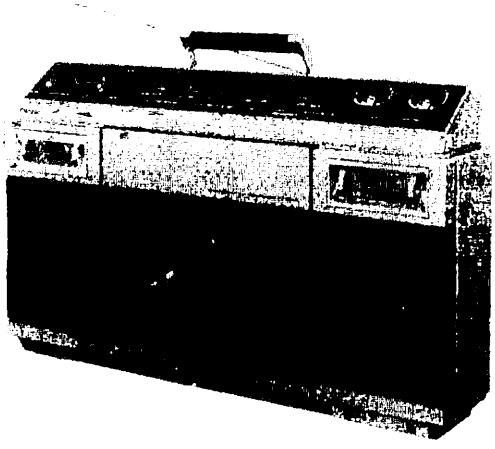
SHARP

OUTSTANDING RECEPTION THE WORLD OVER

SERVICE MANUAL

VZ-2000
VZ-2000X
VZ-2000XA

ATSM182002MCT



(The record in the photo is not included.)
Photo: VZ-2000

VZ-2000
VZ-2000X
VZ-2000XA

In the interests of user-safety the set should be restored to its original condition and only parts identical to those specified be used.

DOLBY SYSTEM ®

Noise reduction system manufactured under license from Dolby Laboratories Licensing Corporation. "Dolby" and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

APSS
Auto Program Search System

INDEX TO CONTENTS

FEATURES

- Automatic playing of both sides of a record.
- Fully automatic control of the turntable with micro-computer and linear tracking mechanism.
- Vertical record player with slim design to save space.
- APSS (Auto Program Search System).
- Dolby NR system.
- 3-way power source operation.

SHARP CORPORATION
SHARP ELECTRONICS CORPORATION

SERVICE MANUAL

SHARP CORPORATION

FOR A COMPLETE DESCRIPTION OF THE OPERATION OF THIS UNIT, PLEASE REFER TO THE OPERATION MANUAL.

SPECIFICATIONS

General

Power source: VZ-2000	AC; 120, 220 V, 50/60 Hz DC; Internal (Batteries): Ten "D" size DC; External: 15 V
Power source: VZ-2000X/XA	AC; 110, 127, 220, 240 V, 50/60 Hz DC; Internal (Batteries): Ten UM/SUM-1 or R20 size DC; External: 15 V
Power consumption:	60 W
Dimensions:	Width; 738 mm (29-1/16") Height; 459 mm (18-1/16") Depth; 193 mm (7-29/32")
Weight:	16.5 kg (36.5 lbs.) without batteries
Input jacks:	Micropnone: 1 mV/600 Ω, φ6.3 mm jack Aux input: 120 mV, 47 kΩ
Output jacks:	Mixing output: 100 mV, 47 kΩ External speaker: 4 – 8 Ω RCA jack Headphones: 8 Ω, φ6.3 mm jack
Other jacks:	FM antenna: outside antenna AM antenna: outside antenna Ground: AM antenna ground
Semiconductors:	1 LSI, 16 ICs, 1 FET, 62 transistors, 44 diodes, 9 LEDs, 3 photo-interruptors, 2 infrared LEDs, 2 LED arrays

Amplifier Section

Circuit:	Multi-channel amplifier
Output power: VZ-2000	Mainspeaker; 4 Watts per channel, minimum RMS, at 4 ohms, from 100 Hz to 3,000 Hz, no more than 10% total harmonic distortion Tweeter; 4 Watts per channel, minimum RMS, at 4 ohms, from 3,000 Hz to 20 kHz, no more than 10% total harmonic distortion
Output power: VZ-2000X/XA	PMPO; Total 64 W (16 W x 2 + 16 W x 2, AC operation with 4 – amplifier MPO; Total 32 W (8 W x 2 + 8 W x 2, AC operation with 4 – amplifier RMS; Total 20 W (5 W x 2 + 5 W x 2, DC operation with 4-amplifier)
Supplied devices:	Bass control, treble control, balance control

Tuner Section

Circuit:	Superheterodyne FM/AM tuner, PLL stereo demodulation circuit
Frequency range:	FM: 87.6 – 108 MHz AM: 520 – 1,620 kHz
Intermediate frequency:	FM: 10.7 MHz AM: 455 kHz

Cassette Deck Section

Recording tracks:	4 track 2 channel stereo system
Recording system:	AC bias (88 kHz)
Erasing system:	AC erasing system (88 kHz) Record/playback head x 1, erase head x 1
Motor:	Electronic control DC motor
Tape speed:	4.8 cm/sec.
Fast forward time:	100 sec. (C-60 tape)
Rewind time:	100 sec. (C-60 tape)
Wow & flutter:	0.065% (WRMS)
Frequency response:	Normal tape: 30 – 14,000 Hz Chrome tape: 30 – 15,000 Hz Metal tape: 30 – 16,000 Hz
S/N:	Dolby NR off; 52 dB Dolby NR on; 62 dB (Metal tape, over 5 kHz)

Player Section

Type:	Microcomputer control, liner tracking full auto
Motor:	DC motor with FG (for platter drive) x 1, DC motor (for tonearm drive) x 1
Drive system:	Belt drive system
Speeds:	33-1/3, 45 rpm
Wow/Flutter:	0.08% (WRMS)
S/N:	66 dB (DIN-B)
Tonearm:	Dynamic balanced
Cartridge:	VM type Frequency response: 20 – 20,000 Hz Exchangeable stylus: STY-123
Supplied devices:	Auto lead-in, auto return, auto record size sensing, automatic speed selection, both sides play, repeat play

Speaker Section

Speakers:	16 cm (16-1/2") woofer x 2 5 cm (2") tweeter x 2
Frequency range:	70 – 20,000 Hz
Crossover frequency:	3,000 Hz
Impedance:	4 Ω

Specifications for this model are subject to change without prior notice.

VOLTAGE SELECTOR ADJUSTMENT

The voltage selector is located on the rear cabinet. If adjustment is necessary, use a screwdriver in order to turn the selector in either direction until the correct voltage figure is displayed in the window next to the adjustment screw.

NAMES OF PARTS

1. Cassette Holder
2. Tape Counter
3. Tape Counter Reset Button
4. Power Indicator
5. Record Indicator
6. Tape Level (Left)/Battery Indicator
7. Tape Level (Right)/Signal Indicator
8. FM Stereo Indicator
9. Meter Selector Switch
10. Loudness Switch
11. Balance Control
12. Mic. Mixing Control
13. Treble Control
14. Bass Control
15. Volume Control
16. Tuning Control
17. Cassette Eject Button
18. Record Button
19. Play Button
20. Stop Button
21. Rewind Button
22. Fast Forward Button
23. Pause Button
24. Power Switch
25. Tape Record Level Control
26. Tape Selector Switch
27. Dolby NR Switch
28. Door Open Button
29. Play/Cut Key
30. Cue Key
31. Cartridge Forward Key
32. Cartridge Reverse Key
33. Both Sides Play Key and Indicator
34. Repeat Play Key and Indicator
35. Side A/B Selector Key and Side A/B Indicators
36. Speed Selector (33/45) Key
37. Function Selector Buttons
38. Tweeter (Left)
39. Woofer (Left)
40. Tweeter (Right)
41. Woofer (Right)
42. Player Door
43. Headphones Jack
44. Microphone Jack
45. FM External Antenna Terminals
46. AM External Antenna Terminal
47. AM Antenna Ground Terminal
48. Auxiliary Input Jacks
49. Mixing Output Jacks
50. FM Rod Antenna
51. Handle
52. Beat Cancel Switch
53. Speaker Selector
54. External Speaker Socket
55. Battery Compartment
56. AC Input Socket
57. External DC Input Socket
58. AC Voltage Selector

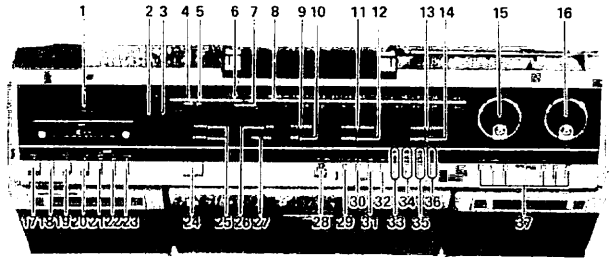


Figure 3–1

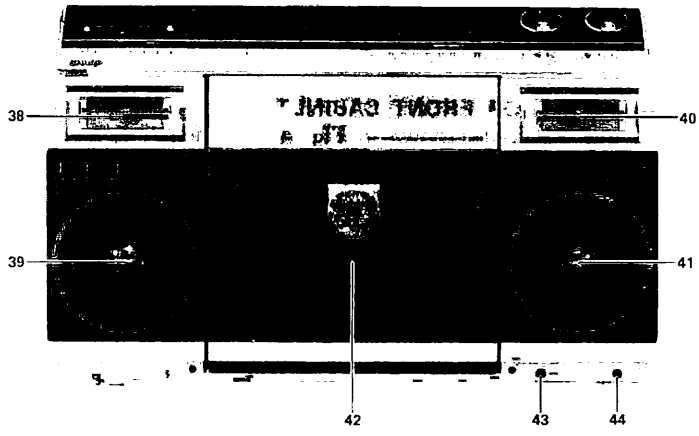


Figure 3–2

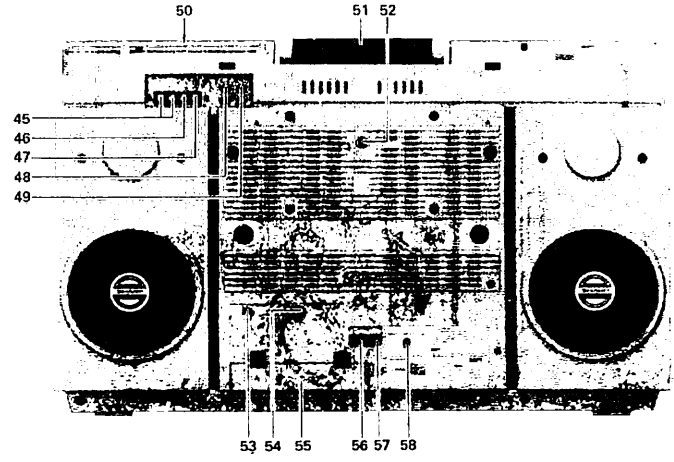


Figure 3–3

DISASSEMBLY

Cautions on Disassembly
Follow the below-mentioned notes when disassembling the unit and reassembling it, to keep its safety and excellent performance:

1. Remove the power supply plug from the wall outlet before starting to disassemble the unit.
2. Take cassette tape and record out of the unit.
3. Take off nylon bands or wire holders where they need be removed when disassembling the unit. After servicing the unit, be sure to rearrange the leads where there have been before disassembling.
4. Use sufficient care on static electricity of integrated circuits and other circuits when servicing.

[A] REMOVAL OF DUST COVER

1. Remove four screws at the dust cover, and take the cover off. See Fig. 4–1.

[B] REMOVAL OF PLAYER DOOR COVER

1. Remove the dust cover in the same way as in "[A] REMOVAL OF DUST COVER."
2. Push the door open button to open the player door.
3. Remove three screws at the player door cover, and take the cover off. See Fig. 4–2.

[C] REMOVAL OF FRONT CABINET

1. Pull out 12 knobs shown in Fig. 4–3. When it is hard to remove them, use a string or the like to help pulling out.
2. Remove four screws at the acoustic insulator, and take the acoustic insulator off. See Fig. 4–3.
3. Remove 11 screws at the front cabinet. See Figs. 4–3 and 4–4.
4. Push the cassette eject button to open the cassette holder.
5. Pull the front cabinet upwards while holding its both sides, being careful not to break the terminal board PWB-D4. Disconnect two speaker sockets (CNS401, CNS402) from the front cabinet, and take the front cabinet off. See Fig. 4–5.

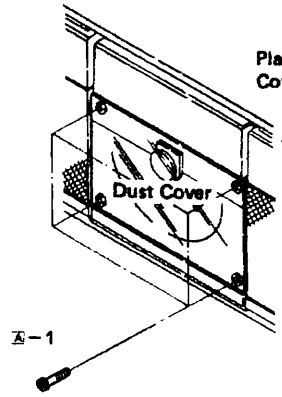


Figure 4–1

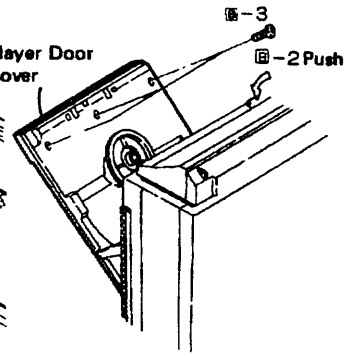


Figure 4–2

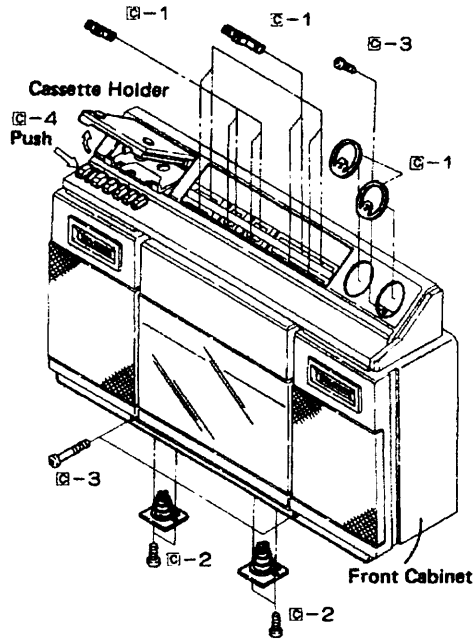


Figure 4–3

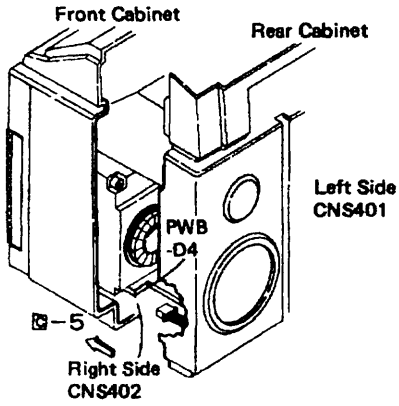


Figure 4–5

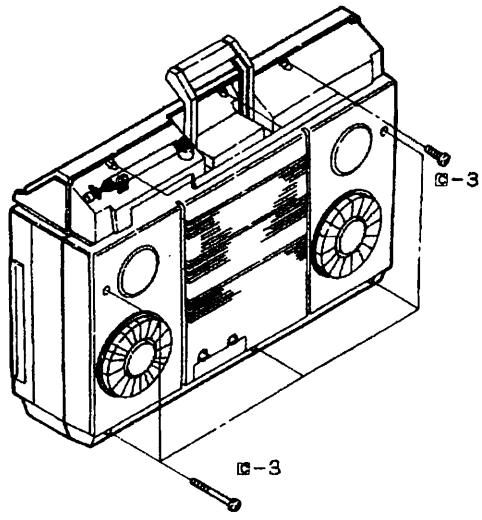


Figure 4–4

[D] REMOVAL OF PLAYER MECHANISM

- **With the front cabinet being removed:**

1. Remove the front cabinet in the same way as in "[C] REMOVAL OF FRONT CABINET."
2. Pull out two sockets (CNS501, CNS504) shown in Fig. 5–1.
3. Remove two screws at PWB-E2 shown in Fig. 5–1.
4. Push the door open button to open the player door, loosen two screws at the player mechanism and take the mechanism off. See Fig. 5–1.

- **With the front cabinet being not removed:**
  Even without the front cabinet removed, it is possible to have access to the side B tonearm and the detector switches.

5. Push the door open button to open the player door.
6. Remove two screws at the player mechanism side B cover, and take the cover off. See Fig. 5–2.
7. Remove two screws at the player mechanism. See Fig. 5–3. Shifting the player mechanism a little forwards, remove the leads from the wire holder, then the player mechanism can be taken out – at the time, take care not to break the leads of the PWB-E2 which is still attached to the unit.

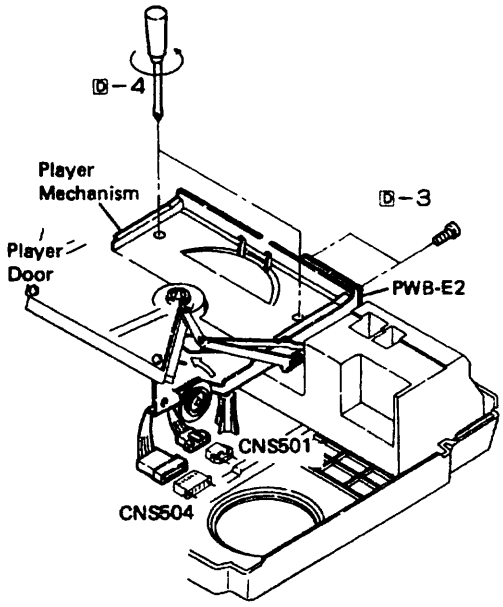


Figure 5–1

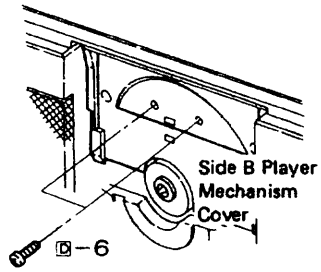


Figure 5–2

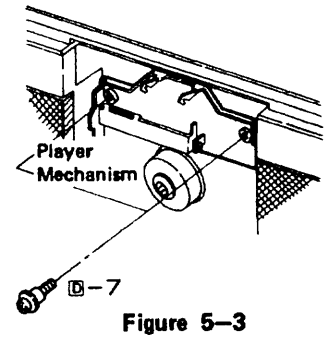


Figure 5–3

[E] REMOVAL OF FRAME

1. Remove the front cabinet and player mechanism referring to "[C] REMOVAL OF FRONT CABINET" and "[D] REMOVAL OF PLAYER MECHANISM."
2. Remove seven screws at the frame, and take the frame off. See Fig. 5–4.

[F] REMOVAL OF TAPE MECHANISM

1. Remove the frame in the same way as in "[E] REMOVAL OF FRAME."
2. Pull out three sockets (CNS201, CNS202, CNS851) shown in Fig. 6–1.
3. Remove four screws at the tape mechanism and a counter belt – shown in Fig. 5–5 and a record/playback change-over spring – shown in Fig. 6–1. Then take the tape mechanism off.

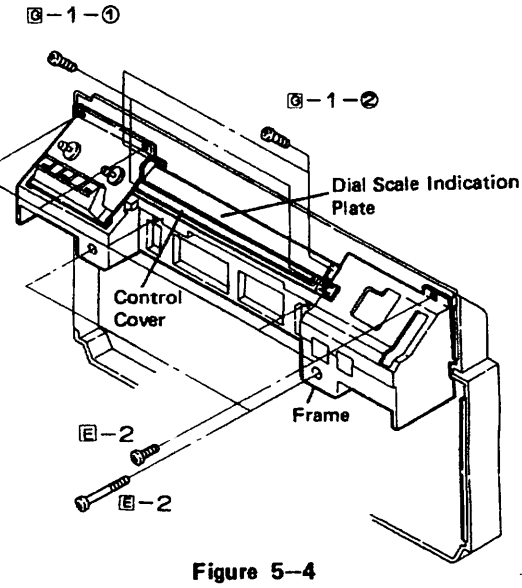


Figure 5–4

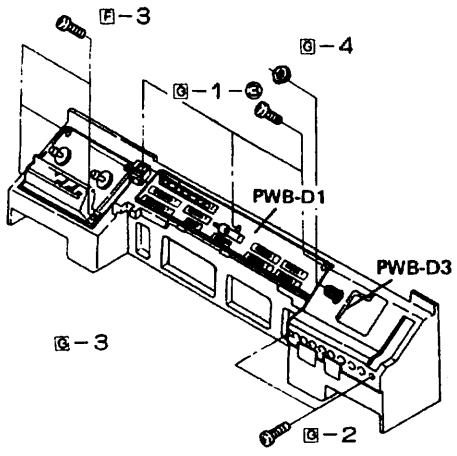


Figure 5–5

G REMOVAL OF P.W. BOARDS

*Prior to disassembling each P.W.B., remove the frame in the same way as in "E REMOVAL OF FRAME."

1. Control/Tape Deck P.W.B. (PWB-D1, PWB-D2)

① Remove two screws at the control cover and a dial illumination lamp (PL901), and take the cover off. See Fig. 5–4.

② Remove two screws at the dial scale indication plate, and take the plate off. See Fig. 5–4.

③ Detach a dial string, and remove five screws at the PWB-D2 shown in Fig. 6–1 and four screws at the PWB-D1 shown in Fig. 5–5. Take both P.W.B. off.

2. Tuner P.W.B. (PWB-B)

① Detach a dial string, remove one socket (CNS101) and two screws at the terminal indication plate shown in Fig. 6–1, and also two screws at the tuner P.W.B. shown in Fig. 5–5, and take the P.W.B. off.

3. Speaker P.W.B. (PWB-D5)

① Remove two screws at the speaker P.W.B. shown in Fig. 6–2, and take the P.W.B. off.

4. Volume P.W.B. (PWB-D3)

① Remove a nut at the volume P.W.B. shown in Fig. 5–5, and take the P.W.B. off.

5. Power Block (PWB-C1, -C2, -C3)

① Remove eight screws at the power block and a insulator cover – shown in Fig. 6–2, and take the power block off.

6. Tape Mechanism P.W.B. (PWB-A)

① Remove the tape mechanism in the same way as in "F REMOVAL OF TAPE MECHANISM."

② Remove a screw at the record/playback changeover lever, two screws at the motor bracket and a screw at the tape mechanism P.W.B. – shown in Fig. 6–3, and take the P.W.B. off.

7. Microcomputer P.W.B. (PWB-E1)

① Remove the player mechanism in the same way as in "D REMOVAL OF PLAYER MECHANISM."

② Remove a screw at the microcomputer P.W.B. shown in Fig. 6–4, and take the P.W.B. off.

H REMOVAL OF SPEAKER

1. Remove the front cabinet in the same way as in "C REMOVAL OF FRONT CABINET."

• **Tweeter**

2. Remove two screws at the tweeter shown in Fig. 6–5, and take the tweeter off.

• **Woofer**

3. Remove four screws at the woofer lid shown in Fig. 6–5, and take the lid off.
4. Remove four screws at the woofer shown in Fig. 6–6, and take the woofer off.

I REMOVAL OF SPEAKER COVER

1. Remove the front cabinet in the same way as in "C REMOVAL OF FRONT CABINET."

• **Tweeter cover**

2. Remove three screws at the tweeter cover shown in Fig. 6–6, and take the cover off.

• **Woofer cover**

3. Remove the woofer in the same way as in "H REMOVAL OF SPEAKER" – steps 3 and 4.
4. Remove a screw at the woofer cover shown in Fig. 6–6, and take the cover off.

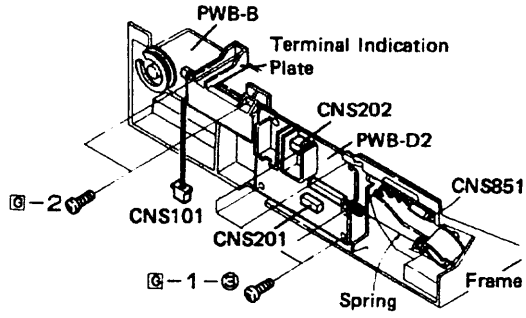


Figure 6–1

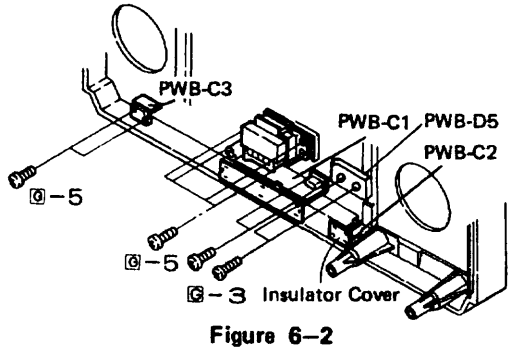


Figure 6–2

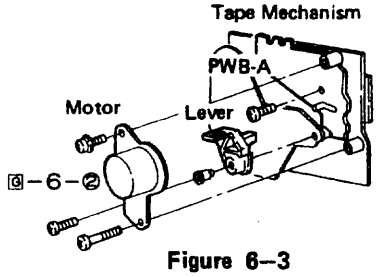


Figure 6–3

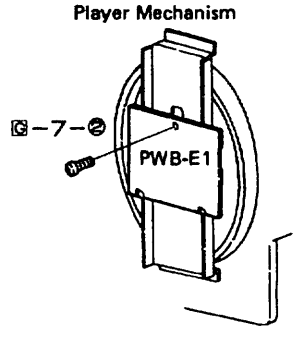


Figure 6–4

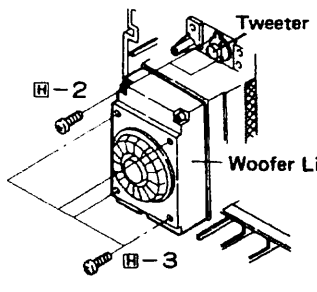


Figure 6–5

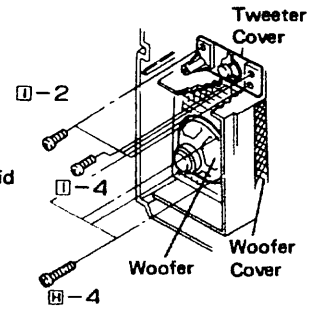
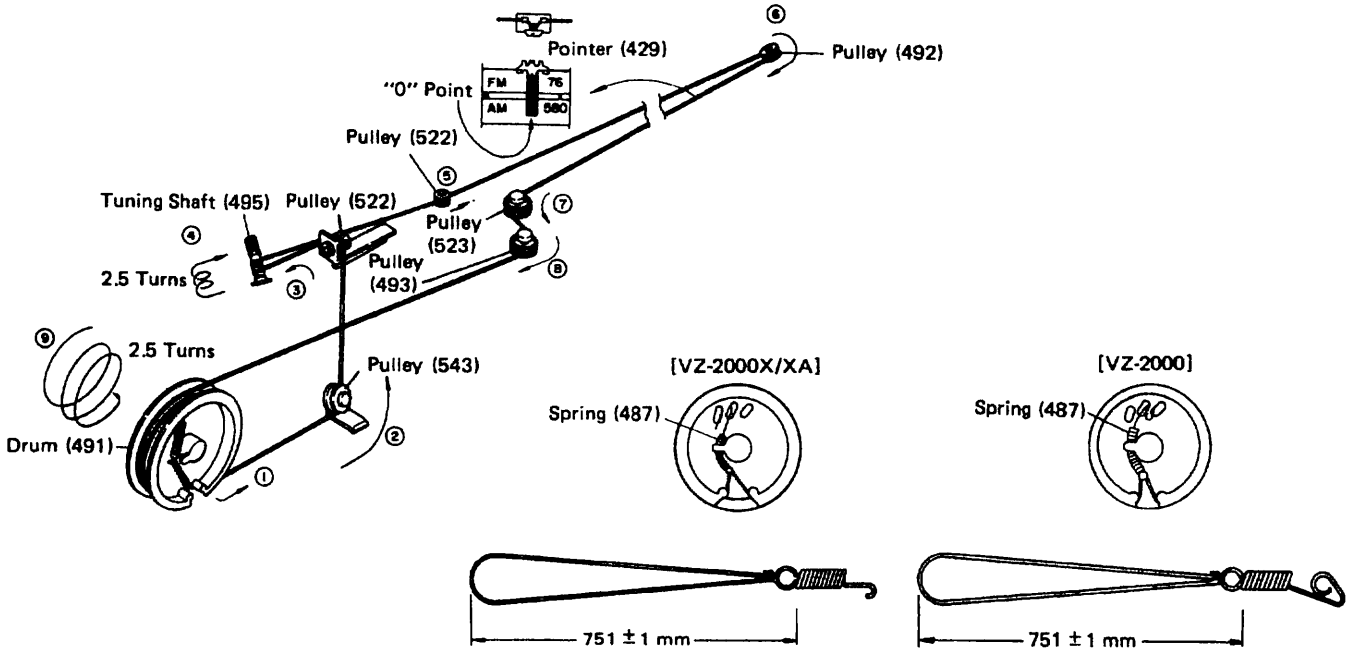


Figure 6–6

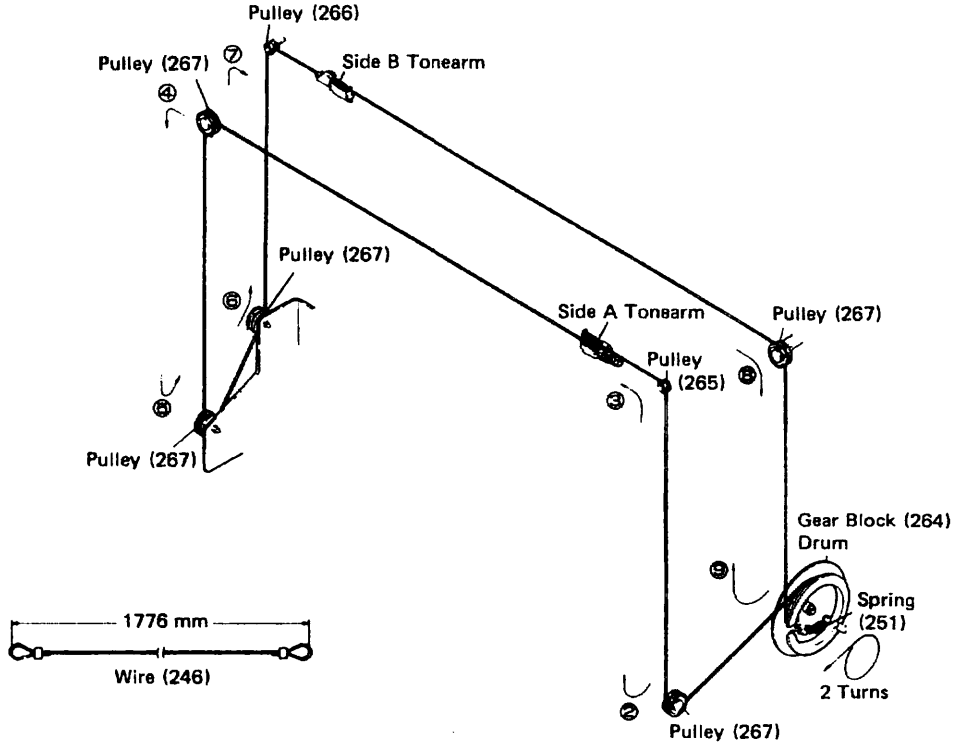
DIAL CORD STRINGING

1. Turn the drum fully counterclockwise (at the highest frequency position), and put a hook of the spring in the hole of the drum.
2. Proceed with stringing in the numerical order from ① to ⑨.
3. After the stringing, turn the dial drive shaft fully counterclockwise (at the lowest frequency position), and align the center of the pointer to zero point of the dial scale plate.



SETTING OF PLAYER WIRE

1. Set the drum at its rest position, and put a hook of the spring in the projection of the drum.
2. Stretch the wire in the numerical order from ① to ⑨.
3. After setting the wire, set the side A tonearm and side B tonearm at their lead-in positions. Refer to the instructions in "POSITIONAL ADJUSTMENT OF TONEARM LEAD-IN POSITION."



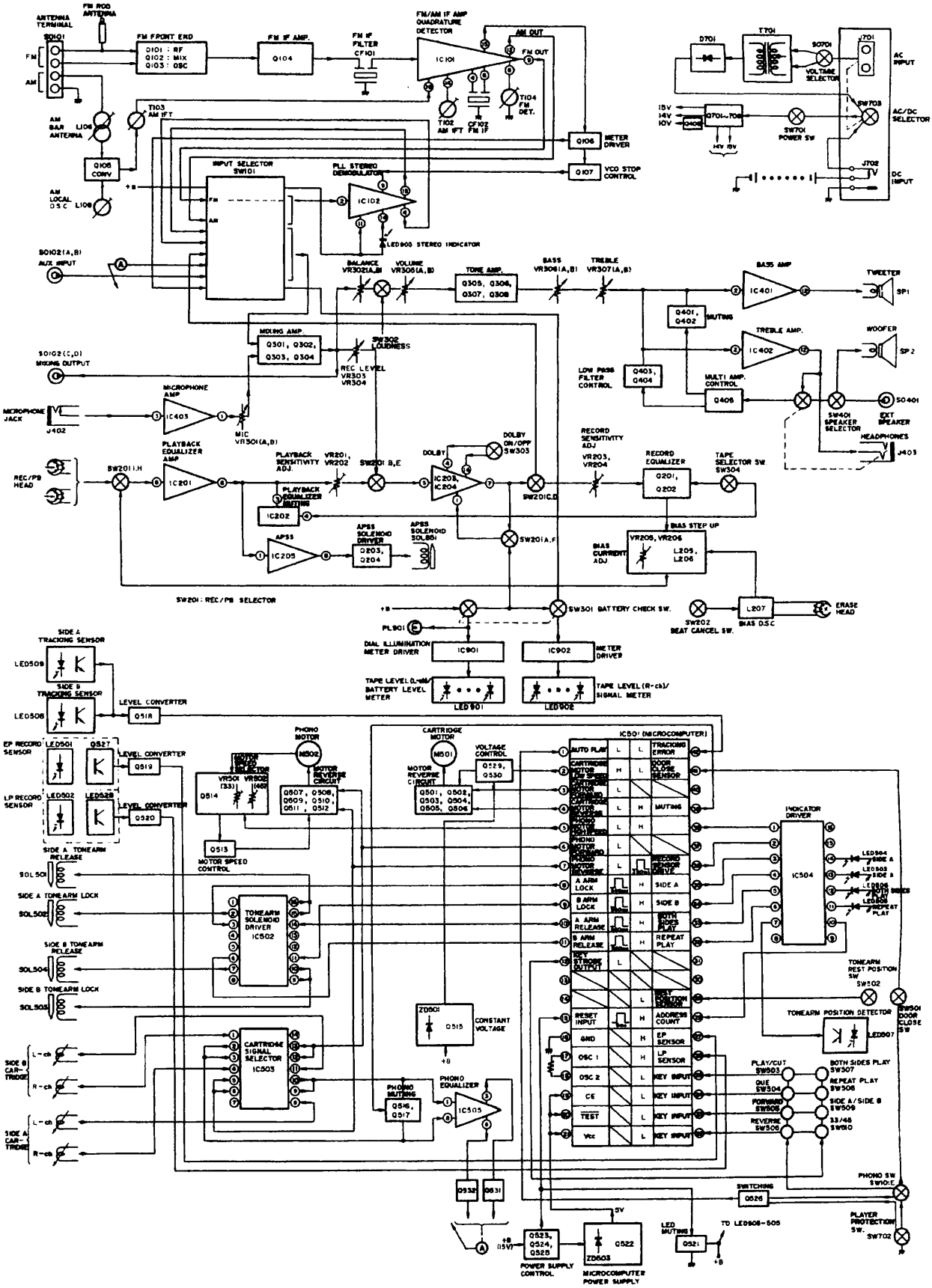


Figure 8 BLOCK DIAGRAM

CIRCUIT DESCRIPTIONS

< OUTLINE OF PLAYER CONTROL SECTION >

KEY CONTROL SECTION

This section is made up of eight keys, and each key is of the lock-out type and its chattering time is limited to 35 msec.

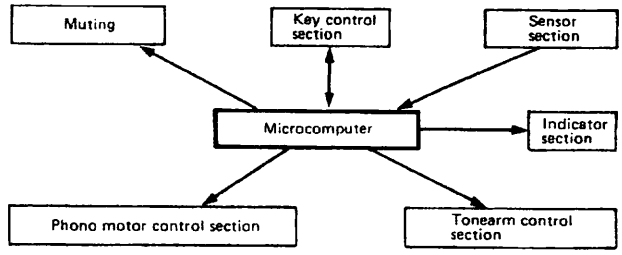
1. **Play/cut key**
   Enables to begin playing a record and to stop it while it is playing – this is effective when the player door is closed. When the tonearm is at its rest position (at right for side A, or at left for side B), player operation starts when this key is pushed: when the tonearm is not at its rest position, the key functions as cut key.
2. **Tonearm cue key**
   Enables cue up and cue down motion of the tonearm while a record is being played. It is used to keep or cancel cue up mode when the unit is not playing a record.
3. **Side A/side B selector key**
   Changes side A play and side B play. With this change, the tonearm moves to lead-in position, which results in playing of the back side of a record which you are listening to.
4. **Cartridge forward key**
   Enables to move the tonearm toward the optional portion on a record (to later selections). The tonearm will move until the key is released.
5. **Cartridge reverse key**
   Enables to move the tonearm back to the optional portion on a record (to previous selections). The tonearm will move until the key is released.
6. **Speed selector (33/45) key**
   Enables to manually change the speed for a record.
7. **Both sides play key**
   Enables to play side A (or side B) followed by automatic play of side B (or side A). The both sides play is cancelled by pushing the key again.
8. **Repeat play key**
   Enables to repeat play of side A or side B. The repeat play is cancelled by pushing the key again.

SENSOR SECTION

1. **Player door close sensor**
   The skelton switch detects that the player door is closed completely.
2. **Tonearm rest position sensor**
   The skelton switch detects that the tonearm is at its rest position (at right for side A, at left for side B).
3. **Tonearm position sensor**
   When the tonearm is out of its rest position, the photo interruptor produces four pulses to detect how far from the rest position the tonearm is situated.
4. **Tracking error sensor**
   The photo interruptor detects a tracking error which may be caused when a record is being played.
5. **Record sensor**
   With the player door closed, the photosensor works to detect the an EP or LP record is loaded or that neither is loaded.

INDICATOR SECTION

1. **Side A player indicator**
   Lights up when side A is instructed by the side A/side B selector key and when side A of a record is being played.



2. **Side B play indicator**
   Lights up when side B play is instructed by the side A/side B selector key and when side B play of a record is being played.
3. **Both sides play indicator**
   Lights up when both sides play is instructed by the both sides play key.
4. **Repeat play indicator**
   Lights up when repeat play is instructed by the repeat play key.

TONEARM CONTROL SECTION

Forward/reverse motion of the tonearm and also its up/down motion are controlled by the microcomputer's signals to be applied to the cartridge motor and tonearm solenoid.

- Output signal at pin ③ to be applied to the cartridge motor: the tonearm rotates forwards when the signal is at "low" level.
- Output signal at pin ④ to be applied to the cartridge motor: the tonearm rotates backwards when the signal is at "low" level.
- Output signal at pin ⑧ to be applied to the tonearm solenoid: the side A tonearm is locked when the signal is at "high" level.
- Output signal at pin ⑨ to be applied to the tonearm solenoid: the side B tonearm is locked when the signal is at "high" level.
- Output signal at pin ⑩ to be applied to the tonearm solenoid: the side A tonearm is released when the signal is at "high" level.
- Output signal at pin ⑪ to be applied to the tonearm solenoid: the side B tonearm is released when the signal is at "high" level.

PHONO MOTOR CONTROL SECTION

Side A or side B play is selected by the microcomputer's signals to be applied to the phono motor: the motor rotates forwards for side A play, and rotates backwards for side B play.

- Output signal at pin ⑤ to be applied to the phono motor: the motor rotates at high speed (45 r.p.m.) when the signal is at "low" level, and the low speed (33 r.p.m.) when it is at "high" level.
- Output signal at pin ⑥ to be applied to the phono motor: the motor rotates forwards when the signal is at "low" level.
- Output signal at pin ⑦ to be applied to the phono motor: the motor rotates backwards when the signal is at "low" level.

MUTING

Muting occurs when the output signal from pin ㊴ of the microcomputer is at "high" level.

< FUNCTIONS OF PLAYER CONTROL SECTION >

WITH POWER ON

The microcomputer starts operating when the power switch is turned on, and the VZ-2000 is first set as follows:

1. The tonearm returns to its rest position if it has been at the other position.
2. Only the side A of a record is ready to be played when the player door has been opened.
3. When the player door has been closed, the microcomputer detects whether there is a record in the compartment or not. If it is loaded, the side A is ready to be played: in the case of EP record, the speed is set at 45 r.p.m. and in the case of LP record, it is set at 33 r.p.m. If a record is not loaded, this operation does not occur.

DOOR OPEN OPERATION

With the player door opened, the door close detector switch turns off to keep the unit muted for about 60 msec, and thereafter the phono motor stops. At the same time the side A of a record is ready to be played and the tonearm returns to its rest position. Also the both sides play mode or the repeat play mode is cancelled if it has been instructed beforehand.

DOOR CLOSE OPERATION

1. When the tonearm is out of its rest position, it returns to the rest position as the player door is closed.
2. When the player door is closed without a record loaded, the record sensor detects this unloading and the microcomputer's presettings are all cancelled. Thereafter any key is ineffective if pushed.
3. When the player door is closed with a record loaded, the record sensor detects whether the record is EP one or LP one, and playing starts: in the case of EP record, the speed is set at 45 r.p.m. and in the case of LP record, the speed is set at 33 r.p.m.

PLAY START OPERATION

When the tonearm is at the rest position and a record has been loaded and the player door closed, playing the record starts when the play/cut key is pushed. When playing starts, the tonearm moves at high speed toward its lead-in position according to the microcomputer's signals to decide the rotational direction and speed of the phono motor. At the lead-in position, the tonearm follows the preset instruction of cue up or cue down operation: with the cue down instruction, it moves down to the record, and with the cue up instruction, it stays at the lead-in position.

TONEARM UP/DOWN MOTION

The tonearm moves up and down through a control of two solenoids.

1. The microcomputer feeds the tonearm lock solenoid with a current for about 500 msec, during which the tonearm guide operation lever is locked against its locking lever, so that the tonearm can move down.
2. The microcomputer feeds the tonearm release solenoid with a current for about 500 msec, during which the tonearm guide operation lever is unlocked from its locking lever, so that the tonearm can move up. While the tonearm is moving up or down, a muting is caused to prevent the shock noise.

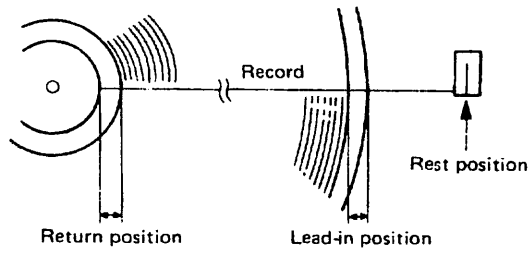


Figure 10–1

TONEARM FORWARD OPERATION

- **When the player door is opened:**
  When the cartridge forward key is pushed, the tonearm advances at high speed toward the EP record lead-in position; at the time, the phono motor is kept in a stop. To return the tonearm to the rest position, push the cartridge reverse key.
  As a result of this operation and with the player door being opened, it is for you accessible to the stylus tip at the time of replacing it.
- **When the player door is closed (provided that a record is loaded in the unit):**

1. When the tonearm is at the rest position, pushing the cartridge forward key makes the tonearm move at high speed toward the lead-in position: at the time, the microcomputer decides the rotational direction and speed of the phono motor according to the type of a record to be loaded in the unit. Then at this position, the tonearm performs cue up or down operation according to the setting of the cue key.
2. When the unit in play mode, if the cartridge forward key is pushed, the tonearm forward speed slows down and it continues to move inwards until the key is released. Then at this position, the tonearm performs cue up or down operation according to the setting of the cue key.
3. If the tonearm reaches its return position with a continuous push of the cartridge forward key, it automatically starts returning toward the rest position at high speed.

CARTRIDGE BACKWARD OPERATION

The tonearm moves backwards when the cartridge reverse key is pushed, provided that the player door has been closed and a record loaded.

1. When the tonearm is placed between the rest position and lead-in position, play operation is cut when the cartridge reverse key is pushed. The tonearm will return to the rest position and the phono motor will stop.
2. When the tonearm is any place between the lead-in position and return position, the tonearm moves backwards at low speed when the cartridge reverse key is pushed. Then the tonearm stops when the key is released and it keeps cue up operation. If the key continues to be pushed until the tonearm exceeds the lead-in position, the tonearm stops once, and it moves back to the lead-in position, and keeps cue up operation.
3. While the unit is playing, pushing the cartridge reverse key makes the tonearm move up and then backwards at low speed. And when the key is released, the tonearm stops and performs cue down operation making the unit ready for playing. If the key continues to be pushed until the tonearm exceeds the lead-in position, the tonearm once steps, and it moves back to the lead-in position and performs cue down operation, making the unit ready for playing.

CUE UP/CUE DOWN OPERATION

Record play stops temporarily when the cue key is pushed, and it resumes from that position when the key is again pushed. Temporary stop of record play is called cue up operation while its restarting is called cue down operation.
Cue up operation changes to cue down operation and vice versa each time the cue key is pushed.

- **Cue down operation**

1. Cue up state is cancelled and the side A or side B play indicator goes off.
2. Cue down operation lasts 1 second, and 2 seconds later the muting is cancelled.

- **Cue up operation**

1. Cue up operation starts, and the side A or side B play indicator blinks (with approx 3 Hz signal).
2. Cue up operation lasts 1 second.
   Muting occurs for 60 msec before cue up operation has started.

SIDE A/SIDE B SELECTION

Side A play or side B play is selected by pushing the side A/side B selector key, provided that the player door has been closed, a record loaded and the tonearm placed anywhere other than at the rest position.

- **During cue up operation**
  When the side A/side B selector key is pushed, lighting of the side A play indicator changes to that of the side B play indicator or vice versa, the tonearm returns at high speed to the lead-in positon and the phono motor changes its direction.
  This motor's rotational change takes about 1 second, and the motor takes another 1 second to be set at its normal speed.
- **While the record is playing**
  When the side A/B selector key is pushed, lighting of the side A indicator changes to that of the side B indicator or vice versa, the tonearm moves up and returns to the rest position, and the phono motor changes its direction: at the time, the play indicator blinks (with approx. 1.5 Hz signal). Then the back side of the record you are listening to will begin playing from the beginning.
  Also in this case, the phono motor takes about 2 seconds from the time it starts changing its direction until it is set at the normal speed.

AUTO RETURN FUNCTION

During play mode and cartridge forward mode, when the tonearm moves on and exceeds the return position, it returns automatically to the rest position or the lead-in position. For play mode, the return operation occurs after the tonearm is once lifted off the record surface.

1. When the return operation occurs with a push of the cartridge forward key, cue up operation once preset is cancelled.
2. The return operation is performed in three different ways according to the setting modes.
   - If only the repeat play key has been pushed, the return operation occurs in such as way as to make the same side of the record played repeatedly.
   - If only the both sides play key has been pushed, the return operation occurs in such a way as to make both sides of the record played; each side being played one time respectively.
   - If the both sides play key and repeat play key have been pushed, the return operation occurs in such a way as to make both sides of the record played repeatedly.
3. For one side repeat play, when side A (or B) is finished, the tonearm returns to the rest position and the same side begins playing from the beginning. For both sides play or both sides repeat play, when side A (or B) is finished, the tonearm returns to the rest position and the side B (or A), or the back side of the record you are listening to, begins playing from the beginning: if the cue key has been pushed, the tonearm performs cue up operation before playing the back side has started.
4. Unless either the both sides play key or the repeat play key has been pushed, playing the record is cut after the return operation.
5. During the return operation in one side repeat play, the play indicator blinks (with approx. 1.5 Hz signal) to show that the same side as you are listening to will begin playing again from the beginning: during the return operation in both sides play, the play indicator blinks (with approx. 1.5 Hz signal) to show that the back side of the record you are listening to will begin playing.
6. For one side repeat play, play is repeated six times for the same side of the record, and after the sixth play the tonearm returns to the rest position and play operation is cut. For both sides repeat play, play is repeated three times for each of the sides A and B, and after the sixth play in whole the tonearm returns to the rest position and play operation is cut.

STOP FUNCTION

1. While the tonearm is away from its rest position, when the play/cut is pushed, the tonearm returns to the rest position with the phono motor stopping.
2. During play, pushing the play/cut key causes the tonearm to move up and return to the rest position and stops the phono motor.
3. All the indicators other than side A or side B indicator go off while the play cut operation is performed.

SIGNAL FROM SENSORS TO MICROCOMPUTER

1. **Player door close detection**
   Closing the player door causes SW501 to turn on, and its output signal (at "low" level) is applied to pin ㊶ of the microcomputer.
2. **Detection of tonearm rest position**
   SW502 is the sensor which detects that the tonearm is at the rest position. The output (at "low" level) from this sensor is applied to pin ㉙ of the microcomputer.
3. **Detection of tonearm position**
   Detection of where the tonearm is placed at is performed by LED507 and a gear drum. The detected pulse is applied to pin ㉘ of the microcomputer.
4. **Detection of tracking error angle**
   The tracking error angle is detected by LED509 (for side A) and LED508 (for side B). The detected signal is applied to pin ㊷ of the microcomputer.
5. **Detection of EP/LP record loading or no loading**
   LED501 and LED502 sense whether an EP or LP record is loaded or not loaded, and their outputs are applied via Q527 and Q528 to pin ㉖ (for LP record) and pin ㉗ for EP record) of the microcomputer.

Mode \ Key	Play/cut	Cue up/cue down (▼ ▲)	Forward (◀◀)	Reverse (▶▶)	Both sides play	Repeat play	Side A/ side B	33/45
Tonearm forwarding (with door opened)	X	Δ	X	O	Δ	Δ	Δ	X
Tonearm at rest position (with door opened)	X	Δ	O	X	Δ	Δ	Δ	X
Tonearm returning with door closed (with record loaded)	X	Δ	X	X	Δ	Δ	Δ	Δ
Tonearm returning with power switch ON (with door closed)	X	Δ	X	X	Δ	Δ	Δ	Δ
Tonearm at rest position (with door closed and record loaded)	O	Δ	O	X	Δ	Δ	Δ	Δ
Tonearm moving from rest position to lead-in position (with door closed and record loaded)	O	Δ	X	O	Δ	Δ	Δ	O
Cuing up (with door closed record loaded)	O	O	O	O	Δ	Δ	O	O
Tonearm moving down (with door closed and record loaded)	O	O	O	O	Δ	Δ	O	O
Tonearm touching the record surface (with door closed and record loaded)	O	O	O	O	Δ	Δ	O	O
Tonearm moving up (with door closed and record loaded)	O	X	O	O	Δ	Δ	O	O
During side A/B selection (with door closed and record loaded)	O	X	X	X	Δ	Δ	O	O
During return (with door closed and record loaded)	O	X	X	X	Δ	Δ	O	O

Table 12–1

Note:
Mark O; With each key pushed, the corresponding mode is obtained.
Mark Δ; With each key pushed, the corresponding mode is obtained but with other mode accompanied.
Mark X; Ineffective

< CIRCUITS AROUND THE MICROCOMPUTER >

POWER CONTROL CIRCUIT

The power control circuit consists of Q522, Q523, Q524 and Q525, and it supplies 5 V to the microcomputer to keep it alive. And also it causes a reset signal when the power switch is turned on or off or when the battery capacity is reduced, so that the microcomputer is reset.

1. **With the power switch turned on:**
   When the power switch is activated, the power supply circuit causes 15 V to be supplied to L502 and R579. Out of this 15 V, a part of 5 V is applied via Q522 and ZD503 to the microcomputer.
   The reset signal is also caused simultaneously with such 5 V and supplied via R581 to the microcomputer, so that the microcomputer is reset for 5 msec the time constant of which is decided by C531 and R579: then Q525 turns on to stop the resetting of the microcomputer. While the reset signal is alive for 5 msec, all the output pins of the microcomputer are at "high" level.
2. **With the power switch turned off:**
   When the power switch is released, 15 V which is once caused by the power circuit is lowered to 7 V so that Q525 turns off to apply the reset signal to the microcomputer.
   Since all the output pins of the microcomputer are at "high" level, the reset signal caused during play mode initiates the tonearm release solenoid to make the tonearm move up. Refer to the "Tonearm Solenoid Drive Circuit" described later.
3. **With battery capacity reduced:**
   As the battery capacity is reduced, the power supply of 5 V to the microcomputer fluctuates so that the microcomputer shows an erroneous operation. To avoid this, when the power supply voltage (15 V) drops down to 7 V, Q525 turns off and the reset signal is applied to the microcomputer to reset it: the resetting continues for about 650 msec the time constant of which is decided by C530 and R583. Then Q523 and Q524 turn on, and Q522 turns off so that the power supply of 5 V to the microcomputer is discontinued.

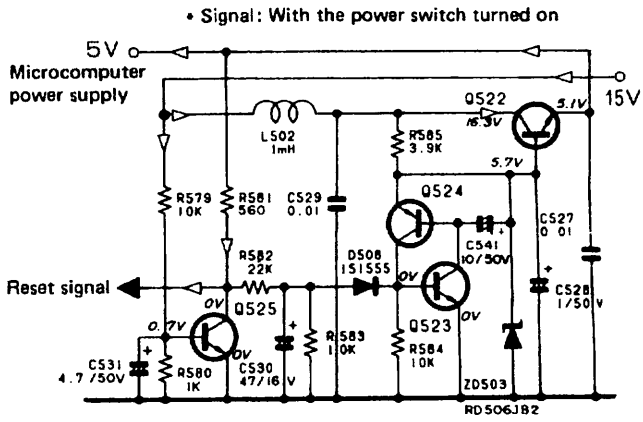


Figure 12–1 Power control circuit

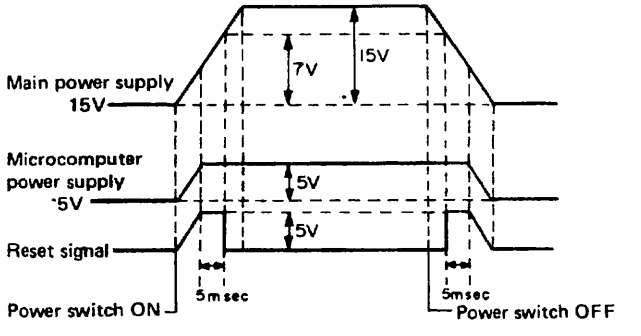


Figure 12–2 Timing chart of power control circuit

CARTRIDGE MOTOR NORMAL/REVERSE ROTATION SELECTOR CIRCUIT AND SPEED SELECTOR CIRCUIT

This circuit is made up of Q501 to Q506, Q529 and Q530, and changes polarity and voltage of the power supply to be applied to the cartridge motor.

1. **To make the motor rotate in normal direction (with tonearm forward operation):**
   In this case, the output from pin ③ of the microcomputer becomes "low" level to turn off Q506 and Q504. With Q506 and Q504 turned off, Q502 turns on so that pin ② of the motor is positive; at the same time, pin ④ of the microcomputer becomes "high" level to turn on Q505 and Q503. As a result, Q501 turns off so that pin ① of the motor is negative, thus allowing the motor to revolve in normal direction.
2. **To make the motor rotate in reverse direction (with tonearm backward operation):**
   In this case, the output from pin ④ of the microcomputer becomes "low" level to turn off Q505 and Q503. With Q505 and Q503 turned off, Q501 turns on so that pin ① of the motor is positive: at the same time, pin ③ of the microcomputer becomes "high" level to turn on Q506 and Q504. As a result, Q502 turns off so that pin ② of the motor is negative, thus allowing the motor to revolve in reverse direction.
3. **High speed/low speed selection**
   High speed/low speed selection of the motor is performed with a control of the microcomputer to change the supply voltage to be applied to the cartridge motor.
   In the case of high speed mode, the output from pin ② of the microcomputer becomes "low" level to turn off Q529. With Q529 turned off, Q530 turns on so that a voltage of about 8.5V is applied to the cartridge motor normal/reverse rotation selector circuit.
   In the case of low speed mode, the output from pin ② of the microcomputer becomes "high" level to turn on Q529. With Q529 turned on, Q530 turns off so that a voltage of about 6.5V is applied via R624 to the cartridge motor normal/reverse rotation selector circuit.
   After that, there is caused a pulse at pin ③ for the motor normal rotation or a pulse at pin ④ for the motor reverse rotation as shown in Fig. 13–2, so that a power voltage of about 6.5V is applied to the cartridge motor.
   The output from pins ③ and ④ of the microcomputer are processed to be 50% of their original duty and used to stabilize the low speed rotation of the cartridge motor – see Fig. 13–2.

TONEARM SOLENOID DRIVE CIRCUIT

This circuit is made of IC502 and drives the side A and side B tonearm solenoids shown below. With the power switch turned off, the charged voltage of C502 is used to drive each solenoid. Table 13–1 shows how the microcomputer controls the action of the tonearm solenoids.

Cartridge motor rotation

Pin No.	Normal rotation (Tonearm forward)	Reverse rotation (Tonearm reverse)
①	–	+
②	+	–

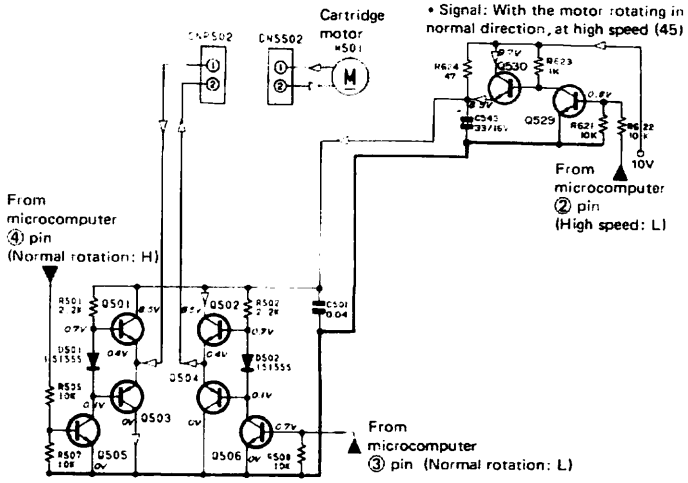


Figure 13–1 Cartridge motor normal/reverse rotation selector circuit and speed selector circuit

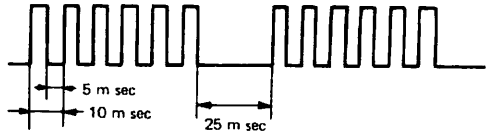


Figure 13–2 Output for low speed motion

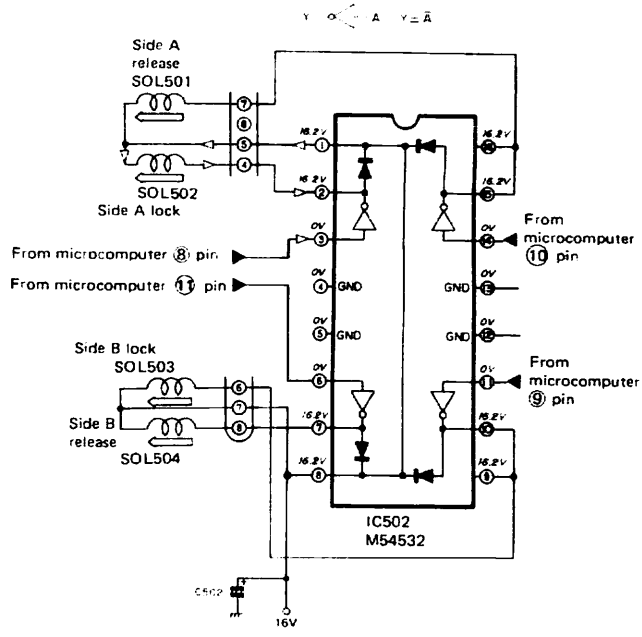


Figure 13–3 Tonearm solenoid drive circuit

Tonearm solenoid		Microcomputer IC501 Pin No.	Microcomputer IC501 Output signal	Tonearm solenoid driving Pin No.	Tonearm solenoid driving Output signal	Tonearm operation
Side A	Tonearm lock	⑧	500msec, 5V, 0V	②	16V, 0V, 500msec	Down
	Tonearm release	⑩		⑮		Up
Side B	Tonearm lock	⑨		⑩		Down
	Tonearm release	⑪		⑦		Up

Table 13–1 Tonearm Solenoid Driving

TRACKING ERROR DETECTOR/CARTRIDGE FORWARD CIRCUIT

This circuit is composed of photo interrupter LED509 for side A (or LED508 for side B) and Q518, and detects the tracking error to control the cartridge forward operation when a record is playing.

At the start of playing the side A of a record, the tonearm is kept slantwise the angle of which is detected by the photo interrupter LED509 (now there is a light emission to the LED509), and the resultant signal ("high" level) is applied to the base of Q518 so that this transistor turns on. With Q518 turned on, the "low" level signal is applied to pin (42) of the microcomputer. Then the signal goes out of pin (3) of the microcomputer, which is a pulse shown in Fig. 14–2, and drives the cartridge motor, thus causing the tonearm to move forwards. As the tonearm further moves forwards, it keeps itself horizontal so that its slanting angle is no more detected by the LED509 (now there is no light emission to the LED509). Then the output of LED509 becomes "low" level to turn off Q518, so that pin (42) of the microcomputer becomes "high" level to stop rotation of the cartridge motor. If by accident the angle of the cartridge becomes slanted, the microcomputer program is that the cartridge be kept in a stop not moving forwards. This is because pin (43) of the microcomputer can accept the cartridge angle's information only when the muting circuit is opend.

In the case of playing the side A of a record, the "low" level signal from pin (6) of the microcomputer is fed to Q512, and this transistor turns off to cut off a light emission to the LED508; as a result, it is then that no tracking error detection happens for the side B of the record. In the case of playing the side B, the "low" level signal from pin (7) of the microcomputer turns off Q511 to prevent the tracking error detection at side A.

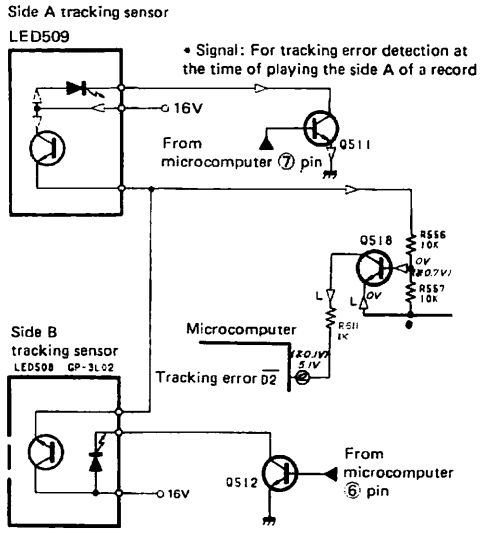


Figure 14–1 Tracking error detection circuit

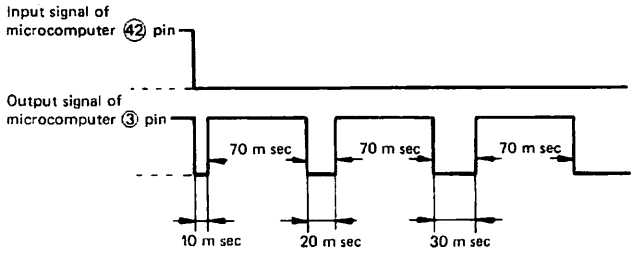


Figure 14–2 Tracking error input and corrected output

PHOTO SENSOR LEVEL CONVERTER CIRCUIT

This circuit is made up of Q519, Q520 and IC504, and the signal from each sensor is here so processed that it is shaped in waveform and changed in level to be applied to the microcomputer.

1. Tonearm position detection

When an EP or LP record is at the lead-in position or return position, LED507 and gear drum work together to detect this, and the resultant signal is applied to pin (7) of IC504, so that there appears at pin (10) of IC504 which is at "high" level (at 5V) arriving at pin (28) of the microcomputer.

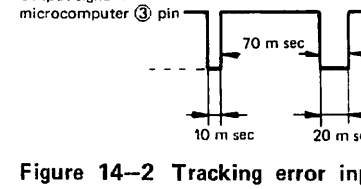


Figure 14–3

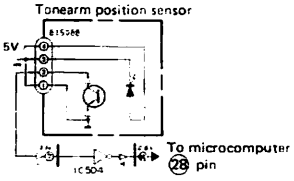


Figure 14–4

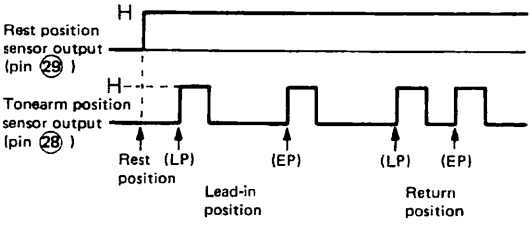


Figure 14–5 Tonearm position sensor output pulse

2. Record detection

- If an EP record is loaded, the sensor stops its light emission to Q527 while sends it to Q528, and so Q519 turns off and Q520 turns on. Therefore, the input signals to pin (26) and (27) of the microcomputer are at "low" level and "high" level respectively, so that the microcomputer can tell that an EP record has been loaded.

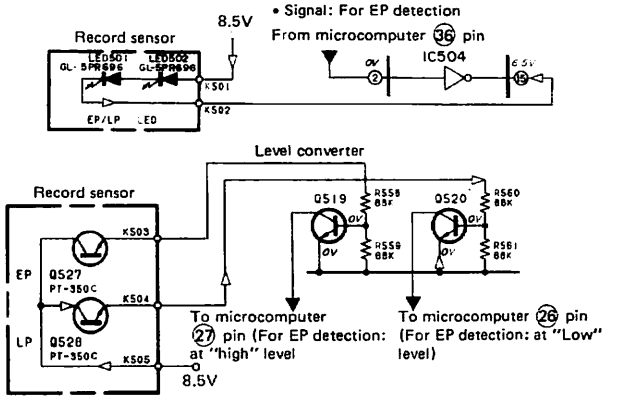


Figure 14–6 Record detection circuit

Record loading	EP sensor input (pin (27))	LP sensor input (pin (26))
EP record loaded	H	L
LP record loaded	H	H
No record loaded	L	L

Table 14–1 Record Detection Input

- If an LP record is loaded, the sensor stops its light emission to Q527 and Q528, and so Q519 and Q520 turn off. With Q519 and Q520 turned off, the input signals to pin (26) and pin (27) of the microcomputer are both at "low" level, so that the microcomputer can tell that an LP record has been loaded.
- When no record is loaded, the sensor sends its light emission to Q527 and Q528, and so Q519 and Q520 turn on. With Q519 and Q520 turned on, the input signals to pin (26) and (27) of the microcomputer are both at "low" level, so that the microcomputer can tell that no record has been loaded.

* The record detection sensors LED501 and LED502 are designed to cause light emission for 200 msec after the player door is closed or the power switch is turned on.

INDICATOR DRIVE CIRCUIT

This circuit is made up of inverter IC504.

When any of the side A/side B selector, both sides play key and repeat play key is pushed, the output from the microcomputer becomes "high" level to be fed to the inverter IC504. Here it is inverted to be "low" level signal to light up the indicator corresponding to one of these keys which has been pushed.

When the power switch is turned on or off, the reset signal from Q521 is applied to the microcomputer, and at the time, each indicator is muted to be kept off.

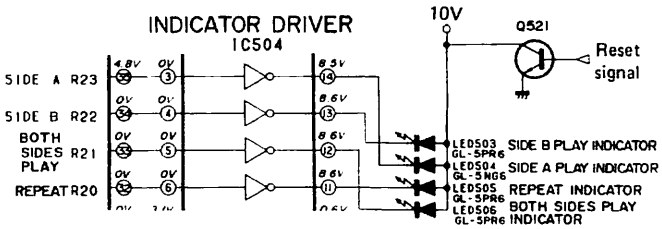


Figure 15–1 Indicator drive circuit

MUTING CIRCUIT

This circuit is made up of Q516 and Q517. When the output from pin (39) of the microcomputer is at "high" level, Q516 and Q517 turn on to cut off the signal which is applied to the side A and side B phono equalizers. This muting happens unless the unit is playing.

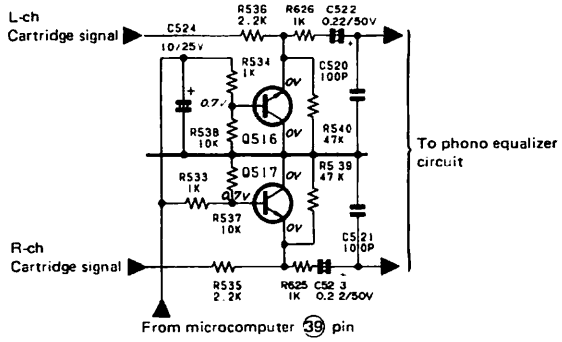


Figure 15–2 Muting circuit

AUTOMATIC PLAY CONTROL CIRCUIT

This circuit is composed of Q526, input selector switch SW101, protector switch SW702 and door close detector switch SW501.

1. When the input selector switch is set at "player" position and the protector switch is set at "off" position, a power of 5V is applied to the base of Q526 so that this transistor tuns on and the resultant "low" level signal is fed to pin (1) of microcomputer. And when the player door is closed, SW501 turns on to apply "low" level signal to pin (41) of the microcomputer. With both pins (1) and (41) fed with "low" level signal, the unit starts to perform record playing automatically: if otherwise, this automatic play does never occur.
2. When the unit is in play mode, if the input selector switch SW101 is changed from "player" poistion to any other position, the earth line of the door close detector switch SW501 is cut off through the switch SW101, so that the input signal to pin (41) of the microcomputer becomes "high" level and the microcomputer causes the tonearm to move up and return it to the rest position.
   If under this the input selector switch is returned to "player" position, the unit doesn't perform the automatic play because pin (41) of the microcomputer is at "high" level now: in order to start the automatic play, pins (1) and (41) of the microcomputer must be at "low" level at a time.
   And now the door close detector switch is turned on with the input selector switch returned to "player" position. Under this state, the voltage to be applied to the base of Q526 is controlled by C532 and R586 the time constant of which is set at 30 msec. Therefore with a time delay of 30 msec, the "low" level signal is applied to pin (1) of the microcomputer and this delay prevents the unit to perform the automatic play by error.
3. When the unit is in play mode, if the protector switch is turned on or off, the unit behaves in the same way as in item 2 above.

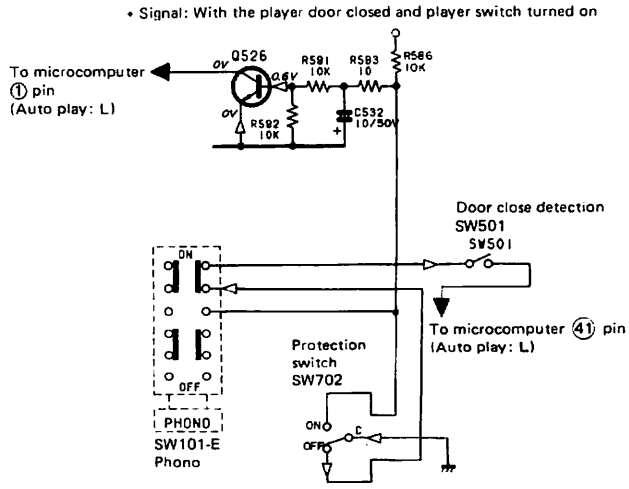


Figure 15–3 Auto play control circuit

PHONO MOTOR CONTROL CIRCUIT

This circuit consists of Q507 to Q517 and controls a proper rotation of the phono motor.

1. Speed (33/45 r.p.m.) selection

When the speed is set at 33 r.p.m., the output from pin (5) of the microcomputer becomes "high" level to turn on Q514, thus the phono motor revolving at the speed of 33 r.p.m. When the speed is set at 45 r.p.m., the output from pin (5) of the microcomputer becomes "low" level to turn off Q514, thus the phono motor revolving at the speed of 45 r.p.m.

The speed is adjustable with VR501 (for 33 r.p.m.) and VR502 (for 45 r.p.m.).

2. Normal/reverse rotation selection

- Normal rotation:
  When the side A is playing, the output from pin (6) of the microcomputer is at "low" level to turn off Q512 and turn on Q510 and Q507, and the output from pin (7) of the microcomputer is at "high" level to turn on Q511 and turn off Q509 and Q508. And a power of 5V is applied via R503 to Q513 to turn it on. Then pin (2) and pin (1) of the phono motor are positive and negative respectively, so that the phono motor revolves in normal direction.
- Reverse rotation:
  When the side B is playing, the output from pin (7) of the microcomputer is at "low" level to turn off Q511 and turn on Q509 and Q508, and the output from pin (6) of the microcomputer is at "high" level to turn on Q512 and turn off Q510 and Q507. Then pin (1) and pin (2) of the phono motor are positive and negative respectively, so that the phono motor revolves in reverse direction.

3. Speeed Control

Speed change of the phono motor between 33 r.p.m. and 45 r.p.m. is in accordance with a change of the voltage to be applied to it.

For instance, when the speed selector is changed from 33 r.p.m. to 45 r.p.m. position, the output from pin (5) of the microcomputer becomes "low" level to turn off Q514. With Q514 turned off, the voltage from pin (3) of the voltage generator in the phono motor is reduced through R518, VR502, VR501, and R517 to be applied to pin (6) of the phono motor. As the result of this voltage reduction of the base potential of R1 increases and the base potential of Q513 decrease respectively, compared with those as when they were at the speed of 33 r.p.m. Therefore the collector-to-emitter resistance of Q513 is also reduced to lower the negative potential of the phono motor (to increase the supply voltage to it), so that the phono motor speed is set at 45 r.p.m.

There may be a variation of the motor rotational speed, and this is corrected in the same way as above mentioned by increasing or decreasing the voltage to be applied to Q513. Thus this Q513 controls a proper voltage to apply it to the phono motor, with its speed being kept steady. With the variation of the motor speed, the voltage from pin (3) of the voltage generator in the phono motor is higher or lower than specified, resulting in that the base potential of Q1 is changed to increase or decrease voltage at the base of Q513. That is, if the motor speed is higher than specified, voltage at the base of Q513 decreases to lower supply voltage to the phono motor, so that the motor speed slows down to the specified one. If the speed is lower than specified, voltage at the base of Q513 increases to raise supply voltage to the phono motor, so that the motor speed grows up to the specified one.

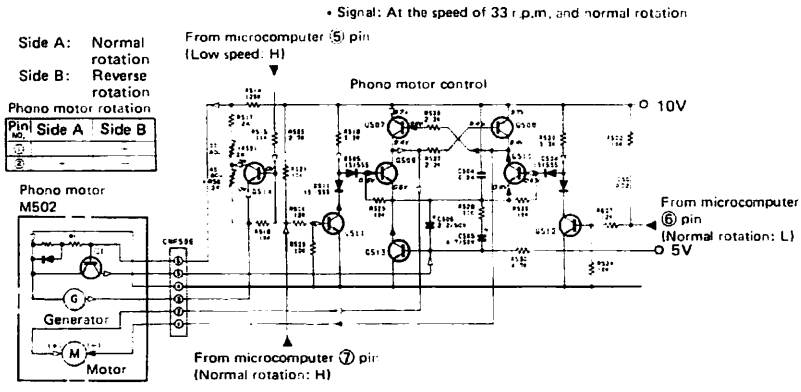


Figure 16–1 Phono motor control circuit

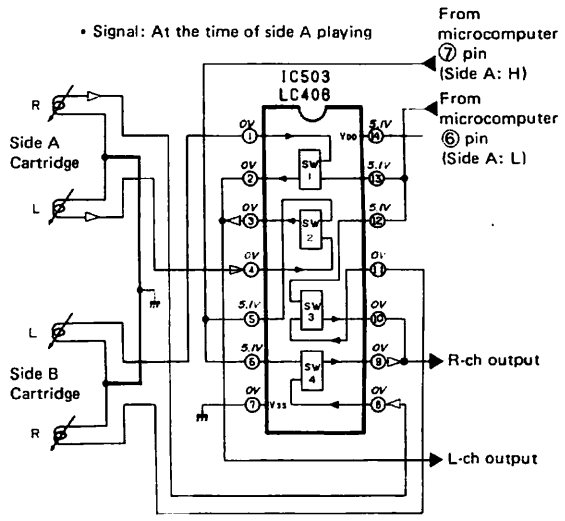


Figure 16–2 Side A/Side B cartridge signal selector circuit

SIDE A/SIDE B CARTRIDGE SIGNAL SELECTOR CIRCUIT

This circuit is made up of IC503, and selects the side A or side B phono equalizer circuit.

When the unit is set in side A play mode, the output from prn (6) of the microcomputer is at "low" level and the output from pin (7) of the microcomputer is at "high" level; and the former is applied to pin (12) (SW1) and pin (13) (SW3) of IC503 and the latter to pin (5) (SW2) and pin (6) (SW4) of IC503. As a result, SW2 and SW4 of IC503 turn on to feed the side A cartridge output to the phono equalizer circuit: at the time, SW1 and SW3 of IC503 are turned off to cut off the side B cartridge output. When the unit is set at side B play mode, the output from pin (6) of the microcomputer becomes "high" level and the output from pin (7) of the microcomputer becomes "low" level, so that SW1 and SW3 turns on, and SW2 and SW4 turns off, thus allowing the side B cartridge output to be applied to the phono equalizer circuit.

< MULTI-AMPLIFIER CIRCUIT >

This circuit is made up of IC401, IC402, Q401, Q403 and Q405: IC401 is a tweeter amplifier and IC402 is a woofer amplifier. Both IC401 and IC402 receives the signals from the tone control circuit; the input signal to the former has passed through the high-pass filter which consists of C435, R441, C401 and R405, and the input signal to the latter has passed through the low-pass filter which consists of R413 and C417.

When the external speaker is operated instead of the built-in speakers, the switches (5) and (6) at the input jack J403 get in contact with each other to apply "low" level signal to the base of Q450 to turn if off. With Q405 turned off, its collector voltage is fed via R426 to the base of Q402 to turn it on. With Q402 turned on, the input signal to the tweeter amplifier IC401 it cut off, none of its output entering the tweeter. With the switches (5) and (6) in contact, "low" level signal is also applied to the base of Q403 so that the low-pass filter is inactive to allow the whole range of signal to be applied to the woofer amplifier IC402. In other words, it is with the external speaker in operation that the IC402 works as a whole-range amplifier with the IC401 being cut off. The same occurs when the headphones is connected to the unit.

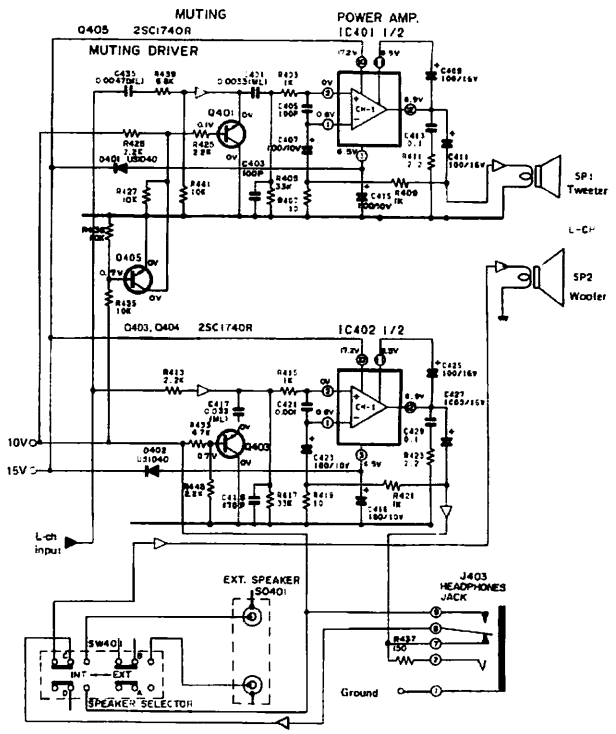
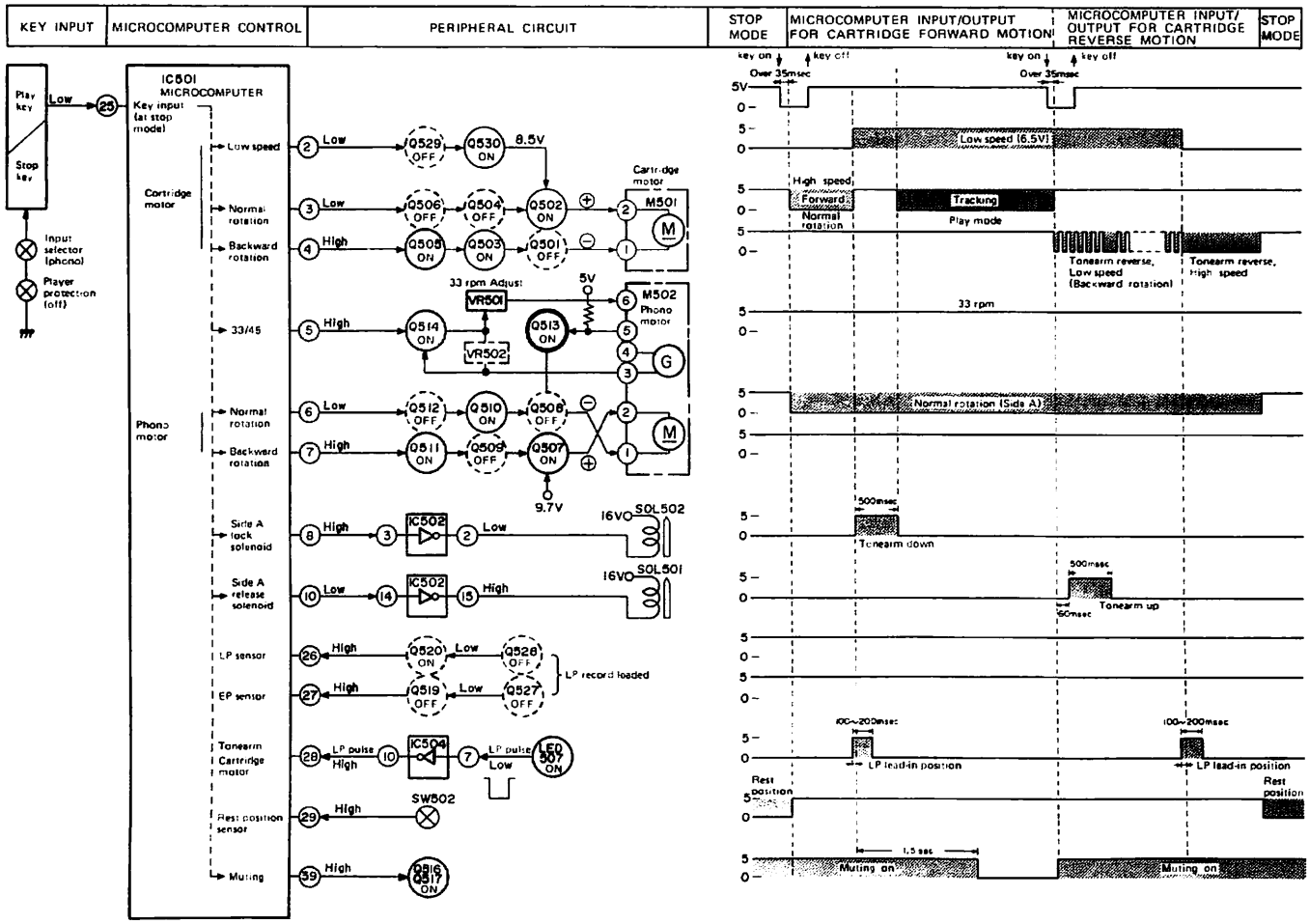
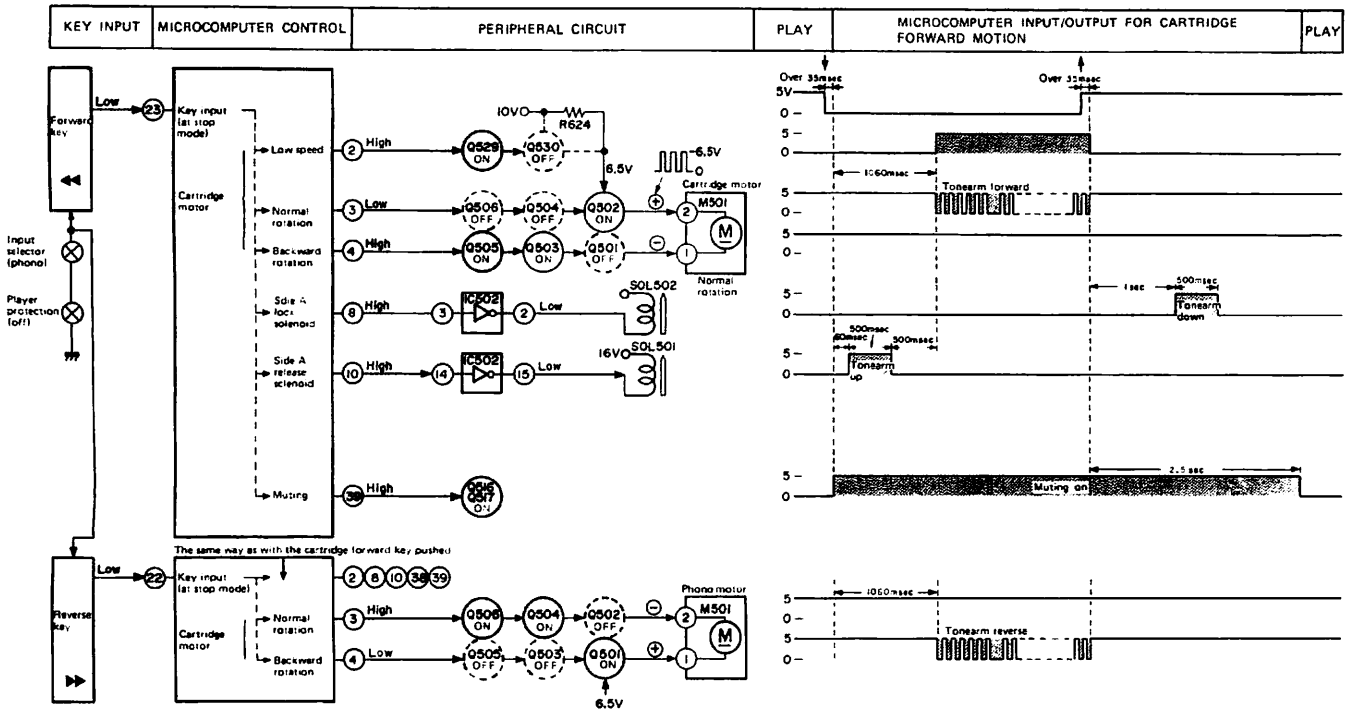
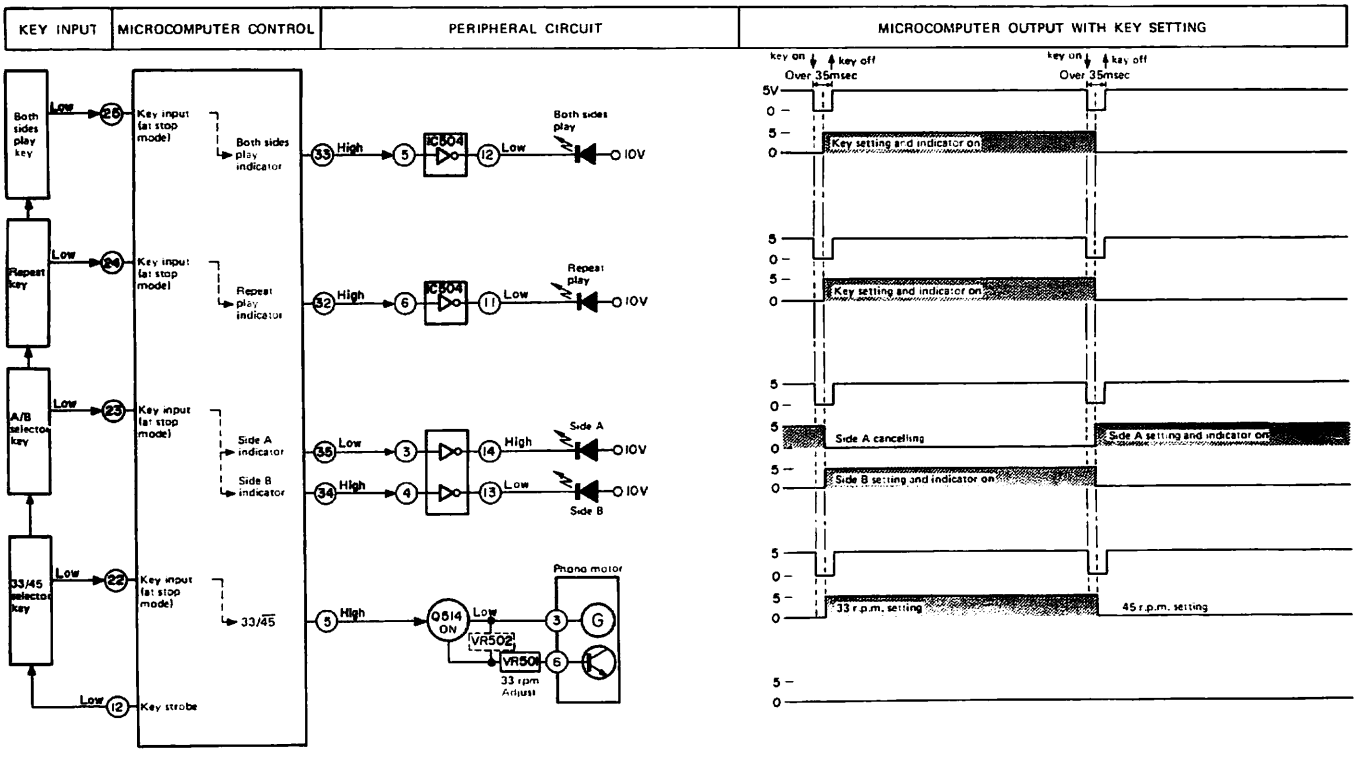


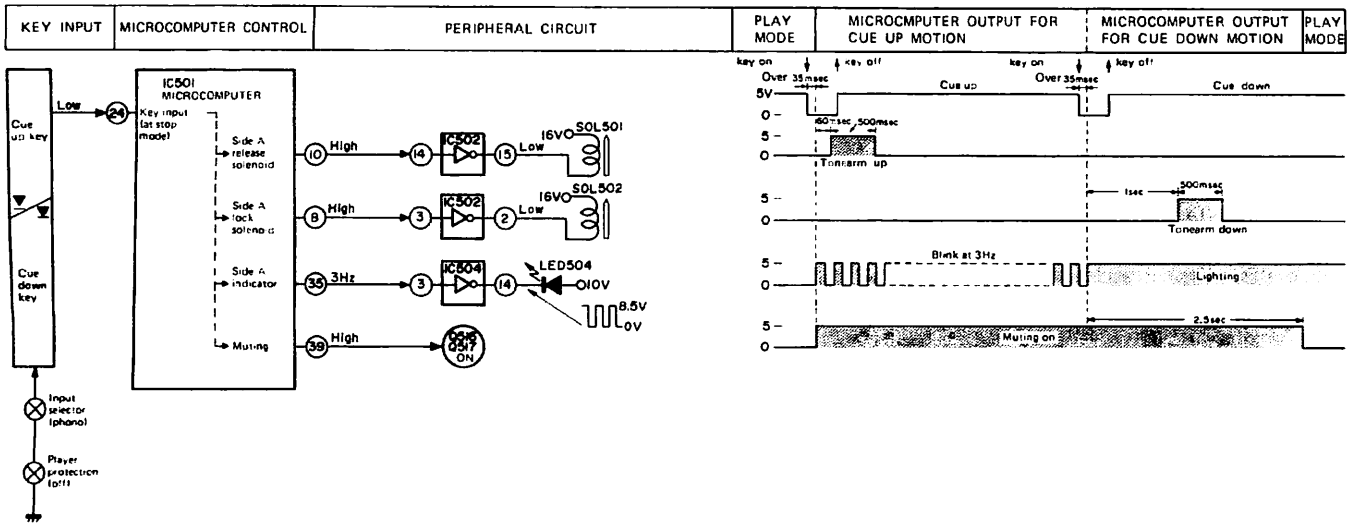
Figure 17–1 Multi amplifier circuit

OPERATION OF MICROCOMPUTER AND ITS PERIPHERAL CIRCUITS




KEY INPUT
MICROCOMPUTER CONTROL
PERIPHERAL CIRCUIT
PLAY
MICROCOMPUTER INPUT/OUTPUT FOR CARTRIDGE FORWARD MOTION
PLAY
Forward key
Reverse key
Input selector (phono)
Player protection (off)
Low
Key input (at stop mode)
Cartridge motor
Low speed
Normal rotation
Backward rotation
Side A lock solenoid
Side A release solenoid
Muting
High
Low
10V
R624
6.5V
Q528 ON
Q530 OFF
Q506 OFF
Q504 OFF
Q502 ON
Q505 ON
Q503 ON
Q501 OFF
M501
Normal rotation
IC502
SOL502
16V
SOL501
Q545 Q547 ON
The same way as with the cartridge forward key pushed
Phono motor
Over 35msec
1060msec
Tonearm forward
1sec
500msec
Tonearm down
300msec
Tonearm up
2.5 sec
Muting on
Tonearm reverse


KEY INPUT
MICROCOMPUTER CONTROL
PERIPHERAL CIRCUIT
MICROCOMPUTER OUTPUT WITH KEY SETTING
Both sides play key
Repeat key
A/B selector key
33/45 selector key
Key input (at stop mode)
Both sides play indicator
Repeat play indicator
Side A indicator
Side B indicator
33/45
Key strobe
High
Low
IC504
10V
Both sides play
Repeat play
Side A
Side B
Q514 ON
VR502
VR501
33 rpm Adjust
Phono motor
key on
key off
Over 35msec
Key setting and indicator on
Side A cancelling
Side A setting and indicator on
Side B setting and indicator on
33 r.p.m. setting
45 r.p.m. setting



ADJUSTMENT OF TAPE MECHANISM

PINCH ROLLER PRESSURE CHECK

1. Place the unit in PLAY mode.
2. Push the pinch roller, at the point shown in Fig. 19–1, by using a tension gauge (500 gr.) so that it will come off the capstan. Then, release the tension slowly until the pinch roller hits the capstan again (i.e., the pinch roller is about to rotate again). Then check the tension gauge is reading 295 gr. to 365 gr.
3. If the reading is outside the range of 295 gr. to 365 gr. replace the pressure spring of the pinch roller.

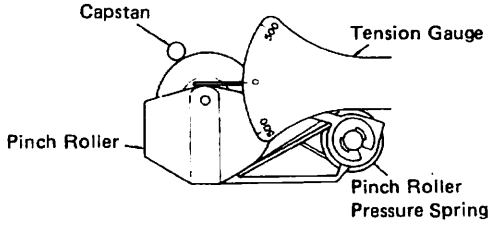


Figure 19–1

TORQUE CHECK AT PLAY, FAST FORWARD AND REWIND MODES

Put a torque meter cassette in the cassette compartment of the set, and see that the measured torque in each mode is normal as follows:

Table 19–1

Mode	Torque meter cassette	Measured torque
Playback	TW-2111	35 ~ 65 gram-cm
Fast-forward	TW-2231	90 ~ 135 gram-cm
Rewind	TW-2231	90 ~ 135 gram-cm

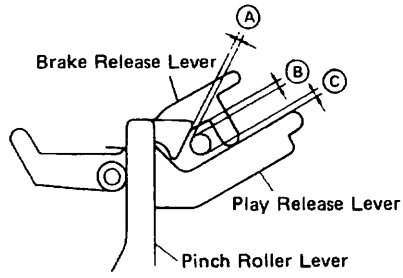


Figure 19–2

GAP CHECK OF PINCH ROLLER LEVER

Place the set in play mode, and see that the pinch roller lever moves to create the gaps (A), (B) and (C) as shown in Fig. 19–2.

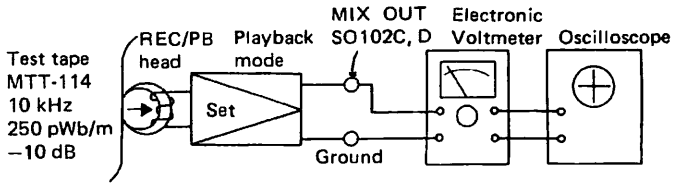


Figure 19–3

RECORD/PLAYBACK HEAD AZIMUTH ADJUSTMENT

As shown in Fig. 19–3, make connection of instruments, and adjust the head azimuth adjusting screw so that Voltmeter reading is maximal, with no phase difference between channels.

TAPE SPEED ADJUSTMENT

As shown in Fig. 19–4, make connection of instruments, put a screwdriver (for high-frequency use) into the hole of the motor, and adjust the variable resistor so that the output frequency is 2970 to 3000 Hz on frequency counter.

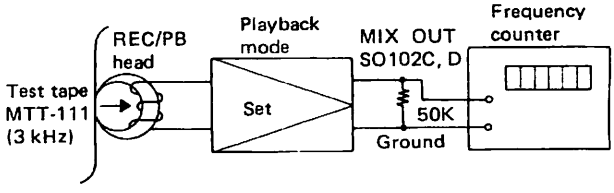


Figure 19–4

ADJUSTMENT OF PLAYER MECHANISM

POSITIONAL ADJUSTMENT OF PLAYER DOOR CLOSE DETECTOR SWITCH

1. Close the player door until it is about to be locked, and check that the player door close detector switch is turned on. Then fix the switch retaining bracket with its screw temporarily.
2. Make the door locked completely, and tighten the screw so that there is a clearance of 1mm at the part Ⓐ shown in Fig. 20–1.

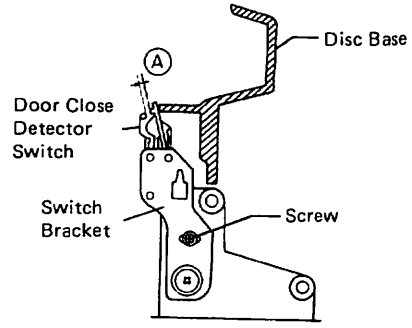


Figure 20–1

POSITIONAL ADJUSTMENT OF TONEARM LEAD-IN POSITION

1. Put an LP record in the unit with the power switch turned on.
2. Push the cue key to set the unit in cue up state.
3. Close the player door, and check that the tonearm moves off the rest position and reaches the LP lead-in position.
4. Operate the cartridge forward key and cartridge reverse key alternately until the tonearm wire tension is constant, and turn off the power switch when the tonearm is at the lead-in position.
5. Loosen the screw at the side A or side B tonearm wire to allow the tonearm to move freely. At the time, hold the tonearm guide not to allow the cartridge stylus to hit the record.
6. Move the tonearm until the cartridge stylus tip is positioned at almost the center of the lead-in groove of the record, and then tighten the tonearm wire screw. Here also hold the tonearm guide not to allow the stylus tip to hit the record.
7. Again turn on the power switch, push the play/cut key and check that the stylus tip descends on the center of the record lead-in groove.
   If not, push the play/cut key again to return the tonearm to the rest position, and repeat steps 2 to 7, or correct it by using the fine adjustment screw.
8. Put an EP record in the unit, and perform the same checking as with an LP record.

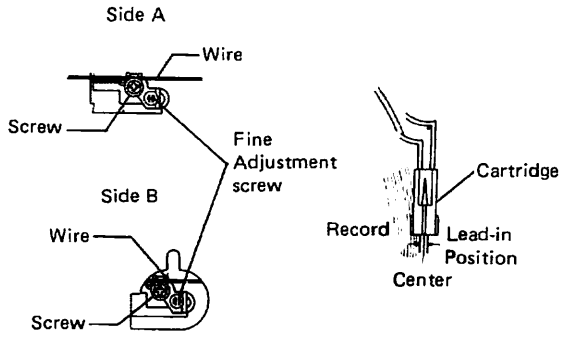


Figure 20–2

POSITIONAL ADJUSTMENT OF REST POSITION DETECTOR SWITCH

1. After the positional adjustment of the tonearm lead-in position, return the tonearm to the rest position and check that the tonearm does not touch the cartridge cushion or the balance cushion.
2. If it touches the cushion, move the rest position detector switch to right and then secure it. See Fig. 20–3.

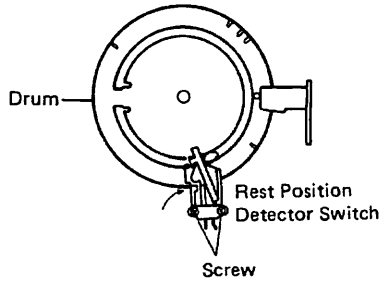
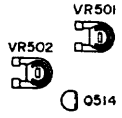


Figure 20–3

ROTATIONAL ADJUSTMENT OF PHONO MOTOR

1. Prepare an LP record which is provided with a strobo viewer, and load it in the unit. Then put the unit in cue up made – by pushing the cue key first and then closing the player door.
2. Adjust variable resistor VR501 or VR502 so that the strobo viewer appears to be still.
   - VR501: at 33 r.p.m. speed
   - VR502: at 45 r.p.m. speed (set by the speed selector key)



MICROCOMPUTER PWB-EI

Figure 20–4 Adjustment points

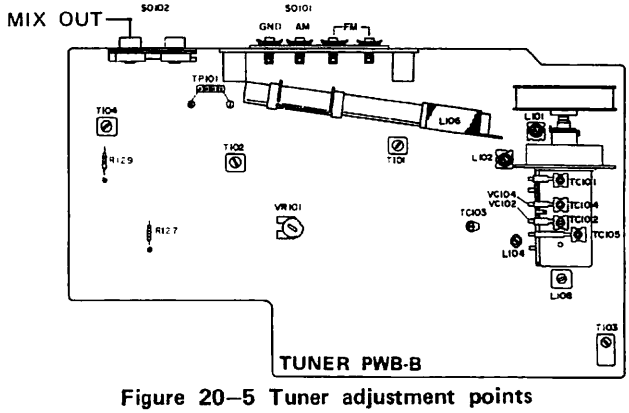


Figure 20–5 Tuner adjustment points

ADJUSTMENT OF TUNER CIRCUIT

AM IF/RF ADJUSTMENT

- Set the function selector switch at AM position.
- Set the signal generator to produce a signal of 400Hz, 30%, AM modulated.

STEP	TEST STAGE	FRE-QUEN-CY	DIAL POINTER SETTING	AD-JUST-MENT	REMARKS
IF (Make connection of instruments as shown if Fig. 21–1.					
1	IF	455kHz	High Frequency	T102, T103	Turn the cores of T102 and T103 until IF waveform is maximal as shown in Fig. 21–2. Repeat this twice or three times to obtain best resalt.
RF (Make connection of instruments as shown in Fig. 21–3.					
2	Band coverage	515kHz	Lowest frequency	L108	Adjust for maximal output.
3		1650kHz	Highest frequency	TC105	
4	Tracking	600kHz	Tune to 600 kHz	L106	
5		1400kHz	Tune to 1400 kHz	TC104	
6	Repeat steps 2, 3 and 4, 5 until no further improvement can be made.				

FM IF/RF ADJUSTMENT

- Set the function selector switch at FM position.
- Set the signal generator to produce a signal of 400Hz, 75kHz dev, FM modulated.

STEP	TEST STAGE	FRE-QUEN-CY-	DIAL POINTER SETTING	AD-JUST-MENT	REMARKS
IF (Make connection of instruments as shown in Fig. 21–4.					
1	IF	10.7MHz	High frequency	T101	Turn the core of T101 until wave-form is symmetrical in right and left as shown in Fig. 21–5.
2	Detec-tion			T104	Turn the core of T104 until wave-form is symmetrical in the upper and lower with best linearity ("S" curve), as shown in Fig. 21–6.
3	Repeat steps 1 and 2 until no further improvement can be made.				
RF (Make connection of instruments as shown in Fig. 21–7.					
4	Band coverage	108.3MHz	Highest frequency	TC103	Adjust for maximal output
5		87.3MHz	Lowest frequency	L104	
6	Tracking	90MHz	Tune to 90MHz	L101, L102	
7		106MHz	Tune to 106MHz	TC101, TC102	
8	Repeat steps 4, 5 and 6, 7 until no further improvement can be made				

VCO FREQUENCY ADJUSTMENT

- Set the function selector switch at FM stereo position.
- Set the signal generator to produce a signal of 400Hz, 75kHz dev, FM modulated (mono signal)
- Make connection of instruments as shown in Fig. 21–8.

FREQUENCY	DIAL POINTER SETTING	ADJUST-MENT	REMARKS
98MHz at 60dB	Tune to 98MHz	VR101	Adjust VR103 so that frequency coun-ter reads 19kHz ± 19Hz.

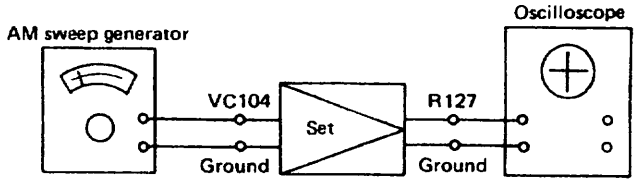


Figure 21–1 AM IF Adjustment

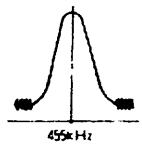


Figure 21–2 AM IF Curve

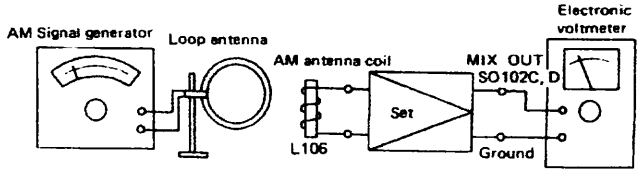


Figure 21–3 AM RF Adjustment

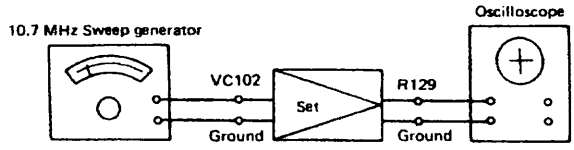
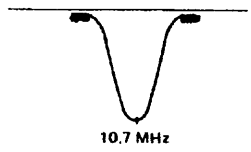


Figure 21–4 FM IF Adjustment



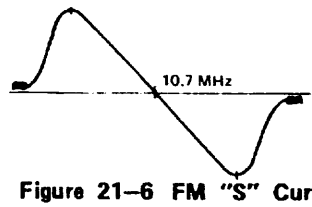


Figure 21–5 FM IF Curve Figure 21–6 FM "S" Curve

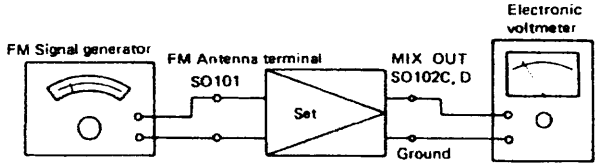


Figure 21–7 FM RF Adjustment

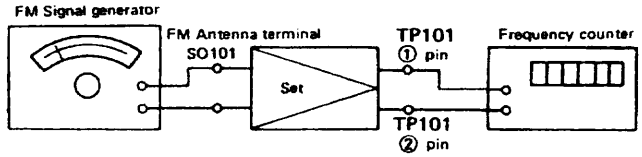


Figure 21–8 VCO Frequency Adjustment

ADJUSTMENT AND CHECK OF RECORD/PLAYBACK AMPLIFIER

BIAS CURRENT ADJUSTMENT

- Make connection of instruments as shown in Fig. 22–1, and adjust variable resistor VR205 or VR206 so that bias current available with the tape selector switch set at each position is shown in Table 22–1.

Table 22–1

Tape selector switch	Voltage (Bias current)	Adjustment
Normal	42 mV (420 μA)	VR205 (L-ch), VR206 (R-ch)
CrO_2	56 ~ 64 mV (560 ~ 640 μA)	Checking
Metal	74 ~ 86 mV (740 ~ 860 μA)	

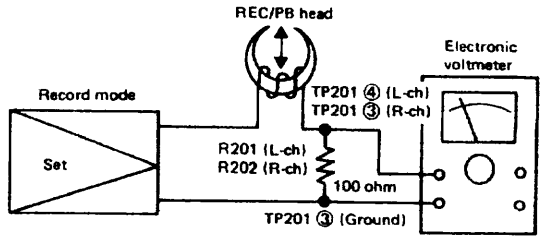


Figure 22–1

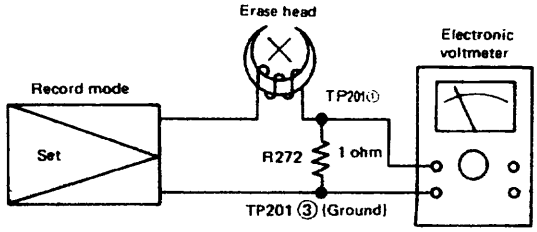


Figure 22–2

ERASE CURRENT CHECK

- Make connection of instruments as shown in Fig. 22- 2, and check if the erase current is as shown in Table 22–2.

Table 22–2

Tape selector switch	Voltage (erase current)
Metal	120 ~ 160 mV (120 ~ 160 mA)

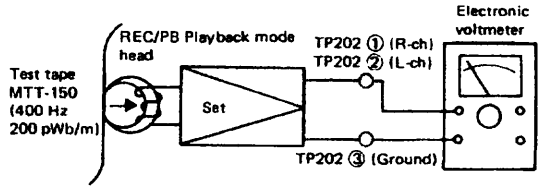


Figure 22–3

PLAYBACK SENSITIVITY ADJUSTMENT

- Make connection of instruments as shown in Fig. 22–3, and adjust variable resistor VR201 or VR202 so that the playback sensitivity is as shown in Table 22–3.

Table 22–3

Switch	Voltage	Adjustment
Tape selector switch at "normal" Dolby NR switch at "off"	580 mV	VR201 (L-ch), VR202 (R-ch)

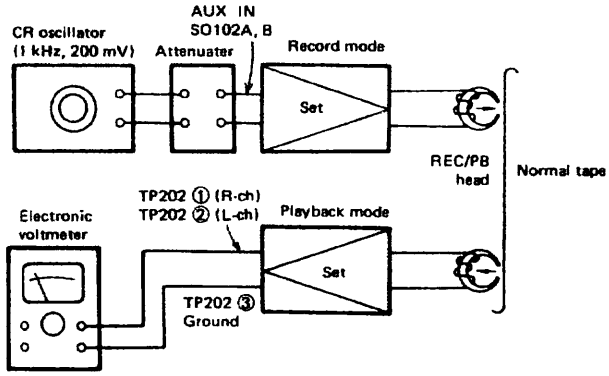


Figure 22–4

RECORD/PLAYBACK SENSITIVITY ADJUSTMENT

- Make connection of instruments as shown in Fig. 22–4, adjust variable resistor VR303, VR304, VR203 or VR204 so that the record/playback sensitivity is as shown in Table 22–4.

Table 22–4

Step	Switch	Voltage	Adjustment
Record	Tape selector switch at "normal" Dolby NR switch at "off"	150 mV	Record level controls VR303 (L-ch), VR304 (R-ch)
Play-back		140 ~ 160 mV	VR203 (L-ch), VR204 (R-ch)

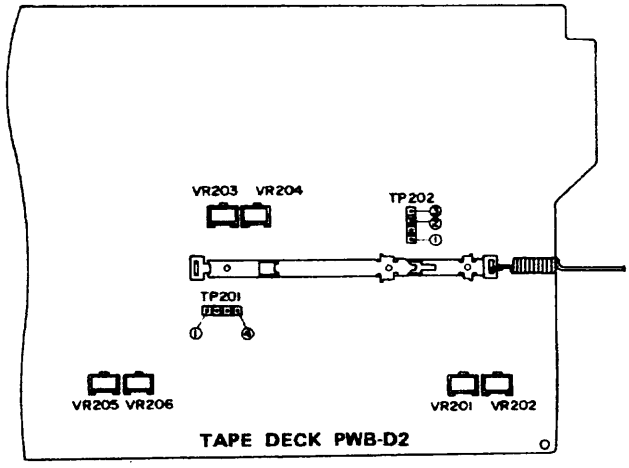
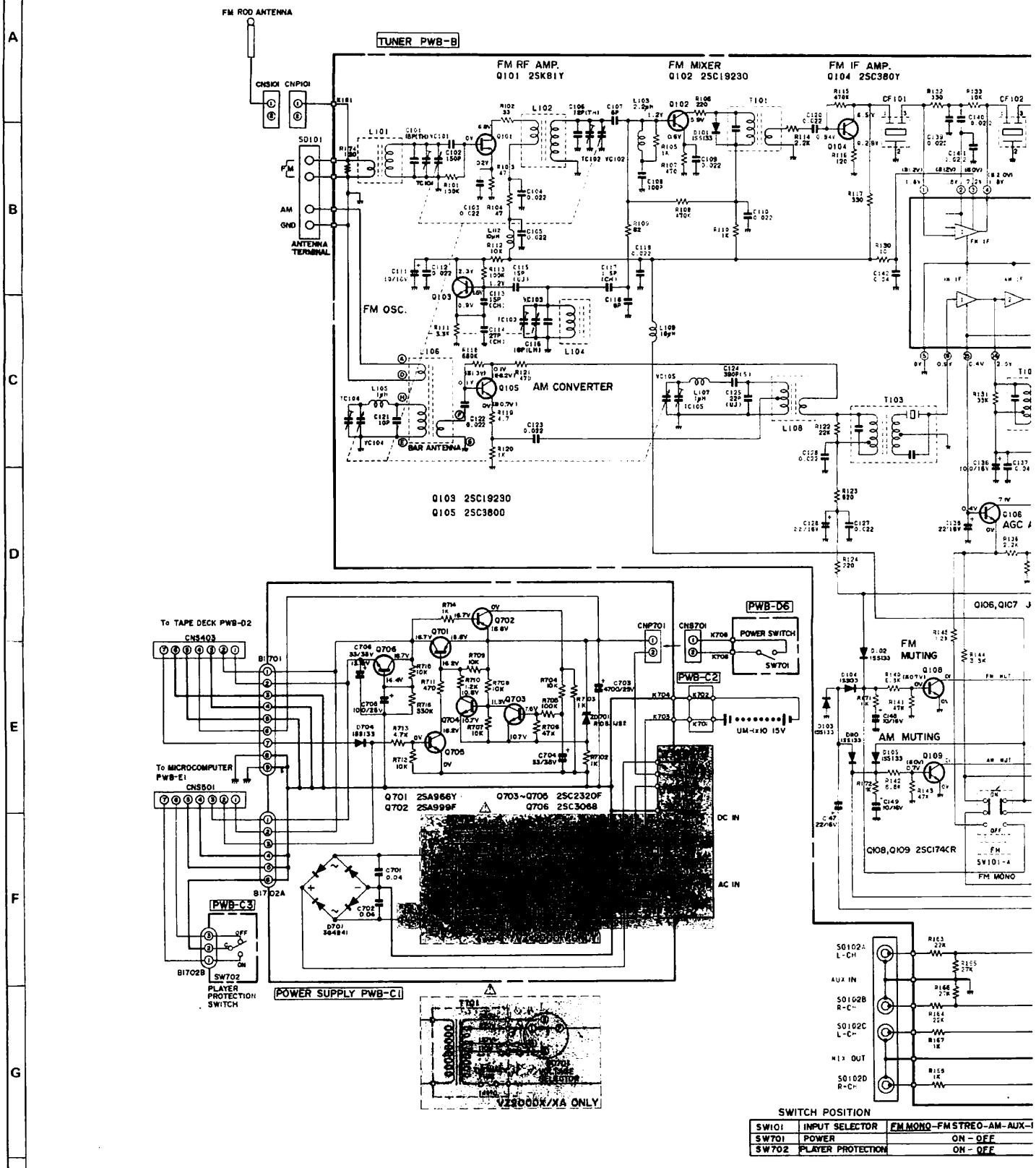


Figure 22–5 Adjustment points

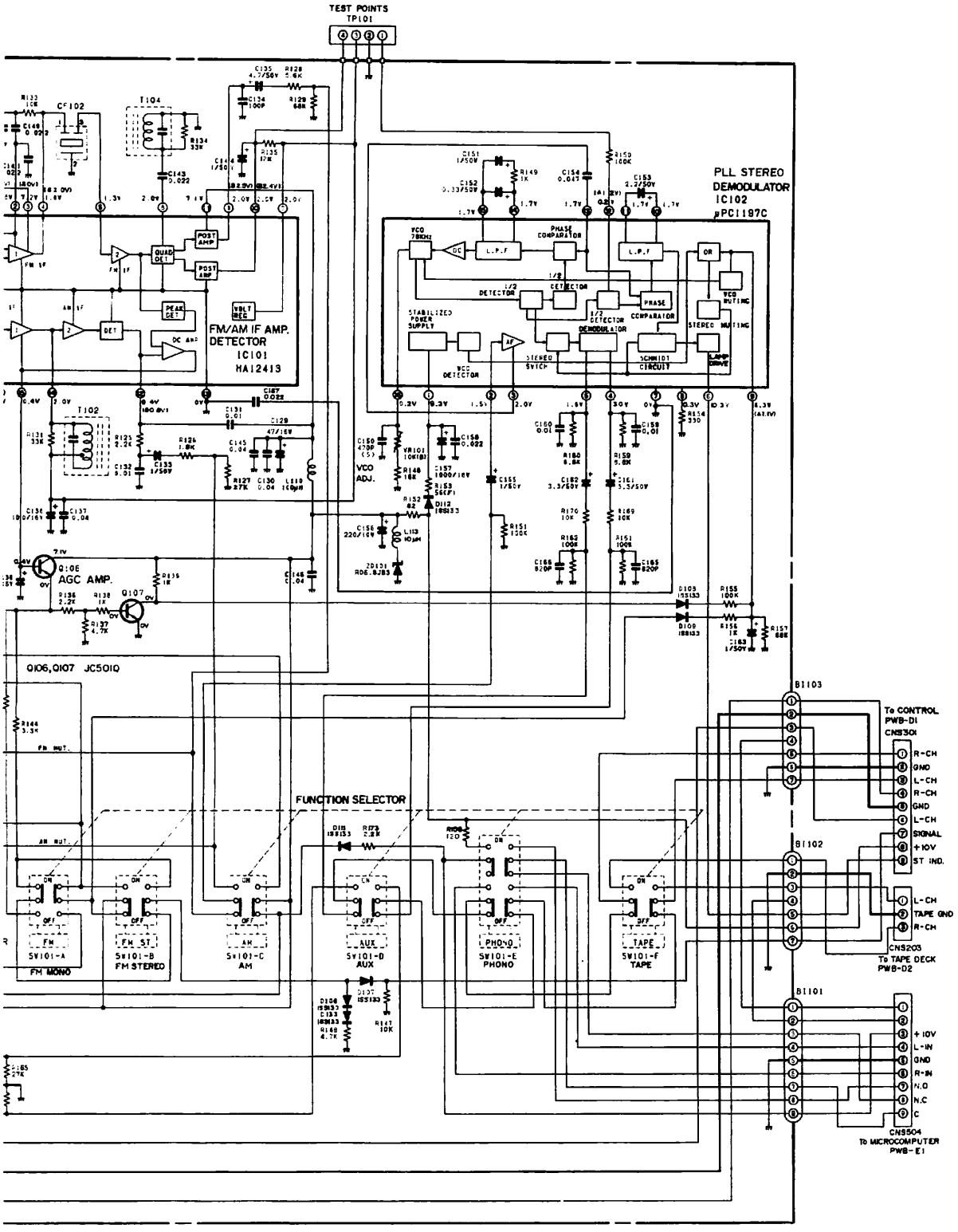


NOTES ON SCHEMATIC DIAGRAM

1. The indicated voltage in each section is the one measured by electronic volt meter between such a section and the chassis with no signal being given.

- Tuner Section (1/4):
  Unless otherwise specified, voltage is measured in FM mono mode. But it is in FM stereo mode for the parts marked with "Δ" and in AM mode for the parts marked with *.

Figure 23 SCHEMATIC DIAGI



STEREO-AM-AUX-PHONO-TAPE
ON-OFF
ON-OFF

- Microcomputer section (4/4):
  Unless otherwise specified, voltage is measured with the player switch set at "on" position, no record loaded, the door closed and the tonearm at the rest position. Voltage with a tracking error caused is indicated by the mark •.

2. Parts marked with "⚠" (▭) are important for maintaining the safey of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.
3. Specifications or wiring diagrams of this model are subject to change for improvement without prior motice.

'IC DIAGRAM (1/4)

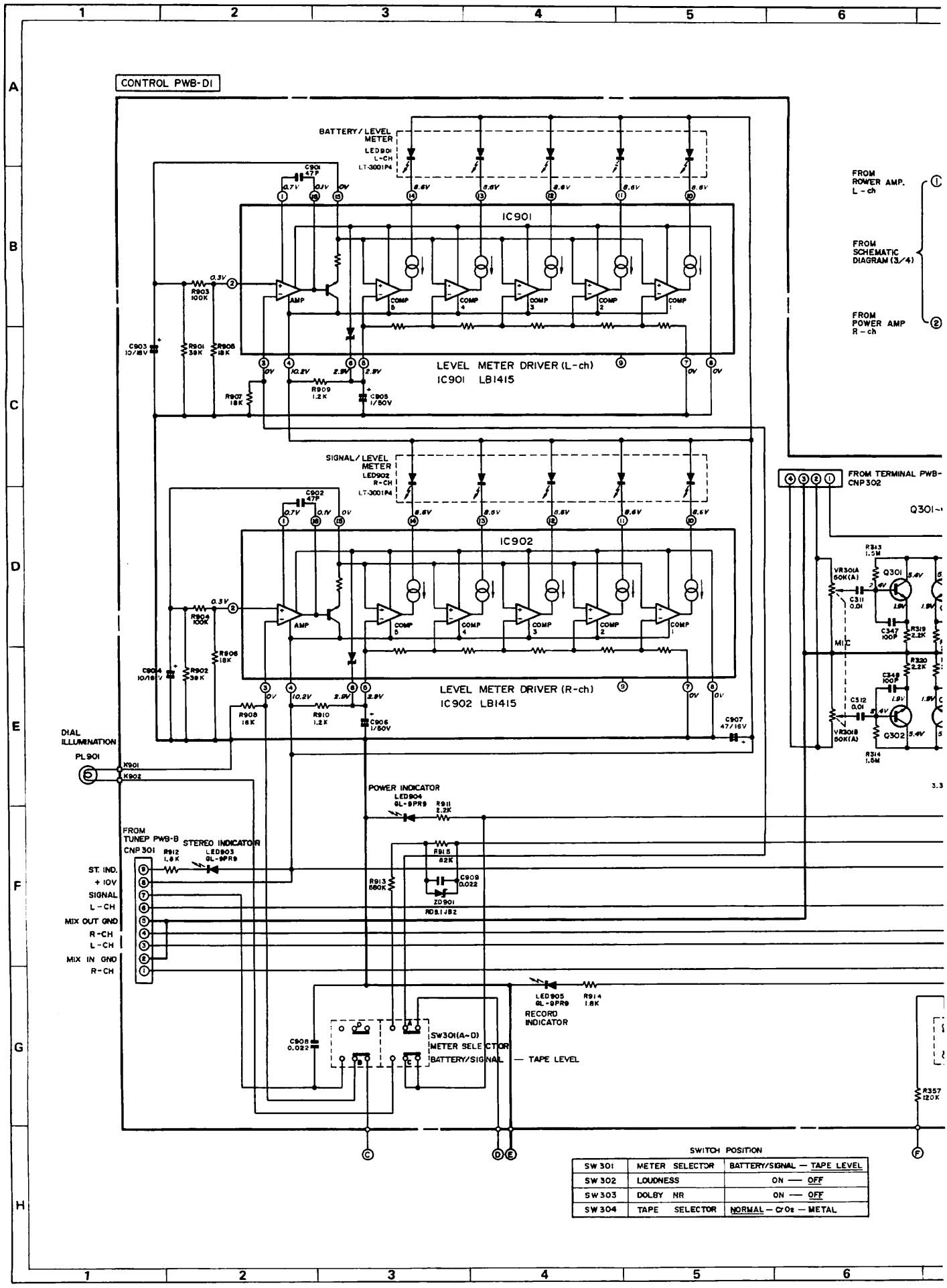
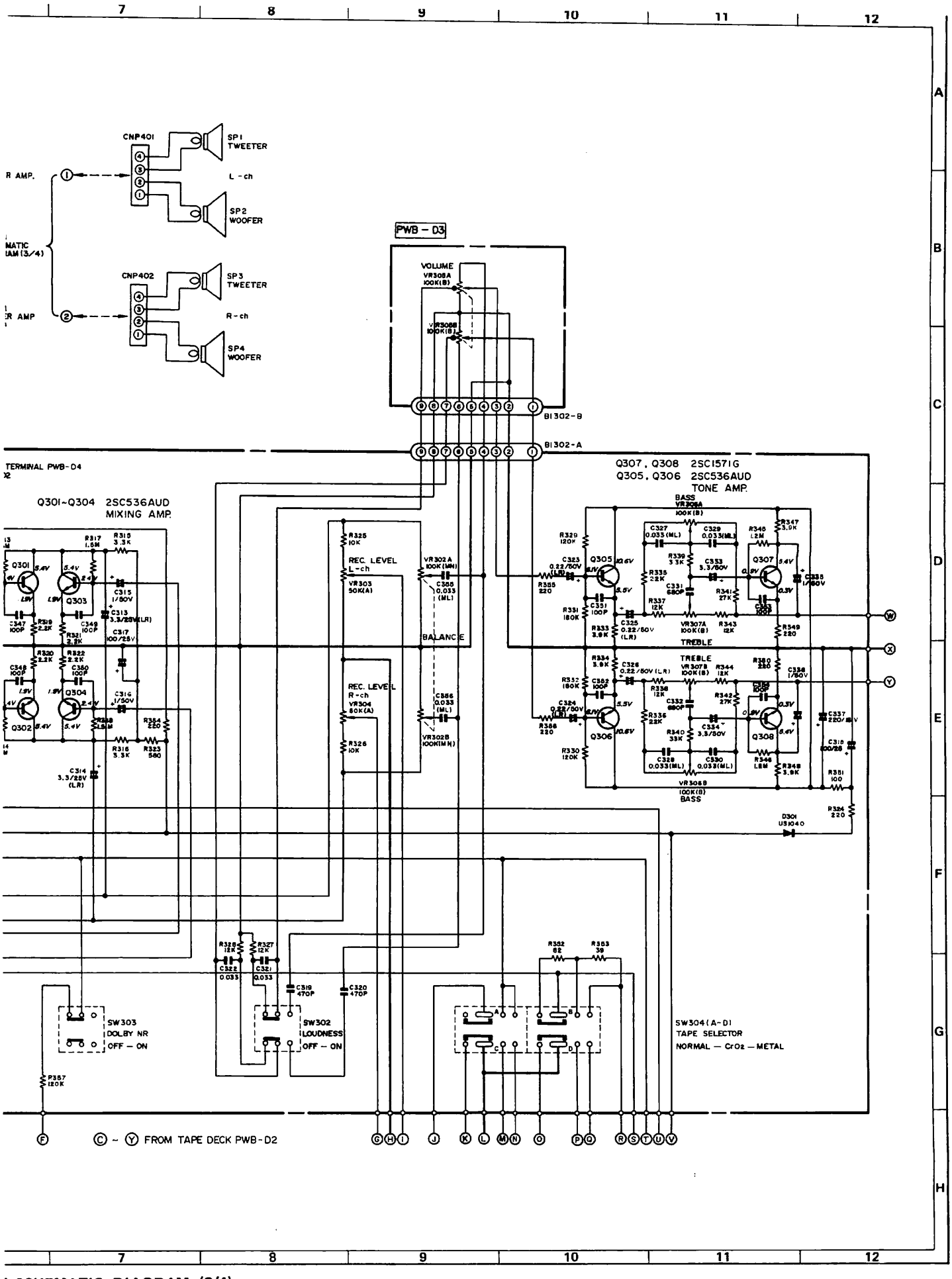
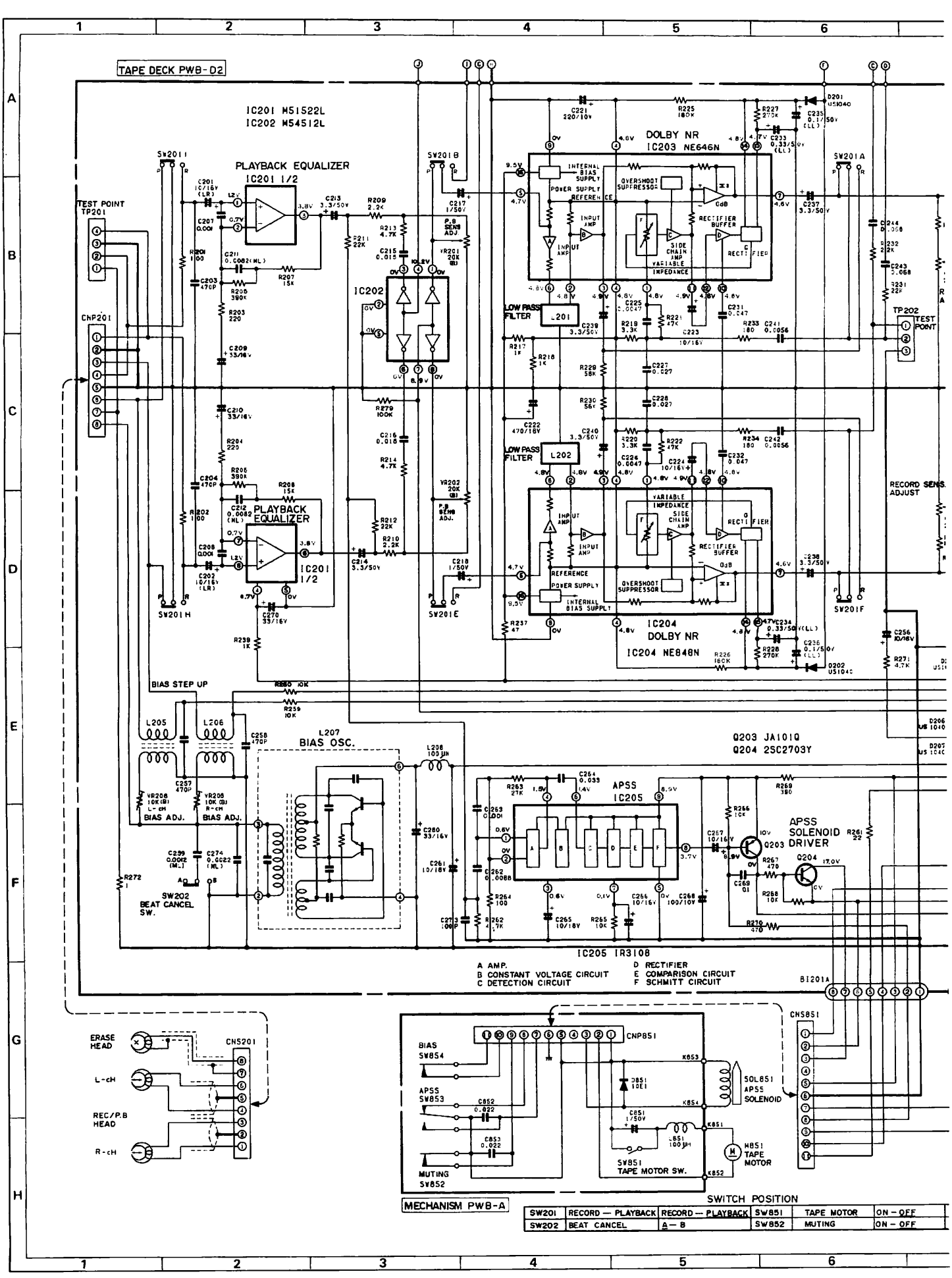


Figure 25 SCHEM.



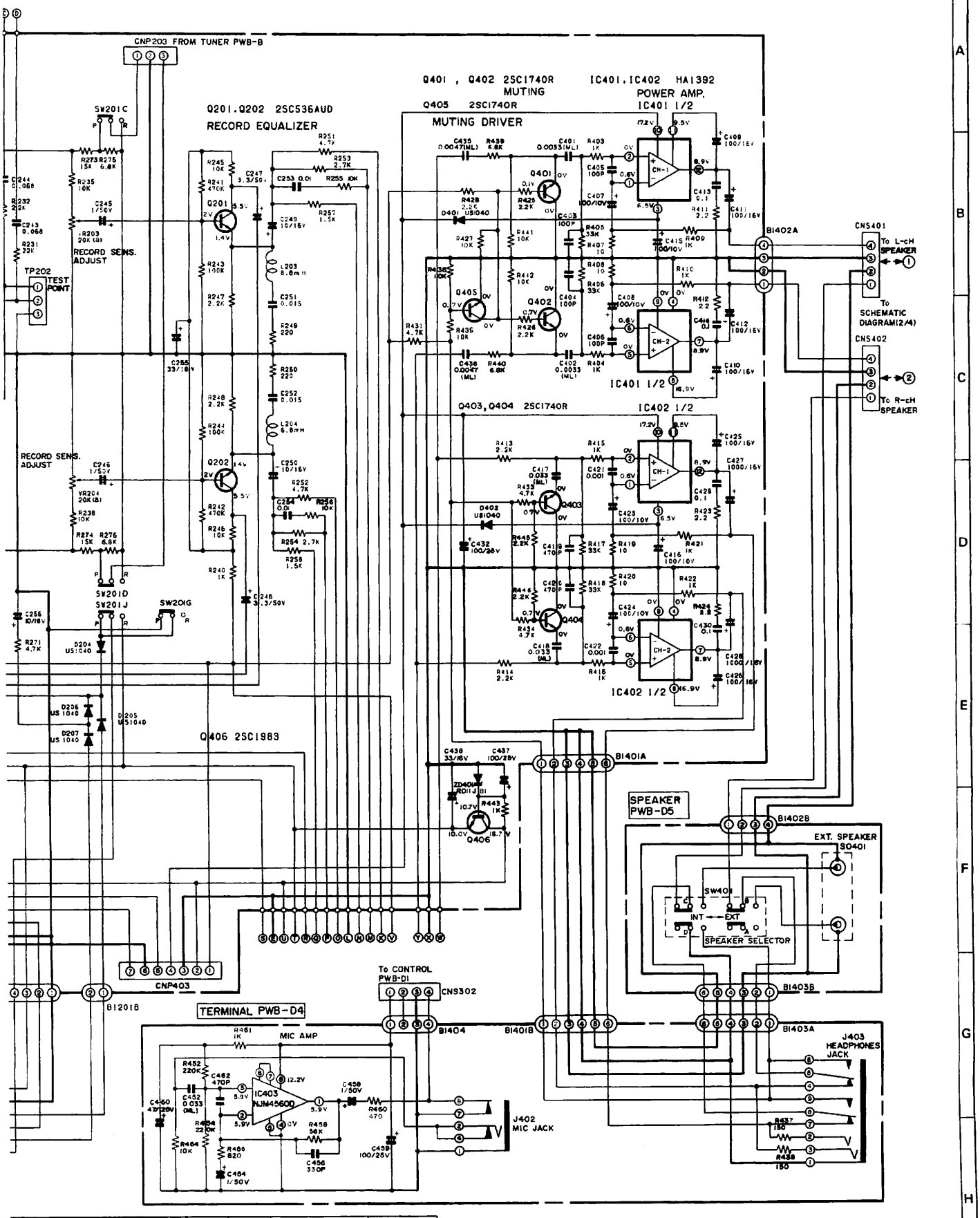
SCHEMATIC DIAGRAM (2/4)



SWITCH POSITION

SW201	RECORD — PLAYBACK	RECORD — PLAYBACK	SW851	TAPE MOTOR	ON — OFF
SW202	BEAT CANCEL	A — B	SW852	MUTING	ON — OFF

Figure 27 SCHEMATIC DIAGR



ON-OFF	SW853	APSS	ON-OFF	SW401	SPEAKER SELECTOR	INT - EXT
ON-OFF	SW854	BIAS	ON-OFF			

C DIAGRAM (3/4)

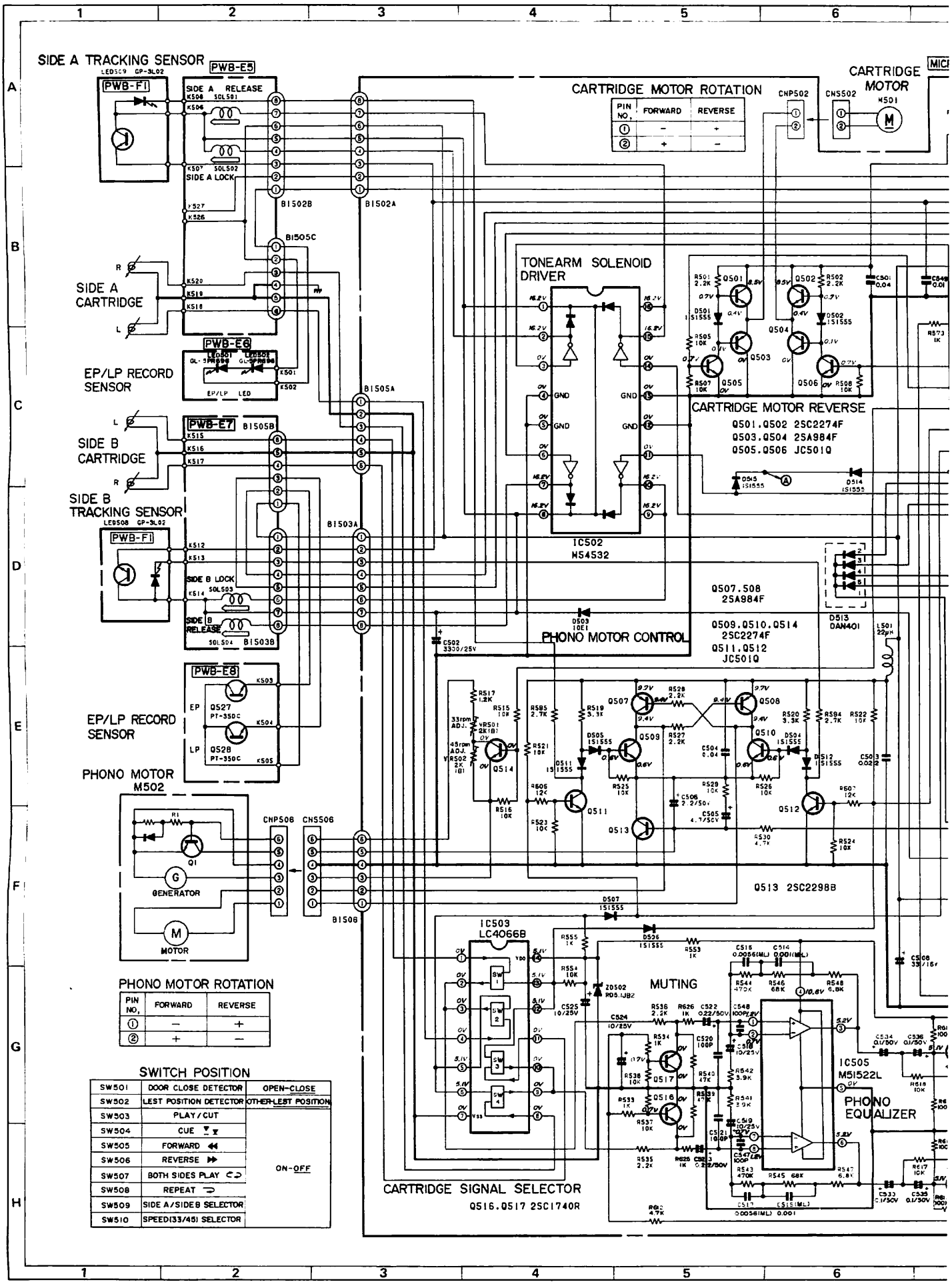
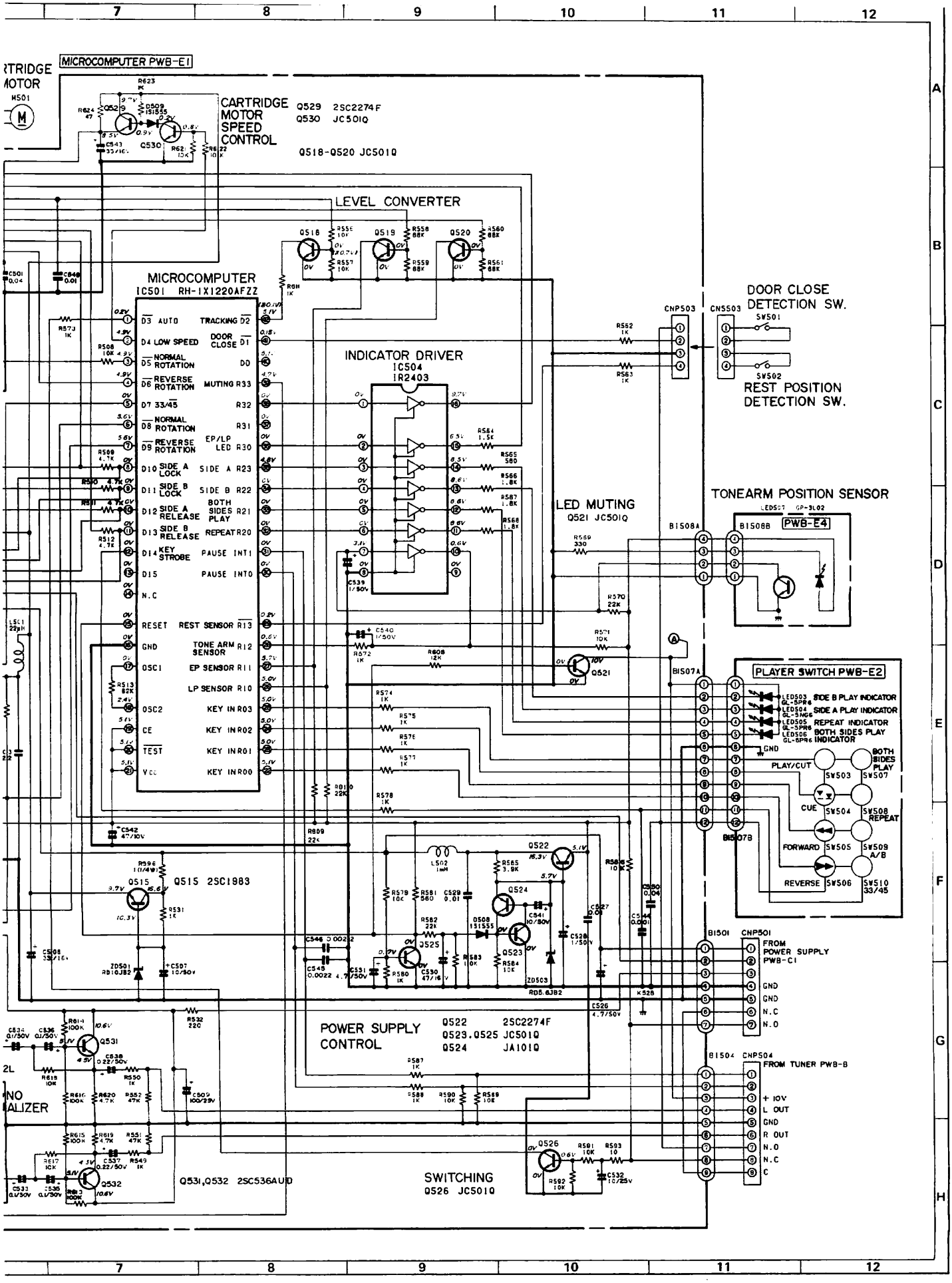


Figure 29 SCHEMA



SCHEMATIC DIAGRAM (4/4)

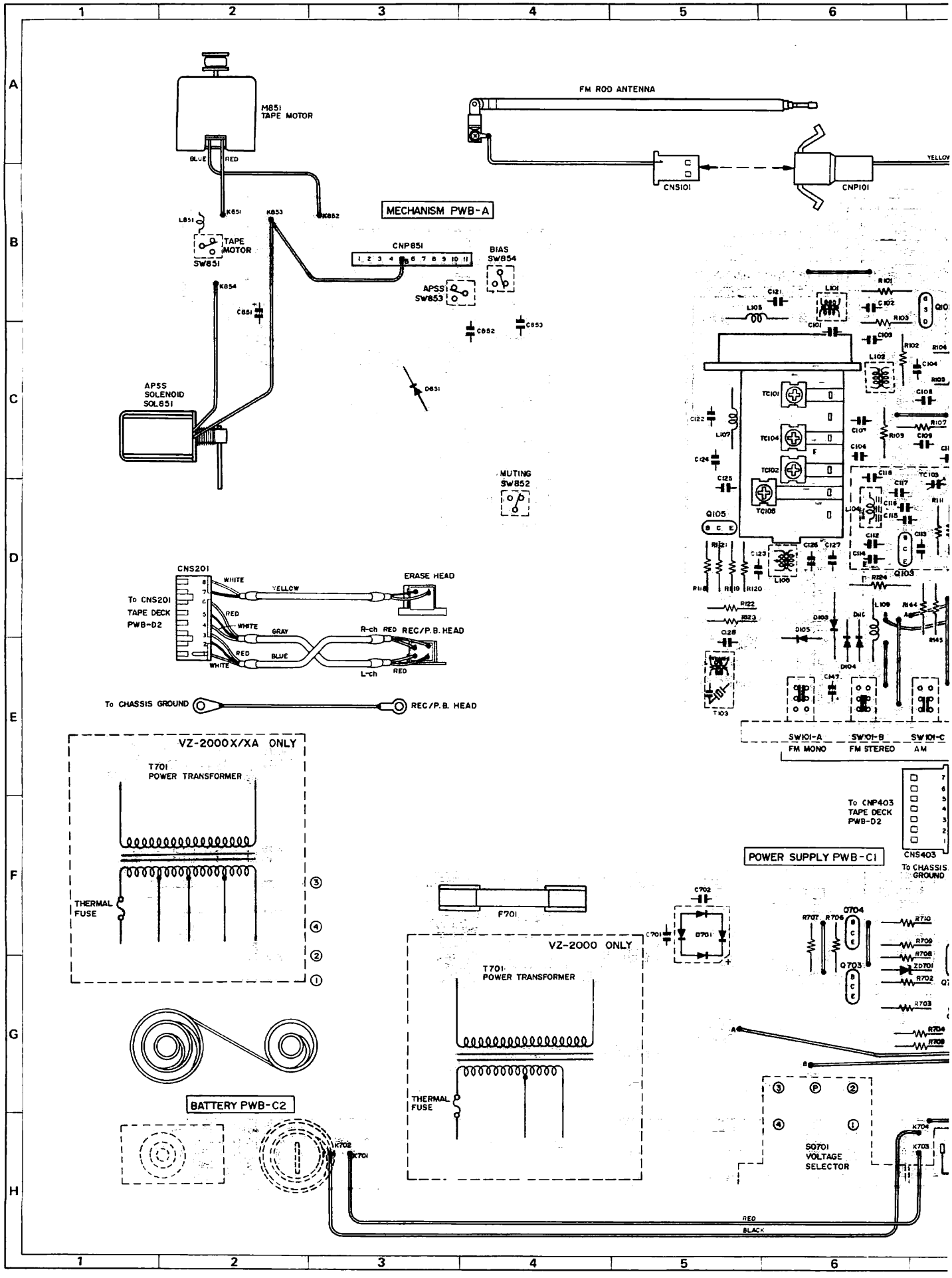
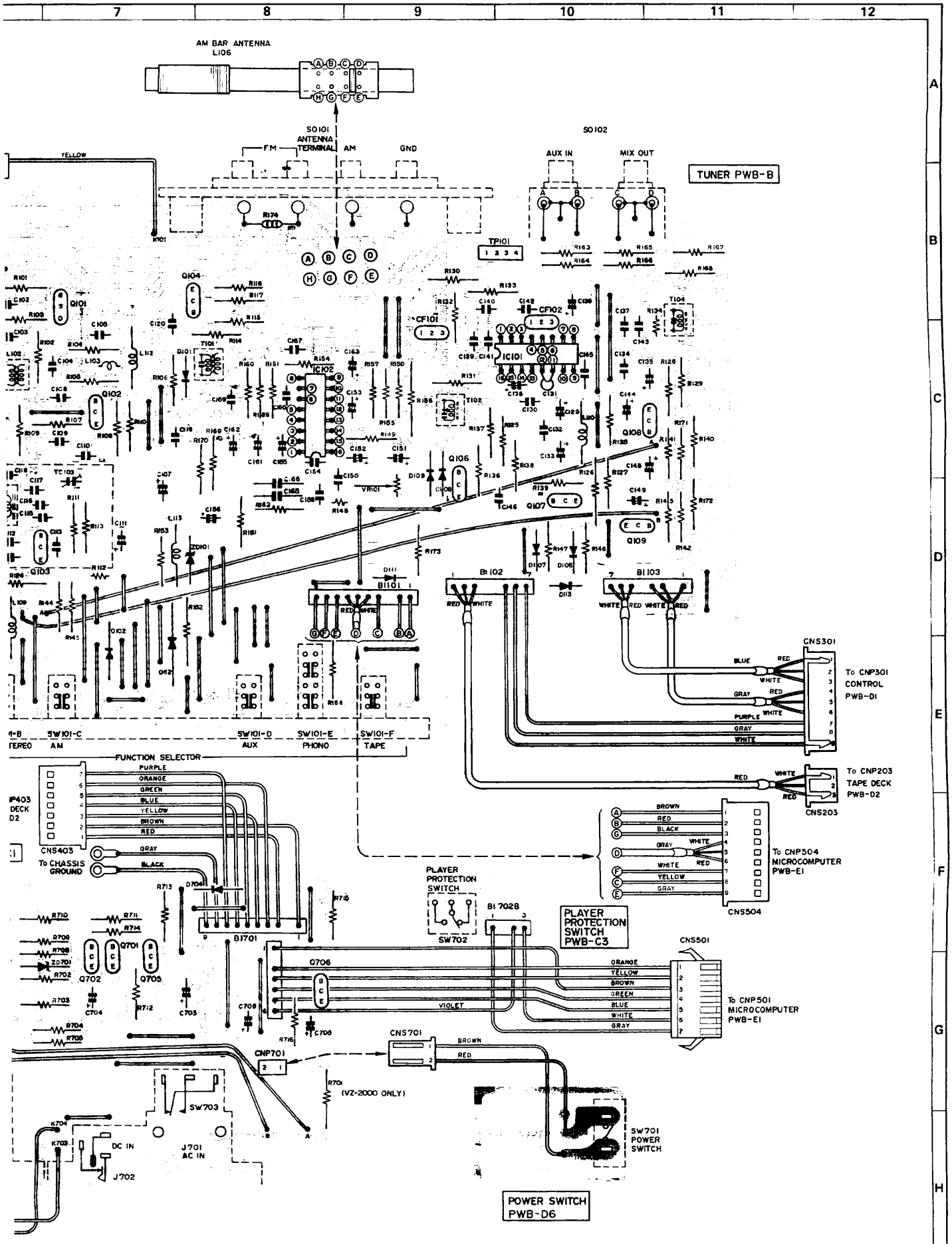


Figure 31 WIRING SIDE OF P.W.



OF P.W. BOARD (1/3)

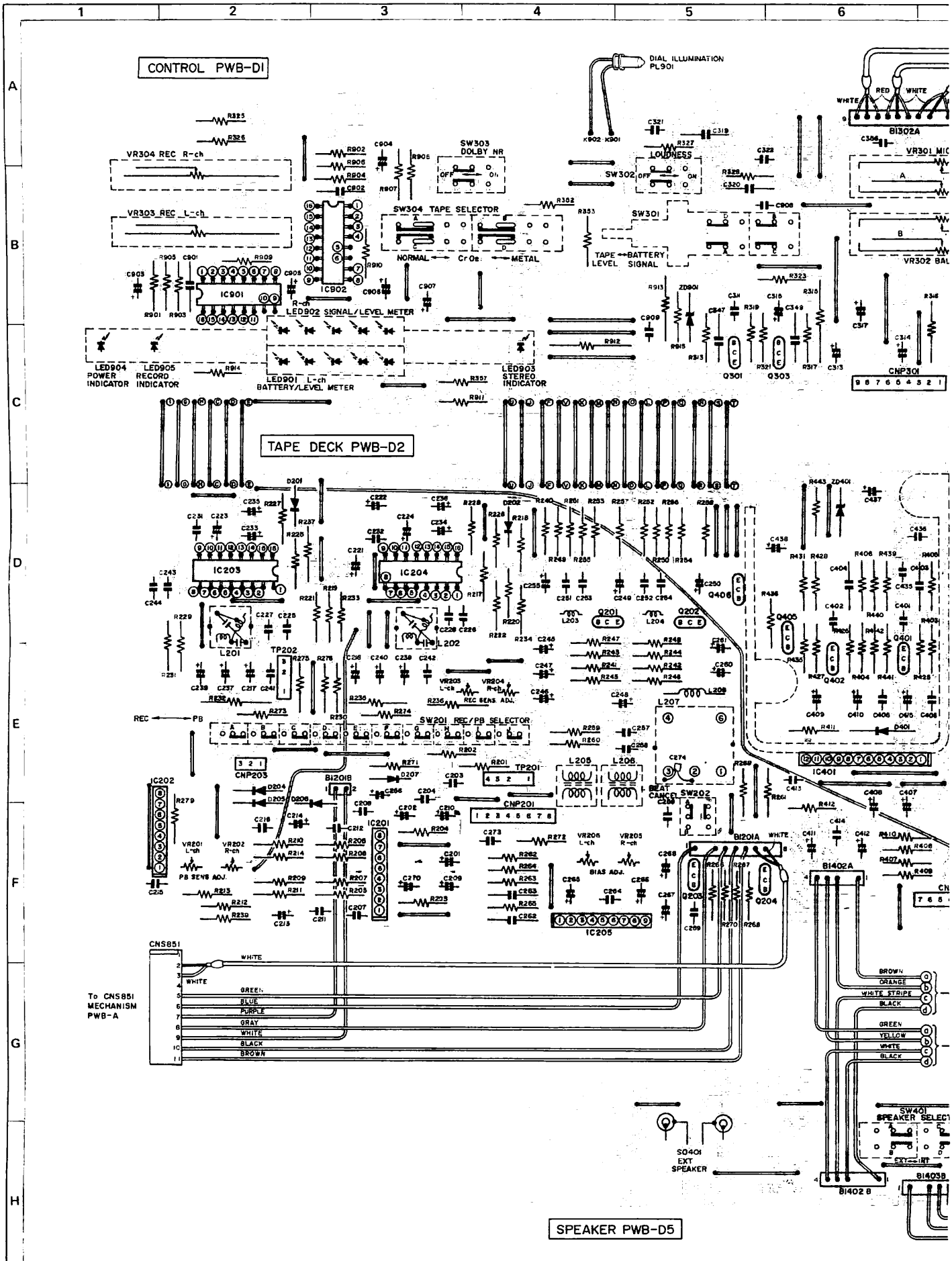
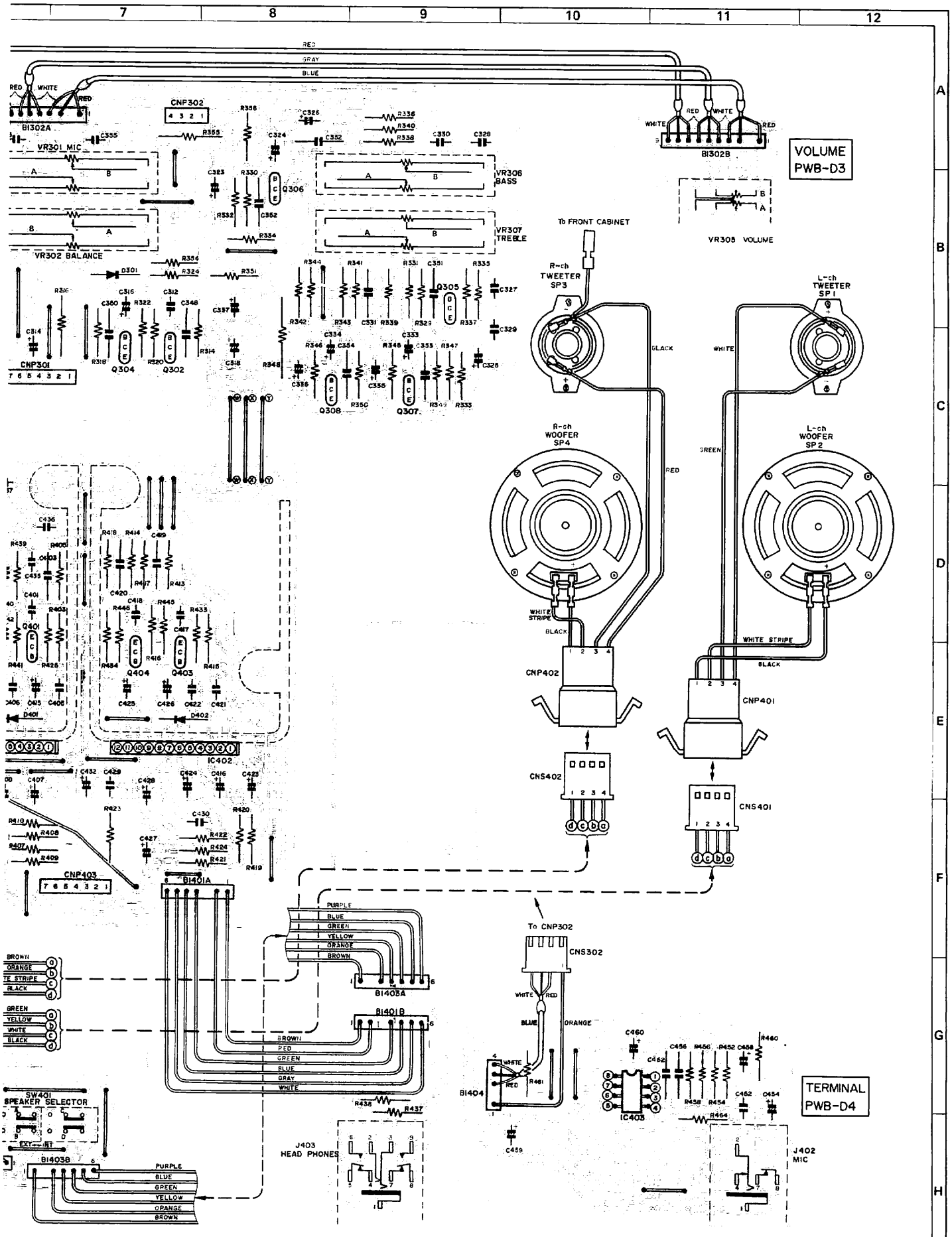


Figure 33 WIRING SID



RING SIDE OF P.W. BOARD (2/3)

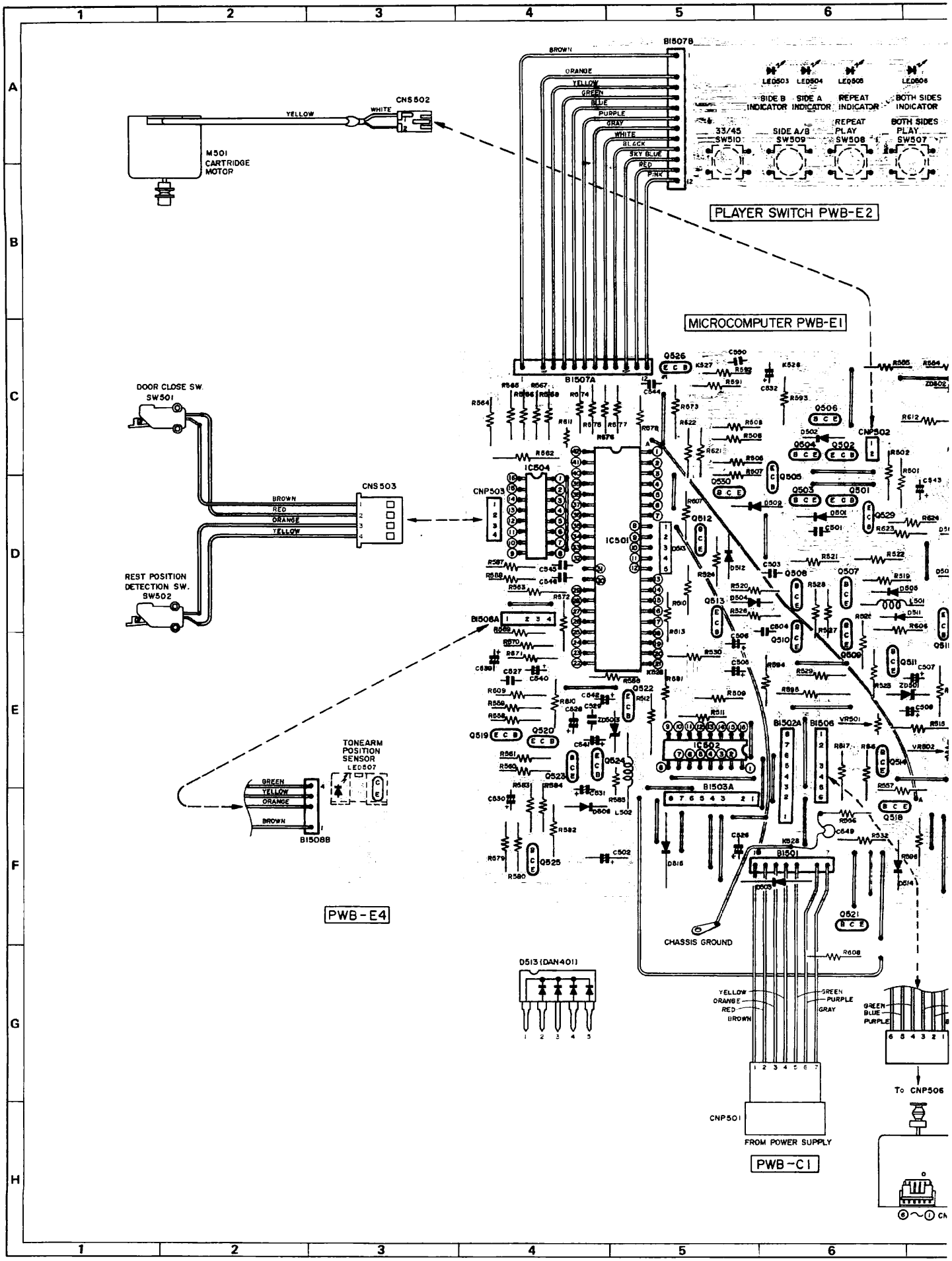
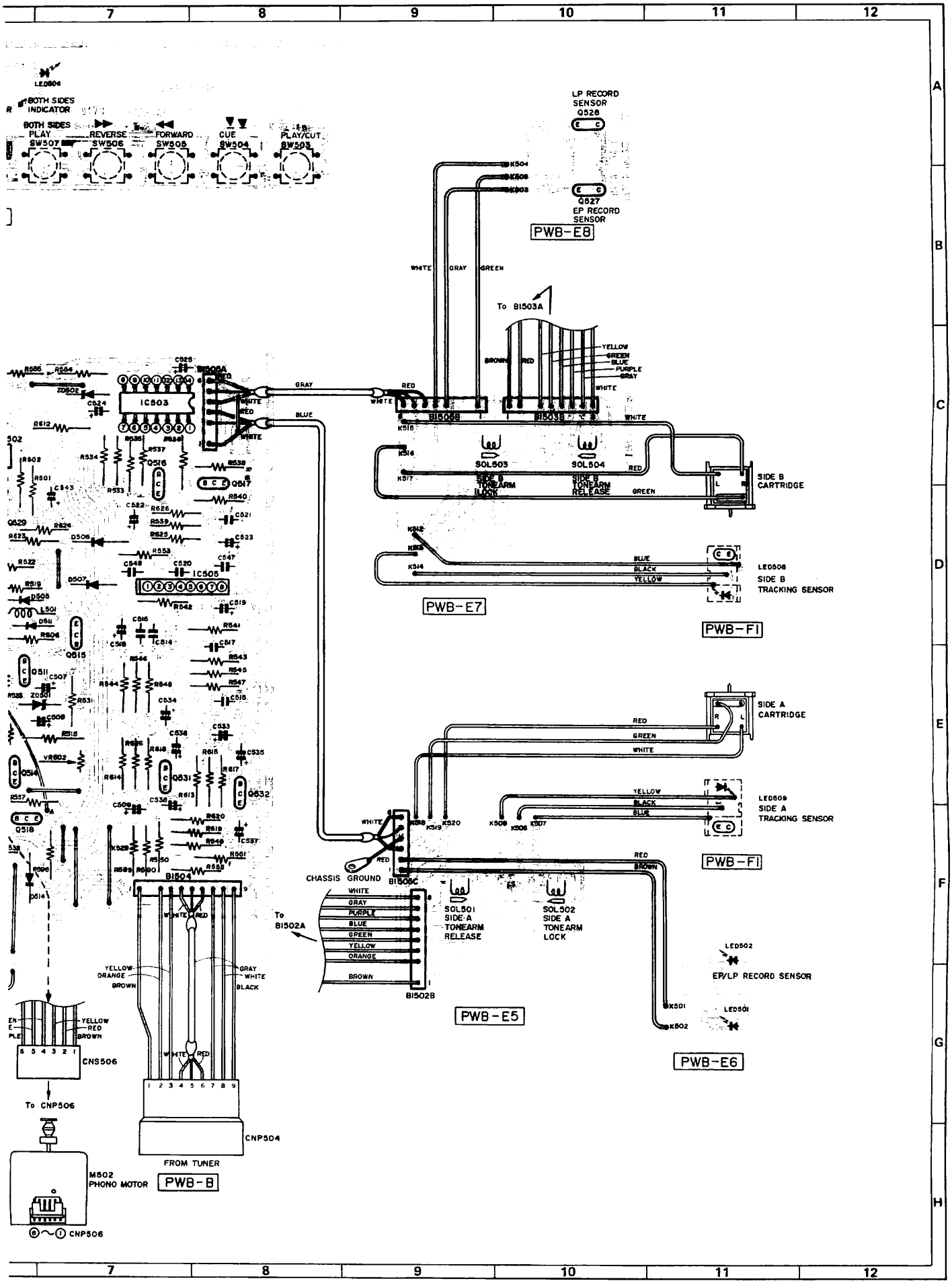


Figure 35 WIRING SIDE OF P.W.



OF P.W. BOARD (3/3)

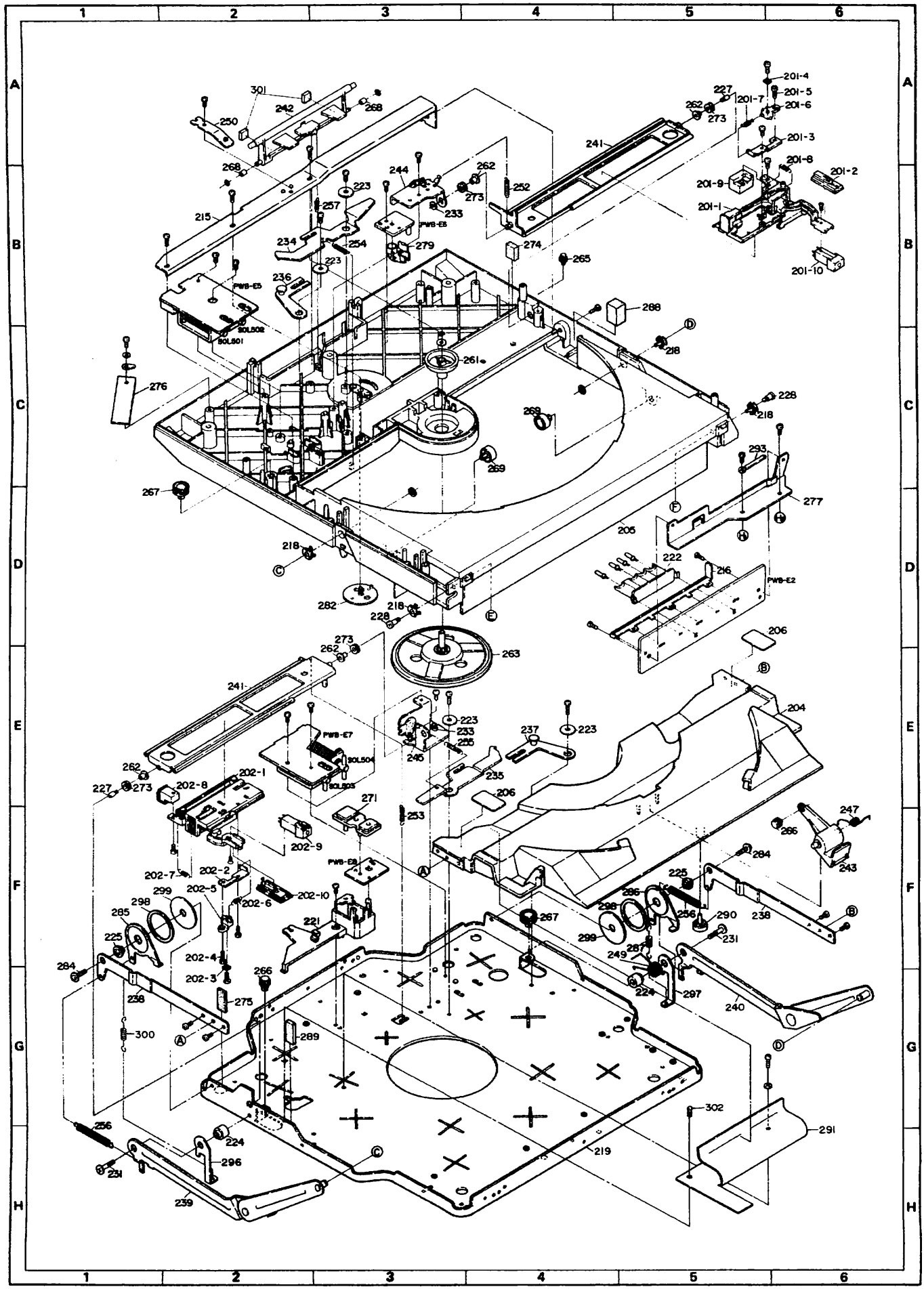


Figure 37 PLAYER MECHANISM EXPLODED TOP VIEW

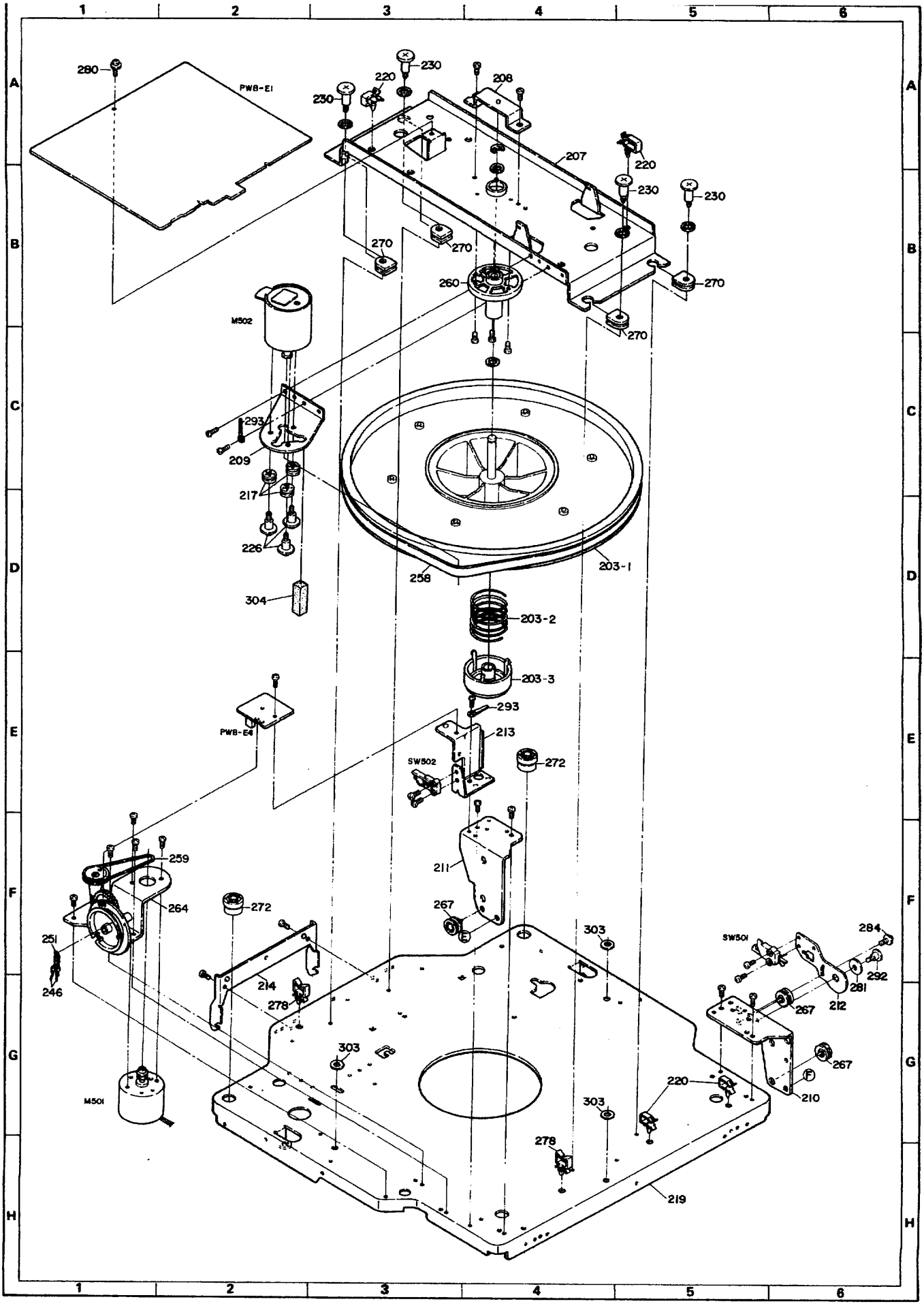


Figure 38 PLAYER MECHANISM EXPLODED BOTTOM VIEW

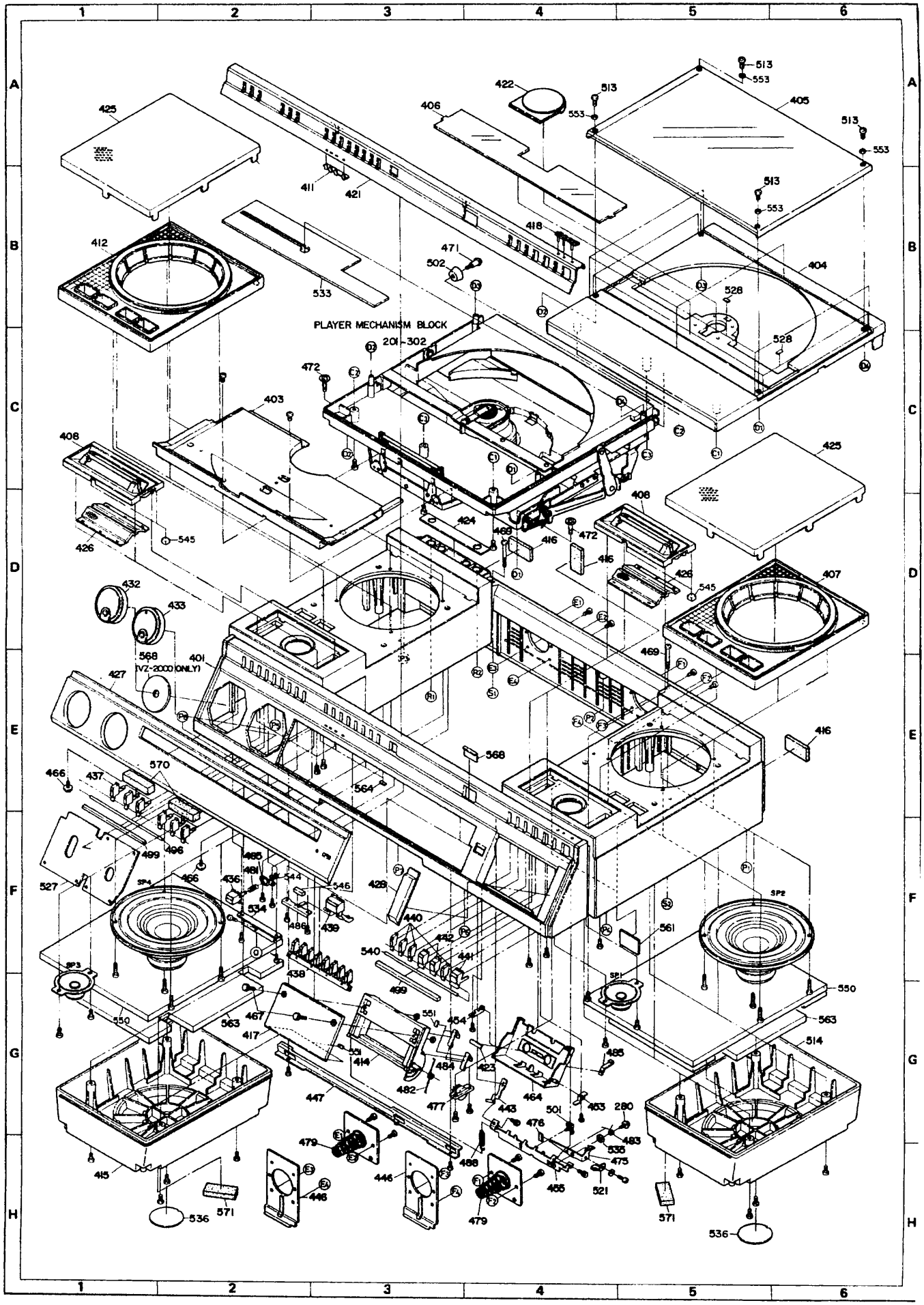


Figure 39 CABINET EXPLODED TOP VIEW

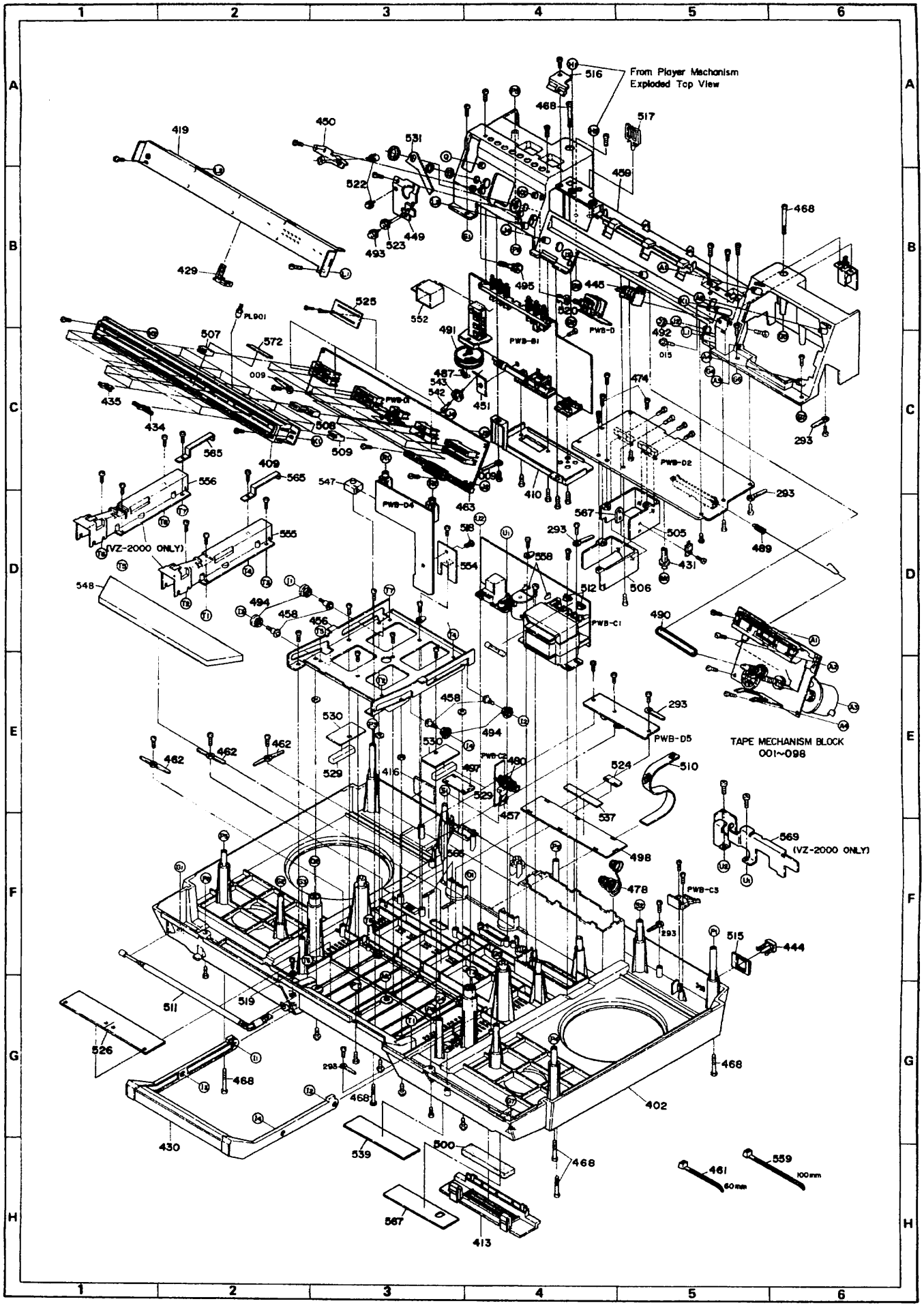


Figure 40 CABINET EXPLODED BOTTOM VIEW

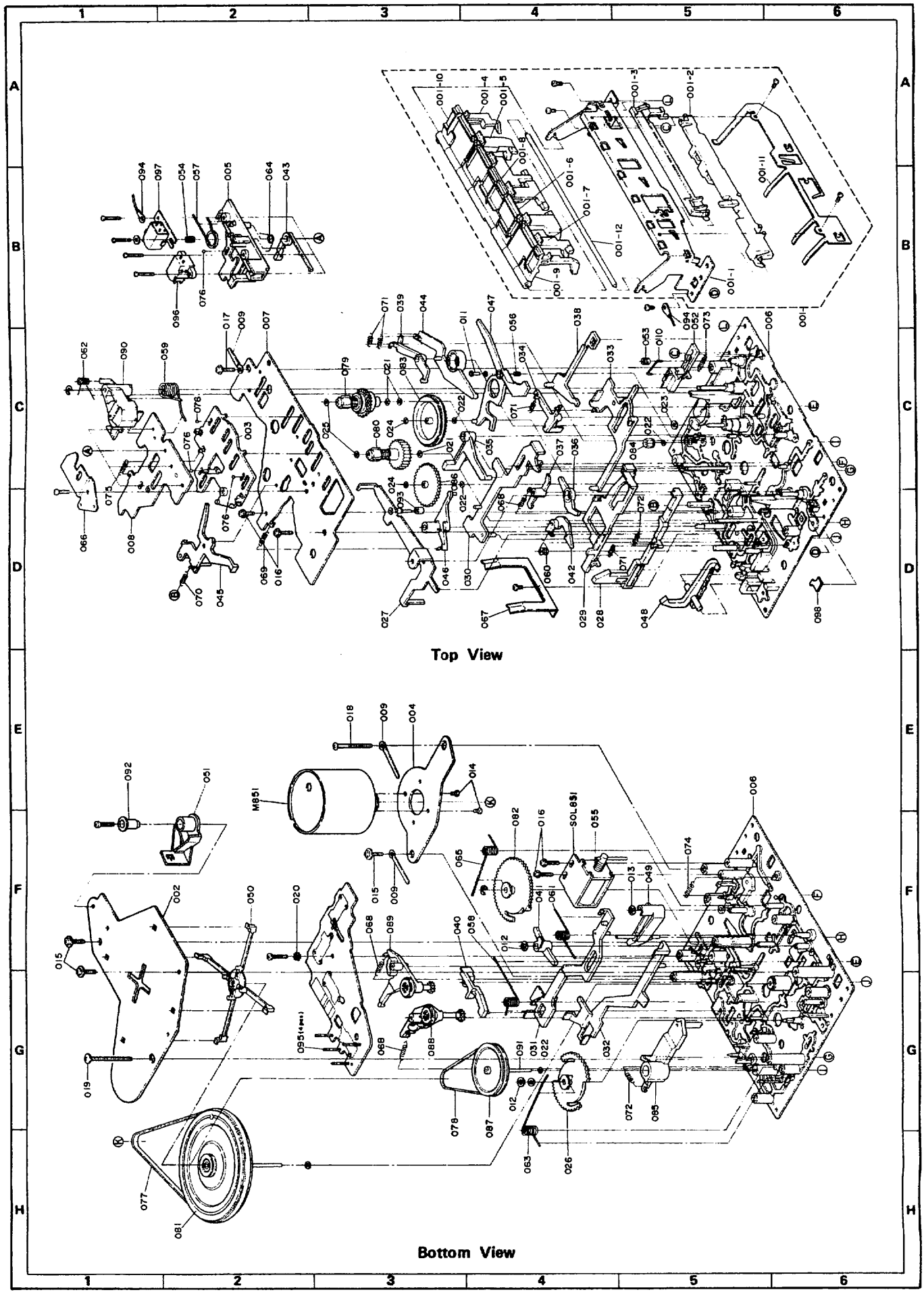


Figure 41 TAPE DECK MECHANISM EXPLODED VIEW

RH-IX1220AFZZ: IC501

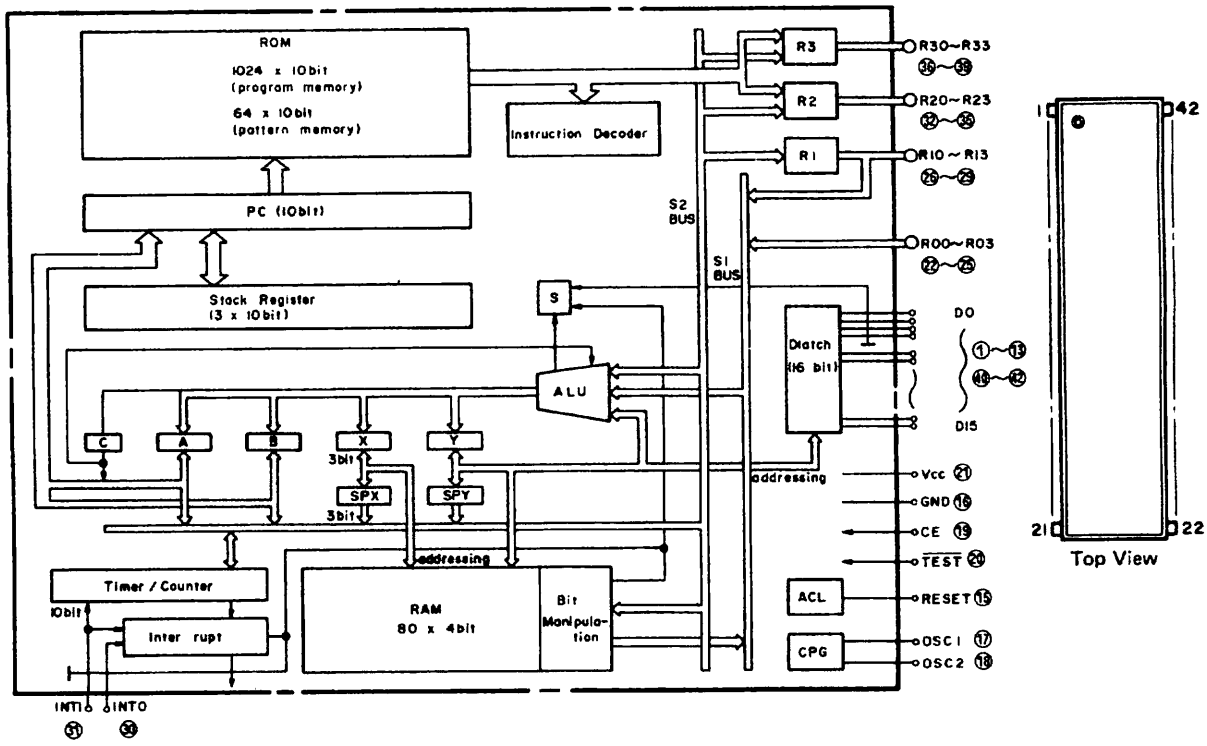


Figure 42–1 BLOCK DIAGRAM OF IC

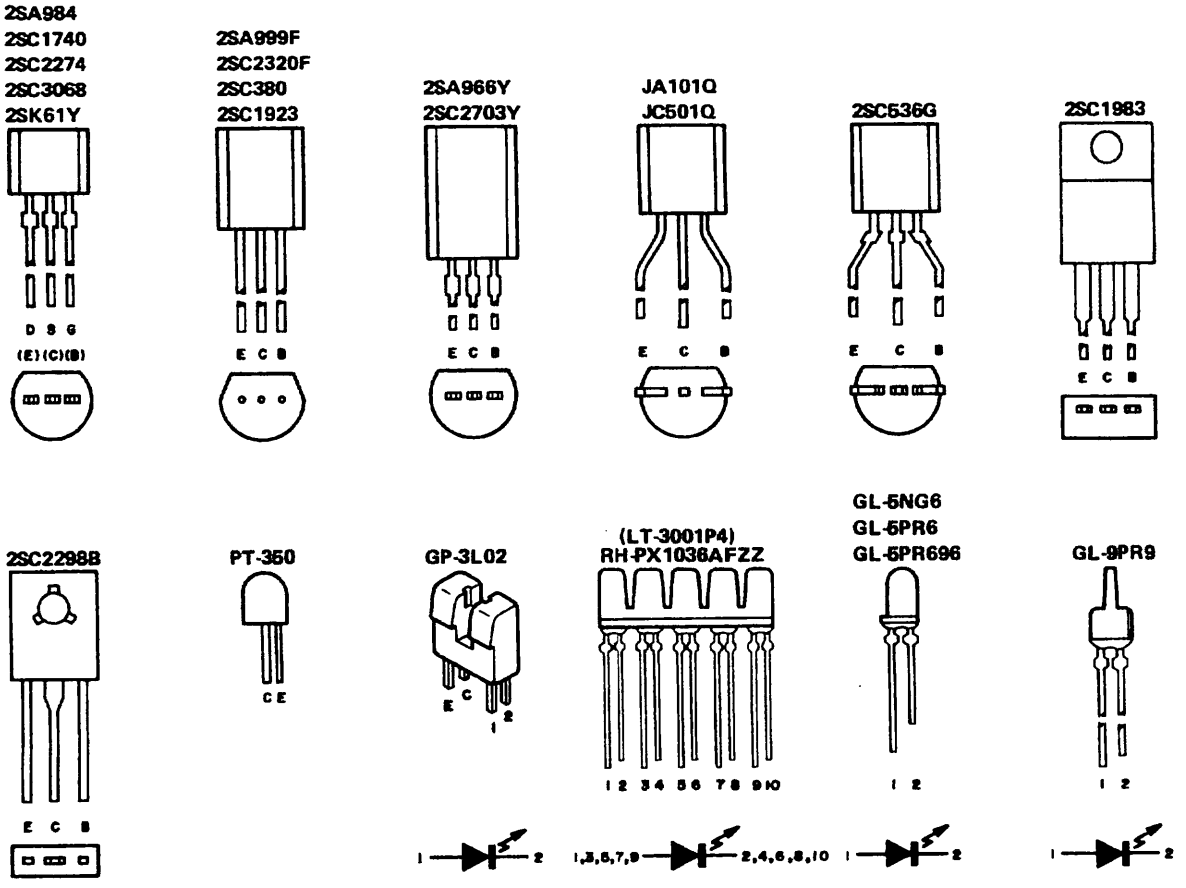


Figure 42–2 TYPES OF TRANSISTOR AND LED

REPLACEMENT PARTS LIST

"HOW TO ORDER REPLACEMENT PARTS"

To have your order filled promptly and correctly, please furnish the following information.

1. MODEL NUMBER 2. REF. NO.
3. PART NO. 4. DESCRIPTION

NOTES: Parts marked with " △ " are important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

REF.NO.	PART NO.	DESCRIPTION	CODE
	INTEGRATED CIRCUITS		
IC101	VHIHA12413/1F	FM/AM IF Amplifier/ Detector (HA12413)	AL
IC102	VHIUPC1197C-1	PLL Stereo Demodulator (μPC1197C)	AH
IC201	VHIM51522L/-1	Playback Equalizer Amplifier(M51522L)	AG
IC202	VHIM54512L/-1	Playback Equalizer Selector(M54512L)	AF
IC203,204	VHINE646N//1F	Dolby NR Circuit(NE646N)	AN
IC205	VHIIR3108//-1	APSS Circuit(IR3108)	AK
IC401,402	VHIHA1392//-1	Power Amplifier(HA1392)	AR
IC403	VHINJM4560D-1	Mic. Amplifier(NJM4560D)	AH
IC501	RH-IX1220AFZZ	Microcomputer	AW
IC502	VHIM54532//-1	Tonearm Solenenoid Driver(M54532)	AK
IC503	RH-IX1215AFZZ	Cartridge Signal Selector (LC4066B)or (MC14066BCP)	AH
IC504	VHIIR2403//-1	Indicator Driver(IR2403)	AG
IC505	VHIM51522L/-1	Phono Equalizer Amplifier (M51522L)	AG
IC901,902	VHILB1415//-1	Level Meter Driver (LB1415)	AH
	TRANSISTORS		
Q101	VS2SK61-Y//-1	FET, FM PF (2SK61Y)	AD
Q102	VS2SC1923O/-1	FM Mixer(2SC1923O)	AC
Q103	VS2SC1923O/-1	FM Local Oscillator (2SC1923O)	AC
Q104	VS2SC380-Y/-1	FM IF Amplifier (2SC380Y)	AC
Q105	VS2SC380-O/-1	AM Converter(2SC380O)	AB
Q106,107	VSJC501Q///-1	AGC Amplifier(JC501Q)	AB
Q108	VS2SC1740R/-1	FM Muting(2SC1740R)	AB
Q109	VS2SC1740R/-1	AM Muting(2SC1740R)	AB
Q201,202	VS2SC536GAUDA	Record Equalizer Amplifier (2SC536AUD)	AB
Q203	VSJA101Q///-1	APSS Solenoid Driver (JA101Q)	AB
Q204	VS2SC2703-Y-1	APSS Solenoid Driver (2SC2703Y)	AD
Q301,302, Q303,304	VS2SC536GAUDA	Mixing Amplifier (2SC536AUD)	AB
Q305,306	VS2SC536GAUDA	Tone Amplifier (2SC536AUD)	AB
Q307,308	VS2SC1571G/-1	Tone Amplifier (2SC1571G)	
Q401,402	VS2SC1740R/-1	Muting (2SC1740R)	AB
Q403,404	VS2SC1740R/-1	High Pass Filter (2SC1740R)	AB
Q405	VS2SC1740R/-1	Muting Driver(2SC1740R)	AB
Q406	VS2SC1983//-1	Voltage Regulator (2SC1983)	AH

REF.NO.	PART NO.	DESCRIPTION	CODE
Q501,502	VS2SC2274-F-1	Cartridge Motor Reverse Circuit(2SC2274F)	AC
Q503,504	VS2SA984-F/-1	Cartridge Motor Reverse Circuit(2SA984F)	AC
Q505,506	VSJC501Q///-1	Cartridge Motor Reverse Circuit(JC501Q)	AB
Q507,508	VS2SA984-F/-1	Phono Motor Reverse Circuit(2SA984F)	AC
Q509,510	VS2SC2274-F-1	Phono Motor Reverse Circuit(2SC2274F)	AC
Q511	VSJC501Q///-1	Phono Motor Reverse Circuit(JC501Q)	AB
Q512	VSJC501Q///-1	Phono Motor Reverse Circuit(JC501Q)	AB
Q513	VS2SC2298-B-1	Phono Motor Speed Control(2SC2298B)	AF
Q514	VS2SC2274-F-1	Phono Motor Speed Selector(2SC2274F)	AC
Q515	VS2SC1983//-1	Cartridge Motor Constant Voltage Circuit (2SC1983)	AH
Q516,517	VS2SC1740R/-1	Phono Muting(2SC1740R)	AB
Q518,519, Q520	VSJC501Q///-1	Level Converter(JC501Q)	AB
Q521	VSJC501Q///-1	LED Muting(JC501Q)	AB
Q522	VS2SC2274-F-1	5V Constant Voltage (2SC2274F)	AC
Q523	VSJC501Q///-1	5V Constant Voltage Control(JC501Q)	AB
Q524	VSJA101Q///-1	5V Constant Voltage Control(JA101Q)	AB
Q525	VSJC501Q///-1	Reset Signal Control (JC501Q)	AB
Q526	VSJC501Q///-1	Switching (JC501Q)	AB
Q527	VHPPT-350C/1F	Photo-transistor EP Record Sensor(PT-350C)	AF
Q528	VHPPT-350C/1F	Photo-transistor LP Record Sensor(PT-350C)	AF
Q529	VS2SC2274-F-1	Switching, Cartridge Motor Power Supply (2SC2274F)	AC
Q530	VSJC501Q///-1	Switching, Cartridge Motor Power Supply (JC501Q)	AB
Q531,532	VS2SC536GAUDA	Phono Equalizer Amplifier (2SC536AUD)	AB
Q701	VS2SA966-Y/-1	Constant Voltage Circuit (2SA966Y)	AE
Q702	VS2SA999-F/-1	Constant Voltage Circuit (2SA999F)	AC
Q703,704, Q705	VS2SC2320-F-1	Constant Voltage Circuit (2SC2320F)	AB
Q706	VS2SC3068//-1	Constant Voltage Circuit (2SC3068)	AD

REF.NO.	PART NO.	DESCRIPTION	CODE
		DIODES	
D101,102, D103,104, D105	VHD1SS133//-1	Protector, Reverse Current (1SS133)	AA
D106	VHD1SS133//-1	Discharge(1SS133)	AA
D107,108, D109,110, D111,112	VHD1SS133//-1	Protector, Reverse Current (1SS133)	AA
D113	VHD1SS133//-1	Discharge (1SS133)	AA
D201,202, D204,205, D206,207, D301	VHDUS1040//-1	Protector, Reverse Current (US1040)	AA
D401,402	VHDUS1040//-1	Protector, Reverse Current (US1040)	AA
D501,502	VHD1S1555V/1G	Protector, Reverse Current (1S1555V)	AB
D503	VHD10E1////-1	Protector, Reverse Current (10E1)	AC
D504,505, D506,507, D508,509, D511,512	VHD1S1555V/1G	Protector, Reverse Current (1S1555V)	AB
D513	VHDDAN401//-1	Protector, Power Supply Fluctuant (DAN401)	AE
D701	VHD3G4B41//-1	Rectifier(3G4B41)	AG
D704	VHD1SS133//-1	Protector, Surge Current (1SS133)	AA
D851	RH-DX1006AFZZ	Protector, Surge Current (10E1)	AC
ZD101	VHERD6R8JB3-1	Zener, 6.8V, Constant Voltage(RD6.8JB3)	AB
ZD401	VHERD110JB1-1	Zener, 11V, Voltage Regulator(RD11JB1)	AB
ZD501	VHERD100JB2-1	Zener, 10V, Constant Voltage(RD10JB2)	AB
ZD502	VHERD5R1JB2-1	Zener, 6.1V, Constant Voltage(RD5.1JB2)	AB
ZD503	VHERD5R6JB2-1	Zener, 5.6V, Constant Voltage(RD5.6JB2)	AB
ZD701	VHERD5R1JB2-1	Zener, 5.1V, Constant Voltage(RD5.1JB2)	AB
ZD901	VHERD9R1JB2-1	Zener, 9.1V, Constant Voltage(RD9.1JB2)	AB
		LEDs	
LED501, LED502	VHPGL5PR6961F	Record Sensor (GL-5PR696)	AC
LED503	VHPGL5PR6//-1	Side B Play Indicator (GL-5PR6)	AC
LED504	VHPGL5NG6//-1	Side A Play Indicator (GL-5NG6)	AD
LED505	VHPGL5PR6//-1	Repeat Play Indicator (GL-5PR6)	AC
LED506	VHPGL5PR6//-1	Both Sides Play Indicator (GL-5PR6)	AC
LED507	VHPGP3L02//-1	Photo-interruptor, Tonearm Position Sensor(GP-3L02)	AK
LED508	VHPGP3L02//-1	Photo-interruptor, Side B Tracking Error Sensor(GP-3L02)	AK
LED509	VHPGP3L02//-1	Photo-interruptor, Side A Tracking Error Sensor(GP-3L02)	AK
LED901, LED902	RH-PX1036AFZZ	Level Meter(LT-3001P4)	AH
LED903	VHPGL-9PR9/-1	Stereo Indicator(GL-9PR9)	AC
LED904	VHPGL-9PR9/-1	Power Indicator (GL-9PR9)	AC
LED905	VHPGL-9PR9/-1	Record Indicator(GL-9PR9)	AC
		COILS	
L101	RCILA0547AFZZ	FM Antenna	AD
L102	RCILR0361AFZZ	FM RF	AD
L103	VP-CH2R2M0000	2.2μH, FM IF Trap	AB
L104	RCILB0621AFZZ	FM Local Oscillation	
L105	VP-CH1R0M0000	1μH, AM IF	AB
L106	RCILA0546AFZZ	AM Bar Antenna	AG
L107	VP-CH1R0M0000	1μH, AM IF	AB
L108	RCILB0615AFZZ	AM Local Oscillation	AC
L109	VP-CH100K0000	10μH, Choke	AB
L110	VP-CH101K0000	100μH, Choke	AB
L112,113	VP-CH100K0000	10μH, Choke	AB
L201,202	RCILL0074AFZZ	Dolby NR Circuit, Low Pass Filter	AG
L203,204	RCILZ0086AFZZ	6.8mH, Peaking	AC
L205,206	RCILB0480AFZZ	Bias Step-up	AD
L207	RCILB0637AFZZ	Bias Oscillation Circuit	AM
L208	VP-CH101K0000	100μH, Noise Filter	AB
L501	VP-CH220K0000	22μH, Noise Filter	AB
L502	VP-CH102K0000	1mH, Noise Filter	AB
L851	RCILZ0062AFZZ	100μH, Noise Filter	AC
		TRANSFORMERS	
T101	RCILI0294AFZZ	AM IF	AC
T102	RCILI0296AFZZ	AM Detector	AC
T103	RFILA0006AFZZ	AM IF	AF
T104	RCILI0295AFZZ	FM Detector	AC
△T701	RTRNP0818AFZZ	Power (VZ-2000)	AY
	RTRNP0819AFZZ	Power (VZ-2000X/XA)	AY
		FILTERS	
CF101,102	RFILF0071AFZZ	Ceramic, FM IF	AD
		VARIABLE RESISTORS	
VR101	RVR-M0199AFZZ	10K ohm(B), VCO Frequency Adjustment	AC
VR201,202	RVR-M0289AFZZ	20K ohm(B), Tape Playback Sensitivity Adjustment	AB
VR203,204	RVR-M0289AFZZ	20K ohm(B), Tape Record Sensitivity Adjustment	AB
VR205,206	RVR-M0288AFZZ	10K ohm(B), Bias Current Adjustment	AB
VR301A,B	RVR-P0082AFZZ	50K ohm(A), Mic. Mixing Control	AH
VR302A,B	RVR-V0051AFZZ	100K ohm(MN), Balance Control	AH
VR303,304	RVR-P0081AFZZ	50K ohm(A), Record Level Control	AF
VR305A,B	RVR-B0256AFZZ	100K ohm(B), Volume Control	AH
VR306A,B	RVR-Q0091AFZZ	100K ohm(B), Bass Control	AG
VR307A,B	RVR-Q0091AFZZ	100K ohm(B), Trable Control	AG
VR501	RVR-M0323AFZZ	2K ohm(B), Phono Motor Speed(33rpm)Adjustment	AB
VR502	RVR-M0323AFZZ	2K ohm(B), Phono Motor Speed(45rpm)Adjustment	AB

REF.NO.	PART NO.	DESCRIPTION	CODE
		VARIABLE CAPACITORS	
VC101~105, TC101,102, TC104,105	RVC-W0055AFZZ	Variable Capacitor Tuning with Trimmer TC101;FM Antenna Trimmer TC102;FM RF Trimmer TC104;AM Antenna Trimmer TC105;AM Local Oscillation Trimmer	AU
TC103	RTO-H1065AFZZ	FM Local Oscillatio Trimmer	AD
		ELECTOROLYTIC CAPACITORS	
		(Unless otherwise specified electorolytic capacitors are ±20%, type)	
C111	RC-EZA106AF1C	10MFD, 16V	AB
C126	RC-EZA226AF1C	22MFD, 16V	AB
C129	RC-EZA476AF1C	47MFD, 16V	AB
C133	RC-EZA105AF1H	1MFD, 50V	AB
C135	RC-EZA475AF1H	4.7MFD, 50V	AB
C136	RC-EZA107AF1C	100MFD, 16V	AB
C138	RC-EZA226AF1C	22MFD, 16V	AB
C144	VCEALA1HW105M	1MFD, 50V	AB
C147	RC-EZA226AF1C	22MFD, 16V	AB
C148,149	RC-EZA106AF1C	10MFD, 16V	AB
C151	VCEALA1HW105M	1MFD, 50V	AB
C152	VCEALA1HW334M	0.33MFD, 50V	AB
C153	VCEALA1HW225M	2.2MFD, 50V	AB
C155	RC-EZA105AF1H	1MFD, 50V	AB
C156	RC-EZA227AF1A	220MFD, 10V	AB
C157	RC-EZV108AF1C	1000MFD, 16V	AD
C161,162	RC-EZA335AF1H	3.3MFD, 50V	AB
C163	RC-EZA105AF1H	1MFD, 50V	AB
C201,202	VCEALA1CC106M	10MFD, 16V	AB
C209,210	RC-EZA336AF1C	33MFD, 16V	AB
C213,214	RC-EZY335AF1H	3.3MFD, 50V	AB
C217,218	RC-EZA105AF1H	1MFD, 50V	AB
C221	RC-EZA227AF1A	220MFD, 10V	AB
C222	RC-EZV477AF1C	470MFD, 16V	AC
C223,224	RC-EZA106AF1C	10MFD, 16V	AB
C233,234	VCEALA1HW334K	0.33MFD, 50V, ±10%	AB
C235,236	VCEALA1HW104K	0.1MFD, 50V, ±10%	AB
C237,238	RC-EZA335AF1H	3.3MFD, 50V	AB
C239,240	RC-EZA335AF1H	3.3MFD, 50V	AB
C245,246	RC-EZA105AF1H	1MFD, 50V	AB
C247,248	RC-EZA335AF1H	3.3MFD, 50V	AB
C249,250	RC-EZA106AF1C	10MFD, 16V	AB
C255	RC-EZA336AF1C	33MFD, 16V	AB
C256	RC-EZA106AF1C	10MFD, 16V	AB
C260	RC-EZA336AF1C	33MFD, 16V	AB
C261,265, C266,267	RC-EZA106AF1C	10MFD, 16V	AB
C268	RC-EZA107AF1A	100MFD, 10V	AB
C270	RC-EZA336AF1C	33MFD, 16V	AB
C313,314	VCEALA1EC335M	3.3MFD, 25V	AB
C315,316	RC-EZA105AF1H	1MFD, 50V	AB
C317,318	RC-EZA107AF1E	100MFD, 25V	AC
C323,324, C325,326	VCEALA1HC224M	0.22MFD, 50V	AB
C333,334	RC-EZA335AF1H	3.3MFD, 50V	AB
C335,336	RC-EZA105AF1H	1MFD, 50V	AB
C337	RC-EZV227AF1C	220MFD, 16V	AB
C407,408	RC-EZA107AF1A	100MFD, 10V	AB
C409,410, C411,412	RC-EZA107AF1C	100MFD, 16V	AB
C415,416, C423,424	RC-EZA107AF1A	100MFD, 10V	AB
C425,426	RC-EZA107AF1C	100MFD, 16V	AB
C427,428	RC-EZV108AF1C	1000MFD, 16V	AB

REF.NO.	PART NO.	DESCRIPTION	CODE
C432	RC-EZA107AF1E	100MFD, 25V	AC
C437	RC-EZA107AF1E	100MFD, 25V	AC
C438	RC-EZA336AF1C	33MFD, 16V	AB
C454,458	RC-EZA105AF1H	1MFD, 50V	AB
C459	RC-EZA107AF1E	100MFD, 25V	AC
C460	RC-EZA476AF1E	47MFD, 25V	AB
C502	RC-EZ1182AFZZ	3300MFD, 25V	AK
C505	RC-EZA475AF1H	4.7MFD, 50V	AB
C506	RC-EZA225AF1H	2.2MFD, 50V	AB
C507	RC-EZA106AF1H	10MFD, 50V	AB
C508	RC-EZS336AF1C	33MFD, 16V	AB
C509	RC-EZA107AF1E	100MFD, 25V	AC
C518,519	RC-EZA106AF1E	10MFD, 25V	AB
C522,523	VCEALA1HW224M	0.22MFD, 50V	AB
C524,525	RC-EZA106AF1E	10MFD, 25V	AB
C526	RC-EZA475AF1H	4.7MFD, 50V	AB
C528	RC-EZA105AF1H	1MFD, 50V	AB
C530	RC-EZA476AF1C	47MFD, 16V	AB
C531	RC-EZA475AF1H	4.7MFD, 50V	AB
C532	RC-EZV106AF1E	10MFD, 25V	AB
C533,534, C535	VCEALA1HW104K	0.1MFD, 50V, ±10%	AB
C536	VCEALV1HW104K	0.1MFD, 50V, ±10%	AB
C537	RC-EZA224AF1H	0.22MFD, 50V	AB
C538	RC-EZV224AF1H	0.22MFD, 50V	AB
C539	RC-EZA105AF1H	1MFD, 50V	AB
C540	RC-EZV105AF1H	1MFD, 50V	AB
C541	RC-EZV106AF1H	10MFD, 50V	AB
C542	RC-EZV476AF1A	47MFD, 10V	AB
C543	RC-EZA336AF1C	33MFD, 16V	AB
C703	RC-EZW478AF1E	4700MFD, 25V	AK
C704	RC-EZV336AF1V	33MFD, 35V	AB
C705	RC-EZV107AF1E	100MFD, 25V	AC
C706	RC-EZV336AF1V	33MFD, 35V	AB
C851	RC-EZS105AF1H	1MFD, 50V	AB
C903,904	RC-EZA106AF1C	10MFD, 16V	AB
C905,906	RC-EZA105AF1H	1MFD, 50V	AB
C907	RC-EZA476AF1C	47MFD, 16V	AB
		CAPACITORS	
		(Unless otherwise specified capacitors are +80 −20%, Ceramic type)	
C101	VCCTPU1HH150J	15PF(TH), 50V, ±5%, Ceramic	AA
C102	VCCSPA1HL151J	150PF, 50V, ±5%, Ceramic	AA
C103,104, C105	VCKZPA1HF223Z	0.022MFD	AA
C106	VCCTPU1HH120J	12PF(TH), 50V, ±5% Ceramic	AA
C107	VCCSPU1HL6R0C	6PF, 50V, ±0.25PF, Ceramic	AA
C108	VCCSPA1HL101J	100PF, 50V, ±5%, Ceramic	AA
C109,110	VCKZPA1HF223Z	0.022MFD	AA
C112	VCKZPA1HF223Z	0.022MFD	AA
C113	VCCCPA1HH150J	15PF(CH), 50V, ±5%, Ceramic	AA
C114	VCCCPA1HH270J	27PF(CH), 50V, ±5%, Ceramic	AA
C115	VCCUPA1HJ150J	15PF(UJ), 50V, ±5%, Ceramic	AA
C116	VCCLPU1HH180J	18PF(LH), 50V, ±5%, Ceramic	
C117	VCCCPA1HH1R5C	1.5PF(CH), 50V, ±5%, Ceramic	AA
C118	VCCSPA1HL8R0C	8PF, 50V, ±0.25PF, Ceramic	AA
C119,120	VCKZPA1HF223Z	0.022MFD	AA
C121	VCCSPA1HL100J	10PF, 50V, ±5%, Ceramic	AA

REF.NO.	PART NO.	DESCRIPTION	CODE
C122,123	VCKZPA1HF223Z	0.022MFD	AA
C124	VCQSMU1HS391J	390PF, 50V, ±5%, Styrol	AB
C125	VCCUPA1HJ220J	22PF(UJ), 50V, ±5%, Ceramic	AA
C127,128	VCKZPA1HF223Z	0.022MFD	AA
C130	VCKZPA1HF403Z	0.04MFD	AA
C131	VCTYPU1EX103K	0.01MFD, 25V, ±10%, Semiconductor	AA
C132	VCTYPA1EX103J	0.01MFD, 25V, ±5%, Semiconductor	AA
C134	VCCSPA1HL101J	100PF, 50V, ±5%, Ceramic	AA
C137	VCKZPA1HF403Z	0.04MFD	AA
C139,140, C141	VCKZPA1HF223Z	0.022MFD	AA
C142	VCKZPA1HF403Z	0.04MFD	AA
C143	VCKZPA1HF223Z	0.022MFD	AA
C145	VCKZPV1HF403Z	0.04MFD	AA
C146	VCKZPA1HF403Z	0.04MFD	AA
C150	VCQSMU1HS471J	470PF, 50V, ±5%, Styrol	AB
C154	VCTYPA1EX473K	0.047MFD, 25V, ±10% Semiconductor	AA
C158	VCKZPA1HF223Z	0.022MFD	AA
C159,160	VCTYPA1EX103J	0.01MFD, 25V, ±5%, Semiconductor	AA
C165,166	VCKYAT1HB821K	820PF, 50V, ±10%, Ceramic	AA
C167	VCKZPA1HF223Z	0.022MFD	AA
C203,204	VCCSPA1HL471J	470PF, 50V, ±5%	AA
C207,208	VCKZPA1HF102Z	0.001MFD	AA
C211,212	VCQYKA1HM822J	0.0082MFD, 50V, ±5%, Mylar	AB
C215,216	VCTYPA1EX153J	0.015MFD, 25V, ±5%, Semiconductor	AB
C225,226	VCTYPA1EX472J	0.0047MFD, 25V, ±5%, Semiconductor	AA
C227,228	VCTYPA1EX273J	0.027MFD, 25V, ±5%, Semiconductor	AB
C231,232	VCTYPA1EX473J	0.047MFD, 25V, ±5%, Semiconductor	AB
C241,242	VCTYPA1EX562J	0.0056MFD, 25V, ±5%, Semiconductor	AA
C243,244	VCTYPA1EX683K	0.068MFD, 25V, ±10%, Semiconductor	AB
C251,252	VCTYPA1EX153J	0.015MFD, 25V, ±5%, Semiconductor	AB
C253,254	VCTYPA1EX103K	0.01MFD, 25V, ±10%, Semiconductor	AA
C257,258	VCCSPA1HL471J	470PF, 50V, ±5%, Ceramic	AA
C259	VCQYKA1HM122K	0.0012MFD, 50V, ±10%, Mylar	AA
C262	VCTYAT1EX682K	0.0068MFD, 25V, ±10%, Semiconductor	AA
C263	VCKYAT1HB102K	0.001MFD, 50V, ±10%, Ceramic	AA
C264	VCQYKA1HM333K	0.033MFD, 50V, ±10%, Mylar	AB
C269	VCTYPV1EX104M	0.1MFD, 25V, ±20%, Semiconductor	AB
C273	VCCSPA1HL101J	100PF, 50V, ±5%, Ceramic	AA
C274	VCQYKU1HM222K	0.0022MFD, 50V, ±10%, Mylar	
C311,312	VCTYPA1EX103K	0.01MFD, 25V, ±10%, Semiconductor	
C319,320	VCKYAT1HB471K	470PF, 50V, ±5%, Ceramic	AA
C321,322	VCQYKA1HM333K	0.033MFD, 50V, ±10%, Mylar	AB
C327,328, C329,330	VCQYKA1HM333K	0.033MFD, 50V, ±10%, Mylar	AB
C331,332	VCKYAT1HB681K	680PF, 50V, ±10%, Ceramic	AA
C347,348, C349,350, C351,352, C353,354	VCCSAT1HL101J	100PF, 50V, ±5%, Ceramic	AA
C355,356	VCQYKA1HM333K	0.033MFD, 50V, ±10%, Mylar	AB
C401,402	VCQYKA1HM332K	0.0033MFD, 50V, ±10%, Mylar	AB
C403,404	VCCSAT1HL101J	100PF, 50V, ±5%, Ceramic	AA
C405,406	VCCSPA1HL101J	100PF, 50V, ±5%, Ceramic	AA
C413,414	VCTYPV1EX104M	0.1MFD, 25V, ±20%, Semiconductor	AB
C417,418	VCQYKA1HM333K	0.033MFD, 50V, ±10%, Mylar	AB
C419,420	VCKYAT1HB471K	470PF, 50V, ±10%, Ceramic	AA
C421,422	VCKZPA1HF102Z	0.001MFD	AA
C429,430	VCTYPV1EX104M	0.1MFD, 25V, ±20%, Semiconductor	AB
C435,436	VCQYKA1HM472J	0.0047MFD, 50V, ±10%, Mylar	AB
C452	VCQYKA1HM333K	0.033MFD, 50V, ±10%, Mylar	AB
C456	VCKYAT1HB331K	330PF, 50V, ±10%, Ceramic	AA
C462	VCKYAT1HB471K	470PF, 50V, ±10%, Ceramic	AA
C501	VCKZPA1HF403Z	0.04MFD	AA
C503	VCKZPA1HF223Z	0.022MFD	AA
C504	VCKZPA1HF403Z	0.04MFD	AA
C514,515	VCQYKA1HM102K	0.001MFD, 50V, ±10%, Mylar	AA
C516,517	VCQYKA1HM562J	0.0056MFD, 50V, ±5%, Mylar	AA
C520,521	VCCSPA1HL101J	100PF, 50V, ±5%, Ceramic	AA
C527,529	VCKZPV1HF103Z	0.01MFD	AA
C544	VCTYPA1EX102K	0.001MFD, 25V, ±10%, Semiconductor	AA
C545,546	VCKZPA1HF222Z	0.0022MFD	AA
C547,548	VCCSPA1HL101J	100PF, 50V, ±5%, Ceramic	AA
C549	VCKZPU1HF103Z	0.01MFD	AA
C550	VCKZPA1HF403Z	0.04MFD	AA
C701,702	VCKZPV1HF403Z	0.04MFD	AA
C852,853	VCKZPU1HF223Z	0.022MFD	AA
C901,902	VCCSAT1HL470J	47PF, 50V, ±5%, Ceramic	AA
C908,909	VCKZPU1HF223Z	0.022MFD	AA

RESISTORS

(Unless otherwise specified resistors are 1/4W, ±5%, Carbon type)

R101	VRD-ST2EE104J	100K ohm	AA
R102	VRD-ST2EE330J	33 ohm	
R103,104	VRD-ST2EE470J	47 ohm	
R105	VRD-ST2EE102J	1K ohm	
R106	VRD-ST2EE221J	220 ohm	
R107	VRD-ST2EE471J	470 ohm	
R108	VRD-ST2EE474J	470K ohm	
R109	VRD-ST2EE820J	82 ohm	
R110	VRD-ST2EE102J	1K ohm	
R111	VRD-ST2EE332J	3.3K ohm	
R112	VRD-SU2EE103J	10K ohm	

REF.NO.	PART NO.	DESCRIPTION	CODE
R113	VRD-ST2EE104J	100K ohm	
R114	VRD-ST2EE222J	2.2K ohm	
R115	VRD-ST2EE474J	470K ohm	
R116	VRD-ST2EE121J	120 ohm	
R117	VRD-ST2EE331J	330 ohm	
R118	VRD-ST2EE684J	680K ohm	
R119	VRD-ST2EE4R7J	4.7 ohm	
R120	VRD-ST2EE102J	1K ohm	
R121	VRD-ST2EE470J	470 ohm	
R122	VRD-ST2EE223J	22K ohm	
R123	VRD-ST2EE821J	820 ohm	
R124	VRD-ST2EE221J	220 ohm	
R125	VRD-ST2EE222J	2.2K ohm	
R126	VRD-ST2EE182J	1.8K ohm	
R127	VRD-ST2EE273J	27K ohm	
R128	VRD-ST2EE562J	5.6K ohm	
R129	VRD-ST2EE683J	68K ohm	
R130	VRD-ST2EE100J	10 ohm	
R131	VRD-ST2EE333J	33 Kohm	AA
R132	VRD-ST2EE331J	330 ohm	
R133	VRD-ST2EE103J	10K ohm	
R134	VRD-SU2EE333J	33K ohm	
R135	VRD-ST2EE123J	12K ohm	
R136	VRD-ST2EE222J	2.2K ohm	
R137	VRD-ST2EE472J	4.7K ohm	
R138,139	VRD-ST2EE102J	1 Kohm	
R140	VRD-ST2EE682J	6.8K ohm	
R141	VRD-ST2EE473J	47K ohm	
R142	VRD-ST2EE682J	6.8K ohm	
R143	VRD-ST2EE473J	47K ohm	
R144	VRD-ST2EE472J	4.7K ohm	
R145	VRD-ST2EE122J	1.2K ohm	
R146	VRD-ST2EE472J	4.7K ohm	
R147	VRD-ST2EE103J	10K ohm	
R148	VRD-SU2EE183J	18K ohm	
R149	VRD-ST2EE102J	1K ohm	
R150,151	VRD-ST2EE104J	100K ohm	
R152	VRD-ST2EE820J	82 ohm	
R153	VRG-ST2EC560J	56 ohm, 1/4W, ±5%, Fusible	AB
R154	VRD-ST2EE331J	330 ohm	
R155	VRD-ST2EE104J	100K ohm	
R156	VRD-ST2EE102J	1K ohm	
R157	VRD-ST2EE683J	68K ohm	
R158	VRD-ST2EE121J	120 ohm	
R159,160	VRD-ST2EE682J	6.8K ohm	
R161,162	VRD-ST2EE104J	100K ohm	
R163,164	VRD-ST2EE223J	22K ohm	
R165,166	VRD-ST2EE273J	27K ohm	
R167,168	VRD-ST2EE102J	1K ohm	
R169,170	VRD-ST2EE103J	10K ohm	
R171,172	VRD-ST2EE102J	1K ohm	
R173	VRD-ST2EE222J	2.2K ohm	
R174	VRD-SU2EE121J	120 ohm	AA
R201,202	VRD-ST2EE101J	100 ohm	
R203,204	VRD-ST2EE221J	220 ohm	
R205,206	VRD-ST2EE394J	390K ohm	
R207,208	VRD-ST2EE153J	15K ohm	
R209,210	VRD-ST2EE222J	2.2K ohm	
R211,212	VRD-ST2EE223J	22K ohm	
R213,214	VRD-ST2EE472J	4.7K ohm	
R217,218	VRD-ST2EE102J	1K ohm	
R219,220	VRD-ST2EE332J	3.3K ohm	
R221,222	VRD-ST2EE473J	47K ohm	
R225,226	VRD-ST2EE184J	180K ohm	
R227,228	VRD-ST2EE274J	270K ohm	
R229,230	VRD-ST2EE563J	56K ohm	
R231,232	VRD-ST2EE223J	22K ohm	
R233,234	VRD-ST2EE181J	180 ohm	
R235,236	VRD-ST2EE103J	10K ohm	
R237	VRD-ST2EE470J	47 ohm	

REF.NO.	PART NO.	DESCRIPTION	CODE
R239,240	VRD-ST2EE102J	1K ohm	
R241,242	VRD-ST2EE474J	470K ohm	
R243,244	VRD-ST2EE104J	100K ohm	
R245,246	VRD-ST2EE103J	10K ohm	
R247,248	VRD-ST2EE222J	2.2K ohm	
R249,250	VRD-ST2EE221J	220 ohm	
R251,252	VRD-ST2EE472J	4.7K ohm	
R253,254	VRD-ST2EE272J	2.7K ohm	
R255,256	VRD-ST2EE103J	10K ohm	
R257,258	VRD-ST2EE152J	1.5K ohm	
R259,260	VRD-ST2EE103J	10K ohm	
R261	VRD-ST2EE220J	22 ohm	
R262	VRD-ST2EE472J	4.7K ohm	
R263	VRD-ST2EE273J	27K ohm	
R264	VRD-ST2EE101J	100 ohm	
R265,266	VRD-ST2EE103J	10K ohm	
R267	VRD-ST2EE471J	470 ohm	
R268	VRD-ST2EE103J	10K ohm	
R269	VRD-ST2EE391J	390 ohm	
R270	VRD-ST2EE471J	470 ohm	
R271	VRD-ST2EE472J	4.7K ohm	
R272	VRD-ST2EE1R0J	1 ohm	
R273,274	VRD-ST2EE153J	15K ohm	
R275,276	VRD-ST2EE682J	6.8K ohm	
R279	VRD-SU2EE104J	100K ohm	
R313,314	VRD-ST2EE155J	1.5Meg ohm	
R315,316	VRD-ST2EE332J	3.3K ohm	
R317,318	VRD-ST2EE155J	1.5Meg ohm	
R319,320, R321,322	VRD-ST2EE222J	2.2K ohm	
R323	VRD-ST2EE561J	560 ohm	
R324	VRD-ST2EE221J	220 ohm	
R325,326	VRD-ST2EE103J	10K ohm	
R327,328	VRD-ST2EE123J	12K ohm	AA
R329,330	VRD-ST2EE124J	120K ohm	
R331,332	VRD-ST2EE184J	180K ohm	
R333,334	VRD-ST2EE392J	3.9K ohm	
R335,336	VRD-ST2EE223J	22K ohm	
R337,338	VRD-ST2EE123J	12K ohm	
R339,340	VRD-ST2EE333J	33K ohm	
R341,342	VRD-ST2EE273J	27K ohm	
R343,344	VRD-ST2EE123J	12K ohm	
R345,346	VRD-ST2EE125J	1.2Meg ohm	
R347,348	VRD-ST2EE392J	3.9K ohm	
R349,350	VRD-ST2EE221J	220 ohm	
R351	VRD-ST2EE101J	100 ohm	
R352	VRD-ST2EE820J	82 ohm	
R353	VRD-ST2EE390J	39 ohm,	
R354,355, R356	VRD-ST2EE221J	220 ohm	
R357	VRD-ST2EE124J	120K ohm	
R403,404	VRD-ST2EE102J	1K ohm	
R405,406	VRD-ST2EE333J	33K ohm	
R407,408	VRD-ST2EE100J	10 ohm	
R409,410	VRD-ST2EE102J	1K ohm	
R411,412	VRD-ST2EE2R2J	2.2 ohm	
R413,414	VRD-ST2EE222J	2.2K ohm	
R415,416	VRD-ST2EE102J	1K ohm	
R417,418	VRD-ST2EE333J	33K ohm	
R419,420	VRD-ST2EE100J	10 ohm	
R421,422	VRD-ST2EE102J	1K ohm	
R423,424	VRD-ST2EE2R2J	2.2 ohm	
R425,426	VRD-ST2EE222J	2.2K ohm	
R427	VRD-ST2EE103J	10K ohm	
R428,430	VRD-ST2EE222J	2.2K ohm	
R431,433, R434	VRD-ST2EE472J	4.7K ohm	
R435,436	VRD-ST2EE103J	10K ohm	
R437,438	VRD-ST2EE151J	150 ohm	
R439,440	VRD-ST2EE682J	6.8K ohm	
R441,442	VRD-ST2EE103J	10K ohm	

REF.NO.	PART NO.	DESCRIPTION	CODE
R443	VRD-ST2EE102J	1K ohm	
R445,446	VRD-ST2EE222J	2.2K ohm	
R452,454	VRD-ST2EE224J	220K ohm	
R456	VRD-ST2EE821J	820 ohm	
R458	VRD-ST2EE563J	56K ohm	
R460	VRD-ST2EE471J	470 ohm	
R461,462	VRD-ST2EE102J	1K ohm	
R464	VRD-ST2EE103J	10K ohm	
R501,502	VRD-ST2EE222J	2.2K ohm	
R505,506, R507,508	VRD-ST2EE103J	10K ohm	
R509,510, R511,512	VRD-ST2EE472J	4.7K ohm	
R513	VRD-ST2EE823J	82K ohm	
R514	VRD-ST2EE124J	120K ohm	
R515,516	VRD-ST2EE103J	10K ohm	
R517	VRD-ST2EE122J	1.2K ohm	
R519,520	VRD-ST2EE332J	3.3K ohm	
R521,522	VRD-ST2EE103J	10K ohm	
R523,524, R525,526	VRD-ST2EE103J	10K ohm	
R527,528	VRD-ST2EE222J	2.2K ohm	
R529	VRD-ST2EE103J	10K ohm	
R530	VRD-ST2EE472J	4.7K ohm	
R531	VRD-ST2EE102J	1K ohm	
R532	VRD-ST2EE221J	220 ohm	
R533,534	VRD-ST2EE102J	1K ohm	
R535,536	VRD-ST2EE222J	2.2K ohm	
R537,538	VRD-ST2EE103J	10K ohm	
R539,540	VRD-ST2EE473J	47K ohm	
R541,542	VRD-ST2EE392J	3.9K ohm	
R543,544	VRD-ST2EE474J	470K ohm	
R545,546	VRD-ST2EE683J	68K ohm	
R545,548	VRD-ST2EE682J	6.8K ohm	AA
R549,550	VRD-ST2EE102J	1K ohm	
R551,552	VRD-ST2EE473J	47K ohm	
R553	VRD-ST2EE102J	1K ohm	
R554,555	VRD-ST2EE103J	10K ohm	
R556,557,	VRD-ST2EE103J	10K ohm	
R558,559, R560,561	VRD-ST2EE683J	68K ohm	
R562,563	VRD-ST2EE102J	1K ohm	
R564	VRD-ST2EE152J	1.5K ohm	
R565	VRD-ST2EE561J	560 ohm	
R566,567, R568	VRD-ST2EE182J	1.8K ohm	
R569	VRD-ST2EE331J	330 ohm	
R570	VRD-ST2EE223J	22K ohm	
R571	VRD-ST2EE103J	10K ohm	
R572,573	VRD-ST2EE102J	1K ohm	
R574,575, R576,577, R578	VRD-ST2EE102J	1K ohm	
R579	VRD-ST2EE103J	10K ohm	
R580	VRD-ST2EE102J	1K ohm	
R581	VRD-ST2EE561J	560 ohm	
R582	VRD-ST2EE223J	22K ohm	
R583,584	VRD-ST2EE103J	10K ohm	
R585	VRD-SU2EE392J	3.9K ohm	
R586	VRD-ST2EE103J	10K ohm	
R587,588	VRD-ST2EE102J	1K ohm	
R589,590, R591,592	VRD-ST2EE103J	10K ohm	
R593	VRD-ST2EE100J	10 ohm	
R594,595	VRD-ST2EE272J	2.7K ohm	
R596	VRG-ST2EE1R0J	1 ohm, 1/4W, ±5%, Fusible	AB
R606,607	VRD-ST2EE123J	12K ohm	
R608	VRD-ST2EE123J	12K ohm	AA
R609,610	VRD-ST2EE223J	22K ohm	
R611	VRD-SU2EE102J	1K ohm	

REF.NO.	PART NO.	DESCRIPTION	CODE
R612	VRD-ST2EE472J	4.7K ohm	
R613,614, R615,616	VRD-ST2EE104J	100K ohm	
R617,618	VRD-ST2EE103J	10K ohm	
R619,620	VRD-ST2EE472J	4.7K ohm	
R621,622	VRD-ST2EE103J	10K ohm	
R623	VRD-ST2EE102J	1K ohm	
R624	VRD-ST2EE470J	47 ohm	
R625,626	VRD-ST2EE102J	1K ohm	
⚠R701	VRD-ST2HD475J	4.7Meg ohm,1/2W,±5%, Carbon(VZ-2000 only)	
R702,703	VRD-ST2EE102J	1K ohm	
R704	VRD-ST2EE103J	10K ohm	
R705	VRD-ST2EE104J	100K ohm	
R706	VRD-ST2EE473J	47K ohm	AA
R707,708, R709	VRD-ST2EE103J	10K ohm	
R710	VRD-ST2EE122J	1.2K ohm	
R711	VRD-ST2EE471J	470 ohm	
R712	VRD-ST2EE103J	10K ohm	
R713	VRD-ST2EE472J	4.7K ohm	
R714	VRD-ST2EE102J	1K ohm	
R715	VRD-ST2EE103J	10K ohm	
R716	VRD-ST2EE334K	330K ohm	
R901,902	VRD-ST2EE393J	39K ohm	
R903,904	VRD-ST2EE104J	100K ohm	
R905,906, R907,908	VRD-ST2EE183J	18K ohm	
R909,910	VRD-ST2EE122J	1.2K ohm	
R911	VRD-ST2EE222J	2.2K ohm	
R912	VRD-ST2EE182J	1.8K ohm	
R913	VRD-ST2EE684J	680K ohm	
R914	VRD-ST2EE182J	1.8K ohm	
R915	VRD-ST2EE823J	82K ohm	

CIRCUIT PARTS

BI101/ CNS504	CCNCW362KAF01	10Pin Board in Plug/9Pin Socket Assembly
BI102,103/ CNS301, CNS203	CCNCW341JAF01	9Pin, 8Pin Board in Plug/ 11Pin, 3Pin Socket Assembly
BI201A,B/ CNS851	CCNCW313LAF02	9Pin, 2Pin Board in Plug/ 11Pin Socket Assembly
BI301/ CNS302	CCNCW359GAF01	7Pin Board in Plug/6Pin Socket Assembly
BI302A,B	CCNCW362KAF03	10Pin Board in Plug ×2 Assembly
BI401A,B	CCNCW367GAF06	7Pin Board in Plug ×2 Assembly
BI402A,B/ CNS401, CNS402	CCNCW365EAF03	5Pin×2 Board in Plug/ 4Pin Socket ×2 Assembly
BI403A,B	CCNCW367GAF05	7Pin Board in Plug ×2 Assembly
BI404/ CNS302	CCNCW357EAF02	5Pin Board in Plug/4Pin Socket Assembly
BI501/ CNP501	CCNCW368HAF01	8Pin Board in Plug/7Pin Socket Assembly
BI502A,B	CCNCW369JAF01	9Pin Board in Plug Assembly
BI503A,B	CCNCW369JAF02	9Pin Board in Plug ×2 Assembly
BI504/ CNP504	CCNCW362KAF02	10Pin Board in Plug/9Pin Plug Assembly

REF.NO.	PART NO.	DESCRIPTION	CODE
BI505A,B,C	CCNCW359GAF04	7Pin x2/6Pin Board in Plug Assembly	
BI506/ CNS506	CCNCW367GAF03	7Pin Board in Plug/6Pin Socket Assembly	
BI507A,B	CCNCW373NAF01	13Pin Board in Plug x2 Assembly	
BI508A,B	CCNCW365EAF02	5Pin Board in Plug x2 Assembly	
BI701/ CNS403	CCNCW370KAF03	10Pin Board in Plug/7Pin Socket Assembly	
BI702A,B/ CNS501	CCNCW367GAF07	7Pin, 4Pin Board in Plug/ 7Pin Socket Assembly	
CNP101	QCNW-1373AFZZ	2Pin Plug Assembly	AE
CNP201	QCNCM404HAFZZ	8Pin Plug	AC
CNP203	QCNCM463CAFZZ	3Pin Plug	AA
CNP301	QCNCM482JAFZZ	9Pin Plug	
CNP302	QCNCM464DAFZZ	6Pin Plug	AB
CNP401	QCNW-1366AFZZ	4Pin Plug Assembly	AF
CNP402	QCNW-1365AFZZ	4Pin Plug Assembly	AF
CNP403	QCNCM327GAFZZ	7Pin Plug	AD
CNP502	QCNCM398BAFZZ	2Pin Plug	AB
CNP503	QCNCM233DAFZZ	4Pin Plug	AC
CNP506	Part of REF. NO. M502	6Pin Plug	
CNP701	QCNCM050BAFZZ	2Pin Plug	AB
CNP851	QCNCM426LAFZZ	11Pin Plug	AD
CNS101	QCNW-1362AFZZ	2Pin Socket Assembly	AE
CNS201	QCNW-1363AFZZ	8Pin Socket Assembly	AL
CNS502	Part of REF. NO. M501	2Pin Socket Assembly	
CNS503	QCNW-1357AFZZ	4Pin Socket Assembly	AE
CNS701	CCNCW050BAF13	2Pin Socket Assembly	AE
△ F701	QFS-B402AAFNB	Fuse, T4.0A/125V	AE
J402	QJAKE0091AFZZ	Microphone Jack (VZ-2000/X)	AE
	QJAKE0087AFZZ	Microphone Jack (VZ-2000XA)	AF
J403	QJAKJ0103AFZZ	Headphones Jack (VZ-2000/X)	AF
	QJAKJ0101AFZZ	Headphones Jack (VZ-2000XA)	AF
△ J701/702/ SW703	QSOCZ2185AFZZ	AC/DC Power Supply Input Socket Assembly	AH
M501	RMOTV0109AFZZ	Cartridge Motor	AS
M502	RMOTP0062AFZZ	Phono Motor	AX
M851	RMOTV0093AFZZ	Tape Motor	AV
PL901	RLMPM0143AFZZ	Lamp, Dial Illumination	AE
SO101	QTANN0465AFZZ	Antenna Terminal	AF
SO102A ~ D	QSOCJ0692AFZZ	Auxiliary Input/Mixing Output Socket Assembly	AE
SO401	QSOCJ2280AFZZ	External Speaker Socket	AD
△ SO701	QSOCE0590AFZZ	Voltage Selector (VZ-2000)	AH
	QSOCE0592AFZZ	Voltage Selector (VZ-2000X/XA)	AH
SOL501,502	RPLU-0144AFZZ	Side A Tonearm Solenoid Assembly	AN
SOL503,504	RPLU-0144AFZZ	Side B Tonearm Solenoid Assembly	AN
SOL851	RPLU-0117AFZZ	APSS Solenoid	AK
SP1,3	VSP0050TB454A	Tweeter	AN
SP2,4	VSP0016PB664A	Woofer(VZ-2000/X)	AW
	VSP0016PB654A	Woofer(VZ-2000XA)	AW
SW101A ~ F	QSW-P0380AFZZ	Switch, Function Selector	AP
SW201A ~ J	QSW-S0320AFZZ	Switch, Record/Playback Selector	AG
SW202	QSW-P0381AFZZ	Switch, Beat Cancel	AF
SW301A ~ D	QSW-P0379AFZZ	Switch, Meter Selector	AF
SW302	QSW-S0351AFZZ	Switch, Loudness	
SW303	QSW-S0351AFZZ	Switch, Dolby NR	
SW304A ~ D	QSW-S0350AFZZ	Switch, Tape Selector	AG
SW401	QSW-S0342AFZZ	Switch, Speaker Selector	AE
SW501	QSW-F0161AFZZ	Switch, Door Close Detection	AD
SW502	QSW-F0161AFZZ	Switch, Rest Position Detection	AD
SW503	QSW-K0056AFZZ	Switch, Play/Cut	AC
SW504	QSW-K0056AFZZ	Switch, Que	AC
SW505	QSW-K0056AFZZ	Switch, Forward	AC
SW506	QSW-K0056AFZZ	Switch, Reverse	AC
SW507	QSW-K0056AFZZ	Switch, Both Sides Play	AC
SW508	QSW-K0056AFZZ	Switch, Repeat	AC
SW509	QSW-K0056AFZZ	Switch, Side A/B Selector	AC
SW510	QSW-K0056AFZZ	Switch, Phono Motor Speed Selector(33/45)	AC
SW701	QSW-P9144AFZZ	Switch, Power	AG
SW702	QSW-S0338AFZZ	Switch, Player Protection	AE
SW851	QSW-F0148AFZZ	Switch, Tape Motor	AE
SW852	QSW-F0137AFZZ	Switch, Muting	AE
SW853	QSW-F0137AFZZ	Switch, APSS	AE
SW854	QSW-F0149AFZZ	Switch, Bias	AE
TP101	QCNCM233DAFZZ	4Pin, Test Point	AC
TP201	QCNCM0402SGZZ	4Pin, Test Point	AB
TP202	QCNCM543CAFZZ	3Pin, Test Point	AA

TAPE DECK MECHANICAL PARTS

001	JBOTN0102AFZZ	Button Block Assembly	AQ
001-1	LANGK0257AFZZ	Bracket, Button Block	AD
001-2	MLEVP0240AFZZ	Lever, Button Lock (Main)	AB
001-3	MLEVP0241AFZZ	Lever, Button Lock (Sub)	AB
001-4	MLEVP0257AFZZ	Lever, Fast-forward Button	AD
001-5	MLEVP0258AFZZ	Lever, Rewind Button	AD
001-6	MLEVP0260AFZZ	Lever, Play Button	AD
001-7	MLEVP0261AFZZ	Lever, Record Button	AD
001-8	MLEVP0323AFZZ	Lever, Stop Button	AD
001-9	MLEVP0324AFZZ	Lever, Eject Button	AB
001-10	MLEVP0325AFZZ	Lever, Pause Button	AC
001-11	MSPRP0260AFFW	Spring(Plate Type), Button Lever	AA
001-12	NSFTT0144AFFD	Shaft, Button Lever	AB
002	LANGF0575AFZZ	Bracket, Flywheel	AE
003	LANGG0078AFZZ	Sub Chassis Guide	AC
004	LANGK0248AFZZ	Bracket, Motor	AC
005	LANGT0978AFZZ	Head Base	AB
006	LCHSM0360AFZZ	Main Chassis	
007	LCHSM0392AFZZ	Second Chassis	
008	LCHSS0159AFZZ	Sub Chassis	
009	LHLDW3056AFZZ	Wire Holder	AA
010	LPINZ0051AFZZ	Pin, Pause Lever	AA
011	LSLVM0113AFFW	Sleeve, Sensor Lever	AC
012	LSTWC2001AFZZ	Stop Ring, 2mm Dia.	AA
013	LSTWC4004AFZZ	Stop Ring, 4mm Dia.	AA
014	LX-BZ0328AFZZ	Screw, Motor Retaining	
015	LX-HZ0056AFFD	Screw, 3mm Dia.x10mm	AA
016	LX-HZ0077AFFZ	Screw, 2.6mm Dia. x10mm	AA
017	LX-HZ0099AFZZ	Screw, 2.6mm Dia. x13mm	
018	LX-HZ0080AFZZ	Screw, 3mm Dia.x25mm	AA
019	LX-HZ0081AFZZ	Screw, 3mm Dia.x30mm	AA
020	LX-WZ0014AGFK	Lock Washer, 2.6mm Dia.	AA
021	LX-WZ5018AFZZ	Washer, 2.1mm Dia.	AA
022	LX-WZ5020AFZZ	Washer, 1.7mm Dia.	AA
023	LX-WZ9053AFZZ	Washer, Oil Thrower	AA
024	LX-WZ0963AFZZ	Washer, 1.5mm Dia.	
025	LX-WZ9064AFZZ	Washer, 2mm Dia.	AA
026	MCAMP0054AFZZ	Cam, Pause	AB
027	MLEVF1120AFZZ	Arm, P.A.D.	AD

REF.NO.	PART NO.	DESCRIPTION	CODE
028	MLEVP0367AFZZ	Lever, Cassette Holder Lock	
029	MLEVP0216AFZZ	Lever, Record	AB
030	MLEVP0217AFZZ	Lever, Play	AB
031	MLEVP0218AFZZ	Lever, Rewind	AB
032	MLEVP0219AFZZ	Lever, Fast-forward	AC
033	MLEVP0221AFZZ	Lever, P.A.D. Lock	AB
034	MLEVP0222AFZZ	Arm, P.A.D. Lock	AB
035	MLEVP0223AFZZ	Lever, Start	AB
036	MLEVP0332AFZZ	Arm, Eject Prevention	
037	MLEVP0225AFZZ	Arm, Record Prevention	AB
038	MLEVP0226AFZZ	Lever, Lock Release	AB
039	MLEVP0227AFZZ	Arm, Brake Release	AB
040	MLEVP0228AFZZ	Lever, APSS Switch Operation	AB
041	MLEVP0229AFZZ	Lever, Fast-forward/ Rewind Prevention	AB
042	MLEVP0230AFZZ	Arm, Record Sensor	AB
043	MLEVP0231AFZZ	Lever, Sub Chassis Lock	AB
044	MLEVP0232AFZZ	Arm, Play Release	AB
045	MLEVP0233AFZZ	Lever, Brake	AB
046	MLEVP0234AFZZ	Lever, Auto STop Killer	AB
047	MLEVP0235AFZZ	Lever, Sensor	AB
048	MLEVP0236AFZZ	Lever, Erase Prevention	AB
049	MLEVP0237AFZZ	Lever, Record Interlocking	AD
050	MLEVP0239AFZZ	Pad, Thrust	AC
051	MLEVP0314AFZZ	Lever, Record/Playback Changeover	AE
052	MLEVP0326AFZZ	Lever, Pause	AC
053	MSPRC0229AFFJ	Spring, Pause Lever Pin	AB
054	MSPRC0230AFFJ	Spring, Head Azimuth	AB
055	MSPRC0231AFFJ	Spring, APSS Solenoid	AB
056	MSPRC0248AFFJ	Spring, Sensor Lever	AB
057	MSPRD0311AFFJ	Spring, Over Stroke	AB
058	MSPRD0312AFFJ	Spring, P.A.D. Lock Lever	AB
059	MSPRD0314AFFJ	Spring, Pinch Roller Pressure	AB
060	MSPRD0315AFFJ	Spring, Record Sensor Arm	AB
061	MSPRD0316AFFJ	Spring, Fast-forward/ Rewind Return Lever	AB
062	MSPRD0317AFFJ	Spring, Pinch Roller Return	AB
063	MSPRD0318AFFJ	Spring, Pause Cam	AB
064	MSPRD0335AFFJ	Spring, Sub Chassis Lock Lever	AB
065	MSPRD0349AFFJ	Spring, P.A.D. Gear	AB
066	MSPRP0283AFFJ	Spring (Plate type), Sub Chassis Presing	
067	MSPRP0278AFFJ	Spring (Plate type), Cassette Pressing	
068	MSPRT0739AFFJ	Spring, Record Prevention Arm/Fast-forward Roller/ Rewind Roller	AB
069	MSPRT0740AFFJ	Spring, Auto Stop Killer Lever	AB
070	MSPRT0741AFFJ	Spring, Brake Lever	AB
071	MSPRT0743AFFJ	Spring, Record Lever/ P.A.D. Lock Lever/Brake Release Arm/Play Release Arm	AB
072	MSPRT0744AFFJ	Spring, Cassette Holder Lock Lever/Play Arm	AB
073	MSPRT0745AFFJ	Spring, Pause Lever	AB
074	MSPRT0746AFFJ	Spring, Play Lever	AB
075	MSPRT0747AFFJ	Spring, Sub Chassis Return	AB
076	NBALS0006AGFJ	Steel Ball, 2mm Dia.	AA
077	NBLTH0076AFZZ	Belt, Flywheel Drive	AC
078	NBLTK0184AFZZ	Belt, Play	AB
079	NDAIR0150AFSA	Turntable, Take-up	AG
080	NDAIR0151AFSA	Turntable, Supply	AE
081	NFLYC0090AFZZ	Flywheel	AP
082	NGERH0066AFZZ	Gear, P.A.D.	AB
083	NGERH0067AFZZ	Gear, Play	AE
084	NGERP0051AFZZ	Gear, Play Drive	AB
085	NIDR-0073AFZZ	Arm, Play	AD
086	NIDR-0074AFZZ	Idler, Rewind	AB
087	NPLYR0076AFZZ	Pully, Play	AB
088	NROLV0017AFZZ	Roller, Fast-forward	AF
089	NROLX0014AFZZ	Roller, Rewind	AF
090	NROLY0037AFZZ	Pinch Roller	AE
091	NSFTN0008AFFW	Shaft, Play Pulley	AB
092	NSFTT0148AFFW	Shaft, Record/Playback Changeover Lever	AD
093	PGUMR0052AFZZ	Cushion, P.A.D. Arm	AB
094	QCNW-0964AFZZ	Earth Terminal with Lead	AC
095	QLUGP9052AFZZ	Wrapping Pin	AA
096	RHEDA0085AFZZ	Erase Head	AM
097	RHEDH0098AFZZ	Record/Playback Head	AP
098	PSHEP0070AFZZ	Spacer, Eject Prevention Arm	

PLAYER MECHANICAL PARTS

201	CAMR-0055AFA1	Side A Tonearm Assembly	
201-1	————	Side A Tonearm	
201-2	HDECQ0157AFSA	Decoration Plate, Tonearm	AD
201-3	LANGJ0091AFFW	Bracket, Tonearm Adjustment Base	AC
201-4	LX-WZ3076AFFW	Wire Cramp	
201-5	LX-JZ0015AFFD	Screw, Tonearm Adjustment Base	AB
201-6	MARMM0066AFFW	Tonearm Adjustment Base	AB
201-7	MAPRT0825AFFJ	Spring, Tonearm Adjustment Base	AB
201-8	MSPRT0826AFFJ	Spring, Stylus Pressurs	AA
201-9	PWET-0056AFFW	Weight, Side A Tonearm Balance	AB
201-10	RCTRE5056AFSA	Cartridge with Stylus	AW
	PNDLD0051AFZZ	Stylus (STY-123)	AX
	QCNW-1312AFZZ	Cartridge Lead Assembly	AF
	QCNW-1456AFZZ	Tracking Sensor Lead Assembly	AD
202	CAMR-0055AFB1	Side B Tonearm Assembly	
202-1	————	Side B Tonearm	
202-2	LANGJ0091AFFW	Bracket, Tonearm Adjustment Base	AC
202-3	LX-WZ3076AFFW	Wire Cramp	
202-4	LX-JZ0015AFFD	Screw, Tonearm Adjustment Base	AB
202-5	MARMM0066AFFW	Tonearm Adjustment Base	AB
202-6	MSPRT0825AFFJ	Spring, Tonearm Adjustment Base	AB
202-7	MSPRT0826AFFJ	Spring, Stylus Pressurs	AA
202-8	PWET-0057AFFW	Weight, Side B Tonearm	AB
202-9	RCTRE5056AFSA	Cartridge with Stylus	AW
	PNDLD0051AFZZ	Stylus (STY-123)	AX
202-10	HDECQ0157AFSB	Decoration Plate, Tonearm Balance	AD
	QCNW-1455AFZZ	Cartridge Lead Assembly	AF
	QCNW-1456AFZZ	Tracking Sensor Lead Assembly	AD
203	CTNT-0052AF02	Turntable Assembly	

REF.NO.	PART NO.	DESCRIPTION	CODE
203-1	————	Turntable	
203-2	MSPRC0247AFFJ	Spring, EP Adaptor	AB
203-3	PEPAP0052AFSA	EP Adaptor	AC
204	GFTAF1028AFSB	Base, Disc (VZ-2000/X)	
	GFTAF1028AFSA	Base, Disc (VZ-2000XA)	
205	GFTAF1029AFSB	Player Door (VZ-2000/X)	
	GFTAF1029AFSA	Player Door (VZ-2000XA)	
206	HDECP0064AFSA	Sheet, Disc Base Protection	AA
207	LANGF0659AFFW	Bracket, Turntable	AH
208	LANGF0660AFZZ	Turntable Thrust Assembly	AC
209	LANGF0661AFFW	Bracket, Phono Motor	AB
210	LANGF0665AFFW	Bracket, Door Left Side	AD
211	LANGF0666AFFW	Bracket, Door Right Side	AD
212	LANGF0668AFFW	Bracket, Door Close Detection Switch	AC
213	LANGF0669AFFW	Bracket, Rest Position Detection Switch	AC
214	LANGF0670AFFW	Bracket, Door Lock	AC
215	LANGF0683AFFW	Bracket, Door Strengthen	AE
216	LANGF0677AFFW	Bracket, Player Switch PWB Strengthen	AB
217	LBSHS0001AG00	Bushing, Motor	AA
218	LBSHZ0074AFZZ	Bushing, Door Shaft	AA
219	LCHSP0051AFZZ	Main Chassis	
220	LCRA-0055AFZZ	Wire Holder	AA
221	LHLDZ1157AFSA	Base, EP/LP Record Sensor	AD
222	LHLDZ1159AFZZ	Holder, Player Switch LED	AC
223	LSLVM0109AFFW	Sleeve, 12mm Dia.	AB
224	LSLVM0117AFFD	Sleeve, Door Arm, 10mm Dia.	AA
225	LSLVM0118AFFW	Sleeve, Disc Base Arm, 10mm Dia.	AB
226	LX-BZ0219AFFD	Screw, Motor	AA
227	LX-BZ0343AFZZ	Screw(Shaft), Tonearm Guide	
228	LX-BZ0342AFZZ	Screw(Shaft), Door	
230	LX-BZ0331AFFD	Screw, Turntable Bracket	AA
231	LX-HZ0098AFFD	Screw, Door Arm	AA
233	LX-WZ1057AFZZ	Washer	AA
234	MLEVF1255AFFW	Lever, Side A Tonearm Guide Operating	AC
235	MLEVF1256AFFW	Lever, Side B Tonearm Guide Operating	AC
236	MLEVF1257AFZZ	Lever, Side A Tonearm Lock	AD
237	MLEVF1258AFZZ	Lever, Side B Tonearm Lock	AD
238	MLEVF1259AFZZ	Arm, Disc Base	AD
239	MLEVF1260AFZZ	Arm, Door Left Side	AH
240	MLEVF1263AFZZ	Arm, Door Right Side	AH
241	MLEVF1270AFZZ	Tonearm Guide	AG
242	MLEVP0318AFZZ	Lever, Door Lock	AE
243	MLEVP0319AFSB	Lever, EP(VZ-2000/X)	
	MLEVP0319AFSA	Lever, EP(VZ-2000XA)	
244	MLIFM0052AFZZ	Damper Assembly, Side A Tonearm	AG
245	MLIFM0053AFZZ	Damper Assembly, Side B Tonearm	AG
246	MLNKM0051AFZZ	Tonearm Wire Assembly	AK
247	MSPRD0370AFFJ	Spring, EP Lever	AA
249	MSPRD0413AFFJ	Spring, Door Right Side Arm	
250	MSPRP0288AFZZ	Spring(Plate type), Disc Pressure	AC
251	MSPRT0841AFFJ	Spring, Tonearm Wire	
252	MSPRT0811AFFJ	Spring, Side A Tonearm Guide	AA
253	MSPRT0812AFFJ	Spring, Side B Tonearm Guide	AA
254	MSPRT0813AFFJ	Spring, Side A Tonearm Guide Operating Lever	AA
255	MSPRT0814AFFJ	Spring, Side B Tonearm Guide Operating Lever	AA
256	MSPRT0817AFFJ	Spring, Disc Base Arm	AA
257	MSPRT0818AFFJ	Spring, Door Lock Lever	AA
258	NBLTH0080AF00	Belt, Turntable	AG
259	NBLTK0203AF00	Belt, Gear	AB
260	NBRGC0078AFZZ	Bearing, Turntable	AF
261	NBRGP0057AFZZ	Bearing, Disc Pressure	AC
262	NBRGM0052AFFW	Bearing, Tonearm Guide	AB
263	CDRM-0172AF01	Disc Pressure Assembly	
264	NGERH0077AFZZ	Gear Assembly	AK
265	NPLYB0061AFZZ	Pulley with Shaft	AB
266	NPLYD0060AFZZ	Pulley with Revet (Small)	AB
267	NPLYD0059AFZZ	Pulley with Revet (Large)	AB
268	NROLM0066AFFW	Roller, Door Lock Lever	AD
269	NROLP0070AFZZ	Roller with Revet	AA
270	PCUSG0152AF00	Cushion, Tarntable Bracket	AA
271	PCUSG0154AFSA	Cushion, Record	AB
272	PCUSG0155AF00	Cushion, Player Mechanism	AA
273	PCUSG0157AF00	Cushion, Tonearm Guide	AA
274	PCUSS0159AFZZ	Cushion, Side A Balance Weight	AA
275	PCUSS0160AFZZ	Cushion, Side B Balance Weight	AA
276	PSLDM7144AFZZ	Shield Sheet, Door	AA
277	LANGT1062AFZZ	Bracket, Player Switch PWB	AC
278	LCRA-0056AFZZ	Wire Holder	AA
279	LHLDZ1164AFZZ	Holder, EP/LP Record Sensor	AA
280	LX-HZ0087AFFD	Screw, Microcomputer PWB	AA
281	LX-WZ3075AFZZ	Washer	AA
282	MLEVP0333AFSB	Lever, EP/LP Record Sensor(VZ-2000/X)	
	MLEVP0333AFSA	Lever, EP/LP Record Sensor(VZ-2000XA)	
284	LX-HZ0053AFFD	Screw, Door Close Detection Switch Bracket/Disc Base Arm	AA
285	MLEVF1321AFFW	Arm, Door Left Side Damper(Large)	AC
286	MLEVF1320AFFW	Arm, Door Right Side Damper(Large)	AC
287	MSPRT0866AFFJ	Spring, Door Right Side Damper Arm	AB
288	PCUSZ0018AFZZ	Cushion, Side A Cartridge	AA
289	PCUSZ0019AFZZ	Cushion, Side B Cartridge	AA
290	PGUMM0148AF00	Rubber, Disc Base	AB
291	PSHEP0072AFSB	Sheet, Side B Stylus (VZ-2000/X)	
	PSHEP0072AFZZ	Sheet, Side B Stylus (VZ-2000XA)	
292	LX-HZ0097AFFD	Screw, Door Close Detection Switch Bracket	AB
293	LHLDW9003CEZZ	Wire Holder	AA
296	MLEVF1323AFFW	Arm, Door Left Side Damper(Small)	AC
297	MLEVF1322AFFW	Arm, Door Right Side Damper(Small)	AC
298	LX-WZ9075AFFW	Washer, Door Damper Arm	
299	LX-WZ3078AFFW	Washer, Door Damper Arm	AA

REF.NO.	PART NO.	DESCRIPTION	CODE
300	MSPRT0865AFFJ	Spring, Door Left Side Damper Arm	AB
301	PCUSS0171AFZZ	Cushion, Door Lock Lever	
302	LX-LZ0071AFZZ	Revet	AA
303	PCUSG0172AF00	Cushion, Transportation Fixing Screw	
304	PCUSG0174AF00	Cushion, Phono Motor Bracket	
	CABINET EXPLODED VIEW PARTS		
401	GCABA1634AFSB	Front Cabinet	BC
402	GCABB1644AFSA	Rear Cabinet	
403	GCOVA1288AFSB	Cover, Side B Player Mechanism (VZ-2000/X)	
	GCOVA1288AFSA	Cover, Side B Player Mechanism (VZ-2000XA)	
404	GCOVA1306AFSA	Cover, Player Door (VZ-2000/X)	
	GCOVA1306AFSB	Cover, Player Door (VZ-2000XA)	
405	GCOVA1290AFSA	Dust Cover	AT
406	GCOVA1303AFSA	Indication Plate, Door (VZ-2000/X)	AM
	GCOVA1303AFSB	Indication Plate, Door (VZ-2000XA)	
407	GCOVA1292AFSB	Cover, Left Side Woofer (VZ-2000/X)	
	GCOVA1292AFSA	Cover, Left Side Woofer (VZ-2000XA)	
408	GCOVA1293AFSA	Cover, Tweeter	
409	GCOVA1305AFSA	Cover, Control(VZ-2000/X)	
	GCOVA1305AFSB	Cover, Control(VZ-2000XA)	
410	GCOVA1302AFSA	Indication Plate, Terminal	
411	GCOVA1297AFSA	Cover, Player LED	AB
412	GCOVA1298AFSB	Cover, Right Side Woofer (VZ-2000/X)	
	GCOVA1298AFSA	Cover, Right Side Woofer (VZ-2000XA)	
413	GFTAB1126AFSA	Lid, Battery Compartment	AD
414	GFTAC1175AFSB	Cassette Holder (VZ-2000/X)	
	GFTAC1175AFSA	Cassette Holder (VZ-2000XA)	
415	GFTAR1101AFSA	Lid, Right Side Woofer	AQ
416	GLEGG0059AF00	Leg	AB
417	GMADC0052AFSB	Window, Cassette Holder (VZ-2000/X)	AN
	GMADC0052AFSA	Window, Cassette Holder (VZ-2000XA)	
418	HBDGB1061AFSA	Badge, SHARP	
419	HDALM0353AFSA	Indication Plate, Dial Scale(VZ-2000/X)	AN
	HDALM0353AFSB	Indication Plate, Dial Scale(VZ-2000XA)	
421	HDECA0505AFSA	Decoration Plate, Front Cabinet	AT
422	HDECQ0159AFSA	Decoration Plate, Door	AH
423	HDECZ0063AFSA	Mirror	AA
424	HINDM1517AFSA	Indication Plate, Headphones Jack	AC
425	HPNC-0144AFSB	Metal Net, Woofer (VZ-2000/X)	AM
	HPNC-0144AFSA	Metal Net, Woofer (VZ-2000XA)	
426	HPNC-0145AFSB	Metal Net, Tweeter	AF
427	HPNLC1348AFSA	Indication Plate, Control (VZ-2000/X)	AY
	HPNLC1348AFSB	Indication Plate, Control (VZ-2000XA)	
428	HPNLC1344AFSB	Decoration Plate, Control (VZ-2000/X)	AG
	HPNLC1344AFSA	Decoration Plate, Control (VZ-2000XA)	
429	HSSND0290AFSA	Dial Pointer	AC
430	JHNDG1078AFSB	Handle	AW
431	JKNBM0424AFSA	Knob, Beat Cancel Switch	AA
432	JKNBN0527AFSB	Knob, Tuning(VZ-2000/X)	
	JKNBN0527AFSA	Knob, Tuning(VZ-2000XA)	
433	JKNBN0528AFSB	Knob, Volume Control (VZ-2000/X)	
	JKNBN0528AFSA	Knob, Volume Control (VZ-2000XA)	
434	JKNBP0170AFSA	Knob, Control	AC
435	JKNBP0171AFSA	Knob, Control	AC
436	JKNBZ0260AFSA	Button, Door Open	AD
437	JKNBZ0224AFSA	Button, Function Selector	AD
438	JKNBZ0225AFSA	Key, Player Operation	AM
439	JKNBZ0261AFSA	Button, Power	AC
440	JKNBZ0256AFSA	Button, Tape Operation	AD
441	JKNBZ0257AFSA	Button, Eject	AE
442	JKNBZ0258AFSA	Button, Tape Operation	AE
443	JKNBZ0230AFSA	Button, Tape Counter Reset	AA
444	JKNBZ0232AFSA	Button, Player Protection Switch	AA
445	KCOUB0118AFZZ	Tape Counter	AL
446	LANGF0682AFZZ	Bracket, Front Cabinet Lower Side	AE
447	LANGF0686AFSB	Bracket, Front Cabinet Upper Side(VZ-2000/X)	
	LANGF0686AFSA	Bracket, Front Cabinet Upper Side(VZ-2000XA)	
449	LANGT1063AFZZ	Bracket, Pulley	AC
450	LANGT1064AFZZ	Bracket, Pulley	AC
451	LANGT1065AFZZ	Bracket, Pulley	AB
453	LANGT1067AFZZ	Bracket, Cassette Base Left Side	AB
454	LANGT1068AFZZ	Bracket, Cassette Base Right Side	AA
455	LANGT1095AFFP	Bracket, Cassette Holder Lock Lever	
456	LANGZ0091AFSA	Bracket, Handle	AL
457	LANGZ0092AFFW	Battery Terminal Plate	AB
458	LBOSZ0108AFFD	Screw(Shaft), Handle	AA
459	LCHSZ0104AFZZ	Frame	AX
461	LHLDW1075AFZZ	Nylon Band (60mm)	AA
462	LHLDW9002CEZZ	Wire Holder	AA
463	LHLDZ1158AFZZ	Holder, Tuner LED	AC
464	LHLDZ9069AFSB	Cassette Base(VZ-2000/X)	
	LHLDZ9069AFSA	Cassette Base(VZ-2000XA)	
465	LHLDZ9071AFZZ	Holder, Door Open Button	AA
466	LX-BZ0308AFFD	Screw, Function Selector Button Shaft	AA
467	LX-BZ0334AFSA	Screw, Cassette Holder Window	AD
468	LX-CZ0002AFZZ	Screw, Cabinet/Fram	AB
469	LX-CZ0007AFFN	Screw, Cabinet	AA
471	LX-HZ0096AFFD	Screw, Acoustic Insulator Cushion	AB
472	LX-JZ0014AFFD	Screw, Player Mechanism	AB
474	LX-JZ0017AFFD	Screw, Heat Sink	AB
475	MLEVF1332AFFW	Lever, Cassette Holder Lock	AB
476	MLEVP0385AFZZ	Lever, Lock	AC
477	MLIFP0013AFZZ	Damper	AD
478	MSPRC0190AFFJ	Spring, Battery	AC
479	CSPRC0259AF01	Acoustic Insulator Assembly	
480	MSPRC0260AFFJ	Spring, Battery	AB
481	MSPRC0262AFFJ	Spring, Door Open Button	AA

REF.NO.	PART NO.	DESCRIPTION	CODE
482	MSPRD0374AFFJ	Spring, Cassette Holder Left Side	AB
483	MSPRD0418AFFJ	Spring, Cassette Holder Lock Lever	AB
484	MSPRP0227AFFJ	Spring(Plate type), Cassette Holder	AA
485	MSPRP0291AFFJ	Spring(Plate type), Cassette Base	AA
486	MSPRP0292AFFJ	Spring(Plate type), Power Button	AB
487	MSPRT0391AFFJ	Spring, Dial Cord (VZ-2000)	AB
	MSPRT0304AFFJ	Spring, Dial Cord (VZ-2000X/XA)	AA
488	MSPRT0822AFFJ	Spring, Cassette Holder Right Side	AB
489	MSPRT0823AFFJ	Spring, Record/Playback Changeover	AB
490	NBLTK0205AFZZ	Belt, Tape Counter	AB
491	NDRM-0165AFZZ	Drum	AD
492	NPLYB0051AFZZ	Pulley	AA
493	NPLYD0054AFZZ	Pulley with Revet	AB
494	NROLP0071AFZZ	Roller, Handle	AA
495	NSFTD0219AFZZ	Tuning Shaft	AG
496	NSFTM0107AFZZ	Shaft, Function Selector	AC
497	PCOVZ9071AF00	Insulator Cover, Battery Compartment(VZ-2000)	
	PCOVW9114AFZZ	Insulator Cover Battery Compartment (VZ-2000X/XA)	
498	PCOVW9115AFZZ	Cover, Battery Compartment(VZ-2000)	
	PCOVZ9066AF00	Cover, Battery Compartment (VZ-2000X/XA)	
499	PCUSS0153AFZZ	Cushion, Function Selector/Tape Operation Button	AB
500	PCUSU0231AF00	Cushion, Battery Compartment Lid	AB
501	PGIDM0105AFZZ	Guide, Lock Lever	
502	PGUMM0146AF00	Rubber, Acoustic Insulator	AB
505	PRDAR0277AFFW	Heat Sink	AG
506	PRDAR0278AFFW	Heat Sink	AG
507	PSPAS0136AFSA	Spacer, Control Button	AB
508	PSPAS0137AFSA	Spacer, Control Button	AA
509	PSPAS0138AFSA	Spacer, Control Button	AB
510	PTPEC0005AG00	Ribbon, Battery Compartment	
511	QANTR0112AFZZ	Rod Antenna	AN
512	QFSHD1001SEZZ	Holder, Fuse	AA
513	LX-BZ0348AFSA	Screw, Dust Cover	AA
514	GFTAR1102AFSA	Lid, Left Side Woofer	AQ
515	GLEGG0061AF00	Leg	AD
516	LANGT1079AFZZ	Bracket, Control PWB	AB
517	LHLDW1060AFZZ	Wire Holder	AA
518	LX-LZ0051AF00	Rivet	AA
519	LX-WZ3017CEFN	Washer, Rod Antenna	AA
520	LX-WZ3070AFZZ	Washer, Volume	AA
521	MSPRP0311AFFJ	Spring(Plate type), Cassette Lock Lever	AB
522	NPLYD0052AFZZ	Pulley with Revet	AB
523	NPLYD0055AFZZ	Pulley with Revet	AB
524	PCOVZ9070AF00	Cover, Rear Cabinet Gap (VZ-2000)	
	PCOVZ9067AF00	Cover, Rear Cabinet Gap (VZ-2000X/XA)	
525	PFLT-0490AF00	Felt, Control Button	AB
526	PFLT-0496AF00	Felt, Rear Cabinet (VZ-2000)	
	PFLT-0491AF00	Felt, Rear Cabinet (VZ-2000X/XA)	
527	PFLT-0497AF00	Felt, Front Cabinet (VZ-2000)	
	PFLT-0492AF00	Felt, Front Cabinet (VZ-2000X/XA)	
528	PGUMS0209AFZZ	Cushion, Dust Cover	
529	PGUMS0210AF00	Cushion, Handle Bracket	AA
530	PSHEP0073AFZZ	Sheet, Handle Slide	
531	PSLDC7063AFZZ	Sheet, Volume Grounding	AB
533	PSLDM7145AFZZ	Sheet, Door Cover Shield	AC
534	LANGT1078AFZZ	Bracket, Function Selector Button Interlocking	AB
535	LSLVM0124AFFW	Sleeve, Cassette Holder Lock Lever	
536	TLABZ0236AFZZ	Label, Speaker(VZ-2000/X)	AB
	TLABZ0228AFZZ	Label, Speaker (VZ-2000XA)	AB
537	TLABP0203AFZZ	Caution Label, Fuse (VZ-2000 Only)	
539	TSPC-0796AFZZ	Label, Specification (VZ-2000)	AC
	TSPC-0798AFZZ	Label, Specification (VZ-2000X)	AC
	TSPC-0830AFZZ	Label, Specification (VZ-2000XA)	
540	NSFTM0108AFZZ	Shaft, Tape Operation Button	
542	LX-BZ0211AFZZ	Screw, Pulley	AA
543	NPLYC0108AFFW	Pulley	
544	PCUSG0164AF00	Cushion, Player Door Open Button	
545	PCUSS0169AFZZ	Cushion, Tweeter Cover	
546	PCUSU0255AFZZ	Cushion, Power Switch Button	
547	PGUMM0149AFZZ	Rubber, Terminal PWB Maintain	AC
548	PGUMS0217AF00	Cushion, Rear Cabinet (VZ-2000)	
	PGUMS0212AF00	Cushion, Rear Cabinet (VZ-2000X/XA)	
549	PGUMS0214AF00	Cushion, Rear Cabinet	
550	PKYU-0067AFZZ	Acoustic Meterial	
551	PSHEF0133AFZZ	Felt, Cassette Holder Spring/Cassette Holder Window	
552	PSLDM3250AFZZ	Shield, Tuner PWB	
553	PSPAG0098AF00	Spacer, Dust Cover Screw	
554	LANGT1080AFZZ	Bracket, Terminal PWB	AB
555	GCOVH1185AF00	Cover, Handle Left Side (VZ-2000 Only)	
556	GCOVH1186AF00	Cover, Handle Right Side (VZ-2000 Only)	
558	QLUGP0156AFZZ	Lug Terminal	AA
559	LHLDW1068AFZZ	Nylon Band(100mm)	AA
561	PSPAI0202AFZZ	Cushion, Front Cabinet	
563	PKYU-0068AFZZ	Acoustic Meterial	
564	PSPAI0197AF00	Spacer, Player Operation Key	
565	LANGT1096AFZZ	Bracket, Handle Cover	
566	PCUSG0166AFZZ	Cushion, Power Supply PWB	
567	QSOCT2151AFZZ	Socket, Transistor	
568	PFLT-0501AF00	Felt, Tuning (VZ-2000 Only)	
567	TCAUS0118AFZZ	Caution Label, Voltege Selector(VZ-2000)	AC
	TCAUS0119AFZZ	Caution Label, Voltege Selector(VZ-2000X/XA)	AC
568	PSPAS0142AFSA	Spacer, Door Open Button	
569	PCOVW1124AFZZ	Cover, Power Supply PWB (VZ-2000 Only)	

REF.NO.	PART NO.	DESCRIPTION	CODE
570	PCUSU0257AFZZ	Cushion, Function Selector Button	
571	PCUSU0258AFZZ	Cushion, Woofer Lid	
572	PFLT-0503AFZZ	Felt, Control Cover	

ACCESSORY/PACKING PARTS

	LX-HZ0094AFZZ	Screw, Transportation Fixing	AB
△	QACCD0051AF00	AC Power Cord (VZ-2000)	AH
△	QACCL0050AF00	AC Power Cord (VZ-2000X/XA)	AM
△	QACCZ0051AF00	AC Power Cord (VZ-2000X/XA)	AH
	QPLGA0251AFZZ	Adaptor(VZ-2000X/XA)	AE
	RTPEK0034AGZZ	DemonstrationTape (VZ-2000X/XA)	AL
	SPAKA0810AFZZ	Packing Add. Left Side (VZ-2000X/XA)	AH
	SPAKA0811AFZZ	Packing Add. Right Side (VZ-2000X/XA)	AL
	SPAKC1909AFZZ	Packing Case (VZ-2000X)	
	SPAKC1991AFZZ	Packing Case (VZ-2000XA)	
	SPAKP0182AFZZ	Polyethylene Bag, Unit (VZ-2000X/XA)	AK
	SPAKX0519AFZZ	Cushion, Dust Cover (Large)(VZ-2000X/XA)	AB
	SPAKX0571AFZZ	Cover, Side A Stylus (White)(VZ-2000X/XA)	AF
	SPAKX0572AFZZ	Cover, Side B Stylus (Green)(VZ-2000X/XA)	AF
	SPAKX0573AFZZ	Cushion, Front and Rear Side(VZ-2000X/XA)	AC
	SPAKX0577AFZZ	Cushion, Dust Cover (Small)(VZ-2000X/XA)	AA
	SPAKX0578AFZZ	Cushion, Lower Side (VZ-2000X/XA)	
	SSAKA0024AFZZ	Polyethylene Bag, Accessories	
	TCAUH0279AFZZ	Caution Label, Power	
	TCAUH0281AFZZ	Caution Card, Screw (VZ-2000)	
	TCAUH0284AFZZ	Caution Card, Screw (VZ-2000X/XA)	
	TCAUH0285AFZZ	Caution Card, Stylus Cover(VZ-2000)	
	TCAUH0286AFZZ	Caution Card, Stylus Cover(VZ-2000X/XA)	
	TCAUS0104AFZZ	Important Safeguards (VZ-2000)	AB
	TGANE1121AFZZ	Warranty Card, For Users in Australia (VZ-2000X/XA)	AC
	TCANE1124AFZZ	Warranty Card (VZ-2000X/XA)	AC
	TINSE0766AFZZ	Operation Manual (VZ-2000)	
	TINSZ0347AFZZ	Operation Manual (VZ-2000X/XA)	AL

PWB ASSEMBLY (Not Replacement Item)

PWB-B	DUNTR0180AF06 (Combined Assembly)	Tuner PWB	—
PWB-C1~C3	DUNTA0132AF02 (Combined Assembly)	Power Supply PWB (VZ-2000)	—
	DUNTA0132AF04 (Combined Assembly)	Power Supply PWB (VZ-2000X/XA)	—
PWB-D1~D6	DUNTK0062AF03 (Combined Assembly)	Control PWB/Tape-Deck PWB/Volume PWB/ Terminal PWB/Speaker PWB/Power Switch PWB	—
PWB-E1~E8	DUNTX0060AF06 (Combined Assembly)	Microcomputer PWB	—

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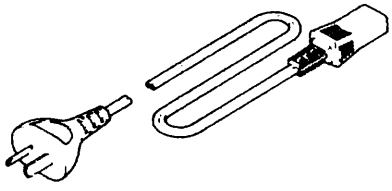

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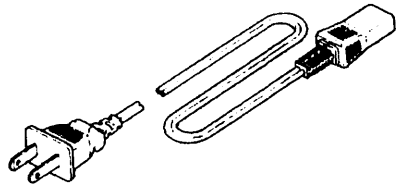

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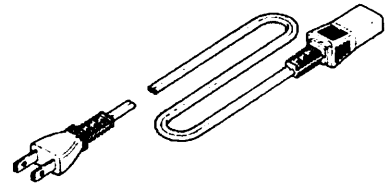

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