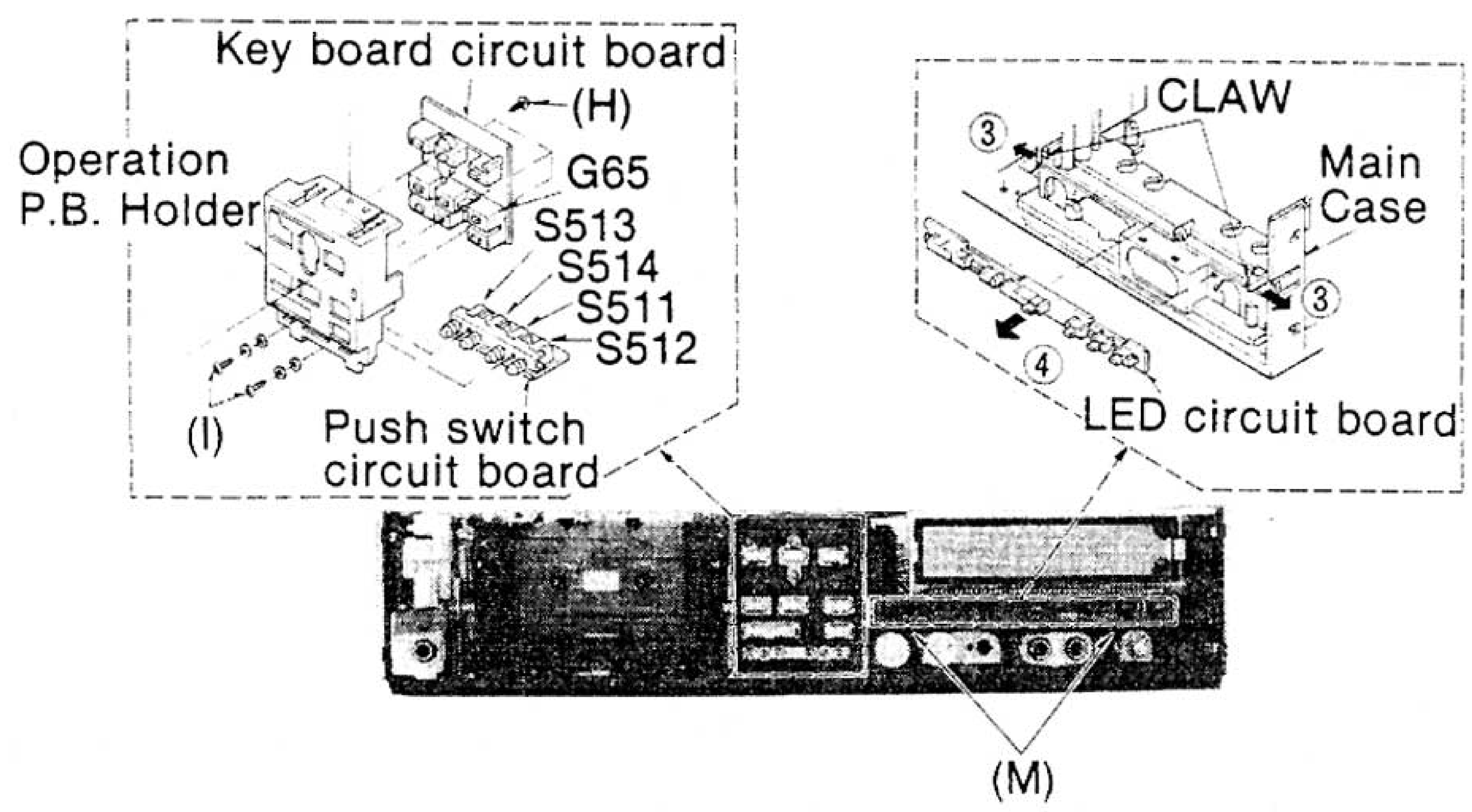


Fig. 5

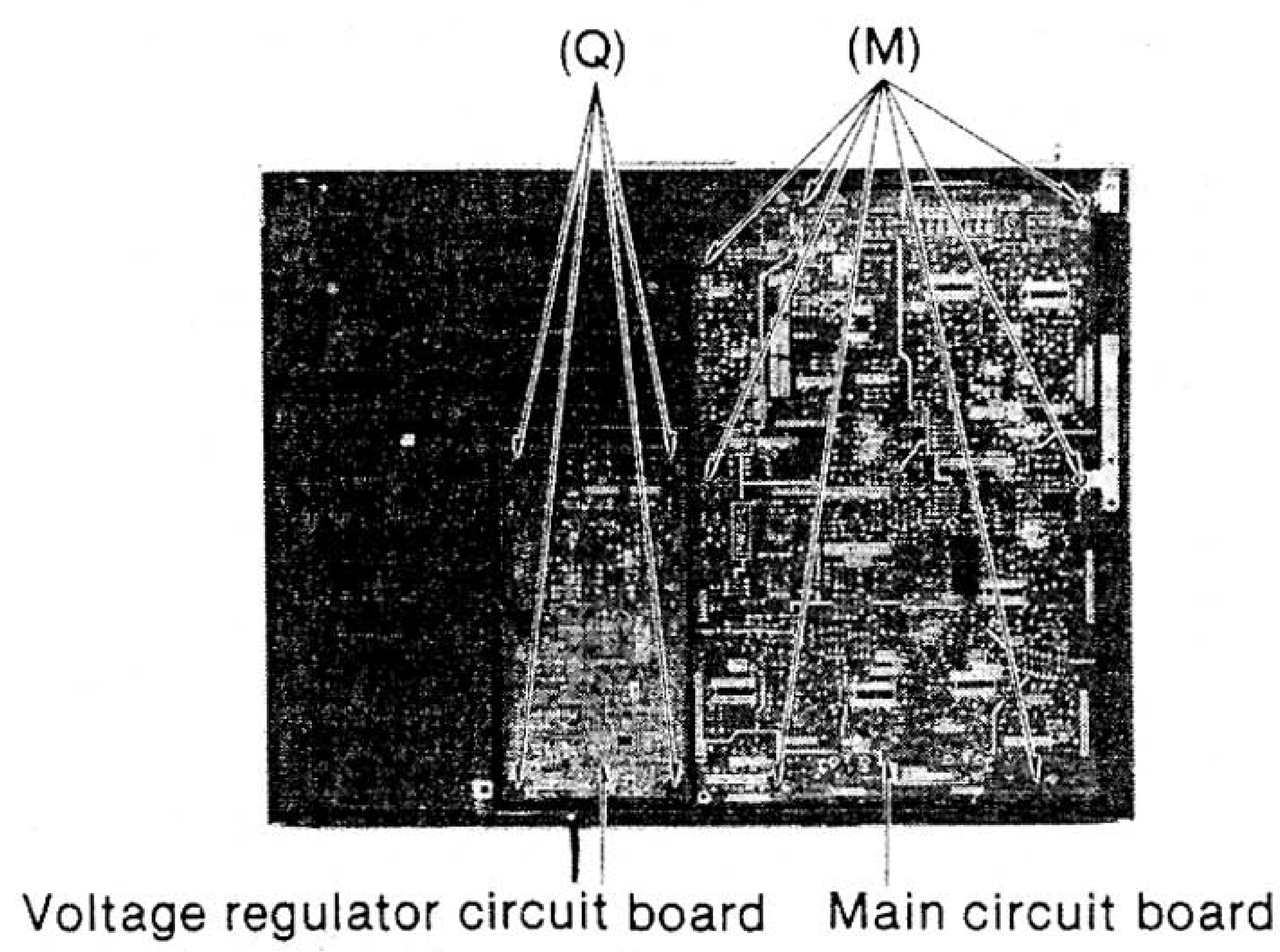


Fig. 6

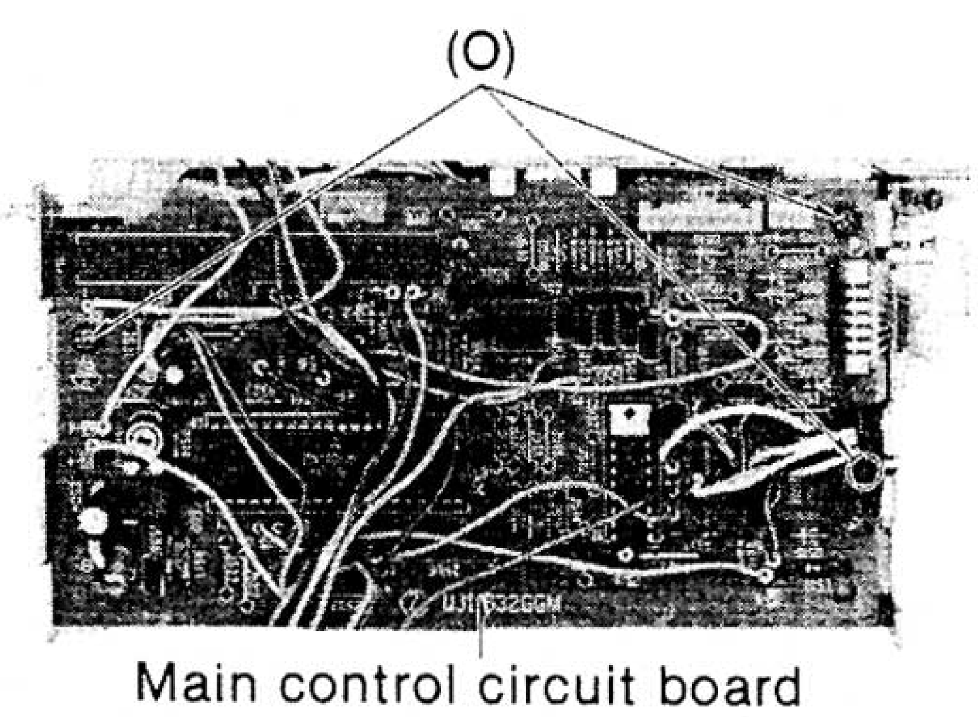


Fig. 7

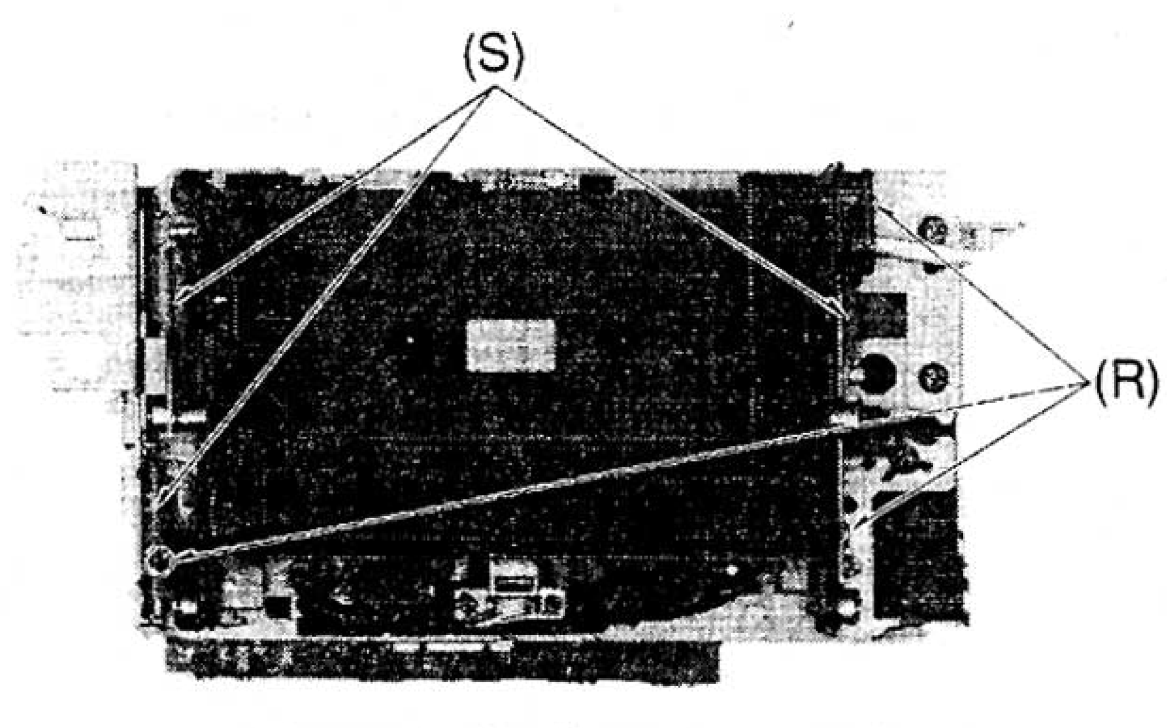


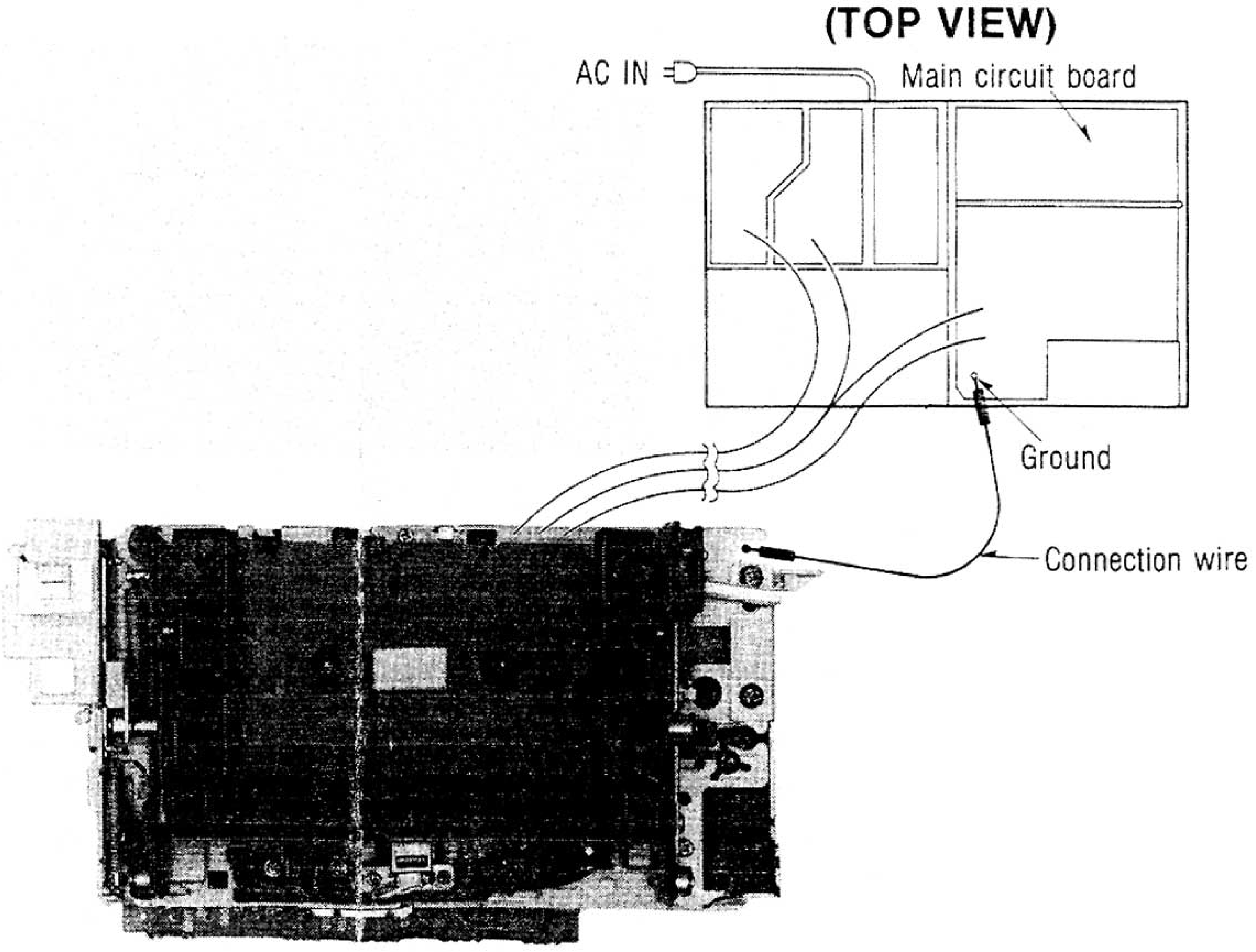
Fig. 8

Ref. No.	Procedure	To remove ——.	Remove ——.	Shown in fig. ——.
1	1	Case cover	• 4 screws ············(A)	1
2	2	Bottom cover	• 6 screws ············(B)	2
3	1→2→3	Front panel	• Cassette lid ············(C) (As shown in fig. 1, pull out in the direction of arrow ①.) • Volume knob-A············(D) • Volume knob-B ············(E) • 4 screws ············(F)	1 1 1 2, 3
4	1→3→4	Push switch circuit board and key board circuit board	• Meter cover ············(G) • 3 screws ············(H) • 2 screws ············(I)	4 5 5
5	1→3→5	FL meter	• 2 red screws············(J)	3
6	1→3→5→6	LED circuit board	• As shown in fig. 5, pull the claw in the direction of arrow ③, then pull LED circuit board in the direction of arrow ④. Then, it can be removed.	5
7	1→3→7	dbx circuit board and Dolby circuit board	• 1 screw············(K) • Wire ············(K)' • 4 screws (As shown in fig. 3, pull Dolby and dbx circuit board in the direction of arrow ⑤.)	3 3 3
8	1→2→3→5→7→8	Main circuit board	• 9 red screws············(M)	5, 6
9	1→3→9	Mechanism unit	• 6 screws ············(N) (As shown in fig. 5, pull out operation P.B. holder.)	2, 3
10	1→3→9→10	Main control circuit board	• 3 screws ············(O)	7
11	1→11	Power transformer circuit board	• 5 screws ············(P)	3
12	1→12	Voltage regulator circuit board	• 4 screws ············(Q)	6
13	1→3→9→13	Cassette holder assembly	• 3 screws ············(R) • Lock lever spring ············(S)	8 8

• DISASSEMBLY NOTES

1. For repair, measurement or adjustment with the front panel and mechanism removed from the unit be sure to ground the lower base plate of the mechanism.
2. For grounding, connect a extension cord to the mechanism's lower base plate and ground for main circuit board.
3. Without grounding, the auto tape selector does not operate properly.

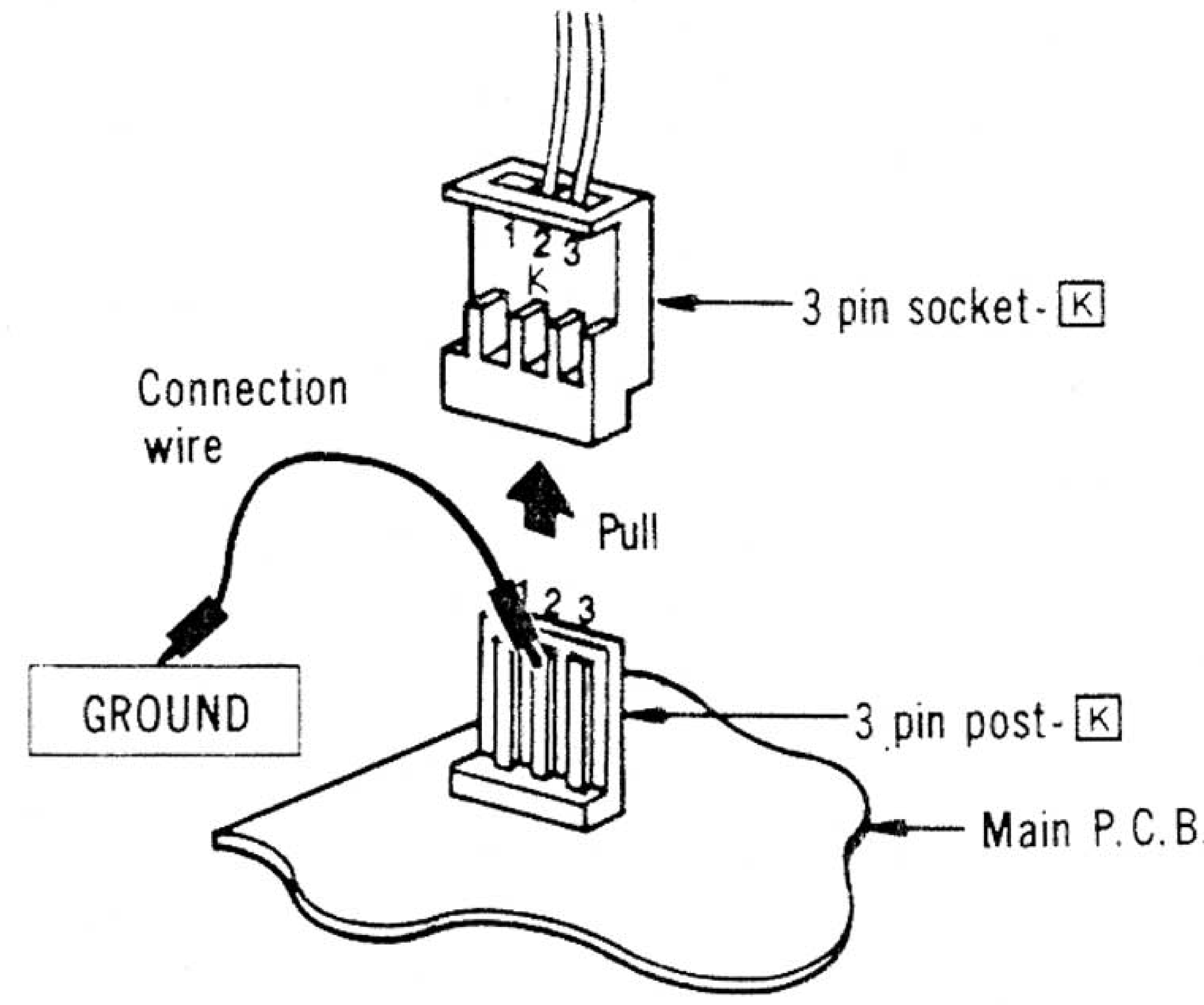
(TOP VIEW)



MEASUREMENT AND ADJUSTMENT METHODS
(WITHOUT dbx SYSTEM)

Tape selector (Tape mode switching)

For measurement adjustment with test tapes without tape detection holes, switch tape modes as follows.
(For normal tape mode, just insert a normal tape into the cassette holder.)



* **Metal tape mode setting:**
  Metal tape mode is obtained by disconnecting the 3 pin socket K from the 3 pin post K on the P.C.B. (Printed Circuit Board).
* **CrO_2 tape mode setting:**
  First, disconnect the 3 pin socket K in the same way as above. Then, as illustrated in the figure right, connect the terminal-2 of the 3 pin post to the ground with a connection wire.

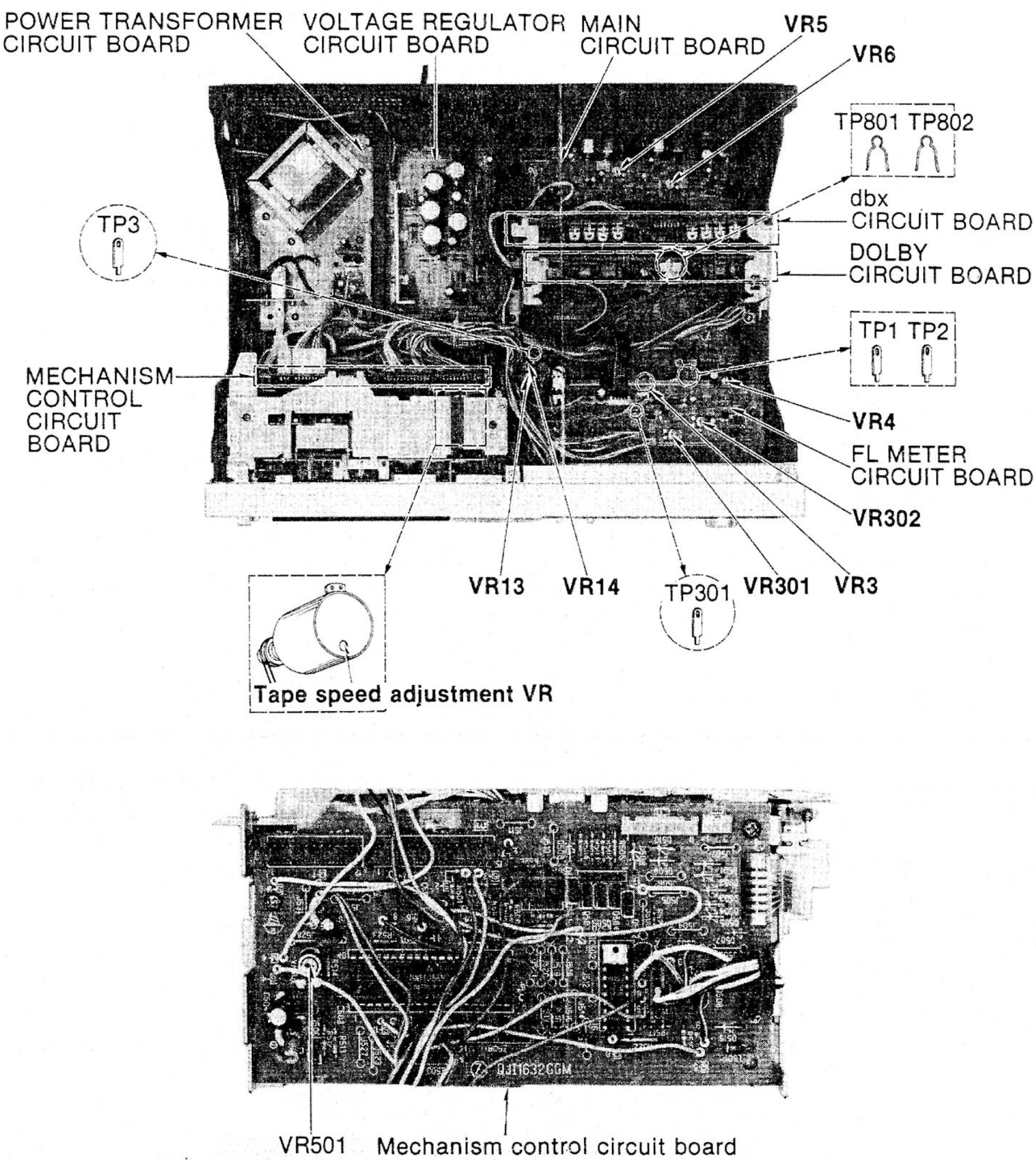


Fig. 1

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±5°C (68±9°F)
- NR switch: OUT
- Timer start switch: OFF
- Intro search: OFF
- 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

L-CH/R-CH output balance adjustment

1. Make connections as shown in fig. 2.

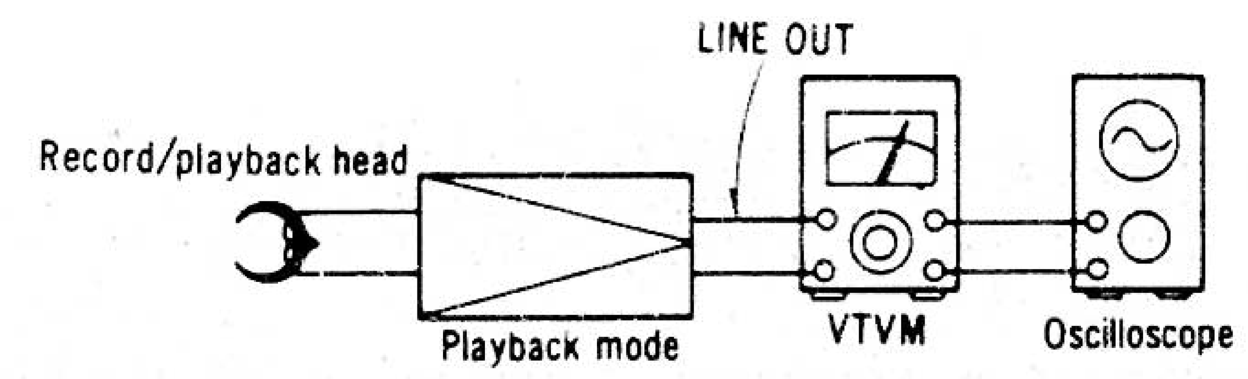


Fig. 2

2. Playback the 8kHz signal from the test tape (QZZCFM).
   Adjust screw (B) in fig. 3 for maximum output L-CH and R-CH levels.
   When the output levels of L-CH and R-CH are not at maximum at the same time, readjust as follows.
3. Turn the screw shown in fig. 3 to find angles A and C (points where peak output levels for left and right channels are obtained). Then, locate the angle B between angles A and C, i.e., a point where L-CH and R-CH output levels come together at maximum. (Refer to figs. 3 and 4.)

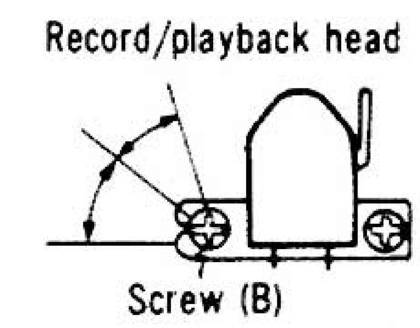


Fig. 3

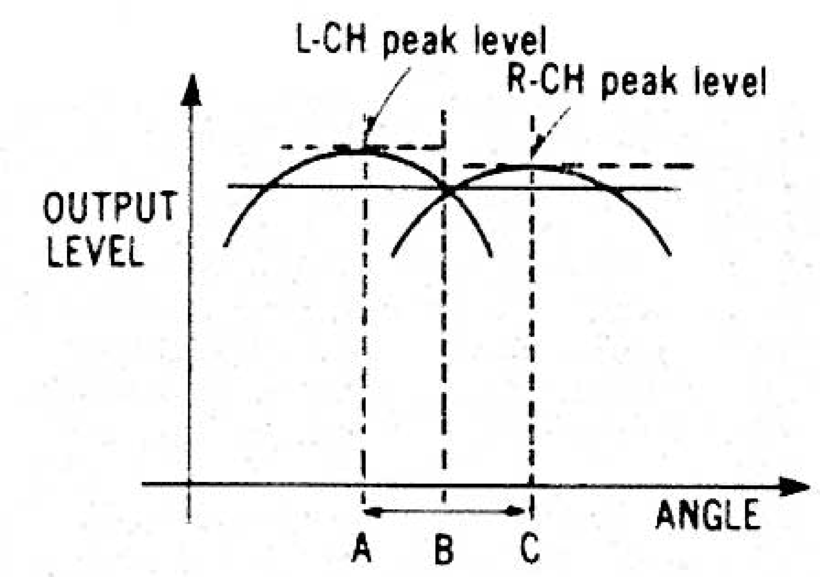


Fig. 4

L-CH/R-CH phase adjustment

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

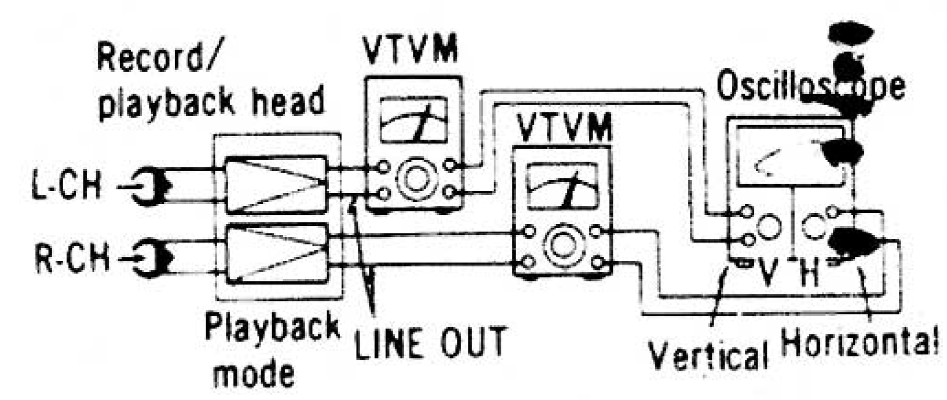


Fig. 5

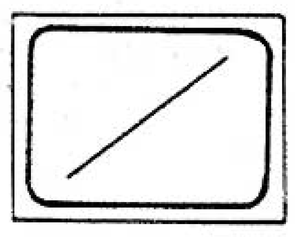


Fig. 6

B Tape speed

Condition:
- Playback mode
- Normal tape mode

Equipment:
- Digital electronic counter
- Test tape ··· QZZCWAT

Tape speed accuracy

1. Test equipment connection is shown in fig. 7.
2. Playback test tape (QZZCWAT 3,000 Hz), and supply playback signal to frequency counter.
3. Take measurement at middle section of tape.
4. Measure this frequency.
5. 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

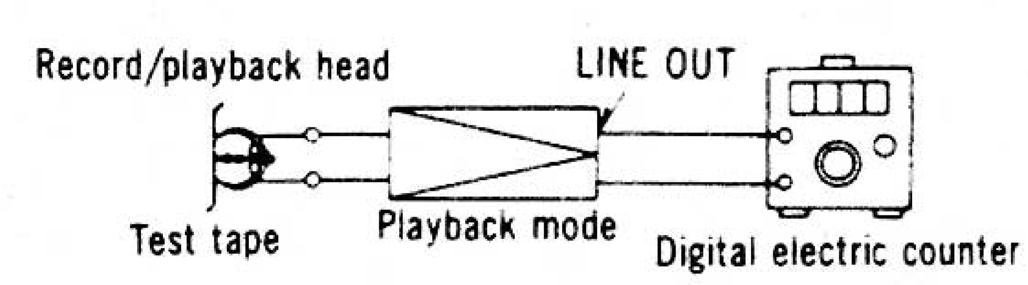


Fig. 7

Standard value: ±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.

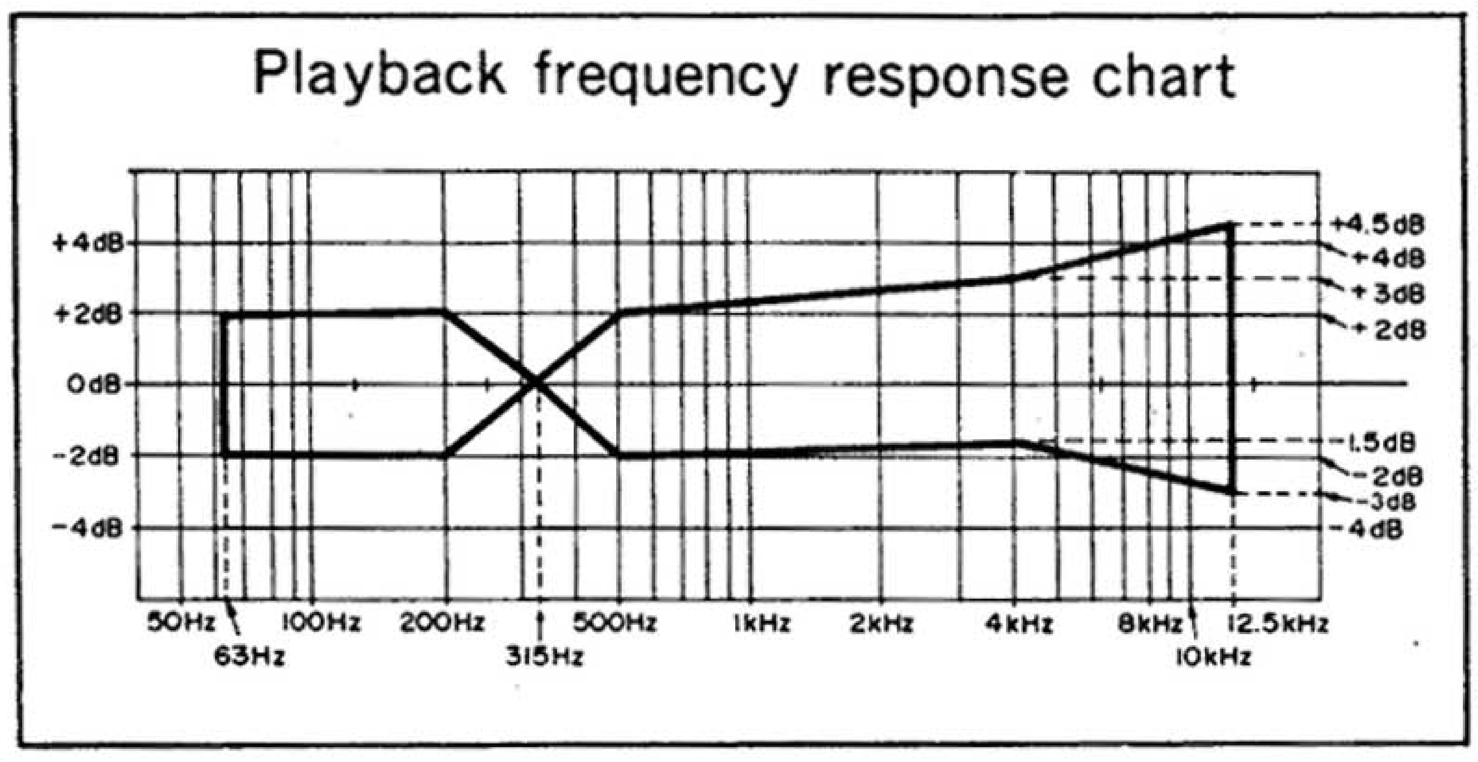
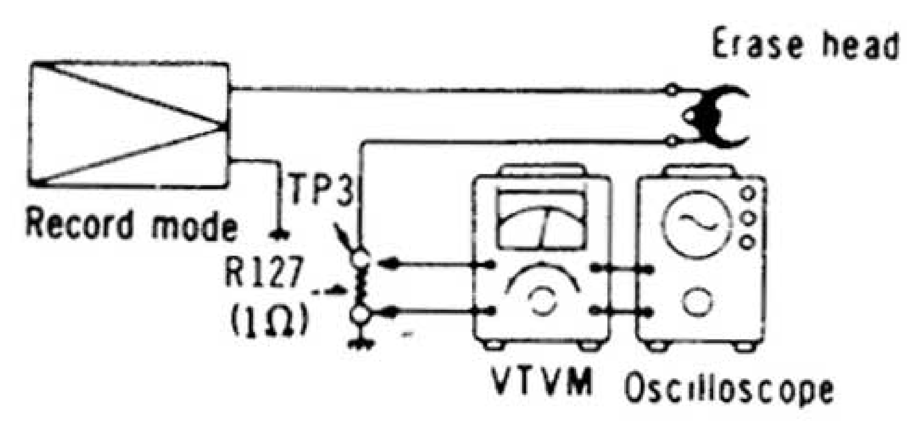
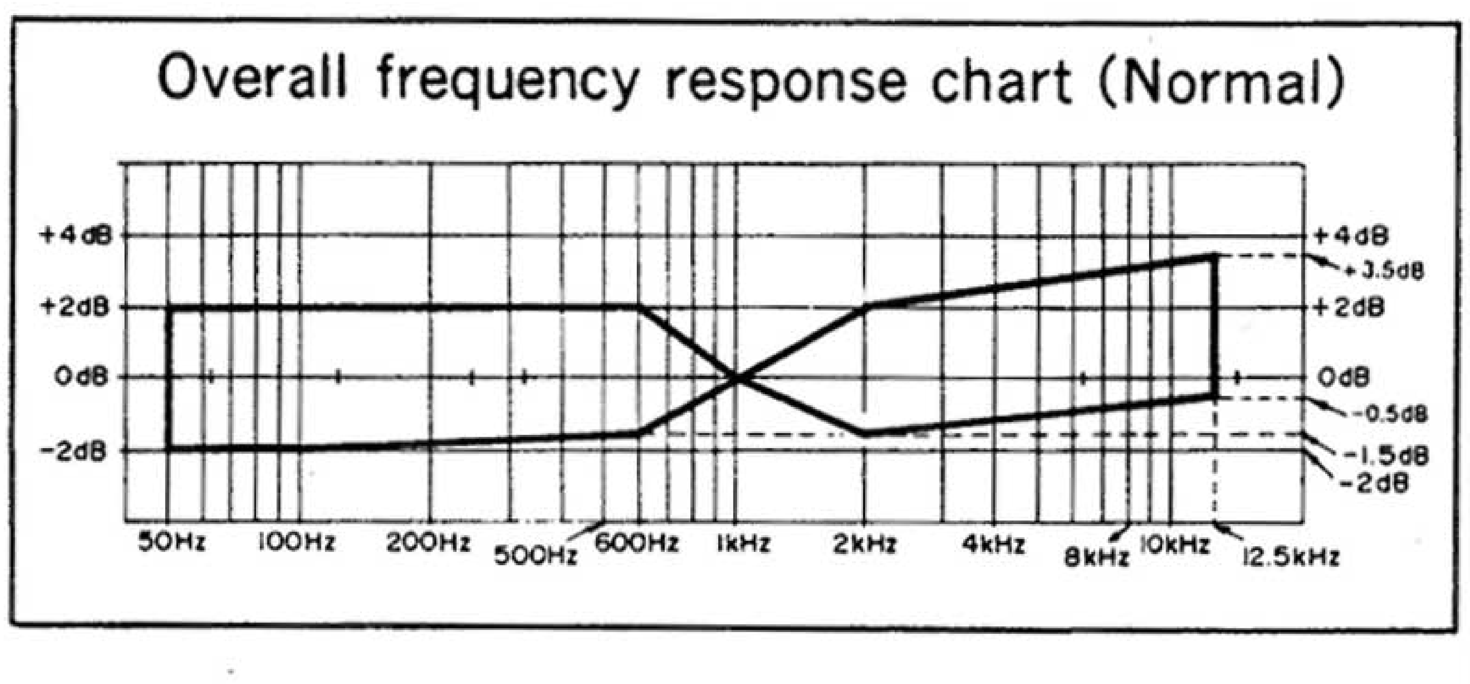
Tape speed fluctuation

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%

ITEM	MEASUREMENT & ADJUSTMENT
Ⓒ Playback frequency response Condition: • Playback mode • Normal tape mode Equipment: • VTVM • Oscilloscope • Test tape ··· QZZCFM	1. Test equipment connection is shown in fig. 2. 2. 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. 8.)  Fig. 8
Ⓓ Playback gain Condition: • Playback mode • Normal tape mode Equipment: • VTVM • Oscilloscope • Test tape ··· QZZCFM	1. Test equipment connection is shown in fig. 2. 2. Playback standard recording level portion on test tape (QZZCFM 315 Hz, 0 dB), and using VTVM measure the output level at LINE OUT jack. 3. Make measurement for both channels. **Standard value:** **0.7 ±0.1 dB [0.28 V: at test points TP801 (L-CH) and TP802 (R-CH)]** **Adjustment** 1. If measured value is not within standard, adjust VR3 (L-CH), VR4 (R-CH) (shown in fig. 1) 2. After adjustment, check "Playback frequency response" again.
Ⓔ Erase current Condition: • Record mode • Metal tape mode Equipment: • VTVM • Oscilloscope	1. Test equipment connection is shown in fig. 9. 2. Place UNIT into metal tape mode. 3. Press the record and pause buttons. 4. Read voltage on VTVM and calculate erase current by following formula. $\text{Erase current (A)} = \dfrac{\text{Voltage across both ends of R127}}{1\ (\Omega)}$  Fig. 9 **Standard value: 150^{+15}_{-10} mA (Metal position)** 5. If measured value is not within standard, adjust as follows. **Adjustment** 1. Open the point (B) and short the point (A) on the main circuit board in the circuit board diagram (See page 27). 2. Make measurement for erase current. 3. Make sure that the measured value is within the erase current of 140 mA to 170 mA. 4. If it is beyond the value, carry out the following adjustments: • If the erase current is less than 140 mA, open the point (A) and (B). • If the erase current is more than 165 mA, short the points (A) and (B).
Ⓕ Overall frequency response Condition: • Record/playback mode • Normal tape mode • CrO_2 tape mode • Metal tape mode • Input level controls ··· MAX • Output level control ··· MAX	**Note:** Before measuring and adjusting, make sure of the playback frequency response (For the method of measurement, please refer to the playback frequency response). **Overall frequency response adjustment by recording bias current** (Recording equalizer is fixed) 1. Make connections as shown in fig. 11. 2. Place UNIT into normal tape mode and load the test tape (QZZCRA).  Fig. 10

ITEM	MEASUREMENT & ADJUSTMENT

Equipment:

- VTVM
- AF oscillator
- ATT
- Oscilloscope
- Resistor (600 Ω)
- Test tape
  (reference blank tape)
  ··· QZZCRA for Normal
  ··· QZZCRX for CrO_2
  ··· QZZCRZ for Metal

3. Input a 1kHz, −24 dB signal through LINE IN.
   Place the set in record mode.
4. Fine adjust the attenuator to obtain 0.7V LINE OUT output.
   - Make sure that the input signal level is −24±4 dB with 0.7V output voltage.
5. Adjust the attenuator to reduce the input signal level by 20dB.
6. Adjust the AF oscillator to generate 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz, 10kHz and 12.5kHz signals, and record these signals on the test tape.
7. Playback the signals recorded in step 6, and check if the frequency response curve is within the limits shown in the overall frequency response chart for normal tapes (fig. 10).
   (If the curve is within the charted specifications, proceed to steps 8, 9, 10 and 11.)
   If the curve is not within the charted specifications, adjust as follows;

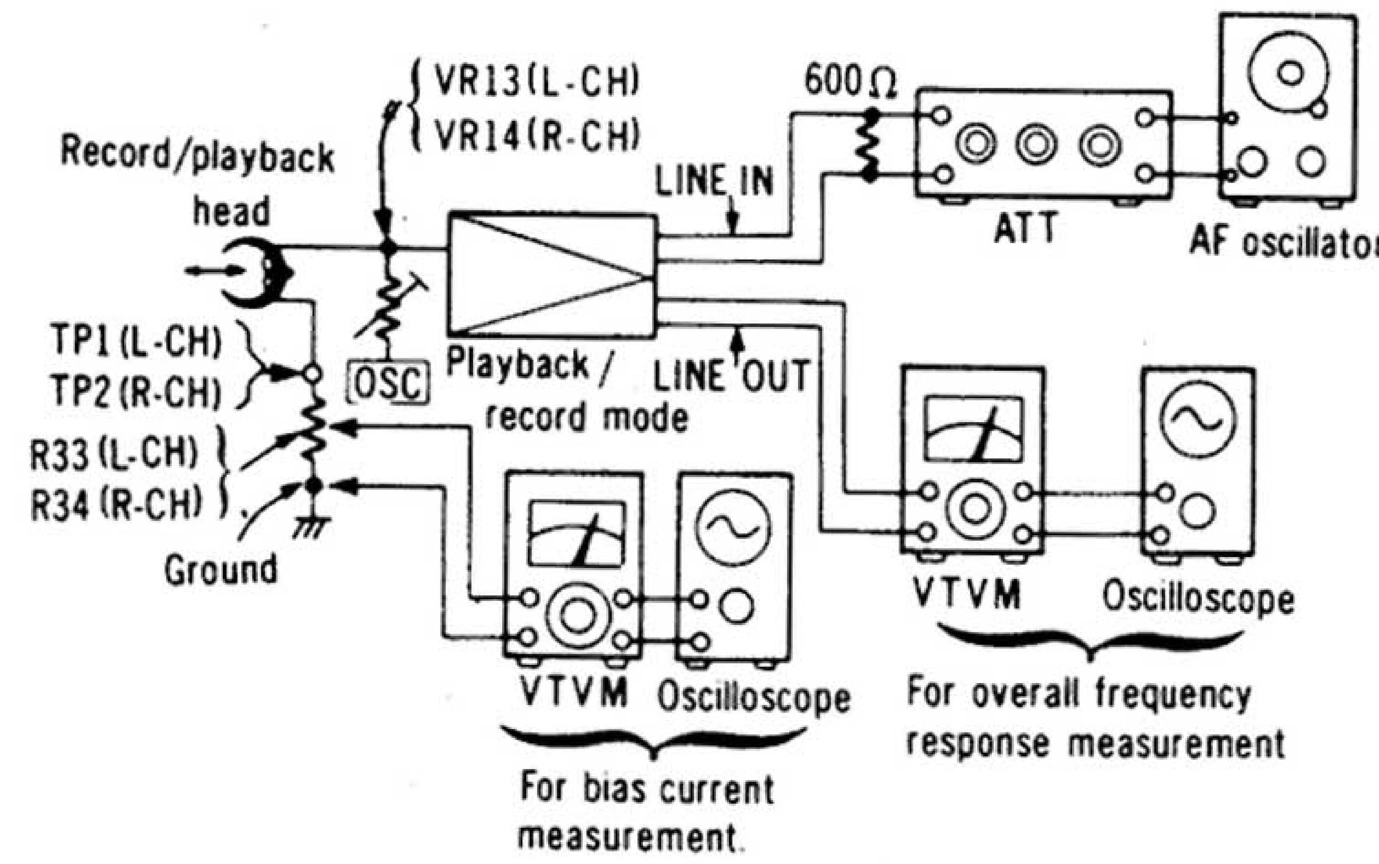


Fig. 11

Adjustment Ⓐ:

When the curve exceeds the overall frequency response chart specifications (fig. 10) as shown in fig. 12.

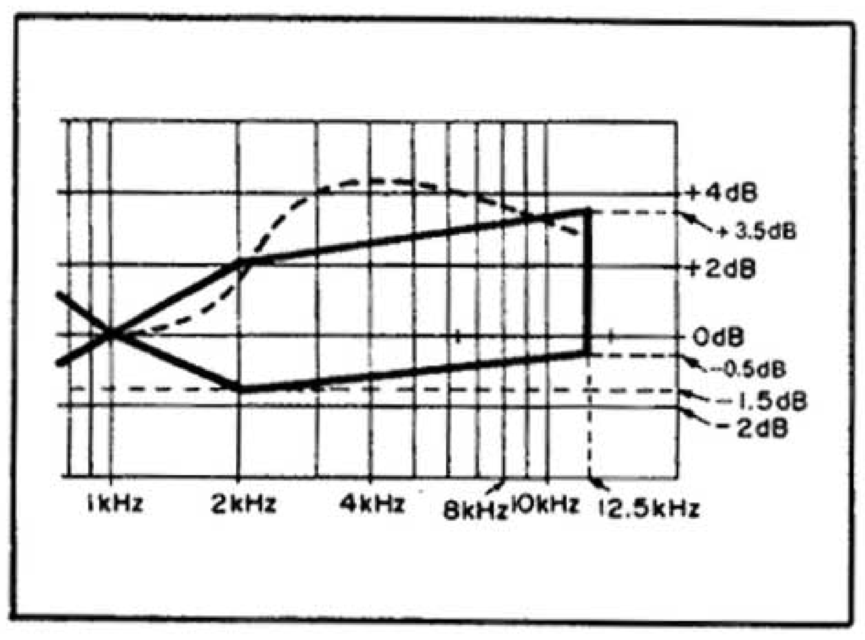


Fig. 12

1) Increase bias current by turning VR13 (L-CH) and VR14 (R-CH).
   (See fig. 1 on page 5).
2) Repeat steps 6 and 7 to confirm.
   (Proceed to steps 8, 9, 10 and 11 if the curve is now within the charted specifications is fig. 10.)
3) If the curve still exceeds the specifications (fig. 10), increase bias current further and repeat steps 6 and 7.

Adjustment Ⓑ:

When the curve falls below the overall frequency response chart specifications (fig. 10) as shown in fig. 13.

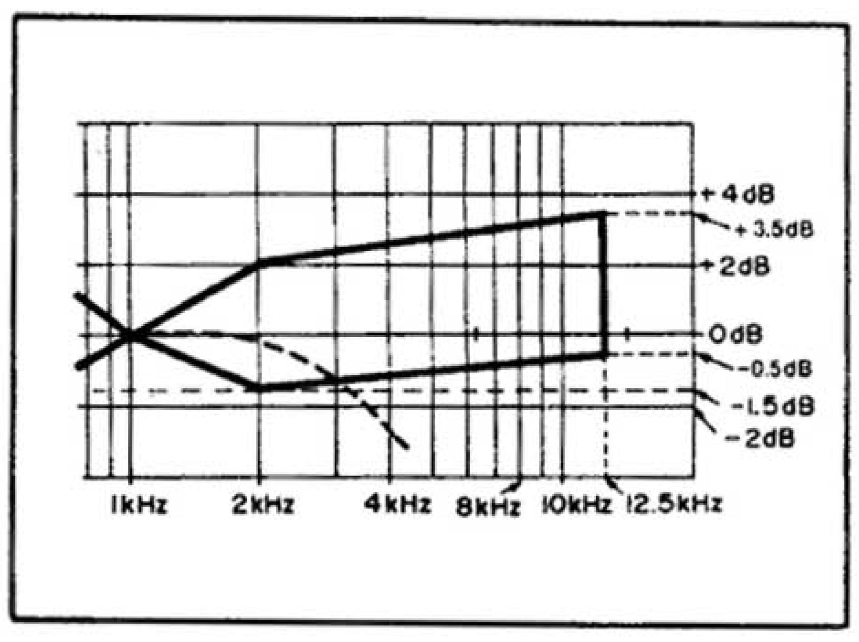


Fig. 13

1) Reduce bias current by turning VR13 (L-CH) and VR14 (R-CH).
2) Repeat steps 6 and 7 to confirm.
   (Proceed to steps 8, 9, 10 and 11 if the curve is now within the charted specifications in fig. 10.)
3) If the curve still falls below the charted specifications (fig. 10), reduce bias current further and repeat steps 6 and 7.

8. Place UNIT into CrO_2 tape mode.
9. Change test tape to QZZCRX, and record 50Hz, 100Hz, 200Hz, 500Hz, 1kHz, 4kHz, 8kHz, 10kHz and 12.5kHz signals. Then, playback the signals and check if the curve is within the limits shown in the overall frequency response chart for CrO_2 tapes (fig. 14).

Overall frequency response chart (CrO_2, Metal)

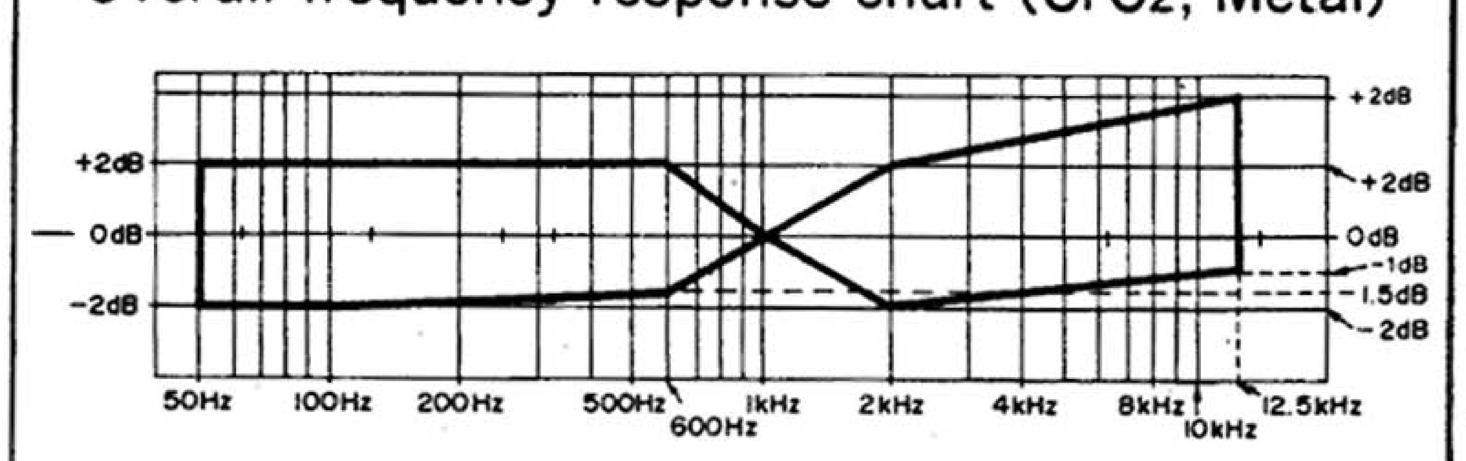


Fig. 14

ITEM	MEASUREMENT & ADJUSTMENT

10. Place UNIT into metal tape mode change test tape to QZZCRZ, and record 50 Hz, 100 Hz, 200 Hz, 500 Hz, 1 kHz, 4 kHz, 8 kHz, 10 kHz and 12.5 kHz signals. Then, playback the signals and check if the curve is within the limits shown in the overall frequency response chart for metal tapes (fig. 14).
11. Confirm that bias currents are approximately as follows when the UNIT is set at different tape mode.
    * 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 180μA (Normal position)
around 250μA (CrO_2 position) } **: measured at TP1 (L-CH) and TP2 (R-CH)**
around 380μA (Metal position)

Ⓖ Overall gain

Condition:
* Record/playback mode
* Normal tape mode
* Input level controls ··· MAX
* Output level control ··· MAX
* Standard input level;
  MIC ········ −72 ± 3 dB
  LINE IN ··· −24 ± 3 dB

Equipment:
* VTVM
* AF oscillator
* ATT
* Oscilloscope
* Resistor (600 Ω)
* Test tape (reference blank tape) ··· QZZCRA for Normal

1. Test equipment connection is shown in fig. 15.
2. Place UNIT into normal tape mode, and load the test tape (QZZCRA).
3. Place UNIT into record mode.
4. Supply 1 kHz signal (−24 dB) from AF oscillaror, through ATT to LINE IN.
5. Adjust ATT until monitor level at LINE OUT becomes 0.7 V.
6. Playback recorded tape, and make sure the value at LINE OUT on VTVM becomes 0.7 V.
7. If measured value is not 0.7 V, adjust VR5 (L-CH), VR6 (R-CH).
8. Repeat from step (2).

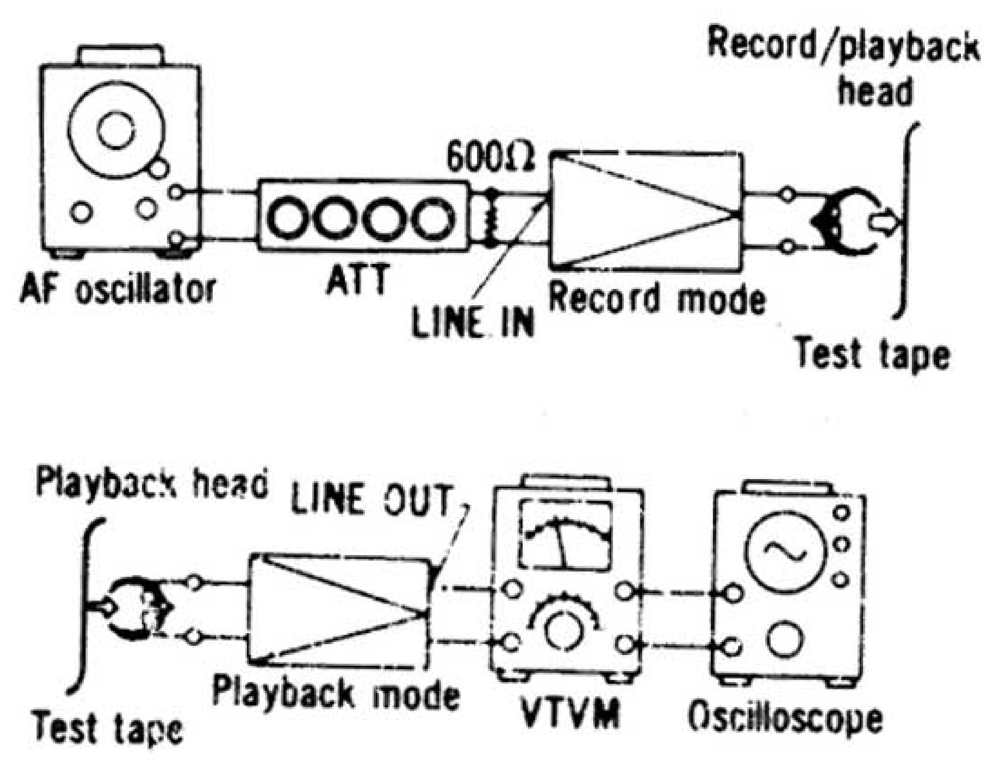


Fig. 15

Ⓗ Fluorescent meter

Condition:
* Record mode
* Input level controls ···· MAX
* Output level control ··· MAX

Equipment:
* VTVM
* AF oscillator
* ATT

• Check for FL meter

To check the accuracy of the FL meter, measure the output level at test point [TP801 (L-CH), TP802 (R-CH)].

1. Make connections as shown (See fig. 16).
2. Connect a wire between TP301 and ground terminal (See fig. 17).
3. In the recording pause mode, apply 1 kHz (−24 dB) to LINE IN.
4. Adjust ATT so that output level at test point [TP801 (L-CH), TP802 (R-CH)] is 0.28 V.

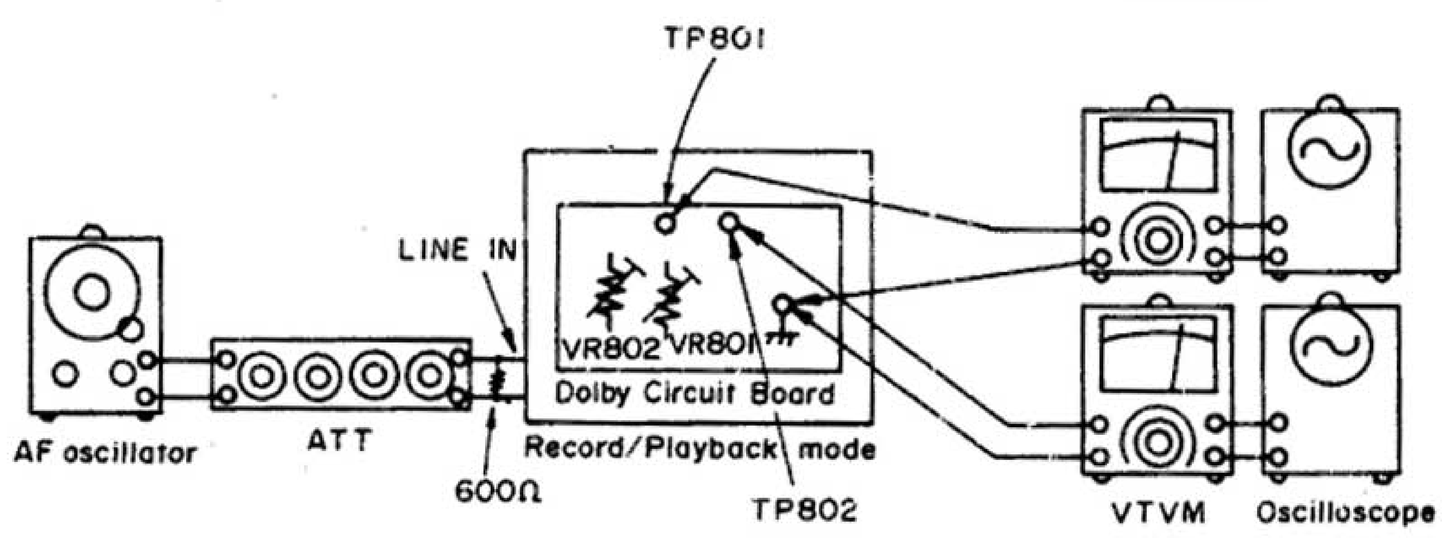


Fig. 16

Cheking FL meter 0 dB segment display ON/OFF

Change the output level at test point [TP801 (L-CH), TP802 (R-CH)] from 0.28 V −1 dB (around 250 mV) to 0.28 V +1 dB (around 310 mV) by adjusting the attenuator, and check that the FL meter 0 dB seqment display OFF state changes to the ON state.

Checking FL meter −40 dB segment display ON/OFF

Lower the signal level 28 dB below the standard input level [−24 dB −28 dB = −52 dB (around 2.5 mV)] and then further lower the level 12 dB [−52 dB −12 dB = −64 dB (around 0.63 mV)] by adjusting the attenuator.
While lowering the level as described above, make sure that only the −40 dB display remains lit, then dims or goes off at the lowest level.

ITEM	MEASUREMENT & ADJUSTMENT

• Adjustment for FL meter

1. Make connections as shown (See fig. 16).
2. Connect a wire between TP301 and ground terminal (See fig. 17).
3. In the recording pause mode, apply 1 kHz (−24 dB) to LINE IN.
4. Adjust ATT so that output level at test point [TP801 (L-CH), TP802 (R-CH)] is 0.28 V.

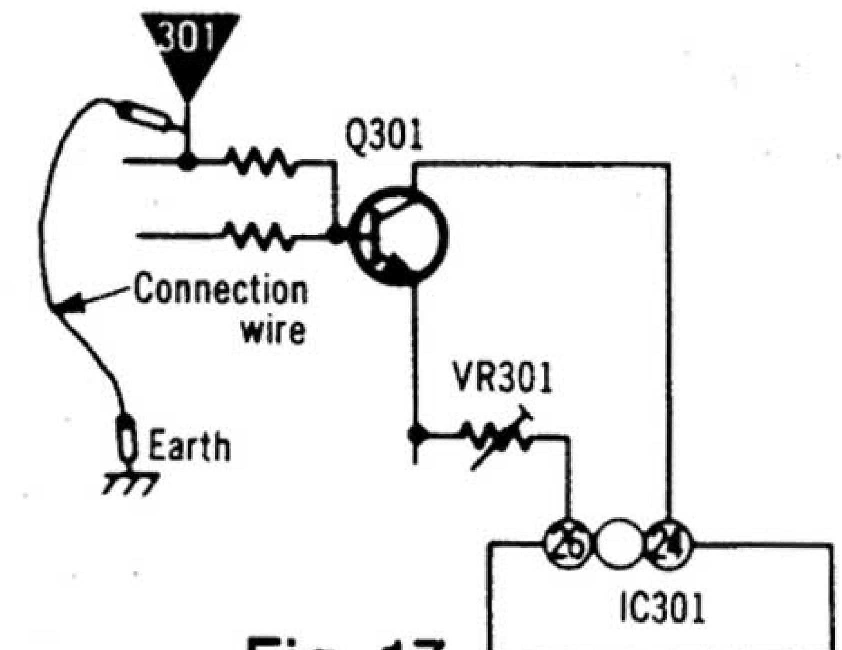


Fig. 17

−40 dB adjustment

5. Adjust ATT so that the level adjusted at step 4 is reuced by 40 dB.
6. At this time, check that −40 dB indicator is dimmed (intermediate brightness between full brightness and light-out: See fig. 18).
7. If the indicator is not lighted halfway as described in step 6, adjust VR302.

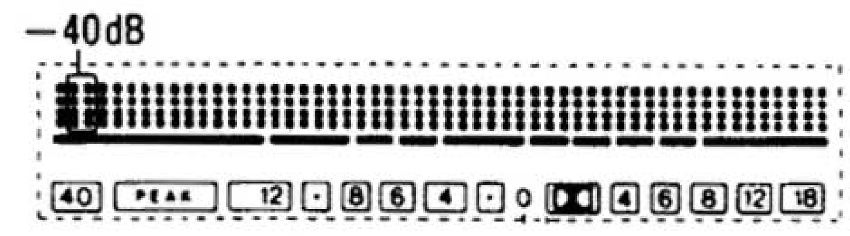


Fig. 18

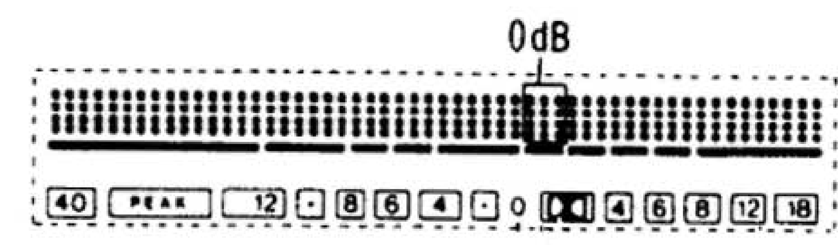


Fig. 19

0 dB adjustment

8. Restore the condition of step 4 (set output level to 0.28 V at test point [TP801 (L-CH), TP802 (R-CH)]).
9. At this time, check that 0 dB indicator is dimmed (intermediate brightness between full brightness and light-out: See fig. 19).
10. If improper, adjust VR301.
11. Repeat adjustments and checks at steps 4, 5, 6, 7, 8, 9 and 10 two or three times.
12. Disconnect the wire between TP301 and ground terminal, which had been connected at step 2.

---

❶ Dolby NR circuit

Condition:
* Record mode
* Dolby NR select switch ··· OUT/B/C
* Input level controls ····· MAX

Equipment:
* VTVM * AF oscillator
* ATT * Oscilloscope
* Resistor (600 Ω)

Dolby circuit frequency response check

• Check of the Dolby-B type encoder characteristics

1. Make connections as shown in fig. 20.
2. Set the unit to the record mode. (NR select switch is OUT.)
3. Apply a 1 kHz signal to LINE IN.
4. Adjust the ATT so that the output level at TP801 (L-CH) and TP802 (R-CH) is 12 mV.
5. The output level at pin 14 should be 0 dB.
6. Set the NR select switch to B, and make sure that the output signal level at pin 14 of IC801 (L-CH) and IC802 (R-CH) is +6 dB±2.5 dB.
7. Set the NR select switch to OUT, and adjust the frequency to 5 kHz. The output signal level at pin 14 should be 0 dB.
8. Set the NR select switch to B and make sure that the output signal level at pin 14 of IC801 (L-CH) and IC802 (R-CH)is 8 dB±2.5 dB.

• Check of Dolby-C type encoder characteristics

9. Repeat steps 1-5 above.
10. Set the NR select switch to C and make sure that the output signal level at pin 14 of IC801 (L-CH) and IC802 (R-CH) is 11.5 dB±2.5 dB.
11. Set the NR select switch to OUT and adjust the frequency to 5 kHz. The output signal at pin 14 should be 0 dB.
12. Set the NR select switch to C and make sure that the output signal level at pin 14 of IC801 (L-CH) and IC802 (R-CH) is 8.5 dB±2.5 dB.

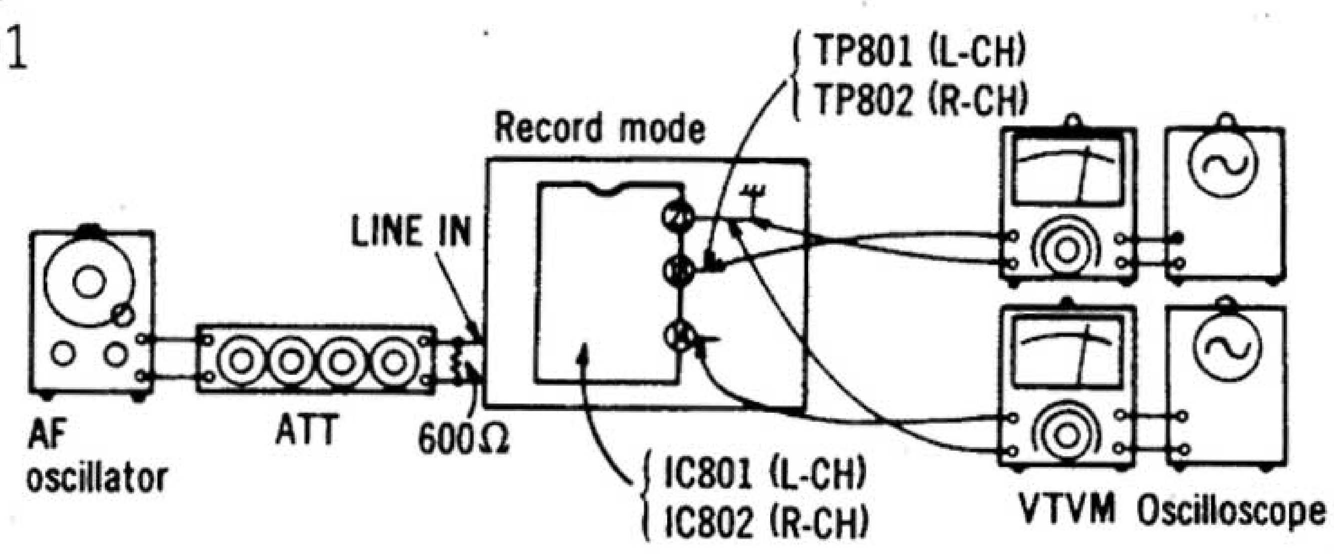


Fig. 20

---

❷ Input scanning time adjustment

Condition:
* Stop mode

Equipment:
* Oscilloscope

1. Connect oscilloscope to ⑰ terminal of IC501.
2. Measure the time of input scanning signal with oscilloscope as shown in fig. 21.

Standard value: About 10 msec

3. If the measured value is markedly different from the signal shown below, make the necessary adjustment with VR501.

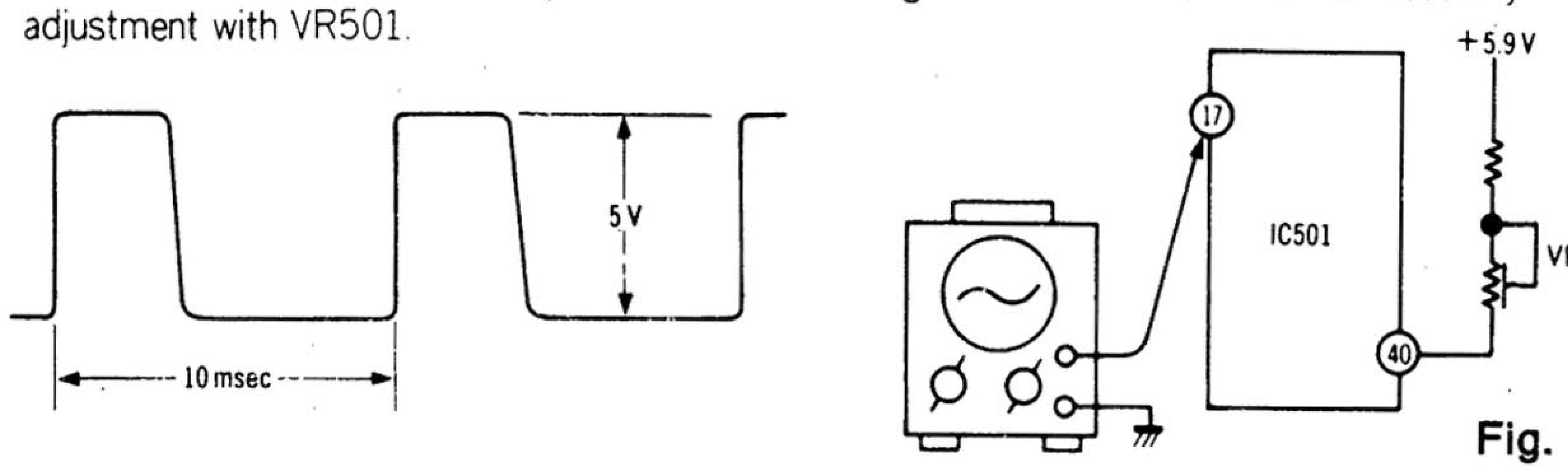
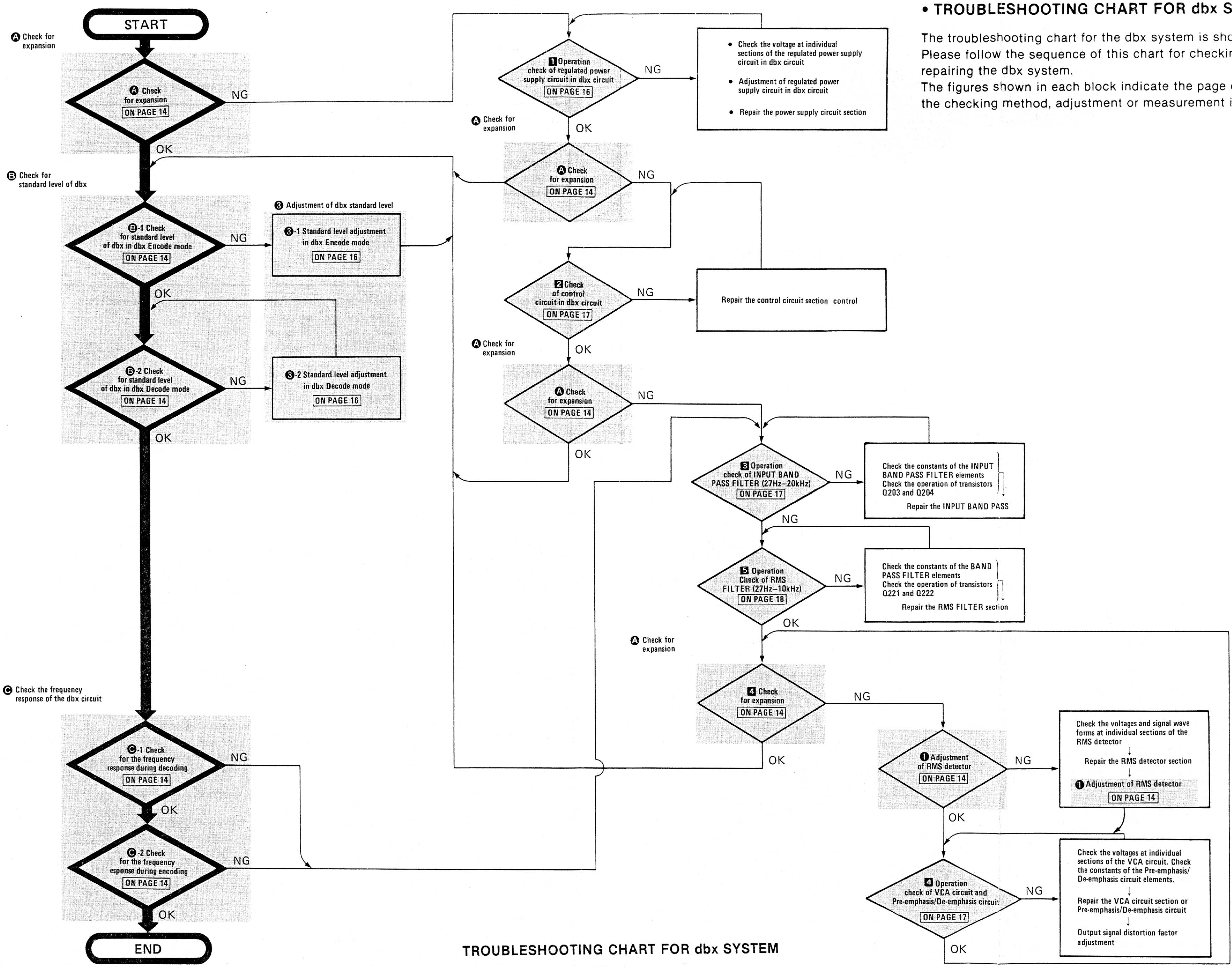


Fig. 21

MEASUREMENT AND ADJUSTMENT METHODS (FOR dbx SYSTEM)

• TROUBLESHOOTING CHART FOR dbx SYSTEM

The troubleshooting chart for the dbx system is shown in Fig. 1. Please follow the sequence of this chart for checking and repairing the dbx system.
The figures shown in each block indicate the page on which the checking method, adjustment or measurement is explamed.



TROUBLESHOOTING CHART FOR dbx SYSTEM

Fig. 1

• ADJUSTMENT PARTS LOCATION OF dbx SYSTEM

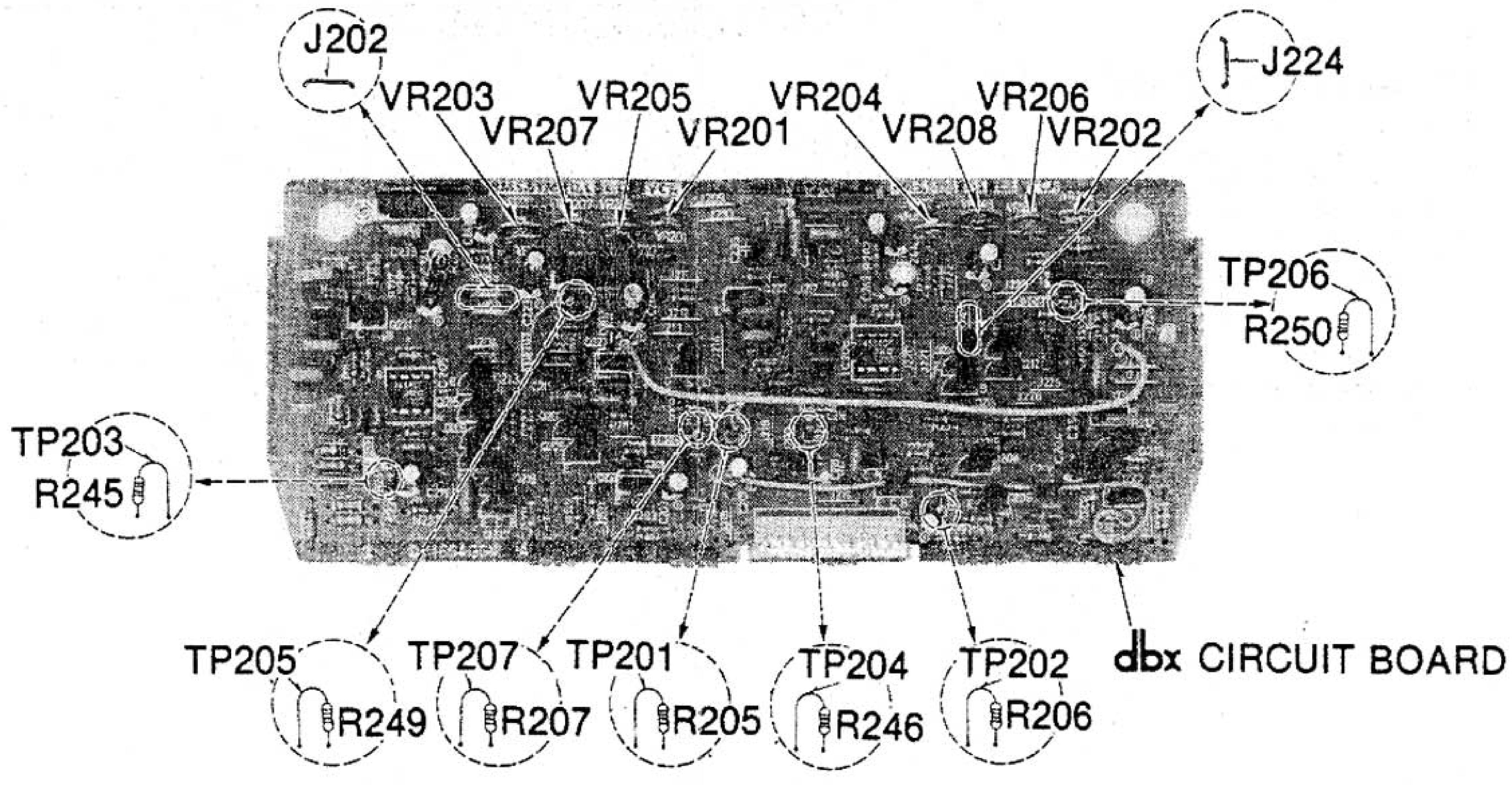
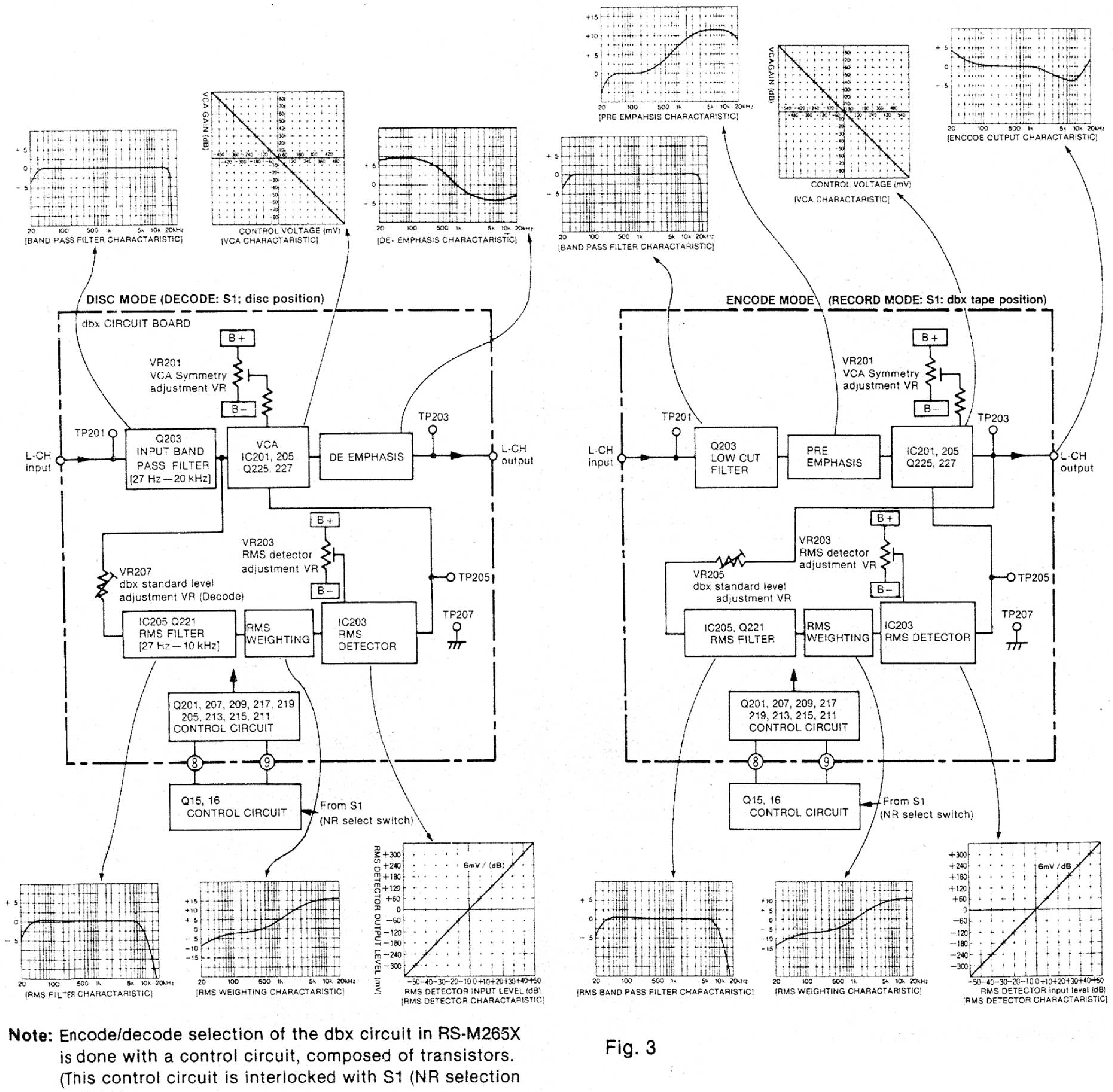


Fig. 2

BLOCK DIAGRAM OF dbx SECTION (L·CH ONLY)



Note: Encode/decode selection of the dbx circuit in RS-M265X is done with a control circuit, composed of transistors. (This control circuit is interlocked with S1 (NR selection switch).)

Fig. 3

dbx SYSTEM CHECKING METHOD

NOTES: Keep good condition. set switches and controls in the following positions, unless otherwise specified.

- Input level controls: Maximum
- Output level control: Maximum

ITEM	CHECKING METHOD

Ⓐ Check for expansion

Item

Condition:
- Stop mode
- Input level controls ··· MAX
- Output level control ··· MAX
- Noise reduction selector ··· disc dbx tape

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

Checking method

Ⓐ Check for expansion

1. Make the connections as shown in fig. 4 and apply 1 kHz −27 dB signal from LINE IN. and set the noise reduction selector to disc position.
2. Adjust ATT. increase input signal level by 10 dB. and make sure that the reading for VTVM increases by 20 dB ± 1 dB.
3. Adjust ATT. decrease the input signal level. and make sure that the reading for VTVM decreases by 20 dB ± 1 dB.

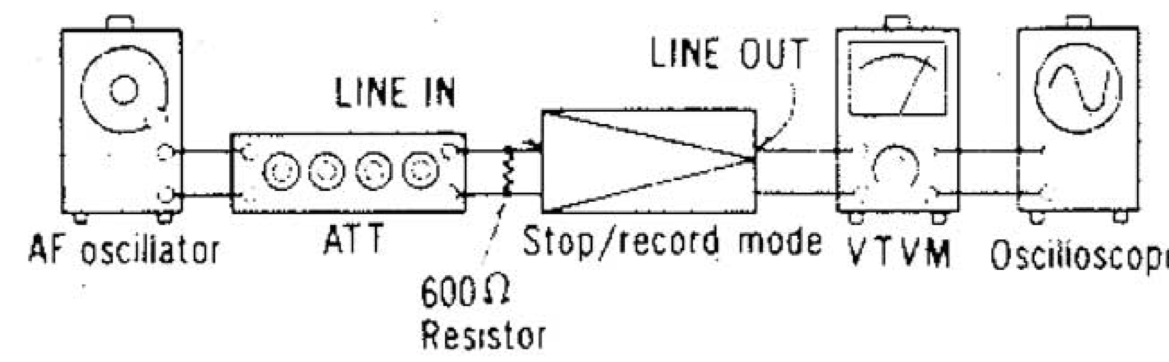


Fig. 4

Ⓑ Check for standard level of dbx

Item

Condition:
- Stop record mode
- Input level controls ··· MAX
- Noise reduction selector ··· disc dbx tape

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

Checking method

Ⓑ-1 Check for standard level of dbx in dbx Encode mode

1. Make the connections as shown in fig. 5 and apply 1 kHz −27 dB signal from LINE IN. and set the noise reduction selector to dbx tape position.
2. Set the unit to record mode. adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300 mV.
3. Make sure that the signal level at TP203 (L-CH) and TP204 (R-CH) is 300 mV ± 0.5 dB.

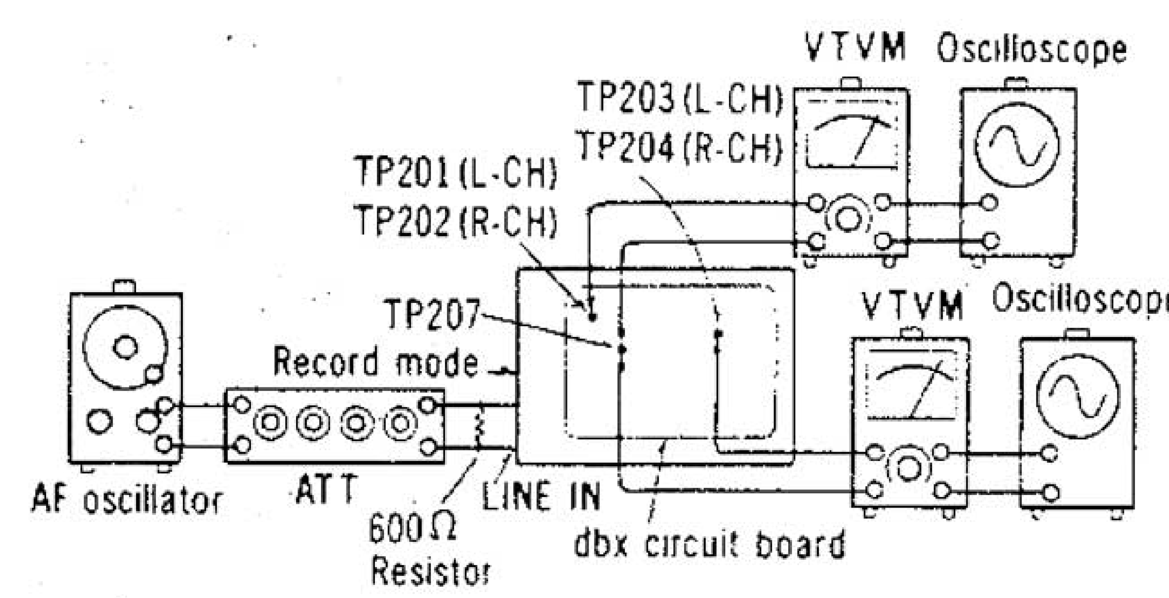


Fig. 5

Ⓑ-2 Check for standard level of dbx in dbx Decode mode

1. Make the connections as shown in fig. 5 and apply 1 kHz −27 dB signal from LINE IN. and check as follows:
2. Set the noise reduction selector to disc position and adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) becomes 300 mV.
3. Make sure that the signal level at TP203 (L-CH) and TP204 (R-CH) is 300 mV ± 0.5 dB.

Ⓒ Check the frequency response of the dbx circuit

Item

Condition:
- Stop record mode
- Input level controls ··· MAX
- Noise reduction selector ··· disc dbx tape

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

Checking method

Ⓒ-1 Check the frequency response during decoding

1. Make the connections as shown in fig. 5 and apply 1 kHz −27 dB signal from LINE IN. and check as follows:
2. Set the noise reduction selector to disc position, and adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) becomes 300 mV.
3. With the signal level at TP203 (L-CH) and TP204 (R-CH) as 0 dB. change the signal frequency to 100 Hz. 20 Hz and 7 kHz respectively. Read signal levels at TP203 (L-CH) and TP204 (R-CH) and check that they are within the specifications-1.

Specifications-1

Frequency	Signal levels at TP203 and TP204
1 kHz	0 dB (300 mV)
100 Hz	−0.5 dB ± 1 dB
20 Hz	−30 dB ± 5 dB
7 kHz	+ 7 dB ± 1 dB

Ⓒ-2 Check the frequency response during encoding

1. Make the connections as shown in fig. 5 and apply 1 kHz −27 dB signal from LINE IN. and check as follows:
2. Set the noise reduction selector to dbx tape position. and the unit to record mode.
3. Adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300 mV.
4. With the signal level at TP203 (L-CH) and TP204 (R-CH) as 0 dB, change the signal frequency to 100 Hz and 7 kHz respectively. Read signal levels at TP203 (L-CH) and TP204 (R-CH) and check that they are within the specifications-2.

Specifications-2

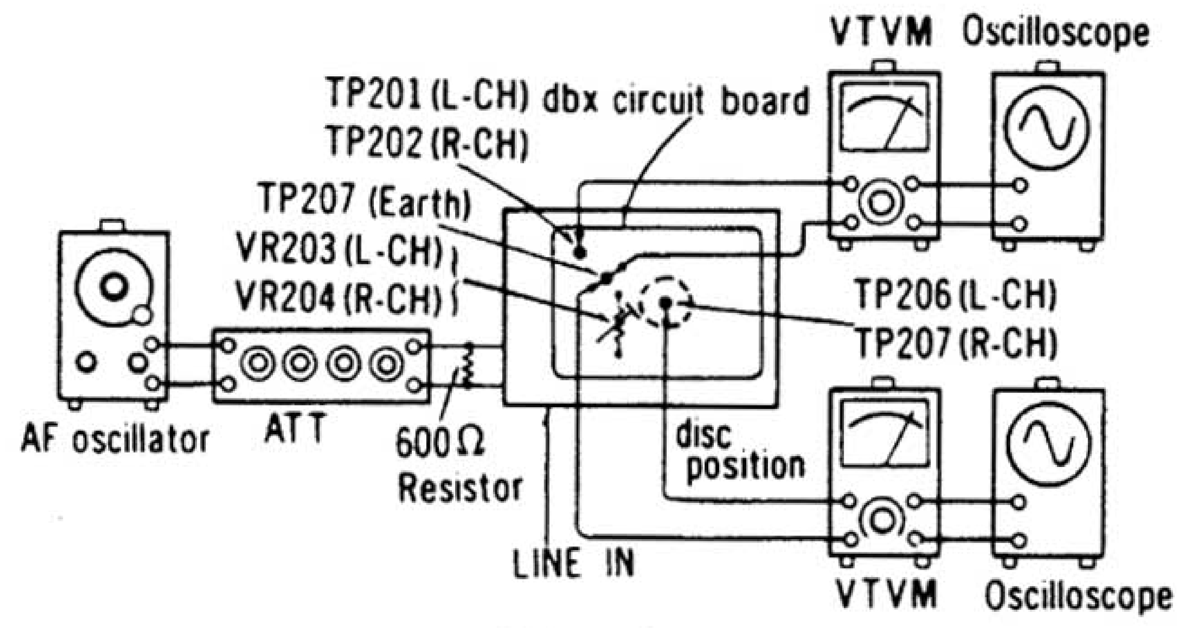
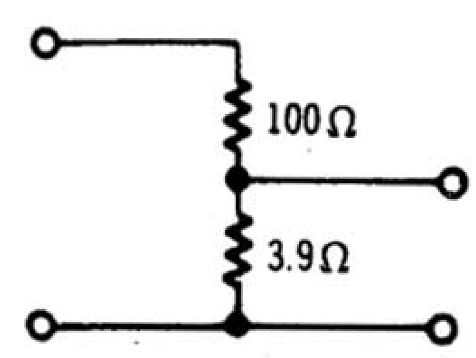
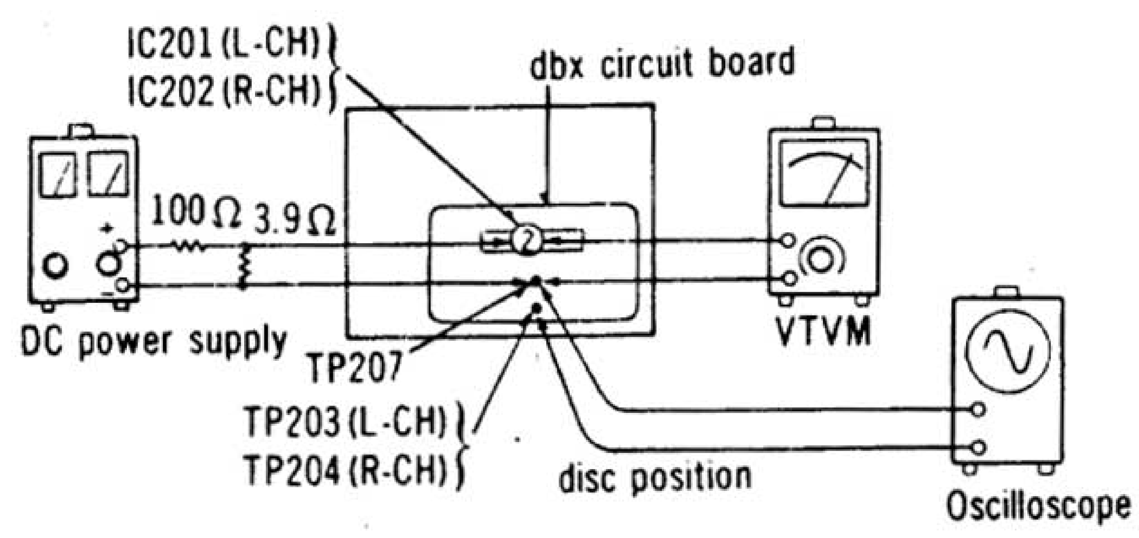
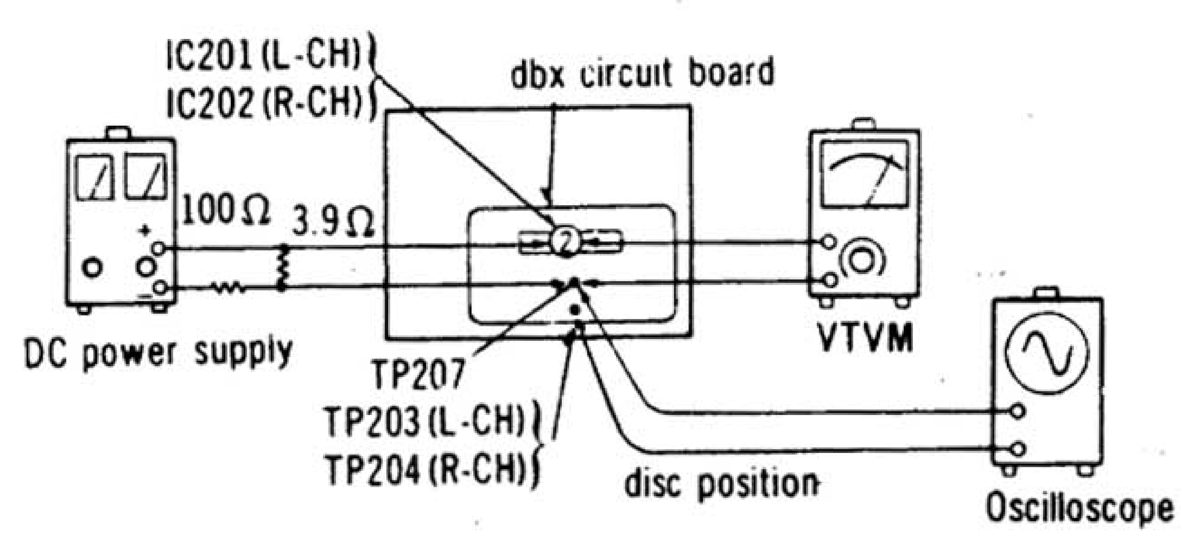
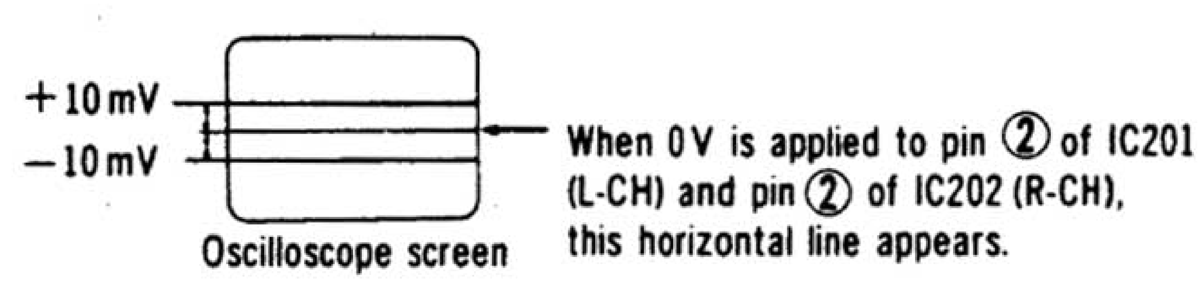
Frequency	Signal levels at TP203 and TP204
1 kHz	0 dB (300 mV)
100 Hz	−0.5 dB ± 1 dB
7 kHz	−3.5 dB ± 1 dB

NOTES:
- If the results of the above checks Ⓐ, Ⓑ and Ⓒ do not satisfy the specifications. perform the following adjustments
- If the specifications are not satisfied even after the adjustments. follow the checking procedure for problems.
- If the output signal is not produced or is extremely distorted. follow the checking procedure for problems.

ADJUSTMENT OF dbx SYSTEM

NOTES: When adjusting the circuit of the dbx system, be sure to perform the adjustments in the following order:
❶ Adjustment of RMS detector, ❷ Adjustment of VCA, ❸ Adjustment of dbx standard level.
Keep good condition, set switches and controls in the following positions, unless otherwise specified.

- Input level controls: Maximum

ITEM	ADJUSTMENT
❶ Adjustment of RMS detector Condition: * Stop mode * Input level controls ··· MAX * Noise reduction selector ··· disc Equipment: * VTVM * AF oscillator * ATT * Oscilloscope * Resistor (600 Ω)	1. Make the connections as shown in fig. 6, and set the noise reduction selector to disc position. 2. Apply 100 Hz −27 dB signal from LINE IN. 3. Adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) becomes 300 mV. 4. Make sure that the output signal at TP205 (L-CH) and TP206 (R-CH) is at 200 Hz sine wave. If the output signal is not sinusoidal as shown in fig. 7, adjust VR203 (L-CH) and VR204 (R-CH) to make it sinusoidal. NOTE: The voltage of the output signal after adjustment is about 0.5 mV rms.  **Fig. 6**  **Fig. 7**
❷ Adjustment of VCA Condition: * Record/stop mode * Input level controls ··· MAX * Noise reduction selector ··· disc/dbx tape Equipment: * VTVM * Oscilloscope * Resistor (100 Ω, 3.9 Ω)	**Preparation before adjustment** 1. Before adjusting VCA, from the device shown below using resistors of 100 Ω and 3.9 Ω (See fig. 8). 2. Set NR switch to dbx disc. Remove jumpers [J202 (L-CH) and J224 (R-CH)]. 3. Arrange connections referring to wire connection diagram (fig. 9 and 10), since 0 V, +180 mV and −180 mV (DC) are applied in this order to pin 2 of IC201 (L-CH) and pin 2 of IC202 (R-CH).  **Fig. 8**  **Connections when applying +180 mV and 0 V** Adjust DC power supply and arrange connections so that +180 mV or 0 V can be applied to TP203 (L-CH) and TP204 (R-CH). **Fig. 9**  **Connections when applying −180 mV** Adjust DC power supply and arrange connections so that −180 mV can be applied to TP203 (L-CH) and TP204 (R-CH). **Fig. 10** **Adjustment procedure** 1. Apply 0 V to pin ② of IC201 (L-CH) and pin ② of IC202 (R-CH), and a horizontal line will appear on the screen of the oscilloscope. Use this line as the reference line. 2. Apply +180 mV to pin ② of IC201 (L-CH) and pin ② of IC202 (R-CH) (See fig. 9), and check that the level is not more than 10 mV from the reference line. If improper, adjust VR201 (L-CH) and VR202 (R-CH). 3. In the same way, apply −180 mV to pin ② of IC201 (L-CH) and pin ② of IC203 (R-CH) (See fig. 10), and check that the level is not more than 10 mV from the reference line. If improper, adjust VR201 (L-CH) and VR202 (R-CH). 4. Repeat steps 2 and 3, and adjust VRs so that the levels are within ±10 mV when +180 mV and −180 mV are applied (fig. 11). 5. After adjustment, connect jumpers J202 (L-CH) and J224 (R-CH) (See fig. 2).  **Fig. 11**
❸ Adjustment of dbx standard level Condition: * Record/stop mode * Input level controls ··· MAX	NOTE: Be sure to perform the standard level adjustment in dbx Encode, followed by the standard level adjustment in dbx Decode.

<table>
<tr><th>ITEM</th><th>ADJUSTMENT</th></tr>
<tr><td>

* Noise reduction selector
  ··· disc /dbx tape

Equipment:

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

</td><td>

❸-1 Standard level adjustment in dbx Encode mode

1. Make the connection as shown in fig. 12 and apply 1kHz −27dB signal from LINE IN, and set the noise reduction selector to dbx tape position.
2. Set unit to record mode, adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300mV.
3. Adjust VR205 (L-CH) and VR206 (R-CH) so that the output signal level at TP203 (L-CH) and TP204 (R-CH) becomes 300mV±0.5dB.

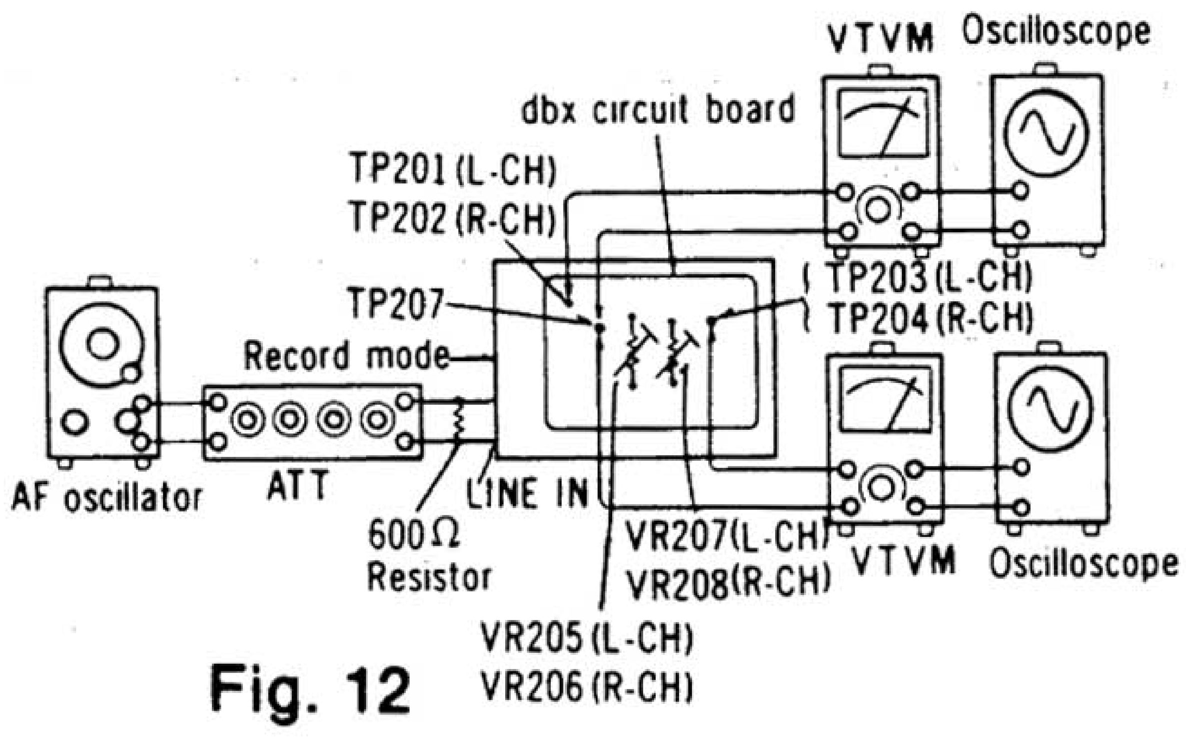


Fig. 12

❸-2 Standard level adjustment in dbx Decode mode

1. Make the connection as shown in fig. 12 and apply 1kHz −27dB signal from LINE IN, and perform the following adjustments.
2. Set the noise reduction selector to disc position, and adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) becomes 300mV.
3. Adjust VR207 (L-CH) and VR208 (R-CH) so that the output signal level at TP203 (L-CH) and TP204 (R-CH) becomes 300mV±0.5dB.

</td></tr>
<tr><td colspan="2">

NOTES:

* After adjustments ❶, ❷ and ❸, re-check according to "dbx SYSTEM CHECKING METHOD".
* If the specifications are not satisfied, perform the adjustments again.

</td></tr>
</table>

CHECKING PROCEDURE FOR PROBLEMS

NOTES: Find defective parts according to the circuit operation checking method given below, and use the results for your reference during repair. Remember to adjust after repair.

Keep good condition, set switches and controls in the following positions, unless otherwise specified.

* Input level controls: Maximum

<table>
<tr><th>ITEM</th><th>CHECKING METHOD</th></tr>
<tr><td>

1 Operation check of regulated power supply circuit in dbx circuit

Equipment:

* DC volt meter
* Oscilloscope

</td><td>

1-1 Check of +10.5V voltage

Make the connection as shown in fig. 13 and make sure that the emitter voltage of Q401 is around +10.5V.

1-2 Check of −10.5V voltage

Make the connection as shown in fig. 13 and make sure that the emitter voltage of Q404 is around −10.5V.

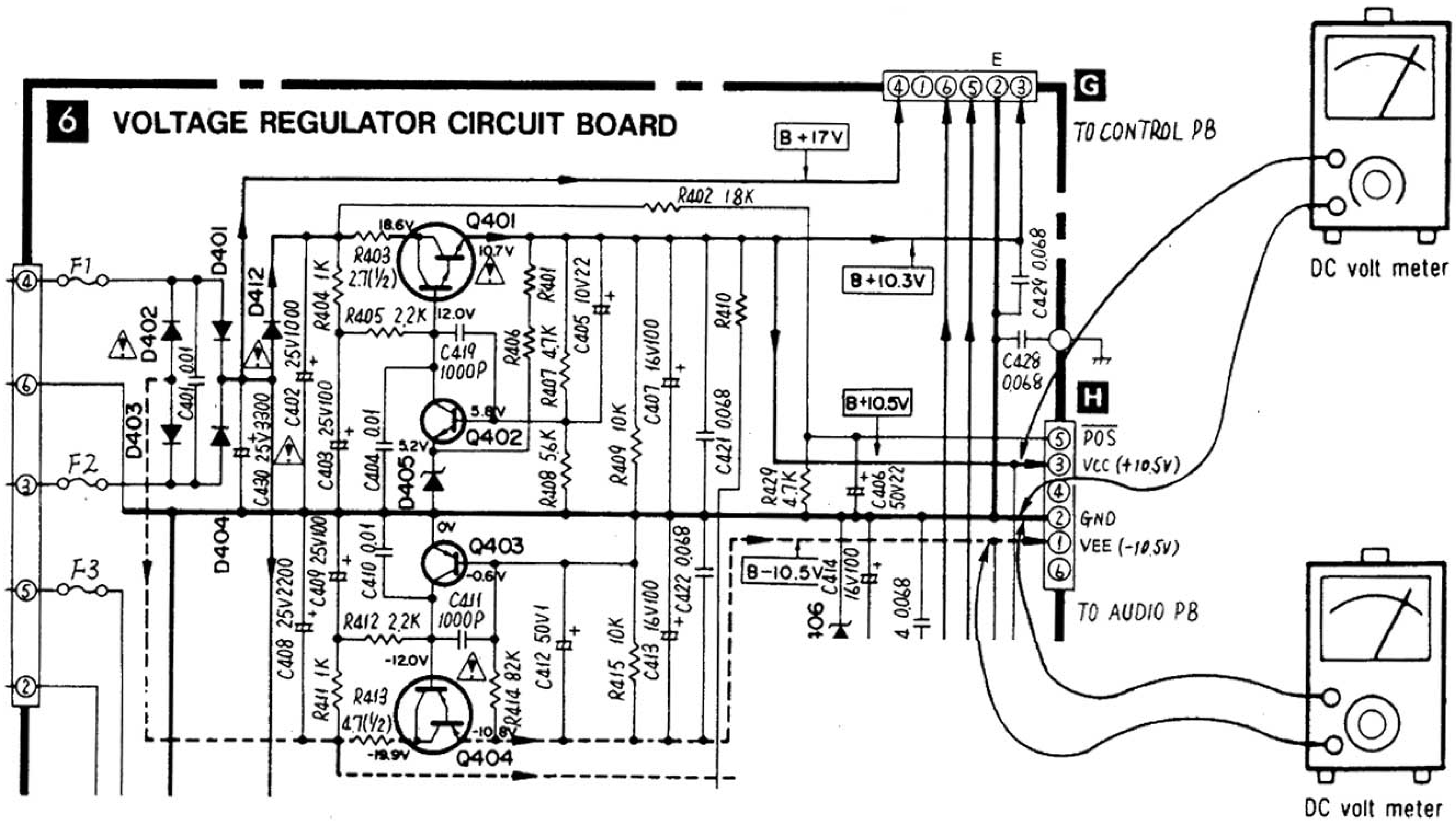


Fig. 13

</td></tr>
</table>

ITEM	CHECKING METHOD

2 Check of control circuit in dbx circuit

Equipment:
- DC volt meter

E.C.B (G.S.D) voltage check of each switching transistor for Encode/Decode

The terminal voltage of each switching transistor in Encode/Decode mode are shown in the table below.

Transistor Ref. No.	Encode (dbx tape)			Decode (dbx tape)			disc		
	E (G)	C (S)	B (D)	E (G)	C (S)	B (D)	E (G)	C (S)	B (D)
Q15	−10.8V	6.0V	−10.8V	−10.8V	−10.8V	−10.1V	−10.8V	−10.8V	−10.1V
Q16	10.7V	−10.4V	10.6V	10.6V	10.7V	9.9V	−10.7V	−10.2V	−10.6V
Q17, 18	−8.8V	0V	0V	0.6V	0V	0V	0.6V	0V	0V
Q19, 20	0.6V	0V	0V	−8.8V	0V	0V	−8.8V	0V	0V
Q21	−10.8V	−10.8V	−10.1V	−10.8V	10.0V	−10.8V	−10.8V	−10.8V	−10.1V
Q30	0V	0V	0.6V	0V	10.7V	0V	0V	0V	0.6V
Q32	10.7V	10.7V	10.1V	10.7V	−10.7V	10.7V	10.7V	10.7V	10.1V

Transistor Ref. No.	Encode (dbx tape)			Decode (dbx tape)		
	E (G)	C (S)	B (D)	E (G)	C (S)	B (D)
Q201	0V	0V	3.46V	0V	0V	−3.26V
Q202	0V	0V	−2.6V	0V	0V	−3.22V
Q205	−0.66V	−1.23V	−1.23V	−1.43V	−1.23V	0.01V
Q206	−2.7V	−1.3V	0V	−3.2V	−1.3V	0V
Q207	−3.36V	−1.23V	0V	−0.66V	−1.23V	−1.23V
Q208	−0.73V	−1.31V	−1.3V	−0.73V	−1.31V	−1.31V
Q209, 210	0.01V	0V	0V	0.01V	0V	0V
Q211	0.04V	0V	0.04V	0.03V	0V	−0.05V
Q212	0.04V	0V	0.02V	0.03V	0V	0.02V

Transistor Ref. No.	Encode (dbx tape)			Decode (dbx tape)		
	E (G)	C (S)	B (D)	E (G)	C (S)	B (D)
Q213	0.01V	0.04V	0V	0.01V	−0.05V	0V
Q214	0.01V	0.04V	0V	0.01V	0.02V	0V
Q215	0.04V	0.04V	0.04V	0.03V	0.02V	0.02V
Q216	0.04V	0V	0V	0.03V	0.02V	0.02V
Q217	−1.37V	−0.27V	−0.26V	−1.34V	−0.31V	−0.4V
Q218	−1.29V	0V	−0.02V	−2.3V	0V	−0.06V
Q219	0.56V	0V	0V	0.56V	0V	0V
Q220	0.57V	0V	0V	0.57V	0V	0V
Q223	−10.06V	−2.52V	−10.19V	−10.08V	−2.34V	−10.2V

NOTE:

- If no abnormality is found in steps 1 and 2, check the operation for each part as follows:

3 Operation check of INPUT BAND PASS FILTER circuit (27Hz−20kHz)

Condition:
- Record mode
- Input level controls ··· MAX
- Noise reduction selector ···dbx tape

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

1. Make the connections as shown in fig. 14, and apply 100Hz −27dB signal from LINE IN, and set the noise reduction selector to dbx tape position.
2. Set the unit to record mode.
3. Adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300mV.
4. Make sure that the emitter signal level of Q203 (L-CH) and Q204 (R-CH) is 300mV.
5. Set the input signal frequency to 5kHz and make sure that the emitter signal of Q203 (L-CH) and Q204 (R-CH) remains at the same level (300mV).

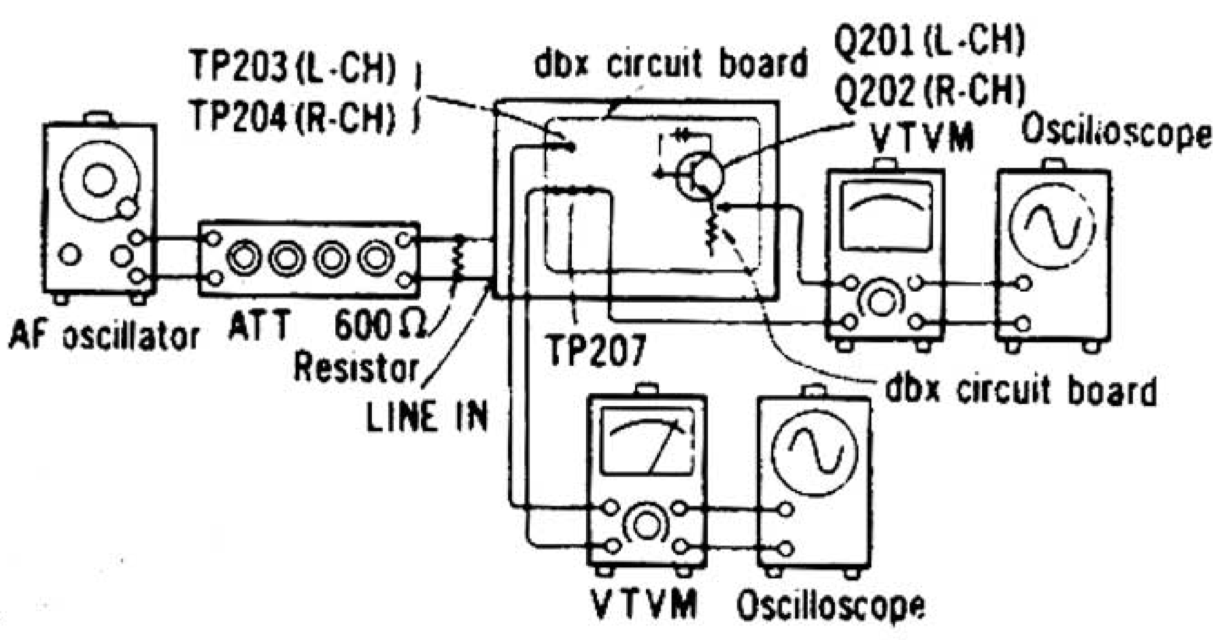


Fig. 14

4 Operation check of VCA circuit and Pre-emphasis/De-emphasis circuit

Condition:
- Stop/record mode
- Input level controls ··· MAX
- Noise reduction selector ··· disc/dbx tape

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

4-1 Operation check of VCA circuit and Pre-emphasis circuit

1. Make the connections as shown in fig. 15, and apply 100Hz −27dB signal from LINE IN.
2. Short pin ③ of IC201 (L-CH) and IC202 (R-CH) to TP207 (ground) as shown in fig. 16.
3. Set the unit to record mode, and set the noise reduction selector to dbx tape position.
4. Adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300mV.
5. Make sure that the output signals at TP203 (L-CH) and TP204 (R-CH) are sinusoidal. (The operation of VCA can then be checked.)
6. Shift the frequency of input signal to 5kHz, and make sure that the output signal levels at TP203 (L-CH) and TP204 (R-CH) are increased by about 12dB. (The operation of the Pre-emphasis circuit can then be checked.)

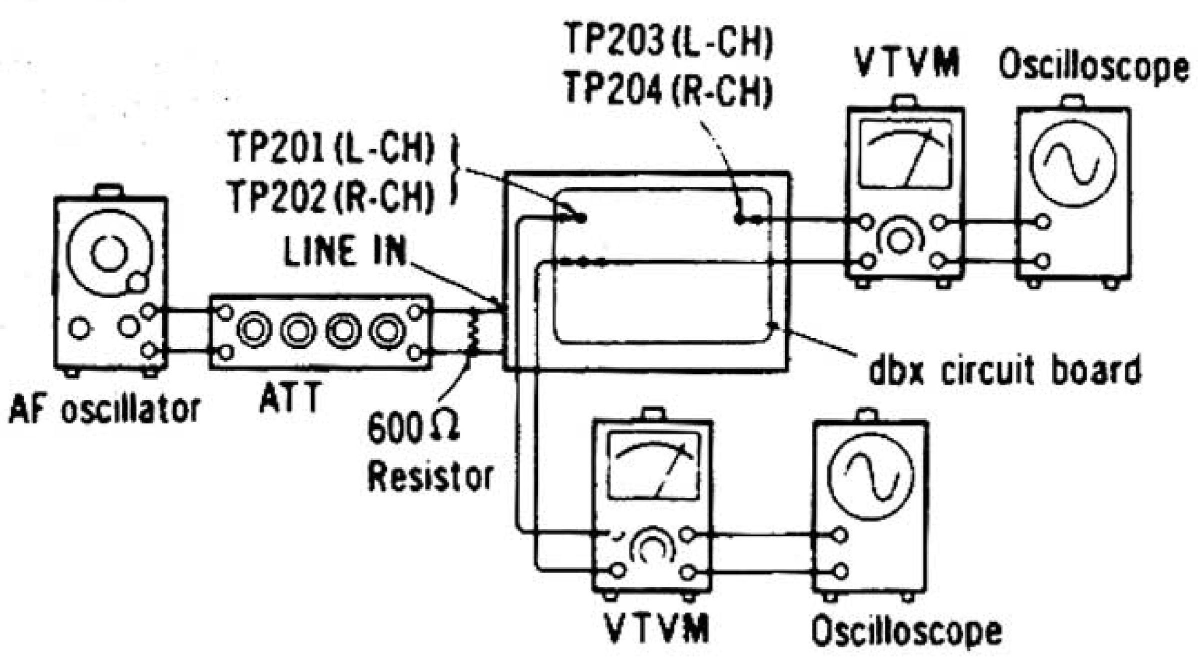


Fig. 15

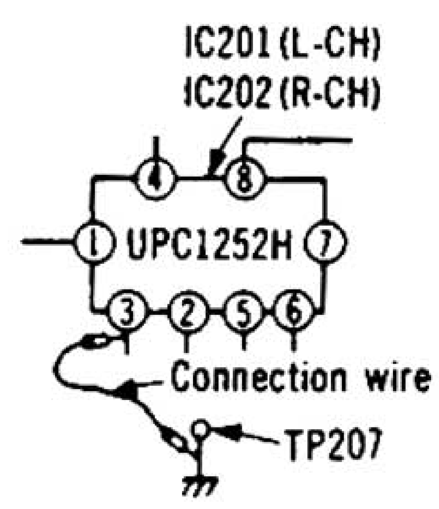


Fig. 16

ITEM	CHECKING METHOD
	4-2 Operation check of VCA circuit and De-emphasis circuit 1. The procedure is the same as 1 for the above 4-1 VCA circuit and Pre-emphasis circuit. 2. Short pin ② of IC201 (L-CH) and IC202 (R-CH) to TP207 (ground) as shown in fig. 17. 3. Set the noise reduction selector to disc position. 4. Adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300 mV. 5. Make sure that the output signals at TP203 (L-CH) and TP204 (R-CH) are sinusoidal. (The operation of VCA can then be checked.) 6. Change the frequency of input signal to 5 kHz and make sure that the output signal level at TP203 (L-CH) and TP204 (R-CH) is decreased by about 12 dB. (The operation of the De-emphasis circuit can then be checked.)
5 Operation check of RMS FILTER circuit (27 Hz—10 kHz) Condition: • Stop mode • input level controls ··· MAX • Noise reduction selector ··· disc Equipment: • VTVM • AF oscillator • ATT • Oscilloscope • Resistor (600 Ω)	1. Make the connections as shown in fig. 18, and apply 100 Hz −27 dB signal from LINE IN. 2. Set the noise reduction selector to disc position. 3. Adjust ATT so that the signal level at TP201 (L-CH) and TP202 (R-CH) is 300 mV. 4. Make sure that the emitter signal level of Q221 (L-CH) and Q222 (R-CH) is around 300 mV. 5. Change the frequency of input signal to 5 kHz and make sure that the emitter signal of Q221 (L-CH) and Q222 (R-CH) remains at the same level (300 mV).

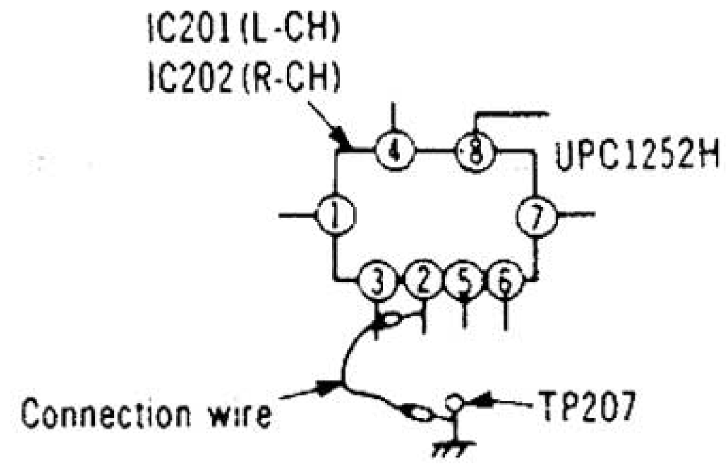


Fig. 17

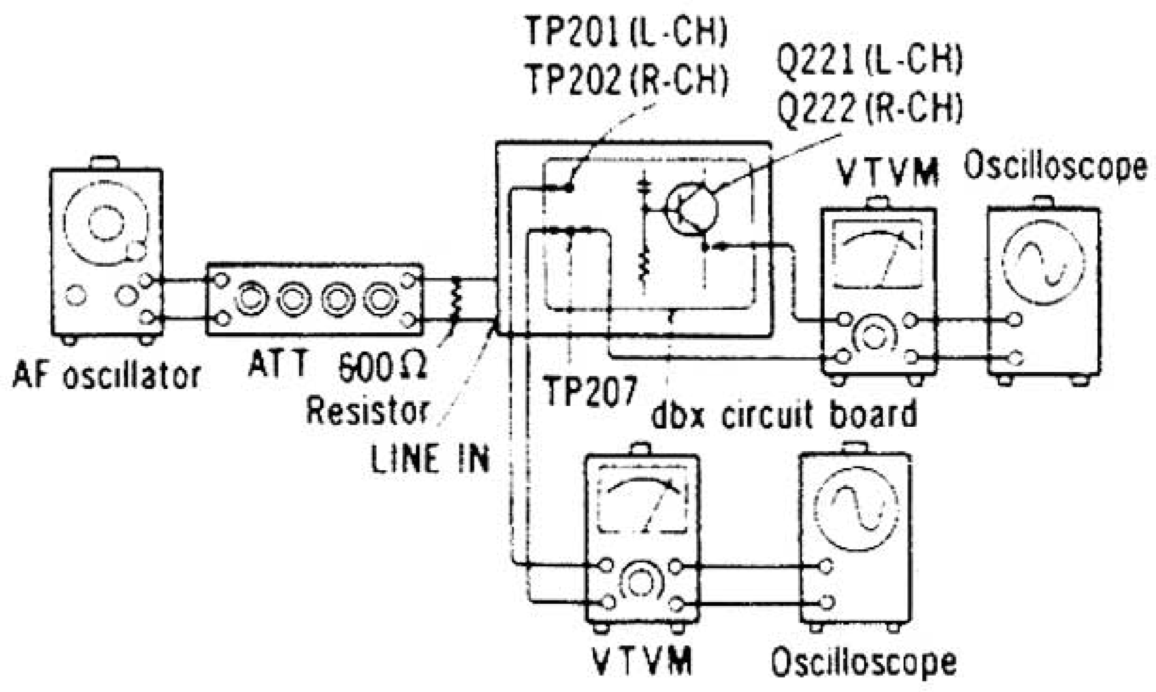
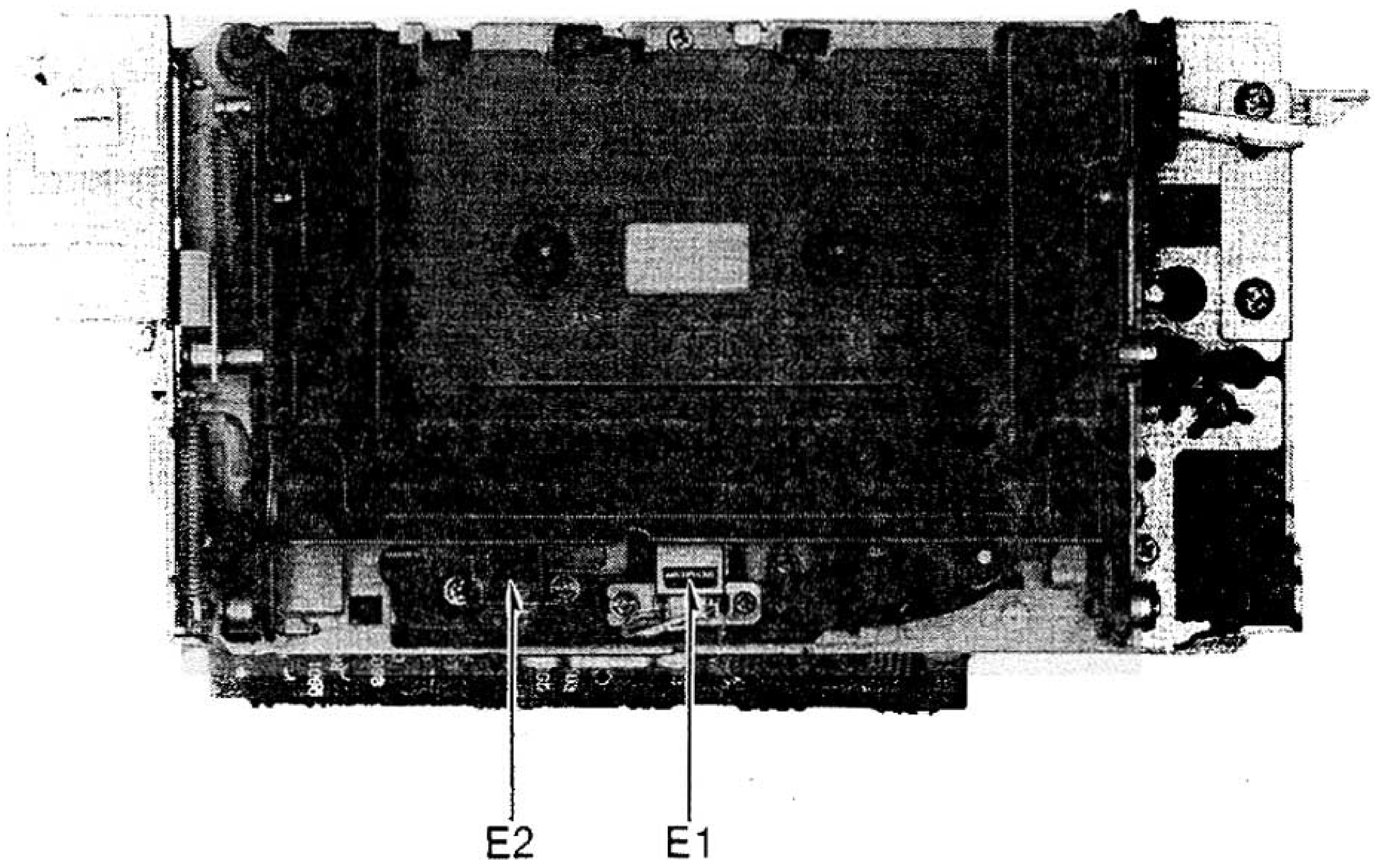
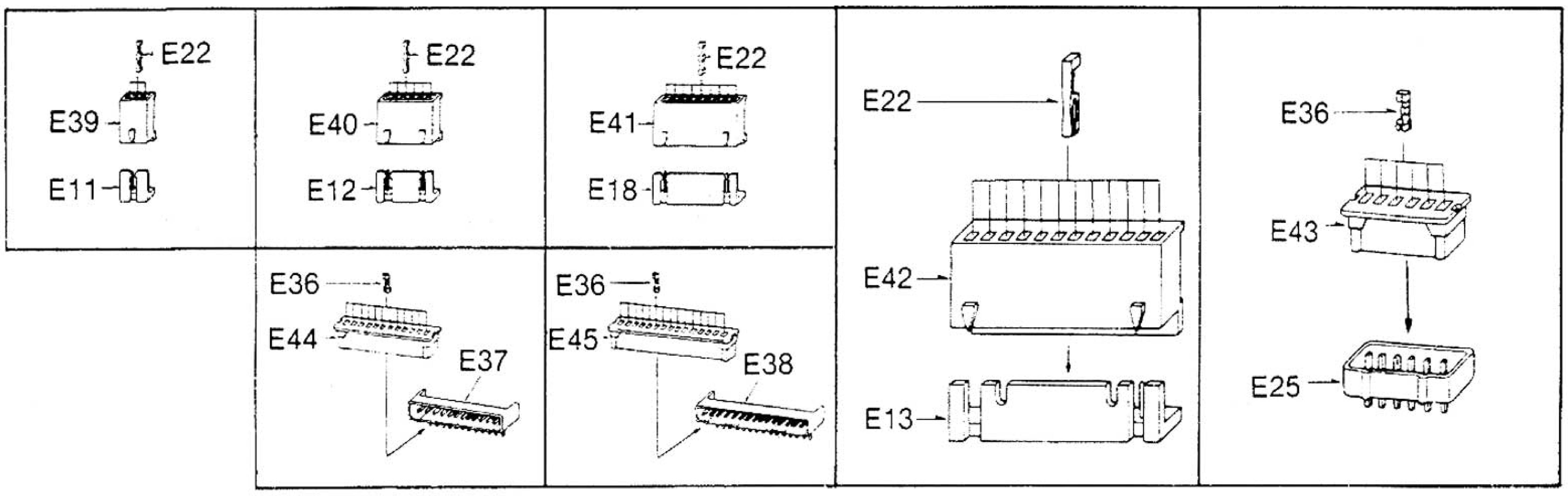
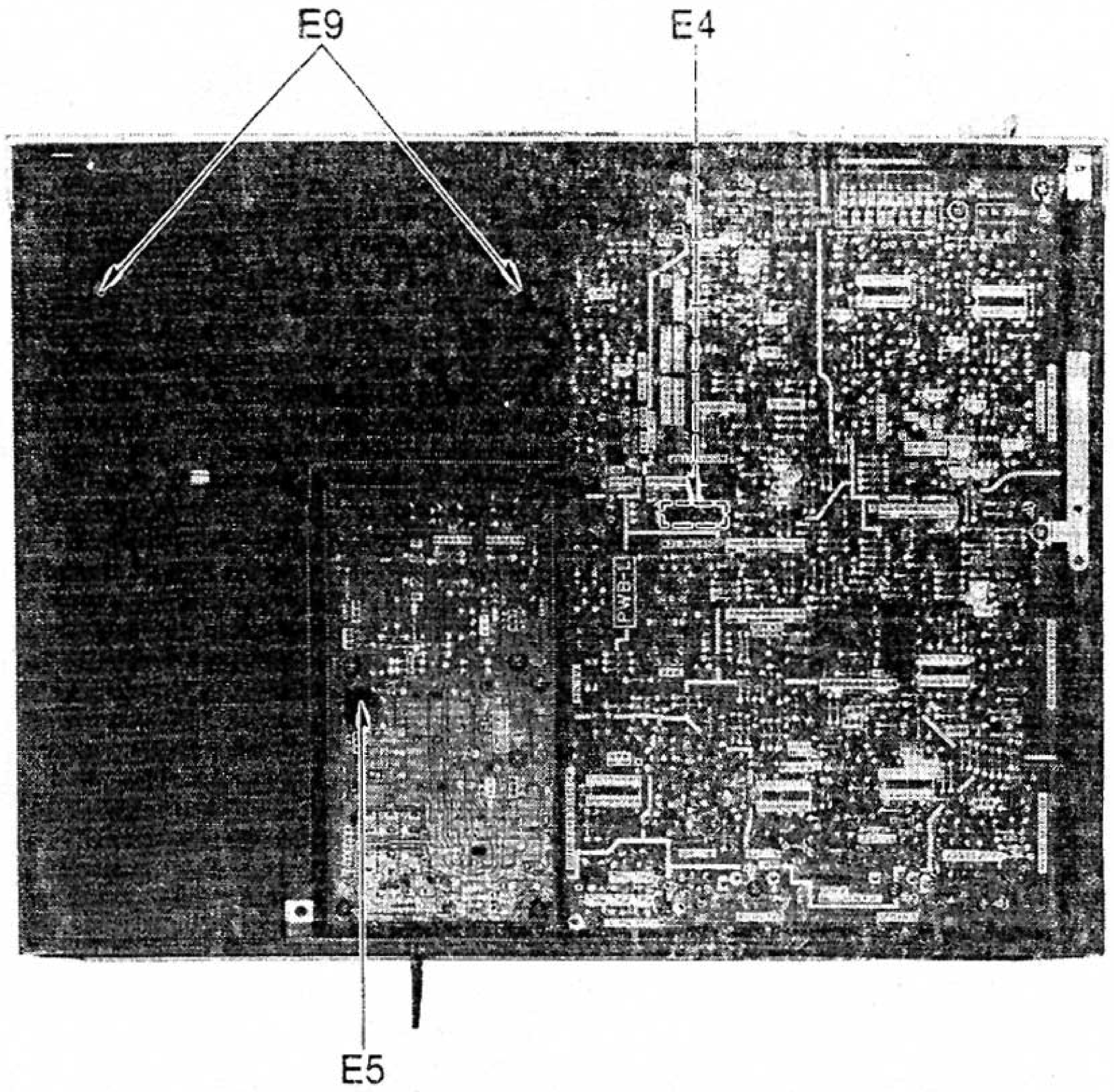


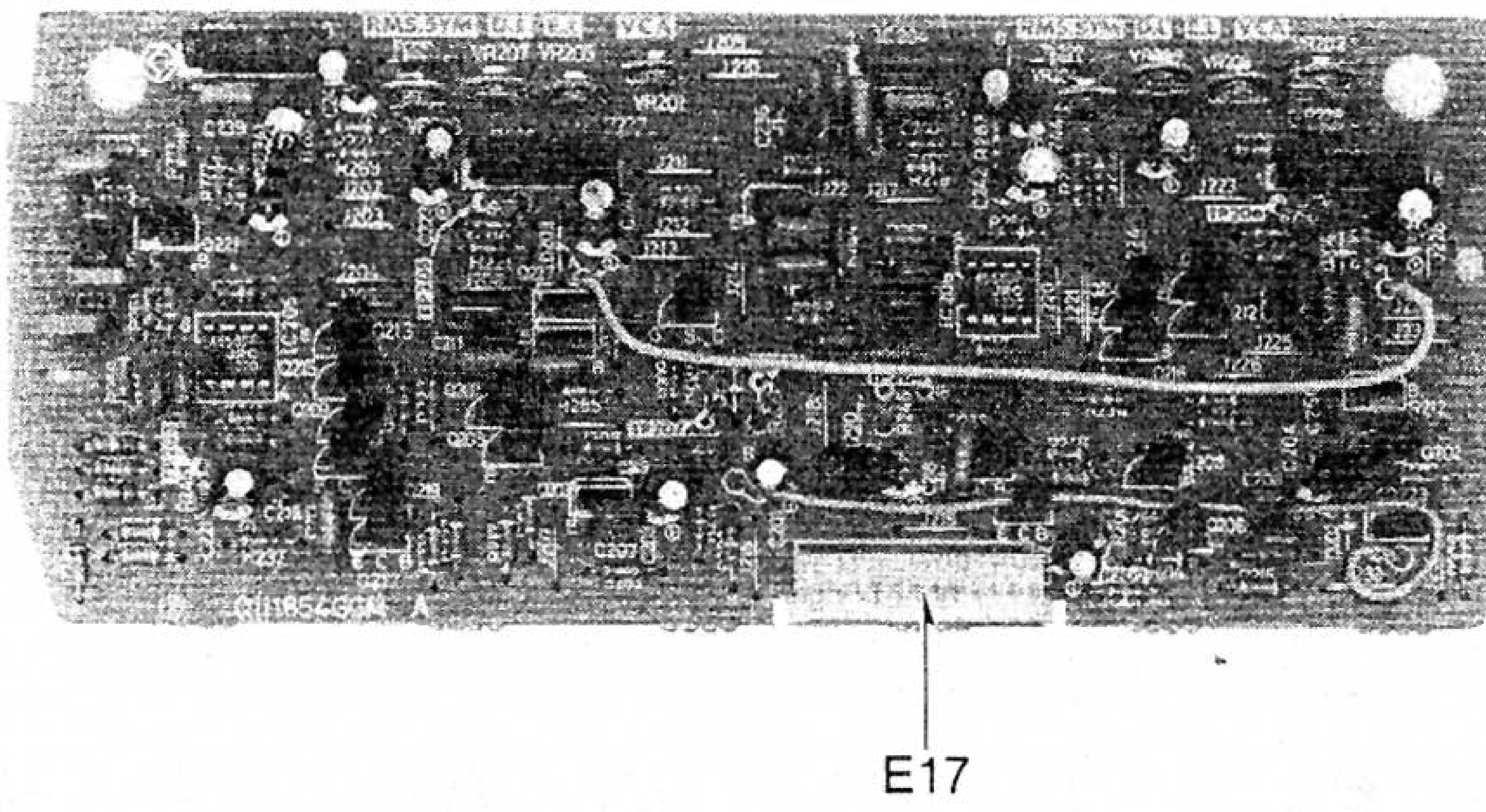
Fig. 18

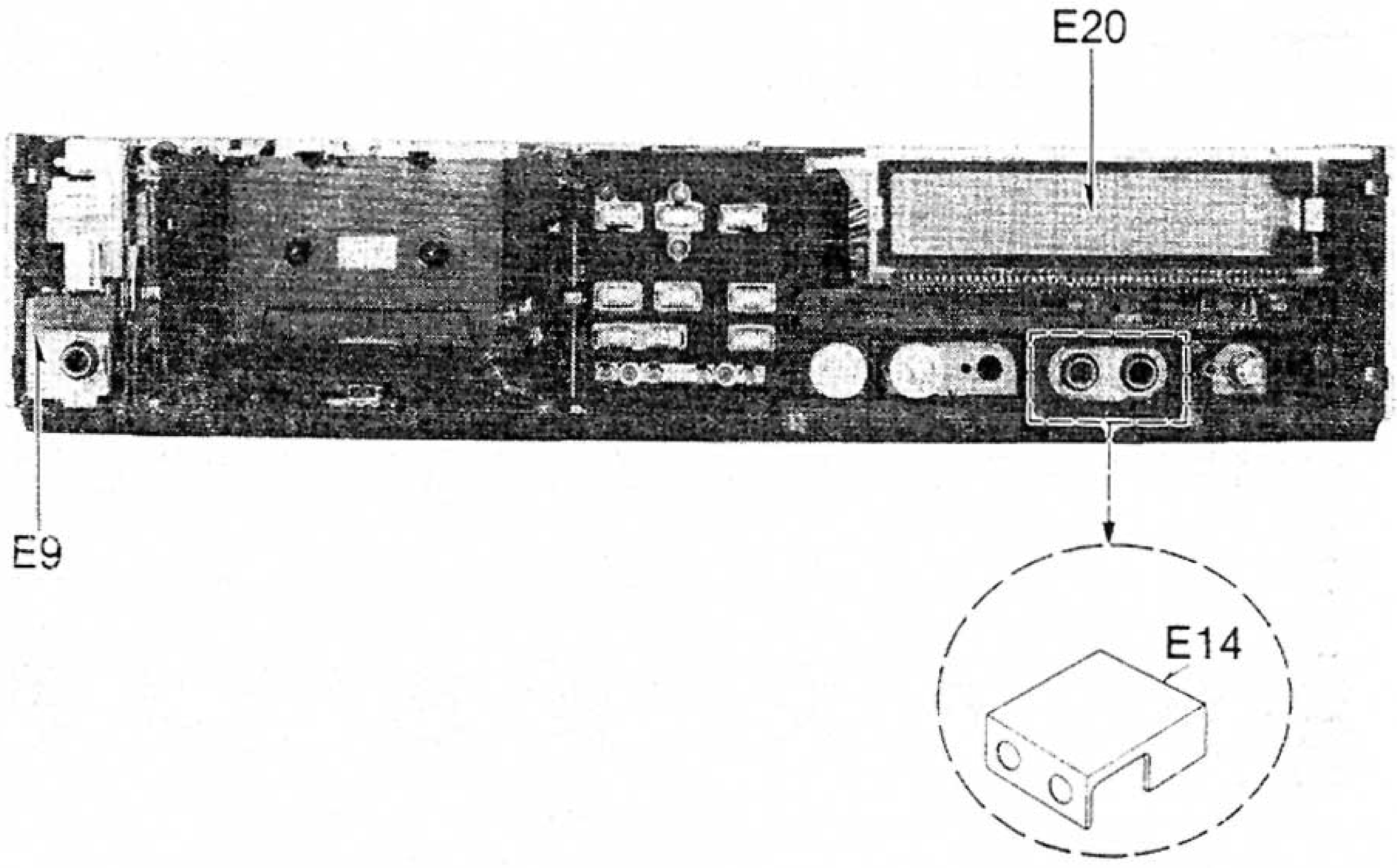
ELECTRICAL PARTS LOCATION

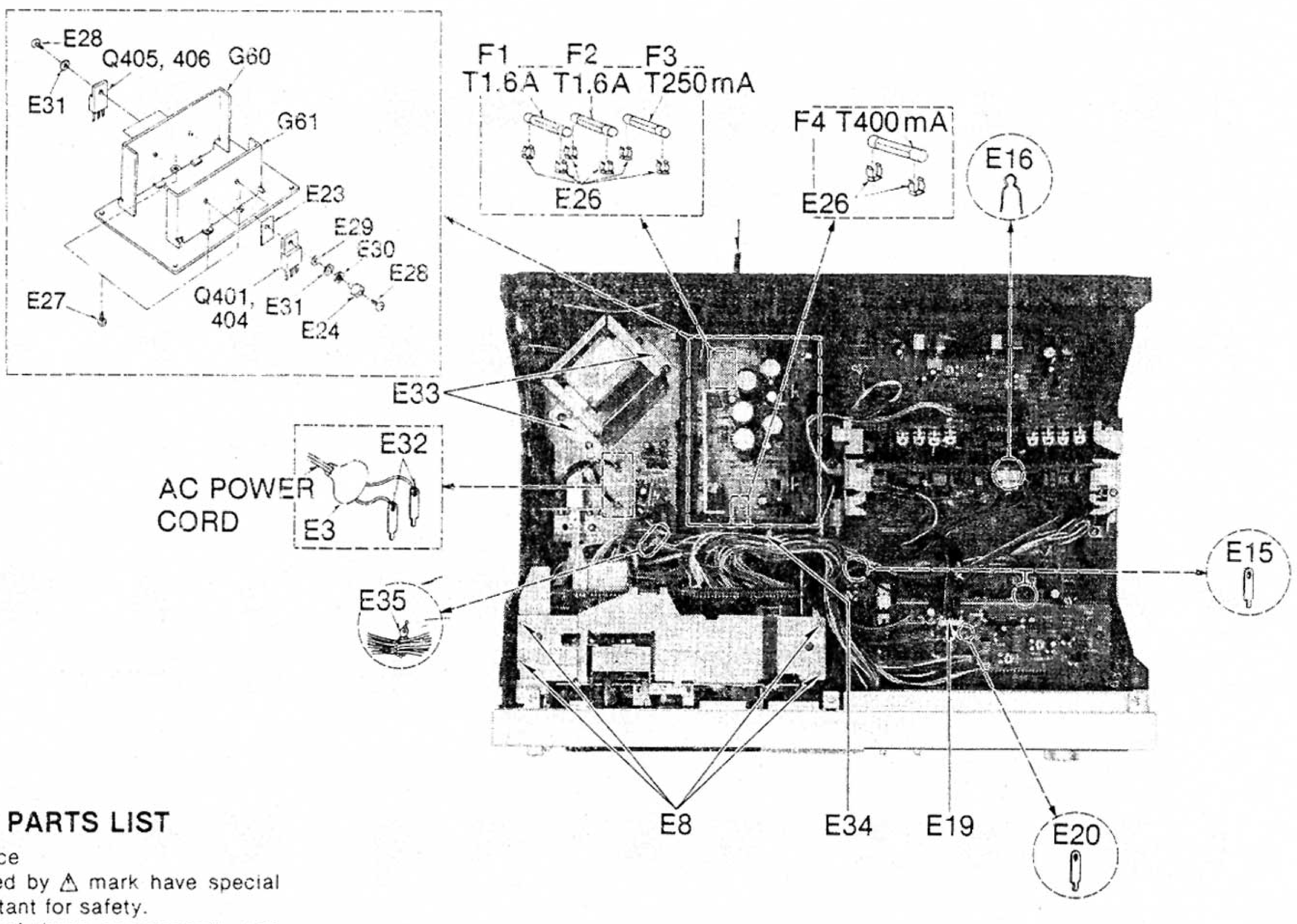












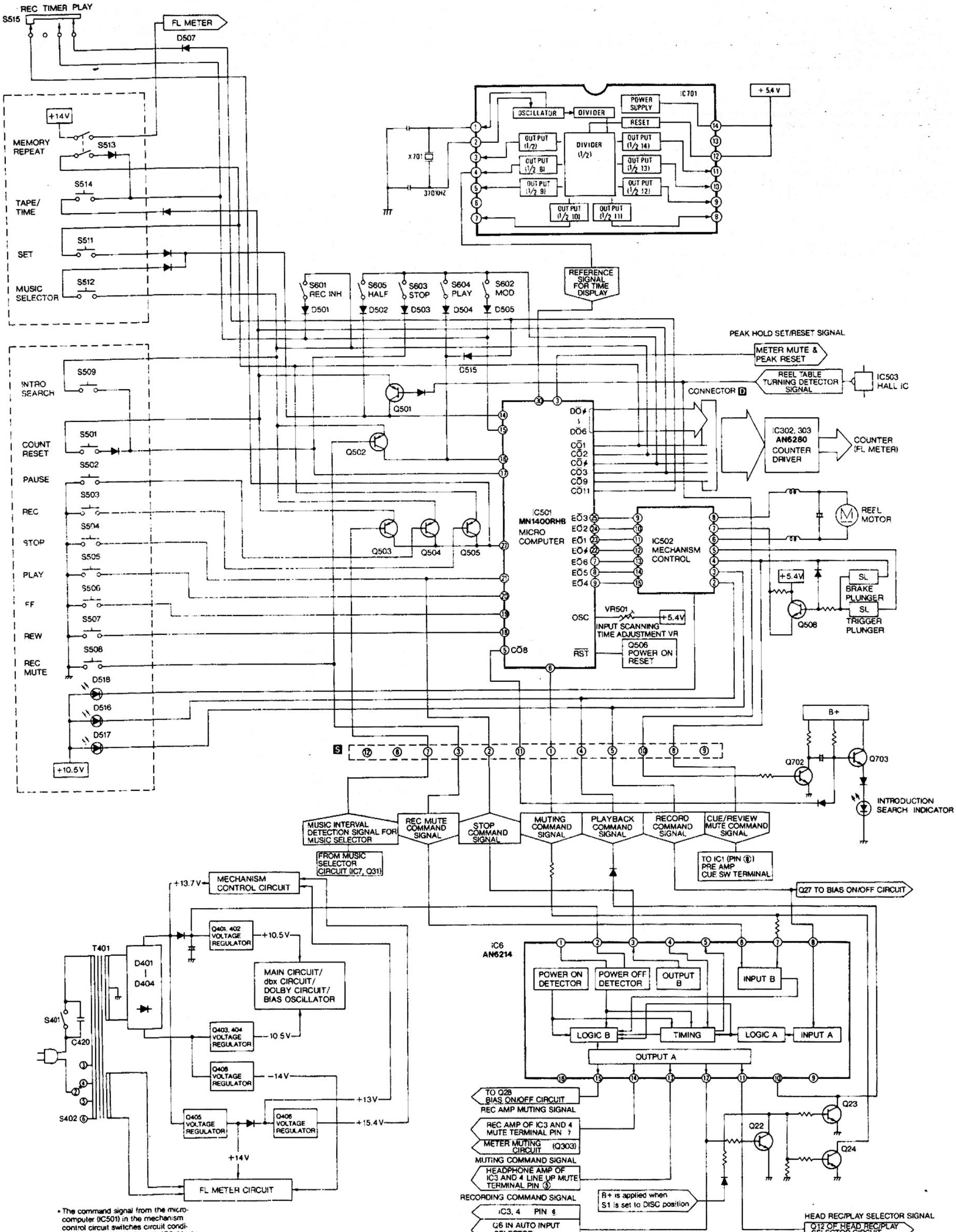
REPLACEMENT PARTS LIST

Important safety notice
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

Ref No.	Part No.	Part Name & Description	Ref No.	Part No.	Part Name & Description	Ref No.	Part No.	Part Name & Description
	ELECTRICAL PARTS		E 13	QJP1924TN	12 Pin Plug	E 30	XWG3	Washer 3φ
			E 14	QTS1579	Shield Plate			
E 1	QWY4137Z	Record/Playback Head	E 15	QJT1041	Check Pin-A	E 31	XWA3B	Washer 3φ
E 2	QWY2138Z	Erase Head	E 16	QJT1090	Jumper	E 32	SJT777	Pin Terminal
E 3	QTW1307	Pin Terminal Cover	E 17	QJS1924TNL	12 Pin Socket (L-Type)	E 33	XTN3+8B	Tapping Screw ⊕3×8
E 4	QBM1316	Cushion-A	E 18	QJP1923TN	9 Pin Post	E 34	QTD1181	Wire Clamper
E 5	QBM1317	Cushion-B	E 19	QJS1961S	Jumper Socket	E 35	RME144Z	Cord Clamper
E 6	QTD1315	Cord Clamper	E 20	QJT1067	Check Pin-B	E 36	QJT1089	Contact
E 7	QTW1277	Shield Plate				E 37	QJP12L001T	12 Pin Post (L-Type)
E 8	XTS3+12B	Tapping Screw ⊕3×12	E 21	QSIFM004F	Fl. Meter	E 38	QJP15L001T	15 Pin Post (L-Type)
E 9	XTS3+10B	Tapping Screw ⊕3×10	E 22	QJT1054	Contact	E 39	QJS1921TN	3 Pin Socket
E 10 ⚠[D]	SJA88	AC Power Cord	E 23	N018E	Insulating Sheet	E 40	QJS1922TN	6 Pin Socket
[For all European areas except United Kingdom.]			E 24	N024B	Bushing			
⚠[B]	QFC1205M	AC Power Cord	E 25	QJP06S001T	6 Pin Post	E 41	QJS1923TN	9 Pin Socket
[For United Kingdom.]			E 26 ⚠	QTF1054	Fuse Holder	E 42	QJS1924TN	12 Pin Socket
			E 27	XTN3+10BFZ	Tapping Screw ⊕3×10	E 43	QJS06001T	6 Pin Socket (L-Type)
E 11	QJP1921TN	3 Pin Plug	E 28	XSN3+8S	Screw ⊕3×8	E 44	QJS12001T	12 Pin Socket (L-Type)
E 12	QJP1922TN	6 Pin Plug	E 29	XWE3	Washer 3φ	E 45	QJS15001T	15 Pin Socket (L-Type)

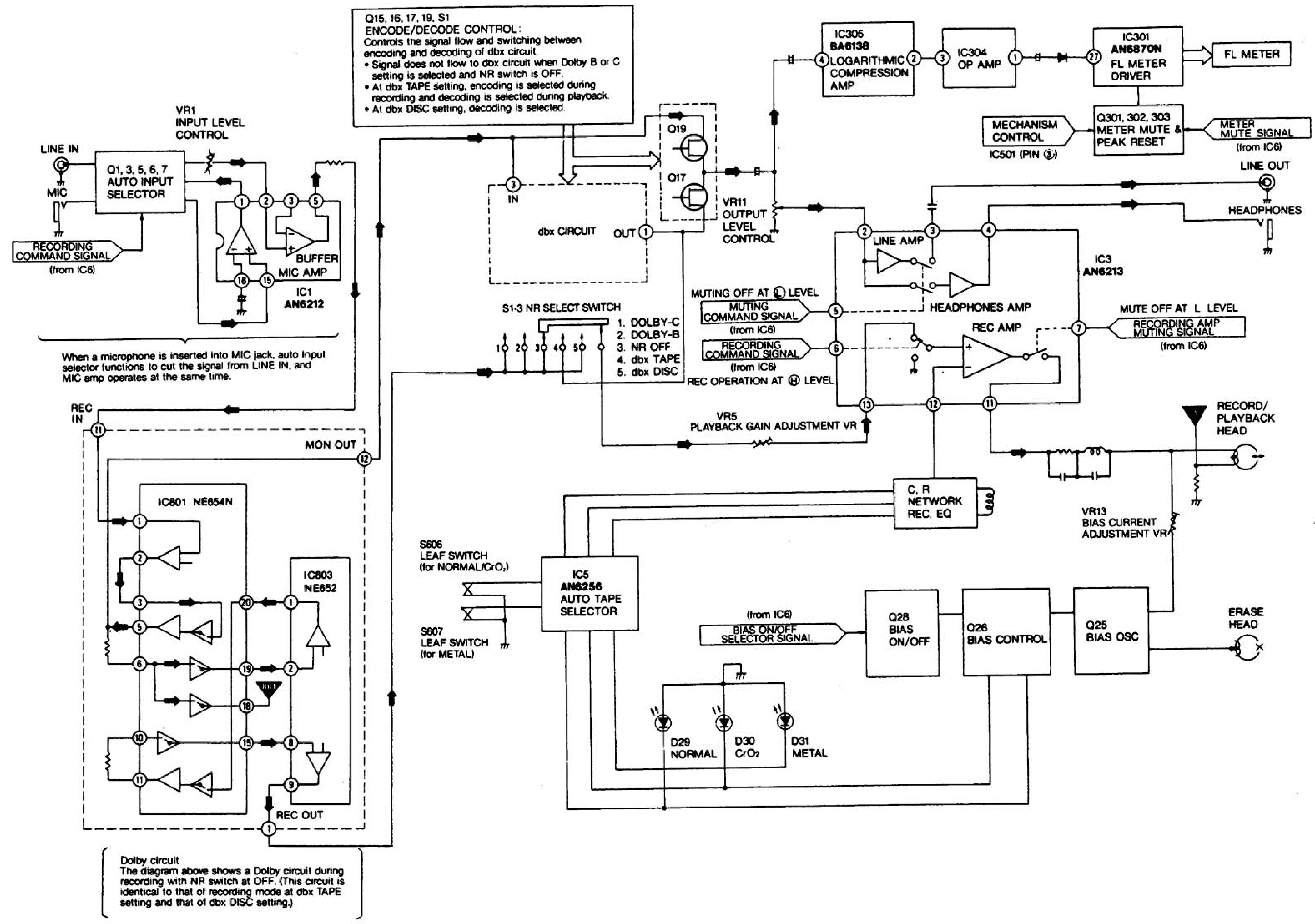
BLOCK DIAGRAM

MECHANISM CONTROL SECTION

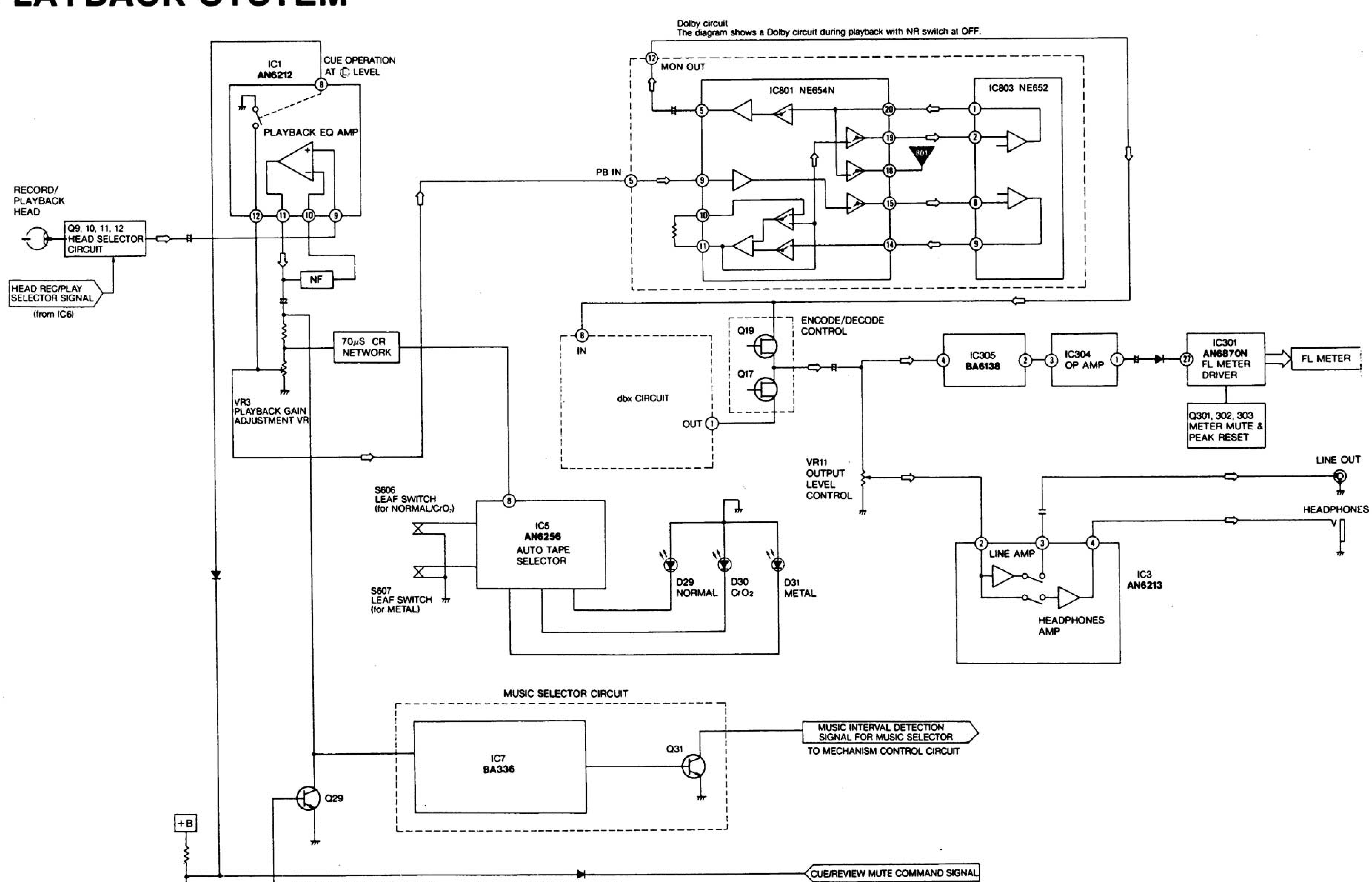


• The command signal from the micro-computer (IC501) in the mechanism control circuit switches circuit conditions in AMP circuit through IC6. Music interval detection signal during music selector/intro search is sent from AMP circuit to the mechanism control circuit.

RECORDING SYSTEM



PLAYBACK SYSTEM

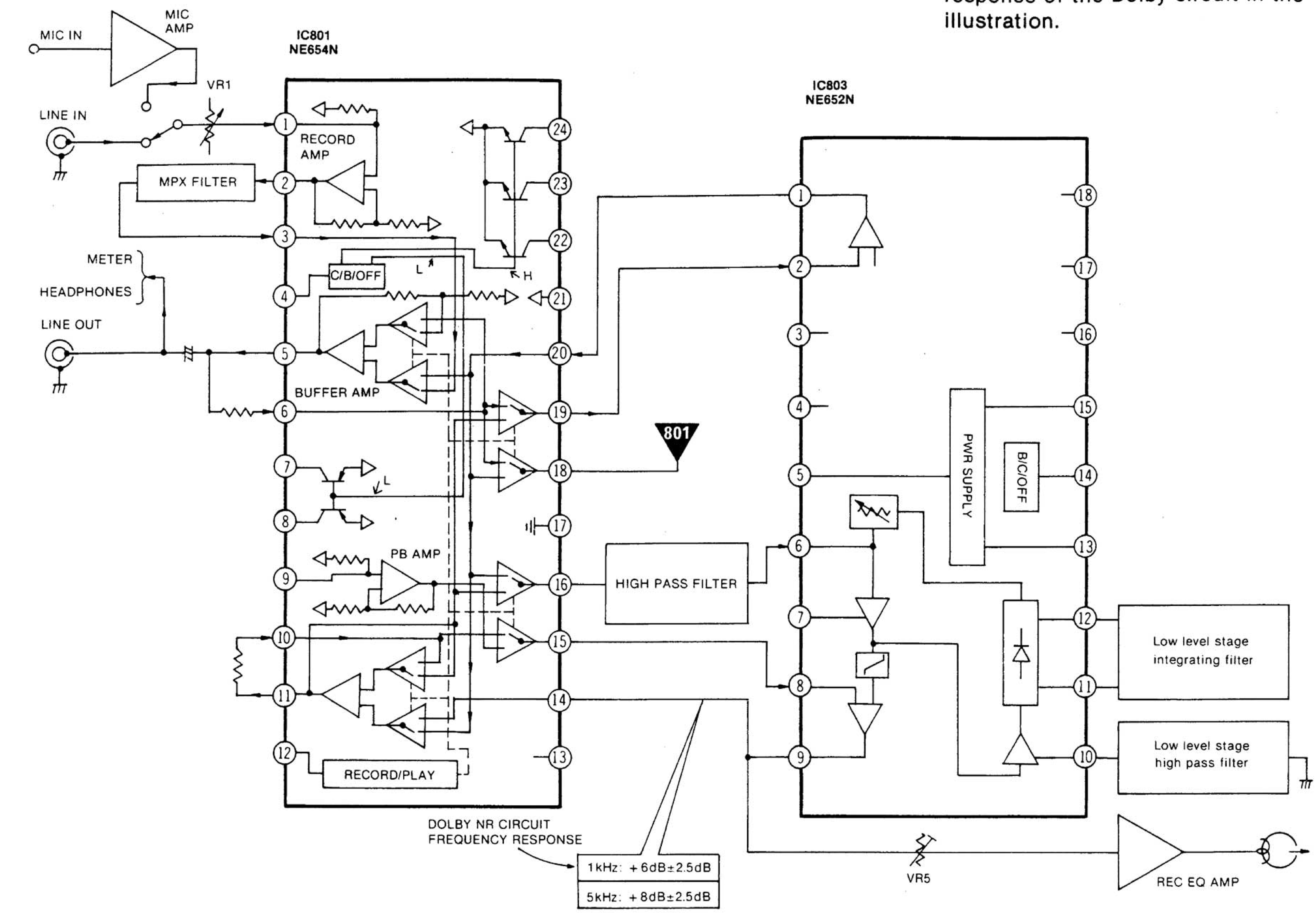


• This block diagram shows the left channel only.
• Switching between recording and playback is made when the command signal of mechanism control circuit is applied to each circuit through the control IC (IC6).
• Mark ━━➡ indicates the signal flow during recording.
• Mark ⇨ indicates the signal flow during playback.
• NR selector switch (S1) is in OUT state.

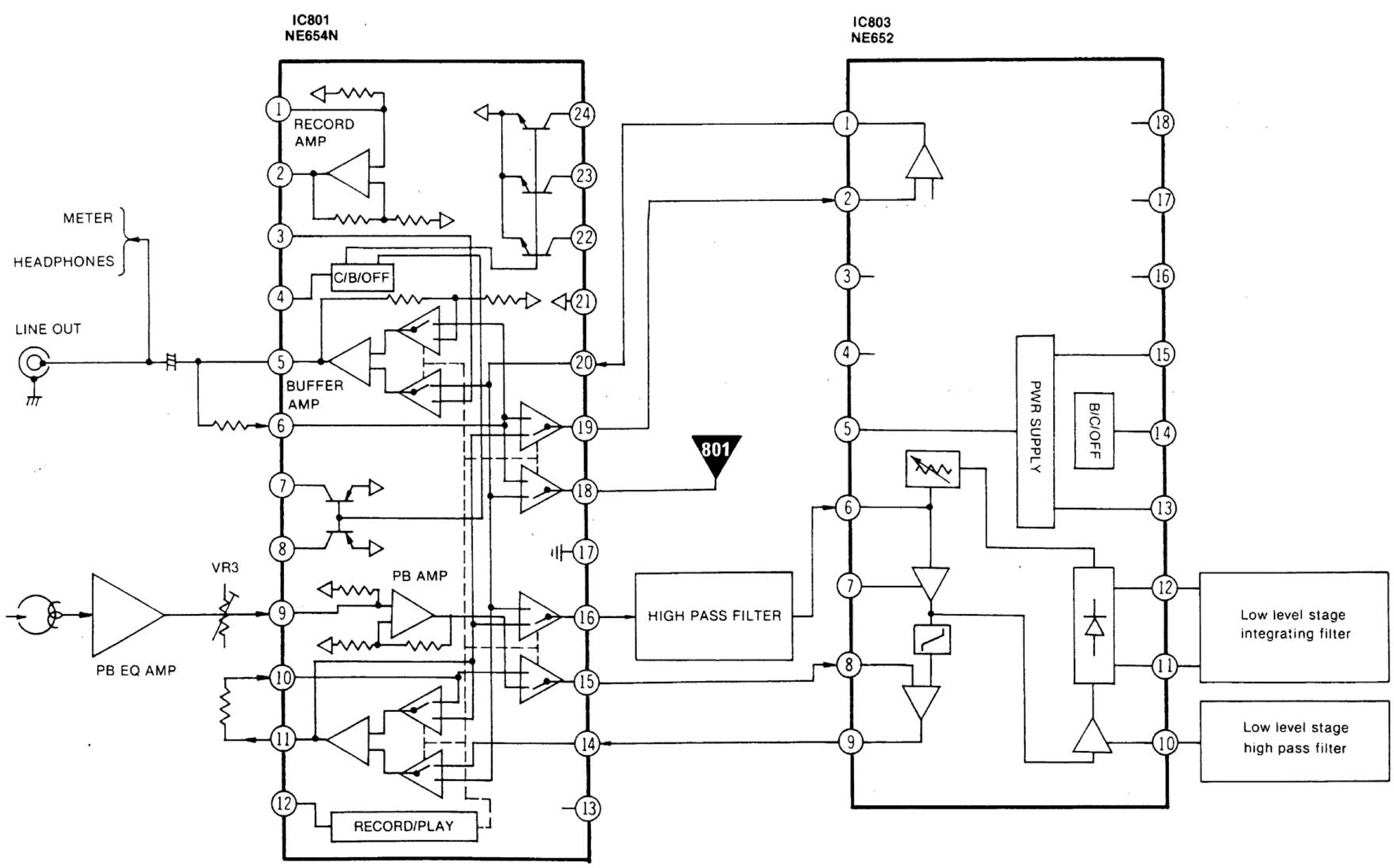
DOLBY SYSTEM (L-CH ONLY)

Refer to Item ❶ "Dolby NR circuit" of the measurement and adjustment section to check the frequency response of the Dolby circuit in the illustration.

Dolby-B Encode

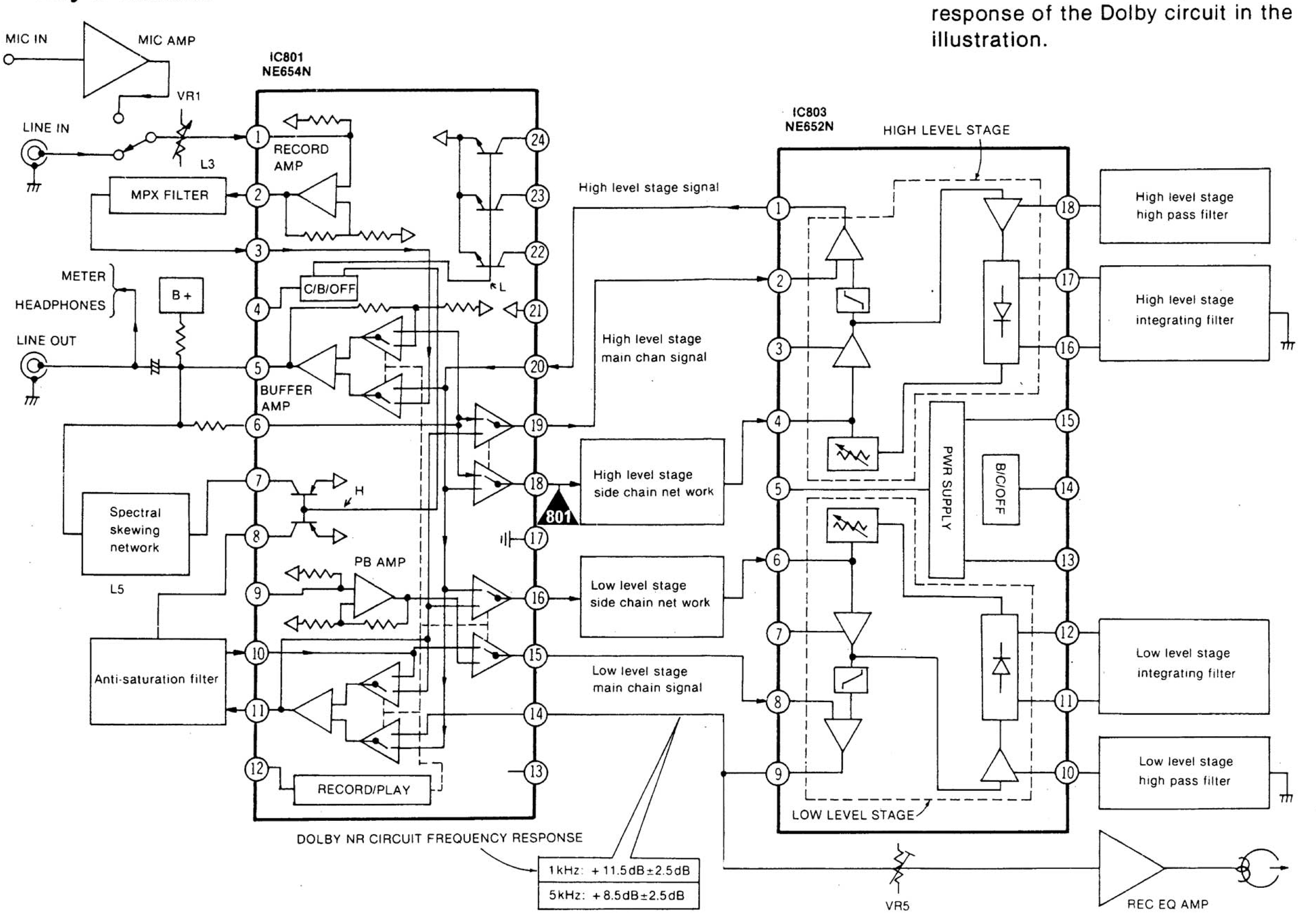


Dolby-B Decode

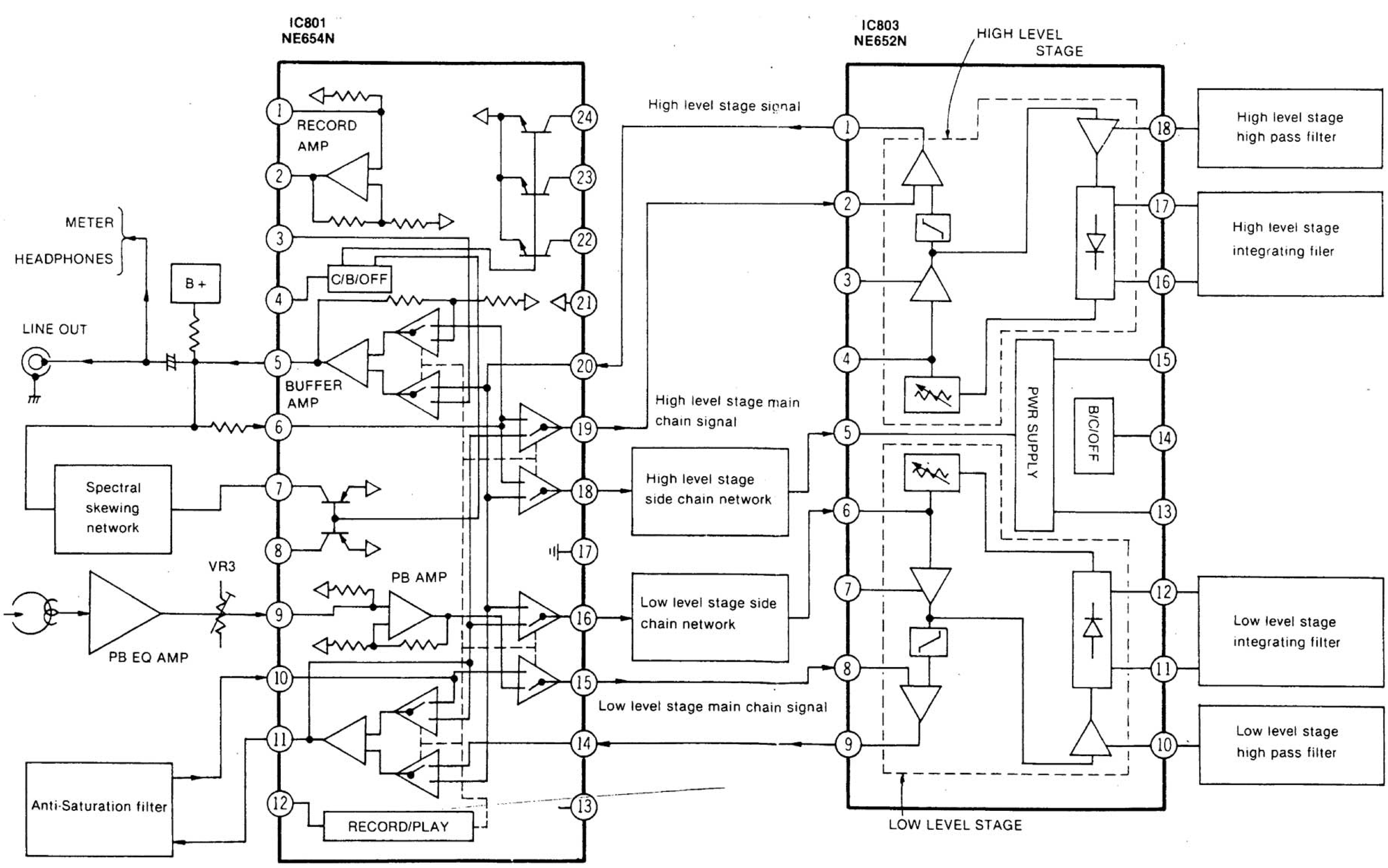


Refer to Item ❶ "Dolby NR circuit" of the measurement and adjustment section to check the frequency response of the Dolby circuit in the illustration.

Dolby-C Encode



Dolby-C Decode



SCHEMATIC DIAGRAM

Q26 [2SD946]

	B	C	E
PLAY	−10.8V	−10.8V	−10.8V
Normal	(−5.0V)	(9.3V)	(−3.6V)
CrO_2	(−3.0V)	(8.8V)	(−1.6V)
Metal	(3.2V)	(7.6V)	(4.6V)

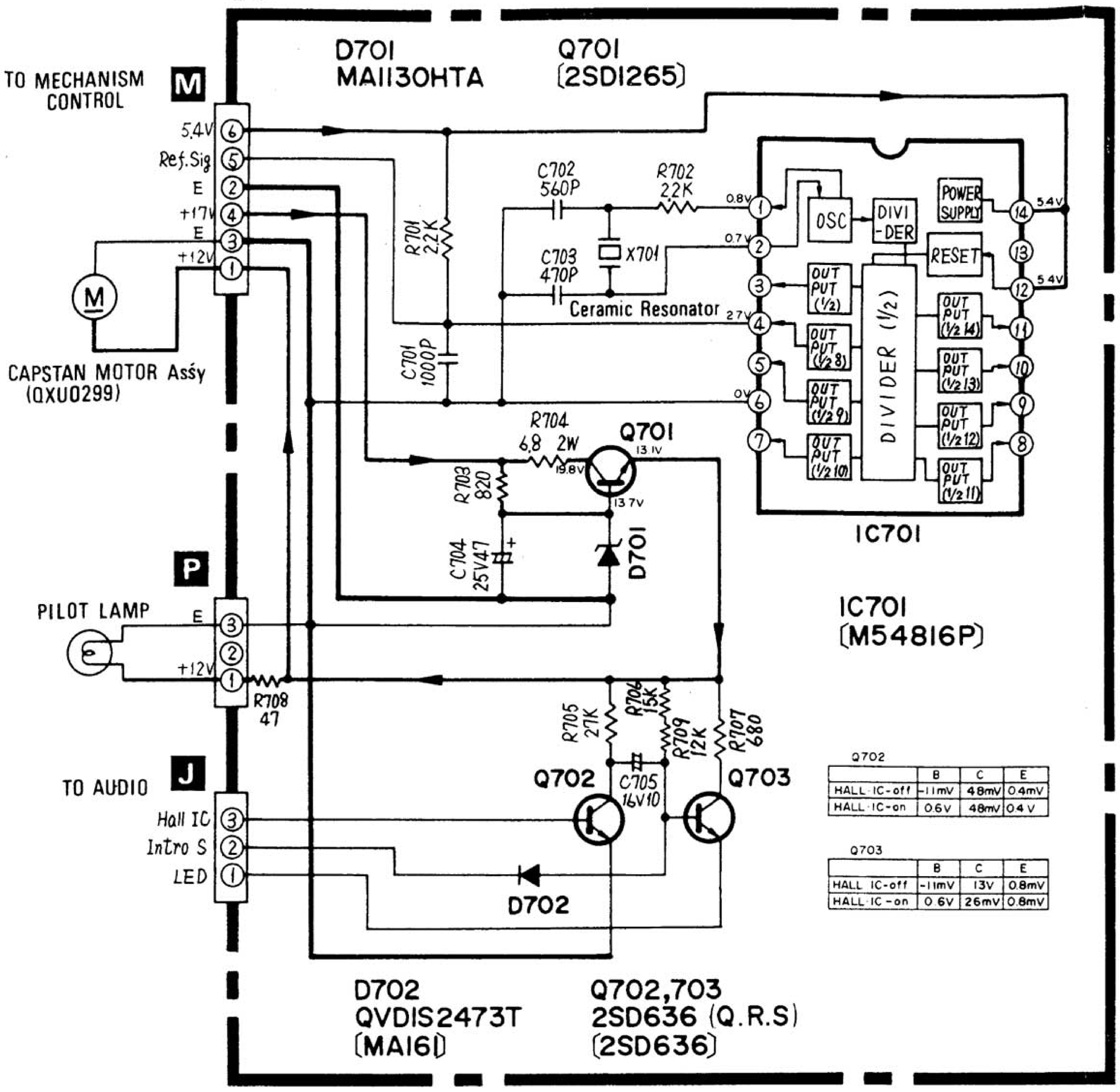
Q27 2SB641RST [2SB641]

	B	C	E
PLAY	—	−10.8V	—
Normal	(8.6V)	(9.3V)	(9.4V)
CrO_2	(8.2V)	8.2V	(8.9V)
Metal	(7.0V)	(7.6V)	(7.7V)

Q28 2SB641RST [2SB641]

	B	C	E
PLAY	10.8V	—	10.7V
Normal	(8.6V)	(9.4V)	(9.4V)
CrO_2	(8.2V)	(8.8V)	(8.8V)
Metal	(7.0V)	(7.6V)	(7.6V)

10 CERAMIC LOCK CIRCUIT SECTION



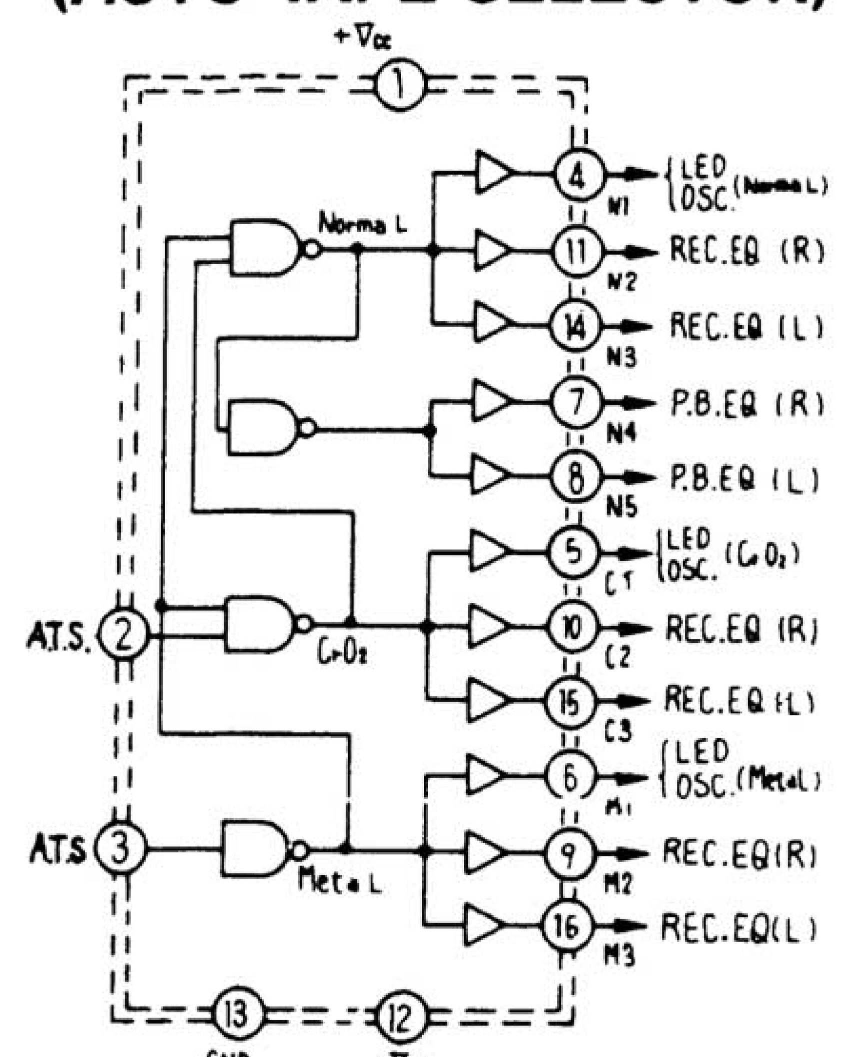
Q702

	B	C	E
HALL·IC-off	-11mV	48mV	0.4mV
HALL·IC-on	0.6V	48mV	0.4 V

Q703

	B	C	E
HALL IC-off	-11mV	13V	0.8mV
HALL·IC-on	0.6V	26mV	0.8mV

IC5 AN6256 (AUTO TAPE SELECTOR)

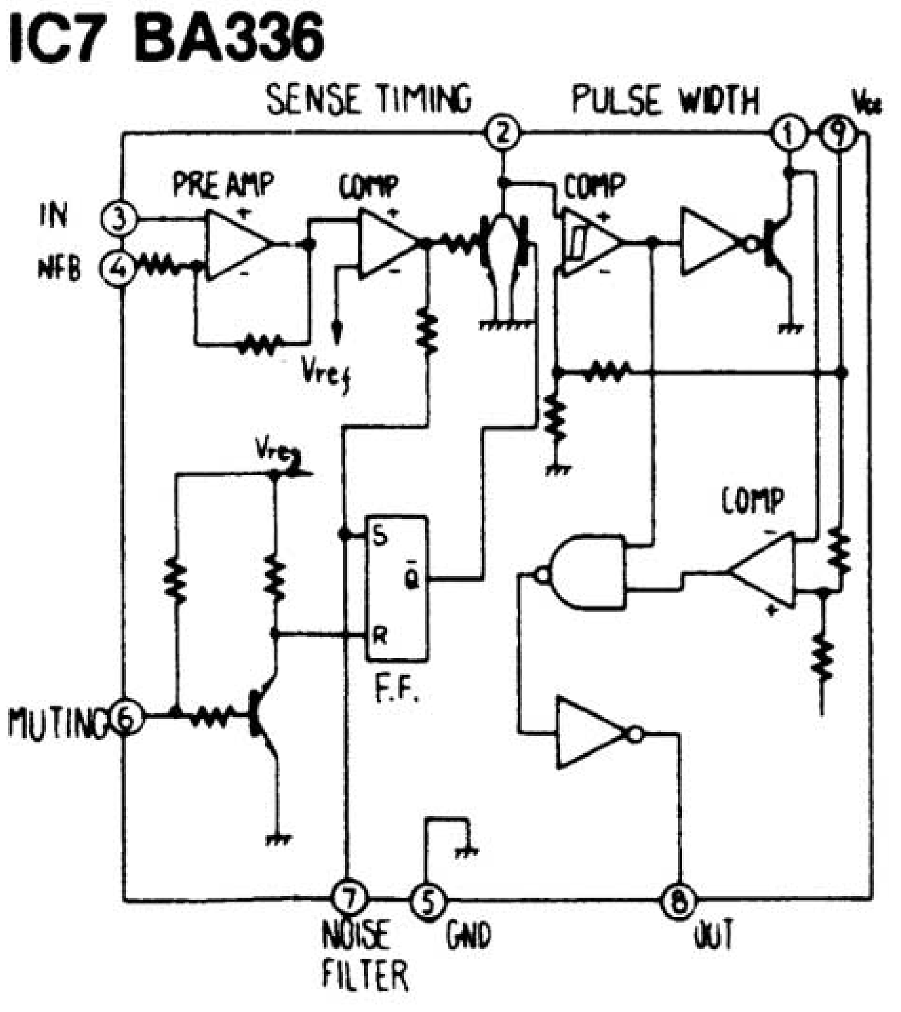


NOTES:

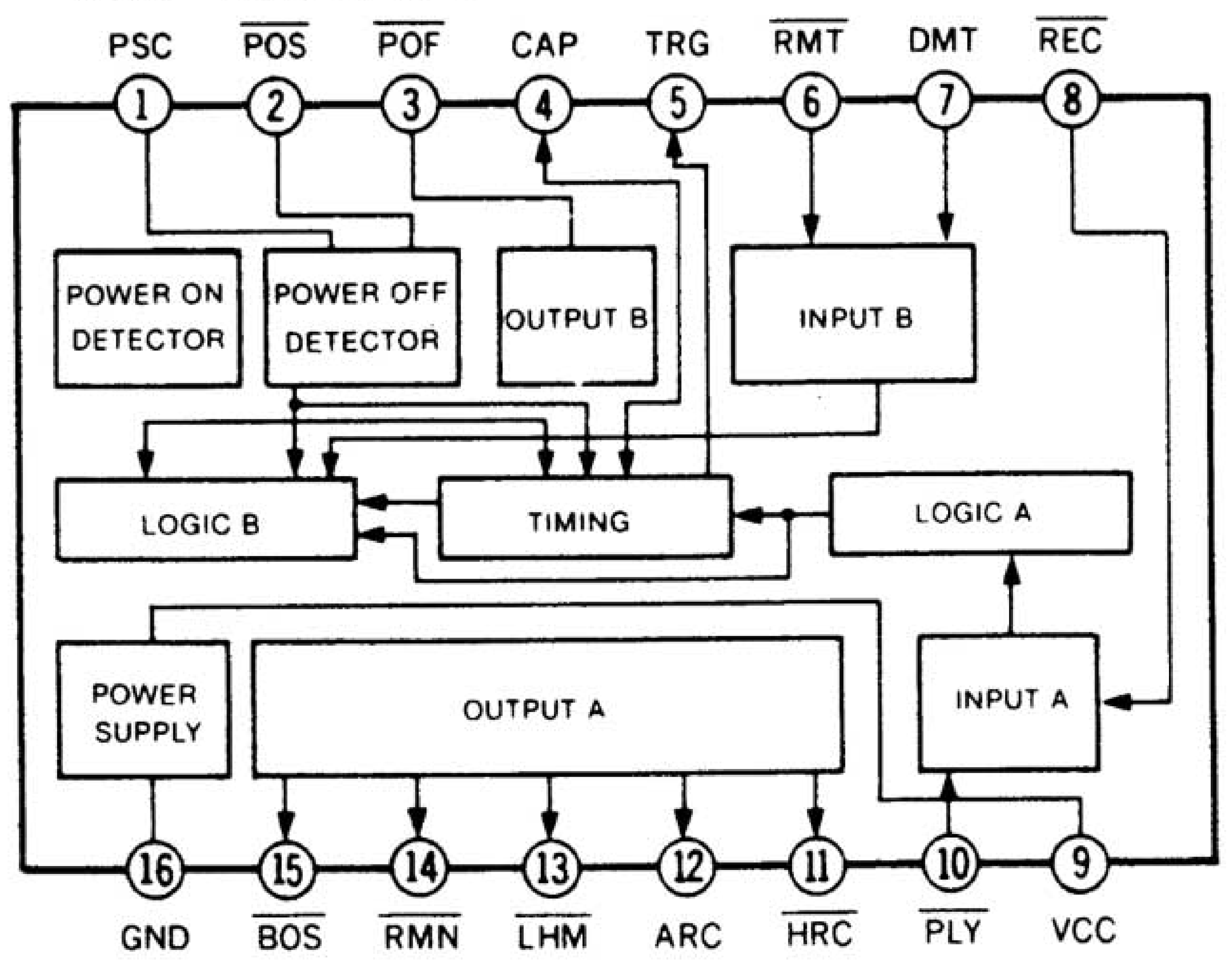
[D] .... For all European areas except United Kingdom.
[B] .... For United Kingdom.
[N] .... For Asia, Latin America, Middle East and Africa areas.

EQUIVALENT CIRCUIT

IC7 BA336



IC6 AN6214



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 ··· QZZCRZ for Metal	Less than 3%
Overall S/N ratio * Test tape ··· QZZCRA for Normal ··· QZZCRX for CrO_2 ··· QZZCRZ for Metal	Greater than 43 dB (Normal) Greater than 45 dB (CrO_2, Metal) (without NAB filter)

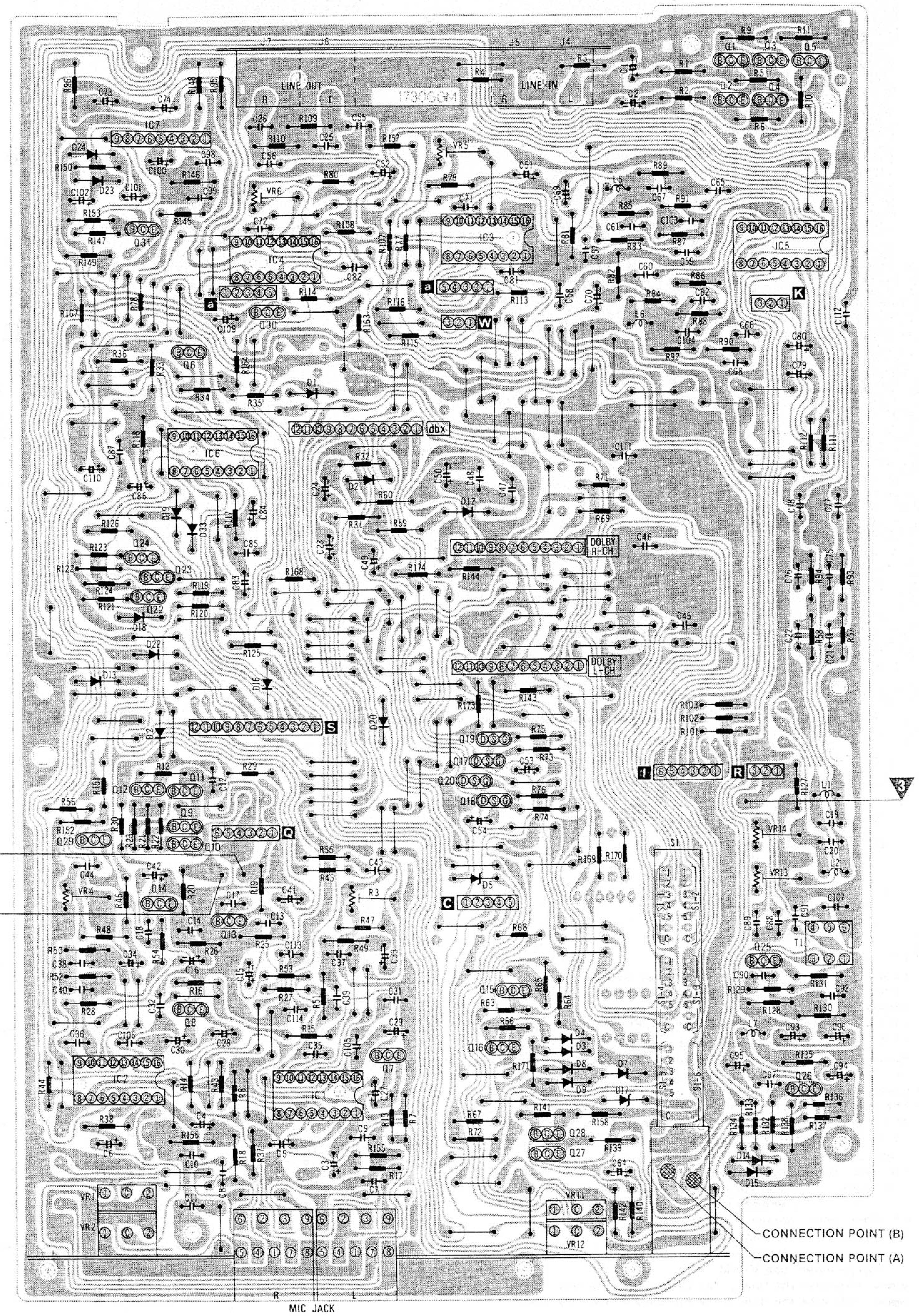
NOTES:

- S1-1–S1-6 ..... NR select switch (shown in out position)
  (1 Dolby-C, 2 Dolby-B, 3 NR OUT, 4 dbx Tape, 5 dbx disc)
- S606 .... Auto tape select switch (For CrO_2/Normal tape)
- S607 .... Auto tape select switch (For Metal tape)
- VR1, 2 .... Input level control
- VR3, 4 .... Playback gain adjustment VR
- VR5, 6 .... Recording gain adjustment VR
- VR11, 12 ...... Output level control
- VR13, 14 ...... Bias current adjustment VR
- Connection point (A), (B)...Bias current adjustment point.
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
  1K = 1,000 (Ω), 1M = 1,000 k(Ω).
- Capacity are in micro-farads (μF) unless specified otherwise.
- The mark (▼) shows test point. e.g. ▼ = Test point 1.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  No mark .... Voltage values at OUT (NR select switch) mode.
  (   ) .... Voltage values at record mode
  dbx disc .... Voltage values at dbx disc mode
  dbx tape .... Voltage values at dbx tape mode
  dbx tape PB..... Voltage values at dbx tape and playback mode
  dbx tape REC..... Voltage values at dbx tape and record mode
  CrO_2 .... Voltage values at CrO_2 tape mode
  Metal .... Voltage values at Metal tape mode
  CrO_2 REC .... Voltage values at CrO_2 tape and record mode
  Metal REC ...... Voltage values at Metal tape and record mode
  STOP .... Voltage values at STOP mode
  REC MUTE ...... Voltage values at REC MUTE mode
  MS, IS .... Voltage values at Intro Search mode.
  For measurement use VTVM.
- ( ) indicates the flow of the playback signal.
- ( ) indicates the flow of the recording signal.
- ( ) indicates the flow of the playback signal (dbx tape).
- ( ) indicates the flow of the recording signal (dbx tape).
- Described in the schematic diagram are two types of numbers; the supply parts number and production parts number for transistors and diodes.
  One type of number is used for supply parts number and production parts number when they are identical.
  e.g. Q1
  2SC1844(E, F) ← Production parts number
  [2SC1844E] ← Supply parts number
  D212
  1S2473T77 ← Production parts number
  [MA161] ← Supply parts numbers
- The supply parts number is described alone in the replacement parts list.

• This schematic diagram may be modified at any time with the development of new technology.

CIRCUIT BOARDS DIAGRAM

1 MAIN CIRCUIT BOARD



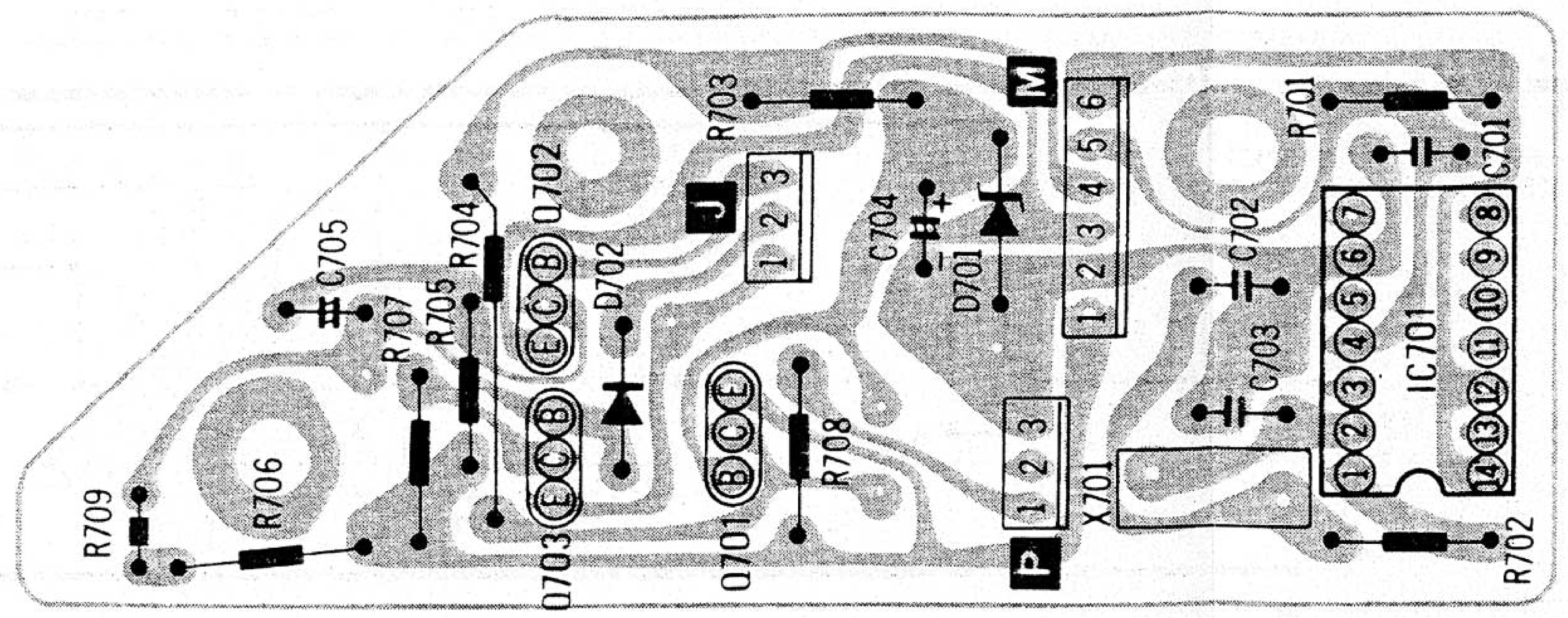
NOTES:

- The circuit shown in [shaded] on the conductor side indicates printed circuit on the back side of the printed circuit board.
- Values indicated in [box] are under no signal condition and playback mode with volume control at minimum position otherwise specified.

No mark .... Voltage values at OUT (NR select switch) mode
( ) .... Voltage values at record mode
dbx disc .... Voltage values at dbx disc mode
dbx tape .... Voltage values at dbx tape mode
dbx tape PB ..... Voltage values at dbx tape and playback mode
dbx tape REC .... Voltage values at dbx tape and record mode
CrO_2 .... Voltage values at CrO_2 tape mode
Metal .... Voltage values at Metal tape mode
CrO_2 REC .... Voltage values at CrO_2 tape and record mode
Metal REC ...... Voltage values at Metal tape and record mode
STOP........... Voltage values at STOP mode
REC MUTE ...... Voltage values at REC MUTE mode
MS.IS .... Voltage values at Intro Search mode
For measurement use VTVM.

- **This schematic diagram may be modified at any time with the development of new technology.**

10 CERAMIC LOCK CIRCUIT BOARD



IC1, 2 [AN6212]

1	−0.3V
2	0V
3	0V
4	9.2V
5	0V
6	9.2V
7	0V
8	8.8V
9	−0.3V
10	−0.3V
11	0V
12	0V
13	0V
14	−9.4V
15	−0.3V
16	−0.3V

IC3 [AN6213]

1	0V
2	0V
3	0V
4	0V
5	4V STOP 0V
6	0V (5.0V)
7	4V STOP 0V
8	10.3V (10.2V)
9	−10.3V
10	0V
11	0V
12	0V
13	0V
14	0V
15	0V
16	0V

IC4 [AN6213]

1	0V
2	0V
3	0V
4	0V
5	4.0V
6	0V (5.0V)
7	4.0V
8	10.3V (10.2V)
9	−10.3V
10	0V
11	0V
12	0V
13	0V
14	0V
15	0V
16	0V

IC5 [AN6256]

1	10.7V		
2	0.2V	CrO_2 / Metal	2.0V / 1.0V
3	0.2V	CrO_2 / Metal	0.2V / 2.0V
4	−10.7V	CrO_2 / Metal	0V / 0V
5	0V	CrO_2 / Metal	−10.7V / 0V
6	0V	CrO_2 / Metal	0V / −10.7V
7	0V		
8	0V		
9	0V		
10	0V		
11	0V		
12	−10.8V		
13	0V		
14	0V		
15	0V		
16	0V		

IC6 [AN6214]

1	5.0V
2	5.3V
3	5.6V
4	10.5V STOP 0.3V
5	2.8V
6	5.5V REC MUTE ON 0V
7	0.4V STOP 5.3V
8	9.2V (0.2V)
9	10.7V
10	0.6V STOP 1.8V
11	5.0V (0V)
12	0V (5.0V)
13	4.0V STOP 0V
14	4.0V STOP REC MUTE ON 0V
15	10.7V (0.1V)
16	0V

IC7 [BA336]

1	0V
2	0V
3	0V
4	1.0V
5	0V
6	1.7V
7	0V
8	0V
9	10.7V

Q1, 2, 3, 4 [2SD636]

B	0.7V (0V) dbx disc 0V
C	0V
E	0V

Q5 [2SC945-Q]

B	2.1V (0V) dbx disc 0V
C	2.8V (−0.3V) dbx disc −0.3V
E	2.8V (0.1V) dbx disc 0.1V

Q6 [2SD636]

B	0V (0.7V) dbx disc 0.7V
C	2.8V (0V) dbx disc 0V
E	0V

Q7, 8 [2SD965]

B	0.7V (0V) dbx disc 0V
C	0V
E	0V

Q9, 10, 11 [2SD1011]

B	0.7V (−16.0V)
C	0V
E	0V

Q12 [2SA921]

B	4.6V (0V)
C	4.9V (−16.0V)
E	5.1V (0V)

Q13, 14 [2SD965]

B	0V (0.7V)
C	0V
E	0V

Q15 [2SD636]

B	−10.8V dbx disc dbx tape P.B −10.1V
C	6.0V dbx disc dbx tape P.B −10.8V
E	−10.8V

Q16 [2SB641]

B	−10.8V dbx tape P.B 10.0V
C	−11.6V dbx tape P.B 10.7V
E	−10.8V dbx tape P.B 10.7V

Q17, 18 [2SK104]

G	−8.8V dbx disc dbx tape P.B 0.6V
S	0V
D	0V

Q19, 20 [2SK104]

G	0.6V dbx disc dbx tape P.B −8.8V
S	0V
D	0V

Q21 [2SD636]

B	−10.8V (−10.1V) dbx disc −10.1V
C	10.0V (−10.8V) dbx disc −10.8V
E	−10.8V (−10.8V)

Q22 [2SD636]

B	0V (0.6V)
C	0V dbx disc 4.0V
E	0V

Q23 [2SD636]

B	0V (0.6V) dbx disc 0.7V
C	0V
E	0V

Q24 [2SD636]

B	0V (0.6V) dbx disc 0.7V
C	0V
E	0V

Q25 [2SD592]

B	−10.8V (−10.4V)
C	−10.8V (−4.8V) CrO_2 (−2.6V) Metal (2.7V)
E	−10.8V (−10.6V)

Q26 [2SD592]

	B	C	E
PLAY	−10.8V	−10.8V	−10.8V
Normal	(−3.3V)	(9.3V)	(−4.6V)
CrO_2	(−1.0V)	(8.8V)	(−2.3V)
Metal	(4.5V)	(7.6V)	(3.1V)

Q27 [2SB641]

	B	C	E
PLAY	—	−10.8V	—
Normal	(8.6V)	(9.3V)	(9.4V)
CrO_2	(8.2V)	(8.8V)	(8.9V)
Metal	(7.0V)	(7.6V)	(7.7V)

Q28 [2SB641]

	B	C	E
PLAY	10.8V	—	10.7V
Normal	(8.6V)	(9.4V)	(9.4V)
CrO_2	(8.2V)	(8.8V)	(8.8V)
Metal	(7.0V)	(7.6V)	(7.6V)

Q29 [2SD636]

B	0.6V
C	0V
E	0V

Q30 [2SC945-Q]

B	0V (0.6V) dbx disc 0.6V
C	10.7V (0V) dbx disc 0V
E	0V

Q31 [2SC945-Q]

B	0V
C	0V
E	0.6V

Q32 [2SB641]

B	10.7V (10.1V) dbx disc 10.1V
C	−10.7V (10.7V) dbx disc 10.7V
E	10.7V

Q33 2SD636RST [2SD636]

B	0.6V
C	9.2V
E	0.2V

Q34 2SD636RST [2SD636]

B	0.6V
C	0V
E	0V

Q701

B	13.7V
C	19.8V
E	13.1V

Q702 [2SD636]

	HALL IC-off	HALL IC-on
B	−11mV	0.6V
C	48mV	48mV
E	0.4V	0.4V

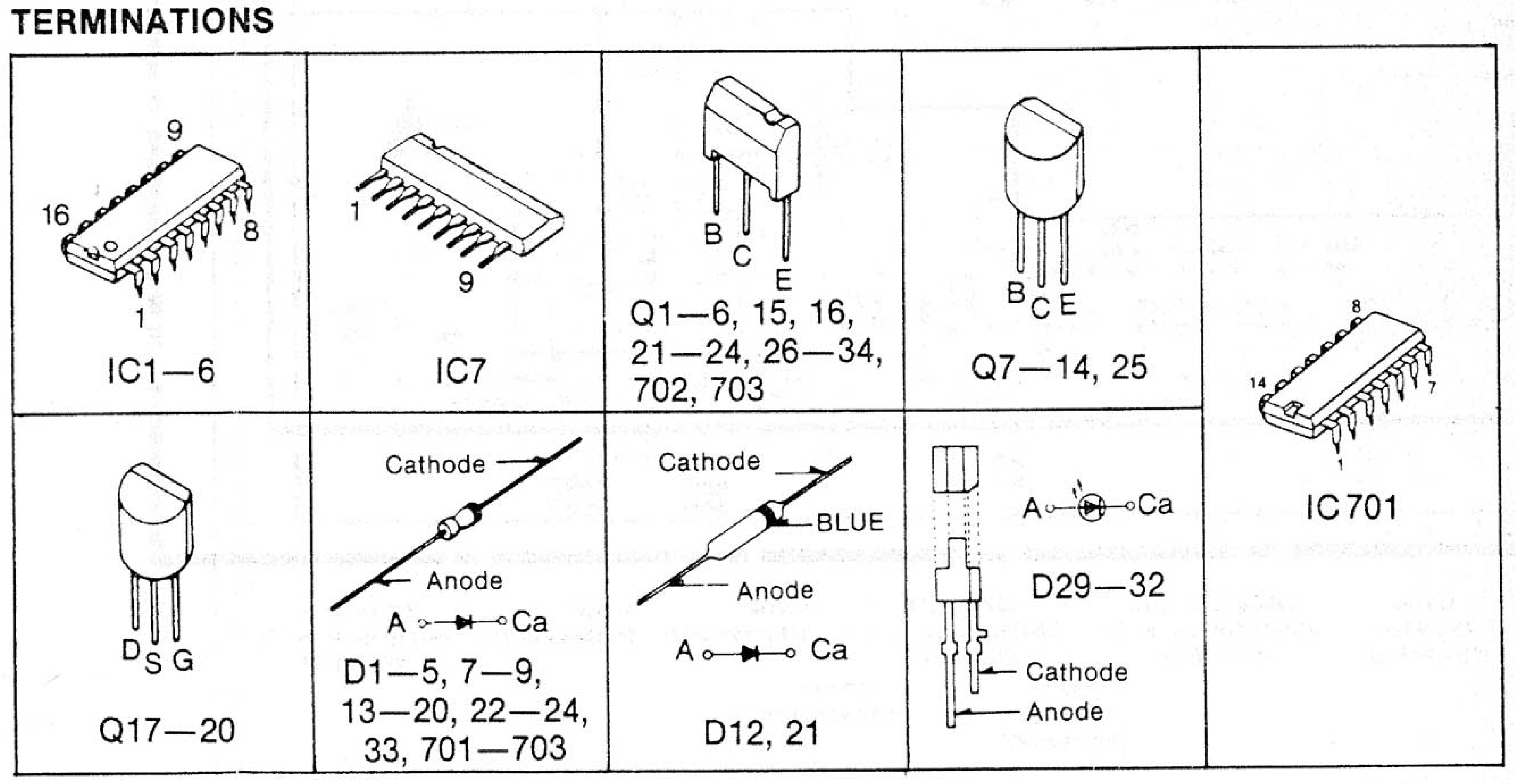
Q703 2SD636

	HALL IC-off	HALL IC-on
B	−11mV	0.6V
C	13V	26mV
E	0.8mV	0.8mV

IC701 M54816P

1	0.8V
2	0.7V
3	—
4	2.7V
5	—
6	0V
7	—
8	—
9	—
10	—
11	—
12	5.4V
13	—
14	5.4V

TERMINATIONS



NOTES: RESISTORS

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

CAPACITORS

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

REPLACEMENT PARTS LIST

Important safety notice
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

Ref No.	Part No.
RASISTORS	
R 1, 2	ERD25TJ273
R 3, 4	ERD25TJ474
R 5, 6	ERD25FJ562
R 7, 8	ERD25FJ103
R 9, 10	ERD25FJ472
R 11	ERD25FJ822
R 12	ERD25TJ223
R 13, 14	ERD25FJ102
R 15, 16	ERD25FJ182
R 17, 18	ERD25FJ471
R 19, 20	ERD25FJ100
R 21, 22	ERD25FJ472
R 23	ERD25FJ561
R 25, 26	ERD25TJ683
R 27, 28	ERD25FJ101
R 29, 30	ERD25FJ102
R 31, 32	ERQ14AJ151
R 33	ERD25FJ222
R 34	ERD25FJ103
R 35	ERD25FJ473
R 36	ERD25TJ223
R 37, 38	ERD25FJ102
R 41, 42	ERD25FJ101
R 43, 44	ERD25TJ123
R 45, 46	ERD25TJ183
R 47, 48	ERD25FJ472
R 49, 50	ERD25TJ224
R 51, 52	ERD25FJ752
R 53, 54	ERD25FJ680
R 55, 56	ERD25FJ562
R 57, 58	ERD25FJ682
R 59, 60	ERQ14AJ330
R 63	ERD25FJ562
R 64, 65	ERD25TJ473
R 66	ERD25FJ103
R 67	ERD25TJ104
R 68	ERD25FJ472
R 69, 71, 72	ERD25TJ104
R 73, 74, 75, 76	ERD25TJ225
R 77, 78	ERD25FJ392
R 79, 80	ERD25FJ182
R 81, 82	ERD25FJ681
R 83, 84	ERD25FJ560
R 85, 86	ERD25FJ332
R 87, 88	ERD25FJ562
R 89, 90	ERD25FJ392
R 91, 92	ERD25FJ222
R 93, 94	ERD25FJ562
R 95, 96	ERQ14AJ270
R 101, 102	ERD25FJ821
R 103	ERD25FJ102
R 107	ERD25FJ561
R 108	ERD25FJ821
R 109, 110	ERD25TJ473
R 111, 112	ERD25FJ391
R 113, 114	ERD25FJ820
R 115, 116	ERD25FJ680
R 117	ERD25TJ223
R 118	ERD25TJ224
R 119	ERD25FJ152
R 120	ERD25TJ273
R 121	ERD25TJ104
R 122, 123, 124	ERD25TJ473
R 125	ERD25FJ471
R 126	ERD25FJ152
R 127	ERD25FJ1R0
R 128	ERD25FJ562
R 129	ERD25FJ100
R 130	ERD25FJ562
R 131	ERD25FJ100
R 132	ERD25FJ101

Ref No.	Part No.
R 133	ERD25FJ682
R 134	ERD25TJ123
R 135	ERD25TJ224
R 136, 137	ERD25TJ104
R 138	ERD25TJ123
R 139	ERD25TJ473
R 140	ERD25FJ562
R 141	ERD25TJ473
R 142	ERD25FJ562
R 143, 144	ERD25FJ103
R 145, 146	ERD25FJ822
R 147	ERD25TJ473
R 148	ERD25TJ334
R 149	ERD25FJ332
R 150	ERD25FJ472
R 151	ERD25FJ103
R 152	ERD25FJ332
R 153	ERD25TJ154
R 155, 156	ERD25TJ123
R 157	ERD25FJ271
R 158	ERD50FJ560
R 163	ERD25TJ104
R 164	ERD25FJ103
R 165, 166	ERD25FJ272
R 167	ERQ14AJ100
R 168	ERD25FJ821
R 169	ERD25FJ152
R 170, 171	ERD25FJ821
R 173, 174	ERD25FJ101
R 201, 203	ERD25TJ104
R 205, 206	ERD25FJ101
R 207, 208	ERD25TJ474
R 209, 210	ERD25TJ105
R 211, 212	ERD25TJ124
R 213, 214	ERD25TJ473
R 215, 216	ERD25FJ472
R 217, 218	ERD25TJ473
R 219, 220	ERD25TJ333
R 221, 222	ERD25FJ103
R 223, 224	ERD25TJ473
R 225, 226	ERD25FJ470
R 227, 228	ERD25TJ124
R 229, 230	ERD25FJ332
R 231, 232	ERD25TJ473
R 233, 234, 235, 236	ERD25TJ104
R 237, 238	ERD25FJ103
R 239, 240	ERD25TJ333
R 241, 242	ERD25FJ102
R 243, 244	ERD25TJ473
R 245, 246	ERD25FJ101
R 247, 248	ERD25TJ473
R 249, 250	ERD25FJ103
R 251, 252	ERD25FJ102
R 253, 254	ERD25FJ392
R 255, 256	ERD25TJ333
R 257, 258	ERD25FJ913
R 259, 260	ERD25FJ472
R 261, 262	ERD25TJ333
R 263, 264	ERD25FJ682
R 265, 266	ERD25FJ472
R 267, 268	ERQ12HJ220
R 269, 270	ERD25TJ393
R 271, 272	ERD25TJ223
R 273, 274	ERD25FJ332
R 275, 276	ERD25TJ333
R 277, 278	ERD25TJ394
R 279, 280	ERD25FJ102
R 281, 282	ERD25FJ8R2
R 283, 284	ERD25TJ333
R 285	ERD25FJ103
R 287	ERD25FJ392
R 289, 290	ERD25FJ103
R 291, 292	ERD25TJ155
R 293, 295, 296	ERD25FJ152

Ref No.	Part No.
R 301, 302, 303, 304	ERD25FJ471
R 305	ERG1ANJ221
R 306, 307	ERD25TJ473
R 309	ERD25TJ223
R 310	ERD25TJ104
R 311	ERD25TJ473
R 312	ERD25FJ183
R 314	ERD25FJ182
R 315	ERD25FJ102
R 316	ERD25FJ103
R 317, 318	ERD25FJ472
R 319, 320	ERD25TJ154
R 321, 322	ERD25TJ683
R 323, 324	ERD25TJ563
R 325, 326	ERD25TJ224
R 327, 328	ERD25FJ222
R 329	ERQ12HJ100
R 330, 331	ERD25FJ562
R 333	ERD25TJ104
R 336	ERD25FJ332
R 337, 338	ERD25TJ684
R 339, 340	ERD25FJ562
R 401	ERD25FJ681
R 402	ERD25TJ183
R 403 ⚠	ERQ12AJ2R7
R 404	ERD25FJ102
R 405	ERD25FJ222
R 406	ERD25FJ561
R 407	ERD25FJ472
R 408	ERD25FJ562
R 409, 410	ERD25FJ103
R 411	ERD25FJ102
R 412	ERD25FJ222
R 413 ⚠	ERQ12AJ4R7
R 414	ERD25TJ823
R 415	ERD25FJ103
R 416	ERD25FJ391
R 417	ERQ12HJ8R2
R 418 ⚠	ERQ12HJ2R2
R 419 ⚠	ERD50FJ221
R 421	ERG2ANJ100
R 422	ERD25FJ122
R 423	ERD25FJ102
R 424	ERD25FJ103
R 425	ERD25TJ333
R 426, 427	ERD50FJ271
R 428	ERQ14AJ470
R 429	ERD25FJ472
R 502, 503, 504, 505	ERD25TJ273
R 506	ERD25FJ331
R 507	ERD25FJ271
R 508	ERD25FJ331
R 509	ERD25FJ271
R 510	ERD25FJ331
R 511	ERD25FJ271
R 512	ERD25TJ104
R 513	ERD25TJ223
R 514	ERD25FJ562
R 515	ERX12ANJR47
R 516	ERD25FJ1R5
R 517, 523	ERD25FJ222
R 524	ERD25FJ102
R 525	ERD25FJ272
R 526	ERD25FJ562
R 527	ERD25FJ471
R 528	ERD25TJ184
R 701, 702	ERD25FJ222
R 703	ERD25FJ821
R 704	ERQ12HJ150
R 705	ERD25TJ273
R 706	ERD25TJ123
R 707	ERD25FJ681
R 708	ERD25FJ470
R 709	ERD25TJ153

Ref No.	Part No.
R 801, 802	2ERD25FJ682
R 803, 804	ERD25FJ222
R 805, 806	ERD25FJ103
R 807, 808	ERD25TJ183
R 809, 810	ERD25FJ682
R 811, 812	ERD25FJ102
R 815, 816	ERD25TJ683
R 817, 818	ERD25FJ512
R 819, 820	ERD25FJ222
R 821, 822	ERD25TJ823
R 823, 824	ERD25FJ472
R 825, 826	ERD25TJ123
R 827, 828	ERD25FJ473
R 829, 830	ERD25TJ753
R 831, 832	ERD25TJ334
R 833, 834, 835, 836	ERD25TJ394
R 837, 838	ERD25TJ334
R 845, 848, 849, 850	ERD25TJ273
R 851	ERD25FJ271
R 852, 853	ERD25FJ332
R 854	ERD25TJ273
R 855	ERD25TJ104
R 856	ERD25JK473
R 857, 858	ERD25TJ224
VARIABLE RESISTORS	
VR 1, 2	EWJSEAF22A24
VR 3, 4	EVNM4AA00B24
VR 5, 6	EVNM4AA00B14
VR 11, 12	QWKGTA024A54
VR 13, 14	EVNM4AA00B25
VR 201, 202, 203, 204	EVNM0AA00B54
VR 205, 206, 207, 208	EVNM0AA00B14
VR 301	EVNM4AA00B24
VR 302	EVNM4AA00B53
VR 501	EVNM4AA00B14
CAPACITORS	
C 1, 2	ECEA1HS100
C 3, 4	ECEA50ZR47
C 5, 6	ECEA50Z1
C 7, 8	ECFDD103KXY
C 9, 10, 11	ECKD1H103ZF
C 12	ECKD1H223ZF
C 13, 14	ECKD1H391KB
C 15, 16	ECEA16M10R
C 17, 18	ECKD1H223ZF
C 19, 20	ECKD2H121KB
C 21, 22	ECFDD272KVY
C 23, 24	ECEA1AS221
C 25, 26	ECKD1H332KB
C 27, 28	ECEA50Z1
C 29, 30	ECEA1AS470
C 31, 32	ECKD1H392KB
C 33, 34	ECEA50Z1
C 35, 36	ECFDD102KVY
C 37, 38	ECQM1H153JZ
C 39, 40	ECCD1H101k
C 41, 42	ECEA1AS221
C 43, 44	ECQM1H123JZ
C 45, 46	ECQM1H562JZ
C 47, 48	ECKD1H223ZF
C 49, 50	ECEA1AS471
C 51, 52	ECEA50Z1
C 53, 54	ECEA1HS100
C 55, 56	ECEA1EN3R3
C 57, 58	ECQM1H223JZ
C 59, 60	ECQM1H562JZ
C 61, 62	ECQM1H393JZ
C 64	ECEA50ZR47

Ref No.	Part No.
C 65, 66	ECQM1H683JZ
C 67, 68	ECQM1H562JZ
C 69, 70	ECEA1ES220
C 71, 72	ECCD1H221K
C 73, 74	ECEA1CS221
C 75, 76	ECFDD103KXY
C 77, 78	ECQV05684JZ
C 79, 80	ECEA1CS330
C 81, 82	ECFDD223KXY
C 83	ECEA1HS100
C 84	ECEA1AS101
C 85	ECFDD104KXY
C 86	ECEA1HS100
C 87	ECFDD104KXY
C 88, 89	ECCD1H101k
C 90	ECFDD153KXY
C 91	ECKD1H103ZF
C 92	ECQM1H822JZ
C 93	ECEA1HF100
C 94	ECEA25Z4R7
C 95	ECEA1ES470
C 96	ECEA1HF100
C 97	ECCD1H820K
C 98	ECQV05334JZ
C 99	ECKD1H392KB
C 100	ECEA50ZR22
C 101	ECEA1HS100
C 102	ECEA25Z4R7
C 103, 104	ECQM1H103JZ
C 105, 106	ECKD1H102KB
C 107	ECQP1153JZ
C 108	ECKD1H103ZF
C 109	ECEA25Z4R7
C 110	ECEA50ZR47
C 111, 112, 113, 114	ECKD1H102KB
C 201, 202	ECEA25Z4R7
C 203, 204	ECEA50Z1
C 205, 206, 207, 208	ECQV05104JZ
C 209, 210	ECQV05334JZ
C 211, 212	ECCD1H201J
C 213, 214	ECQM1H103JZ
C 215, 216	ECCD1H101JZ
C 217, 218	ECQM1H103JZ
C 219, 220	ECCD1H101J
C 221, 222, 223, 224	ECEA25Z4R7
C 225, 226, 227, 228	ECQV05104JZ
C 229, 230, 231, 232	ECQM1H332JZ
C 233, 234	ECCD1H331J
C 235, 236	ECQV05104JZ
C 237, 238	ECQM1H103JZ
C 239, 240	ECQM1H102JZ
C 241, 242	ECEA16M10R
C 243, 244	ECEA1HS100
C 245	ECQM1H102JZ
C 247, 248	ECEA1ES470
C 249, 250	ECCD1H151K
C 301	ECQM1H104JZ
C 302	ECFDD223KXY
C 303, 304	ECEA50Z1
C 305, 306	ECEA50ZR47
C 307, 308	ECEA1HS100
C 309	ECEA1ES101
C 310	ECFDD473KXY
C 401	ECQP1103JZ
C 402	ECEA1V102
C 403	ECEA1ES101
C 404	ECKD1H103ZF
C 405	ECEA1ES220
C 406	ECEA50Z2R2
C 407	ECEA1ES101
C 408	ECEA1ES222

REPLACEMENT PARTS LIST

Important safety notice
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

Ref No.	Part No.
C 409	ECEA1ES101
C 410	ECKD1H103ZF
C 411	ECKD1H102KB
C 412	ECEA50Z1
C 413, 414	ECEA1ES101
C 415	ECEA1ES470
C 416, 417	ECEA1CS472
C 418	ECEA1HS100
C 419	ECKD1H102KB
C 420	ECQU2A103MF
C 421, 422, 423, 424, 425, 426, 428, 429	ECFDD683KXY
C 430	ECEA1ES332
C 431	ECEA1AS101
C 502	ECKD1H102MD
C 503	ECCD1H331KD
C 504	ECEA1AS221
C 505	ECKD1H333ZF
C 506	ECEA50Z2R2
C 507	ECKD1H222MD
C 508	ECEA1CN100
C 511	ECEA50Z1
C 701	ECKD1H102KB
C 702	ECKD1H561KB
C 703	ECKD1H471KB
C 704	ECEA1ES470
C 705	ECEA1CN100
C 801, 802	ECEA50Z1
C 803, 804	ECEA25Z4R7
C 807, 808	ECQM1H103JZ
C 809, 810	ECKD1H681KB
C 811, 812	ECQM1H683JZ
C 813, 814	ECQV05154JZ
C 815, 816	ECQM1H472JZ
C 817, 818	ECQM1H333JZ
C 819, 820	ECQM1H472JZ
C 821, 822	ECQV05104JZ
C 823, 824, 825, 826	ECEA1HS100
C 827, 828	ECQM1H473JZ
C 829, 830	ECQM1H333JZ
C 831, 832, 833, 834, 835, 836	ECQV05104JZ
C 837, 838	ECQM1H333JZ
C 839, 840	ECQV05224JZ
C 841, 842	ECEA25Z4R7
C 845	ECEA1HS100
C 846	ECEA50Z1

SPARK KILLERS

Ref No.	Part No.
Z 301	EXRP682M473T
Z 501	EXBEQ5273K
Z 502	EXBD86181K
Z 503	EXBEQ4272K
Z 504	QCRFWA1
Z 505	EXFP4472ZW
Z 506	EXBD88254K
Z 507	EXRP152K473T

TRANSISORS

Ref No.	Part No.
Q 1, 2, 3, 4	2SD636
Q 5	2SB641
Q 6	2SC945-Q
Q 7, 8	2SD965
Q 9, 10, 11	2SD1011
Q 12	2SA921
Q 13, 14	2SD965
Q 15	2SD636
Q 16	2SB641
Q 17, 18, 19, 20	2SK104F
Q 22, 23, 24	2SD636
Q 25	2SD592
Q 26	2SD946
Q 27, 28	2SB641
Q 29	2SD636
Q 30, 31	2SC945-Q
Q 201, 202	2SK104F
Q 203, 204	2SC945-Q
Q 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220	2SD1010
Q 221, 222, 223	2SC945-Q
Q 225	2SA564R
Q 227	2SC945-Q
Q 301, 302	2SD636
Q 303	2SB641
Q 401	2SD836
Q 402	2SD636
Q 403	2SB641
Q 404	2SB750
Q 405	2SC1846R
Q 406	2SD946
Q 407	2SD636
Q 408, 501, 502, 503, 504, 505	2SB643
Q 506	2SD636
Q 508	2SD965
Q 701	2SD1265
Q 702, 703, 803	2SD636
Q 804	2SB641
Q 805	2SD636
Q 806	2SB641

DIODES & RECTIFIERS

Ref No.	Part No.
D 1, 2, 3, 4	MA161
D 5	RVDRD7R5FB
D 7, 8, 9	MA161
D 12	SM112
D 13, 14, 15, 16	MA161
D 17	RVDRD6R2EB
D 18, 19, 20	MA161
D 21	SM112
D 22, 23, 24	MA161
D 29	TLR208
D 30	TLG208
D 31	TLY208
D 32	TLG208
D 33, 201, 202, 203. 204, 301, 302, 303, 304, 305, 306	MA161
D 401, 402, 403, 404	SM112
D 405	MA1051
D 406	MA1150
D 407	MA1082
D 408	SM112
D 409	MA1056
D 410, 411	MA161
D 412	SM112
D 413	MA1082
D 414	MA1047
D 501, 502, 503, 504, 505; 506, 507, 508, 509, 510, 511, 512, 513, 514	MA161
D 516	LN31GPHL
D 517	LN21RPHL
D 518	LN41YPHL
D 519	MA161
D 701	SVDEQA0113RA
D 702	MA161

INTEGRATED CIRCUITS

Ref No.	Part No.
IC 1, 2	AN6212
IC 3, 4	AN6213
IC 5	AN6256
IC 6	AN6214
IC 7	BA336
IC 201, 202	UPC1252H
IC 203, 204	UPC1253H
IC 205, 206	NJM4558DF
IC 301	AN6870N
IC 302, 303	AN6280
IC 304	AN6552
IC 305	BA6138
IC 501	MN1405RHB
IC 502	AN6270
IC 503	DN6838A
IC 701	M54816P
IC 801, 802	NE654N
IC 803, 804	NE652N

COILS

Ref No.	Part No.	Part Name & Description
L 1, 2	QLQX0343KWA	Bias Trap Coil
L 5	QLQX0332KWA	Peaking Coil
L 6, 7	QLQX0332KWA	Peaking Coil
L 501	ELEH101KA	Choke Coil
L 502,503	QLQZ1014D	Choke Coil
L 801,802	ELM10Q201F	MPX Coil
L 803,804	ELM7Q306A	Skewing Network

TRANSFORMERS

Ref No.	Part No.	Part Name & Description
T 1	QLB0198	Bias Oscillation Transformer
T 401	QLPD71EMX	AC Power Transformer

FUSES

Ref No.	Part No.	Part Name & Description
F 1, 2	XBAQ0010	Fuse (T 1.6A)
F 3	XBAQ025031	Fuse (T 250mA)
F 4	XBAQ0007	Fuse (T 400mA)

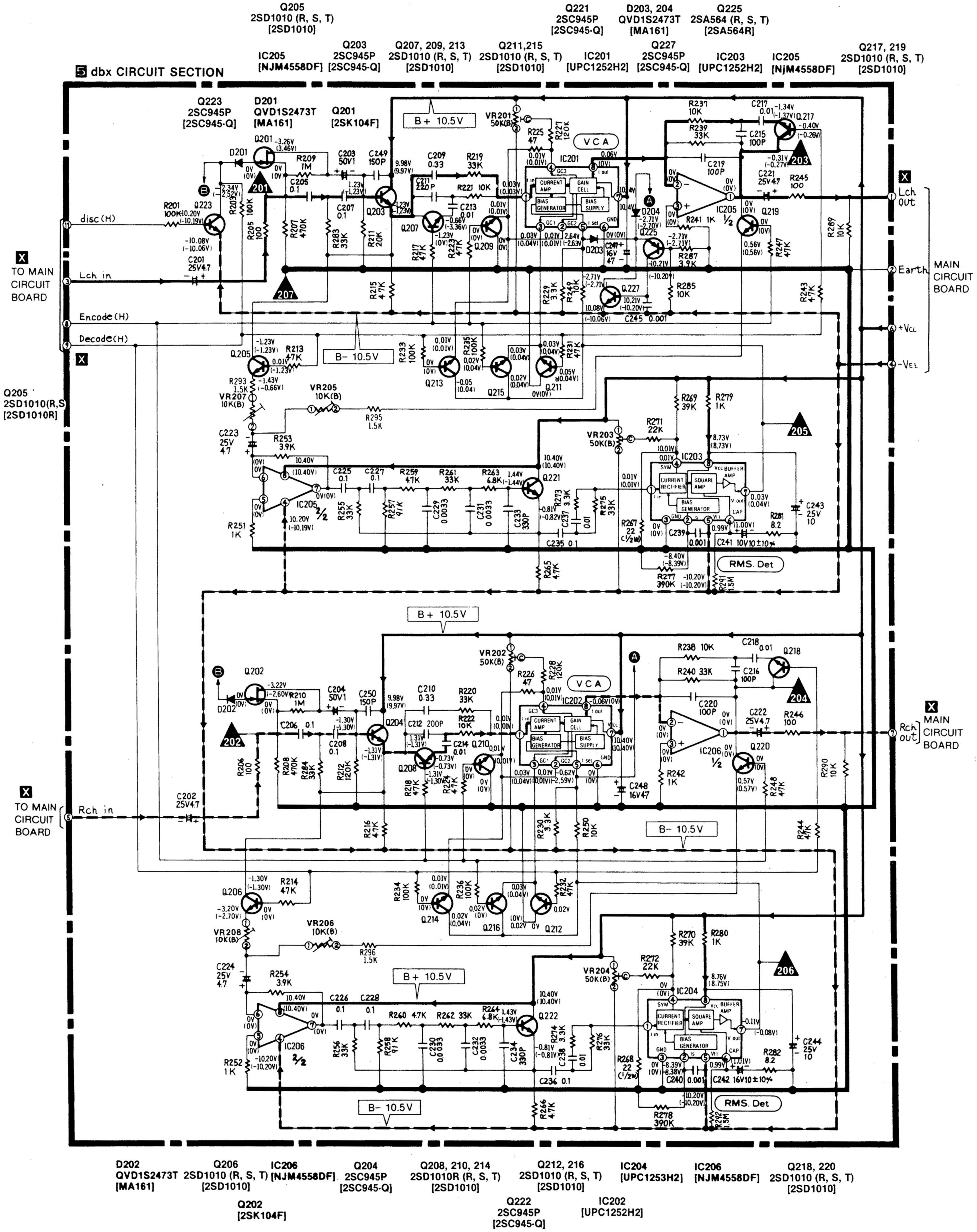
SWITCHES

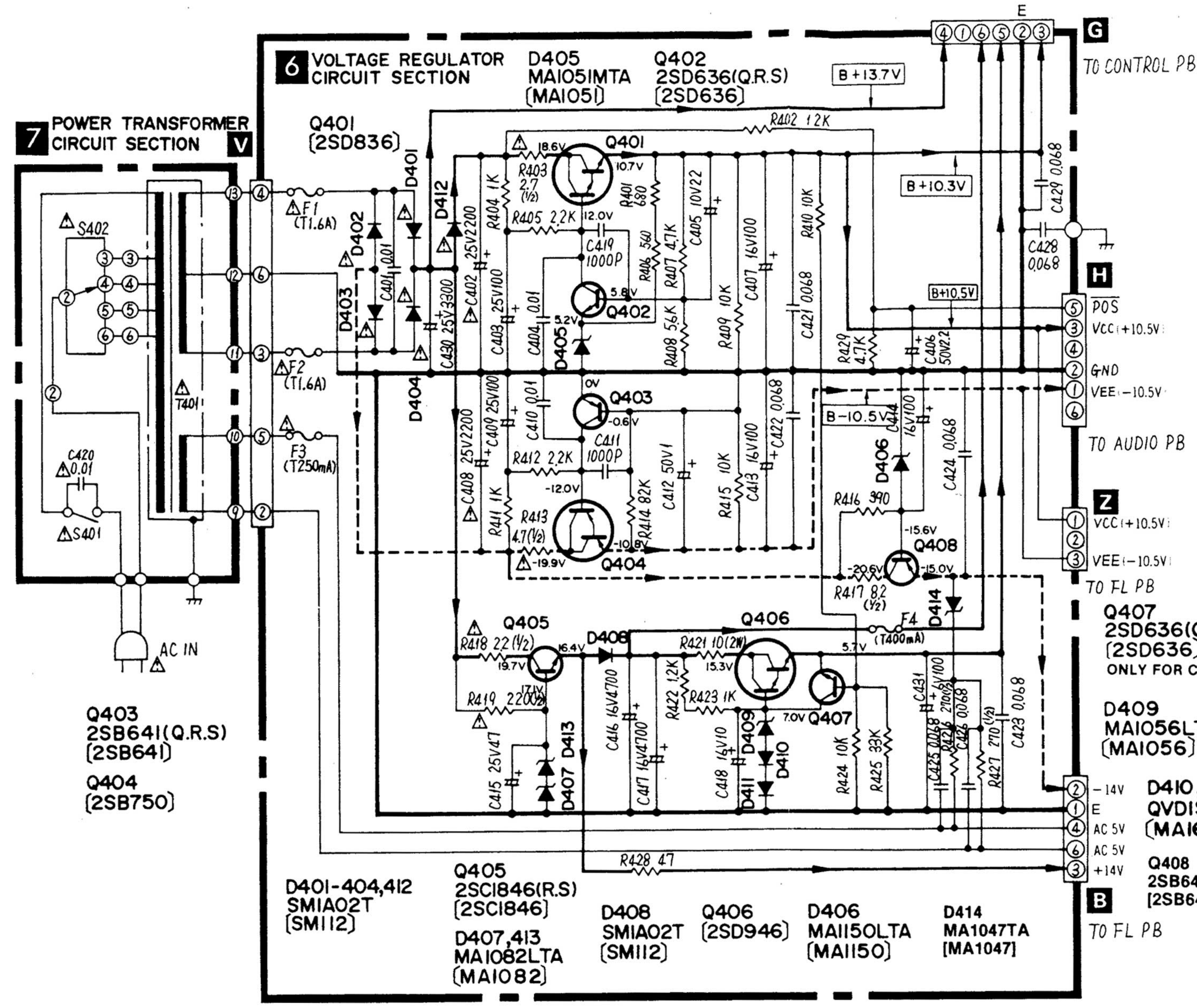
Ref No.	Part No.	Part Name & Description
S 1	QSR6501	Rotary Switch (NR Selector)
S 401	QSW1117AS	Push Switch (Power ON/OFF)
S 402	QSR1407	Rotary Switch (AC Power Voltage Selector)
S 501	QSW1118	Push Switch (Counter Reset ON/OFF)
S 502	QSW1118	Push Switch (Pause ON/OFF)
S 503	QSW1118	Pusth Switch (Recording)
S 504	QSW1118	Push Switch (STOP)
S 505	QSW1118	Push Switch (Playback)
S 506	QSW1118	Push Switch (Fastfoward)
S 507	QSW1118	Push Switch (Rewind)
S 508	QSW1118	Push Switch (REC MUTE)
S 509	QSW1118	Push Switch (Introduction Search)
S 511,512	QSWY408A	Switch 4 Key Push Switch
S 513	QSWY408A	Switch 4 Key Push Switch
S 514	QSWY408A	Switch 4 Key Push Switch
S 515	QSS1303	Slide Switch (Timer Switch)
S 601	QSB0260	Leaf Switch (Accidental Erase Prevention)
S 602	QSB0260	Leaf Switch (Mode)
S 603	QSB0261	Leaf Switch (Playback)
S 604	QSB0260	Leaf Switch (Stop)
S 605	QSB0261	Leaf Switch (Cassette Detection)
S 606	QSB0266	Leaf Switch (Auto Tape Selector)
S 607	QSB0266	Leaf Switch (Auto Tape Selector)

JACKS

Ref No.	Part No.	Part Name & Description
J 1, 2	QJA0262	Microphone Jack
J 3	QJA0259	Headphone Jack
J 4, 5, 6, 7	QEJ5003S	Jack Board Assembly (LINE IN/OUT)

SCHEMATIC DIAGRAMS





NOTES:

- S401.......... AC power switch
- S402.................... AC power voltage select switch.
- VR201, 202 .... VCA symmetry adjustment VR
- VR203, 204 .... RMS detector adjustment VR
- VR205, 206 .... dbx standard level adjustment VR (Encode)
- VR207, 208 .... dbx standard level adjustment VR (Decode)
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise. 1K = 1,000 (Ω), 1M = 1,000 k(Ω).
- Capacity are in micro-farads (μF) unless specified otherwise.
- The mark (▼) shows test point. e.g. ▼ = Test point 1.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  - Voltage values shown in dbx section.
    No mark ...... Voltage values at dbx Tape and playback mode.
    (   ) .... Voltage values at dbx Tape and record mode.
  - Voltage values shown in voltage regulator section.
    No mark ...... Voltage values at playback mode.
    (   ) .... Voltage values at record mode.

  For measurement use VTVM.
- (■➧■) indicates the flow of the recording signal (dbx tape).
- (━➧━) indicates the flow of the playback signal (dbx tape).

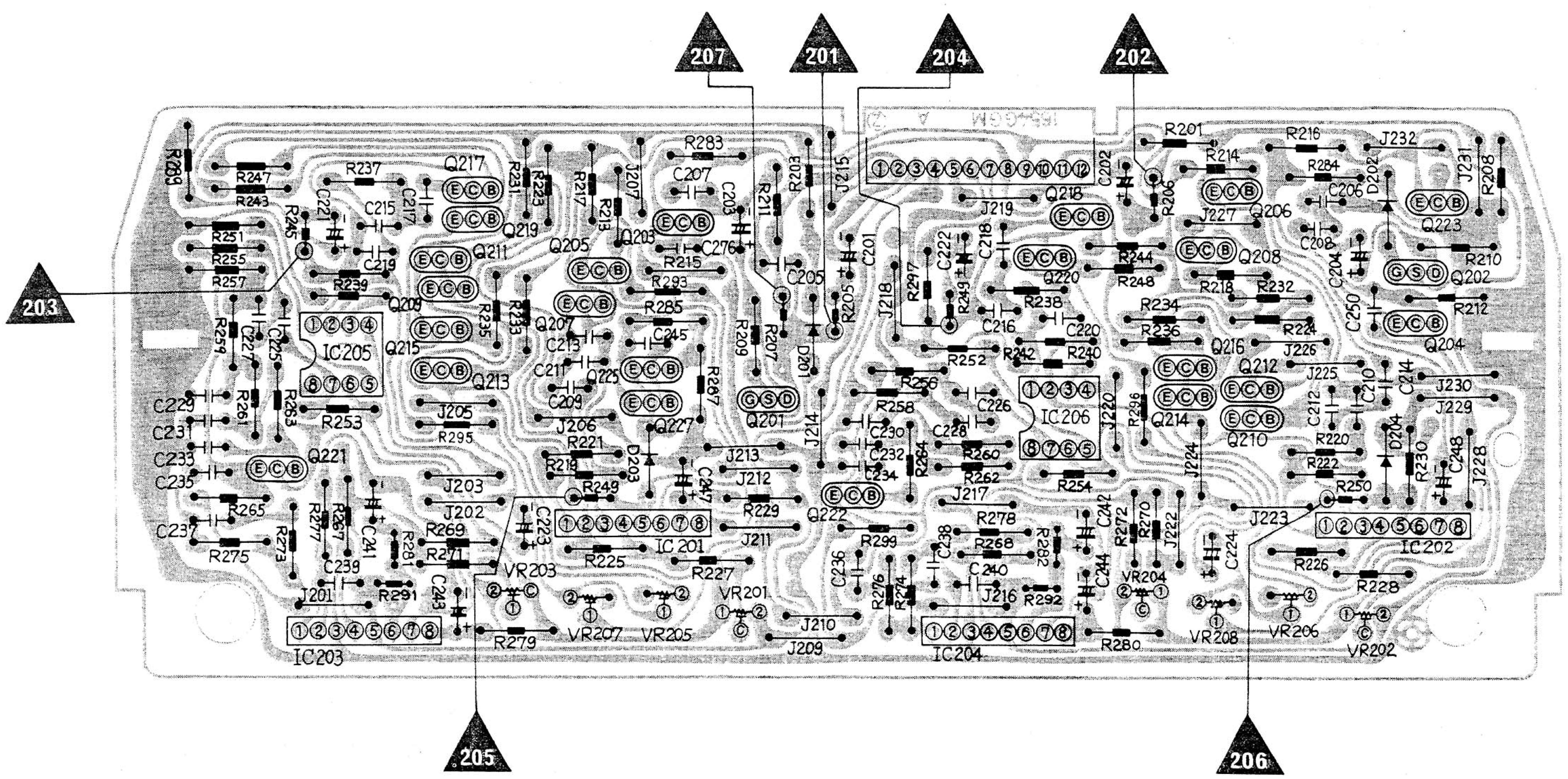
- Important safety notice
  Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- Described in the schematic diagram are two types of numbers; the supply parts number and production parts number for transistors and diodes.
  One type of number is used for supply parts number and production parts number when they are identical.

  e.g. Q1
  2SC1844(E, F) ← Production parts number
  [2SC1844E] ← Supply parts number
  D212
  1S2473T77 ← Production parts number
  [MA161] ← Supply parts numbers
- The supply parts number is described alone in the replacement parts list.

- **This schematic diagram may be modified at any time with the development of new technology.**

CIRCUIT BOARDS

5 dbx CIRCUIT BOARD



Q201 [2SK104]

G	0V
S	0V
D	−3.26V (3.46V)

Q202 [2SK104]

G	0V
S	0V
D	−3.22V (−2.60V)

Q203 [2SC945-Q]

B	−1.23V
C	9.98V
E	−1.23V

Q204 [2SC945-Q]

B	−1.30V
C	9.98V
E	−1.31V

Q205 [2SD1010]

B	0.01V (−1.23V)
C	−1.23V (−1.23V)
E	−1.43V (−0.66V)

Q206 [2SD1010]

B	0V
C	−1.30V
E	−3.20V (−2.70V)

Q207 [2SD1010]

B	−1.23V (0V)
C	−1.23V
E	−0.66V (−3.36V)

Q208 [2SD1010]

B	−1.31V
C	−1.31V
E	−0.73V

Q209 [2SD1010]

B	0V
C	0V
E	0.01V

Q210 [2SD1010]

B	0V
C	0V
E	0.01V

Q211 [2SD1010]

B	−0.05V (0.04V)
C	0V
E	−0.03V (0.04V)

Q212 [2SD1010]

B	0.02V
C	0V
E	−0.03V

Q213 [2SD1010]

B	0V
C	−0.05V (0.04V)
E	−0.01V (0.01V)

Q214 [2SD1010]

B	0V
C	0.02V (0.04V)
E	−0.01V (0.01V)

Q215 [2SD1010]

B	0.02V
C	0.02V
E	0.03V

Q216 [2SD1010]

B	0.02V
C	0.02V
E	0.03V

Q217 [2SD1010]

B	−0.40V (−0.26V)
C	−0.31V (−0.27V)
E	−1.34V

Q218 [2SD1010]

B	−0.06V (−0.02V)
C	0V
E	−2.30V (−1.29V)

Q219 [2SD1010]

B	0V
C	0V
E	0.56V

Q220 [2SD1010]

B	0V
C	0V
E	0.57V

Q221 [2SC945-Q]

B	−1.44V
C	10.40V
E	−0.81V

Q222 [2SA564R]

B	−1.43V
C	10.40V
E	−0.81V

Q223 [2SC945-Q]

B	−10.20V
C	−2.34V (−2.52V;
E	−10.08V

Q225 [2SA564R]

B	−2.71V
C	−9.71V (−9.62V)
E	−2.85V

Q227 [2SC945-Q]

B	−10.21V
C	−2.71V
E	−9.66V

Q401 [2SD836]

B	12.0V
C	18.6V
E	10.7V

Q402 [2SD636]

B	5.8V
C	12.0V
E	5.2V

Q403 [2SB641]

B	−0.6V
C	−12.0V
E	0V

Q404 [2SB750]

B	−12.0V
C	−19.9V
E	−10.8V

Q405 [2SC1846]

B	17.1V
C	19.7V
E	16.4V

Q406 [2SD946]

B	7.0V
C	15.3V
E	5.7V

Q408 [2SB643]

B	−15.6V
C	−20.6V
E	−15.0V

IC201 [UPC1252H2]

1	0.03V
2	0.01V
3	0.03V
4	0.01V
5	−2.64V
6	0V
7	10.4V
8	−0.06V (0V)

IC202 [UPC1252H2]

1	0.01V
2	0.01V
3	0.03V
4	0V
5	−2.62V (−2.59V)
6	0V
7	10.40V
8	−0.06V (0V)

IC203 [UPC1253H2]

1	0.01V
2	−8.40V
3	0V
4	0.01V
5	−10.20V
6	0.99V
7	0.03V
8	8.73V

IC204 [UPC1253H2]

1	0.01V
2	−8.39V (8.38V)
3	0V
4	0V
5	−10.20V
6	0.99V (1.01V)
7	−0.11V (−0.08V)
8	8.76V

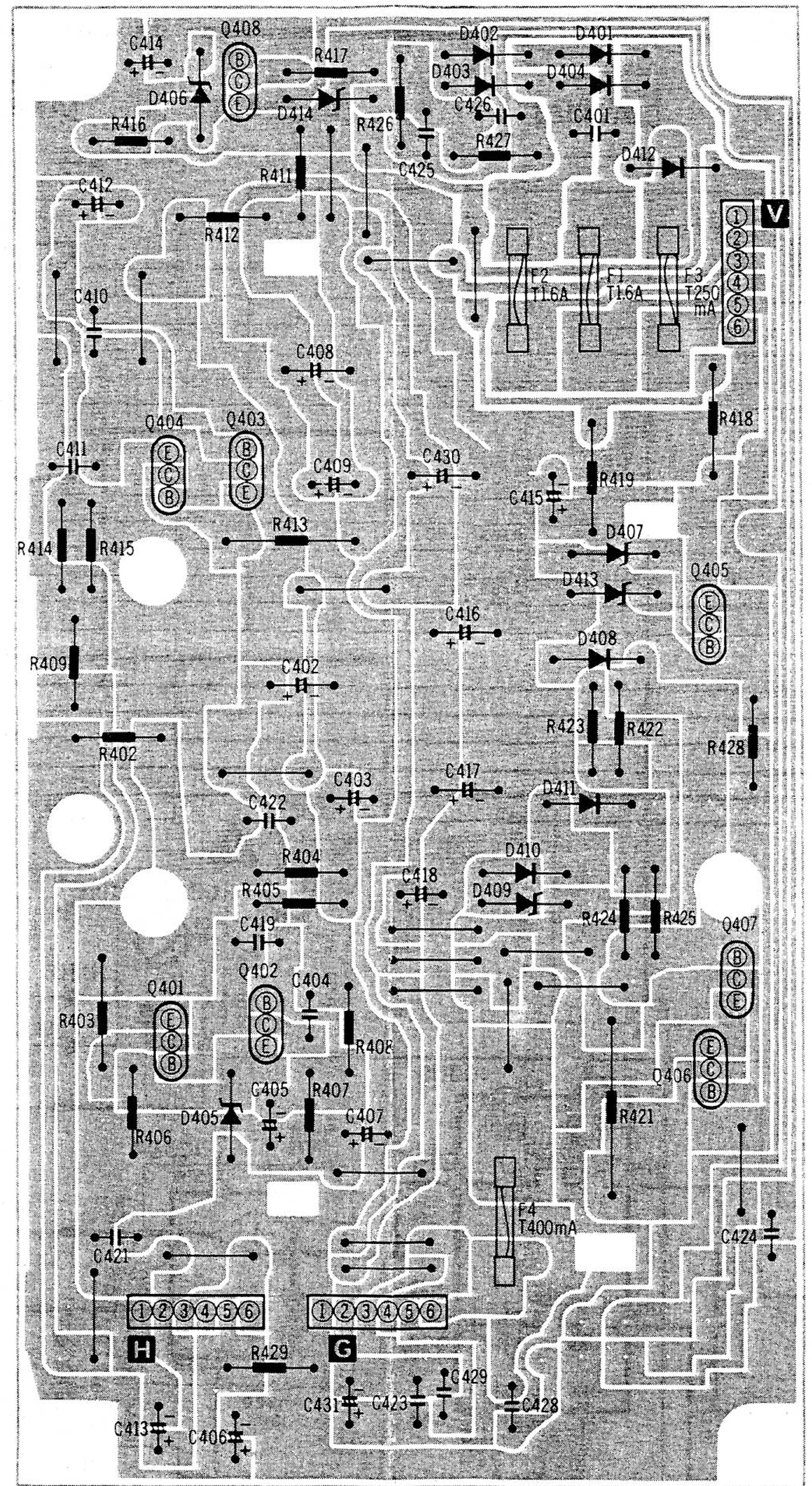
IC205 [NJM4558DF]

1	0V
2	0V
3	0V
4	−10.20V
5	0V
6	0V
7	0V
8	10.40V

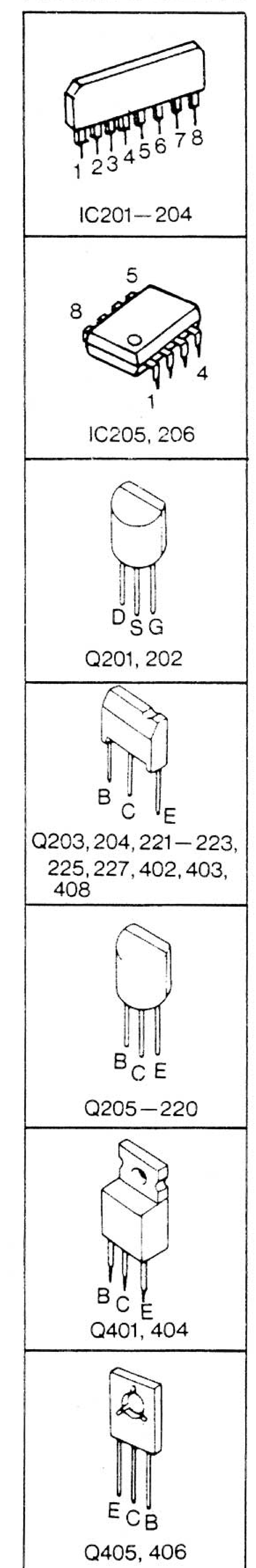
IC206 [NJM4558DF]

1	0V
2	0V
3	0V
4	−10.20V
5	0V
6	0V
7	0V
8	10.40V

6 VOLTAGE REGULATOR CIRCUIT BOARD



TERMINATIONS

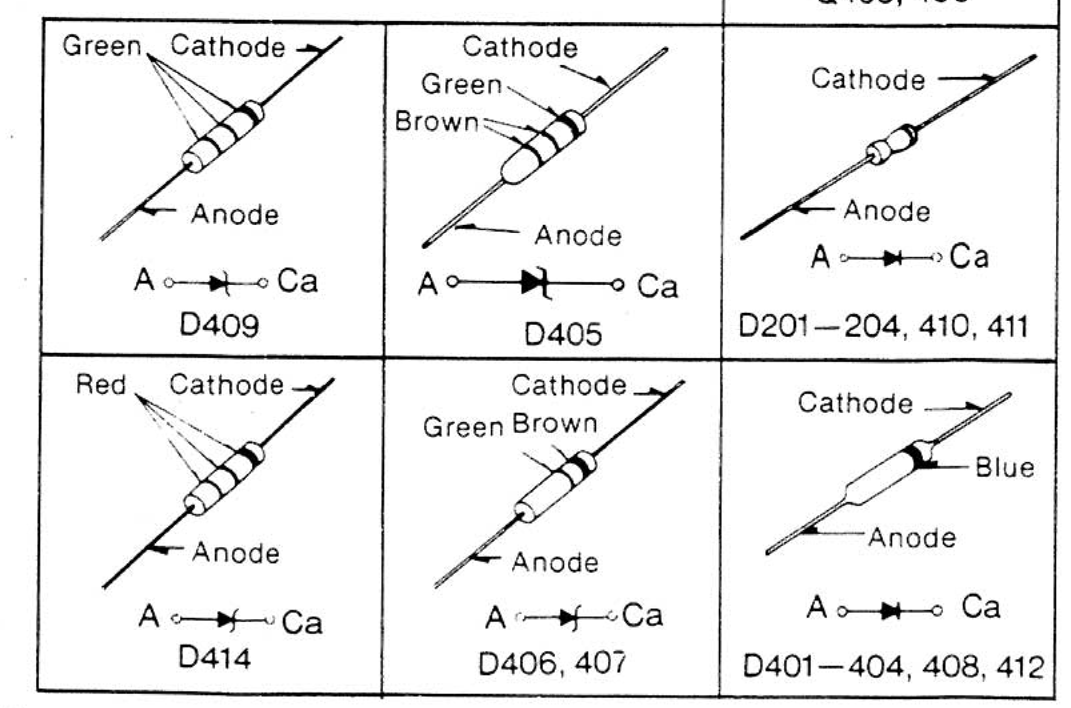


NOTES:

- The circuit shown in ▒▒▒ on the conductor side indicates printed circuit on the back side of the printed circuit board.
- Values indicated in ☐ are under no signal condition and playback mode with volume control at minimum position otherwise specified.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  - Voltage values shown in dbx section.
    No mark ...... Voltage values at dbx Tape and playback mode.
    ( )........ Voltage values at dbx Tape and record mode.
  - Voltage values shown in voltage regulator section.
    No mark ...... Voltage values at playback mode.
    ( )........ Voltage values at record mode.

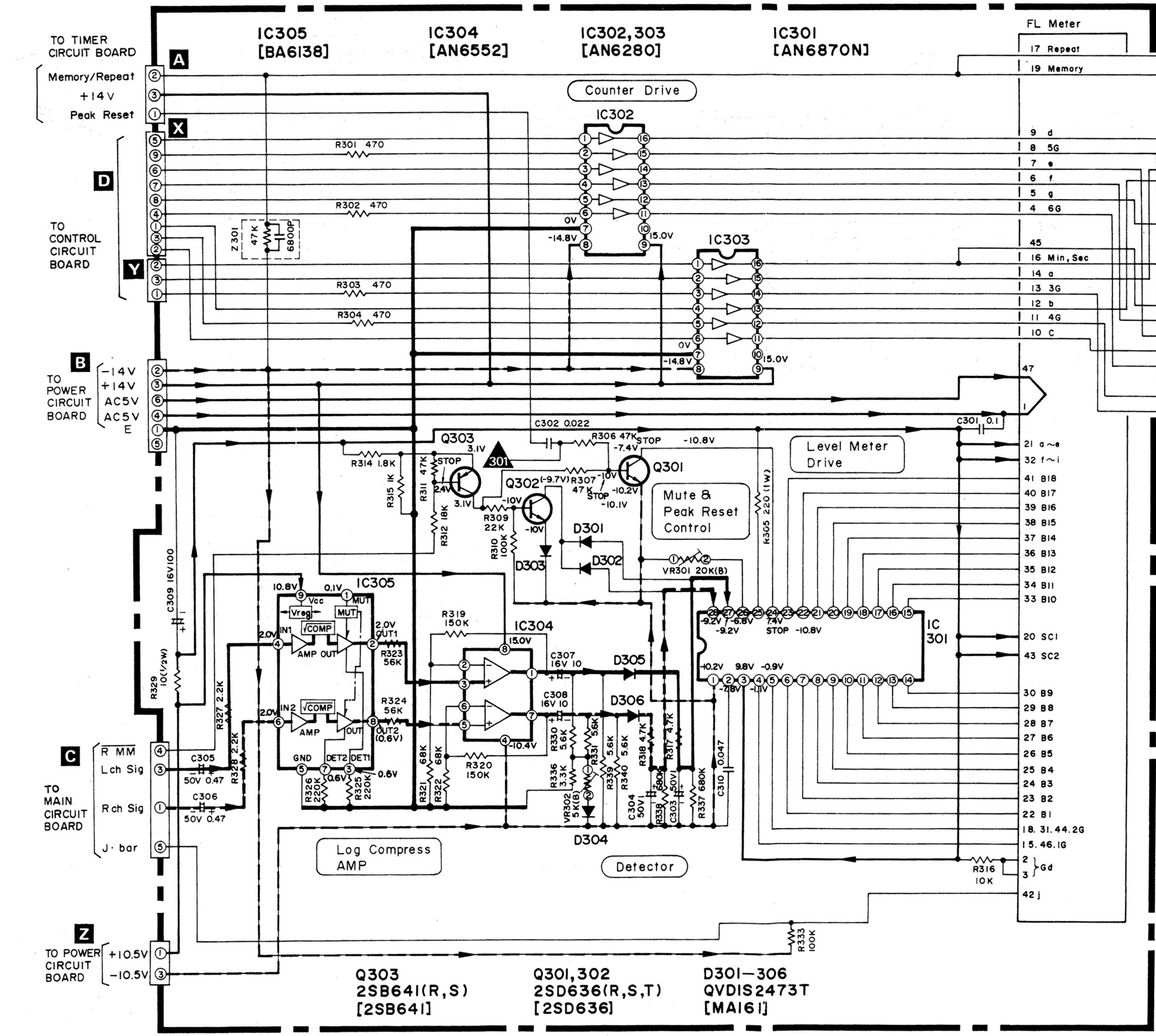
  For measurement use VTVM.

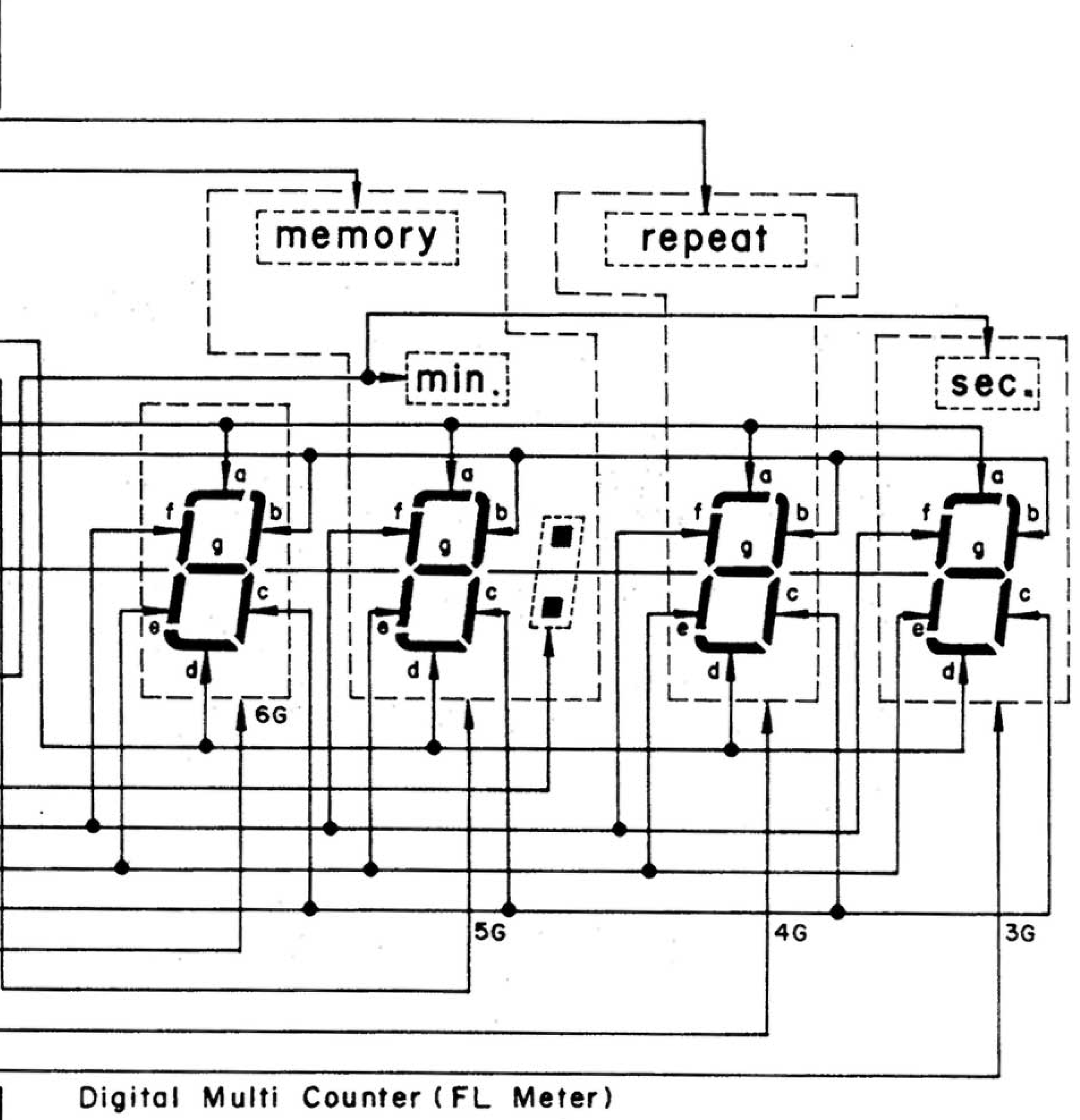
- **This circuit board diagram may be modified at any time with the development of new technology.**



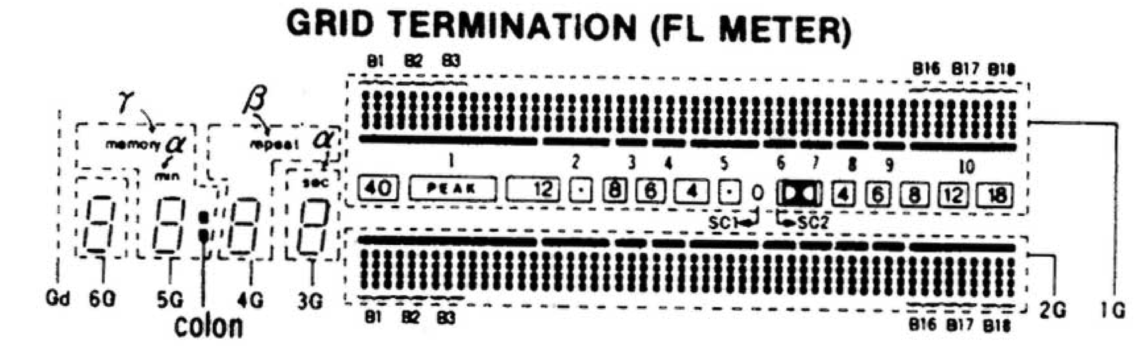
SCHEMATIC DIAGRAM

8 FL METER CIRCUIT SECTION



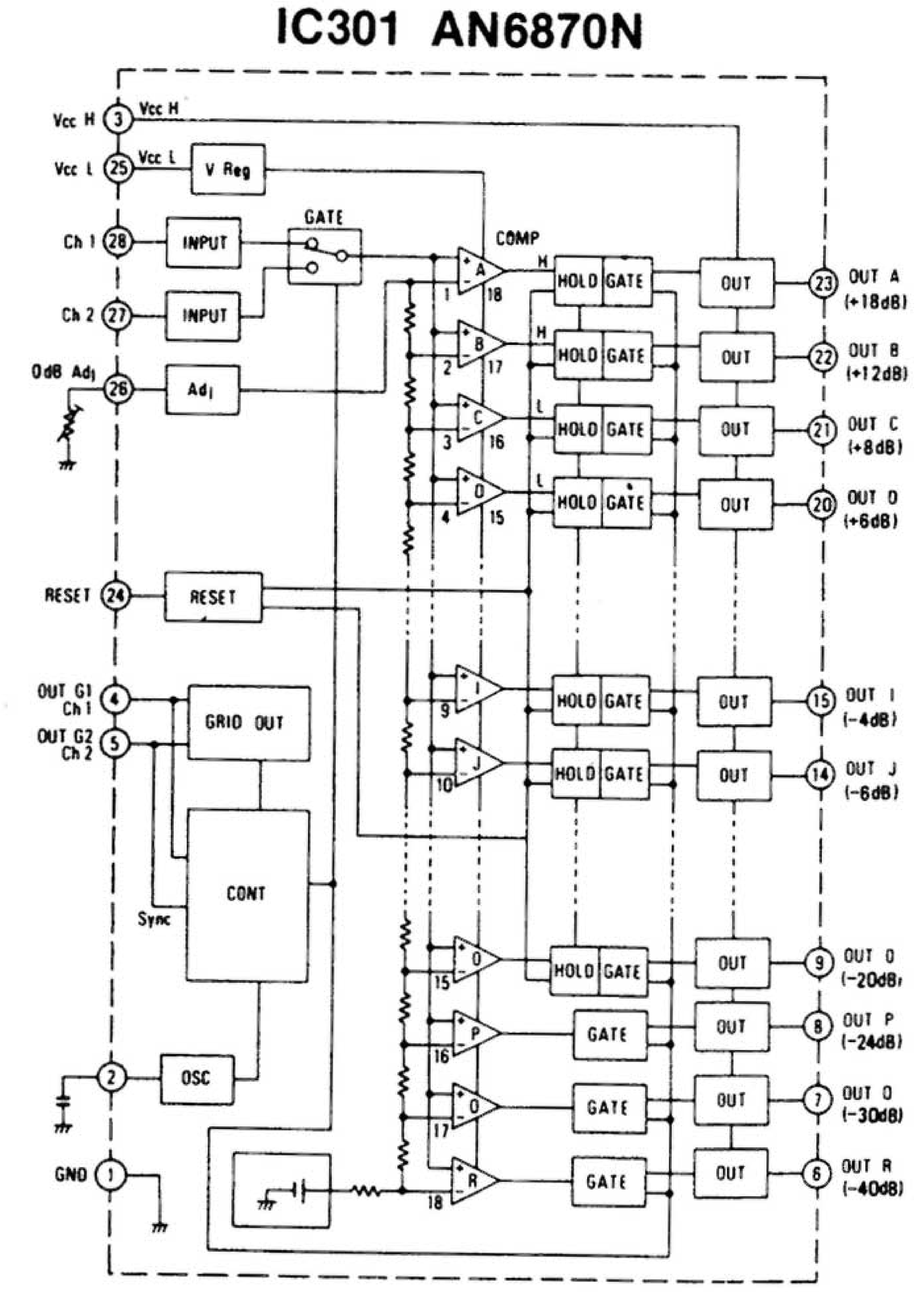


GRID TERMINATION (FL METER)



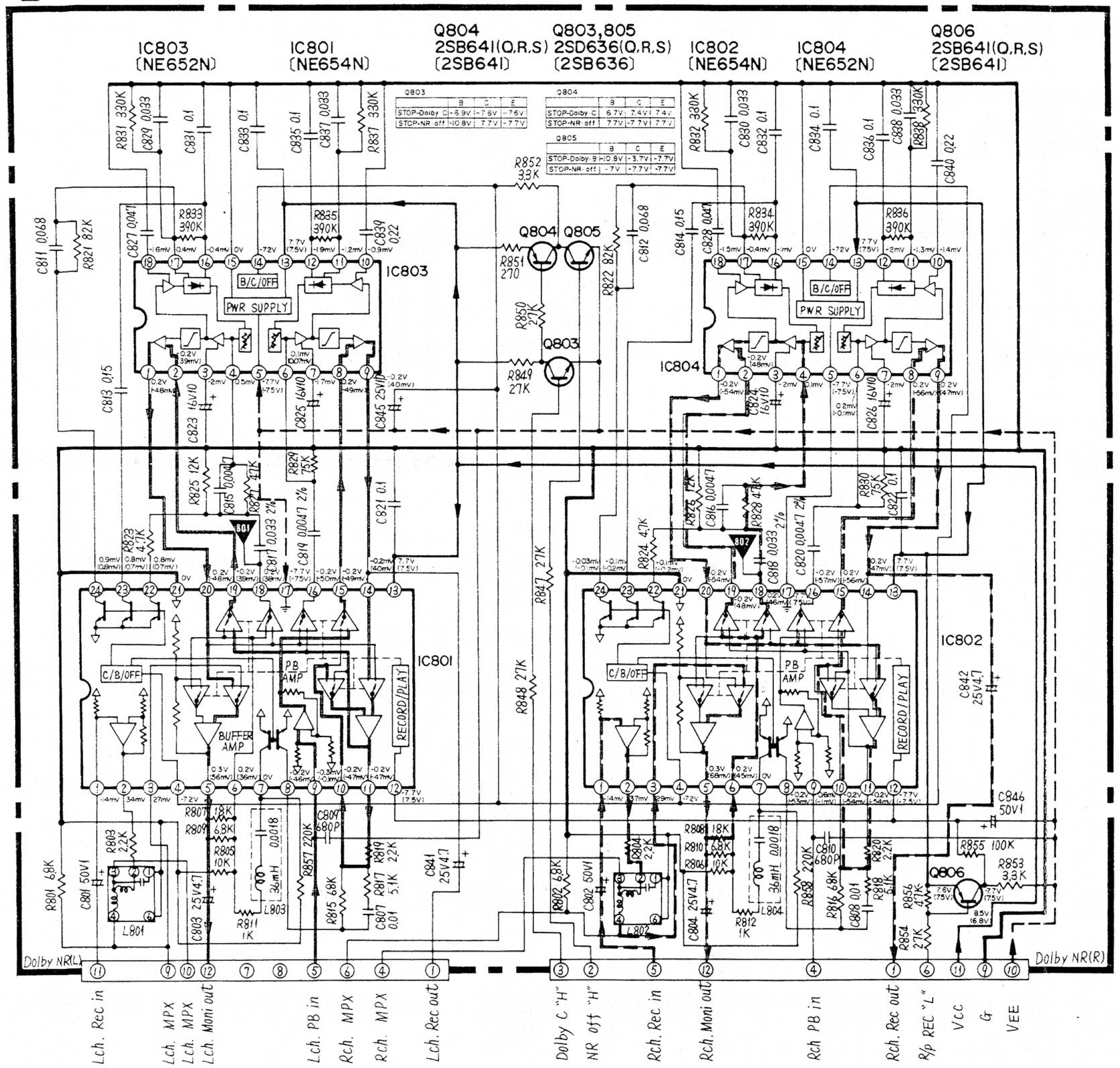
EQUIVALENT CIRCUIT

IC301 AN6870N



SCHEMATIC DIAGRAM

4 DOLBY CIRCUIT SECTION

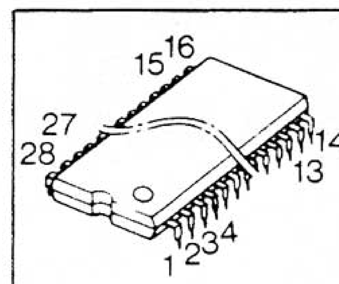


NOTES:
- VR301 . . . . . FL meter adjustment VR (0dB indication)
- VR302 . . . . . FL meter adjustment VR (−40dB indication)
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
  1K = 1,000Ω, 1M = 1,000 k(Ω).
- Capacity are in micro-farads (μF) unless specified otherwise.
- The mark (▼) shows test point. e.g. ∇ = Test point 1.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  (   ) . . . . Voltage values at record mode.
  STOP . . . . . Voltage values at stop mode.
  DOLBY B.....Voltage values at Dolby-B mode.
  DOLBY C.....Voltage values at Dolby-C mode.
  DOLBY B-C..Voltage values at Dolby-B or Dolby-C mode.
  For measurement use VTVM.
- ( ) indicates B + (bias).
- ( ) indicates B − (bias).
- ( ) indicates the flow of the recording signal (dbx tape).
- ( ) indicates the flow of the playback signal (dbx tape).
- Described in the schematic diagram are two types of numbers; the supply parts number and production parts number for transistors and diodes.
  One type of number is used for supply parts number and production parts number when they are identical.

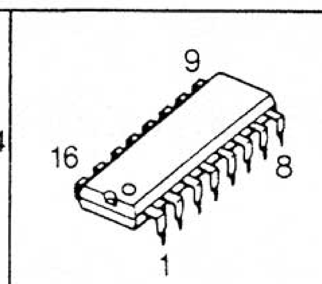
  e.g. Q1
  2SC1844(E, F)◄— Production parts number
  [2SC1844E]◄— Supply parts number
  D212
  1S2473T77◄— Production parts number
  [MA161]◄— Supply parts numbers

- The supply parts number is described alone in the replacement parts list.

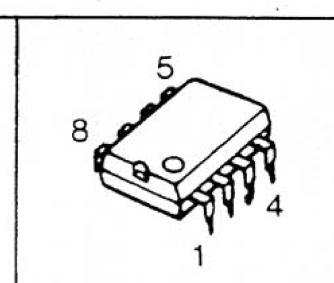
- **This schematic diagram may be modified at any time with the development of new technology.**



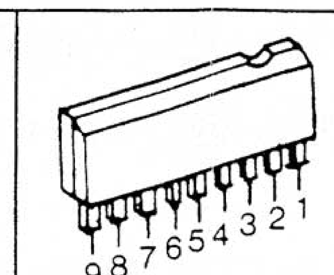
IC301



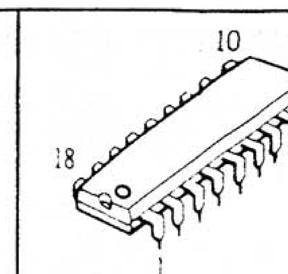
IC302, 303



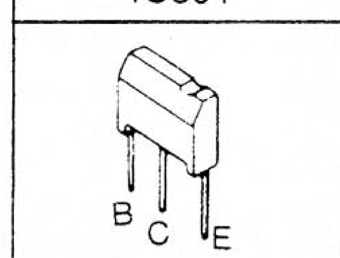
IC304



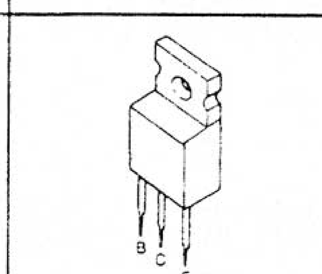
IC305



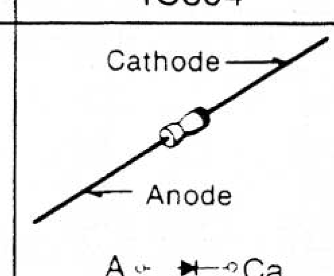
IC803, 804



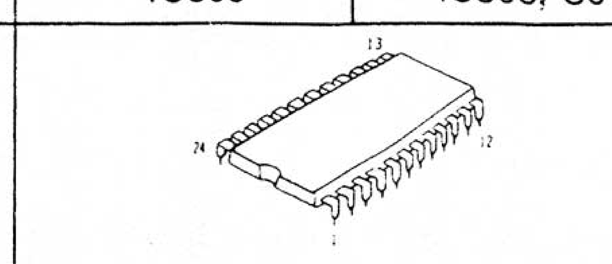
Q301—303, 803—806



Q701



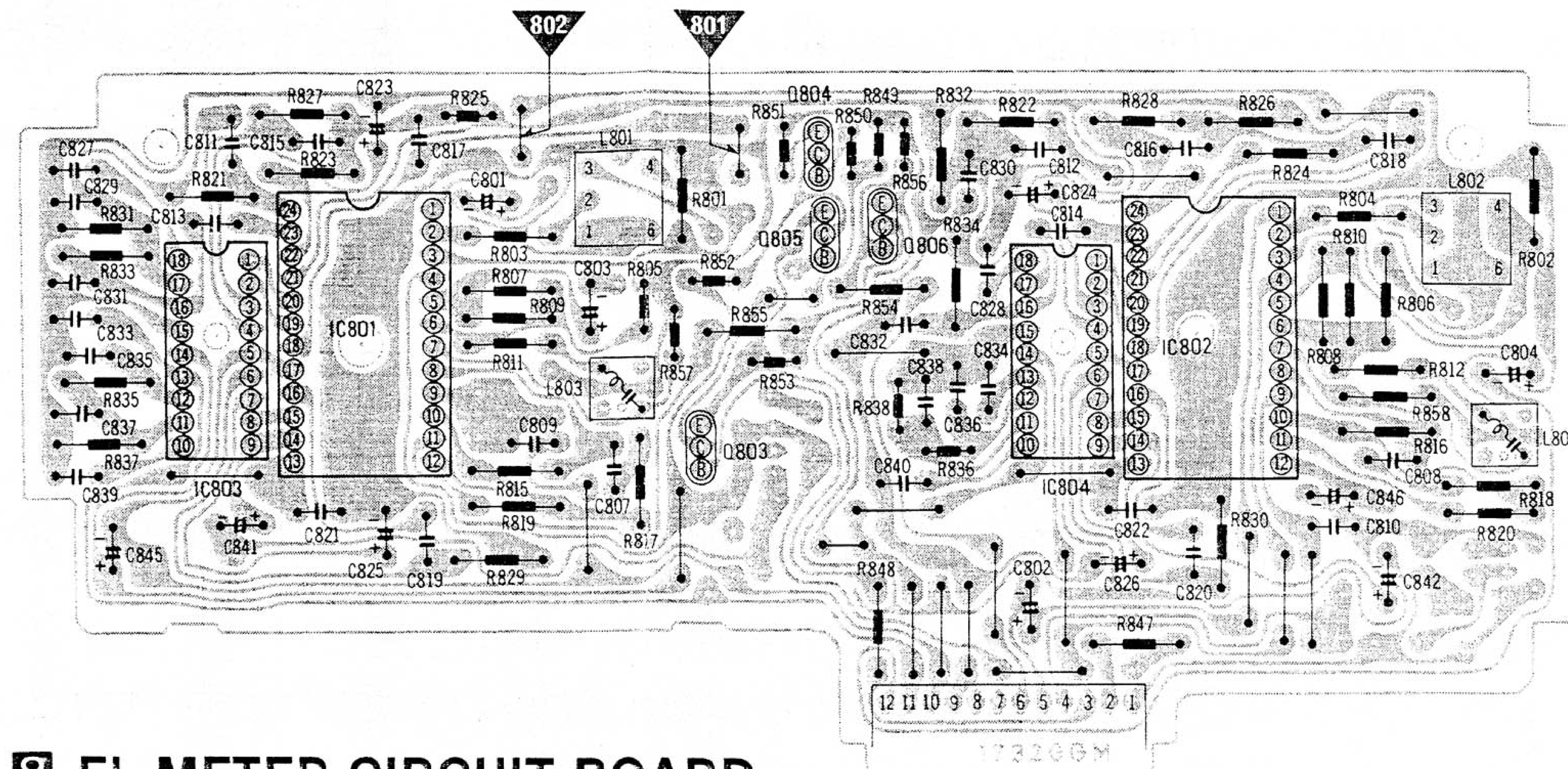
D301—306



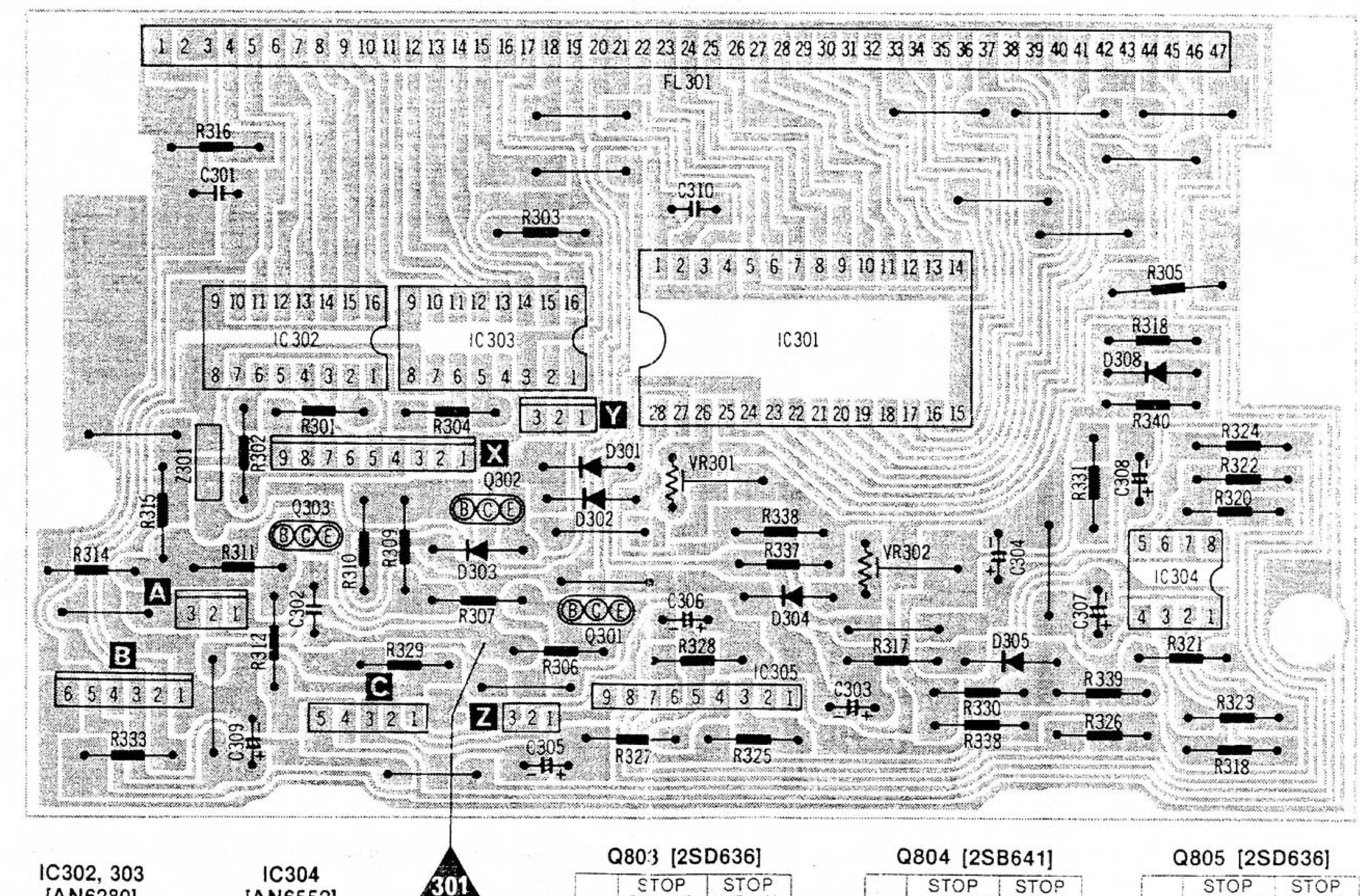
IC801, 802

CIRCUIT BOARDS

4 DOLBY CIRCUIT BOARD



8 FL METER CIRCUIT BOARD



IC301
[AN6870N]

1	−10.8V	
2	−8.3V	
3	10.3V	
4	−1.0V	
5	−0.9V	
24	−7.4V	STOP −10.8V
25	5.3V	
26	−6.8V	
27	−9.7V	
28	−9.7V	

IC302, 303
[AN6280]

7	0V
8	−14.8V
9	15.0V
10	0V

IC304
[AN6552]

1	0V
2	0V
3	0V
4	−10.8V
5	0V
6	0V
7	0V
8	15.0V

Q803 [2SD636]

	STOP Dolby-C	STOP NR-off
B	−6.9V	−10.8V
C	−7.6V	7.7V
E	−7.6V	−7.7V

Q804 [2SB641]

	STOP Dolby-C	STOP NR-off
B	6.7V	7.7V
C	7.4V	−7.7V
E	7.4V	7.7V

Q805 [2SD636]

	STOP Dolby-B	STOP NR-off
B	−10.8V	−7V
C	−3.7V	−7.7V
E	−7.7V	−7.7V

Q806 [2SB641]

B	8.5V	(6.8V)
C	−7.7V	(7.5V)
E	7.6V	(7.5V)

IC305
[BA6138]

1	0.1V	
2	0V	
3	0.6V	
4	2.0V	
5	0V	
6	2.0V	
7	0.6V	
8	0V	(0.6V)
9	10.8V	

Q301
[2SD636]

B	−10.8V	STOP −10.1V
C	−7.4V	STOP −10.8V
E	−10.8V	

Q302
[2SD636]

B	−10.8V	STOP −10.1V
C	−9.7V	STOP −10.3V
E	−10.8V	STOP −10.3V

Q303
[2SB641]

B	—	STOP 2.4V
C	3.1V	
E	3.1V	

IC801
[NE654N]

1	−14mV	
2	34mV	
3	27mV	
4	−7.2V	
5	0.3V	(56mV)
6	0.2mV	(36mV)
7	0V	
8	−0.2V	(−46mV)
9	−0.3V	(−0.1mV)
10	−0.2V	(−47mV)
11	−0.2V	(−47mV)
12	−7.7V	(7.5V)
13	7.7V	(7.5V)
14	−0.2mV	(40mV)
15	0.2V	(−49mV)
16	−0.2V	(−50mV)
17	−7.7V	(−7.5V)
18	0.2V	(38mV)
19	−0.2V	(39mV)
20	0.2V	(−48mV)
21	0V	
22	0.8mV	(0.7mV)
23	0.8mV	(0.7mV)
24	0.9mV	(0.8mV)

IC802
[NE654N]

1	−14mV	
2	37mV	
3	29mV	
4	−7.2V	
5	0.3V	(68mV)
6	0.2V	(45mV
7	0V	
8	−0.2V	(−53mV)
9	0.6mV	(−1mV)
10	−0.2V	(−54mV)
11	−0.2V	(−54mV)
12	−7.7V	(−7.5V)
13	7.7V	(7.5V)
14	0.2V	(47mV)
15	0.2V	(−56mV)
16	−0.2V	(−57mV)
17	−7.7V	(−7.5V)
18	0.2V	(46mV)
19	−0.9V	(48mV)
20	−0.2V	(−54mV)
21	0V	
22	−0.1mV	(−0.2mV)
23	0.1mV	(−0.2mV)
24	−0.03mV	(−0.1mV)

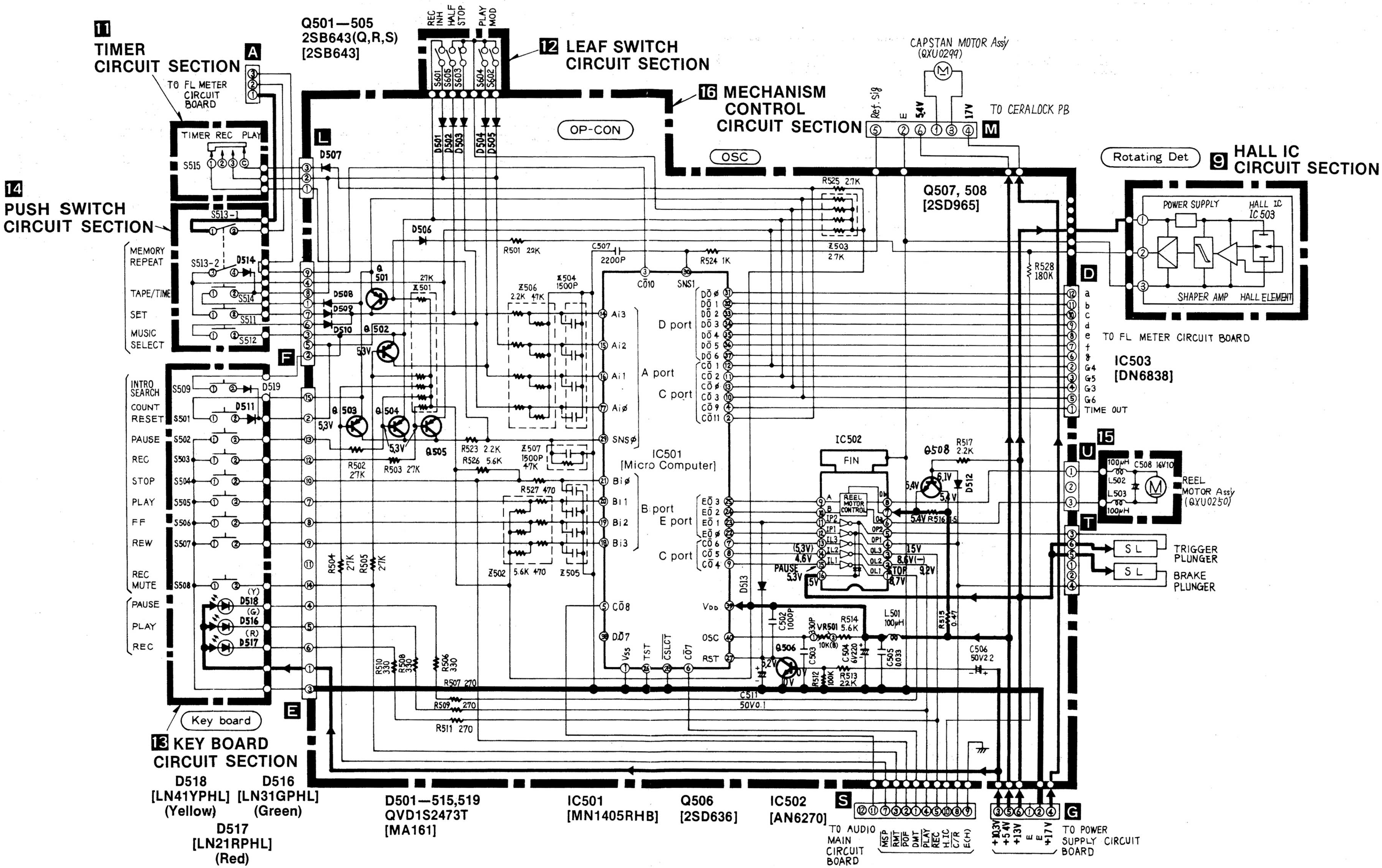
IC803, 804
[NE652N]

1	0.2V	(−48mV)
2	−0.2V	(39mV)
3	−2mV	
4	0.5mV	
5	−7.7V	(−7.5V)
6	0.1mV	(0.07mV)
7	−1.7mV	
8	0.2V	(−49mV)
9	−0.2V	(40mV)
10	−0.9mV	
11	−1.2mV	
12	−1.9mV	
13	7.7V	(7.5V)
14	−7.2V	
15	0V	
16	−0.4mV	
17	0.4mV	
18	−1.6mV	

NOTES:
- The circuit shown in on the conductor side indicates printed circuit on the back side of the printed circuit board.
- Values indicated in are under no signal condition and playback mode with volume control at minimum position otherwise specified.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  (   ) . . . . Voltage values at record mode.
  STOP . . . . . Voltage values at stop mode.
  DOLBY B.....Voltage values at Dolby-B mode.
  DOLBY C.....Voltage values at Dolby-C mode.
  DOLBY B-C..Voltage values at Dolby-B or Dolby-C mode.
  For measurement use VTVM.

- **This circuit board diagram may be modified at any time with the development of new technology.**

SCHEMATIC DIAGRAM 16 MECHANISM CONTROL CIRCUIT SECTION



NOTES:

- VR501 ..... Input scanning time adjustment VR
- S501 ...... Counter reset switch
- S502 ...... Pause switch
- S503 ...... Record switch
- S504 ...... Stop switch
- S505 ...... Playback switch
- S506 ...... Fast Forward switch
- S507 ...... Rewind switch
- S508 ...... Record mute switch
- S509 ...... Intro search switch.
- S511 ...... Set switch
- S512 ...... Music select switch
- S513 ...... Memory repeat switch
- S514 ...... Tape/Time select switch
- S515 ...... Timer switch (shown in REC position; (1) REC, (2) OFF, (3) PLAY)
- S601 ...... Accidental erase prevention switch
- S602 ...... Mode switch
- S603 ...... Stop switch
- S604 ...... Playback switch
- S605 ...... Cassette detection switch

(S602–S604: Mode sensing switches)

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

P = Pico-farads.

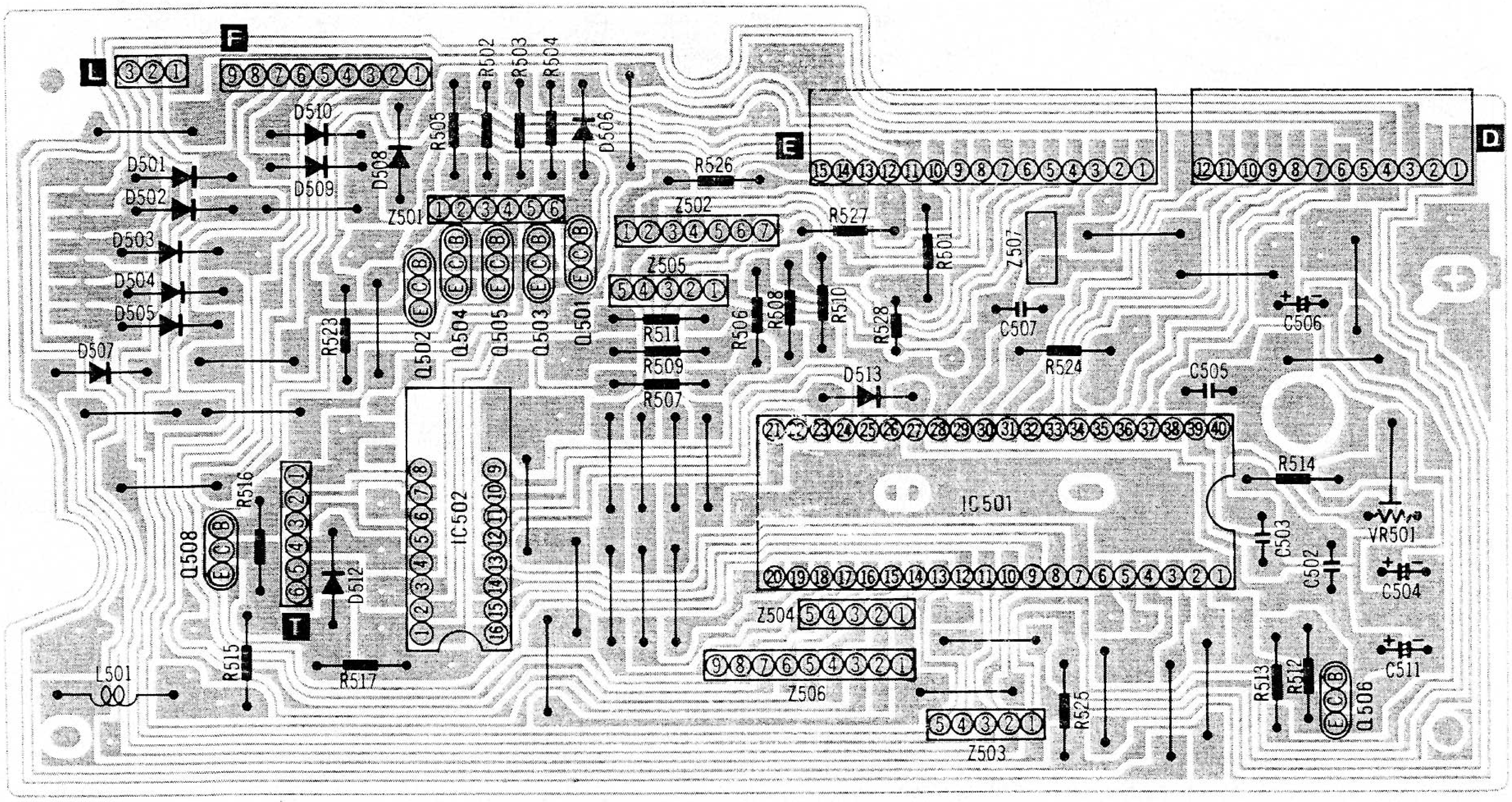
- The mark (▼) shows test point. e.g. ▽ = Test point 1.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position. However, the voltage in record mode is indicated in ( ) when it differs from that in playback mode. For measurement, use VTVM.
- Described in the schematic diagram are two types of numbers; the supply parts number and production parts number for transistors are diodes. One type of number is used for supply parts number and production parts number when they are identical.

e.g. Q1
2SC1844(E, F) ← Production parts number
[2SC1844E] ← Supply parts number
D301
QVD1S2473T ← Production parts number
[MA161] ← Supply parts

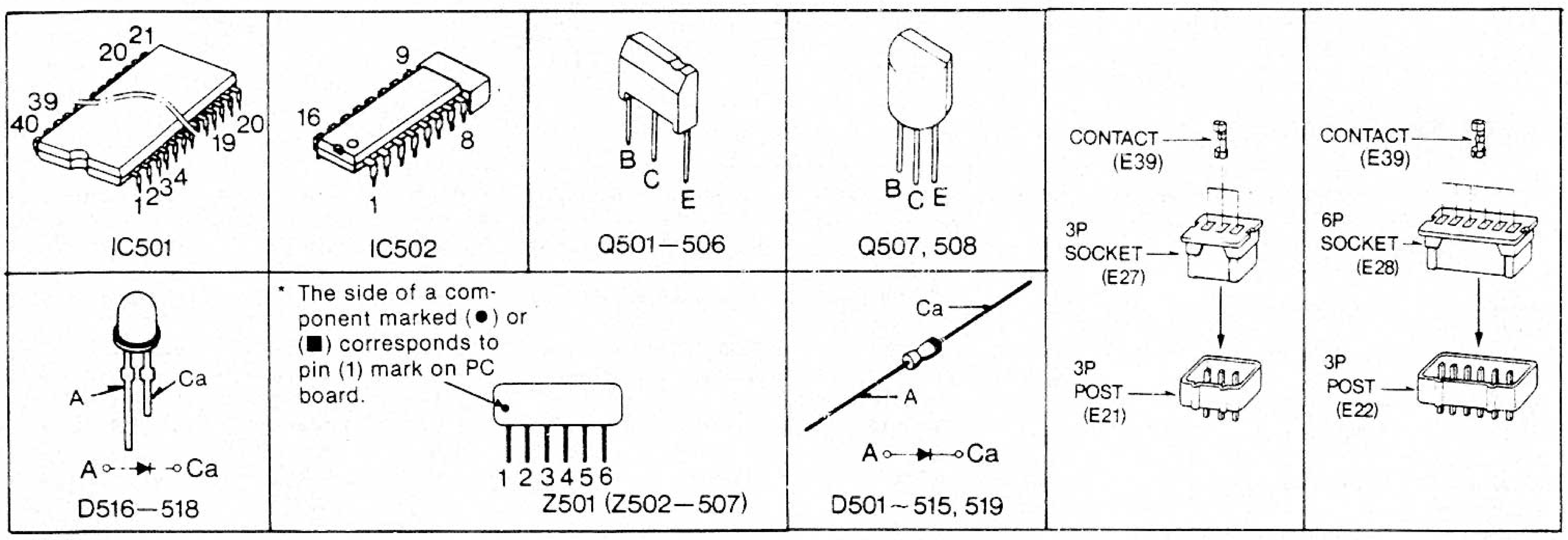
- The supply parts number is described alone in the replacement parts list.

• This schematic diagram may be modified at any time with the development of new technology.

CIRCUIT BOARD DIAGRAM
16 MECHANISM CONTROL CIRCUIT BOARD



TERMINATIONS



NOTES:
- The circuit shown in [shaded] on the conductor side indicates printed circuit on the back side of the printed circuit board.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position. However, the voltage in record mode is indicated in ( ) when it differs from that in record mode. For measurement, use VTVM.

- **This circuit board diagram may be modified at any time with the development of new technology.**

IC501 [MN1405RHB]

1	0V	21	5.4V
2	0V	22	0V
3	—	23	0V
4	0V TIME COUNT 5.3V	24	0V
5	0V INTRO SEARCH 5.3V	25	0V
6	0V STOP 5.3V	26	0V
7	0V (5.3V)	27	5.2V
8	4.6V	28	0V
9	0V PAUSE 5.3V	29	—
10	—	30	—
11	—	31	—
12	—	32	—
13	—	33	—
14	—	34	—
15	—	35	—
16	—	36	—
17	—	37	—
18	5.4V	38	—
19	5.4V	39	5.4V
20	5.4V	40	—

IC502 [AN6270]

1	9.7V PAUSE 0V
2	0V STOP 9.2V
3	9.2V (0V)
4	15V FF/REW 0V
5	0V
6	0V
7	5.4V
8	0V
9	0V
10	0V
11	0V
12	0V
13	0V (5.3V)
14	4.6V
15	0V PAUSE 5.3V
16	15V

Q501 [2SB643]

B	—
C	—
E	—

Q502, 503, 504, 505 [2SB643]

B	5.4V
C	—
E	—

Q506 [2SD636]

B	0V
C	5.2V
E	0V

Q507 [2SD965]

B	0.6V
C	5.4V
E	0V

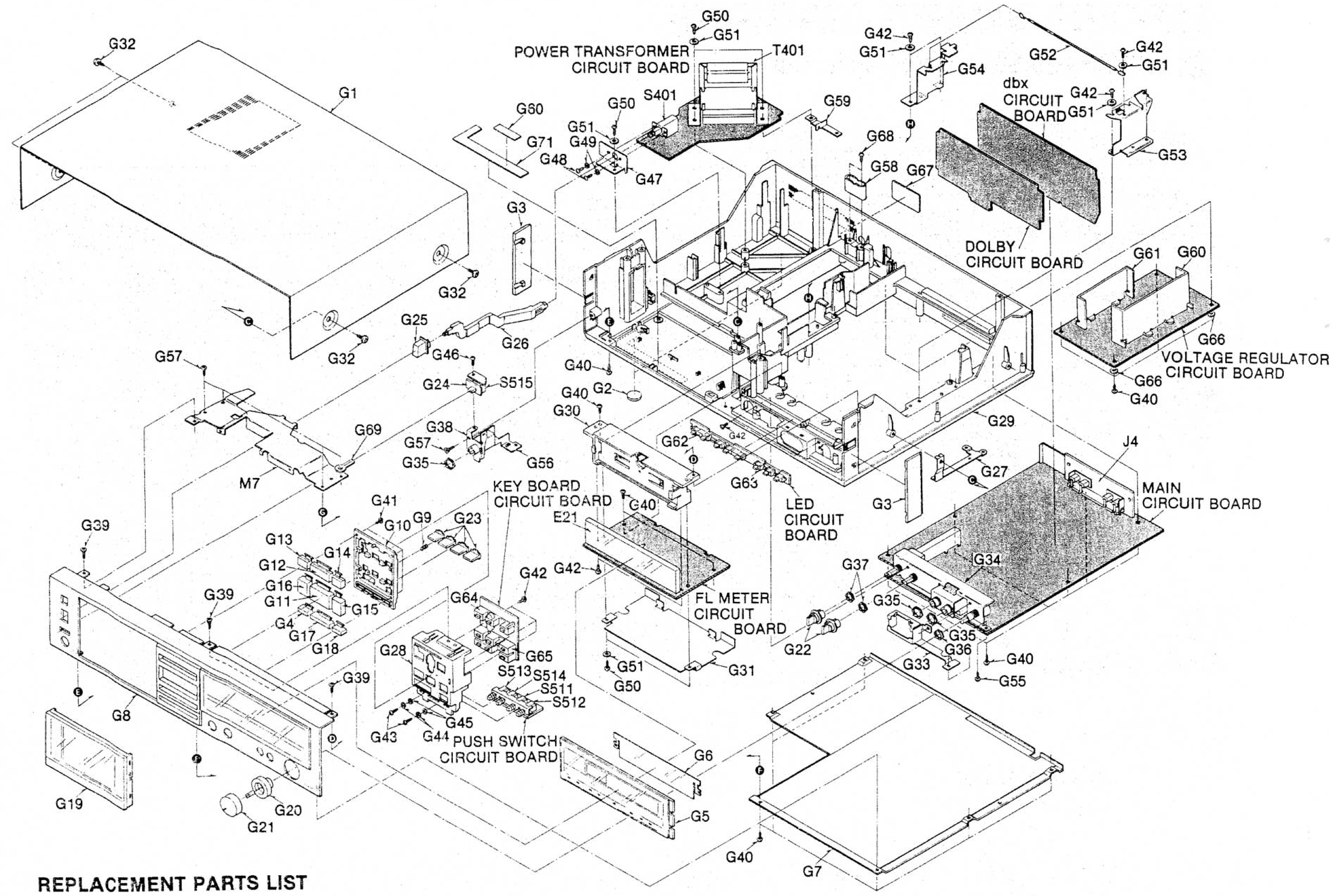
Q508 [2SD965]

B	6.0V
C	5.4V
E	5.4V

IC503 [DN6838A]

1	14.8V
2	0V
3	—

CABINET PARTS LOCATION



REPLACEMENT PARTS LIST

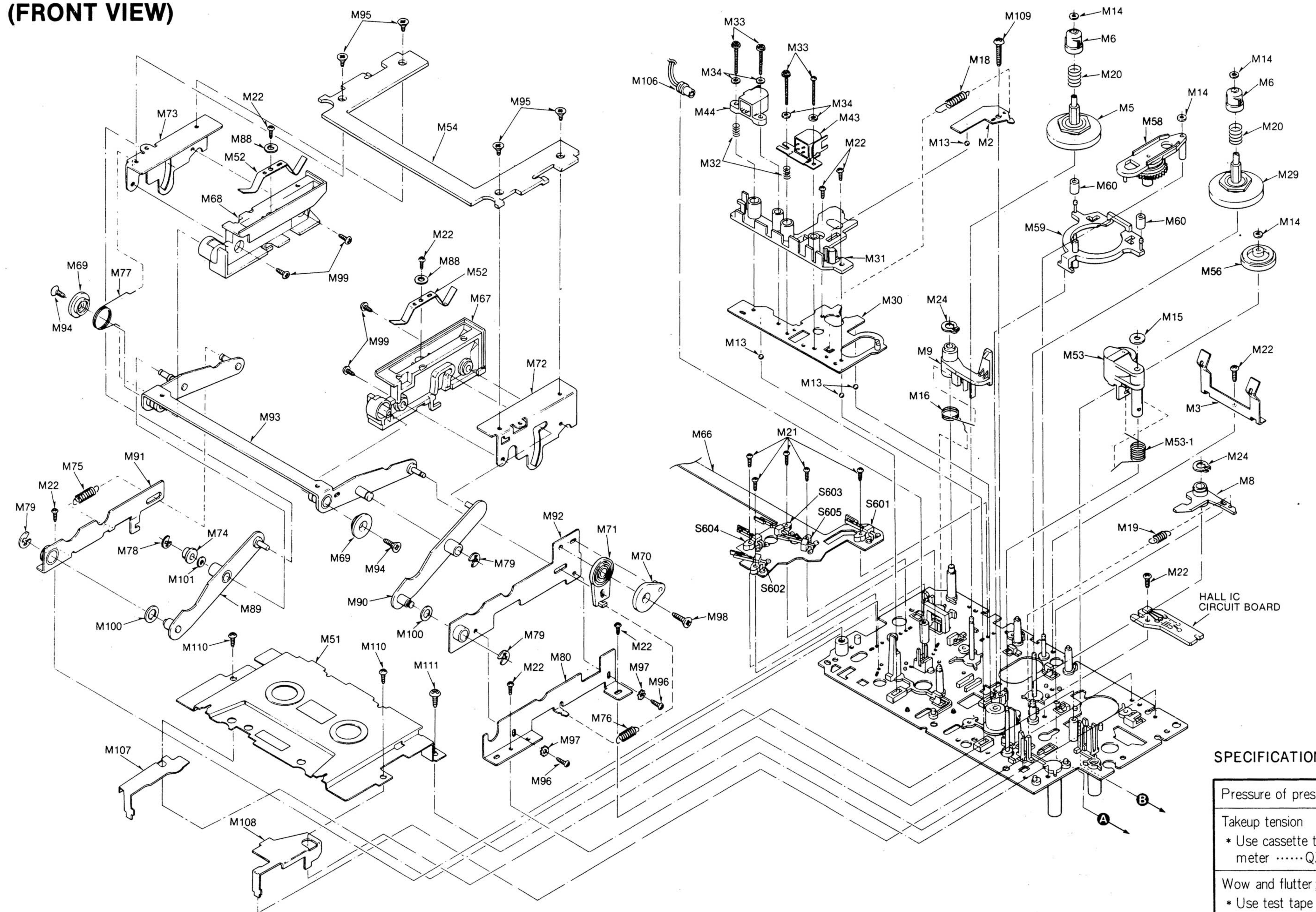
Ref No.	Part No.	Part Name & Description
	CABINET PARTS	
G 1	QGC1225 "Silver Type"	Case Cover
	QGC1225K "Black Type"	Case Cover
G 2	QKA1086	Rubber Foot
G 3	QGK3217 "Silver Type"	Side Panel
	QGK3217K "Black Type"	Side Panel
G 4	QGO2050	Intoroduction Search Button
G 5	QGK3295 "Silver Type"	Meter Cover
	QGK3295K "Black Type"	Meter Cover
G 6	QGL1174	Meter Filter
G 7	QYB0416	Bottom Cover Assembly
G 8	QYP1124 "Silver Type"	Front Panel Assembly
	QYP1124K "Black Type"	Front Panel Assembly
G 9	QBC1159	Button Spring
G 10	QGG0194	Button Holder
G 11	QXB0763	Play Button Assembly
G 12	QXB0762	Pause Button Assembly
G 13	QXB0761	REC Button Assembly
G 14	QGO1984 "Silver Type"	Operation Button (REC MUTE)
	QGO1984Y "Black Type"	Operation Button (REC MUTE)
G 15	QGO1981 "Silver Type"	Operation Button (Fast Forward)
	QGO1981Y "Black Type"	Operation Button (Fast Forward)
G 16	QGO1980 "Silver Type"	Operation Button (Rewind)
	QGO1980Y "Black Type"	Operation Button (Rewind)
G 17	QGO1982 "Silver Type"	Operation Button (Stop)
	QGO1982 "Black Type"	Operation Button (Stop)
G 18	QGO1983	Operation Button (Reset)
G 19	QYF0573 "Silver Type"	Cassette Lid Assembly
	QYF0573K "Black Type"	Cassette Lid Assembly
G 20	QGT1571	Knob-B
G 21	QYT0640	Knob-A Assembly
G 22	QGT1569	Knob (for Output Level/NR Selector)
G 23	QGO1985S	Function Button
G 24	QGO1987S	Timer Button
G 25	QGO1986	Push Button (for Power ON/OFF)
G 26	QMR1985	Power Rod
G 27	QJC0047	Earth Plate-A
G 28	QKJ0514	Operation P.B Holder
G 29	QKM1547	Main Case
G 30	QKJ0513	Meter Holder
G 31	QTS1572	Shield Plate (for FL Meter)
G 32	XTB4+10BFN "Silver Type"	Tapping Screw ⊕4×10
	XTB4+10BFZ "Black Type"	Tapping Screw ⊕4×10
G 33	QJC0048	Earth Plate-B
G 34	QMA4360	Volume Angle
G 35	QNQ1070	Nut 12φ
G 36	QNQ1039	Nut 9φ
G 37	QNQ1004	Nut 8φ
G 38	QMA4361	Headphones Angle
G 39	XTS3+12B	Tapping Screw ⊕3×12
G 40	XTV3+10BFN	Tapping Screw ⊕3×10
G 41	XTN26+8B	Tapping Screw ⊕2.6×8
G 42	XTN3+10B	Tapping Screw ⊕3×10
G 43	XSN26+8	Screw ⊕2.6×8
G 44	XWA26B	Washer 2.6φ
G 45	XWG26	Washer 2.6φ
G 46	XTN3+6B	Tapping Screw ⊕3×6
G 47	QMA4362	Switch Angle
G 48	XSN3+8S	Screw ⊕3×8
G 49	XWA3B	Washer 3φ
G 50	XTN3+12B	Tapping Screw ⊕3×12
G 51	XWG3	Washer 3φ
G 52	QBS1140	Connection Wire
G 53	QMA4435	NR P.B Holding Angle-R
G 54	QMA4434	NR P.B Holding Angle-L
G 55	XTN3+8B	Tapping Screw ⊕3×8
G 56	QJC0052	Earth Plate-C
G 57	XTS3+10B	Tapping Screw ⊕3×10
G 58	QTD1164	Cord Bushing
G 59	QJC0053	Earth Plate-D
G 60	QTH1162	Heat Sink-A
G 61	QTH1163	Heat Sink-B
G 62	QKJ0515	L.E.D Holder-A
G 63	QKJ0516	L.E.D Holder-B
G 64	QKJ0541	Switch Holder-A
G 65	QKJ0542	Switch Holder-B
G 66	QBK7126	Washer
G 67 [D]	QGS3032	Name Plate
	[For all European areas except United Kingdom.]	
[B]	QGS3033	Name Plate
	[For United Kingdom.]	
G 68	XTN3+16B	Tapping Screw ⊕3×16
G 69	QJT0015	Lug Terminal
G 70	QTS1592	Head Shield Sheet
G 71	QTW1277	Shield Plate
	ACCESSORIES	
A 1	QEB0125	Connection Cord
A 2 [D]	QQT3348	Instraction Book
	[For all European areas except United Kingdom.]	
[B]	QQT3349	Instraction Book
	[For United Kingdom.]	
	PACKINGS	
P 1	QPN4359	Inside Carton
P 2	QPA0673	Cushion-R
P 3	QPA0674	Cushion-L
P 4	QPA0662	Spacer
P 5	XZB50X65A02	Poly Bag (for UNIT)
P 6	QPC0072	Poly Sheet

WIRING CONNECTION DIAGRAM

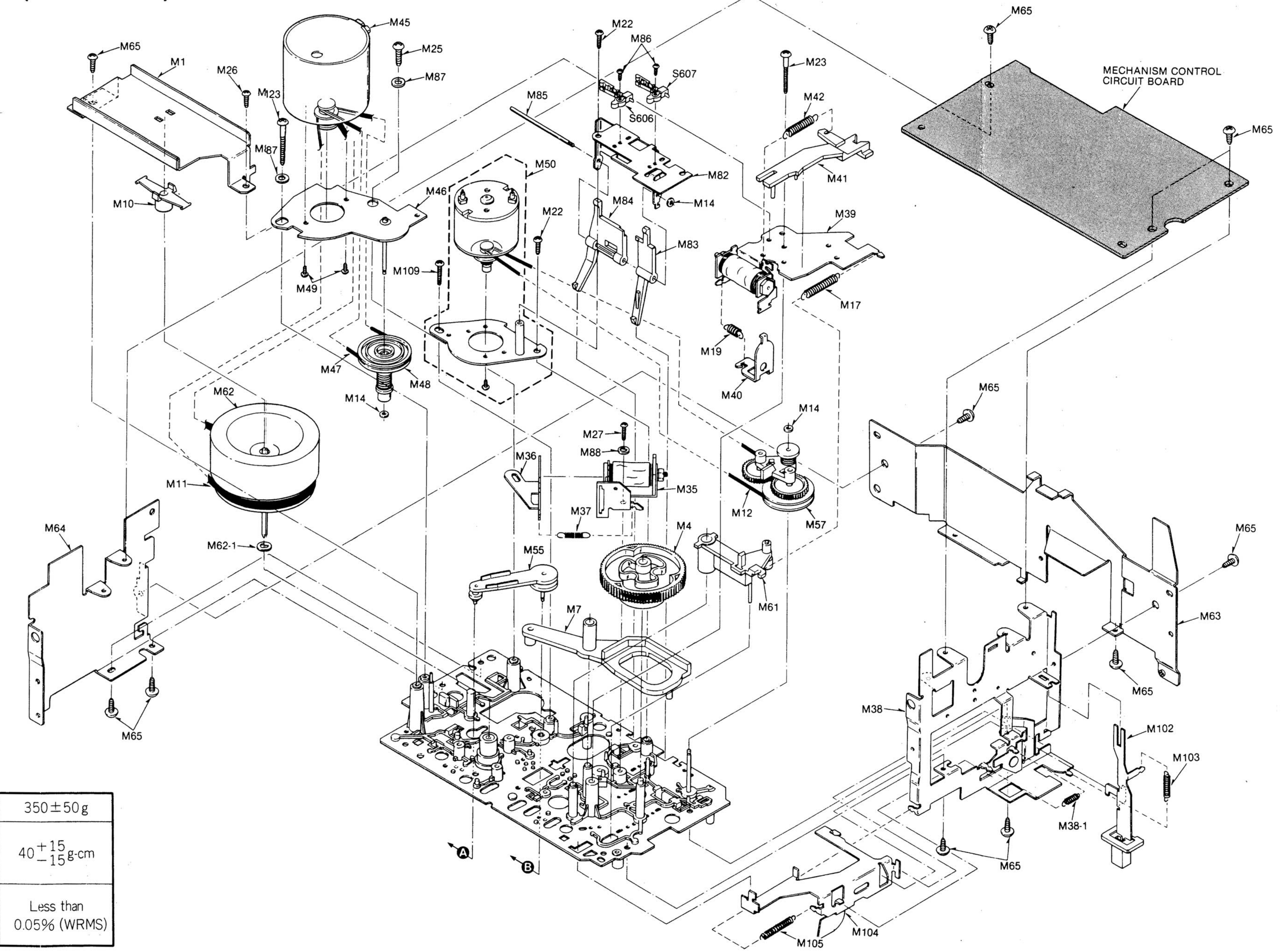
NOTES:
BLK ......Black
BLU ......Blue
BRN......Brown
GRY......Gray
GRN ...Green
L. BLU ...Light Blue
NIL ......No Color Mark
ORG ...Orange
PNK......Pink
RED......Red
SLD ......Shield Wire
VLT ......Violet
WHT......White
YEL ......Yellow

MECHANICAL PARTS LOCATION

(FRONT VIEW)



(REAR VIEW)



SPECIFICATIONS

Pressure of pressure roller	350±50g
Takeup tension • Use cassette torque meter ······QZZSRKCT	40^{+15}_{-15}g-cm
Wow and flutter; (JIS) • Use test tape ······QZZCWAT	Less than 0.05% (WRMS)

REPLACEMENT PARTS LIST

Ref No.	Part No.	Part Name & Description
	MECHANICAL PARTS	
M 1	QMA4450	Flywheel Retainer
M 2	QBP1894	Head Base Plate Spring
M 3	QBP1895	Cassette Pressure Spring
M 4	QXG1059	Main Gear Assembly
M 5	QDR1146	Supply Reel Table
M 6	QMB1336	Reel Table Hub
M 7	QML3655	Cam Follower
M 8	QML3660	Idler Select Lever
M 9	QML3661	Erase Safety Lever
M 10	QMZ1293	Flywheel Thrust Retainer
M 11	QDB0326	Flywheel Belt
M 12	QDB0287	Changing Belt
M 13	QDK1012	Steel Ball 2.5φ
M 14	QBW2008	Snap Washer
M 15	QBW2046	Snap Washer
M 16	QBN1772	Erase Safty Lever Spring
M 17	QBT1725	Lock Lever Spring
M 18	QBT1927	Head Base Plate Spring
M 19	QBT1920	Idler Spring
M 20	QBC1373	Reel Table Spring
M 21	XTN2+5B	Tapping Screw ⊕2×5
M 22	XTN26+6B	Tapping Screw ⊕2.6×6
M 23	XTN3+24B	Tapping Screw ⊕3×24
M 24	XUB4FT	Stop Ring 4φ
M 25	XTN3+10B	Tapping Screw ⊕3×10
M 26	XTN3+10B	Tapping Screw ⊕3×10
M 27	XTN26+8B	Tapping Screw ⊕2.6×8
M 29	QXD0120	Takeup Reel Table Assembly
M 30	QMK1867	Head Base Plate
M 31	QMZ1263	Head Spacer
M 32	QBC1103	Head Spring
M 33	XSN2+16	Screw ⊕2×16
M 34	XWG2	Washer 2φ
M 35	QXA1232	Brake Plunger Assembly
M 36	QML3865	Plunger Lever
M 37	QBT1955	Plunger Spring
M 38	QXA1216	Side Angle Assembly
M 38-1	QBT1920	Idler Spring
M 39	QXA1076	Trigger Plunger Assembly
M 40	QML3651	Trigger Plunger Lever
M 41	QML3653	Control Lever
M 42	QBT1278	Record Lock Lever Spring
M 43	Refer to E1	Record/Playback Head
M 44	Refer to E2	Erase Head
M 45	QXU0299	Capstan Motor Assembly
M 46	QXA1077	Motor Retainer Assembly
M 47	QDB0286	Takeup Belt
M 48	QXP0621	Takeup Pulley Assembly
M 49	XSN26+3	Screw ⊕2.6×3
M 50	QXU0250	Reel Moto Assembly
M 51	QXH0410	Mechanism Cover Assembly
M 52	QBP1925	Cassette Pressuer Spring
M 53	QXL1550	Pressure Roller Assembly
M 53-1	QBN1771	Pressure Roller Spring
M 54	QMF2234	Cassette Holder Plate
M 55	QXL1423	Idler Lever Assembly
M 56	QXi0116	Takeup Idler Assembly
M 57	QXL1408	Swing Gear Assembly
M 58	QXL1409	Fast Wind Gear Assembly
M 59	QML3659	Brake Lever
M 60	QBG1132	Brake Rubber
M 61	QXL1411	Lock Lever Assembly
M 62	QXF0200	Flywheel Assembly
M 62-1	QBW2099	Poly Washer
M 63	QMA4085	Center Angle
M 64	QMA4449	Side Angle-R
M 65	XTN3+6B	Tapping Screw ⊕3×6
M 66	QJi1466RR	Leaf Switch P.C.B
M 67	QMH2069	Cassette Holder-R
M 68	QMH2070	Cassette Holder-L
M 69	QKJ0465	Damper Cover
M 70	QDP1892	Damper Pulley-1
M 71	QDP1893	Damper Pulley-2
M 72	QMA4114	Holder Angle-R
M 73	QMA4115	Holder Angle-L
M 74	QDP1894	Roller
M 75	QBT1932	Link Lever-L Spring
M 76	QBT1931	Link Lever-R Spring
M 77	QBN1827	Holder Spring-L
M 78	XUC2FT	Stop Ring 2φ
M 79	XUC3FT	Stop Ring 3φ
M 80	QMA4112	Angle-R
M 82	QMA4072	Auto Tape Selector Angle
M 83	QML3716	Tape Detection Lever (for CrO_2 Tape)
M 84	QML3717	Tape Detection Lever (for Metal Tape)
M 85	QMN2642	Detection Lever Shaft
M 86	XTN2+6B	Tapping Screw ⊕2×6
M 87	XWG3	Washer 3φ
M 88	XWG26B	Washer 2.6φ
M 89	QXL1450	Link Lever-L Assembly
M 90	QXL1451	Link Lever-R Assembly
M 91	QXA1137	Angle-L Assembly
M 92	QXH0361	Angle-R Assembly
M 93	QXL1452	Center Lever Assembly
M 94	XTS26+8B	Screw ⊕2.6×8
M 95	XSS26+4BV	Screw ⊕2.6×4
M 96	XSN3+6S	Screw ⊕3×6
M 97	XWC3B	Washer 3φ
M 98	XSS26+8	Screw ⊕2.6×8
M 99	XSN26+4BV	Screw ⊕2.6×4
M 100	QBW2020	Poly Washer
M 101	QBW2014	Poly Washer
M 102	QXL1536	Eject Button Assembly
M 103	QBT1932	Eject Lever Spring
M 104	QML3772	Lock Lever
M 105	QBT1933	Lock Lever Spring
M 106	XAMQ44P200	Pilot Lamp
M 107	QMA4448	Reinforcement Angle-A
M 108	QMA4447	Reinforcement Angle-B
M 109	XTN26+12B	Tapping Screw ⊕2.6×12
M 110	XTN26+6BFZ	Tapping Screw ⊕2.6×6
M 111	XTN3+8B	Tapping Screw ⊕3×8

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