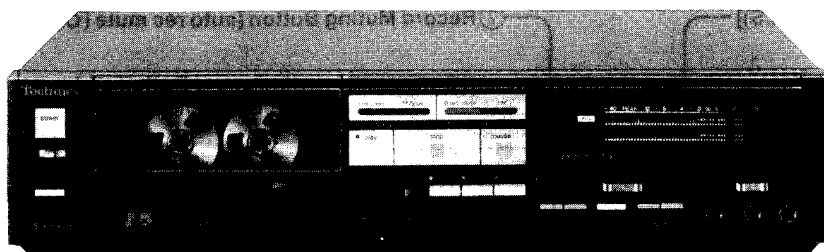


Service Manual

dbx/Dolby B-C NR, Auto-Reverse
Cassette Deck

Cassette Deck
RS-B58R
(Silver Face)
(Black Face)



This is the Service Manual
for the following areas.

D ...For all European
areas except United
Kingdom.

B ...For United Kingdom.

RS-8R MECHANISM SERIES

Specifications

Track system:	4-track 2-channel stereo recording and playback	Inputs:	MIC; sensitivity 0.25mV, applicable microphone impedance 400Ω~10kΩ LINE; sensitivity 60mV, input impedance 47kΩ or more
Tape speed:	4.8cm/s	Outputs:	LINE; output level 400mV, output impedance 1.5kΩ or less HEADPHONES; output level 80mV (at 8Ω) applicable headphone impedance 8Ω~600Ω
Wow and flutter:	0.05% (WRMS), ±0.14% (DIN)	Bias frequency:	80kHz
Frequency response:	Metal tape; 20~20,000Hz 30~18,000Hz (DIN) 40~17,000Hz±3dB CrO ₂ tape; 20~19,000Hz 30~17,000Hz (DIN) 40~16,000Hz±3dB Normal tape; 20~18,000Hz 30~16,000Hz (DIN) 40~15,000Hz±3dB	Heads:	2-head system 1-AX (AMORPHOUS) head for record/playback 1-double-gap ferrite head for erasure
Dynamic range:	110dB (at 1kHz) with dbx in	Motor:	2 plus 1-motor system (• 1-Electrical governor motor) (• 2-DC motor)
Max. input level improvement:	10dB or more improved with dbx in (at 1kHz)	Power requirements:	D ...AC; 220V, 50-60Hz B ...AC; 110/125/220/240V, 50-60Hz Pre-set power voltage 240V
Signal-to-noise ratio:	dbx in; 92dB (A weighted) Dolby C NR in; 73dB (CCIR) Dolby B NR in; 67dB (CCIR) NR out; 58dB (A weighted) (Signal level = max. input level, CrO ₂ type tape)	Power consumption:	18W
Fast forward and rewind time:	Approx. 90 seconds with C-60 cassette tape	Dimensions:	43cm(W)×9.8cm(H)×27.3cm(D)
		Weight:	5kg

Design and specifications are subject to change without notice.

* The term dbx is a registered trademark of dbx Inc.

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

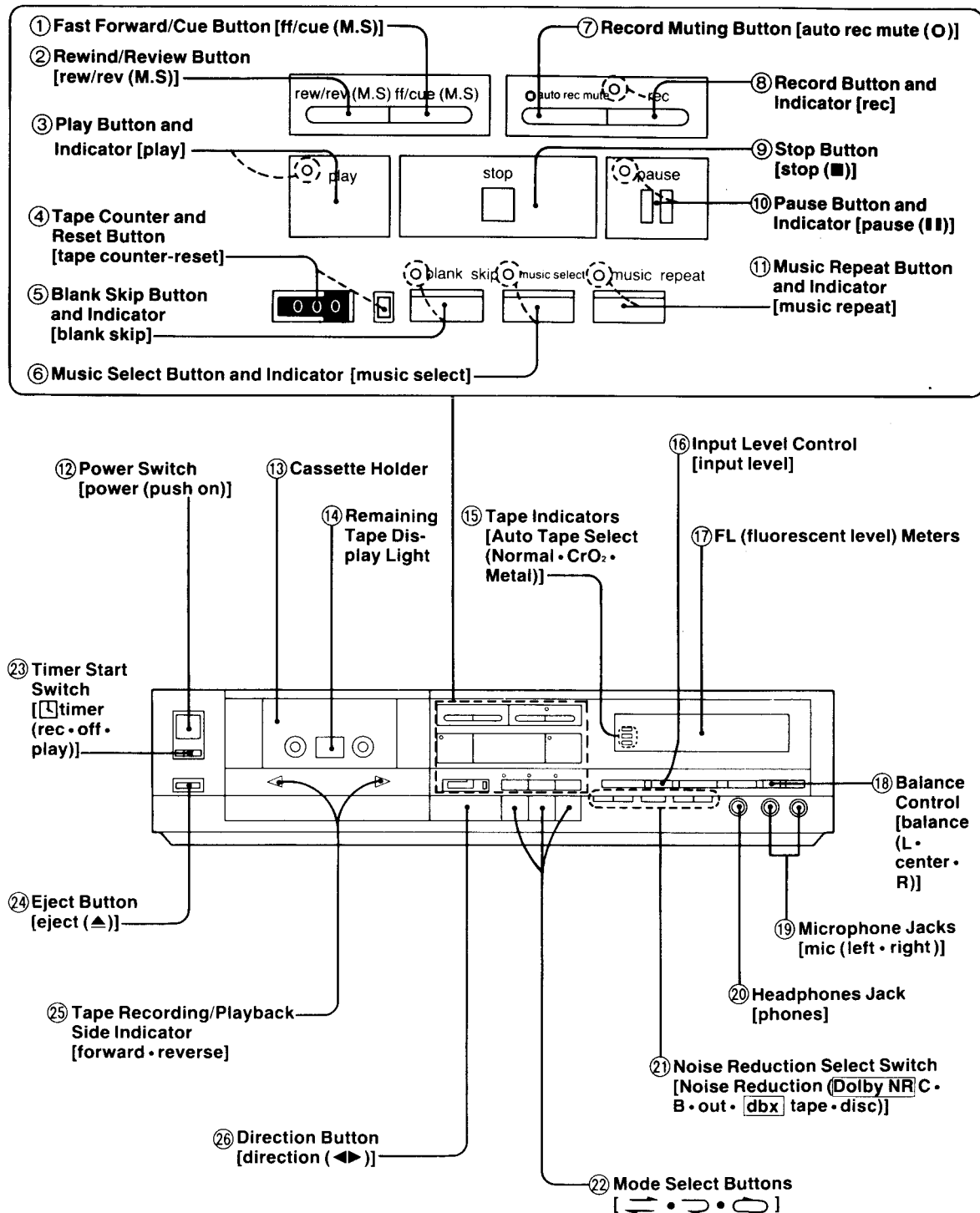
Technics

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

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• Disassembly Instructions	3	• Electrical Parts List.....	23
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LOCATION OF CONTROLS AND COMPONENTS



DISASSEMBLY INSTRUCTIONS

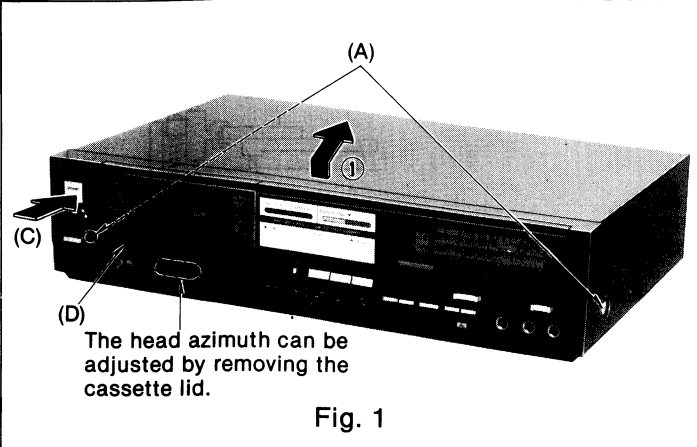


Fig. 1

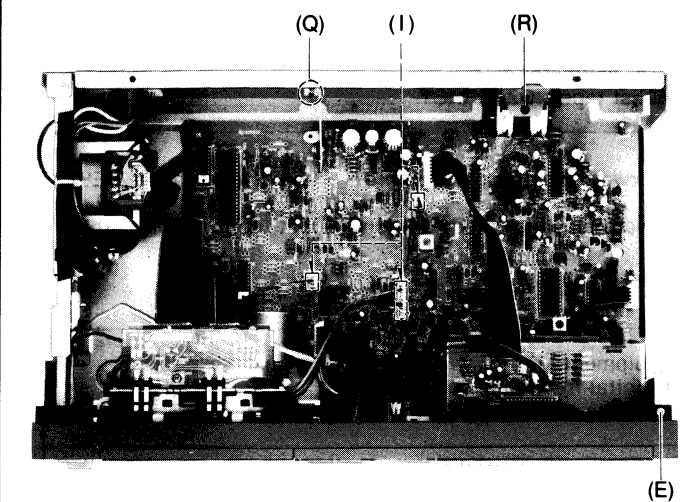
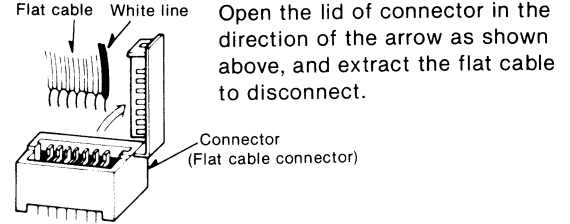
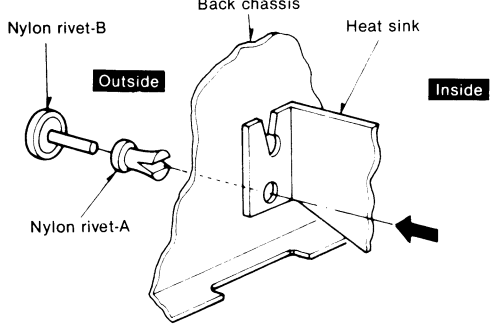


Fig. 3

(J) How to remove flat cable



(Q) How to remove nylon rivet



To remove a heat sink from the back chassis, first press nylon rivet-A from the inside in the direction indicated by the arrow as shown above, and extract the rivet to the outside. Next remove nylon rivet-B from the outside. Consequently, the heat sink can be removed from the back chassis.

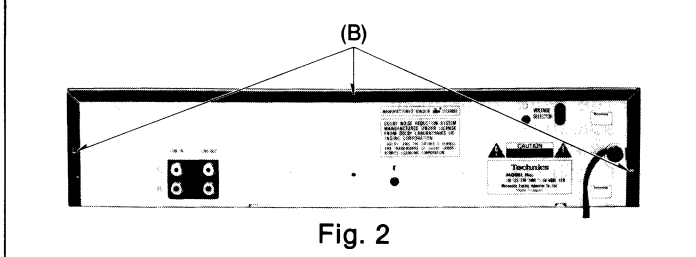


Fig. 2

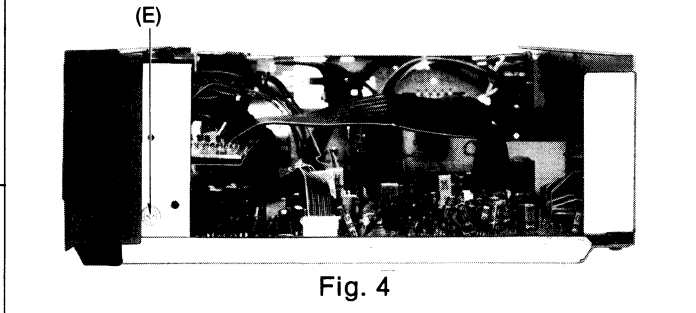


Fig. 4

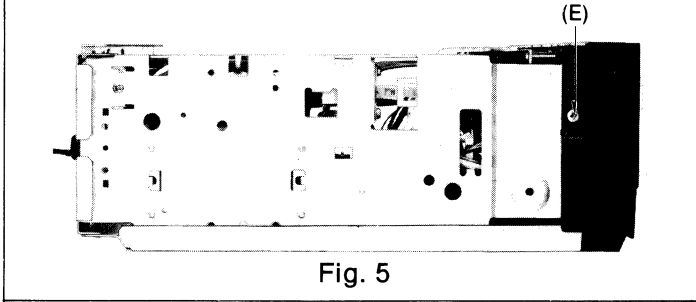


Fig. 5

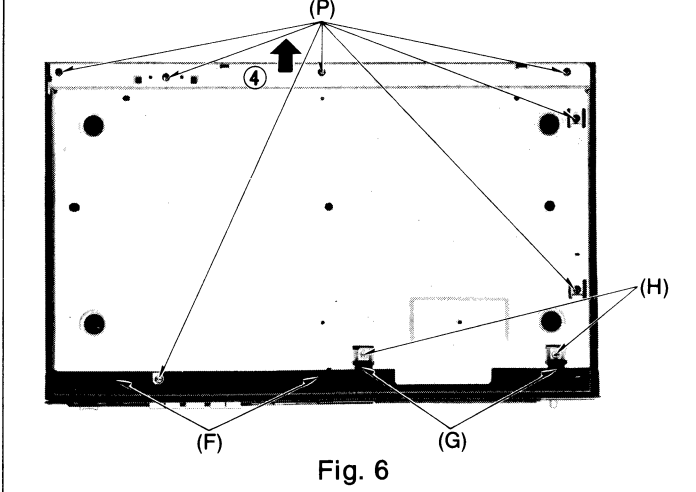


Fig. 6

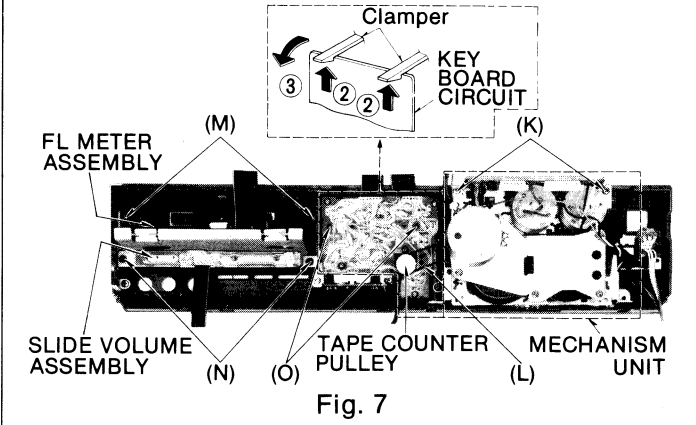


Fig. 7

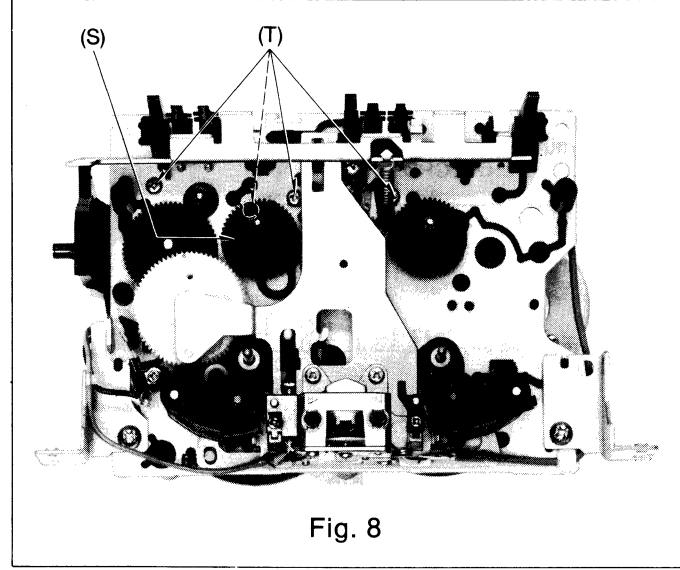


Fig. 8

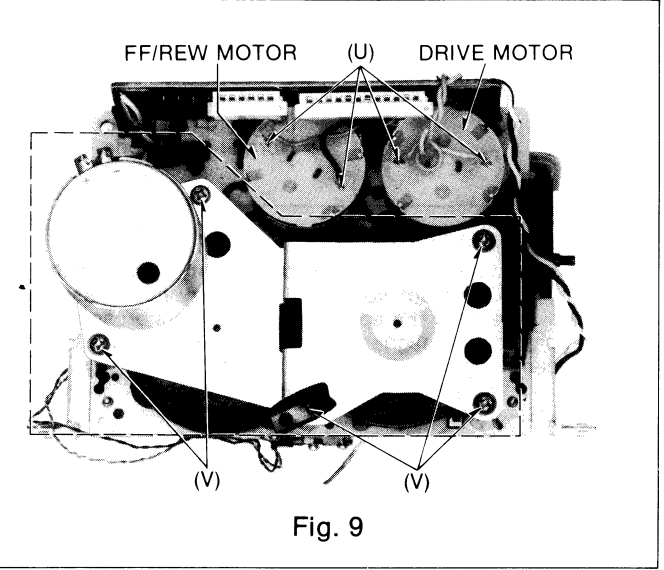


Fig. 9

Ref. No.	Procedure	To remove —	Remove —	Shown in fig. —
1	1	Case cover	• 2 ornament screws.....(A) • 3 screws(B) • As shown in fig. 1, pull case cover in the direction of arrow ①.	1 2 1
2	1 → 2	Front panel assembly and mechanism unit	• 3 screws(E) • 2 screws(F) • 2 screws(G) • 2 screws(H) • Pull out the connectors A F G H L(I) • How to remove flat cable(J)	3, 4, 5 6 6 6 3 3
3	1 → 3	Mechanism unit	• Push the eject button(C) • Cassette lid.....(D) • 2 screws(G) • 2 screws(H) • 2 screws(K) • Counter belt(L)	1 1 6 6 7 7
4	1 → 4	FL meter assembly	• 2 screws(M)	7
5	1 → 5	Slide volume assembly	• 2 screws(N)	7
6	1 → 6	Key board circuit	• 2 screws(O) • As shown in fig. 7, raise the clamper in the direction of arrow ② and remove the key board circuit in the direction of arrow ③.	7 7
7	7	Bottom cover	• 2 screws(F) • 2 screws(H) • 7 screws(P) • Slide the bottom cover in the direction arrow ④ and remove it.	6 6 6 6
8	1 → 7 → 8	Main circuit board	• How to remove nylon rivet(Q) • 1 screw(E) • 1 screw(R)	3 4 3
9	1 → 3 → 9	FF/REW motor and drive motor	• Remove the reel table(S) • 4 screws(T) • Unsolder the soldered portion of the FF/REW motor terminal and driver motor terminal(U)	8 8 9
10	1 → 3 → 10	Capstan motor	• 5 screws(V)	9

PRE

Removing the

The Mode Sel Bushings, as Assembly and the Button Bu parts. Be care will pop out.

Reassembling

1. For repair, mechanism lower base p For ground mechanism' circuit board Without gro properly.
2. Before attach Assembly, th (M18) and th Fig. 12, and screws (K) Counter Bel thread it ove 7. Make su

Replacement Repeat Butto

The Blank Skip are a one-piece part.). As shown in F that the Front Ornament Plate (A) are melted Ornament Plate To remove thi Ornament Plate part (C) of the seven pins (A Fig. 2.) As mentioned by heat, both replaced when

Replacement

To replace the the five screws three LED's. from the Base (Refer to the F

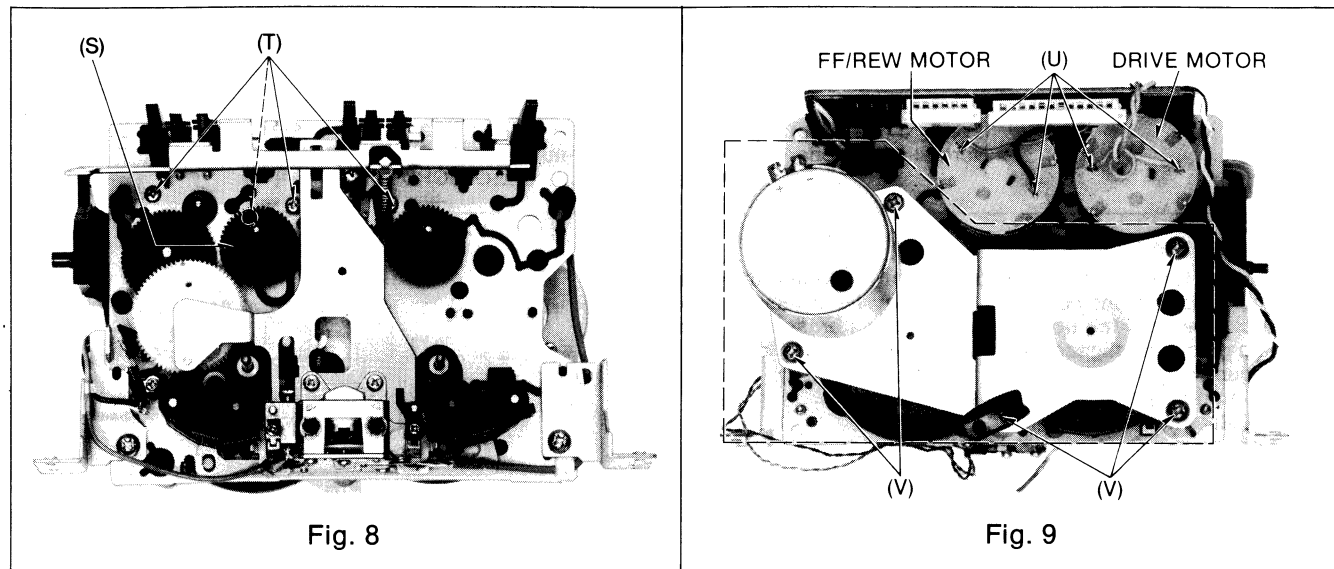


Fig. 8

Fig. 9

Ref. No.	Procedure	To remove —	Remove —	Shown in fig. —
1	1	Case cover	• 2 ornament screws.....(A) • 3 screws(B) • As shown in fig. 1, pull case cover in the direction of arrow ①.	1 2 1
2	1 → 2	Front panel assembly and mechanism unit	• 3 screws(E) • 2 screws(F) • 2 screws(G) • 2 screws(H) • Pull out the connectors A F G H L(I) • How to remove flat cable(J)	3, 4, 5 6 6 6 3 3
3	1 → 3	Mechanism unit	• Push the eject button(C) • Cassette lid.....(D) • 2 screws(G) • 2 screws(H) • 2 screws(K) • Counter belt(L)	1 1 6 6 7 7
4	1 → 4	FL meter assembly	• 2 screws(M)	7
5	1 → 5	Slide volume assembly	• 2 screws(N)	7
6	1 → 6	Key board circuit	• 2 screws(O) • As shown in fig. 7, raise the clumper in the direction of arrow ② and remove the key board circuit in the direction of arrow ③.	7 7
7	7	Bottom cover	• 2 screws(F) • 2 screws(H) • 7 screws(P) • Slide the bottom cover in the direction arrow ④ and remove it.	6 6 6 6
8	1 → 7 → 8	Main circuit board	• How to remove nylon rivet(Q) • 1 screw(E) • 1 screw(R)	3 4 3
9	1 → 3 → 9	FF/REW motor and drive motor	• Remove the reel table(S) • 4 screws(T) • Unsolder the soldered portion of the FF/REW motor terminal and driver motor terminal(U)	8 8 9
10	1 → 3 → 10	Capstan motor	• 5 screws(V)	9

Removing the Mode Select Button

The Mode Select Buttons are press-fit with the Button Bushings, as shown in Fig. 11, with the Front Panel Assembly and Button Springs between them. Remove the Button Bushings using pliers to disassemble these parts. Be careful not to lose the Button Springs as they will pop out.

Reassembling the Mechanism Unit

- For repair, measurement or adjustment with the mechanism removed from the unit be sure to ground the lower base plate of the mechanism. For grounding, connect a extension cord to the mechanism's lower base plate and the ground of main circuit board. Without grounding, the mechanism does not operate properly.
- Before attaching the Mechanism Unit to the Front Panel Assembly, thread the Counter Belt over the Reel Table (M18) and the 6-pin Jumper Socket Cover as shown in Fig. 12, and then secure the Mechanism Unit with two screws (K) (Refer to the Fig. 7.). Then, remove the Counter Belt from the 6-pin Jumper Socket Cover, and thread it over the Tape Counter Pulley as shown in Fig. 7. Make sure that the Counter Belt is not twisted.

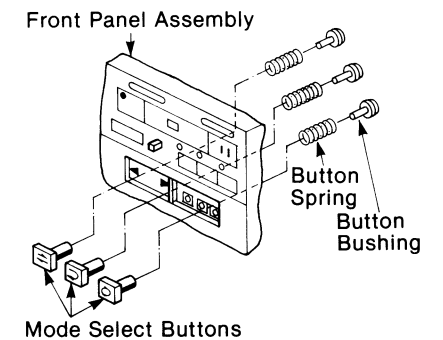


Fig. 11

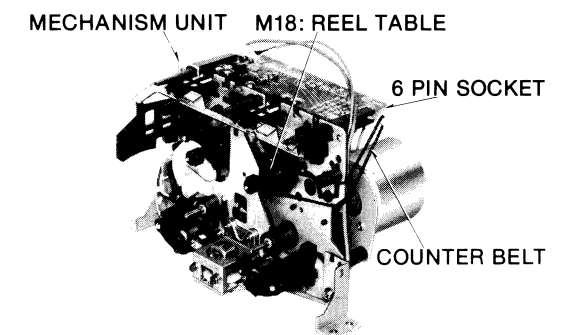


Fig. 12

PRECAUTIONS FOR PARTS REPLACEMENT

Replacement of the Blank Skip/Music Select/Music Repeat Button

The Blank Skip, Music Select and Music Repeat Buttons are a one-piece resin molded part (It is supplied as a single part.).

As shown in Fig. 1, this button is fixed in such a manner that the Front Panel Assembly is sandwiched between the Ornament Plate (G5-1) and the button (G5-2) and three pins (A) are melted by heat. (Four pins (B) are used to fix the Ornament Plate. Refer to Fig. 2.)

To remove this part, first, remove the four lugs on the Ornament Plate from the Front Panel. Then, while pulling part (C) of the Ornament Plate toward the front, heat the seven pins (A) and (B) with a soldering iron. (Refer to the Fig. 2.)

As mentioned above, this part is fixed by melting the pins by heat, both the Ornament Plate and button must be replaced when replacement is required.

Replacement of Parts on the Keyboard Circuit

To replace the parts on the keyboard circuit, first, remove the five screws (F), and then desolder six terminals (G) of three LED's. The Operation Chassis can then be removed from the Base Plate and the parts be replaced. (Refer to the Fig. 3).

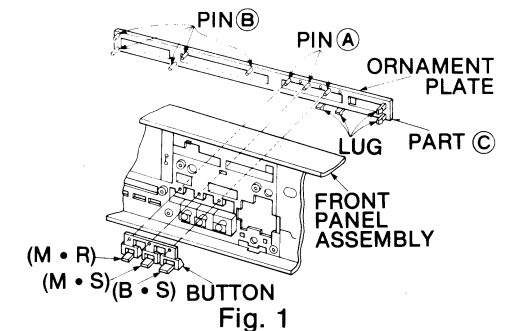


Fig. 1

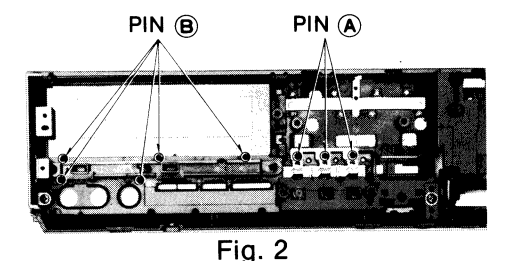


Fig. 2

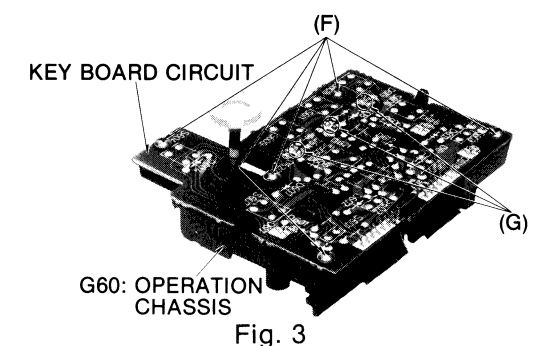


Fig. 3

REPLACING ROTARY HEAD ASSEMBLY

Considerations in mounting the rotary head assembly

1. This recorder requires a record/playback head of extremely precise head height. In replacing the rotary head, install a factory-adjusted full rotary head assembly.

[Never attempt to disassemble the rotary head assembly by removing screws (A).]

2. In installing the replacement rotary head assembly, make certain that the change gear is placed at location (B) on the change rod. (See Fig. 1.)

3. Trace the record/playback head lead-wire as follows (Refer to Fig. 2):

- Set the record/playback head in its forward playback direction.
- Slacken the wire between the head assembly and the mechanism angle-R (by making a 5 or 6mm turnup).

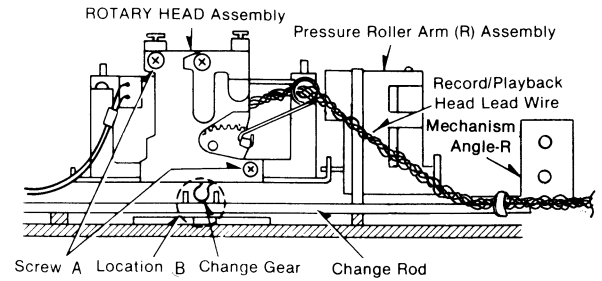


Fig. 1

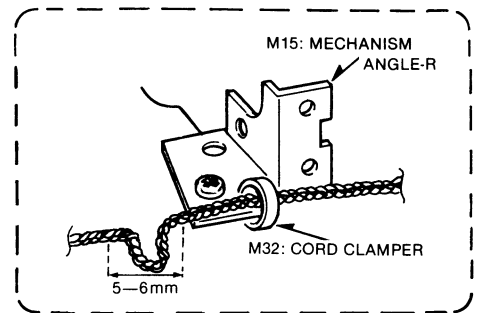


Fig. 2

MEASUREMENT AND ADJUSTMENT METHODS

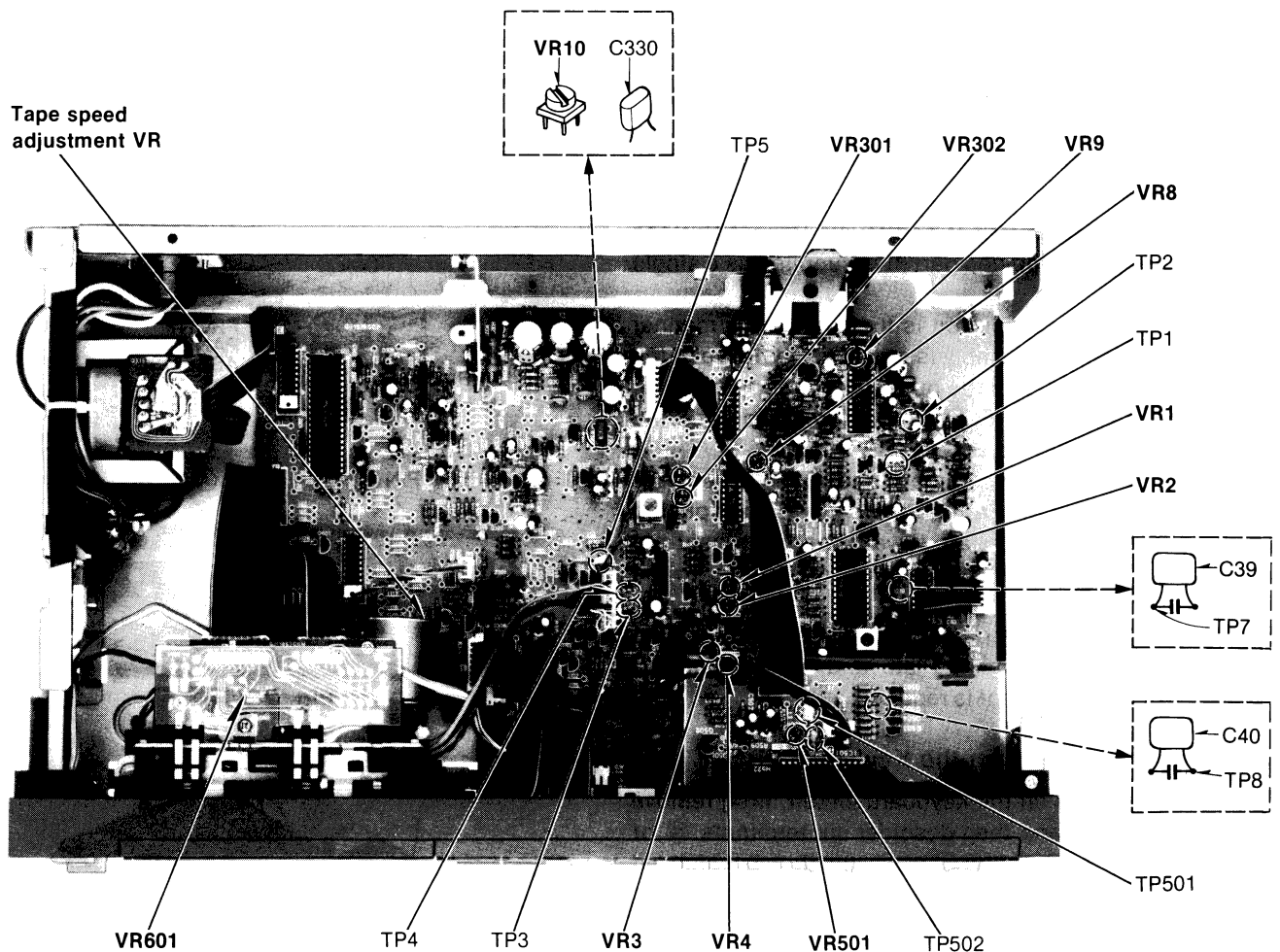


Fig. 1

NOTES: 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
- Input level control: Maximum

- Mode switch:  mode
- Blank skip switch: OFF
- Music select switch: OFF
- Music repeat switch: OFF

A Head adjustment

Condition:

- Playback mode (Forward • Reverse)
- Normal tape mode

Equipment:

- VTVM
- Oscilloscope
- Test tape (azimuth)...QZZCFM
- Test tapeQZZCRD

HEAD HEIGHT ADJUSTMENT

1. Turn the tape guide height adjustment screw and the erase head height adjustment screw on the rotary head assembly counter-clockwise until the upper end face of the erase head and of the tape guide are aligned on the same plane as the top face of their respective guide pins. (Refer to Figs. 2, 3 and 4).
2. Put a point ink-mark on the head of each adjustment screw.
3. With the marks as guides, turn the erase head height adjustment screw 3.2 turns clockwise and the tape guide height adjustment screw 2.5 turns clockwise.
4. Install a test tape (tape with mirror: QZZCRD) on the recorder; place the recorder in the FORWARD PLAY mode. Make fine adjustments of the erase head height and tape guide height adjustment screws as necessary, to attain on the recording/reproducing head face the tape position shown in Fig. 5.
5. Run the tape in the forward play mode and check it for zigzag running. (Shown in Fig. 5) If zigzag tape running occurs, repeat step 4.
6. Place the recorder in the reverse play mode and perform the above steps 4 and 5.
7. Repeat steps 5 and 6 two or three times and verify that the tape position shown in Fig. 5 is ensured.

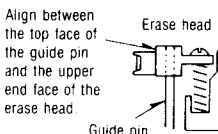
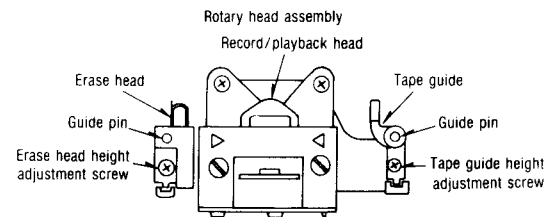


Fig. 2

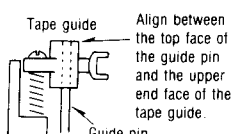


Fig. 3

Fig. 4

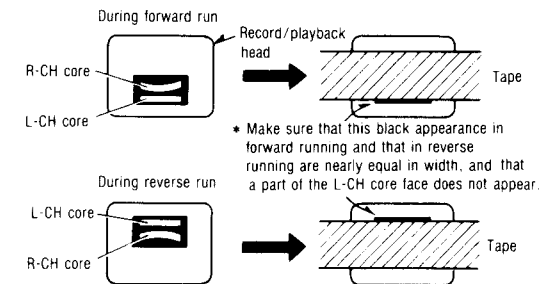


Fig. 5

L-CH/R-CH output balance adjustment

8. Make connections as shown in fig. 6.
9. In the forward playback mode, playback the 8kHz signal from the test tape (QZZCFM). Adjust the azimuth screw (Forward) shown in fig. 7 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 point adjust as follows.
10. Turn the azimuth screw (Forward) shown in fig. 7 to find angles A and C (points where peak output levels for left and right channels are obtained). Then, locate angle B between angles A and C, i.e., point where L-CH and R-CH outputs are balanced. (Refer to figs. 7 and 8.)
11. In the reverse playback mode, adjust the azimuth screw (reverse) in the same way described above.

L-CH/R-CH phase adjustment

12. Make connections as shown in fig. 9.
13. In the forward playback mode, playback the 8kHz signal from the test tape (QZZCFM). Adjust the azimuth screw (Forward) shown in fig. 7 so that pointers of the two VTVMs swing to maximum and a lissajous waveform as illustrated in fig. 9-1 is obtained on the oscilloscope.
14. In the reverse playback mode, adjust the azimuth screw (reverse) in the same way described above.

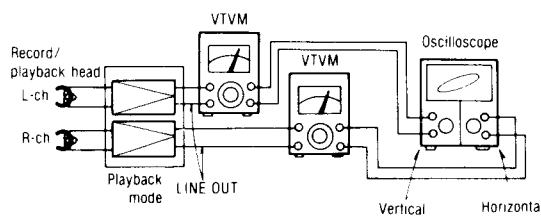


Fig. 9

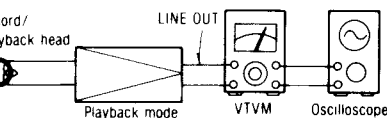


Fig. 6

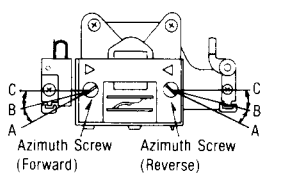


Fig. 7

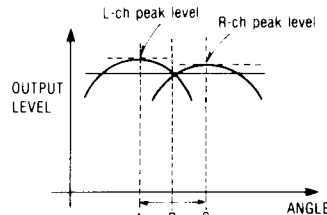


Fig. 8

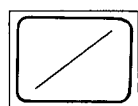


Fig. 9-1

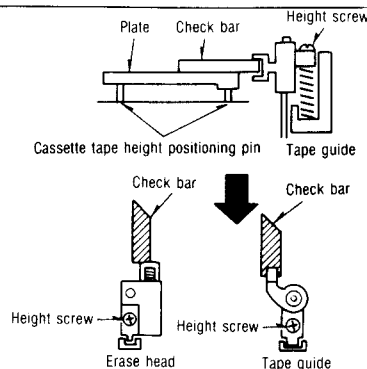
Checking the difference in level between forward and reverse running

15. Reproduce the playback level adjustment signal (315Hz at 0dB) on the standard playback adjustment tape, and check that the difference between the level in forward running and that in reverse running is within 1.0dB.
16. After adjustment, lock the erase head height, tape guide height and angle adjustment screws.

Head Height Adjustment using the Head Adjustment Jig (QZZ0207)

The head adjustment jig (QZZ0207) enables accurate, speedy head height adjustment in the following manner.

- a. Place the plate onto the mechanism.
- b. Set the mechanism to the PLAY mode.
- c. Place the check bar onto the plate.
- d. Pass the check bar through each tape guide.
- e. Adjust the height screw so that the check bar does not touch any of the tape guides.
- f. Run a mirror tape (QZZCRD) and check to see that the tape does not touch (twist around, etc.) the tape guide.
- g. After that, adjust items 4 thru 13 in the adjustment procedure.



E Takeup torque

Condition:

- Playback mode

Equipment:

- DC voltmeter
- Test tape...QZZSRKCT

1. Set the test tape (or RT-60) into the cassette holder.
2. Adjust the takeup torque adjusting potentiometer VR601 in the forward playback mode for 3.5 volts between the FF/REW motor terminals.
3. Run the QZZSRKCT takeup torque measurement tape in the forward playback mode and check that the torque is within quoted tolerance.

Standard value: 50±10gr-cm

G Tape speed

Condition:

- Playback mode

Equipment:

- Digital frequency counter
- Test tape...QZZCWAT

Tape speed accuracy

1. Test equipment connection is shown in fig. 10.
2. Playback test tape (QZZCWAT 3,000Hz), and supply playback signal to the digital frequency counter.
3. Measure this frequency.
4. On the basis of 3,000Hz, determine value by following formula:
$$\text{Tape speed accuracy} = \frac{f - 3,000}{3,000} \times 100(\%)$$
 where, f = measured value
5. Take measurement at middle section of tape.

Standard value: ±1.5%

6. If measured value is not within the standard value, adjust it by using the 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:

$$\text{Tape speed fluctuation} = \frac{f_1 - f_2}{3,000} \times 100(\%) \quad f_1 = \text{maximum value, } f_2 = \text{minimum value}$$

Standard value: Less than 1%

NOTE:

Please use non metal type screwdriver when you adjust tape speed on this unit.

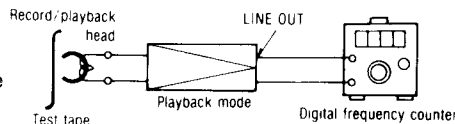


Fig. 10

Ⓓ **Playback frequency response**

Condition:
 • Playback mode
 (Forward • Reverse)
 • Normal tape mode

Equipment:
 • VTVM
 • Oscilloscope
 • Test tape...QZZCFM

1. Test equipment connection is shown in fig. 6.
2. Playback the frequency response portion of test tape (QZZCFM).
3. Measure output level at 315Hz, 12.5kHz, 8kHz, 4kHz, 1kHz, 250Hz, 125Hz and 63Hz, and compare each output level with the standard frequency 315Hz, at LINE OUT.
4. Make measurements for both channels.
5. Make sure that the measured values are within the range specified in the frequency response chart. (Shown in fig. 11).

Playback frequency response (Forward • Reverse)

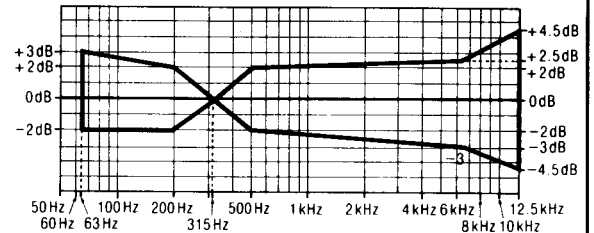


Fig. 11

Ⓔ **Playback gain**

Condition:
 • Playback mode
 • Normal tape mode

Equipment:
 • VTVM
 • Oscilloscope
 • Test tape...QZZCFM

1. Test equipment connection is shown in fig. 6.
2. Playback standard recording level portion on test tape (QZZCFM 315Hz) and, using VTVM, measure the output level at test points [TP7 (L-CH), TP8 (R-CH)].
3. Make measurements for both channels.

Standard value: 0.42 ± 0.05 V [around 0.28V: at test points TP7 (L-CH) and TP8 (R-CH)]

Adjustment

1. If the measured value is not within standard the adjust VR1 (L-CH) or VR2 (R-CH) (See 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. 12.
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:

$$\text{Erase current (A)} = \frac{\text{Voltage across resistor R301}}{1 (\Omega)}$$

Standard value: 155 ± 15 mA (Metal)

Adjustment

- If the measured value is not within standard value, adjust VR10 (shown in fig. 1).

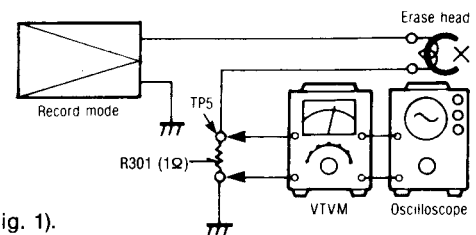


Fig. 12

③ Overall frequency response

Condition:

- Record/playback mode
- Normal tape mode
- CrO₂ tape mode
- Metal tape mode
- Input level control...MAX

Equipment:

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

• Test tape
(reference blank tape)
...QZZCRA for Normal
...QZZCRX for CrO₂
...QZZCRZ for Metal

Note:

Before measuring and adjusting, the overall frequency response make sure of the playback frequency response (For the method of measurement, please refer to the playback frequency response).

(Recording equalizer is fixed)

1. Make connections as shown in fig. 13.
2. Place UNIT into normal tape mode and insert the normal reference blank test tape (QZZCRA).
3. Supply a 1kHz signal from the AF oscillator through ATT to LINE IN.
4. Adjust ATT so that input level is -20dB below standard recording level (standard recording level = 0 VU).
5. Adjust the AF oscillator frequency to 1kHz, 50Hz, 100Hz, 200Hz, 500Hz, 4kHz, 8kHz, 10kHz and 12.5kHz signals, and record these signals on the test tape.
6. Playback the signals recorded in step 5, and check if the frequency response curve is within the limits shown in the overall frequency response chart for normal tapes (fig. 14).
(If the curve is within the charted specifications, proceed to steps 7, 8 and 9.)
If the curve is not within the charted specifications, adjust as follows;

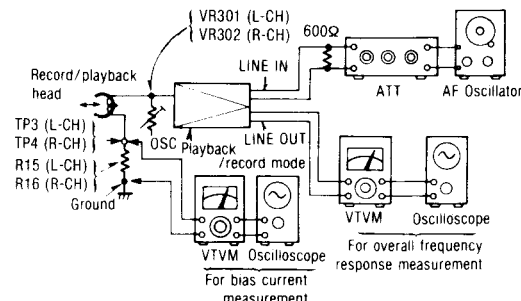


Fig. 13

Overall frequency response chart (Normal)

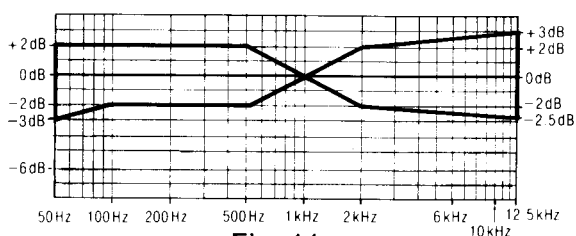


Fig. 14

Adjustment (A):

When the curve exceeds the overall specified frequency response chart (fig. 14) as shown in fig. 15.

- 1) Increase bias current by turning VR301 (L-CH) and VR302 (R-CH).
(See fig. 1 on page 6.)
- 2) Repeat steps 5 and 6 for confirmation (Proceed to steps 7, 8 and 9 if the curve is now within the charted specifications as shown fig. 14.)
- 3) If the curve still exceeds the specifications (fig. 14), increase bias current further and repeat steps 5 and 6.

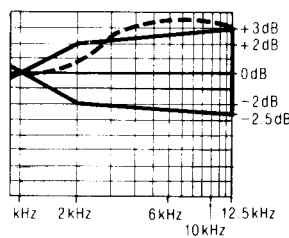


Fig. 15

Adjustment (B):

When the curve falls below the overall specified frequency response chart (fig. 14) as shown in fig. 16.

- 1) Reduce bias current by turning VR301 (L-CH) and VR302 (R-CH).
- 2) Repeat steps 5 and 6 for confirmation (Proceed to steps 7, 8 and 9 if the curve is now within the charted specifications as shown fig. 14.)
- 3) If the curve still falls below the charted specifications (fig. 14), reduce bias current further and repeat steps 5 and 6.

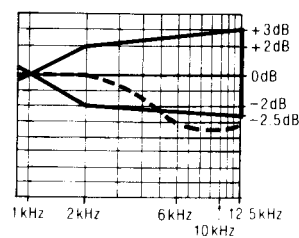


Fig. 16

7. Place UNIT into CrO₂ tape mode.
8. Change test tape to CrO₂ reference blank test tape (QZZCRX), and record 1kHz, 50Hz, 100Hz, 200Hz, 500Hz, 4kHz, 8kHz, 10kHz and 15kHz signals. Then, playback the signals and check if the curve is within the limits shown in the overall frequency response chart for CrO₂ tapes (fig. 17).
9. Place UNIT into metal tape mode and change test tape to metal reference blank test tape (QZZCRZ), and record 1kHz, 50Hz, 100Hz, 200Hz, 500Hz, 4kHz, 8kHz, 10kHz, 12.5kHz and 15kHz 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. 17).
10. Confirm that bias currents are approximately as follows when the UNIT is set at different tape mode.

- Read voltage on VTVM between ground and test point (TP3 for L-CH, TP4 for R-CH) and calculate bias current by following formula:

$$\text{Bias current (A)} = \frac{\text{Value read on VTVM (V)}}{10 (\Omega)}$$

around 200μA (Normal position)
Standard value: around 300μA (CrO₂ position)
around 400μA (Metal position)

Overall frequency response chart (CrO₂, Metal)

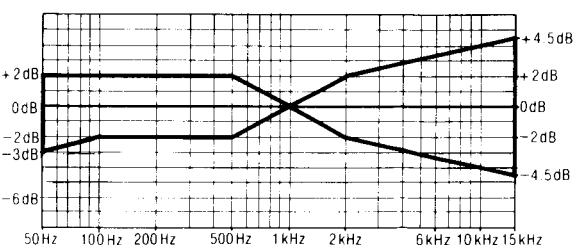


Fig. 17

Overall gain

Condition:

- Record/playback mode
- Normal tape mode
- Input level controls...MAX
- Standard input level;
MIC -72 ± 4 dB
LINE IN -24 ± 4 dB

Equipment:

- VTVM
- AF oscillator
- ATT
- Oscilloscope
- Resistor (600Ω)
- Test tape
(reference blank tape)
...QZZCRA for Normal

1. Test equipment connection is shown in fig. 18.
2. Insert the normal reference blank tape (QZZCRA).
3. Place UNIT into record mode.
4. Supply a 1kHz signal through ATT (-24 dB) from AF oscillator, to LINE IN.
5. Adjust ATT until monitor level at LINE OUT becomes 0.42 V.
6. Playback recorded tape, and make sure that the output level at LINE OUT becomes 0.42 V.
7. If measured value is not $0.42\text{V} \pm 2\text{dB}$, adjust it by using VR3 (L-CH) or VR4 (R-CH).
8. Repeat from step (2).

Standard value: $0.42\text{V} \pm 2\text{dB}$
[around 0.28V : at test points TP7 (L-CH) and TP8 (R-CH)]

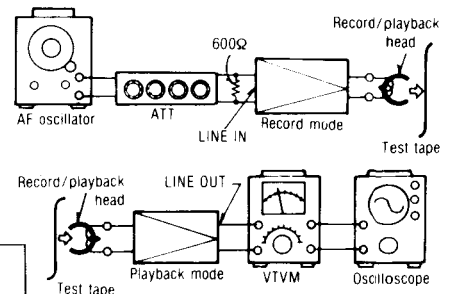


Fig. 18

Dolby NR circuit

Condition:

- Record mode
- Dolby NR switch...IN/OUT
- Dolby NR select switch...B/C
- Input level control...MAX

- Output level control...MAX
- Balance control...Center

Equipment:

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

Record side

- Check of the Dolby-B type encoder characteristics

1. Make connections as shown in fig. 19.
 2. Set the unit to the record mode. (NR select switch is OUT.)
 3. Apply a 1kHz signal to LINE IN.
 4. Adjust the ATT so that the output level at TP7 (L-CH) and TP8 (R-CH) is 12.3mV .
 5. The output level at pin 14 should be 0dB .
 6. Set the NR select switch to B, and make sure that the output signal level at pin 14 of IC3 (L-CH) and IC4 (R-CH) is $+6\text{dB} \pm 2.5\text{dB}$.
 7. Set the NR select switch to OUT, and adjust the frequency to 5kHz . The output signal level at pin 14 should be 0dB .
 8. Set the NR select switch to B and make sure that the output signal level at pin 14 of IC3 (L-CH) and IC4 (R-CH) is $+8\text{dB} \pm 2.5\text{dB}$.
- Check to 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 IC3 (L-CH) and IC4 (R-CH) is $+11.5\text{dB} \pm 2.5\text{dB}$.
 11. Set the NR select switch to OUT and adjust the frequency to 5kHz . The output signal at pin 14 should be 0dB .
 12. Set the NR select switch to C and make sure that the output signal level at pin 14 of IC3 (L-CH) and IC4 (R-CH) is $+8.5\text{dB} \pm 2.5\text{dB}$.

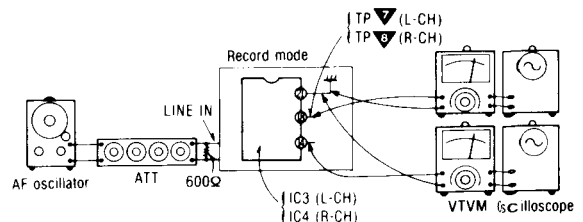


Fig. 19

Attack recovery time adjustment (dbx circuit)

Condition:

- Record mode
- Input level control...MAX
- Noise reduction selector
...dbx tape

Equipment:

- VTVM
- ATT
- AF oscillator
- DC voltmeter

1. Make the connections as shown in fig. 20 and apply $1\text{kHz} -27\text{dB}$ 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 C107 (L-CH) and C108 (R-CH) is 300mV .
3. Read voltage on DC voltmeter.

Reference value: $15 \pm 0.5\text{mV}$

4. If measured value is not within reference, adjust VR9 (shown in fig. 1).

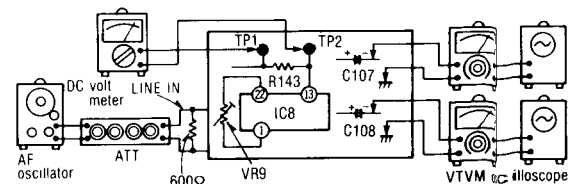


Fig. 20

Input scanning time adjustment

Condition:
• Stop mode

Equipment:
• Oscilloscope

1. Place the recorder in the stop mode.
2. Connect an oscilloscope to pin 31 of IC601, as shown in Fig. 21.
3. If the measured value is not within standard value, correct it by opening or closing the jumper junctions (A) and (B) as follows (See Fig. 22):
After closing (A) and opening (B), read the resulting value.
 - If it is less than 70Hz, close (B).
 - If more than 120Hz, open (A) but close (B).
 - If opening (A) and closing (B) do not cause the reading to be less than 120Hz, open both (A) and (B).

Standard value: 100 ± 20 Hz (pulse frequency)

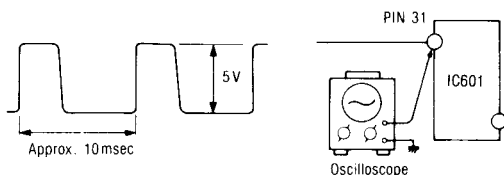


Fig. 21

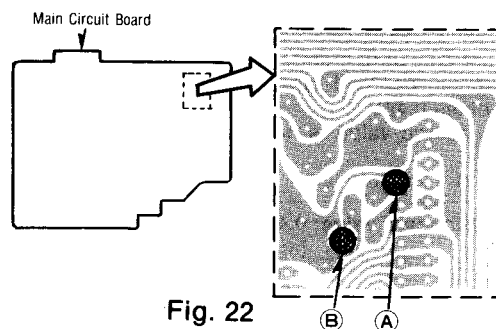


Fig. 22

Fluorescent meter

Condition:
• Record mode
• Input level controls...MAX

Equipment:
• VTVM
• ATT
• AF oscillator

• Check for FL meter

To check the accuracy of the FL meter, measure the output level at test point [TP7 (L-CH), TP8 (R-CH)].

1. Make connections as shown (See fig. 23).
2. Connect a wire between TP501 and TP502 terminal (See fig. 24).
3. In the recording pause mode, apply 1kHz (-24dB) to LINE IN.
4. Adjust ATT so that output level at test point [TP7 (L-CH), TP8 (R-CH)] is 0.28V.

Checking FL meter 0dB segment display ON/OFF

Change the output level at test point [TP7 (L-CH), TP8 (R-CH)] from 0.28V -1dB (≈ 250 mV) to 0.28V +1dB (≈ 310 mV) by adjusting the attenuator, and check that the FL meter 0dB segment display OFF state changes to the ON state.

Checking FL meter -40dB segment display ON/OFF

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

• Adjustment for FL meter

1. Make connections as shown (See fig. 23).
2. Connect a wire between TP501 and TP502 terminal (See fig. 24).
3. In the recording pause mode, apply 1kHz (-24dB) to LINE IN.
4. Adjust ATT so that output level at test point [TP7 (L-CH), TP8 (R-CH)] is 0.28V.

-40dB adjustment

5. Adjust ATT so that the level adjusted at step 4 is reduced by 40dB.
6. At this time, check that -40dB indicator is dimmed (intermediate brightness between full brightness and light-out: See fig. 25).
7. If the indicator is not lighted halfway as described in step 6, adjust VR8.

0dB adjustment

8. Restore the condition of step 4 (set output level to 0.28V at test point [TP7 (L-CH), TP8 (R-CH)]).
9. At this time, check that 0dB indicator is dimmed (intermediate brightness between full brightness and light-out: See fig. 26).
10. If improper, adjust VR501.
11. Repeat adjustments at steps 4, 5, 6, 7, 8, 9 and 10 two or three times.
12. Disconnect the wire between TP501 and TP502 terminal, which had been connected at step 2.

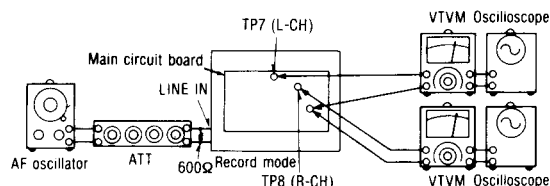


Fig. 23

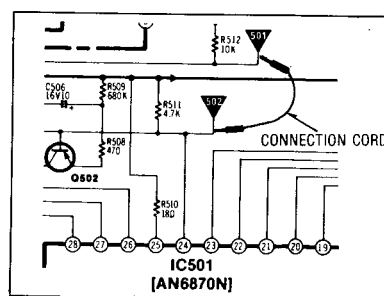


Fig. 24



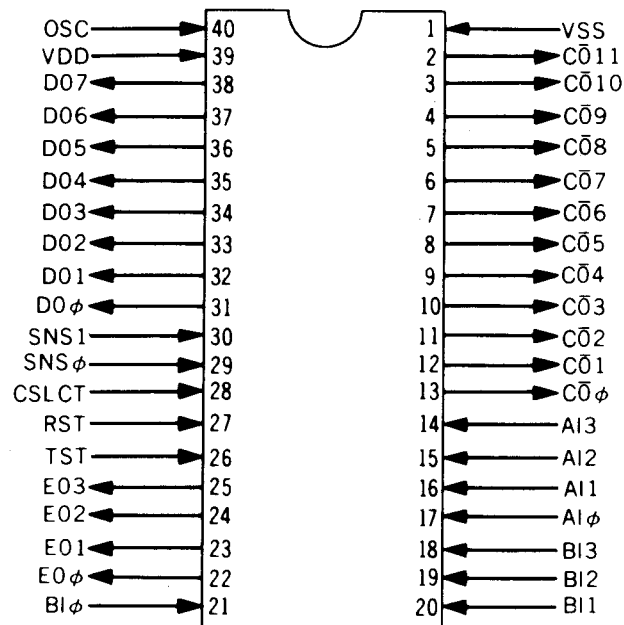
Fig. 25



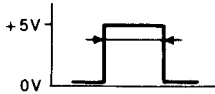
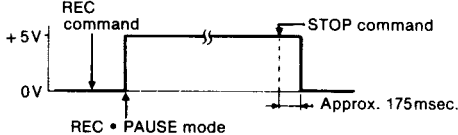
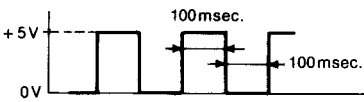
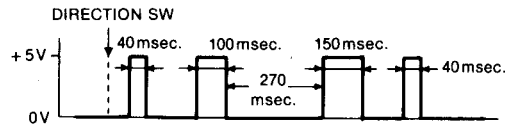
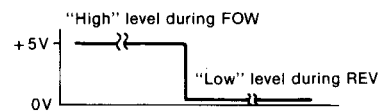
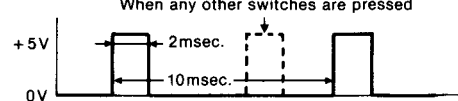
Fig. 26

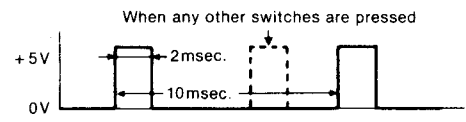
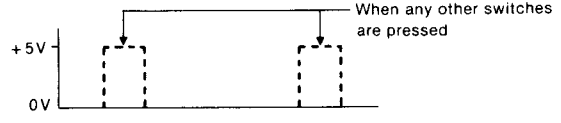
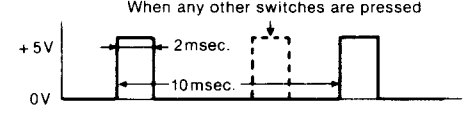
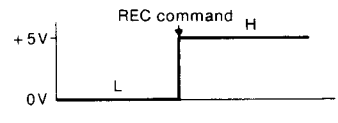
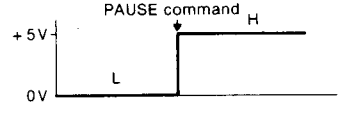
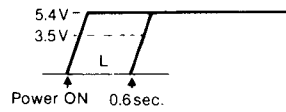
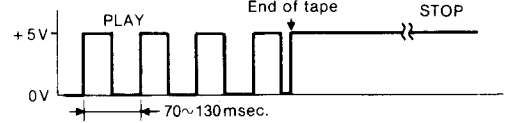
MICROCOMPUTER TERMINAL FUNCTION AND WAVEFORM (IC601: MN1405RMS)

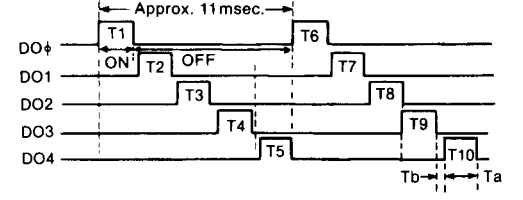
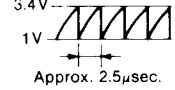
(BOTTOM VIEW)



Terminal No.	Symbol	Name	Function/operation
1.	VSS	GND	
2.	CO11	Music select (M.S) command	• "High" level with music select at ON.
3.	CO10	Blank skip (B.S) command	• "High" level with blank skip at ON.
4.	CO9	Music repeat (M.R) command	• "High" level with music repeat at ON.
5.	CO8	REC MUTE	• "High" level pulse with REC MUTE button pressed during REC PLAY.
6.	CO7	CUE/REVIEW MUTE	• "High" level pulse with CUE/REVIEW button pressed during PLAY.
7.	CO6	Drive motor CCW rotation command	• "High" level pulse in each mode in operational sequence REV PLAY → PAUSE → STOP → FOW PLAY. • During switching between REV PLAY and FOW PLAY.

Terminal No.	Symbol	Name	Function/operation
8.	CO5	Drive motor CW rotation command	• "High" level pulse in each mode in operational sequence FOW PLAY → PAUSE → STOP → REV PLAY. 
9.	CO4	Muting for all amplifiers	• "High" level during FF, REW and STOP. • "Low" level during REC, PLAY and CUE/REV.
10.	CO3	Bias oscillation ON/OFF	• Goes to "High" immediately after REC or PAUSE operation. • Remains in "High" during REC or PLAY operation. • Goes to "Low" approximately 175msec after the STOP command is given. 
11.	CO2	FF/REW motor rotation select (FF/REW motor CCW rotation command)	• "High" level during: - FOW PLAY - FOW FF - REV REW
12.	CO1	FF/REW motor rotation select (FF/REW motor CW rotation command)	• "High" level during: - REV PLAY - REV FF - FOW REW
13.	CO ϕ	FF and REW blinking-indication command	• "High" level during FF and REW. 
14.	AI3	Reading of input switch state CAM B (S606)	• Input in switching-over from FOW PLAY to REV PLAY. 
15.	AI2	Reading of input switch state CAM A (S605)	
16.	AI1	Connection to + B (bias)	
17.	AI ϕ	Reading of input switch state REC INH	• "High" level when a tape not prepared with miserase prevention masking is loaded. • "Low" level with the cassette lid open.
18.	BI3	Reading of input switch state DIR	• Waveform when the cassette lid is closed with no tape loading. 

Terminal No.	Symbol	Name	Function/operation
19.	BI2	Reading of input switch state REC • PLAY	Waveform when the cassette lid is closed with no tape loading. 
20.	BI1	Reading of input switch state BS • PAUSE • FF	Waveform when the cassette lid is closed with no tape loading. 
21.	BIφ	Reading of input switch state BS • PAUSE • FF	Waveform when the cassette lid is closed with no tape loading. 
22.	EOφ	REC indication output	"High" level concurrently with REC command. - In TIMER REC mode, "High" level just after power on. - In TIMER REC mode, "High" level remains unchanged even if the automatic stop reset mechanism operates with power on. 
23.	EO1	PAUSE indication output	"High" level concurrently with PAUSE command. 
24.	EO2	Reel takeup torque selection and blank skip LED indication	"High" level during PLAY. "Low" level during FF, REW and STOP.
25.	EO3	DIRECTION indication output	"Low" level during FORWARD. "High" level during REVERSE.
26.	—	—	Connection to GND.
27.	RST	Reset terminal	- Terminal for reset signal to computer. - Reset at "Low" level (less than 0.8 volts). 
28.	CSLCT	—	Non connection.
29.	SNSφ	End-of-tape detection	

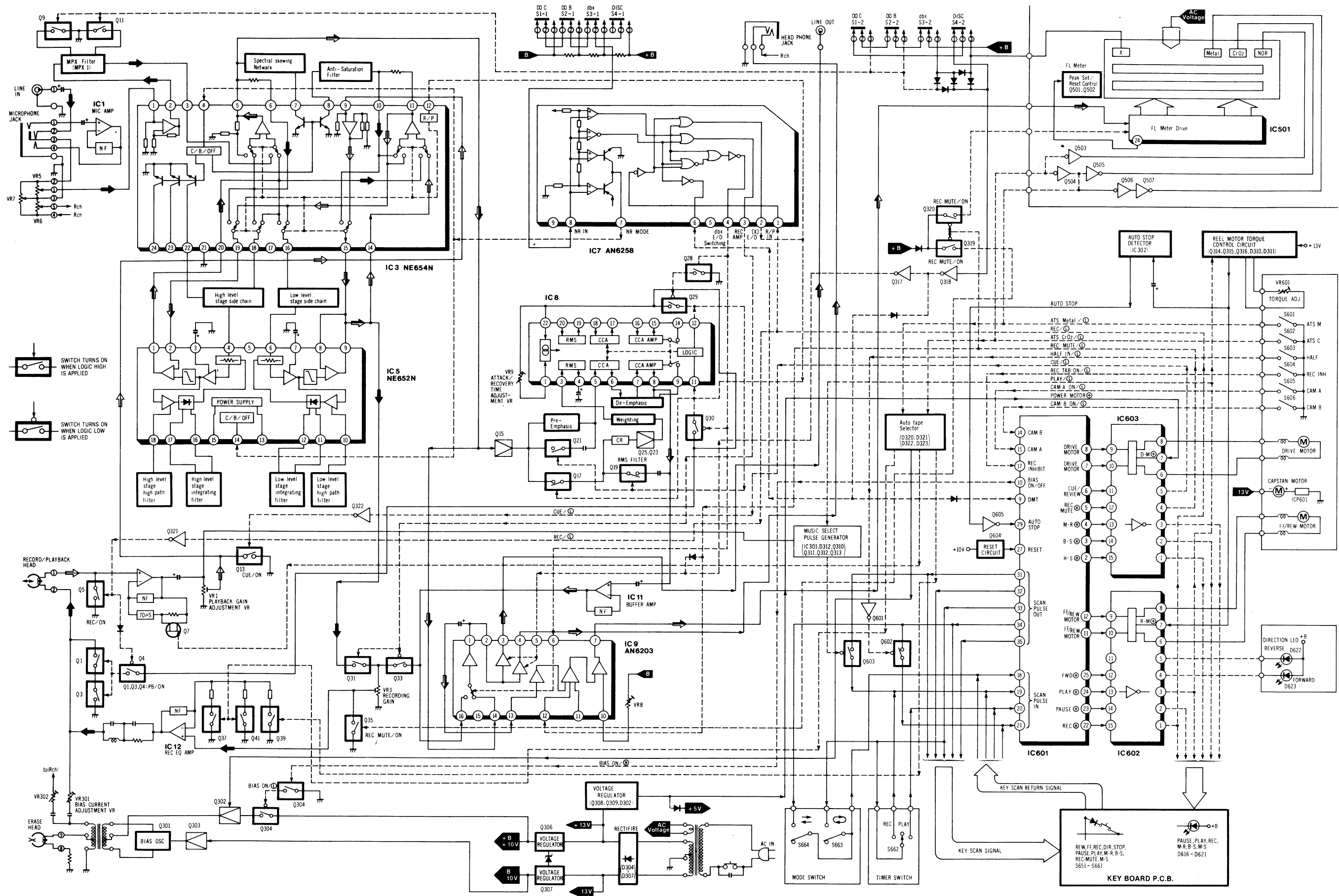
Terminal No.	Symbol	Name	Function/operation
30.			Non connection.
31.	DOφ	Input switch scanning	 Pulse width: Ta = Approx. 2.0msec, Tb = Approx. 100μsec.
32.	DO1		
33.	DO2		
34.	DO3		
35.	DO4		
36.	DO5		Non connection.
37.	DO6		
38.	DO7		
39.	VDD	Power supply terminal	Operative on 4.6 to 6.0 volts (typically 5.5 volts).
40.	OSC	Oscillation terminal	- Generates oscillation at approximately 600kHz. - Because the connection of a probe affects the terminal, nothing should be connected to this terminal for any other measurements. - Use DOφ to 4 in measuring the computer's velocity; Approx. 125Hz in STOP condition. 

NOTES:

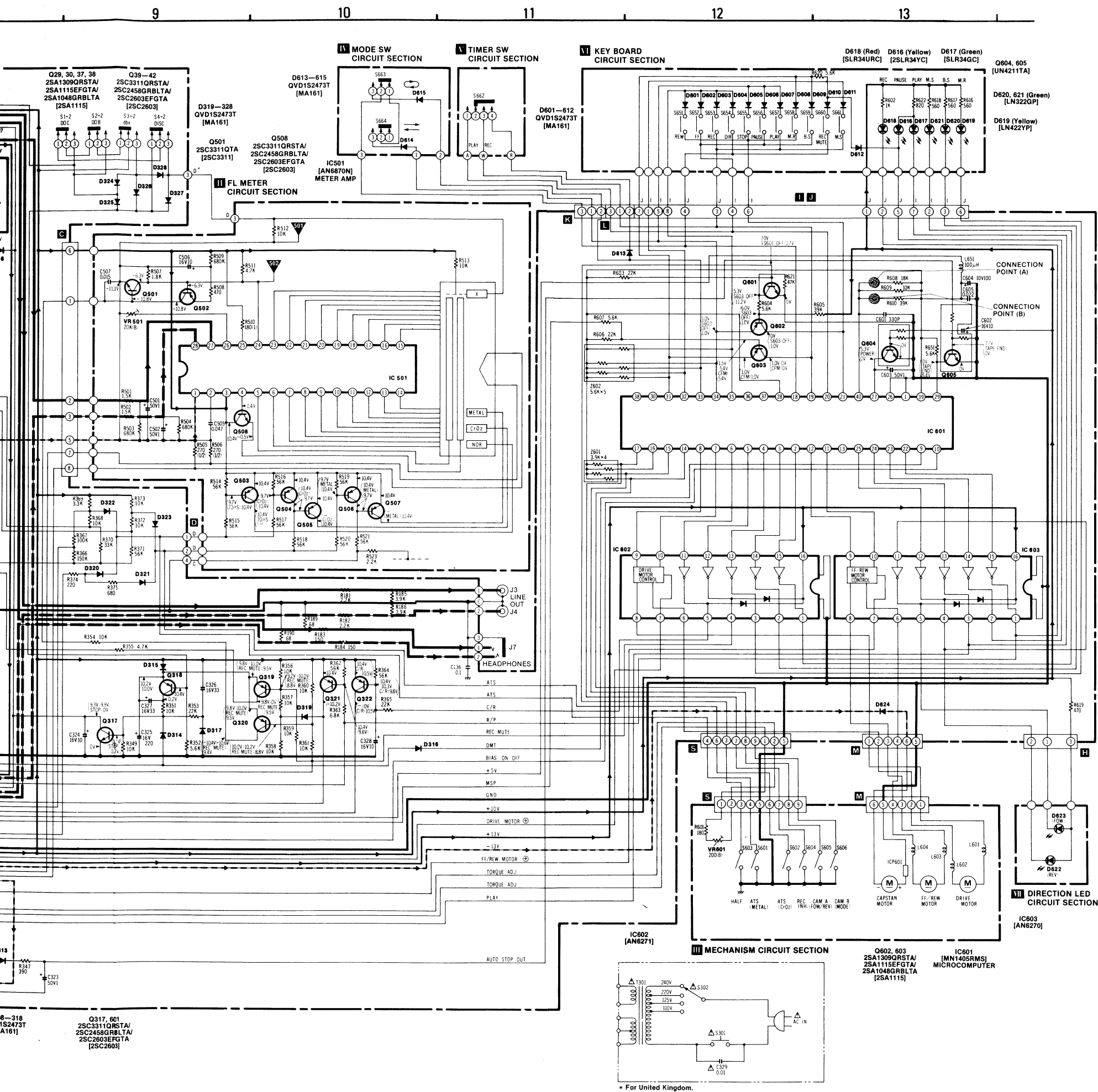
- S1-1, S1-2Dolby-C IN/OUT switch (shown in OUT position).
- S2-1, S2-2Dolby-B IN/OUT switch (shown in OUT position).
- S3-1, S3-2dbx "Tape" IN/OUT switch (shown in OUT position).
- S4-1, S4-2dbx "Disc" IN/OUT switch (shown in OUT position).
- S301Power ON/OFF switch (shown in OFF position).
- S302AC power voltage select switch.
- S601Auto tape select switch (for Metal tape).
- S602Auto tape select switch (for CrO₂ tape).
- S603Half switch (shown in OFF position).
- S604REC inhibit switch (shown in OFF position).
- S605Forward/Reverse detection switch (shown in OFF position).
- S606Mode detection switch (shown in OFF position).
- S651Rewind switch (shown in OFF position).
- S652F.F switch (shown in OFF position).
- S653Record switch (shown in OFF position).
- S654Direction switch (shown in OFF position).
- S655Stop switch (shown in OFF position).
- S656Pause switch (shown in OFF position).
- S657Play switch (shown in OFF position).
- S658Music repeat switch (shown in OFF position).
- S659Blank Skip switch (shown in OFF position).
- S660Rec Mute switch (shown in OFF position).
- S661Music select switch (shown in OFF position).
- S662Timer switch (shown in 1 position).
- (1...TIMER REC, 2...OFF, 3...TIMER PLAY)
- S663, S664Mode selection switch (1 / 2 / 3).

- VR1, 2Playback gain adjustment VR.
- VR3, 4Overall gain adjustment VR.
- VR5, 6Input level controls.
- VR7Balance control.
- VR8FL meter adjustment VR (-40dB indication).
- VR9Attack recovery time adjustment VR.
- VR10Erase current adjustment VR.
- VR301, 302Bias current adjustment VR.
- VR501FL meter adjustment VR (0dB indication).
- VR601Takeup torque adjustment VR.
- ()This symbol indicates the PNP switching transistor.
- ()This symbol indicates the NPN switching transistor.
- () this arrow indicates the flow of the recording signal. (NR OUT).
- () this arrow indicates the flow of the playback signal. (NR OUT).
- () this arrow indicates the flow of the recording signal and playback signal combination.
- () this arrow indicates the flow of the control signal.

BLOCK DIAGRAM







IC501

1	-11.1V	
2	-8.4V (-8.6V)	
3	10.4V	
4		
5		
6	-10.1V	Segment 9.3V
23		
24	-6.3V (-6.4V)	
25	6.8V (6.7V)	CFM 6.4V
26	-8.3V (-8.4V)	
27	-9.4V (-9.5V)	CFM -7.5V
28	-9.4V (-9.5V)	CFM -7.5V

IC601

1	0V	
2	0V	MS 5.3V
3	0V	BS 5.3V
4	0V	MR 5.3V
5	0V	REC MUT 5.3V
6	0V	C/R 5.3V
7	0V	
8	0V	
9	0V	STOP 5.3V
10	0V (3.8V)	
11	5.3V	REV/PLAY 0V
12	0V	REV/PLAY 5.3V
13	0V	
14	0V	
15	5.4V	REV 0V
16	5.4V	
17	0V	
18	1.0V (0V)	
19	1.0V (0V)	
20	1.0V	
21	0V	
22	0V (5.3V)	
23	0V	PAUSE 5.4V
24	5.3V	STOP 0V
25	0V	REV 5.4V
26	0V	
27	0V	Power ON 0V
28	5.4V	
29	5.4V	TAPE END 5.4V
30	0V	
31	1.0V	
35		
36	0V	
37	0V	
38	0V	PAUSE 5.3V
39	5.4V	
40	2.2V	

NOTES:

- S1-1, S1-2.....Dolby-C IN/OUT switch (shown in OUT position).
- S2-1, S2-2.....Dolby-B IN/OUT switch (shown in OUT position).
- S3-1, S3-2....."Tape" IN/OUT switch (shown in OUT position).
- S4-1, S4-2.....dbx "Disk" IN/OUT switch (shown in OUT position).
- S301.....Power ON/OFF switch (shown in OFF position).
- S302.....AC power voltage select switch (for United Kingdom only).
- S601.....Auto tape select switch (for Metal tape).
- S602.....Auto tape select switch (for CrO₂ tape).
- S603.....Half switch (shown in OFF position).
- S604.....REC inhibit switch (shown in OFF position).
- S605.....Forward/Reverse detection switch (shown in OFF position).
- S606.....Mode detection switch (shown in OFF position).
- S651.....Rewind switch (shown in OFF position).
- S652.....F.F switch (shown in OFF position).
- S653.....Record switch (shown in OFF position).
- S654.....Direction switch (shown in OFF position).
- S655.....Stop switch (shown in OFF position).
- S656.....Pause switch (shown in OFF position).
- S657.....Play switch (shown in OFF position).
- S658.....Music repeat switch (shown in OFF position).
- S659.....Blank Skip switch (shown in OFF position).
- S660.....Rec Mute switch (shown in OFF position).
- S661.....Music select switch (shown in OFF position).
- S662.....Timer switch (shown in 1 position).
- (1...TIMER REC, 2...OFF, 3...TIMER PLAY)
- S663, S664.....Mode selection switch (shown in OFF position).
- VR1, 2.....Playback gain adjustment VR.
- VR3, 4.....Overall gain adjustment VR.
- VR5, 6.....Input level controls.
- VR7.....Balance control.
- VR8.....FL meter adjustment VR (-40dB indication).
- VR9.....Attack recovery time adjustment VR.
- VR10.....Erase current adjustment VR.
- VR301, 302.....Bias current adjustment VR.
- VR501.....FL meter adjustment VR (0dB indication).
- VR601.....Takeup torque adjustment points.
- Point (A), (B).....Input scanning time adjustment VR.
- L1, L2.....Skewing Network.
- L3, L4.....Bias Trap Coil.
- L5, L6.....Peaking Coil.
- L7.....Choke Coil.
- L301.....Bias Trap Coil.
- L601-L604.....Choke Coil.
- L651.....Choke Coil.
- MPX1, 2.....Multiplex Filter.
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
- 1K = 1,000(Ω), 1M = 1,000(KΩ).
- Capacity are in micro-farads (μF) unless specified otherwise.
- The mark (▼) shows test point. e.g. ▼ = Test point 1.

IC602

1	10.1V (0.1V)	
2	(2.1V) PAUSE 0V	
3	0.2V	STOP 10.4V
4	1.8V	REV 0V
5	0V	REV 0.9V
6	4.1V	REV/PLAY 0V
7	4.1V	
8	0V	REV/PLAY 5.0V
9	0V	REV/PLAY 5.3V
10	5.3V	REV/PLAY 0V
11	1.8V	REV 0V
12	0V	REV 5.4V
13	5.3V	STOP 0V
14	0V	PAUSE 5.3V
15	0V (5.3V)	
16	13.8V (13.6V)	

IC603

1	9.0V (8.9V)	MS 0V
2	9.0V (8.9V)	BS 0V
3	9.0V (8.9V)	MR 0V
4	9.6V (10.1V)	REC MUTE 0V
5	10.1V (10.2V)	C/R 0V
6	0V	
7	6.3V	
8	0V	
9	0V	
10	0V	
11	0V	C/R 5.3V
12	0V	REC MUTE 5.3V
13	0V	MR 5.3V
14	0V	BS 5.3V
15	0V	MS 5.3V
16	13.8V (13.6V)	

ELECTRICAL PARTS LIST

- 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.
 Tape Voltage values at dbx tape mode.
 disc Voltage values at dbx disc mode.
 CrO₂ Voltage values at CrO₂ tape mode.
 Metal Voltage values at Metal tape mode.
 Stop Voltage values at Stop mode.
 C/R Voltage values at CUE/REV mode.
 FF/REW Voltage values at FF/REW mode.
 REC MUTE Voltage values at REC MUTE mode.
 70 μ s Voltage values at CrO₂ or Metal tape mode.
 NR IN Voltage value at which the noise reduction switch is turned on.
 B Voltage values at Dolby-B mode.
 C Voltage values at Dolby-C mode.
 MS Voltage values at music select mode.
 BS Voltage values at blank skip mode.
 MR Voltage values at music repeat mode.
 CFM Voltage value at which the test tape QZZCFM (315Hz/0dB) is played.

Segment Voltage value at which the corresponding FL meter segment is lit.

POWER ON Voltage value at which the power source is on.

TAPE END Voltage at the end of the cassette tape.

S603: OFF Voltage at which the S603 switch is off.

For measurement use VTVM.

- ($\blacksquare$) indicates B + (bias).
- ($\blacktriangle$) indicates B - (bias).
- ($\blacktriangleright$) indicates the flow of the playback signal. (NR out).
- ($\blacktriangleleft$) indicates the flow of the recording signal. (NR out).
- Important safety notice
 Components identified by Δ 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 numbers 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.

SPECIFICATIONS

Playback S/N ratio * Test tape...QZZCFM	Greater than 45dB
Overall distortion * Test tape ...QZZCRA for Normal ...QZZCRX for CrO ₂ ...QZZCRZ for Metal	Less than 4%
Overall S/N ratio * Test tape...QZZCRA	Greater than 43dB (without NAB filter)

- * Input level control...MAX
- * Balance control.....Center

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

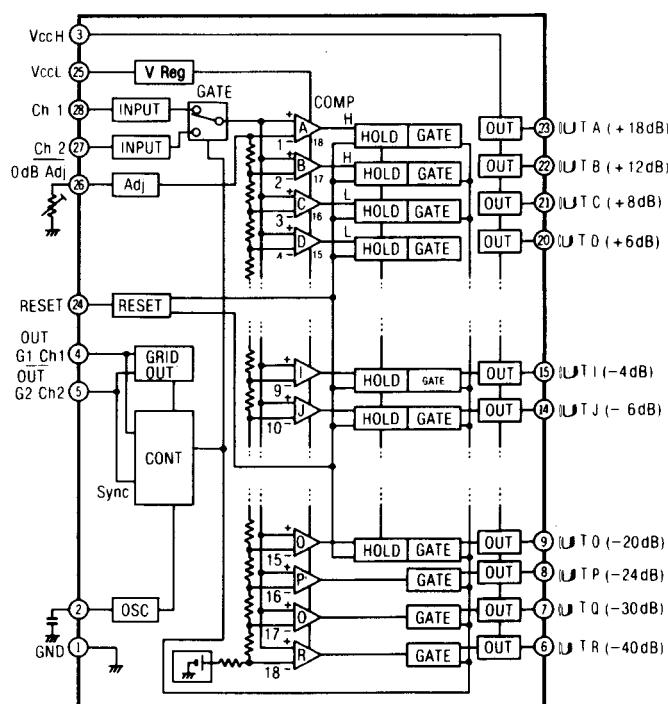
Components identified by Δ mark have special characteristics important for safety.

When replacing any of these components, use only manufacturer's specified parts.

Ref. No.	Part No.	Ref. No.	Part No.
RESISTORS		R 37, 38	ERD25TJ104
R 1, 2	ERD25TJ273	R 39, 40	ERD25FJ103
R 3, 4	ERD25TJ394	R 41, 42	ERD25FJ472
R 5, 6	ERD25FJ102	R 43, 44	ERD25FJ272
R 7, 8	ERD25TJ273	R 45, 46	ERD25TJ183
R 9, 10	ERD25FJ102	R 47, 48	ERD25FJ181
R 11, 12	ERD25FJ472	R 49, 50, 51, 52	ERD25FJ103
R 13, 14	ERD25TJ224	R 53, 54	ERD25FJ101
R 15, 16	ERD25FJ100	R 55, 56	ERD25FJ512
R 17, 18	ERD25FJ472	R 57, 58	ERD25FJ102
R 19	ERD25FJ561	R 59, 60	ERD25TJ224
R 20	ERD25TJ223	R 61, 62	ERD25TJ683
R 21, 22	ERD25TJ563	R 63, 64	ERD25FJ512
R 23, 24	ERD25FJ101	R 65, 66	ERD25FJ222
R 25, 26	ERD25FJ102	R 67, 68	ERD25TJ823
R 27, 28	ERD25FJ181	R 69, 70	ERD25FJ472
R 29, 30	ERD25TJ334	R 71, 72	ERD25TJ123
R 31, 32	ERD25FJ682	R 73, 74	ERD25TJ473
R 33, 34	ERD25FJ562	R 75, 76	ERD25TJ753
R 35, 36	ERD25TJ225		

EQUIVALENT CIRCUIT

IC501: AN6870N

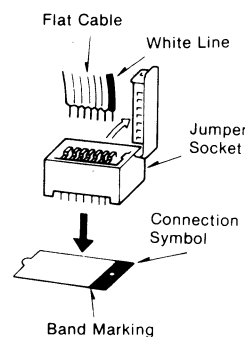


Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Part Name & Description		
R 77, 78	ERD25TJ334	R 337	ERD25TJ563	C 43, 44	ECEA1CS100	TRANSISTORS				MULTIPLEX FILTERS		
R 79, 80, 81, 82	ERD25TJ394	R 338	ERQ14AJ180	C 45, 46	ECQM1H472JZ	Q 1, 2, 3	2SD1011	MPX 1, 2	QLM9Z10K		Multiplex Filter	
R 83, 84	ERD25TJ334	R 339	ERD25FJ120	C 47	ECFDD103KVY	Q 4	2SB1036	COILS				
R 85	ERD25FJ222	R 340	ERD25FJ103	C 48	ECEA1AS101	Q 5, 6	2SD1450	L 1, 2	ELM7Q306A		Skewing Network	
R 86	ERD25FJ472	R 341	ERD25FJ471	C 49, 50	ECEA1CS100	Q 7, 8	2SK330GRY	L 3, 4	QLQX0343KWA		Bias Trap Coil	
R 87	ERD25FJ222	R 342, 343	ERD25FJ102	C 51, 52	ECEA1ES4R7	Q 9, 10, 11, 12	2SD1450	L 5, 6	QLQX2722D		Peaking Coil	
R 88	ERD25FJ472	R 345	ERD25FJ103	C 53, 54	ECQM1H473JZ	Q 13, 14, 15, 16, 17, 18, 19, 20,	21, 22	2SC2603	L 7		QLQX1012DT	Choke Coil
R 91, 92	ERD25TJ153	R 346	ERD25FJ332	C 55, 56	ECQM1H333JZ	Q 23, 24	2SD1011	L 301	QLB0198		Bias Trap Coil	
R 93, 94	ERD25FJ102	R 347	ERD25FJ391	C 57, 58, 59, 60	ECQM1H104JZ	Q 25, 26, 27, 28	2SC2603	L 601, 602, 603, 604	ELEH101KA		Choke Coil	
R 95, 96, 97, 98	ERD25TJ104	R 349	ERD25FJ103	C 61, 62	ECQM1H333JZ	Q 29, 30	2SA1115	L 651	QLQX1012DT		Choke Coil	
R 99, 100	ERD25FJ332	R 351	ERD25FJ103	C 63, 64	ECQM1H224JZ	Q 31, 32	2SK330GRY	TRANSFORMER				
R 101, 102, 103, 104	ERD25TJ223	R 352	ERD25FJ562	C 65	ECQM1H104JZ	Q 33, 34	2SJ105GR	T 301	[D] Δ QLPD86ELX	AC Power Transformer		
R 105, 106	ERD25FJ822	R 353	ERD25TJ223	C 66	ECEA50Z3R3	Q 35, 36	2SD1450	[For all European areas except United Kingdom.]				
R 107, 108	ERD25TJ333	R 354	ERD25FJ103	C 67, 68	ECEA1HSR22	Q 37, 38	2SA1115	[B] Δ QLPA76ELX AC Power Transformer				
R 109, 110	ERD25TJ244	R 355	ERD25FJ472	C 69, 70, 71, 72	ECQM1H104JZ	Q 39, 40, 41, 42	2SC2603	[For United Kingdom.]				
R 111, 112	ERD25TJ154	R 356, 357, 358, 359, 360, 361	ERD25FJ103	C 73, 74, 75, 76	ECQM1H332JZ	Q 301, 302	2SD592	FUSES				
R 113, 114	ERD25FJ472	R 362	ERD25TJ563	C 77, 78	ECDD1H331J	Q 303	2SA719	F 2, 3	Δ XBAQ050027	Fuse (T1A)		
R 115, 116	ERD25TJ333	R 363	ERD25FJ682	C 79, 80	ECQM1H223JZ	Q 304	2SA1115	SWITCHES				
R 117, 118	ERD25FJ682	R 364	ERD25TJ154	C 81, 82	ECDD1H471J	Q 305	UN4211TA	S 1, 2, 3, 4	QSW2240	Push Switch (NR Selector)		
R 119, 120, 121, 122	ERD25FJ332	R 365	ERD25TJ104	C 83, 84	ECEA50MR68R	Q 306	2SD1265	S 301	Δ QSW1127	Push Switch (Power ON/OFF)		
R 123, 124	ERD25TJ223	R 366	ERD25FJ103	C 85, 86	ECEA1CS100	Q 307	2SB941	S 302	[B] Δ QSR1407	Rotary Switch (AC Power Voltage Selector)		
R 125, 126	ERD25FJ472	R 367	ERD25FJ332	C 87, 88	ECQM1H472JZ	Q 308	2SD1275	[For United Kingdom.]				
R 127, 128	ERD25TJ153	R 368	ERD25FJ332	C 89, 90	ECEA16Z10	Q 309, 310, 311, 312, 313	2SC2603	S 601, 602, 603, 604	QSB0296	Leaf Switch (Metal Tape/CrO ₂ Tape/ Half/REC Inhibit)		
R 129	ERD25FJ472	R 369	ERD25FJ332	C 91, 92	ECQM1H333JZ	Q 314	2SA1115	S 605, 606	QSB0295	Leaf Switch (Forward Reverse Detection)		
R 130	ERD25TJ274	R 370	ERD25TJ333	C 93, 94	ECEA50MR33R	Q 315	2SC3242	S 651, 652, 653	QSWY207A	Key Board Switch (REW/F.F/REC)		
R 131, 132	ERD25FJ102	R 371	ERD25TJ563	C 95, 96	ECEA0JS470	Q 316	UN4211TA	$\S$ 654, 655, 656, 657, 658, 659	SSG13	Key Board Switch (DIRECTION/STOP/ PAUSE/PLAY/M.R.B.S)		
R 133, 134	ERD25FJ103	R 372, 373	ERD25FJ103	C 97, 98	ECDD1H391J	Q 317	2SC2603	S 660	QSWY207A	Key Board Switch (REC MUTE)		
R 135, 136	ERD25FJ151	R 374	ERD25FJ221	C 99, 100	ECQM1H223JZ	Q 318, 319, 320, 321, 322	2SA1115	S 661	SSG13	Key Board Switch (M.S)		
R 137, 138	ERD25FJ472	R 375	ERD25FJ681	C 101	ECEA1CS100	Q 501	2SC3311	S 662	QSS1306	Slide Switch (Timer REC/PLAY)		
R 139, 140	ERD25TJ153	R 376	ERD25FJ470	C 102, 103, 104	ECEA1HS010	Q 502, 503, 504, 505, 506, 507	2SA1115	S 663, 664	QSW2241	Push Switch (Mode Selector)		
R 141	ERD25FJ103	R 377	ERD25FJ102	C 105	ECEA1AS471	Q 508	2SC2603	JACKS				
R 142	ERD25TJ104	R 378	ERD25FJ681	C 106	ECEA0JS331	Q 601	2SC2603	J 1, 2, 3, 4	QEJ5030C	Jack Board (LINE IN/OUT)		
R 143	ERD25FJ102	R 379	ERD25TJ333	C 107, 108	ECEA1HS100	Q 602, 603	2SA1115	J 5, 6	QJA0452	Microphone Jack		
R 144	ERD25TJ473	R 380	ERD25FJ472	C 109, 110	ECKD2H121KB	Q 604, 605	UN4211TA	J 7	QJA0266	Headphones Jack		
R 145	ERD25FJ222	R 381	ERD25FJ103	C 111, 112	ECKD1H561KB	D 1	MA161	CONNECTORS				
R 147	ERD25TJ153	R 382	ERD25TJ563	C 113, 114	ECEA50Z3R3	D 3, 4	MA161	CN 1	QJT1090	Check Pin		
R 148	ERD25FJ151	R 383	ERD25FJ682	C 115, 116	ECEA1CN100	D 5	MA1056	CN 2	QJT1054	Contact		
R 149	ERD25FJ102	R 384	ERD25TJ563	C 117, 118	ECQM1H273JZ	D 6	MA161	CN 3	QJS1920TN	2 Pin Socket		
R 150, 151	ERG2ANJ560	R 385	ERD25TJ223	C 119, 120	ECFDD472KVY	D 301	MA1220M	CN 4	QJP1920TN	2 Pin Post		
R 152	ERD25FJ103	R 386	ERD25FJ181	C 125, 126, 127, 128	ECEA1HS010	D 302	MA1075LF	CN 5	QJS1921TN	3 Pin Socket		
R 153, 154	ERD25TJ104	R 387	ERD25FJ102	C 133, 134	ECFDD223KVY	D 303, 304, 305, 306, 307	SM112	CN 6	QJP1921TN	3 Pin Post		
R 155, 156	ERD25FJ102	R 388	ERD25FJ332	C 135	ECFDD103KVY	D 308, 309, 310, 311, 312, 313, 314, 315, 316, 317	MA161	CN 7	QJS1922TN	6 Pin Socket		
R 157, 158	ERD25TJ123	R 389	ERD25FJ332	C 136	ECQM1H104JZ	D 319, 320, 321, 322, 323, 324, 325, 326, 327, 328	MA161	CN 8	QJP1922TN	6 Pin Post		
R 159, 160, 161, 162	ERD25FJ225	R 390	ERD25TJ393	C 137	ECEA1ES4R7	D 329	LD702DU	CN 9	QJS1997S	Jumper Socket (3 Pin)		
R 163, 164	ERD25FJ182	R 391	ERD25FJ102	C 138	ECKD1H223ZF	D 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615	MA161	CN 10	QJS1961S	Jumper Socket (5 Pin)		
R 165, 166	ERD25FJ682	R 392	ERD25FJ103	C 301, 302	ECDD1H470KC	D 616	SLR34YC	CN 11	QJS1962S	Jumper Socket (7 Pin)		
R 167, 168	ERD25FJ102	R 393	ERD25TJ393	C 303	ECQP1153JZ	D 617	SLR34GC	CN 12	QJS1983S	Jumper Socket (8 Pin)		
R 169, 170	ERD25FJ390	R 394	ERD25FJ562	C 304	ECFDD153KVY	D 618	SLR34URC	CN 13	QJS2000S	Jumper Socket (6 Pin/Type-L)		
R 171, 172	ERD25FJ821	R 395	ERD25FJ562	C 305	ECFDD822KVY	D 619	LN322GP	CN 14	QJS2001S	Jumper Socket (9 Pin/Type-L)		
R 173, 174	ERD25FJ272	R 396	ERD25FJ562	C 306, 307	ECEA1ES220	D 620	LN422YP					
R 175, 176	ERD25FJ103	R 397	ERD25FJ562	C 308, 309	ECKD1H223ZF	D 621	LN322GP					
R 177, 178	ERD25FJ222	R 398	ERD25FJ562	C 310, 311	ECEA1CS331	D 622, 623	QVDSL005M					
R 179, 180	ERD25FJ272	R 399	ERD25FJ562	C 312	ECKD1H223ZF	(with Direction LED P.C.B.)	D 624	SM112				
R 181, 182	ERD25FJ222	R 400	ERD25FJ562	C 313	ECEA1ES220	INTEGRATED CIRCUITS						
R 183, 184	ERD25FJ151	R 401	ERD25FJ562	C 314	ECEA1ES472	IC 1	M5218L					
R 185, 186	ERD25FJ392	R 402	ERD25FJ562	C 315	ECEA1CS222	IC 2	M5220L					
R 187	ERD25FJ270	R 403	ERD25FJ562	C 316	ECEA1ES332	IC 3, 4	NE654N					
R 189, 190	ERD25FJ680	R 404	ERD25FJ562	C 317	ECEA1CS330	IC 5, 6	NE652N					
R 301	ERD25FJ1R0	R 405	ERD25FJ562	C 318	ECEA1CS100	IC 7	AN6258					
R 302	ERD25FJ100	R 406	ERD25FJ562	C 319	ECQM1H394JZ	IC 8	AN6291					
R 303, 304	ERD25FJ562	R 407	ERD25FJ562	C 320	ECEA1ES4R7	IC 9, 10	AN6203					
R 305, 306	ERD25FJ100	R 408	ERD25FJ562	C 321	ECEA1HS010	IC 11, 12	M5218L					
R 307	ERD25FJ222	R 409	ERD25FJ562	C 322	ECEA1HS010	IC 301, 302	M5218L					
R 311	ERD25FJ222	R 410	ERD25FJ562	C 323	ECEA1CS100	IC 501	AN6870N					
R 312	ERD25FJ562	R 411	ERD25FJ562	C 324	ECEA1CS221	IC 601	MN1405RMS					
R 313	ERD25TJ473	R 412	ERD25FJ562	C 325	ECEA1CS221	IC 602	AN6270					
R 316, 317	Δ ERD2FCJ47R	R 413	ERD25FJ562	C 326, 327	ECEA1CS330	IC 603	AN6271					
R 318, 319	Δ ERD25FJ681	R 414	ERD25FJ562	C 328	ECEA1CS100							
R 320	Δ ERX2ANJ8R2	R 415	ERD25FJ562	C 329	ECQU2A103MF							
R 321	Δ ERD25FJ102	R 416	ERD25FJ562	C 330	ECQM1H474JZ							
R 322	ERD25FJ103	R 417	ERD25FJ562	C 331	ECEA1CS100							
R 323	ERD25TJ153	R 418	ERD25FJ562	C 501, 502	ECEA1HS010							
R 324	ERD25TJ683	R 419	ERD25FJ562	C 505	ECFDD473KVY							
R 325	ERD25FJ472	R 420	ERD25FJ562	C 506	ECEA1CS100							
R 326, 327	ERD25FJ103	R 421	ERD25FJ562	C 507	ECFDD153KVY							
R 328	ERD25FJ272	R 422	ERD25FJ562	C 601	ECDD1H331J							
R 329	ERD25FJ101	R 423	ERD25FJ562	C 602	ECEA1CS100							
R 330	ERD25FJ103	R 424	ERD25FJ562	C 603	ECEA1HS010							
R 331	ERD25TJ104	R 425	ERD25FJ562	C 604	ECEA0JS101							
R 332	ERD25TJ124	R 426	ERD25FJ562	C 605	ECKD1H223ZF							
R 333	ERD25FJ100	R 427	ERD25FJ562									
R 334	ERD25FJ102	R 428	ERD25FJ562									
R 335	ERD25TJ184	R 429	ERD25FJ562									
R 336	ERD25TJ104	R 430	ERD25FJ562									
		R 431	ERD25FJ562									
		R 432	ERD25FJ562									
		R 433	ERD25FJ562									
		R 434	ERD25FJ562									
		R 435	ERD25FJ562									
		R 436	ERD25FJ562									
		R 437	ERD25FJ562									
		R 438	ERD25FJ562									
		R 439	ERD25FJ562									
		R 440	ERD25FJ562									
		R 441	ERD25FJ562									
		R 442	ERD25FJ562						</			

CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM

CONNECTION OF A FLAT CABLE

Connect the flat cable to the jumper socket so that the white line on the flat cable corresponds to the band mark side of the connection symbol (yellow or white symbol on the PC board) for the jumper socket. (This connection may differ from those for conventional models.)



NOTES:

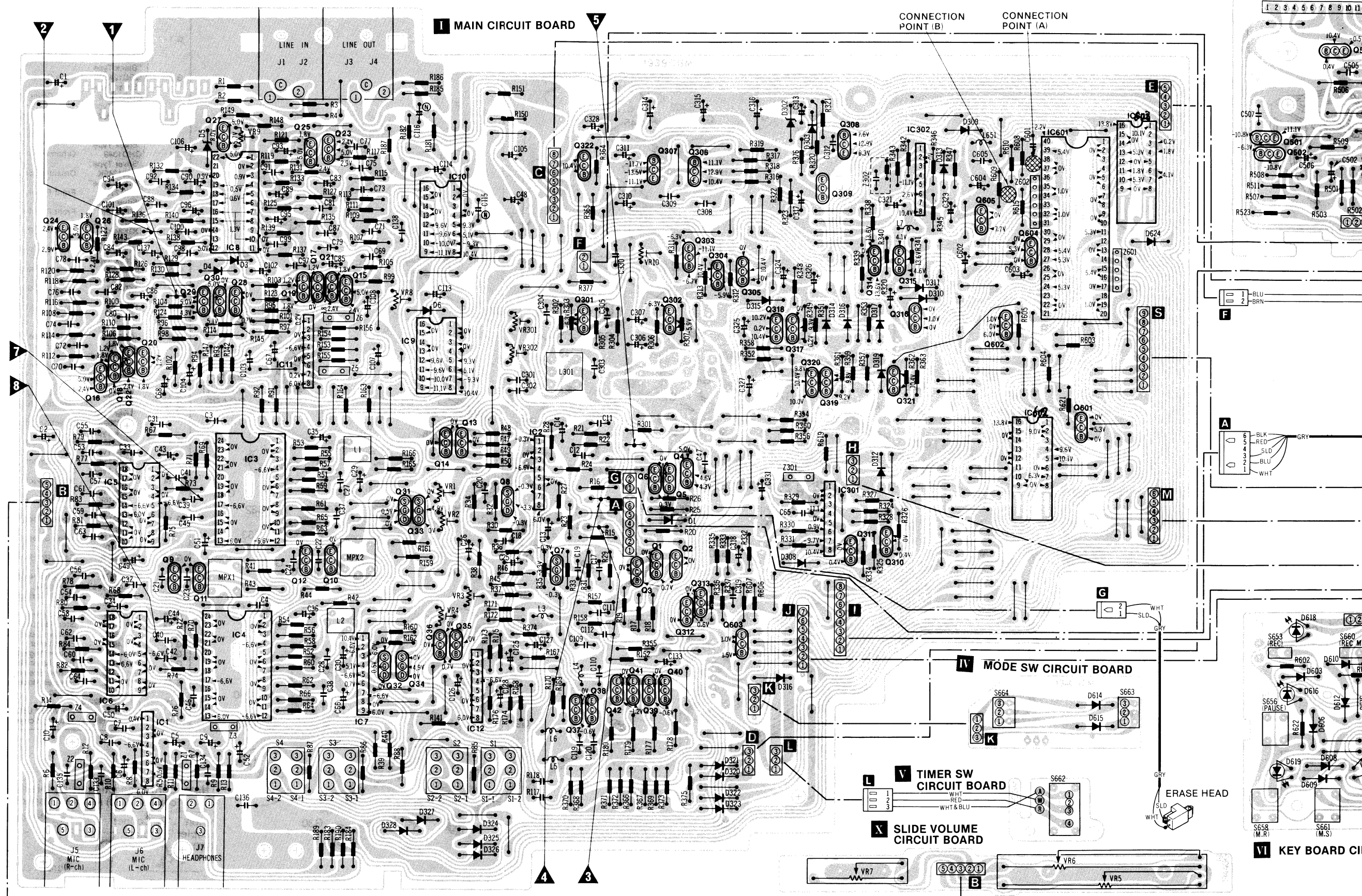
- The circuit shown in  on the conductor side indicates printed circuit on the back side of the printed circuit board.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position. For measurement, use VTVM.

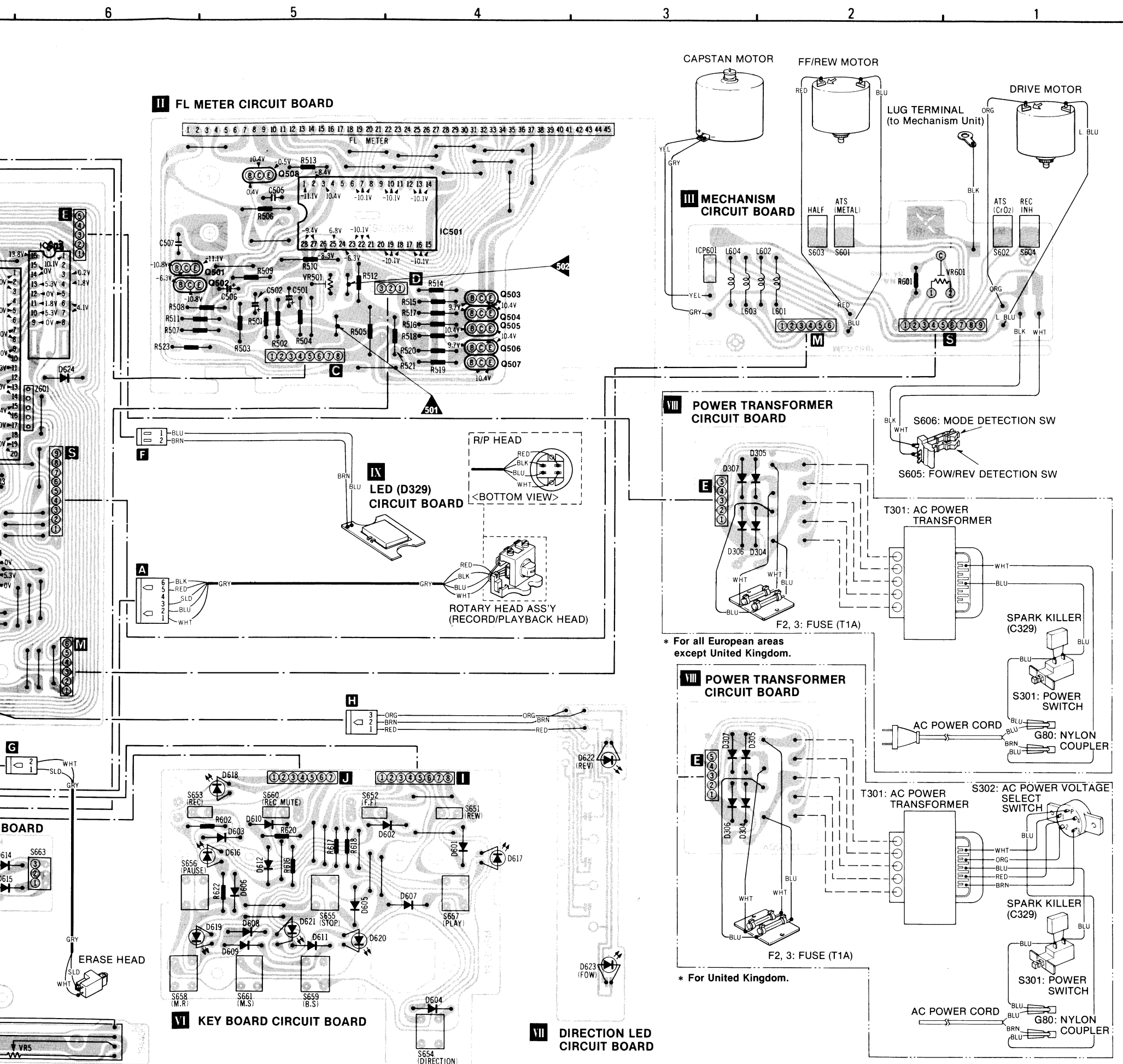
- This circuit board diagram may be modified at any time with the development of new technology.

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





TERMINATIONS

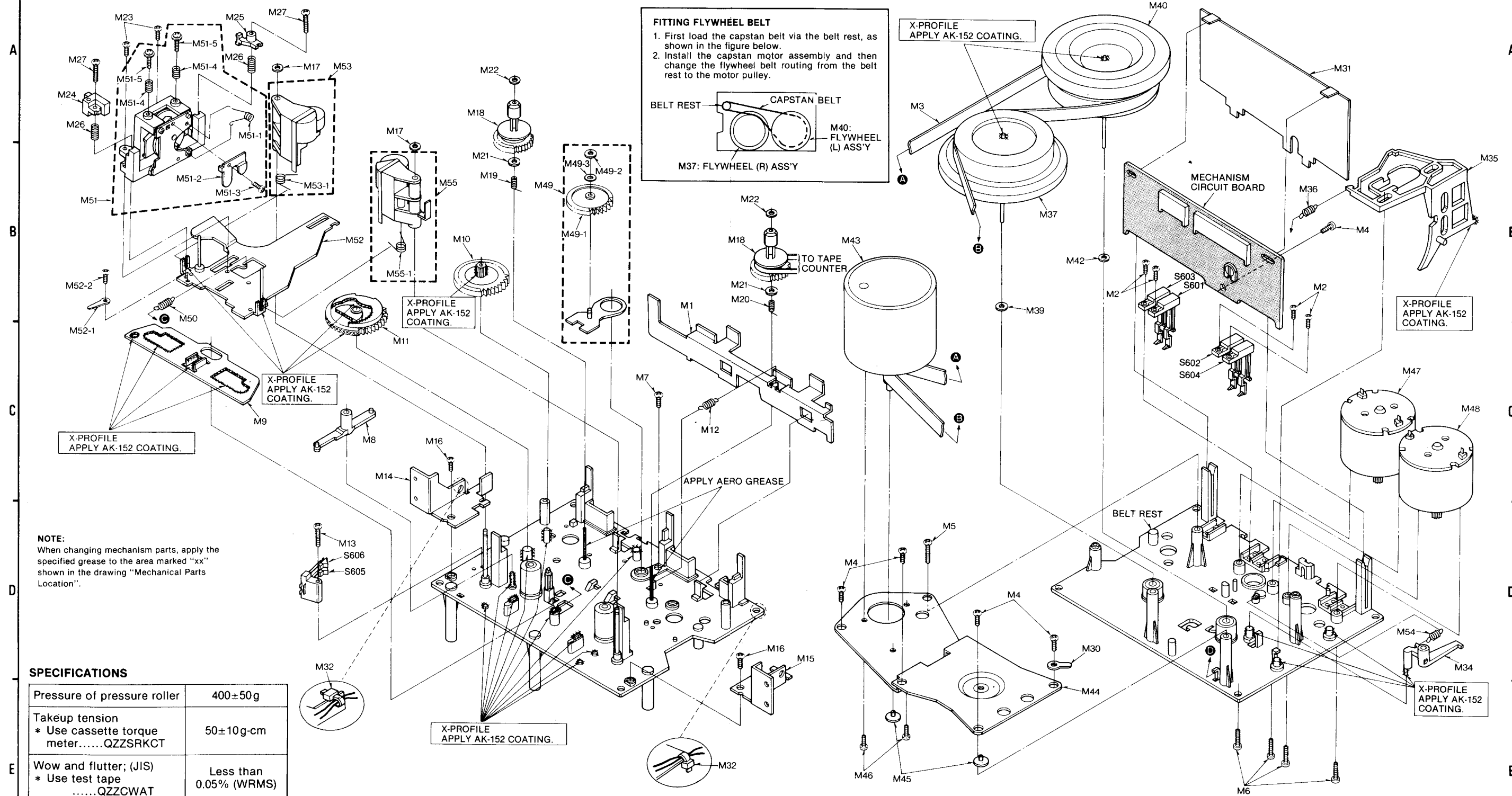
IC2, 7, 11, 12, 301, 302	IC9, 10	IC8
IC602, 603	IC601	IC5, 6
Q1-3, 23, 24, 301-303, 315	Q306-308	D5, 302
Q7, 8, 31-34	D303-307	L5, 6
L301, MPX1, 2	L1, 2	D1, 3, 4, 6, 308-328, 601-612, 614, 615
D616-618	D619-621	L7, 601
L3, 4	IC1	IC501

CONNECTORS

CN1	(2 Pin) CN2
(3 Pin) CN2	(3 Pin) CN3
(3 Pin) CN5	(3 Pin) CN4
(3 Pin) CN6	(6 Pin) CN2
(3 Pin) CN9	(6 Pin) CN7
(5 Pin) CN10	(7 Pin) CN11
(8 Pin) CN12	(6 Pin) CN13 (Type-L)
(9 Pin) CN14 (Type-L)	Removing contacts

Push the pawl of a contact in each hole in the housing with a flat bladed screwdriver and pull its lead wire to remove the contact.

MECHANICAL PARTS LOCATION

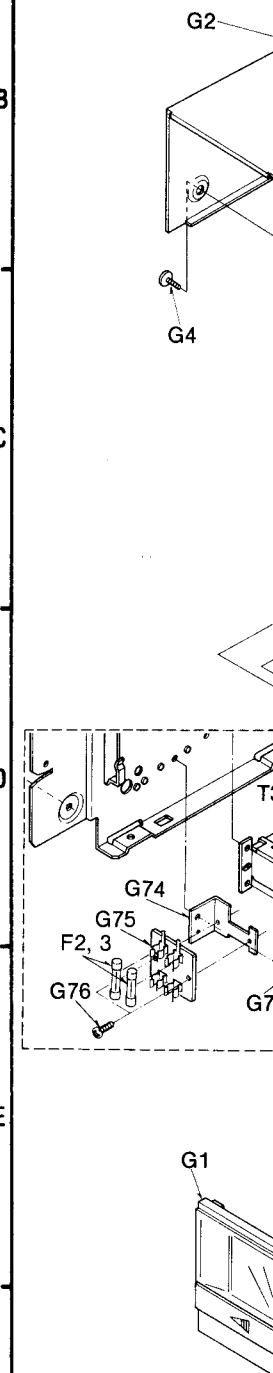


SPECIFICATIONS

Pressure of pressure roller	400±50g
Takeup tension * Use cassette torque meter.....QZZSRKCT	50±10g-cm
Wow and flutter; (JIS) * Use test tapeQZZCWAT	Less than 0.05% (WRMS)

REPLACEMENT PARTS LIST

Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description	Ref. No.	Part No.	Part Name & Description
MECHANICAL PARTS			M 11	QDG1309	Main Gear	M 23	XTN26 + 6B	Tapping Screw @2.6 x 6	M 39	QBW2116	Washer (2.4 ϕ)	M 49-1	QDG1307	Center Gear
M 1 M 2 M 3 M 4 M 5 M 6 M 7 M 8 M 9 M 10	QMA4620	Eject Angle	M 12	QBT2003	Eject Angle Spring	M 24	QWY2148Y	Erase Head	M 40	QXF0220	Flywheel (L) Assembly	M 49-2	QBW2007	Washer (2.5 ϕ)
		Tapping Screw @2 x 8	M 13	XTN2 + 14B	Tapping Screw @2 x 14	M 25	QMGO124	Tape Guide	M 42	QBW2117	Washer (2.7 ϕ)	M 49-3	QBH0151	Spacer
		Flywheel Belt	M 14	QMA4628	Mechanism Angle-L	M 26	QBC1448	Tape Guide Spring	M 43	QXU0331	Capstan Motor Assembly (with Motor Governor P.C.B.)	M 50	BTT1742	Head Base Plate Spring
		Tapping Screw @3 x 8	M 15	QMA4627	Mechanism Angle-R	M 27	XSN2 + 18	Screw @2 x 18	M 51	QXV0195	Rotary Head Assembly (Record/Playback Head)	M 52-1	QTD1258	Lug Terminal
		Tapping Screw @3 x 22	M 16	XTN3 + 6B	Tapping Screw @3 x 6	M 30	QJT0015	Lug Terminal	M 51-1	QBN1994	Click Spring	M 52-2	XTN2 + 4B	Tapping Screw @2 x 4
		Screw @2.6 x 10	M 17	QBW2046	Washer (3 ϕ)	M 31	QTW1342	Insulator Sheet	M 51-2	QBP1993	Head Thrust Spring	M 53	QXL1654	Pressure Roller Arm (L) Assembly
		Tapping Screw @3 x 6	M 18	QDR1173	Reel Table	M 32	QTD1315	Cord Clamper	M 51-3	XTN2 + 4B	Screw @2 x 4	M 53-1	QBN1992	Pressure Roller Spring (L)
		Change Lever	M 19	QBC1449	Reel Table Spring-L	M 34	QML4026	Obstruction Lever	M 51-4	QCBC1470	Head Spring	M 54	QBT1962	Obstruction Lever Spring
		Change Rod	M 20	QBC1450	Reel Table Spring-R	M 35	QMR2097	Eject Rod	M 51-5	QHQ1352	Screw	M 55	QXL1655	Pressure Roller Arm (R) Assembly
		Sub Gear	M 21	QBW2012	Washer (2.1 ϕ)	M 36	QBT1947	Head Release Spring	M 48	QXU0333	Drive Motor Assembly	M 55-1	QBN1993	Pressure Roller Spring (R)
	QDG1308		M 22	QBW2008	Washer (2 ϕ)	M 37	QXF0221	Flywheel (R) Assembly	M 49	QXG1076	Center Gear Assembly			



CABINET PARTS LOCATION

REPLACEMENT PARTS LIST

Important safety notice
Components identified by Δ 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
CABINET PARTS		
G 1	QYF0700 "Silver Type" QYF0700K "Black Type"	Cassette Lid Assembly
G 2	QGC1245 "Silver Type" QGC1245K "Black Type"	Case Cover
G 3	XTB3 + 8BFN "Silver Type" XTB3 + 8JFZ "Black Type"	Tapping Screw $\Phi 3 \times 8$
G 4	QH01349 "Silver Type" QH01349K "Black Type"	Ornament Screw
G 5	QYP1215S "Silver Type" QYP1215K "Black Type"	Front Panel Assembly
G 5-1	QK3432 "Silver Type" QK3432K "Black Type"	Ornament Plate
G 5-2	QGO2308	Function Button
G 5-3	refer to D329	LED (D329)
G 6	QYT0657	Valance Control Knob Assembly
G 7	QYT0658	Input Level Control Knob Assembly
G 8	QGO227	Slide Guide
G 9	QGL1189 "Silver Type" QGL1189K "Black Type"	Meter Filter
G 10	QGO2306	Eject Button
G 11	QMA4636	Side Angle-R
G 12	QGO2309 "Silver Type" QGO2309K "Black Type"	Direction Button
G 13	QGO2315 "Silver Type" QGO2315K "Black Type"	Mode Select Button-A
G 14	QGO2316 "Silver Type" QGO2316K "Black Type"	Mode Select Button-B
G 15	QGO2317 "Silver Type" QGO2317K "Black Type"	Mode Select Button-C
G 16	QYF0697S "Silver Type" QYF0697K "Black Type"	Cassette Holder Assembly
G 17	QBP1925	Cassette Holder Assembly Holder Spring
G 18	QBN1961	Eject Spring
G 19	XUB04FT	Stop Ring 4 ϕ
G 20	QYF0627	Dumper Gear Assembly
G 21	QML4063	Eject Lever
G 22	QMA4626	Holder Angle-L
G 23	QBP2007	Eject Lever Spring
G 24	QMB1429	Button Bushing
G 25	QBC1473	Reverse Mode Button Spring
G 26	refer to D622 & D623	FOV/REV LED
G 27	XTN26 + 6B	Tapping Screw $\Phi 2.6 \times 6$

Ref. No.	Part No.	Part Name & Description
G 28	XTN26 + 6BFZ	Tapping Screw $\Phi 2.6 \times 6$ (Black)
G 29	XTN3 + 10B	Tapping Screw $\Phi 3 \times 10$
G 30	XTB3 + 10BFN	Tapping Screw $\Phi 3 \times 10$
G 31	XWG3	Washer 3 ϕ
G 32	QGC1246	Bottom Cover
G 33	QKA1094	Rubber Foot
G 34	QDB0169	Counter Belt
G 35	QKJ0609	Nylon Rivet
G 36	[D] QMK2121	Back Chassis
	[For all European areas except United Kingdom.]	
	[B] QMK2122	Back Chassis
	[For United Kingdom.]	
G 37	QMR2059	Power Switch Rod
G 38	QGO2142	Power Button
G 39	QGT1642	Timer Button
G 40	QGO2310	NR Button-A ("C")
G 41	QGO2311	NR Button-B ("B")
G 42	QGO2312	NR Button-C ("OUT")
G 43	QGO2313	NR Button-D ("TAPE")
G 44	QGO2314	NR Button-E ("DISC")
G 45	XTB3 + 8BFN	Tapping Screw $\Phi 3 \times 8$
G 46	XTB3 + 12BFZ	Tapping Screw $\Phi 3 \times 12$
G 47	XTB3 + 12BFN	Tapping Screw $\Phi 3 \times 12$
G 48	QGO2307R	Push Button (REC)
G 49	QGO2307D	Push Button (REC MUTE)
G 50	QGO2307H	Push Button (FF/REW)
G 51	XSB3 + 6BNS	Screw $\Phi 3 \times 6$
G 52	QKJ0608	Tapping Support
G 53	QTH1178	Heat Sink
G 54	XSN3 + 8S	Screw $\Phi 3 \times 8$
G 55	QMA4680	MIC Angle
G 56	QJC0069	Earth Plate
G 57	QNQ1070	Nut 12 ϕ
G 58	XTN3 + 8B	Tapping Screw $\Phi 3 \times 8$
G 59	QKJ0683	LED Holder (for D619-621)
G 60	QMK2092	Operation Chassis
G 61	QXC0084	Tape Counter Assembly
G 62	QSF1011F	FL Meter
G 63	QKJ0681	Meter Holder
G 64	QTS1617	Shield Plate (for FL Meter)
G 65	QMA4681	Volume Angle
G 66	XSN2 + 3	Screw $\Phi 2 \times 3$
G 67	QMA4679	Side Angle-L
G 68	[D] Δ RJA23Z	AC Power Cord
	[For all European areas except United Kingdom.]	
	[B] Δ QFC1205M	AC Power Cord
	[For United Kingdom.]	
G 69	QTD1164	Cord Bushing
G 70	[B] QTW00026	Switch Cover (for S302)
	[For United Kingdom.]	
G 71	QTW1195	Spark Killer Cover
G 72	[B] QMA4603	Switch Angle (for S302)
	[For United Kingdom.]	
G 73	QTD1315	Nylon Binder
G 74	QMA4729	Fuse Angle
G 75	Δ QTF1020	Fuse Holder
G 76	XTN3 + 6B	Tapping Screw $\Phi 3 \times 6$
G 77	XWA3B	Washer 3 ϕ
G 78	QTD1322	Cord Clamp
G 79	QBJ1425	Cord Bushing
G 80	Δ QJT1079	Nylon Coupler
G 81	QKJ0598	Switch Cover
G 82	XTN3 + 24B	Tapping Screw $\Phi 3 \times 24$
G 83	[B] QGS3160	Main Name Plate
	[For United Kingdom.]	

ACCESSORIES

A 1	QEB0125	Connection Cord
A 2	QQT3571	Instruction Book

PACKINGS

P 1	QPN4514	Inside Carton
P 2	QPA0701	Cushion-R
P 3	QPA0702	Cushion-L
P 4	QPS0434	Pad
P 5	QPA0712	Spacer
P 6	XZB40X60A02	Poly Sheet (for UNIT)
P 7	QPC0072	Poly Sheet (for AC Power Cord)

NOTES:

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

Note: Cord connection using this nylon coupler (G80) requires a special tool.

