ORDER NO. ARD83080271C2-16

Service Manual

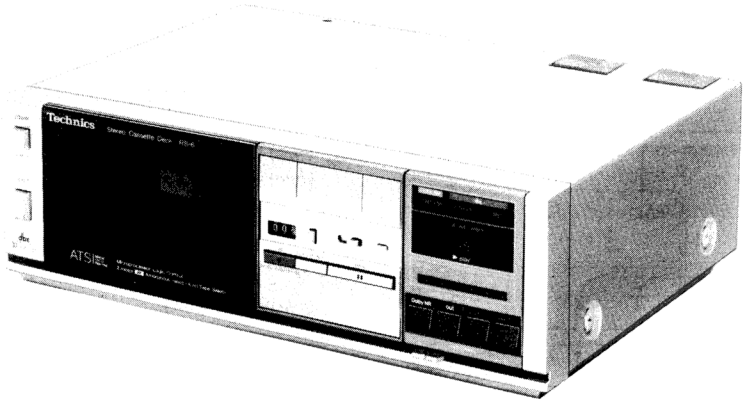
Cassette Deck

RS-6

(Silver Face
Black Face)

315 Series Mini-Size 2 Motor Microprocessor Control Cassette Deck with dbx System

DOLBY SYSTEM



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
Tape speed:	4.8cm/s
Wow and flutter:	0.05% (WRMS), ±0.14% (DIN)
Frequency response:	Metal tape; 20—17,000Hz 30—16,000Hz (DIN) CrO_2 tape; 20—17,000Hz 30—16,000Hz (DIN) Normal tape; 20—16,000Hz 30—15,000Hz (DIN)
Dynamic range:	110dB (at 1kHz) with dbx* in
Max. input level improvement:	10dB or more improved with dbx in (at 1kHz)
Signal-to-noise ratio:	dbx in; 92dB (A weighted) Dolby** B NR in; 67dB (CCIR) NR out; 57dB (A weighted) (Signal level = max. input level CrO_2 type tape)
Fast forward and rewind time:	Approx. 90 seconds with C-60 cassette tape
Inputs:	MIC; sensitivity 0.25mV, applicable microphone impedance 400Ω—10kΩ LINE; sensitivity 60mV, input impedance 47kΩ or more
Outputs:	LINE; output level 400mV, output impedance 1.5kΩ or less
Bias frequency;	80kHz
Heads:	2-head system 1-AX (AMORPHOUS) head for record/playback 1-double-gap ferrite head for erasure
Motor:	(2 plus 1-motor system Electrical governor motor (×1), DC motor (×2))
Power requirements:	D .....AC; 220V, 50-60Hz B .....AC; 240V, 50-60Hz
Power consumption:	14W
Dimensions:	31.5cm(W)×9.9cm(H)×23.9cm(D)
Weight:	3.7kg

Desing 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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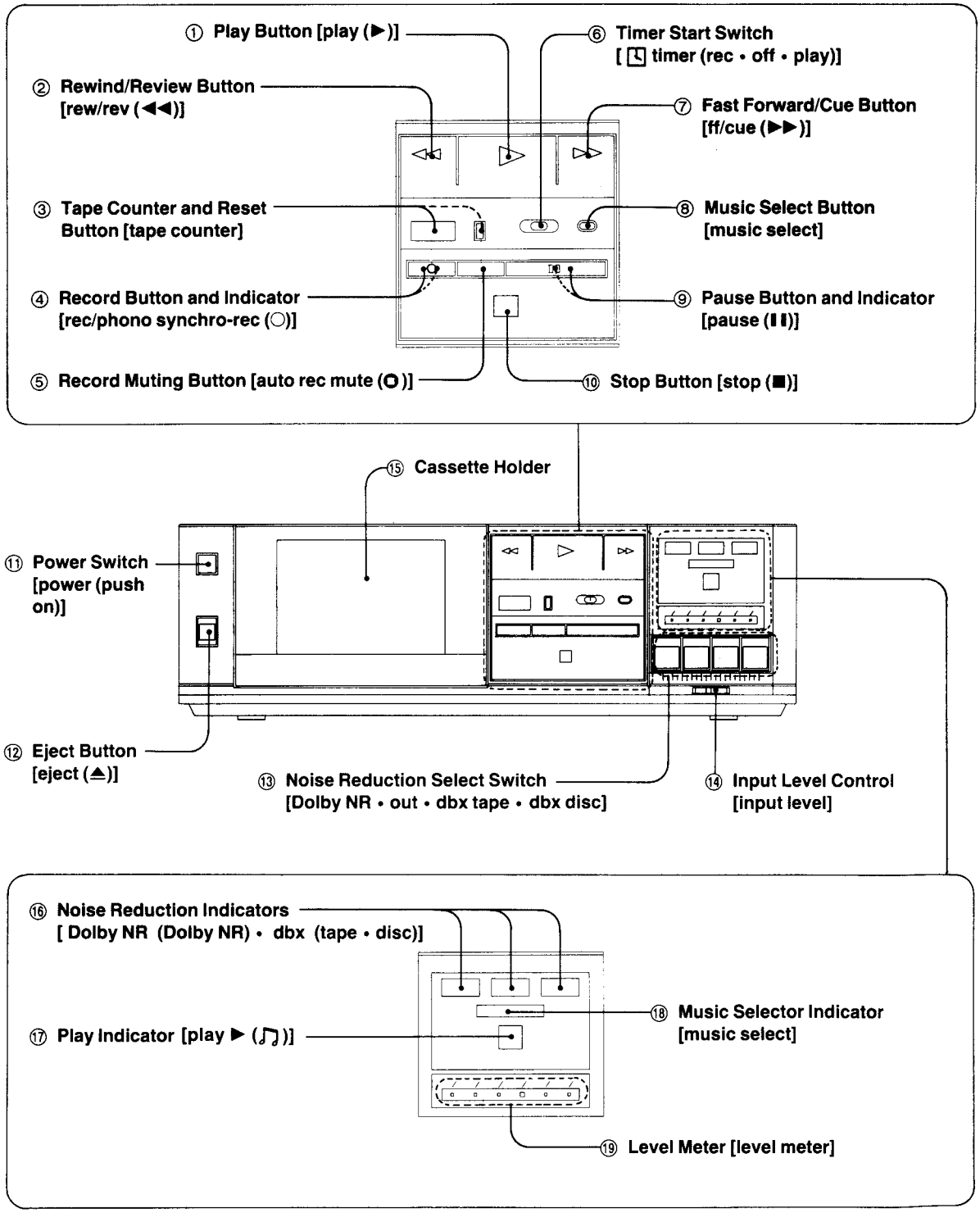
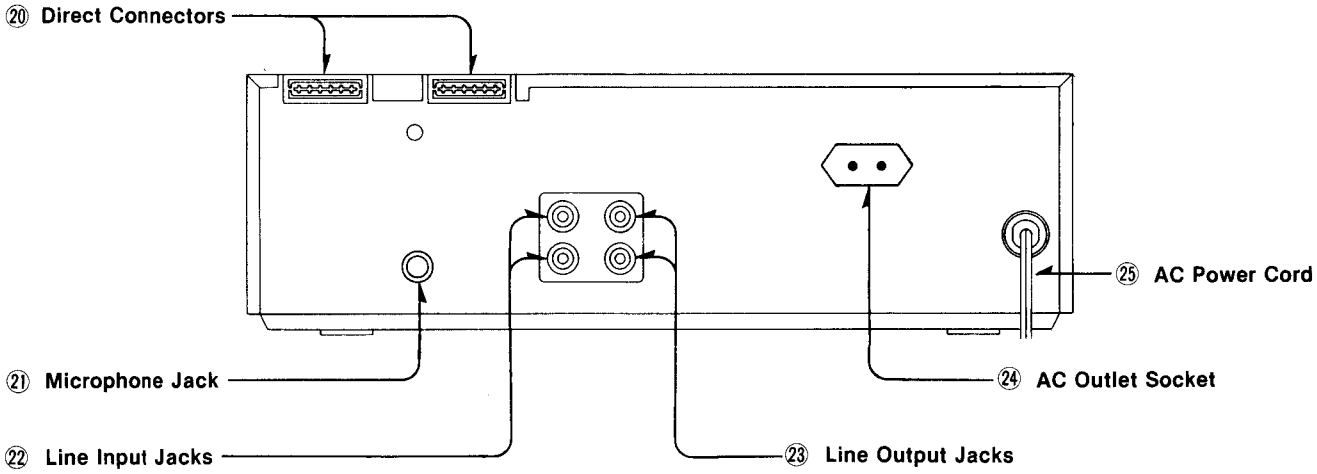
LOCATION OF CONTROLS AND COMPONENTS





OPERATING INSTRUCTION

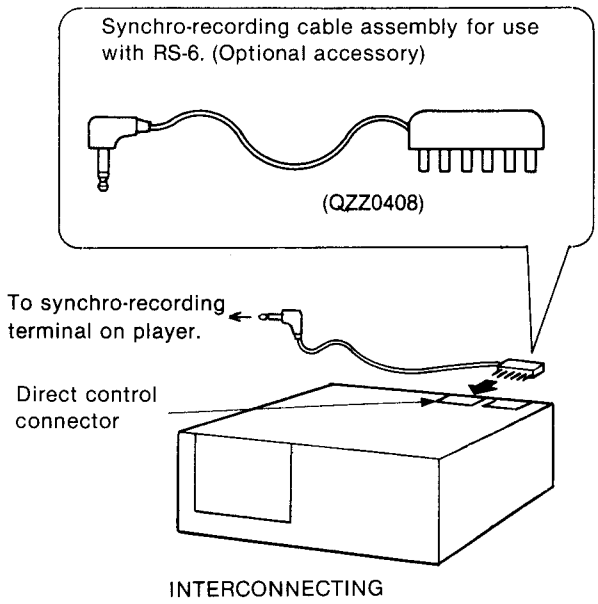
1. About Synchro-recording

Why use synchro-recording?

When the tape deck's Record Button is pushed, and the deck placed in the record-pause condition, when the stylus of the tonearm is lowered onto the record surface, the Pause mode will be automatically released and recoridng will begin. When the stylus leaves the surface of the record, approximately four seconds of non-recorded interval will be allowed to pass before the recording stops automatically. This function is called synchro-recording.

NOTE:

For synchro-recording with a system provided with no direct control connector, an optional synchro-recording cable assembly, QZZ0408, is required.



INTERCONNECTING

DISASSEMBLY INSTRUCTIONS

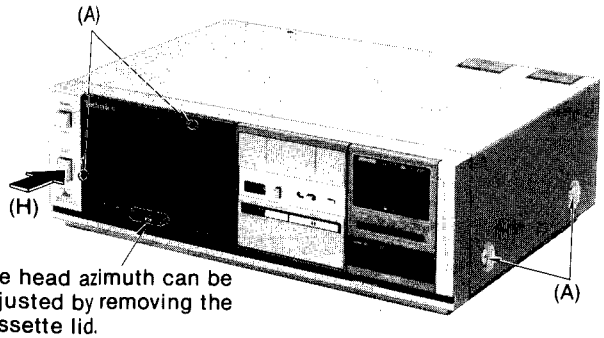


Fig. 1

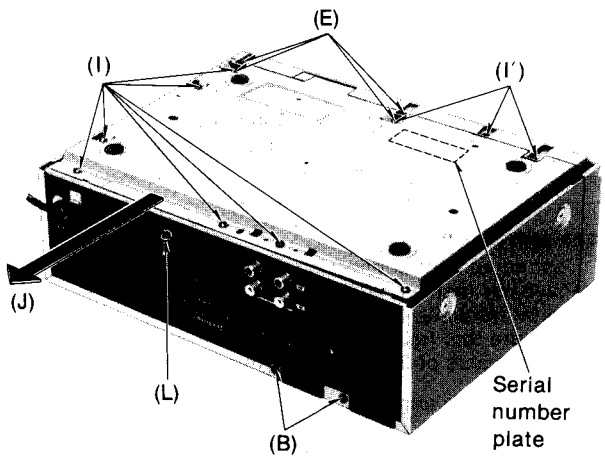
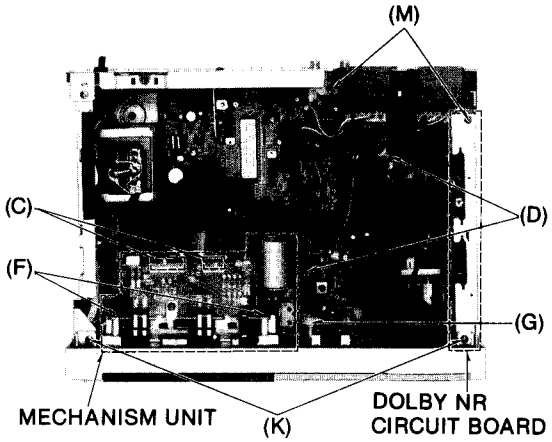
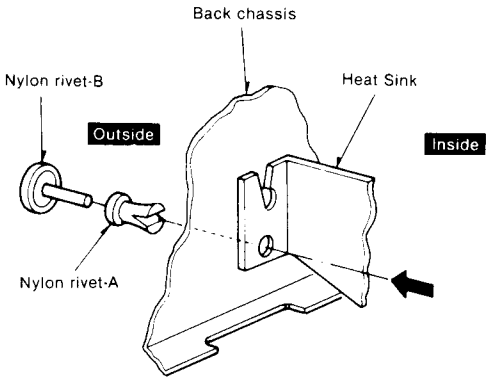


Fig. 2

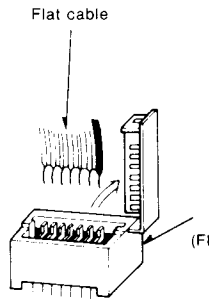


(L) How to remove nylon rivet



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.

(C) How to remove flat cable



Open the lid of connector in the direction of the arrow as shown above, and extract the flat cable to disconnect.

Fig. 3

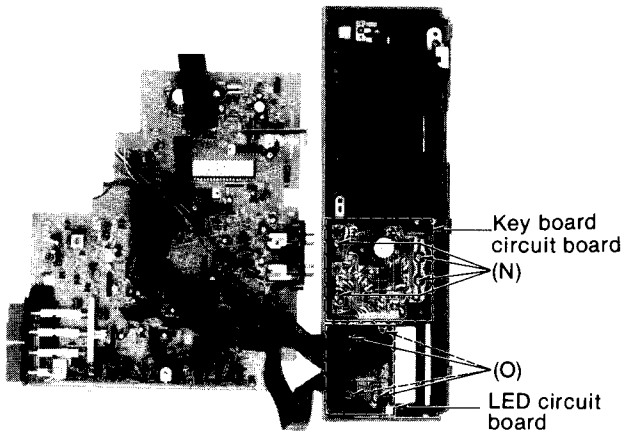


Fig. 4

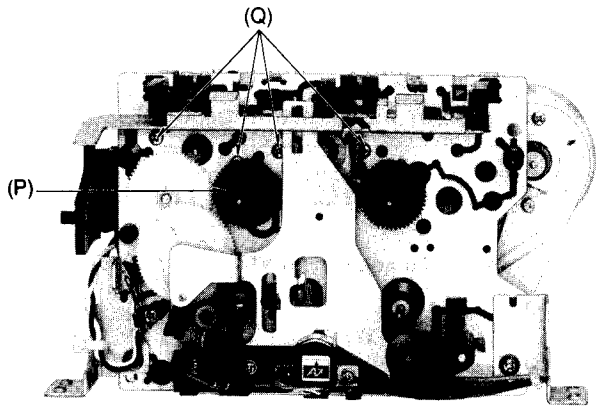


Fig. 5

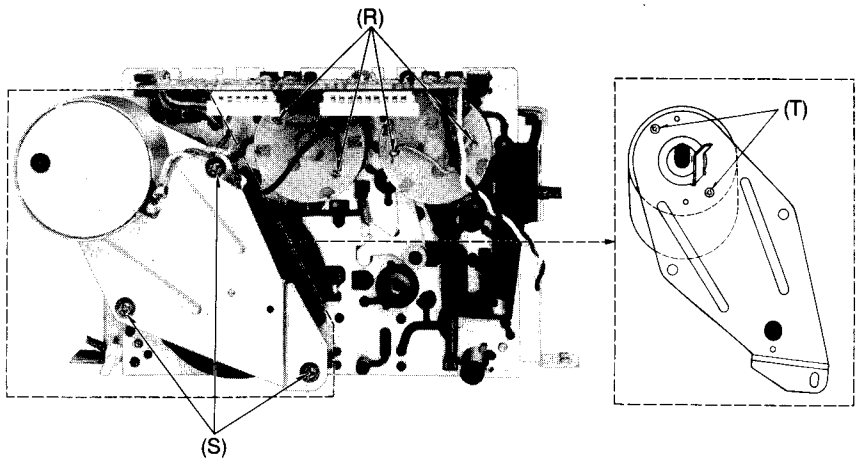


Fig. 6

Ref. No.	Procedure	To remove —.	Remove —.	Shown in fig —.
1	1	Case cover	• 4 screws .....(A) • 2 screws .....(B)	1 2
2	1 → 2	Mechanism unit	• How to remove flat cable .....(C) • Pull the connector .....(D) • 4 screws .....(E) • 2 screws .....(F) • Remove the counter belt .....(G) • Push the eject button.....(H)	3 3 2 3 3 1
3	3	Bottom cover assembly	• 4 screws .....(E) • 10 screws .....(I) (I') • Slide the bottom cover assembly in the direction of arrow (J) and remove it.	2 2 2
4	1 → 2 → 4	Front panel assembly	• 3 screws .....(I') • 2 screws .....(K)	2 3
5	1 → 2 → 3 → 5	Main circuit board and Dolby NR circuit board	• How to remove nylon rivet .....(L) • 2 screws .....(M)	2 3
6	1 → 2 → 4 → 6	Key board circuit board	• 4 screws .....(N)	4
7	1 → 2 → 4 → 7	LED circuit board	• 4 screws .....(O)	4
8	1 → 2 → 8	FF/REW motor and Driver motor	• Remove the reel table .....(P) • 4 screws .....(Q) • Unsolder the soldered portion of the FF/REW motor terminal and driver motor terminal .....(R)	5 5 6
9	1 → 2 → 8	Capstan motor	• 3 screws .....(S) • 2 screws .....(T)	6 6

* Serial No. Indication.
The serial number plate of this product is attached to the bottom cover (shown in Fig. 2).

MEASUREMENT AND ADJUSTMENT METHODS

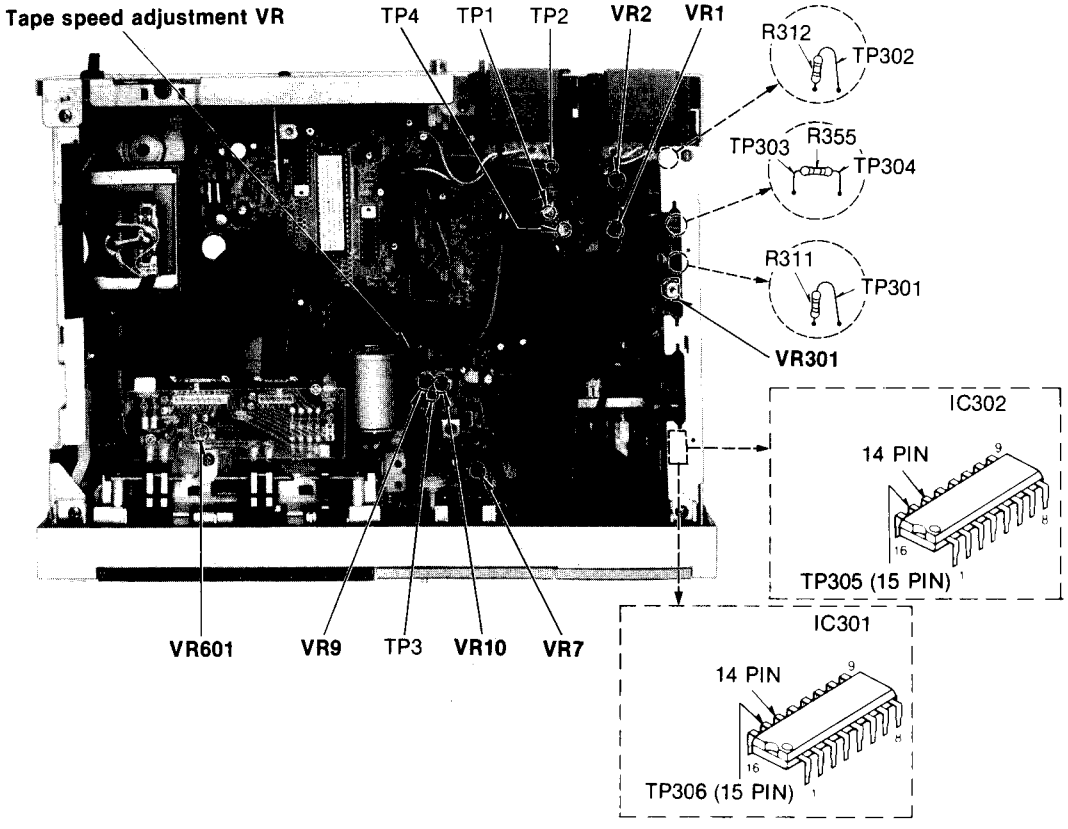


Fig. 7

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

Ⓐ Head azimuth adjustment

Condition:
- Playback mode
- Normal tape mode

Equipment:
- VTVM
- Oscilloscope
- Test tape (azimuth)...QZZCFM

L-CH/R-CH output balance adjustment

1. Make connections as shown in fig. 2.

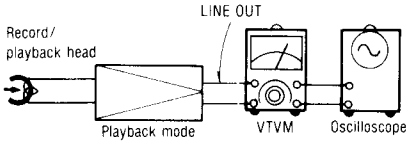


Fig. 2

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 point adjust as follows.
3. Turn screw (B) shown in fig. 3 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. 3 and 4.)

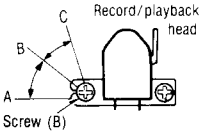


Fig. 3

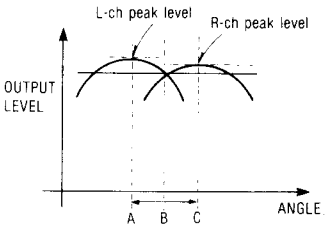


Fig. 4

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 lissajous waveform as illustrated in fig. 6 is obtained on the oscilloscope.

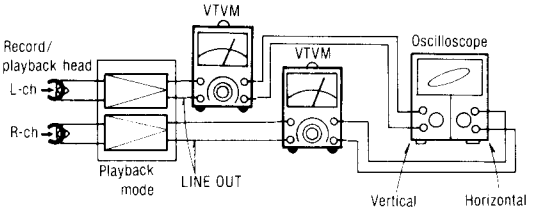


Fig. 5

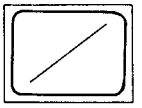


Fig. 6

Ⓑ 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 playback mode for 3.5 volts between the FF/REW motor terminals.
3. Run the QZZSRKCT takeup measurement tape in the playback mode and check that the torque is within quoted tolerances.

Standard value: 50±10gr-cm

Ⓒ Tape speed

Condition:
- Playback mode

Equipment:
- Digital frequency counter
- Test tape...QZZCWAT

Tape speed accuracy

1. Test equipment connection is shown in fig. 7.
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%

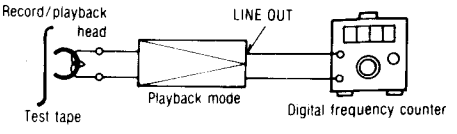


Fig. 7

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:

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

Standard value: Less than 1%

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

Ⓓ 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. 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. 8).

Playback frequency response (Forward • Reverse)

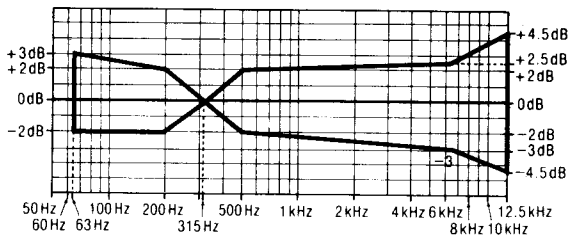


Fig. 8

Ⓔ 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 315Hz) and, using VTVM, measure the output level at test points [TP305 (L-CH), TP306 (R-CH)].
3. Make measurements for both channels.

Standard value: 0.4±0.02V [around 0.42V: at test points TP305 (L-CH) and TP306 (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. 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:

$$\text{Erase current (A)} = \frac{\text{Voltage across resistor R133}}{1\ (\Omega)}$$

Standard value: 155±15mA (Metal)

5. If the measured value is not within standard value, adjust VR7 (shown in fig. 1).

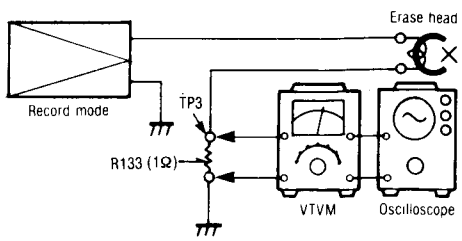


Fig. 9

G Overall frequency response

Condition:
- Record/playback mode
- Normal tape mode
- CrO_2 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 CrO_2
  ...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. 10.
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. 11).
   (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;

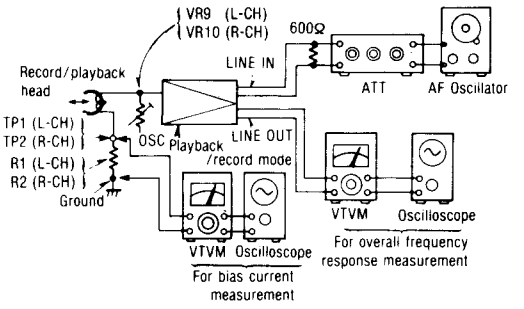


Fig. 10

Overall frequency response chart (Normal)

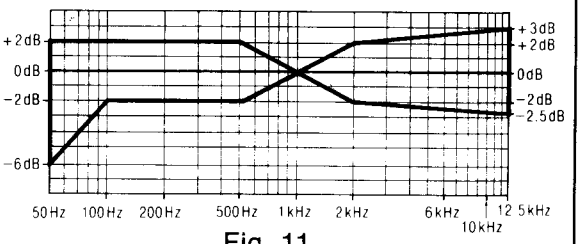


Fig. 11

Adjustment (A):
When the curve exceeds the overall specified frequency response chart (fig. 11) as shown in fig. 12.

1) Increase bias current by turning VR9 (L-CH) and VR10 (R-CH).
   (See fig. 1 on page 5.)
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. 11.)
3) If the curve still exceeds the specifications (fig. 11), increase bias current further and repeat steps 5 and 6.

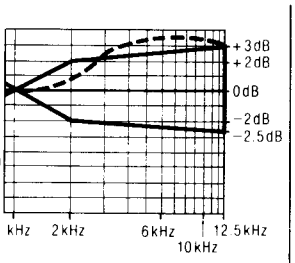


Fig. 12

Adjustment (B):
When the curve falls below the overall specified frequency response chart (fig. 11) as shown in fig. 13.

1) Reduce bias current by turning VR9 (L-CH) and VR10 (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. 11.)
3) If the curve still falls below the charted specifications (fig. 11), reduce bias current further and repeat steps 5 and 6.

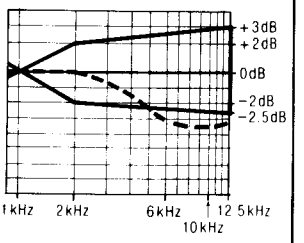


Fig. 13

7. Place UNIT into CrO_2 tape mode.
8. Change test tape to CrO_2 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 CrO_2 tapes (fig. 14).
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. 14).
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 (TP1 for L-CH, TP2 for R-CH) and calculate bias current by following formula:

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

Standard value:	around 200μA (Normal position) around 300μA (CrO_2 position) around 400μA (Metal position)

Overall frequency response chart (CrO_2, Metal)

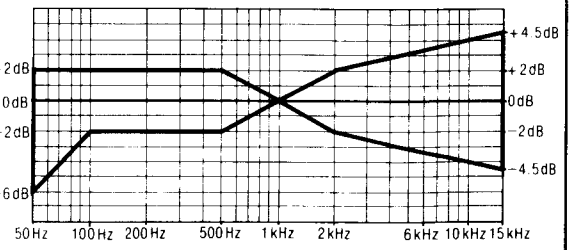


Fig. 14

⓱ Overall gain

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

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

1. Test equipment connection is shown in fig. 15.
2. Insert the normal reference blank tape (QZZCRA).
3. Place UNIT into record mode.
4. Supply a 1kHz signal through ATT (−24dB) from AF oscillator, to LINE IN.
5. Adjust ATT until monitor level at LINE OUT becomes 0.38V.
6. Playback recorded tape, and make sure that the output level at LINE OUT becomes 0.4V.
7. If measured value is not 0.4V±2dB, adjust it by using VR3 (L-CH) or VR4 (R-CH).
8. Repeat from step (2).

Standard value: 0.4V±2dB
[around 0.42V: at test points TP305 (L-CH) and TP306 (R-CH)]

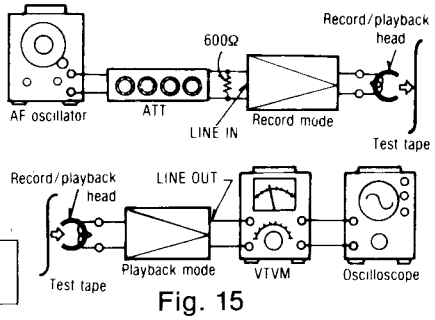


Fig. 15

⓲ Dolby NR circuit

Condition:
- Record mode
- Dolby NR switch...IN/OUT
- Input level control...MAX

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

1. Make connections as shown in fig. 16.
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 TP305 (L-CH) AND TP306 (R-CH) is 17.5mV.
5. The output level at pin 14 should be 0dB.
6. Set the NR select switch to IN, and make sure that the output signal level at pin 14 of IC301 (L-CH) and IC302 (R-CH) is +6dB±1.5dB.
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 IN and make sure that the output signal level at pin 14 of IC301 (L-CH) and IC302 (R-CH) is +8dB±1.5dB.

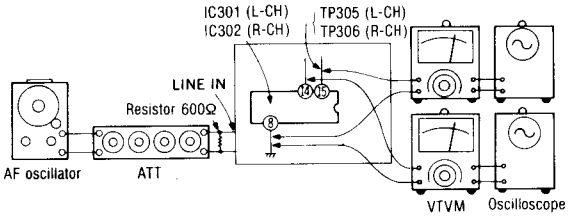


Fig. 16

⓳ 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. 17 and apply 1kHz −27dB 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 C27 (L-CH) and C28 (R-CH) is 300mV.
3. Read voltage on DC volt meter.

Reference value: 15±0.5mV

4. If measured value is not within reference, adjust VR301 (shown in fig. 1).

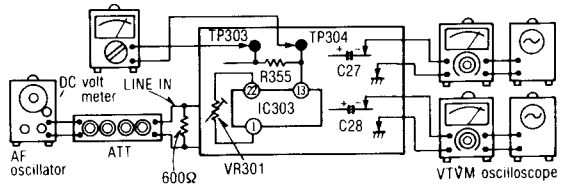


Fig. 17

Ⓚ 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 IC10, as shown in Fig. 18.
3. If the measured value is not within standard value, correct it by opening or closing the jumper junctions Ⓐ and Ⓑ as follows (See Fig. 19):
   After opening Ⓐ and closing Ⓑ, read the resulting value.
   - If it is less than 80Hz, close Ⓐ.
   - If more than 120Hz, close Ⓐ but open Ⓑ.
   - If closing Ⓐ and opening Ⓑ do not cause the reading to be less than 120Hz, open both Ⓐ and Ⓑ.

Standard value: 100^{+30}_{-20} Hz (pulse frequency)

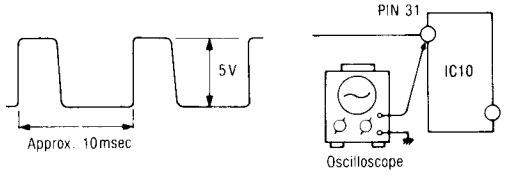


Fig. 18

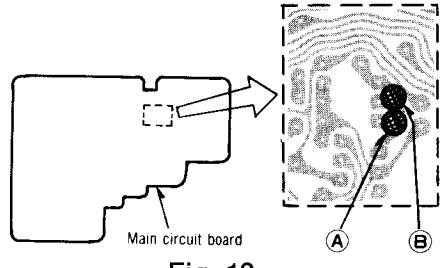


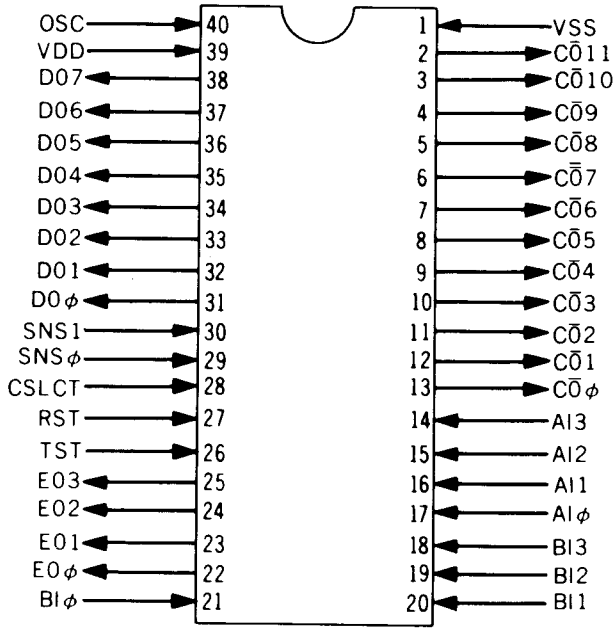
Fig. 19

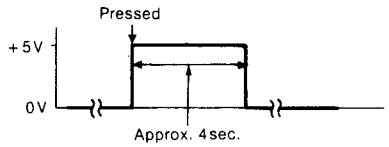
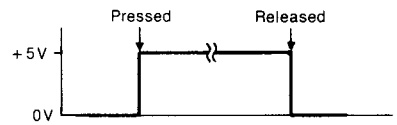
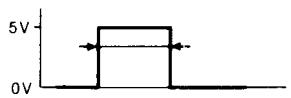
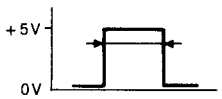
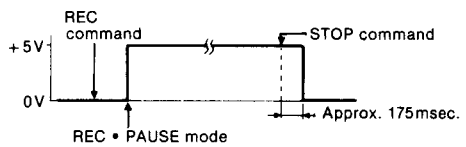
Ⓛ Level meter

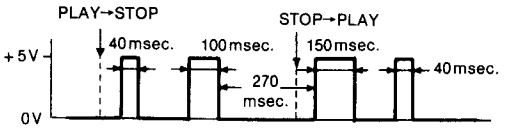
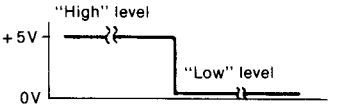
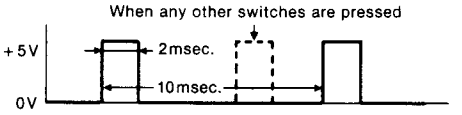
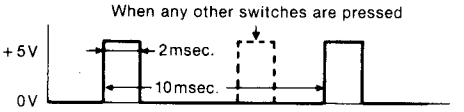
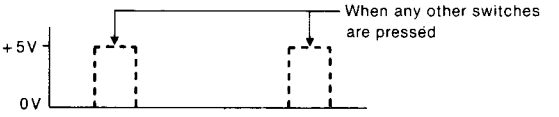
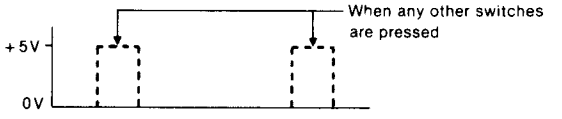
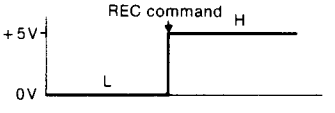
Check that the LEVEL meter LED "0" is lit when 0.4V ± 1.5dB output appears at the LINE OUT terminal.

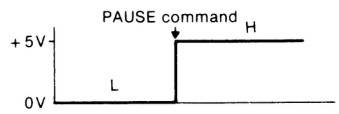
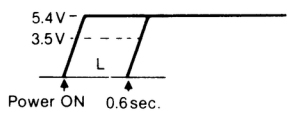
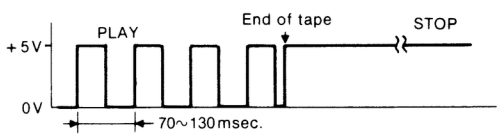
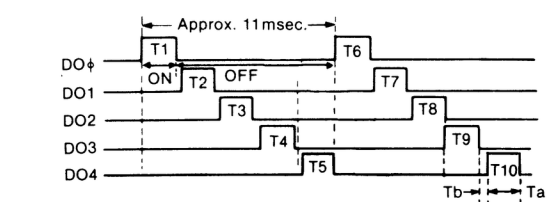
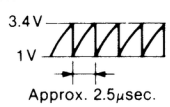
MICROCOMPUTER TERMINAL FUNCTION AND WAVEFORM

(BOTTOM VIEW)



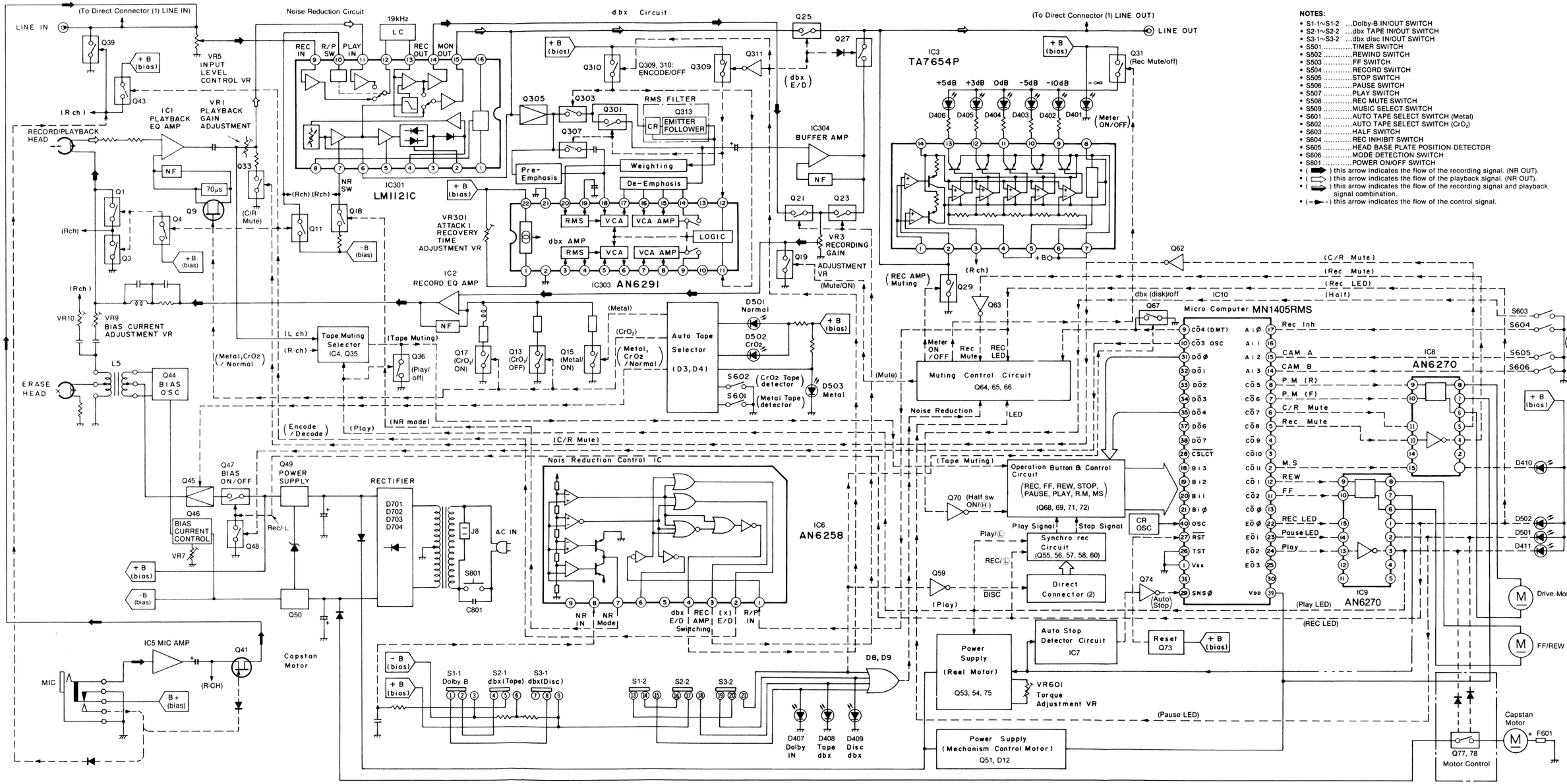
Terminal No.	Symbol	Name	Function/operation
1.	VSS	GND	
2.	CO11	Music select (M.S) command	• "High" level with music select at ON.
3.	CO10		• Non connection.
4.	CO9		• Non connection.
5.	CO8	REC MUTE	• "High" level pulse with REC MUTE button pressed during REC PLAY. 
6.	CO7	CUE/REVIEW MUTE	• "High" level pulse with CUE/REVIEW button pressed during PLAY. 
7.	CO6	Drive motor CCW rotation command	• "High" level pulse in each mode in operation STOP→PLAY, STOP→PAUSE, STOP→REC. 
8.	CO5	Drive motor CW rotation command	• "High" level pulse in each mode in operation PLAY→STOP, PAUSE→STOP, REC→STOP. 
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: { PLAY / FF

Terminal No.	Symbol	Name	Function/operation
12.	CO1	FF/REW motor rotation select (FF/REW motor CW rotation command)	• "High" level during REW.
13.	COϕ		• Non connection.
14.	AI3	Reading of input switch state CAM B (S606)	• Input in switching-over from STOP to PLAY. 
15.	AI2	Reading of input switch state CAM A (S605)	
16.	AI1	Connection to + B (bias)	
17.	AIϕ	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 REC MUTE	• Waveform when the cassette lid is closed with no tape loading. 
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 PAUSE • FF	• Waveform when the cassette lid is closed with no tape loading. 
21.	BIϕ	Reading of input switch state STOP • REW	• 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. 

Terminal No.	Symbol	Name	Function/operation
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		• Non connection.
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	
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.	V_{DD}	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 3 in measuring the computer's velocity; Approx. 125Hz in STOP condition. 

RS-6 RS-6

BLOCK DIAGRAM



NOTES:

- S1-1~S1-2 ....Dolby-B IN/OUT SWITCH
- S2-1~S2-2 ....dbx TAPE IN/OUT SWITCH
- S3-1~S3-2 ....dbx disc IN/OUT SWITCH
- S501 .....TIMER SWITCH
- S502 .....REWIND SWITCH
- S503 .....FF SWITCH
- S504 .....RECORD SWITCH
- S505 .....STOP SWITCH
- S506 .....PAUSE SWITCH
- S507 .....PLAY SWITCH
- S508 .....REC MUTE SWITCH
- S509 .....MUSIC SELECT SWITCH
- S601 .....AUTO TAPE SELECT SWITCH (Metal)
- S602 .....AUTO TAPE SELECT SWITCH (CrO_2)
- S603 .....HALF SWITCH
- S604 .....REC INHIBIT SWITCH
- S605 .....HEAD BASE PLATE POSITION DETECTOR
- S606 .....MODE DETECTION SWITCH
- S801 .....POWER ON/OFF SWITCH
- ( ) 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.

SCHEMATIC DIAGRAM

I MAIN CIRCUIT SECTION

II DOLBY NR CIRCUIT SECTION

III LED CIRCUIT SECTION

IV MECHANISM CIRCUIT SECTION

V KEYBOARD CIRCUIT SECTION

VI DIRECT CONNECTOR (A) CIRCUIT SECTION

VII DIRECT CONNECTOR (B) CIRCUIT SECTION

VIII POWER TRANSFORMER CIRCUIT SECTION

IC10 MN1405RMS

IC10 MN1405RMR

CONNECTION POINT (A)

CONNECTION POINT (B)

* For United Kingdom only.

* For United Kingdom.

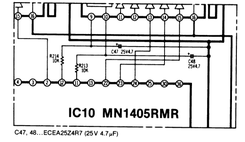
* For all European areas except United Kingdom.

CAUTION (1)

Precautions when servicing the microcomputer (IC10)

- This product includes a microcomputer (IC10), either an MN1405RMR or MN1405RMS.
- The product using the MN1405RMR must have C47 and C48 on the foil (back) side of the PC board.
  The following label is placed on the MN1405RMR microcomputer.

  [MN1405RMR]—[MN1405RMS] QQC2073
  MN1405RMR is used in this unit. When you use a MN1405RMS, remove two of 4.7μF 25V (C47 and C48) on the foil side of the P.C.B.
- The product using the MN1405RMS does not need capacitors on the foil (back) side.
- When servicing the product which employs an MN1405RMR, remove the C47 and C48 capacitors as shown fig. 1, since only the MN1405RMS is supplied.



C47, 48...ECEA25Z4R7 (25V 4.7μF)

Fig. 1

NOTES:

- S1-1~S1-2 ...Dolby-B IN/OUT switch (shown in OUT position).
- S2-1~S2-2 ...dbx tape IN/OUT switch (shown in OUT position).
- S3-1~S3-2 ...dbx disc IN/OUT switch (shown in OUT position).
- S501 .....Timer switch (shown in 1 position).
  (1...TIMER PLAY, 2...OFF, 3...TIMER REC)
- S502 .....Rewind switch (shown in OFF position).
- S503 .....FF switch (shown in OFF position).
- S504 .....Record switch (shown in OFF position).
- S505 .....Stop switch (shown in OFF position).
- S506 .....Pause switch (shown in OFF position).
- S507 .....Play switch (shown in OFF position).
- S508 .....REC Mute switch (shown in OFF position).
- S509 .....Music select switch (shown in OFF position).
- S601 .....Auto tape select switch (for Metal tape).
- S602 .....Auto tape select switch (for CrO_2 tape).
- S603 .....Half switch (shown in OFF position).
- S604 .....REC inhibit switch (shown in OFF position).
- S605 .....Head base plate position detector (shown in OFF position).
- S606 .....Mode detection switch (shown in OFF position).
- S801 .....Power ON/OFF switch (shown in OFF position).
- VR1, 2 .....Playback gain adjustment VR.
- VR3, 4 .....Overall gain adjustment VR.
- VR5, 6 .....Input level controls.
- VR7 .....Erase current adjustment VR.
- VR9, 10.....Bias current adjustment VR.
- VR301 .....Attack recoverly time adjustment VR.
- VR601 .....Takeup torque adjustment VR.
- Point (A), (B)...Input scanning time adjustment points.
- L1, 2 .....Bias trap adjustment coil.
- L5 .....Bias Oscillation coil.
- L301, 302 .....MPX coil.
- Resistance are in ohms (Ω), 1/4 watt unless specified otherwise.
  1K = 1,000(Ω), 1M = 1,000k(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 circuity 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.
  IN .....Voltage values at Dolby NR IN mode.
  ALL .....Voltage values at all modes.
  For measurement use VTVM.
- ( ) indicates B+ (bias).
- ( ) indicates B− (bias).
- ( ) indicates the flow of the playback signal. (NR out).
- ( ) indicates the flow of the recording signal. (NR out).
- 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 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] ← Sypply 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 * Input level controls...MAX

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)

IC1

		IN	TAPE	DISC
1	−0.26V (−0.27V)	−0.26V	−0.26V	−0.27V
2	0.02V (0V)	0.02V	0.02V	0.01V
3	0.02V (0V)	0.02V	0.02V	0.01V
4	−7.9V	−7.7V	−7.9V	−7.8V
5	0.02V (0V)	0.02V	0.02V	0.01V
6	0.02V (0V)	0.02V	0.02V	0.01V
7	−0.26V (−0.27V)	−0.26V	−0.26V	−0.27V
8	7.6V (7.3V)	7.4V	7.5V	7.4V

IC6

		IN	TAPE	DISC
1	9.0V (6.6V)		9.0V	
2	−10.6V (9.8V)	−10.6V	−10.6V	9.9V
3	10.0V (9.9V)	9.9V	10.1V	9.9V
4	9.2V	9.1V	−10.5V	−10.5V
5	−10.6V (−10.7V)		−10.7V	
6	10.0V (9.9V)	9.9V	9.9V	−10.6V
7	−10.6V (−10.7V)	9.1V	−10.6V	−10.6V
8	−0.04V (−0.11V)	−9.4V	4.2V	8.8V
9	10.0V (9.9V)	9.9V	10.0V	10.0V

IC301

		IN	TAPE	DISC
1	−7.9V (−7.8V)	−7.6V	−7.9V	−7.7V
2		−0.17V		
3		−0.02V		
4		−0.02V		
5	0.01V	0.02V	0.01V	0.01V
6		0V		
7	−3.2V	−7.7V	−3.2V	−3.2V
8		0V		
9		0V		
10	−7.9V (6.6V)	−7.6V	−7.9V	6.6V
11		0V		
12	0.05V (0.04V)	0.05V	0.05V	0.04V
13	0.05V (0.04V)	0.05V	0.05V	0.04V
14	−0.10V (−0.09V)	−0.11V	−0.10V	−0.09V
15	−0.10V (0.12V)	−0.10V	−0.10V	0.12V
16	7.5V (7.2V)	7.3V	7.4V	7.3V

IC302

		IN	TAPE	DISC
1	−7.9V (−7.8V)	−7.6V	−7.9V	−7.7V
2		−0.18V		
3		−0.02V		
4		−0.02V		
5	0.01V	0.06V	0.01V	0.01V
6		0V		
7	−3.2V	−7.7V	−3.2V	−3.2V
8		0V		
9	0V (0.01V)		0V	
10	−7.9V (6.6V)	−7.7V	−7.9V	6.6V
11		0V		
12	0.04V (0.06V)	0.04V	0.04V	0.06V
13	0.03V (0.06V)	0.03V	0.03V	0.06V
14	−0.05V (−0.13V)	−0.08V	−0.05V	−0.03V
15	−0.05V (0.15V)	−0.09V	−0.05V	−0.15V
16	7.5V (7.2V)	7.3V	7.4V	7.3V

IC303

		IN	TAPE	DISC
1	4.8V	4.8V	4.6V	4.6V
2	0V			
3	0.87V			
4	0.47V (0.41V)	0.44V	0.29V	0.27V
5	0.61V			
6	0.61V			
7	1.35V			
8	1.35V			
9	0V	0V	1.33V	1.33V
10	1.35V			
11	−0.17V	−0.17V	4.6V	4.6V
12	4.8V	4.8V	−0.26V	−0.26V
13	4.8V	4.8V	4.6V	4.6V
14	0V	0V	1.33V	1.33V
15	1.35V			
16	1.35V			
17	0.61V			
18	0.61V			
19	0.47V (0.44V)	0.44V	0.27V	0.24V
20	0.87V			
21	0V			
22	4.8V	4.8V	4.6V	4.6V

Q2

		IN	TAPE	DISC
B	0.69V (−18.6V)	0.69V	0.69V	0.1V
C	0.02V (0V)	0.02V	0.02V	0V
E	0.01V (−2.8V)	0.01V		

Q23

		IN	TAPE	DISC
D	0V	0V	−0.09V	−0.14V
G	8.7V (8.6V)	8.6V	−0.58V	8.6V
S	0.07V (0.11V)	0.07V	−0.09V	0.07V

Q24

		IN	TAPE	DISC
D	0V	0V	−0.09V	−0.14V
G	8.7V (8.6V)	8.6V	−0.58V	8.6V
S	0.07V (0.1V)	0.07V	−0.09V	0.07V

Q25

		IN	TAPE	DISC
D	−0.1V (0.12V)	−0.11V	−0.1V	0.12V
G	0.46V (0.67V)	0.4V	−9.1V	−9.1V
S	0.1V (0.12V)	−0.11V	−0.09V	−0.14V

Q26

		IN	TAPE	DISC
D	−0.05V (0.15V)	−0.08V	−0.05V	0.15V
G	0.5V (0.7V)	0.47V	−9.2V	−9.2V
S	−0.05V (0.15V)	−0.08V	−0.09V	−0.14V

Q27

		IN	TAPE	DISC
D	0V	0V	−0.09V	−0.14V
G	8.0V	7.9V	−0.57V	−0.62V
S	−0.05V (0.15V)	−0.08V	−0.09V	−0.14V

Q28

		IN	TAPE	DISC
D	0V	0V	−0.09V	−0.14V
G	7.9V (8.0V)	7.9V	−0.57V	−0.62V
S	−0.08V (0.15V)	−0.08V	−0.09V	−0.14V

Q66

		IN	TAPE	DISC
B	10.0V (9.9V)	9.4V		
C	0V	0.02V		
E	9.8V (9.7V)	9.8V		

Q302

		IN	TAPE	DISC
B	−0.17V	−0.17V	0.02V	0.02V
C	1.16V	1.16V	−0.62V	−0.62V
E	−0.62V			

Q304

		IN	TAPE	DISC
B	1.79V	1.79V	−0.26V	−0.26V
C	1.17V (1.16V)	1.17V		
E	1.16V	1.16V	−0.62V	−0.62V

Q306

		IN	TAPE	DISC
B	0V			
C	4.8V	4.8V	4.6V	4.6V
E	−0.62V			

Q307

		IN	TAPE	DISC
B	0.03V	0.03V	−0.26V	−0.26V
C	−0.62V			
E	−0.62V	−0.62V	−0.03V	−0.03V

Q308

		IN	TAPE	DISC
B	0.02V	0.02V	−0.26V	−0.26V
C	−0.62V			
E	−0.62V	−0.62V	−0.03V	−0.03V

Q311

		IN	TAPE	DISC
B	0.66V	0.66V	−4V	−4V
C	0.04V	0.04V	9.9V	9.9V
E	0V			

Q314

		IN	TAPE	DISC
B	2.7V	2.7V	2.6V	2.6V
C	4.8V	4.8V	4.6V	4.6V
E	2.1V	2.1V	2.0V	2.0V

ELECTRICAL PARTS LIST

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.

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

RESISTORS

Ref. No.	Part No.
R 1, 2	ERD25TJ100
R 3, 4	ERDS2TJ472
R 5	ERDS2TJ561
R 6	ERDS2TJ563
R 7	ERDS2TJ123
R 8, 9	ERDS2TJ103
R 10	ERDS2TJ682
R 11, 12	ERDS2TJ101
R 13, 14	ERDS2TJ102
R 15, 16	ERDS2TJ181
R 17, 18	ERDS2TJ682
R 19, 20	ERDS2TJ562
R 21, 22	ERDS2TJ334
R 23	ERD25TJ104
R 24	ERDS2TJ104
R 25, 26	ERDS2TJ155
R 27	ERDS2TJ151
R 29	ERDS2TJ274
R 30	ERDS2TJ103
R 31	ERDS2TJ223
R 33, 34	ERDS2TJ123
R 35, 36	ERDS2TJ272
R 37, 38	ERDS2TJ103
R 39, 40	ERDS2TJ332
R 41, 42	ERDS2TJ272
R 43, 44	ERDS2TJ390
R 45	ERDS2TJ563
R 46	ERDS2TJ333
R 47	ERDS2TJ154
R 48	ERDS2TJ104
R 49	ERDS2TJ103
R 50	ERDS2TJ332
R 51, 52	ERDS2TJ103
R 53	ERDS2TJ122
R 55, 56	ERDS2TJ152
R 57, 58	ERDS2TJ682
R 59, 60, 61, 62, 63, 64, 65, 66	ERDS2TJ155
R 67, 68	ERDS2TJ103
R 69, 70	ERDS2TJ222
R 71, 72	ERDS2TJ102
R 73, 74	ERDS2TJ474
R 75, 76	ERDS2TJ104
R 77	ERDS2TJ153
R 78	ERDS2TJ563
R 79	ERDS2TJ124
R 80, 81	ERDS2TJ563
R 82, 83, 84, 85, 86	ERDS2TJ102
R 87, 88	ERDS2TJ472
R 89	ERDS2TJ272
R 91, 92	ERDS2TJ181
R 93	ERDS2TJ103
R 94, 95	ERDS2TJ183
R 96	ERDS2TJ683
R 97	ERDS2TJ272
R 98	ERDS2TJ101
R 99, 100	ERDS2TJ103
R 101	ERDS2TJ104
R 102	ERDS2TJ124
R 103	ERDS2TJ102
R 104	ERDS2TJ184
R 105	ERDS2TJ104
R 106, 107	ERDS2TJ103
R 108	ERDS2TJ563
R 109, 110	ERDS2TJ474
R 111, 112	ERDS2TJ153
R 113, 114	ERDS2TJ822
R 115	ERDS2TJ332
R 116	ERDS2TJ155
R 117	ERDS2TJ103
R 118	ERDS2TJ102
R 119	ERDS2TJ272
R 120	ERDS2TJ223
R 121	ERDS2TJ102
R 123, 124	ERDS2TJ563
R 125	ERDS2TJ103
R 126, 127	ERDS2TJ472
R 128	ERDS2TJ682
R 129	ERDS2TJ222
R 130, 131	ERDS2TJ561
R 132	ERDS2TJ821
R 133	ERD25TJ1R0
R 134	ERDS2TJ100
R 135, 136	ERDS2TJ562
R 137	ERDS2TJ100
R 138	ERG12SJ100
R 139, 140	ERDS2TJ222
R 141	ERDS2TJ562
R 142	ERDS2TJ681
R 143	ERDS2TJ103
R 144, 145	ERDS2TJ563
R 146, 147	ERG1SJ560
R 148	ERD2FCJ4R7
R 149	ERDS2TJ681
R 150	ERDS2TJ821
R 151	ERD2FCJ4R7
R 152	ERX1SJ8R2
R 153	ERDS2TJ102
R 154	ERDS2TJ101
R 155	ERDS2TJ153
R 156	ERDS2TJ123
R 157	ERD2FCG180
R 158	ERDS2TJ100
R 159	ERDS2TJ103
R 160	ERDS2TJ391
R 161	ERDS2TJ101
R 162	ERDS2TJ103
R 163	ERDS2TJ332
R 164	ERDS2TJ391
R 165	ERDS2TJ272
R 166	ERDS2TJ103
R 167	ERDS2TJ104
R 168	ERDS2TJ333
R 169, 170	ERDS2TJ334
R 171	ERDS2TJ103
R 172	ERDS2TJ473
R 173	ERDS2TJ223
R 174	ERDS2TJ102
R 175, 176	ERDS2TJ561
R 177, 178	ERDS2TJ223
R 179	ERDS2TJ472
R 180	ERDS2TJ223
R 181	ERDS2TJ103
R 182	ERDS2TJ472
R 183, 184	ERDS2TJ223
R 185, 186	ERDS2TJ103
R 187, 188	ERDS2TJ562
R 189, 190	ERDS2TJ393
R 191, 192	ERDS2TJ223
R 193	ERDS2TJ473
R 194, 195	ERDS2TJ223
R 196	ERDS2TJ562
R 197	ERDS2TJ183
R 198	ERDS2TJ103
R 199	ERDS2TJ393
R 200	ERDS2TJ562
R 201	ERDS2TJ103
R 202	ERDS2TJ102
R 203, 204	ERDS2TJ223
R 205	ERDS2TJ274
R 206	ERDS2TJ103
R 207, 208	ERDS2TJ102
R 210	ERDS2TJ222
R 211	ERDS2TJ103
R 212 [B]	ERDS2TJ122
[For United Kingdom.]	
R 213, 214	ERDS2TJ103
R 301, 302	ERDS2TJ473
R 303, 304	ERDS2TJ332
R 305, 306	ERDS2TJ274
R 307	ERD25TJ163
R 308	ERDS2TJ163
R 309, 310	ERDS2TJ122
R 311, 312	ERD25TJ472
R 313, 314, 315, 316, 317, 318	ERDS2TJ223
R 319, 320	ERDS2TJ822
R 321, 322	ERDS2TJ333
R 323, 324	ERDS2TJ154
R 325, 326	ERDS2TJ472
R 327, 328, 329, 330	ERDS2TJ153
R 331, 332	ERDS2TJ332
R 333, 334	ERDS2TJ153
R 335	ERDS2TJ472
R 337, 338	ERDS2TJ103
R 339, 340	ERDS2TJ102
R 341, 342	ERDS2TJ151
R 343, 344	ERDS2TJ472
R 345, 346	ERDS2TJ153
R 347, 348	ERDS2TJ222
R 349, 350	ERDS2TJ104
R 351, 352	ERO25VKG1051
R 353, 354	ERDS2TJ102
R 355	ERD25FJ102
R 356	ERDS2TJ103
R 357	ERDS2TJ123
R 358	ERDS2TJ473
R 359, 360	ERDS2TJ181
R 361, 362	ERDS2TJ473
R 363	ERDS2TJ223
R 365, 366	ERDS2TJ753
R 367, 368	ERDS2TJ244
R 501	ERDS2TJ821
R 502	ERDS2TJ102
R 503	ERDS2TJ562
R 601	ERD25TJ181

VARIABLE RESISTORS

VR 1, 2	QVNB3A00B223
VR 3, 4	QVNB3A00B103
VR 5, 6	QVBP1P05CA24
VR 7	QVNB3A00B103
VR 9, 10	QVNB3A00B474
VR 301	EVNM0AA00B23
VR 601	EVNK4AA00B22

CAPACITORS

C 3, 4	ECCD1H470J
C 5, 6	ECQV05103JZ
C 7, 8	ECEA1AS101
C 9, 10	ECEA1HS010
C 11, 12	ECCD1H121J
C 13, 14	ECKD1H561K
C 15, 16	ECEA50ZR1
C 21, 22	ECQM1H472JZ
C 23, 24	ECQV05273JZ
C 25	ECEA1AS470
C 27, 28, 29, 30, 31, 32	ECEA1CS100
C 33, 34	ECEA1ES4R7
C 35	ECEA1AS220
C 36	ECEA1HS010
C 37	ECQV05104JZ
C 38, 39	ECEA1CS100
C 40	ECQV05474JZ
C 41, 42	ECEA50MR47
C 43	ECKD1H102K
C 44	ECEA1ES4R7
C 45	ECKD1H102K
C 46	ECEA1HS010
C 49	ECEA1ES4R7
C 50	ECQV05153JZ
C 51	ECQM1H822JZ
C 52	ECEA1ES220
C 53, 54	ECCD1H470J
C 55	ECEA1AS101
C 56	ECEA1AS471
C 57	ECEA1CS331
C 58	ECEA1CS101
C 59, 60	ECKD1H102K
C 61	ECEA1CSS222
C 62	ECEA1CS222
C 63	ECEA1CS472
C 64	ECFTD223KXY
C 66	ECEA1HS010
C 67	ECEA1ES4R7
C 68	ECEA1HS010
C 69	ECEA1CS471
C 70	ECEA1HS2R2
C 71	ECEA1CS100
C 72	ECEA1CS101
C 73	ECFTD223KXY
C 74	ECCD1H331J
C 75	ECEA1HS010
C 76	ECEA1CS100
C 77, 78	ECEA1HS010
C 79	ECEA1CS330
C 80	ECEA1HS010
C 81	ECEA1HN010
C 82	ECQP1183JZ
C 301, 302, 303, 304	ECEA50MR47
C 305, 306	ECQM1H392JZ
C 307, 308	ECEA1CS100
C 309, 310	ECQM1H472JZ
C 311, 312	ECQV05473JZ
C 313, 314	ECEA50MR33
C 315, 316	ECQV05104JZ
C 317, 318	ECEA1CS100
C 319, 320	ECQV05333JZ
C 321, 322	ECEA50MR47
C 323, 324, 325, 326	ECQV05104JZ
C 327, 328	ECEA1CS100
C 329, 330, 331, 332	ECQM1H332JZ
C 333, 334	ECCD1H331J
C 335, 336	ECEA50MR33
C 337, 338	ECEA50MR68
C 339, 340	ECCD1H471J
C 341, 342	ECQV05223JZ
C 343, 344	ECEA16M10
C 345, 346	ECEA1AS470
C 347, 348	ECQV05333JZ
C 349, 350	ECQM1H472JZ
C 351, 352	ECCD1H391J
C 353, 354	ECQV05223JZ
C 355, 356, 357, 358	ECEA1CS100
C 359	ECEA0JS331
C 360	ECEA1ES4R7
C 361, 362	ECCD1H560J
C 363, 364	ECEA1ES4R7
C 801 ⚠	ECQU2A103MF

COMBINATION PARTS

Z 1, 2	EXRP331K104
Z 3	EXRP470K683
Z 4	EXRP220K124
Z 5	EXRP221K334
Z 6	EXBEQ4392K
Z 7	EXBEQ5562K
Z 301, 302	EXRP101K153

TRANSISTORS

Q 1, 2, 3	2SD1011
Q 4	2SA921
Q 5, 6	2SD1468
Q 7	2SA1115
Q 9, 10	2SK381C
Q 11, 12, 13, 14, 15, 16	2SC2603
Q 17, 18	2SA1115
Q 19, 20	2SD1468
Q 21, 22	2SK381C
Q 23, 24	2SJ40
Q 25, 26	2SK381C
Q 27, 28	2SJ40
Q 29, 30	2SD1468
Q 31	2SA1115
Q 33, 34, 35, 36, 37, 38	2SC2603
Q 39, 40	2SD636
Q 41, 42	2SK381C
Q 43	2SA1115
Q 44, 45	2SD471K
Q 46	2SA952L
Q 47	2SB641
Q 48	2SC2603
Q 49	2SD1265O
Q 50	2SB744
Q 51	2SD1275
Q 52	2SC2603
Q 53	2SA1115
Q 54	UN4211TA
Q 55, 56	2SC2603
Q 57, 58, 59	UN4211TA
Q 60, 61	2SC2603
Q 62	2SA1115
Q 63	DTA124F
Q 64	2SA1115
Q 65	2SC2603
Q 66	2SA1115
Q 67	2SC2603
Q 68, 69	2SA1115
Q 70	2SC2603
Q 71, 72	2SA1115
Q 73, 74	UN4211TA
Q 75	2SD471K
Q 76	2SA1115
Q 77 [B]	DTA114Y
[For United Kingdom.]	
Q 78 [B]	2SD965
[For United Kingdom.]	
Q 301, 302, 303, 304, 305, 306, 307, 308	2SC2603
Q 309, 310	2SB894R
Q 311	2SC2603
Q 313, 314	2SC2603

DIODES & RECTIFIERS

D 1	1SS133
D 2	MTZ6R2B
D 3, 4	MC921
D 5, 6	1SS133
D 8	1SS133
D 9	MC921
D 10	MTZ22C
D 11	SM112
D 12	MTZ7R5C
D 13	1SS133
D 14	MC921
D 15, 16	1SS133
D 17	MC911
D 18, 19, 20	1SS133
D 21, 22	MC911
D 24	MTZ5R1B
D 25, 26, 27, 28, 29, 30, 31	1SS133
D 33 [D]	SM112
[For all European areas except United Kingdom.]	
D 34, 35, 36, 37	1SS133
D 38 [B]	MC911
[For United Kingdom.]	
D 301	MC911
D 303	MTZ5R1B
D 401, 402, 403, 404, 405, 406	SLV31VC
D 407, 408	SLV31MT
D 409	SLV31VC
D 410, 411	SLV31MT
D 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513	1SS133
D 701, 702, 703, 704 ⚠	SM112

INTEGRATED CIRCUITS

IC 1	M5220L
IC 2	M5218L
IC 3	TA7654P
IC 4, 5	M5218L
IC 6	AN6258
IC 7	M5218L
IC 8, 9	AN6270
IC 10	MN1405RMS
IC 301, 302	LM1121C
IC 303	AN6291
IC 304	M5218L

I.C PROTECTOR

ICP 601	QRUF10WH

Ref. No.	Part No.	Part Name & Description

COILS

L 1, 2	QLQX0343KWA	Bias Trap Coil
L 3, 4	QLQX2722D	Peaking Coil
L 5	QLB0198	Bias Oscillation Coil
L 6, 7	ELEH101KA	Choke Coil
L 301, 302	QLM9Z9K	M.P.X. Coil
L 601, 602, 603, 604	ELEH101KA	Choke Coil

TRANSFORMER

T 1 [D] ⚠	QLPD80ELC	Power Transformer
[For all European areas except United Kingdom.]		
[B] ⚠	QLPD85ELC	Power Transformer
[For United Kingdom.]		

FUSE

F 1 [D] ⚠	XBAQ0010	Fuse (T 1.6A)
[For all European areas except United Kingdom.]		

SWITCHES

S 1	QSWX415	Push Switch (NR Select)
S 501	QSS1305H	Slide Switch
S 502, 503	SSG13	Key Board Switch (REW/F.F.)
S 504	QSW1124	Key Board Switch with D502 (Record)
S 505	SSG13	Key Board Switch (Stop)
S 506	QSW1126	Key Board Switch with D506 (Pause)
S 507	SSG13	Key Board Switch (Play)
S 508, 509	SSG13	Key Board Switch (Rec Mute/Music Select)
S 601, 602, 603, 604	QSB0296	Leaf Switch (Metal tape/CrO_2 Tape/Half/Rec Inhibit)
S 605, 606	QSB0295C	Leaf Switch (Forward•Reverse Detection/Mode)
S 801 ⚠	QSW1127	Push Switch (Power ON/OFF)

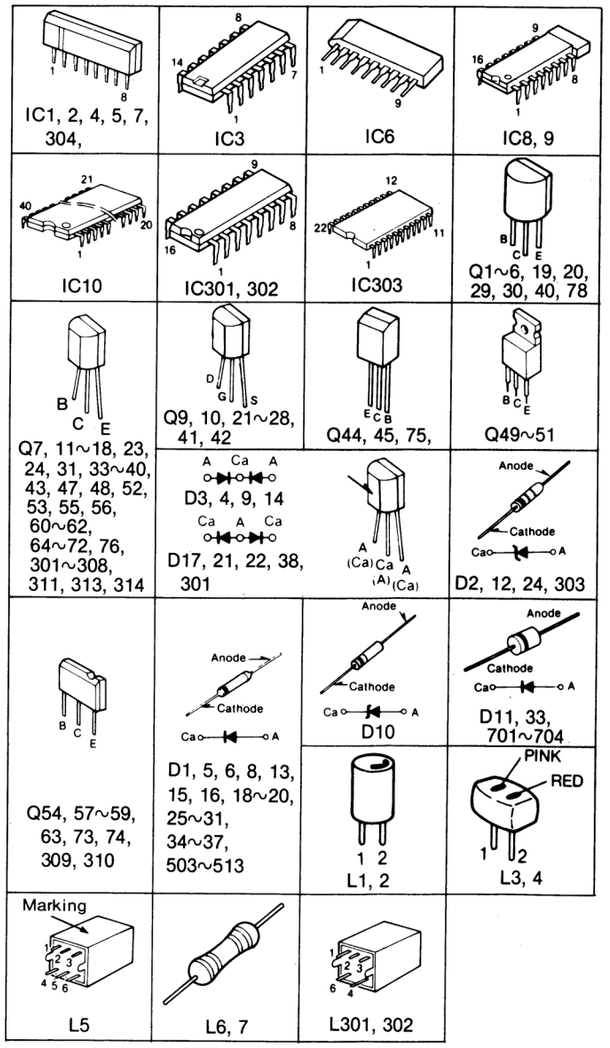
JACKS

J 1, 2, 3, 4	QEJ5030C	Jack Board (LINE IN/OUT)
J 5	QJA0258	Microphone Jack
J 6, 7	SJS9607	Direct Connector
J 8 [D] ⚠	SJS9225	AC Outlet
[For all European areas except United Kingdom.]		
[B] ⚠	SJS9227	AC Outlet
[For United Kingdom.]		

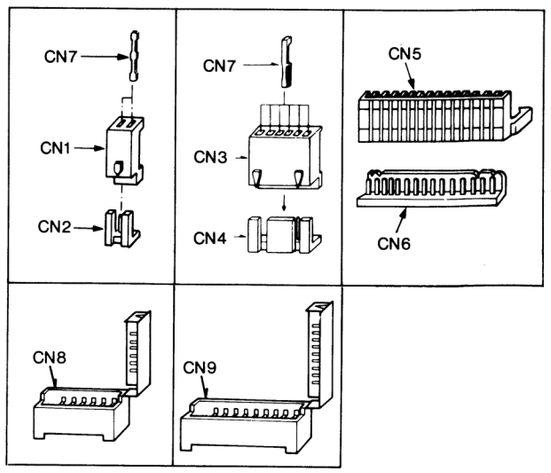
CONNECTORS

CN 1	QJS1920TN	2 Pin Socket
CN 2	QJP1920TN	2 Pin Post
CN 3	QJS1922TN	6 Pin Socket
CN 4	QJP1922TN	6 Pin Post
CN 5	QJS1925TNL	15 Pin Socket (L-Type)
CN 6	QJP1925TN	15 Pin Post
CN 7	QJT1054	Contact
CN 8	QJS1994S	Jumper Socket (6 Pin, Type-L)
CN 9	QJS2001S	Jumper Socket (9 Pin, Type-L)

TERMINATIONS



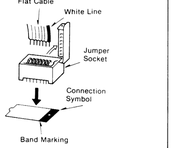
CONNECTORS



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:
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

NOTES:
D.....For all European areas except United Kingdom.
B.....For United Kingdom.

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.

VII DIRECT CONNECTOR (B) CIRCUIT BOARD

II DOLBY NR CIRCUIT BOARD

I MAIN CIRCUIT BOARD

CONNECTION POINT (A)

CONNECTION POINT (B)

V DIRECT CONNECTOR (A) CIRCUIT BOARD

RECORD/ PLAYBACK HEAD

ERASE HEAD

III LED CIRCUIT BOARD

IV KEY BOARD CIRCUIT

* For United Kingdom.

* Refer to caution (1) on page 20.

CAPSTAN MOTOR

LUG TERMINAL

FF/REW MOTOR

DRIVE MOTOR

VI MECHANISM CIRCUIT BOARD

S605, 606: MODE SWITCH

T1: AC POWER TRANSFORMER

J8: AC OUTLET

C801: SPARK KILLER

S801: POWER ON/OFF SWITCH

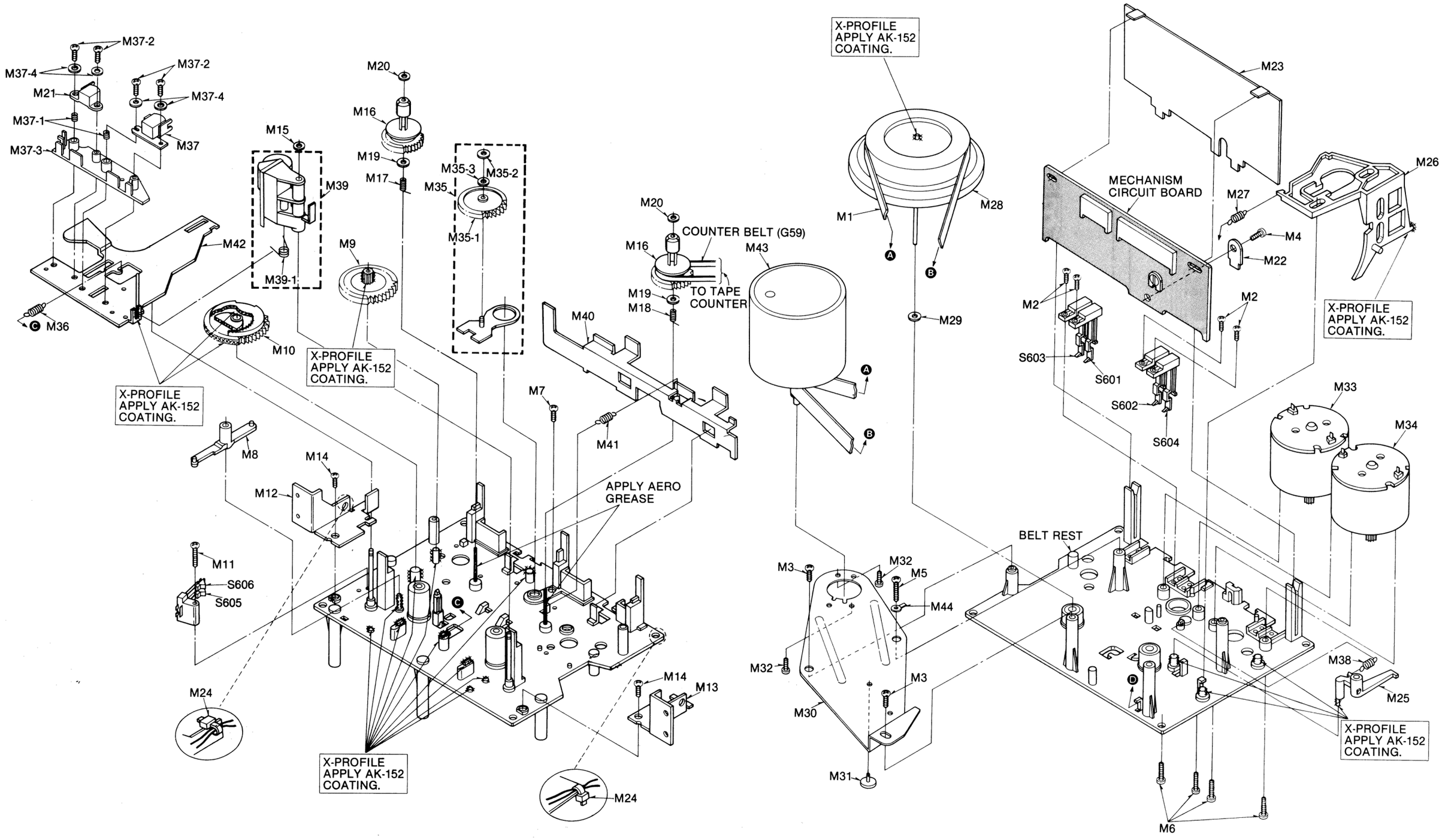
AC POWER CORD

G70: NYLON COUPLER

VIII POWER TRANSFOMER CIRCUIT BOARD

* For United Kingdom.

MECHANICAL PARTS LOCATION



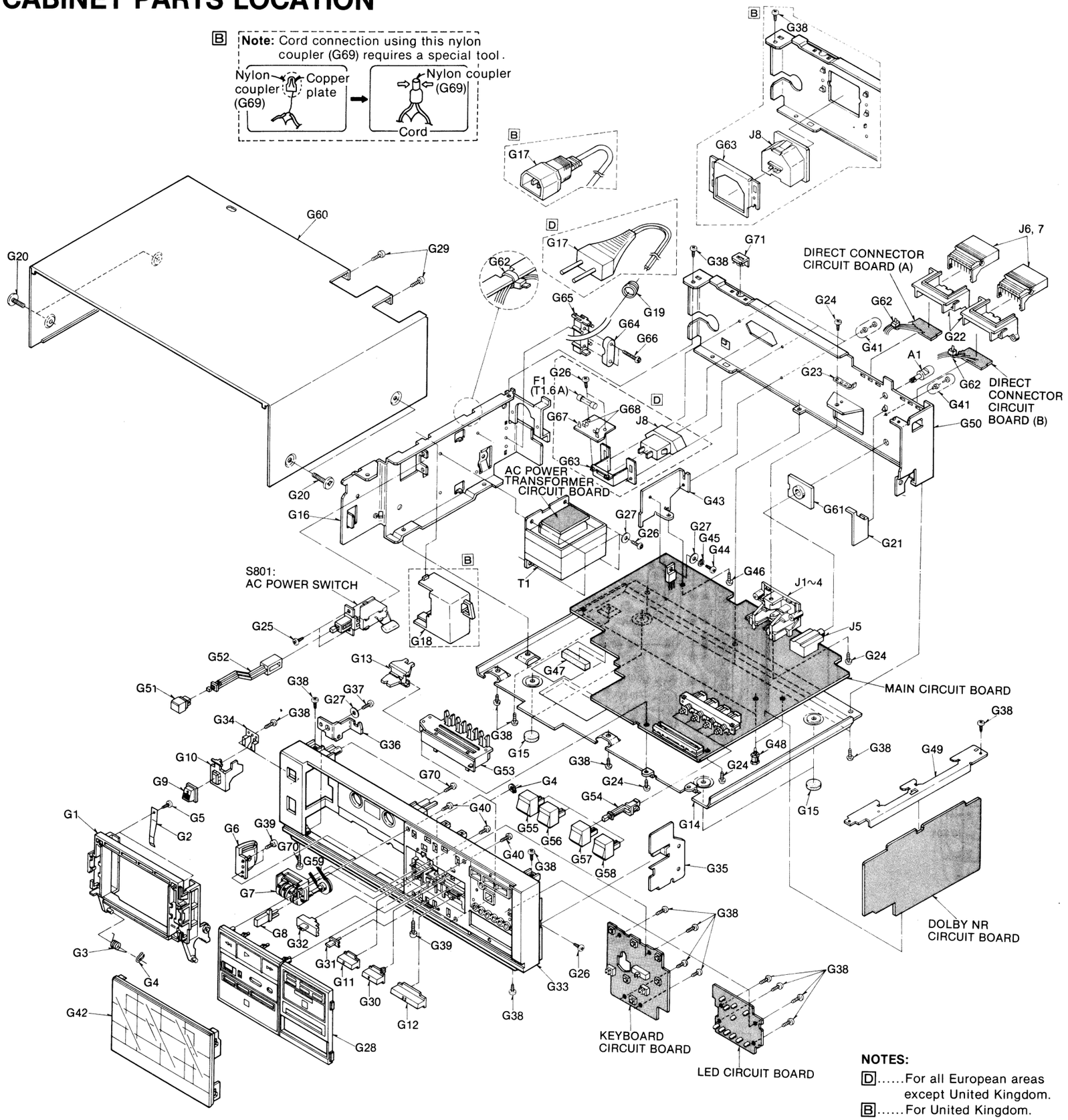
SPECIFICATIONS

Pressure of pressure roller	400±50g
Takeup tension * Use cassette torque meter.....QZZSRKCT	50±10g-cm
Wow and flutter; (JIS) * Use test tape .....QZZCWAT	Less than 0.1% (WRMS)

REPLACEMENT PARTS LIST

Ref. No.	Part No.	Part Name & Description
	MECHANICAL PARTS	
M 1	QDB0333	Flywheel Belt
M 2	XTN2+8B	Tapping Screw ⊕2×8
M 3	XTN3+8B	Tapping Screw ⊕3×8
M 4	XTN3+8B	Tapping Screw ⊕3×8
M 5	XTN3+22B	Tapping Screw ⊕3×22
M 6	XSN26+10	Screw ⊕2.6×10
M 7	XTN3+6B	Tapping Screw ⊕3×6
M 8	QML4025	Change Lever
M 9	QDG1308	Sub Gear
M 10	QDG1309	Main Gear
M 11	XTN2+14B	Tapping Screw ⊕2×14
M 12	QMA4628	Mechanism Angle-L
M 13	QMA4627	Mechanism Angle-R
M 14	XTN3+6B	Tapping Screw ⊕3×6
M 15	QBW2046	Washer (3φ)
M 16	QDR1173	Reel Table
M 17	QBC1449	Reel Table Spring-L
M 18	QBC1450	Reel Table Spring-R
M 19	QBW2012	Washer (2.1φ)
M 20	QBW2008	Washer (2φ)
M 21	QWY2138Z	Erase Head
M 22	QBP1998	Earth Spring
M 23	QTW1342	Insulator Sheet
M 24	QTD1315	Cord Clamper
M 25	QML4026	Stop Lever
M 26	QMR2097	Eject Rod
M 27	QBT1947	Head Release Spring
M 28	QXF0221	Flywheel
M 29	QBW2116	Washer (2.4φ)
M 30	QMF2312	Flywheel Retainer
M 31	QMZ1306	Flywheel Thrust Retainer
M 32	XSN26+3	Screw ⊕2.6×3
M 33	QXU0332	FF/REW Motor Assembly
M 34	QXU0333	Drive Motor Assembly
M 35	QXG1076	Center Gear Assembly
M 35-1	QDG1307	Center Gear
M 35-2	QBW2007	Washer (2.5φ)
M 35-3	QBH0151	Spacer
M 36	QBT1742	Head Base Plate Spring
M 37	QXV0188	Record/Playback Head Assembly
M 37-1	QBC1103	Head Spring
M 37-2	XSN2+14	Screw ⊕2×14
M 37-3	QMZ1310	Head Spacer
M 37-4	XWG2	Washer 2φ
M 38	QBT1962	Stop Lever Spring
M 39	QXL1655	Pinch Roller Assembly
M 39-1	QBN1993	Pinch Roller Spring
M 40	QMA4620	Eject Angle
M 41	QBT2003	Eject Angle Spring
M 42	QXK2857	Head Base Plate Assembly
M 43	QXU0342	Capstan Motor Assembly
M 44	QJT0015	Lug Terminal

CABINET PARTS LOCATION



NOTES:

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

B.....For United Kingdom.

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
	CABINET PARTS	
G 1	QYF0659	Cassette Holder
G 2	QBP1946	Cassette Pressure Spring
G 3	QBN2007	Holder Spring
G 4	XUB4FT	Stop Ring
G 5	XTN26+5BFZ	Screw ⊕2.6×5
G 6	QXG1081	Damper Gear Holding Angle
G 7	QDC0162	Counter
G 8	QGO2250	Counter Button
G 9	QGO2242	Push Button (for Eject)
G 10	QML4030	Eject Lever
G 11	QXB0790	Push Button Assembly (Record)
G 12	QXB0791	Push Button Assembly (Pause)
G 13	QYT0665	Slide Knob Assembly
G 14	QYB0431	Bottom Cover Assembly
G 15	SKL245-4	Case Foot
G 16	QMA4629	Side Angle (L)
G 17		
	[D] ⚠ SJA151	AC Power Cord
	[For all European areas except United Kingdom.]	
	[B] ⚠ SJA149-1	AC Power Cord
	[For United Kingdom.]	
G 18	[B] QKJ0598	Power Switch Cover
	[For United Kingdom.]	
G 19	QBJ1425	Cord Bushing
G 20	QHQ1349 "Silver Type"	Ornament Screw
	QHQ1349K "Black Type"	Ornament Screw
G 21	QMA4638	Connector Holding Angle
G 22	SHR9631	Connector Holding Plate
G 23	RME143Z	Cord Clamper
G 24	XTN3+12BFZ	Tapping Screw ⊕3×12
G 25	XTN3+5B	Tapping Screw ⊕3×5
G 26	XTN3+6B	Tapping Screw ⊕3×6
G 27	XWG3	Washer 3φ
G 28	QYKM0020 "Silver Type"	Operation Plate Assembly
	QYKM0020Y "Black Type"	Operation Plate Assembly
G 29	XTN3+10BFZ	Screw ⊕3×10
G 30	QGO2247	Push Button (Rec Mute)
G 31	QGO2244	Push Button (Music Select)
G 32	QGO2249	Slide Switch Knob (Timer)
G 33	QYPM0080 "Silver Type"	Front Panel Assembly
	QYPM0081 "Black Type"	Front Panel Assembly
G 34	QBP1995	Eject Spring (A)
G 35	QMA4630	Side Angle (R)
G 36	QMA4626	Holder Angle (L)
G 37	XTN3+8B	Tapping Screw ⊕3×8
G 38	XTN26+8B	Tapping Screw ⊕2.6×8
G 39	XTN3+12B	Tapping Screw ⊕3×12
G 40	XTN26+6B	Tapping Screw ⊕2.6×6
G 41	QKJ0609	Nylon Ribet
G 42	QYFM0072 "Silver Type"	Cassette Lid Assembly
	QYFM0072Y "Black Type"	Cassette Lid Assembly
G 43	QTH1181	Heat Sink
G 44	XSN3+8S	Screw ⊕3×8
G 45	XWA3G	Washer 3φ
G 46	XSN3+6S	Screw ⊕3×6
G 47	QBM1335	Cushion
G 48	QKJ0608	Tapping Support
G 49	QMA4631	P.C.B Holding Angle
G 50	[D] QMKM0011	Back Chassis
	[For all European areas except United Kingdom.]	
	[B] QMKM0014	Back Chassis
	[For United Kingdom.]	
G 51	QGO2243	Push Button (Power ON/OFF)
G 52	QMR2099	Power Rod
G 53	QGG0222	Slide Guide
G 54	QMR2100	Switch Rod
G 55	QGOM0137 "Silver Type"	Push Button (Dolby)
	QGOM0137Y "Black Type"	Push Button (Dolby)
G 56	QGOM0138 "Silver Type"	Push Button (Out)
	QGOM0138K "Black Type"	Push Button (Out)
G 57	QGOM0139 "Silver Type"	Push Button (Tape)
	QGOM0139K "Black Type"	Push Button (Tape)
G 58	QGOM0140 "Silver Type"	Push Button (Disc)
	QGOM0140K "Black Type"	Push Button (Disc)
G 59	QDB0220	Counter Belt
G 60	QGC1241 "Silver Type"	Case Cover
	QGC1241K "Black Type"	Case Cover
G 61	QKJ0667	MIC Jack Holding Plate
G 62	QTD1315	Cord Clamper
G 63	[D] QMA4663	AC Outlet Angle
	[For all European areas except United Kingdom.]	
	[B] QMA4664	AC Outlet Angle
	[For United Kingdom.]	
G 64	QTD1164	Cord Bushing
G 65	QTD1322	Cord Clamper
G 66	XTN3+20B	Tapping Screw ⊕3×20
G 67		
	[D] ⚠ SJT777	Pin Terminal
	[For all European areas except United Kingdom.]	
G 68		
	[D] ⚠ QTF1054	Fuse Holder
	[For all European areas except United Kingdom.]	
G 69		
	[B] ⚠ QJT1079	Nylon Coupler
	[For United Kingdom.]	
G 70	XTN3+10B	Tapping Screw ⊕3×10
G 71	QMA4665	Line Guide Cover
	ACCESSORIES	
A.1	SHE135 "Silver Type"	Fixing Pin
	SHE135-1 "Black Type"	Fixing Pin
A 2	QQT3533	Instruction Book
	PACKINGS	
P 1	QPNM0214	Inside Carton
P 2	QPA0729	Cushion-L
P 3	QPA0730	Cushion-R
P 4	QPS0673	Pad
P 5	XZB40X50A02	Poly Bag
P 6	QPC0072	Poly Sheet

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