DENON

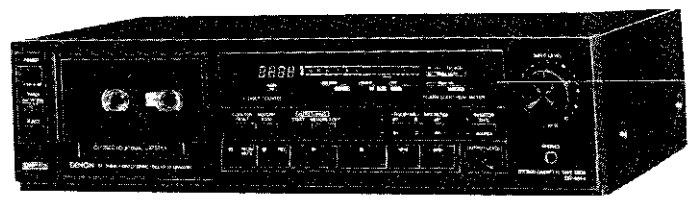
Hi-Fi Component

SERVICE MANUAL

STEREO CASSETTE TAPE DECK

MODEL DR-M33/DR-M44

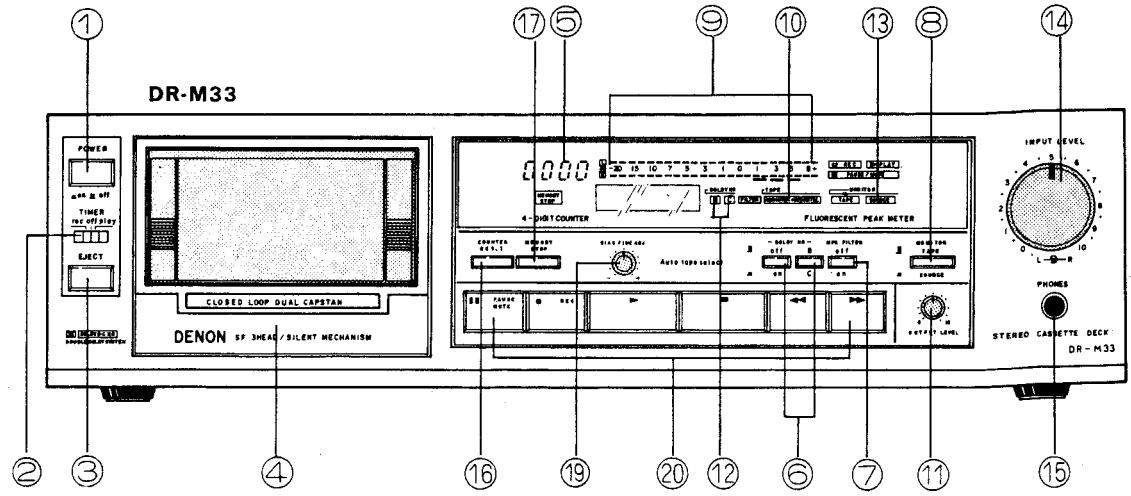
DR--M33

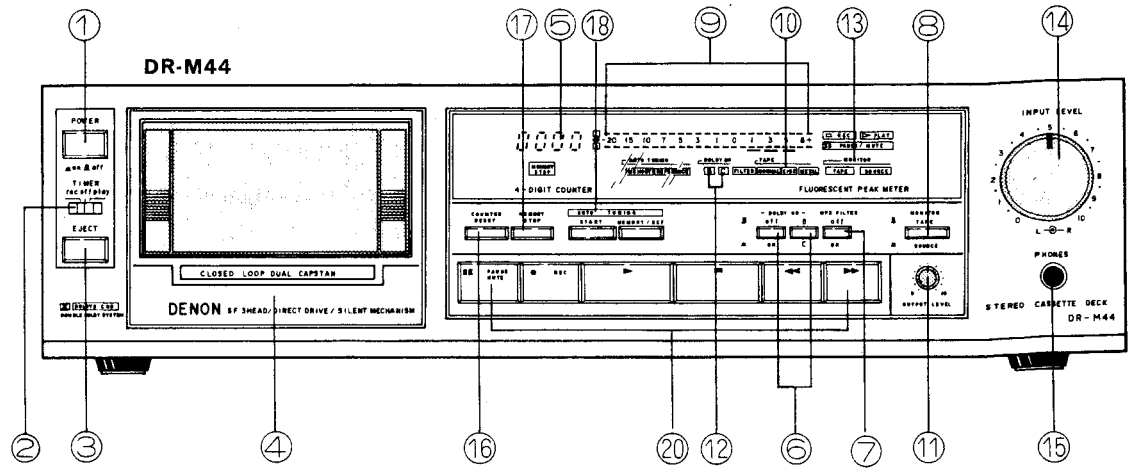


DR--M44

NIPPON COLUMBIA CO., LTD.

PART NAMES AND FUNCTIONS





1. POWER switch
Controls the supply of AC power to the deck. One push turns the deck on, a second push turns it off. The deck remains in a stand-by (non-operative) mode for approximately 4 seconds after it is switched on.

2. TIMER switch
This switch is provided for use with an optional audio timer for unattended recording or morning-alarm playback. For non-timer operation, this switch should be set in the "off" position.

3. EJECT button
Press this button to eject the cassette. When the deck is operating (tape is running), press the stop (■) key first to stop the tape transport; then press the eject button.

4. CASSETTE COMPARTMENT COVER
If this compartment cover is not closed completely, the deck's transport controls will remain inoperative.

5. TAPE COUNTER
A four-digit readout indicates the present tape count position.

6. DOLBY NR switches
The left Dolby NR switch activates (in) or deactivates (out) the deck's Dolby noise reduction circuitry. The right switch selects between Dolby B-Type (out) or C-Type NR (in).

7. MPX FILTER switch
The MPX FILTER switch should be used to prevent interference with the Dolby NR circuit when making Dolby NR encoded recordings of FM stereo programs. When making Dolby NR encoded recordings from any program source other than FM stereo, leave this switch in the "off" (out) position.

8. MONITOR switch
The SOURCE (in) position of this switch allows you to

monitor the source program before it is recorded. The TAPE (OUT) position of this switch is used for tape playback monitoring or simultaneous monitoring during recording.

9. FLUORESCENT PEAK METERS

These meters indicate recording or playback peak levels for each channel. For peak levels exceeding −1dB, the Auto Peak Hold Feature holds the peak level reading for approximately 1.5 seconds.

10. TAPE SELECT indicator

This indicator light is interlocked with the Auto Tape Select feature which automatically adjusts the deck to the type of tape in use. (NORMAL, CrO_2, or METAL).

11. OUTPUT LEVEL control

This control adjusts playback, recording monitor, and headphones output levels for the both channels simultaneously.

12. NR SYSTEM indicator

This indicator light is interlocked with the Dolby NR switch and informs the user that Dolby NR is in use as well as which (B or C) Type.

13. MONITOR indicator

This indicator light is interlocked with the MONITOR switch to inform the use of the selected monitoring source – TAPE or SOURCE.

14. INPUT LEVEL controls

These controls are used to adjust recording levels for each channel. The front control is for the left channel; the rear control for the right channel.

15. PHONES jack

For private music enjoyment without disturbing others, or for monitoring a recording, a set of headphones may be plugged in. Impedance is from 8 to 1200 ohms.

16. RESET button

Operation of the button resets the counter to all zero.

17. MEMORY STOP button

During rewinding operations, the tape will stop at the "0000" counter point automatically when this button is pressed in.

18. AUTO TUNING system (DR-M44 only)

By pushing this button, the deck automatically adjusts itself for the optimal recording characteristics of the tape that is being used.

19. Bias Fine Adjustment (for NORMAL and CrO_2 tape) (DR-M33 only)

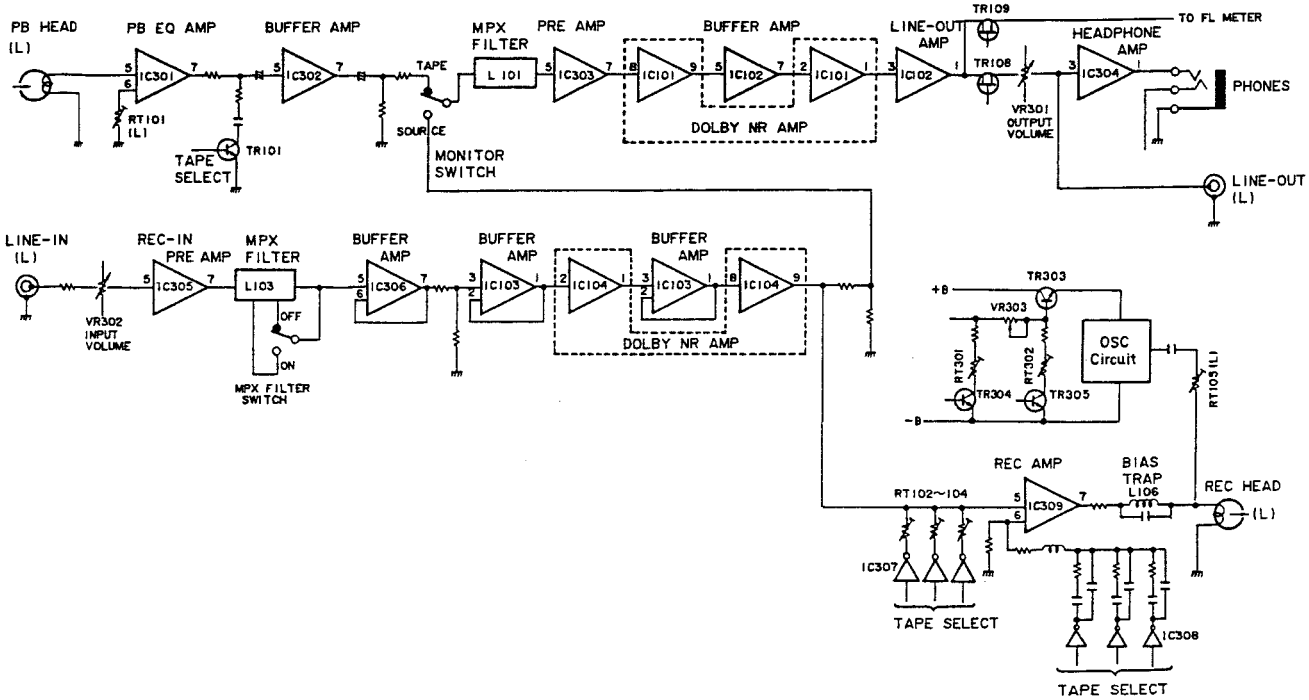
Adjust the bias according to the tape characteristics. Standard biasing is obtained at the center click-stop position.

20. Tape Transport Controls

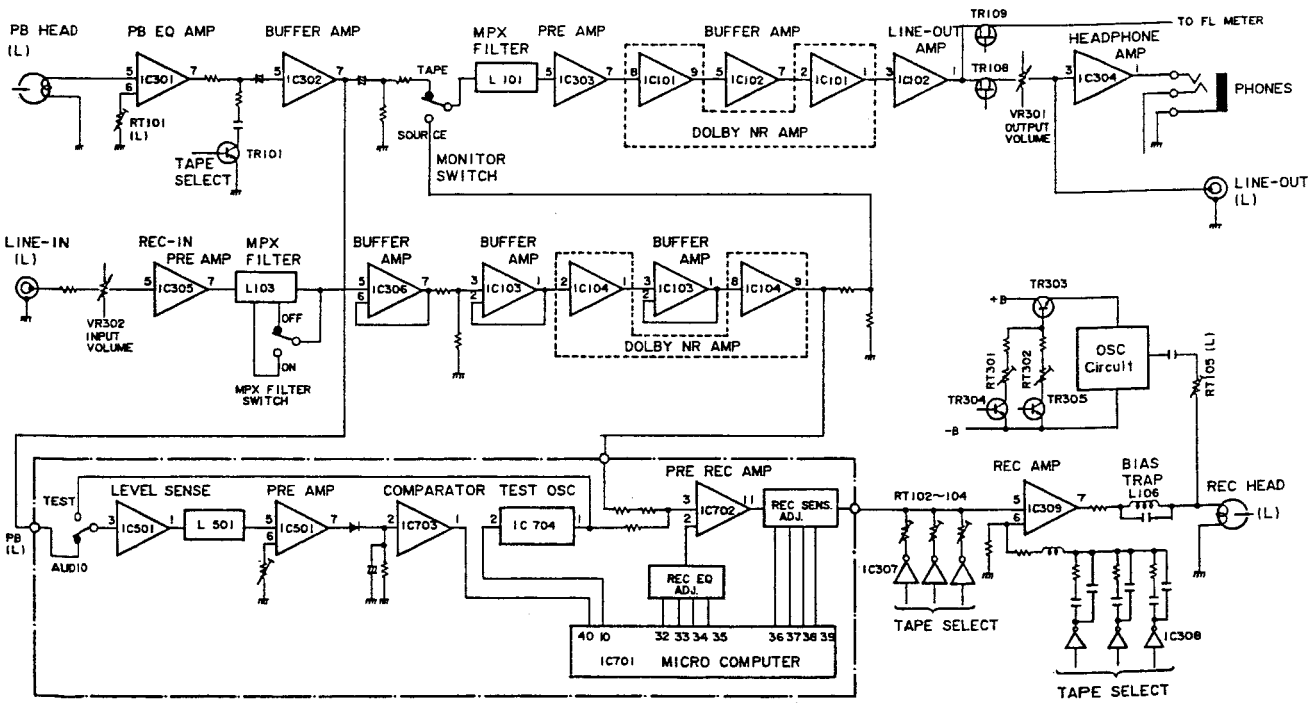
▶	▶ PLAY KEY	Press to playback tape.
■	■ STOP KEY	Press to stop tape in any mode.
◀◀	◀◀ REW KEY	Press for fast rewind.
▶▶	▶▶ FF KEY	Press for fast forward tape winding.
● REC	● RECORD KEY	To begin recording, press the RECORD and PLAY keys simultaneously. If only the RECORD key is pressed, the deck is placed in the REC PAUSE (record standby) mode.
▮▮ PAUSE MUTE	▮▮ PAUSE/MUTE KEY	The PAUSE key causes the tape to stop momentarily during recording or to mute the recording input to create blank (non-recorded) portions on the tape

BLOCK DIAGRAM

DR–M33

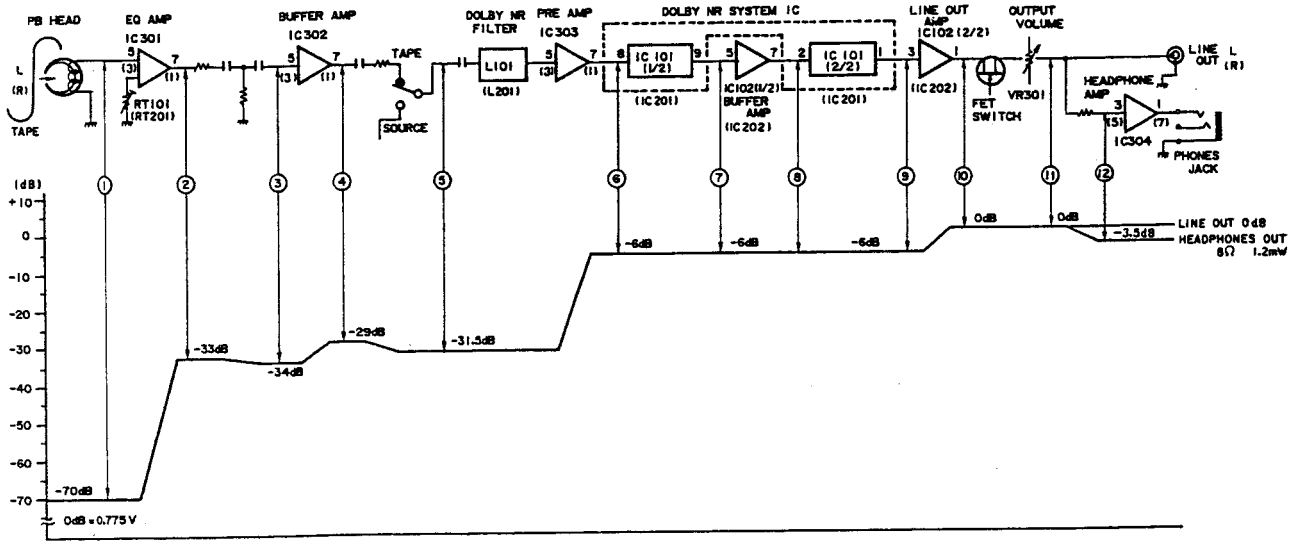


DR–M44

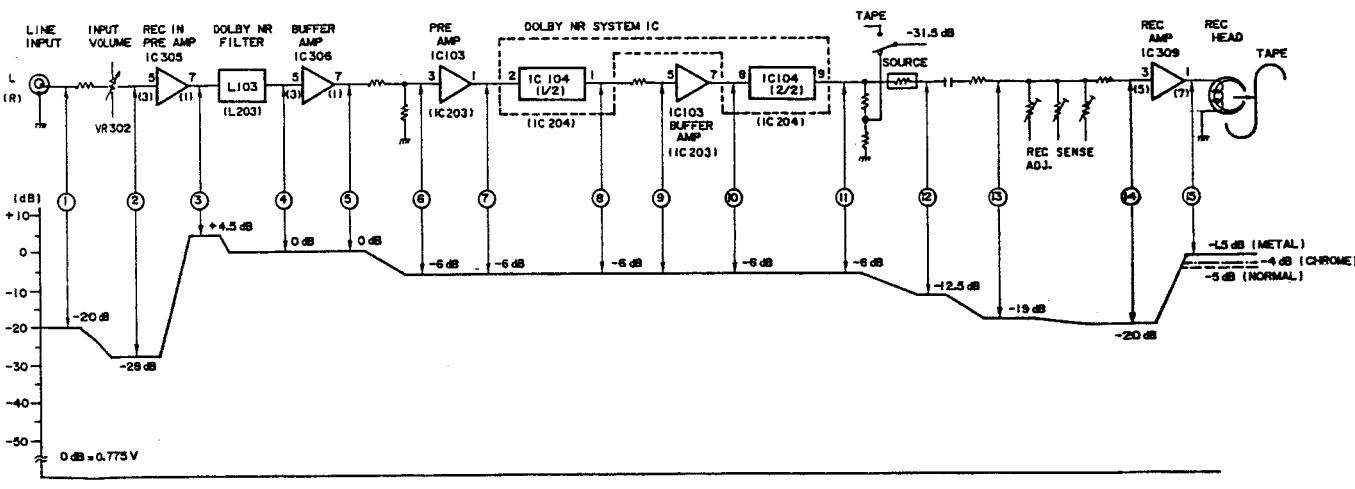


LEVEL DIAGRAM

PLAYBACK SYSTEM



RECORDING SYSTEM



• Outline of the Mechanism Control Microcomputer

The function of the microcomputer, which is applied to the uni-directional transport cam drive control cassette deck mechanism, will receive an outside signal from the operation switch (operations such as PLAY, REC, STOP, FF) during the recognition of the current condition or from the surrounding circuits of the microcomputer (automatic tuning, linear counter, cam encoder, reel pulse, etc.) and sends the appropriate control signal.

To the mechanism: rotational direction of the reel motor, speed, stop, rotational direction of the cam motor, stop.

To the linear counter: makes an output of the mechanism run mode command (REW, FF, PAUSE, PLAY).

To the automatic tuning: REC, P/B, LINE mute signal commands. Makes an output of the BIAS ON/OFF command (CUE command).

To the display: REC, PAUSE (REC MUTE during flash).

In addition, the following points are taken into consideration.

(1) Stable and accurate cam rotation position control is required since a cam drive method is employed to make the mechanism silent. Accurate rotation position control is performed by using a cam drive with a rotary encoder detected digital feedback servo.

(2) Since the leading time of the cam drive is slower when compared to that of the plunger method, problems will arise when attempting record/playback or stop at the designated tape position from FF or REW, since tape overrun occurs. This is especially important when controlling the recording from the position where the automatic tuning was completed.
(Erasing the previous music when making recordings after the automatic tuning is completed must be prevented.)
For this, the tape cuing is corrected after the automatic tuning is completed to control the tape position accurately.

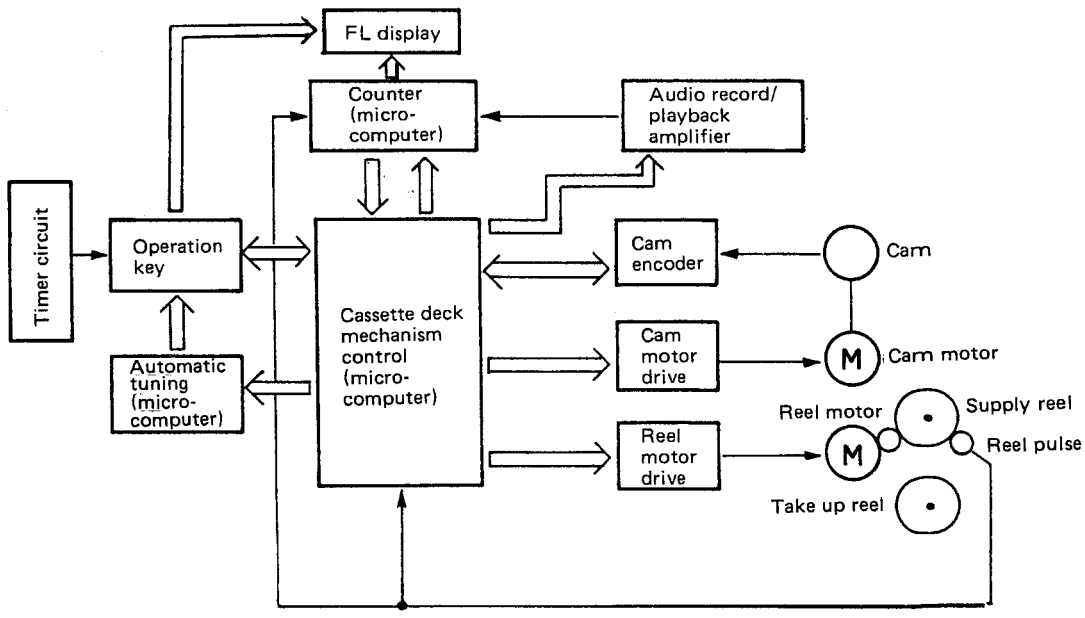
(3) Power outage measures
When the power supply is cut off, the cam of the mechanism shifts to STOP.

(4) Overload measures of the cam
If the cam stops due to an overload for any reason and cannot shift to the target position within 4 seconds, it is immediately shifted to STOP. If this cannot be shifted within 4 seconds, the microcomputer will stop all controls and stop the motor to prevent a breakdown.

• Auto Tuning (CTS)

This tuning system automatically sets the equalizer and recording sensitivity, both of which are important to maximizing the performance of various tapes and to make high quality recordings. The tuning time is only 6 seconds; recording chances are not missed. When the cassette is loaded, the auto tape selector sets the deck to the standard optimum condition. Strictly speaking, however, the recording sensitivity and frequency characteristics of the tapes vary, depending on its type.

The auto tuning system allows the maximum performance of the tape to be heard and at the same time ideally corrects the frequency characteristics to a flat and wide range characteristic.



DISASSEMBLY INSTRUCTIONS

1. How to Remove the Front Panel

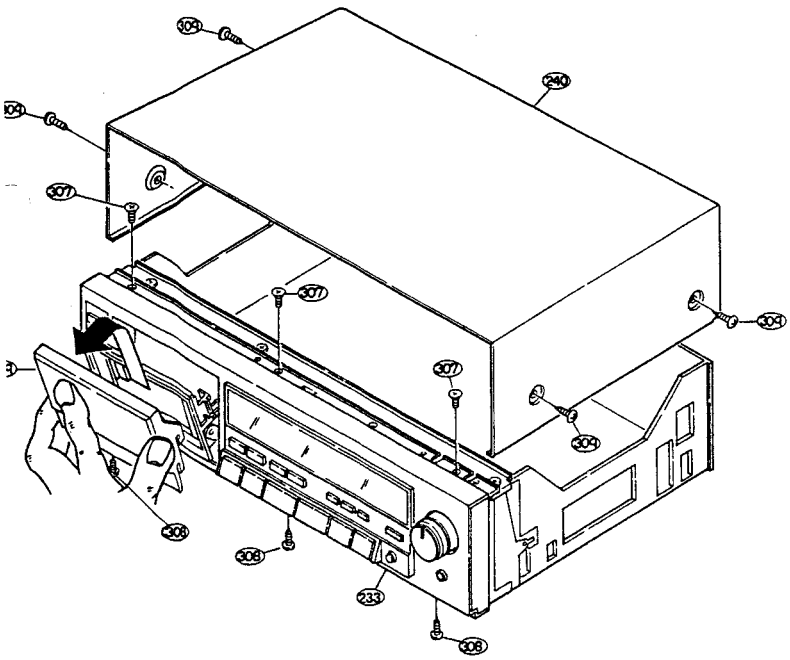
(1) Unscrew the 4 screws 309 from both sides of the top cover 240 and take off the top cover by pulling it up.

(2) Press the eject knob 231, open the cassette window 239 and take off the mechanism, as shown in the diagram.

Note: Be careful when handling the cassette window, as it is easily scratched.)

(3) Remove the connector (5P) with lead wires, which runs from the timer switch 234 to the rear of the logic circuit board 202, from the logic circuit board.

(4) The front panel can be removed by unscrewing the 3 upper screws (3x8 CFTS S tight) 307 from the front panel 233 and the 3 lower screws (3x8 CBTS P tight) 308.



2. How to Remove the Mechanisms

(1) Remove the top cover 240 and the front panel 233. (Refer to section 1)

(2) Unscrew the 2 mechanism holding screws (3x6 CBTS S tight) 304 from the bottom surface of the chassis 201.

(3) Unscrew the 2 screws (3x6 CBTS S tight) 304 holding the angle 210 and the mechanism 207 and the 3 chassis holding screws 301, 310 and remove the angle.

(4) Remove the connectors with lead wires, which runs from the mechanism section, from the circuit board.

Audio circuit board side
- 2P connector CN101 CN201
- 3P connector CN302 CN303
- 4P connector CN301

Logic circuit board side
- 2P connector CN2 CN3
- 4P connector CN13 (DR-M44 only)
- 5P connector CN10 CN11
- 6P connector CN9

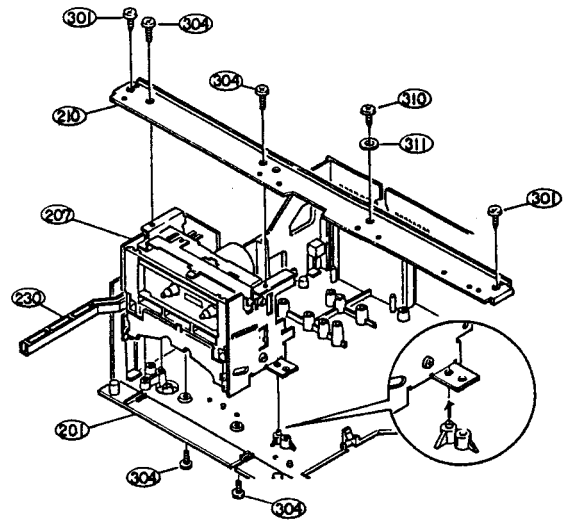
Note: When assembling, check to make sure the connectors are inserted correctly.

(5) Pull out the power switch lever 230 from the power switch 259.

(6) Remove the eject knob 231.

(7) The mechanism can be removed by holding the mechanism and pulling up.

Note: When assembling, do so after checking to make sure the 2 stay holes on the lower side of the mechanism unit are matched with the chassis protrusions.



3. Removal of Front Escutchion, Meter Window, and Control Button

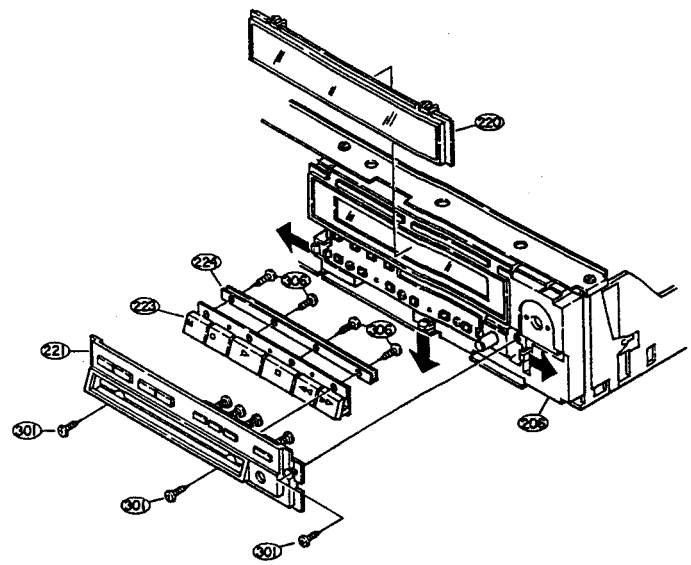
(1) Remove Top Cover (240) and Front Panel (233). (Refer to Section 1)

(2) Unscrew the 3 screws (3 x 8 CBTS P Tight) (301) which secure Front Escutchion.

(3) Front Escutchion (221) is fixed to the Front Chassis (206) by 3 pins; located at right, left, and below, so that Front Escutchion may be removed when these pins are removed in order of right, below and left as indicated by arrow.

(4) Meter Window (220) may be removed after Front Escutchion is removed.

(5) Control Button (223) should be removed after the 4 screws (306) (2.6 x 8 CBTS P Tight) are removed which secure the Press Bar (224).

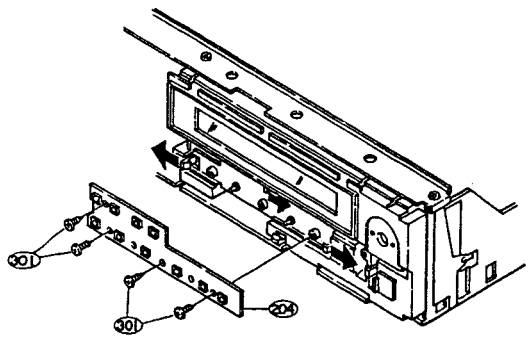


4. How to Remove the Control Circuit Board

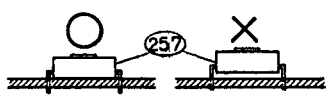
(1) Remove the top cover 240 and the front panel 233 (Refer to section 1)
(2) Remove the front escuchion 221. (Refer to section 3)
(3) Remove the connectors with lead wires which run from the control circuit board 204.

FL counter circuit board side	5P connector CN404
Logic circuit board side	8P connector CN4
CTS circuit board side	4P connector CN701
	CN704

(4) By unscrewing 3 screw (3x8 CBTS P tight) 301 holding the control circuit board and loosening the 3 hooks on the control circuit board 204 can be removed.



Note: When replacing the tact switch 257, always check to make sure that it is not floating above the circuit board. If it is floating, the switch will be in the on condition when the set is assembled.



5. How to Remove the FL Meter

(1) Remove the top cover 240 (Refer to section 1)
(2) Remove the connectors on the FL meter circuit board 205.
(3) Remove the 2 screws (307) (3 x 8 CFTS S Tight) which secure FL Meter, Screw (310) (3 x 10 CBS), and washer (3W). Then the FL Meter may be removed.

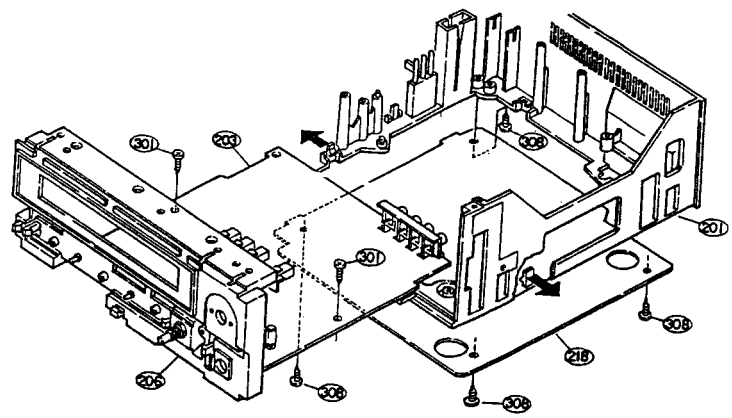
CAUTION:
During assembly, avoid snagging the Shield Sheet (243), which is located under the Counter/Meter Circuit board (205), on the FL Meter.

6. How to Remove the CTS Circuit Board (DR-M44 only)

(1) Remove the top cover 240 (Refer to section 1)
(2) Remove the 4P connectors from the CTS circuit board 217.
(3) The CTS circuit board 217 can be removed upwards by pulling it upwards and loosening the 2 hooks on the chassis 201.

7. How to Remove the Audio Circuit Board

(1) Remove the top cover 240 and the front panel 233. (Refer to section 1)
(2) Remove the angle 210 (Refer to section 2)
(3) Remove the front escuchion 221 and the meter window 220. (Refer to section 3)
(4) Remove the control circuit board 204, and the FL meter 256. (Refer to sections 4, 5)
(5) Remove the CTS circuit board 217. (Refer to section 6)
(6) Remove the connectors from the audio circuit board 203.
(7) Unscrew the 4 bottom cover holding screws (3x8 CBTS P tight) 308 on the back side of the chassis 201 and remove the bottom cover 218.
(8) Unscrew the screw 301 holding the Audio amp circuit board.
(9) By lifting the front chassis 206 and loosening the 2 hooks on the chassis holding the audio circuit board 203, the audio circuit board can be removed.



When Separating the Audio Circuit Board by Itself

(10) Unscrew the nut holding the input volume 253 and remove the input volume and the shield bracket 209 toward the rear.

(11) Unscrew the nut holding the output volume 254.

(12) Remove the spring plate holding the hedephone jack 255.

(13) By removing front chassis 206, the audio circuit board can be removed by itself.

Note: Most repairs to the audio circuit board can be performed by removing the bottom cover on the chassis. Refer to the above procedure only when necessary.
When reassembling, follow the procedures in reverse order; however, if each of the various parts are not assembled properly in their respective position, the set cannot be assembled. When assembling, check the work of each step carefully.

8. How to Remove the Logic Circuit Board

(1) Remove the top cover 240. (Refer to section 1)

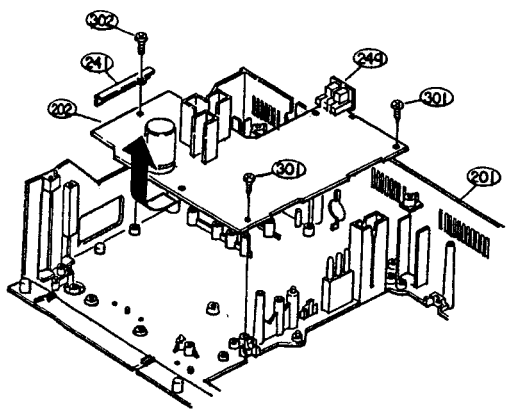
(2) Remove the CTS circuit board 217. (Refer to section 6)

(3) Remove the various connectors from the logic circuit board 202.

(4) Unscrew the 2 screws (3x8 CBTS P tight) 301 holding the logic circuit board.

(5) Unscrew the screw (3x10 CBTS P tight) 302 holding the P.W.B support 241.

(6) Pull the logic circuit board 202 forward until the DIN jack 240 is disconnected from the rear of the chassis 201; it can then be removed.



9. How to Remove the Power Supply Circuit Board

(1) Remove the top cover 240. (Refer to section 1)

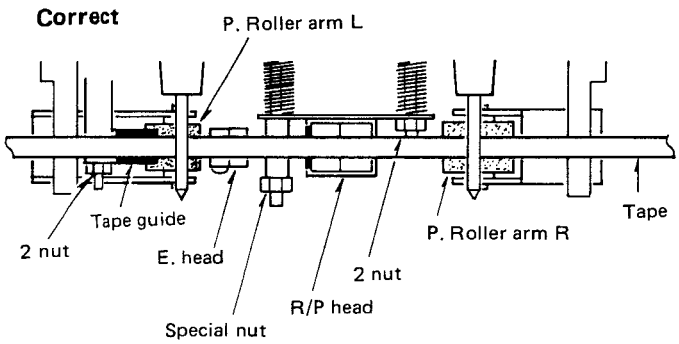
(2) Unscrew the 1 screw (3x8 CBTS P tight) 301 holding the bracket 216 of the power supply circuit board 215.

(3) By pulling the power switch lever 230 out of the power supply switch, the power supply circuit board can be removed upwards.

ADJUSTING AND CHECKING THE MECHANISM SECTION

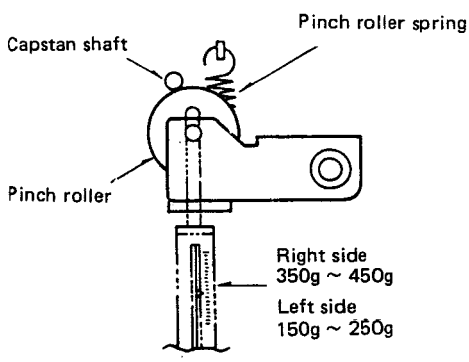
1. Replacing the Pinch Roller 23 and 104

Before replacing the pinch roller, clean the tape contact surface of the pinch roller and the capstan shaft.
Most causes of poor tape transport can be traced to dirty pinch rollers and capstan shafts.
The right side pinch roller 23 can be taken out by removing spring 24 and slit washer 317. In the same manner, the left side pinch roller 104 can be taken out by removing spring 106 and slit washer 317. After replacing, play a padless C-90 tape and check for tape curls at the head tape guide section.
In addition, in the playback mode, check to make sure that the right side pinch roller contacts the capstan shaft before the left side pinch roller contacting.



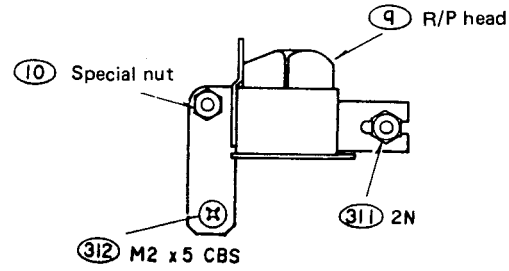
2. Checking the Pressure Force of the Pinch Roller

In the playback mode, hook a spring weight onto the bracket at the center of the pinch roller. After separating the pinch roller from the capstan shaft, allow the pinch roller to contact the capstan shaft again. When the pinch roller starts to rotate, check to make sure the rod type spring weight reading is 350g—450g for the right side and 150g ~ 250g for the left side.
If it is not within the normal range, replace the pinch roller spring 24 or 106.



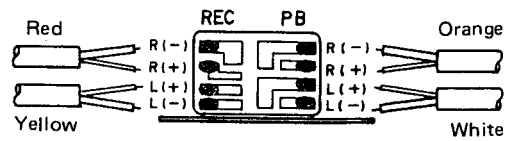
3. Replacing the Record/Playback Head

* Before replacing, remove the front panel 202.
(1) How to remove the R/P HEAD.
1) Next, Take out the azimuth adjustment NUT 311, tilt adjustment screw 312, and the height adjustment ORDER SCREW 10 loosening them alternately.
If they are not loosened alternately, the R/P HEAD base may become warped.
2) By unsoldering the HEAD WIRES on the circuit board section of the R/P HEAD, the entire R/P HEAD can be taken off the mechanism unit.



(2) How to assemble the R/P HEAD.
Reverse the above (1) procedures for removing the R/P HEAD.

* Solder the HEAD WIRES according to the diagram above.



4. Adjusting the R/P HEAD

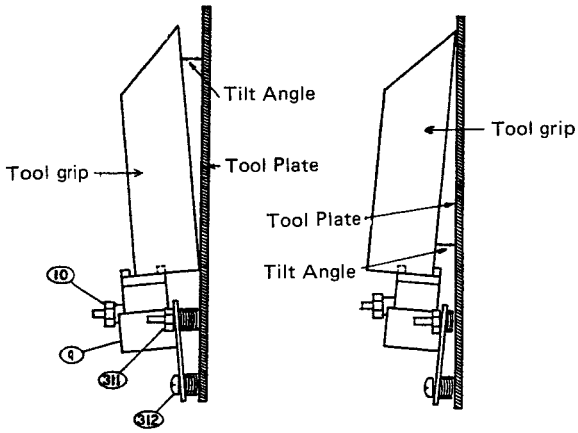
(1) Height adjustments (Use the head adjusting jig M-300)
1) Set the M-300 tool plate on the mechanism unit; turn the height adjustment ORDER SCREW 10 and adjust so that the 3.8 mm measure section of the M-300 (tool grip) can pass without contacting the tape guide of the R/P HEAD 9.
2) When adjusting the height, make sure the R/P HEAD is not tilted by turning the azimuth adjustment nut 311 nut, and checking with your eyes.

* Never allow the M-300 (tool grip) to hit the tape contact surface of the R/P HEAD strongly. It may scratch the surface.

(2) Adjusting Tilt Angle

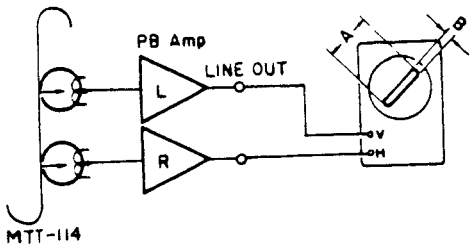
1) Set the M-300 Tool Plate on the Mechanism Unit and then place the M-300 Tool Grip on the R/P Head, and check the Tilt Angle between M-300 Tool Plate and M-300 Tool Grip. If the M-300 Tool Grip is tilting toward the front, loosen Tilt with screw (312). If the M-300 (Tool Grip) is tilting toward the rear, tighten it. Adjust the Tilt screw (312) until the M-300 Tool Grip becomes parallel with the M-300 Tool Plate.

2) If the Tilt Angle is adjusted more than once, height Adjustment may slip. Always make sure to check height adjustment. If height has slipped, adjust it again. After adjustment, fix screw.

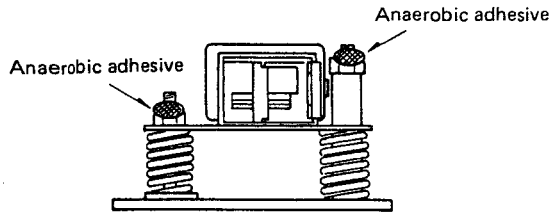


(3) Azimuth adjustments

Play back the TEAC MTT-114 test tape. Turn the azimuth adjustment nut and adjust so that A of the resurge wave form is maximum and B is minimum. After the azimuth adjustments, re-check the head height with the M-300 to make sure the height has not deviated.



* After the adjustments, apply anaerobic adhesive on the positions indicated in the diagram.



5. Adjustment and Replacement of Erasing Head (15)

(1) Height Adjustments

Set the M-300 Tool Plate on the mechanism unit. Using a surface measure of 3.8 mm from the M-300 Tool Grip, turn screws (312) and (333) and adjust the height of Erasing Head's center to coincide with the center of the M-300 Tool Grip. After adjustment, place the M-300 Tool Grip on the Erasing Head, check to see that the M-300 Tool Plate and the M-300 Tool Grip are parallel, and that the Tilt Angle has not changed. Lock after adjustment.

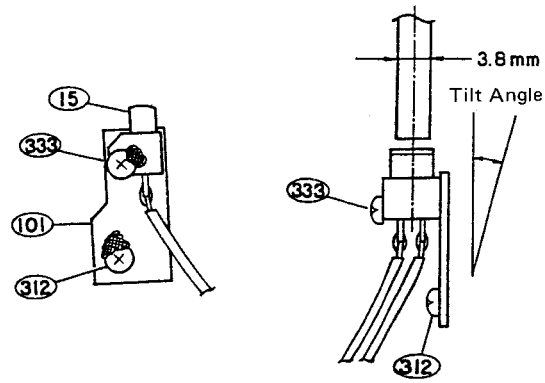
(2) Tilt Angle Adjustment

Set the M-300 Tool Plate on the mechanism unit. Place the M-300 Tool Grip on the Erasing Head, and check the gap between the M-300 Tool Plate and the Tool Grip. If the M-300 Tool Grip is tilting toward the front, loosen the Tilt screw (312). If it is tilting toward the rear, tighten it and adjust the Tilt screw (312) until the M-300 Tool Grip becomes parallel with the M-300 Tool Plate.

CAUTION: After adjusting the Tilt Angle, height adjustment may sometimes be warped. Recheck height adjustment. If it is warped, readjust the height. After adjusting, fix screws (312) and (333).

(3) Erasing Head Replacement

Erase Head may be replaced after removing screws (312) and (333) which affix it to the deck mechanism. After replacement, adjust the height and the Tilt angle.

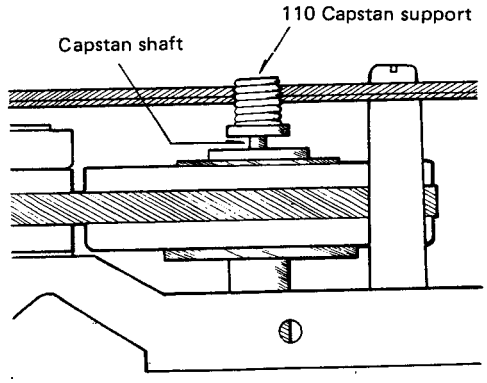


6. Height Adjustment of the Tape Guide 103

Set the M-300 jig plate onto the mechanism unit and adjust the height by rotating the height adjustment nut 311 so that the 3.8mm section of the M-300 jig can pass through without contacting the tape guide section of tape guide 103.

7. Thrust Play Check and Adjustments of the Capstan Shaft

Thrust Play check and Adjustments of the Capstan Shaft 45, 111. From the front of the mechanism, grasp the capstan shaft and move back and forth in the axis direction, Check to make sure there are thrust play in the right side capstan shaft 45. Rotate and adjust capstan support 110 so that the range of the thrust play of the left side capstan shaft 111 is within 0.2mm–0.4mm. After adjusting, apply anaerobic adhesive to the capstan support 110.



8. Checking the Take-up Torque

Load the cassette type torque meter. Check to make sure that the torque meter average reading is within 50 ~ 100 g-cm during playback. If it is not within this range, check the voltage (3.5V ± 0.3V) of the reel motor. If the voltage is low, the torque will be weak; if it is high, the torque will be strong. In addition, check for reel thrust movement in section 9.

9. Adjusting the Reel Thrust Movement

Check to make sure that the reel thrust movement is within 0.2–0.4 mm.

10. Checking the FF and REW Torques

* When using the cassette type torque meter.
  Check to make sure the torque meter indicates more than 70 g-cm at the end of FF and REW.
* When using a modified cassette half.
  Load the modified cassette half; hook the end of the dial tension meter (full scale 100–300 g) onto the triangle section. In the FF (REW) mode, feed the tape in at a rate somewhat slower than the take up speed. Check to make sure the dial tension meter reads more than 60 g-cm.

11. Checking the Back Tension Torque During Record/Playback

Load the cassette type torque meter; check to make sure the torque meter reads between 7 ~ 13 g-cm during playback and that there is no unevenness.
If it is not within this range, check the section on adjusting the reel trust movement; or replace the spring 109.

12. Checking the FF and REW Times

Load a C-60 cassette tape; check to make sure the tape is fast forwarded or rewound within 70–110 seconds. If it is not within this range, check sections 9 and 11.

13 Checking the Operation of the Erase Prevention, Metal and Chrome Switch Operation Arms

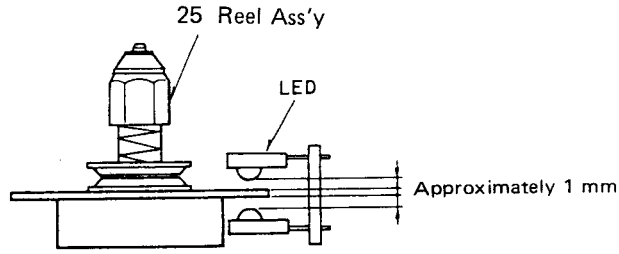
Check to make sure the operation arms 58, 59 operate the switches positively, depending on whether or not there are holes.

14. Checking the EJECT Switch 75

To check the operation of the EJECT SW with only the mechanism unit, make sure the angle 205 operates the switch positively when the hook lever 203 is operated.

15. Checking the Gap Between the Pulse Detection LED and the Reel Ass'y

Check to make sure the gap between the surface of the shutter section of the reel ass'y and the LEDs is approximately 1 mm.



ADJUSTING THE ELECTRICAL SECTIONS

• Measuring instruments necessary for adjustments

(1) Audio signal generator
(2) Variable resistance attenuator
(3) Vacuum tube voltmeter
(4) Oscilloscope
(5) Frequency counter
(6) Adjustment screwdriver
(7) Trap coil adjustment square stick
(8) Test tapes (TEAC MTT-111, MTT-114, MTT-150)
(A-BEX TCC-262)
(DENON DX 3, DXM, DX7/50N, LX)
(9) Transport Check cassette tape
(COLUMBIA C-120, modified)

• Cautions on adjusting

(1) Before adjusting, clean the head surface, capstan and the pinch roller with a gauze or a cotton swab moistened with alcohol.
(2) Demagnetize the R/P HEAD and the E. HEAD with a head eraser.
(3) Completely demagnetize the adjustment screwdriver.
(4) Unless instructed otherwise, set the various controls as follows:
– INPUT volume . . . . . maximum
– OUTPUT LEVEL volume . . . . . maximum
– DOLBY NR switch . . . . . OFF
– MONITOR switch . . . . . TAPE

1. Tape Transport Check

Load the transport check cassette. In the operational mode, illuminate the fixing guides of the R/P HEAD with a lamp and check to make sure the tape edge does not come in contact with the tape guide section.

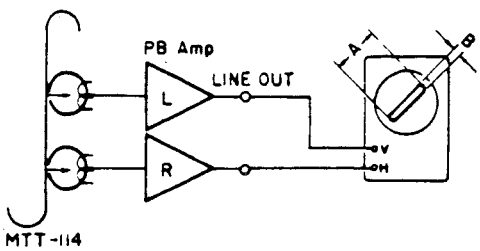
The tape transport is the most important element in determing the performance of a cassette deck.

Avoid moving the various adjustment screws, nuts, etc., as much as possible. Refer to the pages on "Adjusting and Checking the Mechanism Section" when replacing or adjusting the R/P HEAD.

2. Adjusting the Azimuth

(1) After completing the tape transport check load the test tape (TEAC MTT-114).

(2) Play back the test tape; adjust the azimuth screw so that section A of the resurge wave form is maximum and section B is minimum.

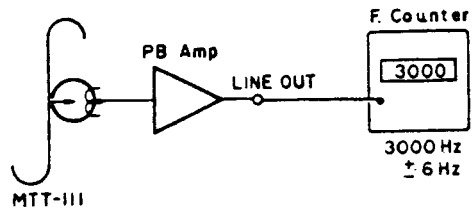


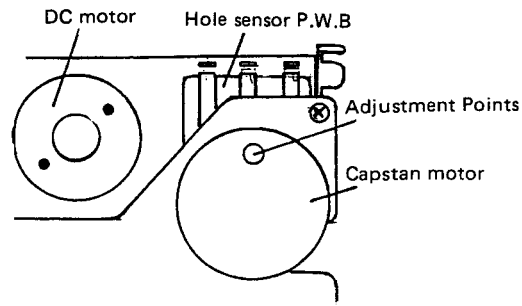
3. Checking and Adjusting the Tape Speed

1) Connect the frequency counter to the LINE OUT terminal and load the test tape (TEAC MTT-111). DR-M44

2) Play back the test tape; at the midpoint of the tape, where the transport is stable, adjust VR 901 so that the frequency counter reading is in the range of 3,000 Hz ± 6Hz.
DR-M33

3) Playback a test tape. At about halfway through the tape, where the tape transport is stable, adjust the adjustment points on the back of the capstan motor so that the frequency counter will have a reading within the range of 3,000 Hz ± 6Hz.

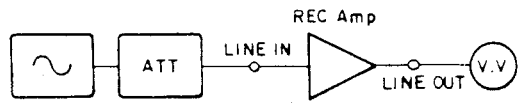




4. Adjusting the Input Sensitivity

(1) Set the MONITOR switch to SOURCE position, the operational mode at STOP. Supply a 400 Hz signal to the LINE IN terminal and set the input signal level (approx. −20 dB) so that the output level at the LINE OUT TERMINAL (L ch) becomes 0dB.

(2) At the same time, check to make sure the R ch output level is also 0dB.

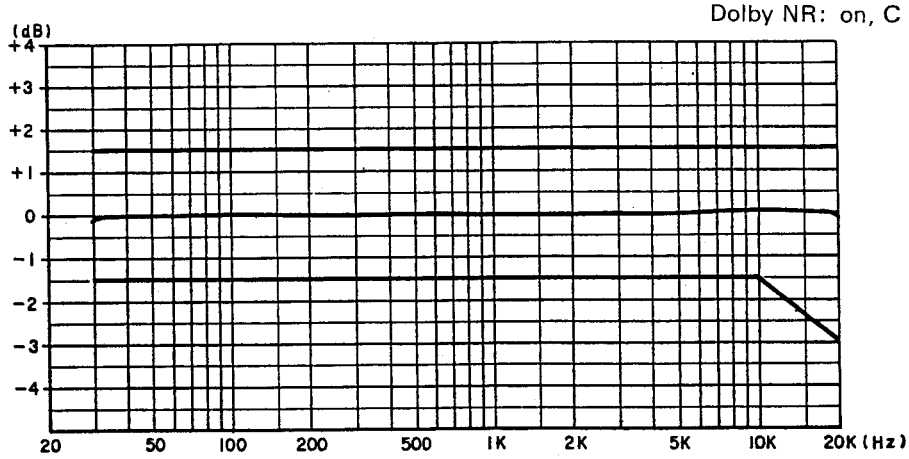


5. Checking the Operation of the DOLBY

Set the MONITOR switch to SOURCE. When a −41dB signal input is made to the LINE IN terminal, check to make sure the output frequency response from the LINE OUT terminal meets the specification in the diagram below.

Dolby C Back to Back Frequency Response

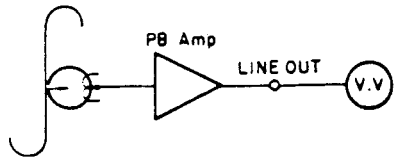
Level: − 20dB from Dolby
Monitor: Source
Dolby NR: on, C



6. Adjusting the Playback Section

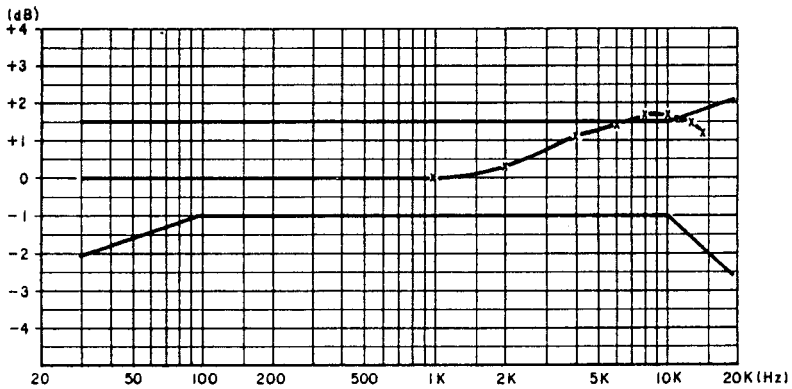
(1) Adjusting the playback level
Play back the Dolby standard level test tape (TEAC MTT-150) and adjust RT 101 (L ch), RT 201 (R ch) so that the LINE OUT voltage becomes 0 dB (0.775V).

(2) Adjusting the playback frequency response
Play back the test tape (A-BEX TCC-262) and check to make sure that the frequency response meets the specifications in the diagram.



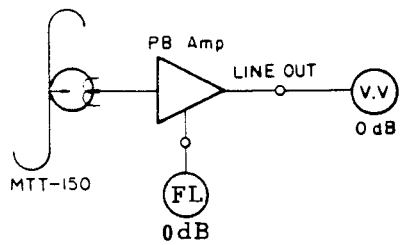
Playback Frequency Response

Tape : A-BEX TCC-262
When using MTT-316 make corrections along.



7. Adjusting the FL Meter

After adjusting the playback level, playback the test tape (TEAC MTT-150) and adjust RT401 (L ch), RT402 (R ch) so that the FL meter indicates 0dB when the LINE OUT terminal level is 0dB (0.775V).

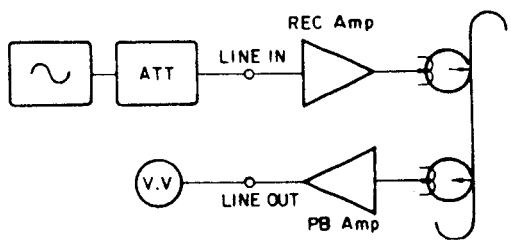


8. Adjusting the Recording Section

(1) Adjusting the record/playback overall frequency response.

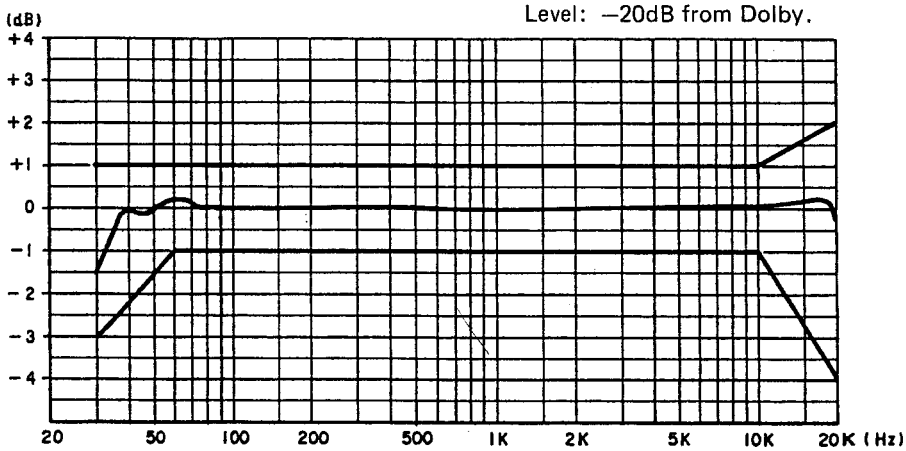
1) Load the test tape DX7/50N; record a signal with an input level of −41 dB, 1 KHz at the LINE IN terminal; play back this recording.

2) Change the frequency of the input signal to 12kHz, record and playback; adjust RT105 (L ch), RT205 (R ch) so that the characteristic standards meet the following diagram when compared to the 1kHz signal output level.



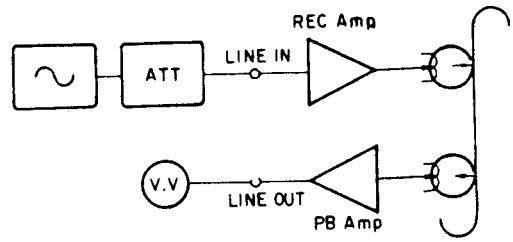
Record/Playback Overall Frequency Response

Tape: DN7N Dolby: off
Level: −20dB from Dolby.



(2) Adjusting the record/playback levels

1) Load the test tape DX7/50N and record a signal of 1kHz (–41 dB).
2) Adjust RT103 (L ch), RT203 (R ch) so that the output level is the same when the MONITOR switch is switched from SOURCE to TAPE position.
3) Load the test tape and record a signal of 1kHz (–41 dB).
4) Adjust RT 102 (L ch), RT 202 (R ch) so that the output level is the same when the MONITOR switch is switched from SOURCE to TAPE position.
5) Load the test tape DX3 and record a signal of 1kHz (–41 dB).
6) Adjust RT104 (L ch), RT 204 (R ch) so that the output level is the same when the MONITOR switch is switched from SOURCE to TAPE position.

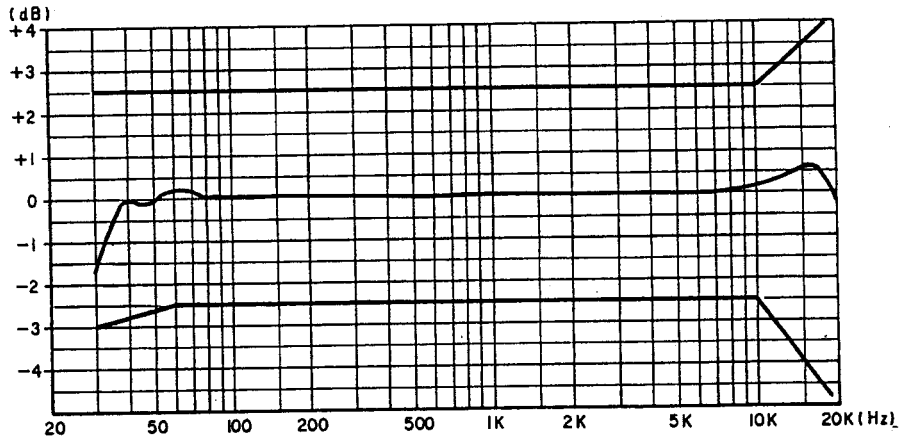


(3) Checking the Dolby C record/playback overall frequency response

1) Set the DOLBY NR switch to the "C" position.
2) Using the test tapes DXM, DX7/50N, DX-3, perform record/playback in the same manner as 8-(1).
3) Check to make sure that the record/playback overall frequency response meets the specifications in the diagram.

Dolby C Record/Playback Overall Frequency Response.

Tape: DX7N
Dolby: on, C
Level: –20dB from Dolby



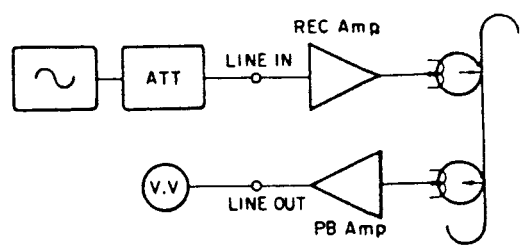
9. Adjusting the CTS

(1) Adjusting the CTS Amplifier Gain

Set the switch S701 of the CTS circuit board to the TEST side and press the CTS START button. During its operation, adjust VR 501 (L ch), VR 601 (R ch) so that the levels at TP(L), TP(R) alternates frequently between H → L or L → H.

(2) Checking the CTS Operation

1) Load the LX-C60 cassette tape. Light the preset lamp and set to the preset mode. Record/playback lkHz and 12kHz signals and note the frequency response.
2) Press the CTS START button. After it is completed, (CTS lamp lit), record/playback the lkHz signals and check to make sure the frequency response is improved over those recorded in section 1).



● **Beat Interference**

Beat interference may result if the unit is used close to an AM tuner. In this case separate the distance between the tuner and the cassette deck.

PARTS LIST OF P.W. BOARD

KU-5200 AUDIO AMP UNIT

Ref. No.	Part No.	Part Name	Remarks
SEMICONDUCTOR GROUP			
IC101,104	2630311002	NE651	
201,204			
IC307,308	2620290007	HD74LS05P	
IC301	2630226003	M5220L	
IC302~306	2630189001	M5218L	
IC309			
IC102,103			
202,203			
TR302	2710113010	2SA999 (F)	
TR101~107	2730204035	2SC2320 (E/F)	
201~207			
110~115			
210~215			
301,302			
304~308			
TR303	2730195005	2SC2060 (Q)	
TR108,109	2750043014	2SK381 (C/D)	
208,209			
D301~308	2760049008	IS2076	
TH101,201	2760118007	D33A	
RESISTOR GROUP			
R322	2412313082	RD14B2E4R7JFRF	4.7Ω ¼w
R188,288	2412339024	RD14B==244J	220KΩ
VR303	2118077004	V1220V30KB501	DR-M33 only
VR301	2118076005	V1620V--103KA	10KΩA
VR302	2118075006	V1611V--503KA	50KΩA
RT104,204	2116000015	V08PB103	10KΩB
RT302	2116000060	V08PB501	500ΩB
RT101,201	2116000099	V08PB202	2KΩB
RT102,103	2116000073	V08PB203	20KΩB
202,203			
RT105,205	2116000086	V08PB204	200KΩB
RT301	2116000099	V08PB202	2KΩB
CAPACITOR GROUP			
			Ceramic
C102,202	2533635005	CC45SL1H221J	220PF 50V
C122,222	2533633007	CC45SL1H181J	180PF 50V
C121,133	2539014002	CK45=1E683M	0.068μF 25V
C221,233			
C101,152	2531055056	CK45B1H221K	220PF 50V
201,252			
C155,255	2531003008	CK45B1H681K	680PF 50V
C146,246	2531006005	CK45B1H222K	0.0022μF 50V
C148,248	2531061008	CK45B1H272K	0.0027μF 50V
C309	2531007004	CK45B1H332K	0.0033μF 50V
C318	2531062007	CK45B1H392K	0.0039μF 50V
C315~317	2531024003	CK45F1H103Z	0.01μF 50V
C153,253	2531008003	CK45B1H472K	0.0047μF 50V
			Electrolytic
C103,203	2544129005	CE04W1A470=	47μF 10V
301,302			
C313	2544131006	CE04W1A221=	220μF 10V

Ref. No.	Part No.	Part Name	Remarks
C106~108	2544132005	CE04W1C100=	10μF 16V
116,123			
124,128			
136,140			
141,142			
206~208			
216,223			
224,228			
236,240			
241,242			
303~307			
157,257			
C125,150	2544140000	CE04W1V4R7=	4.7μF 35V
225,250			
311			
C109,118	2549014005	CE04W1H0R1M	0.1μF 50V
130,137			
209,218			
230,237			
C117,129	2549014034	CE04W1HR15M	0.15μF 50V
217,229			
C156,256	2544146004	CE04W1H010=	1μF 50V
312			
			Film
C154,254	2551120039	CQ93M1H182J	0.0018μF 50V
C147,247	2551120026	CQ93M1H152J	0.0015μF 50V
C145,245	2551120042	CQ93M1H222J	0.0022μF 50V
C144,244	2551120068	CQ93M1H332J	0.0033μF 50V
C113,114	2551120084	CQ93M1H472J	0.0047μF 50V
213,214			
127,137			
149,227			
234,249			
C104,105	2551120097	CQ93M1H562J	0.0056μF 50V
204,205			
C112,212	2551121025	CQ93M1H103J	0.01μF 50V
135,235			
C310	2551073005	CQ93M1H123K	0.012μF 50V
C115,126	2551121083	CQ93M1H333J	0.033μF 50V
215,226			
C110,119	2551078000	CQ93M1H333K	0.033μF 50V
131,138			
210,219			
231,238			
C151,251	2551121096	CQ93M1H393J	0.039μF 50V
C120,132	2551122008	CQ93M1H473J	0.047μF 50V
220,232			
C308	2554078081	CQ93P2A562J	0.0056μF 100V
C111,139	2561030025	CF93B2A224J	0.22μF 100V
211,239			

Ref. No.	Part No.	Part Name	Remarks
OTHER PARTS GROUP			
	4148205103	SHIELD CASE	
L101,201	2310825009	BIAS FILTER	
L102,104	2358011008	INDUCTOR	
202,204			
L103,203	2328043006	MPX FILTER	
L105,205	2358005001	INDUCTOR	
L106,206	2328044005	BAND TRAP FILTER	
L301	2358005030	INDUCTOR	
T301	2398024000	OSC COIL	
S301	2129223009	PUSH SWITCH	DOLBY SW
S302	2129224008	PUSH SWITCH	MONITOR SW
J301	2048114008	4P PIN JACK	
J302	2048109013	HEADPHONE JACK	
CN101,201	2032075001	2P CONNECTOR BASE	PB HEAD
CN301	2035622024	4P MINI CONN. PIN	REC HEAD
CN302	2035622008	3P MINI CONN. PIN	E HEAD
303			
CN304	2035622079	7P MINI CONNE PIN	
CN305	2035691042	3P EI CON WITH W	
CN306	2035691039	3P EI CON WITH W	
CN307	2041640003	6P EI CON WITH W	

• The carbon resistors rated at ¼W are not listed herein.

KU-0451-1 CTS UNIT

Ref. No.	Part No.	Part Name	Remarks
SEMICONDUCTOR GROUP			
IC701	2620346003	HD44705A42	
IC703	2630161003	μPC358C	
IC501	2630229000	LA6458DS	
601,702			
704			
TR501~511	2730204035	2SC2320 (E/F)	
601~611			
702~712			
D501,502	2760049008	IS2076	
601,602			
701			
D503,504	2760001004	IN34A	
603,604			
RESISTOR GROUP			
VR501,601	2116004024	V08QB202	2KΩB
CAPACITOR GROUP			
			Ceramic
C504,604	2531002009	CK45B1H471K	470PF 50V
C505,605	2531004007	CK45B1H102K	0.001μF 50V
C701,702	2531153000	CK99B1H102MP4	0.001μF 50V
			Electrolytic
C704	2544130007	CE04W1A101=	100μF 10V
C507,508	2544132005	CE04W1C100=	10μF 16V
512,607			
608,612			
C701,703	2544134003	CE04W1C330=	33μF 16V
C506,509	2544140000	CE04W1V4R7=	4.7μF 35V
606,609			
613,513			
			Film
C503,603	2551060005	CQ93M1H102K	0.001μF 50V
C610,611	2551062003	CQ93M1H152K	0.0015μF 50V
C502,602	2551063002	CQ93M1H182K	0.0018μF 50V
C501,601	2551066009	CQ93M1H332K	0.0033μF 50V
C510,511	2551074004	CQ93M1H153K	0.015μF 50V
C702	2551079009	CQ93M1H393K	0.039μF 50V
OTHER PARTS GROUP			
CN701,704	2035622024	4P MINI CONN. PIN	
CN702,703	2050171000	12P BASE CONTACT	
L501,601	2310825009	BIAS FILTER	
S701	2129190103	SLIDE SW	

• The carbon resistors rated at ¼W are not listed herein.

KU-5210 POWER AND LOGIC UNIT

Ref. No.	Part No.	Part Name	Remarks
SEMICONDUCTOR GROUP			
IC1,2	2620294003	HD74LS32P	
IC3	2620443003	HD74LS15P	
IC4	2620427003	HD74LS138P	
IC5	2620408006	UPD1511C-097	
IC6,7	2620447009	BA6109U1	
TR6,15 17~19,22	2710113010	2SA999 (F)	
TR2,12	2710105002	2SA966 (Y)	
TR7,11	2720055029	2SB772 Q/P	
TR5,8,9 13,14,16, 20,21 23~26	2730204035	2SC2320 (E/F)	
TR1	2730195005	2SC2060 (Q)	
TR3,4,10	2740078031	2SD882 (Q/P)	
D1	2760246005	RB152	
D2,7	2760057003	V06B	
D3~6	2760237001	RV06	
D8~12	2760049008	IS2076	
ZD1	2760249002	HZ18-2	
ZD2,5	2760303003	HZ6C-2	
ZD3,4	2760052053	HZ11B-1	
ZD6	2760220018	HZ24-1	
ZD7,11,14	2760299052	HZ3B-3	
ZD8	2760185027	HZ4B-2	
ZD9	2760185056	HZ4C-2	
ZD10	2760236073	HZ5B-1	
ZD12	2760051083	HZ7C-3	
ZD13	2760218046	HZ9B-1	
RESISTOR GROUP			
R2	2442028017	RD14B2E330JFRF	33Ω ¼W
R48	2440079026	RS14B3D270JNBF	27Ω 2W
R17	2410163001	RD14B2H121J	120Ω 2W
RB1	2462018007	RK99=2B103MP6	10KΩx6 1/8W
RB2	2462011088	RK99=2B153MP3	15KΩx3 1/8W
RB3	2462010076	RK99=2B103MP4	10KΩx4 1/8W
RB4	2462010092	RK99=2B104MP4	100KΩx4 1/8W
CAPACITOR GROUP			
			Ceramic
C30	2533627000	CC45SL1H101J	100PF 50V
C29	2533635005	CC45SL1H221J	220PF 50V
C36,38	2531024003	CK45F1H103Z	0.01μF 50V
C31~34	2531004007	CK45B1H102K	0.001μF 50V
C21~26 15,40,45	2531024003	CK45F1H103Z	0.01μF 50V
C37,39	2531025002	CK45F1H223Z	0.022μF 50V
C27	2539014002	CK45=1E683M	0.068μF 25V
C44	2539012004	CK45=1E333M	0.033μF 25V
C99	2539015001	CK45=1E104M	0.1μF 25V
C90	2539014002	CK45=1E683M	0.068μF 25V
C42	2538010007	CK45=2GAC103P	0.01μ 400V
			Electrolytic
C3,4	2544128006	CE04W1A220=	22μF 10V
C6,9,10,12	2544129005	CE04W1A470=	47μF 10V
C7,13, 20,35	2544130007	CE04W1A101=	100μF 10V
C5,8,11	2544163032	CE04W1C102M	1000μF 16V
C17~19	2544138009	CE04W1E470=	47μF 25V
C2	2546071009	CE04W1E103=	10000μF 25V
C10,14,28	2544140000	CE04W1V4R7=	4.7μF 35V
C16	2544165014	CE04W1V471M	470μF 35V
C43	2544147003	CE04W1H2R2=	2.2μF 50V
OTHER PARTS GROUP			
	4170140207	RADIATOR	
	3998031007	CERAMIC RESONATOR	
	2048110002	8P DIN JACK	
CN2,3	2032075001	2P CONNE. BASE	
CN1,10,11	2035622066	5P MINI CONN. PIN	
CN4	2035622037	8P MINI CONN. PIN	
CN5	2031637037	4P EI CON	
CN8	2045408018	7P EI CON	
CN7	2041639014	6P EI CON	
CN12	2041639001	6P EI CON	
CN1	2039632023	5P EI CON	
CN6	2050170001	12P BOARD BASE	
CN9,13	2035622024	4P MINI CON PIN	
	2129188005	SLIDE SWITCH	
⚠	**2129136028**	**POWER SW**	
LF1 ⚠	**2398019002**	**LINE FILTER COIL**	
⚠	FEP1287	FUSE HOLDER	**Except EU**
	4118343202	POWER SW BRACKET	
⚠	**2061031032**	**FUSE 0.16A**	**Except EU**
⚠	**2061031045**	**FUSE 0.25A**	**E1 only**

• The carbon resistors rated at ¼W are not listed herein.

WARNING:
Parts marked with ⚠ and/or shading have special characteristics important to safety. Be sure to use the specified parts for replacement.

KU-5220/KU-5221 CONTROL UNIT

Ref. No.	Part No.	Part Name	Remarks
C541~460	2124388004	TACT SWITCH	
CN451	2045413003	8P EI CON WITH W	
CN452	2041630026	5P EI CON WITH W	
CN453	2037643108	4P EI CON ASSY	

KU-5230 COUNTER/METER UNIT

Ref. No.	Part No.	Part Name	Remarks
SEMICONDUCTOR GROUP			
IC401	2620439004	UPD554C-121	
IC402,403	2620523004	BA668	
TR412,415	2710113010	2SA999 (F)	
416,418			
TR405~409	2730204035	2SC2320 (E/F)	
413,414			
417			
TR410,411	2750043014	2SK381 (C/D)	
D401~407	2760049008	IS2076	
ZD401	2760236060	HZ5C2	
RESISTOR GROUP			
RT401,402	2116000044	V08PB503	50KΩB
RB404	2462011091	RK99=2B473MP3	47KΩx3 1/8W
RB406	2462011046	RK99=2B472MP3	4.7KΩx3 1/8W
RB401	2462010092	RK99=2B104MP4	100KΩx41/8W
RB402	2462012032	RK99=2B104MP8	100KΩx81/8W
RB405	2462018010	RK99=2B473MP6	47KΩx6 1/8W
CAPACITOR GROUP			
			Ceramic
C418	2533627000	CC45SL1H101J	100PF 50V
C402	2531060009	CK45B1H182K	0.0018μF 50V
C404	2531008003	CK45B1H472K	0.0047μF 50V
C417	2539011005	CK45=1E223M	0.022μF 25V
			Electrolytic
C405~407	2544132005	CE04W1C100=	10μF 16V
410~413			
C414	2544146004	CE04W1H010=	1μF 50V
C401,408	2544147003	CE04W1H2R2=	2.2μF 50V
409,413			
C403	2544148002	CE04W1H3R3=	3.3μF 50V
OTHER PARTS GROUP			
CN401	2035622082	6P CONN BASE	
402,406			
CN404	2035622066	5P MINI CONN. PIN	
CN405,407	2035622008	3P MINI CONN. PIN	
CN408	2035622024	4P MINI CONN. PIN	
	2358014034	INDUCTOR	
	3934013005	FL METER	
	4428141000	METER HOLDER	

• The carbon resistors rated at ¼W are not listed herein.

KU-5231 COUNTER/METER UNIT

Ref. No.	Part No.	Part Name	Remarks
SEMICONDUCTOR GROUP			
IC401	2620439004	UPD554C-121	
IC402,403	2620523004	BA668	
TR401~404	2710113010	2SA999 (F)	
412,415			
416,418			
TR405~409	2730204035	2SC2320 (E/F)	
413,414			
417			
TR410,411	2750043014	2SK381 (C/D)	
D401~407	2760049008	IS2076	
ZD401	2760236060	HZ5C2	
RESISTOR GROUP			
RT401,402	2116000044	V08PB503	50KΩB
RT471	2412334003	RD14B==152J	1.5KΩ
RB404	2462011091	RK99=2B473MP3	47KΩx3 1/8W
RB406	2462011046	RK99=2B472MP3	4.7KΩx3 1/8W
RB401	2462010092	RK99=2B104MP4	100KΩx41/8W
RB402	2462012032	RK99=2B104MP8	100KΩx81/8W
RB405	2462018010	RK99=2B473MP6	47KΩx6 1/8W
CAPACITOR GROUP			
			Ceramic
C418	2533627000	CC45SL1H101J	100PF 50V
C402	2531060009	CK45B1H182K	0.0018μF 50V
C404	2531008003	CK45B1H472K	0.0047μF 50V
C417	2539011005	CK45=1E223M	0.022μF 25V
			Electrolytic
C405~407	2544132005	CE04W1C100=	10μF 16V
410~413			
C414	2544146004	CE04W1H010=	1μF 50V
C401,408	2544147003	CE04W1H2R2=	2.2μF 50V
409,413			
C403	2544148002	CE04W1H3R3=	3.3μF 50V
OTHER PARTS GROUP			
CN401	2035622082	6P CONN BASE	
402,406			
CN403	2031639040	4P EI CON	
CN404	2035622066	5P MINI CONN. PIN	
CN405,407	2035622008	3P MINI CONN. PIN	
CN408	2035622024	4P MINI CONN. PIN	
	2358014034	INDUCTOR	
	3934013005	FL METER	
	4428141000	METER HOLDER	

• The carbon resistors rated at ¼W are not listed herein.

PARTS LIST OF EXPLODED VIEW (DR-M33)

Ref. No.	Part No.	Part Name	Remarks
201	4118341602	CHASSIS	
	4118341615	CHASSIS	BK, E1 only
	4118341518	CHASSIS	E1 only
202	KU-5210	PWR LOGIC UNIT	
203	KU-5200	AUDIO PWB UNIT	
204	KU-5220	CONTROL UNIT	
205	KU-5230	COUNTER/METER UNIT	
206	1038244303	FRONT CHASSIS	
207	3388015002	V. MECHA 81	
208	4118347101	EARTH PLATE (A)	
209	4148198003	SHIELD BRACKET	
210	4118346115	ANGLE	
⚠ 211	2339082001	POWER TRANS	
	2339084009	POWER TRANS	E1 only
	2339083107	POWER TRANS	EU only
212	4118342410	TRANS BRACKET	
	4118342407	TRANS BRACKET	E1, EU only
⚠ 213	2062002031	AC CORD	E2
	2006031026	AC CORD	E1
	2006019310	AC CORD	EA
	2062024006	AC CORD WITH LABEL	EK
	2062019008	AC CORD	EU
⚠ 214	4450018004	CORD BUSH	
	MD-3802	CORD BUSH	E1, EU only
	MD-2982H	CORD BUSH	EA only
215	KU-52102	POWER SW PWB	
216	4118343202	POWER SW BRACKET	
218	1058089108	BOTTOM COVER	
219	4610162004	FELT PAD	
220	1438041009	METER WINDOW	
221	1038246026	FRONT ESC	BK
	1038246042	FRONT ESC	
222	1138174108	PUSH KNOB (A)	BK
	1138174111	PUSH KNOB (A)	
223	1138175204	CONTROL BUTTON	BK
	1138175217	CONTROL BUTTON	
224	4118421001	PRESS BAR	
225	1138179006	PUSH BUTTON (A)	BK
	1138179019	BUSH BUTTON (A)	
226	1138180008	BUTTON SHAFT	
227	4638623004	SPRING	
228	1138181007	PUSH BUTTON (B)	BK
	1138181018	PUSH BUTTON (B)	
229	4318098108	PUSH SW LEVER	
230	4318101008	P.S. LEVER ASS'Y	BK
	4318101011	P.S. LEVER ASSY	
231	4318102007	EJECT KNOB ASS'Y	BK
	4318102010	EJECT KNOB ASS'Y	
232	4318104102	EJECT PLATE	
233	1038247122	FRONT PANEL ASS'Y	BK
	1038247148	FRONT PANEL ASS'Y	
234	KU-52101	TIMER SW PWB	
235	1138155130	SLIDE KNOB (B)	BK
	1138155143	SLIDE KNOB (B)	

Ref. No.	Part No.	Part Name	Remarks
236	1128112109	VOL. KNOB (A)	BK
	1128112112	VOL. KNOB (A)	
237	1128113108	VOL. KNOB (B)	BK
	1128113111	VOL. KNOB (B)	
238	1128114000	VOL. KNOB (C)	BK
	1128114013	VOL. KNOB (C)	
239	1038253103	C. WINDOW ASS'Y	BK
	1038253129	C. WINDOW ASS'Y	
240	1028319251	TOP COVER	BK
	1028319248	TOP COVER	
241	4428055002	P.W.B. SUPPORT	
242	4428141000	METER HOLDER	
243	4118420109	SHIELD SHEET	
244	4128747102	SHIELD BRACKET	
246	1038249104	SIDE FRAME (L)	BK
	1038249117	SIDE FRAME (L)	
247	1038250106	SIDE FRAME (R)	BK
	1038250119	SIDE FRAME (R)	
248	4170140207	RADIATOR	BK
	4170140100	RADIATOR	
249	2048110002	8P DIN JACK	
250	2129223009	PUSH SWITCH	
251	2129224008	PUSH SWITCH	
252	2048114008	4P PIN JACK	
253	2118075006	V1611V..503KA	50KΩA
254	2118076005	V2620V..103KA	10KΩA
255	2048109013	HEADPHONE JACK	
256	3934013005	FL METER	
257	2124388004	TACT SWITCH	
258	1290024073	SOFT TAPE	
259	2129136028	POWER SW	
271	4428230005	PWB GUIDE	
272	4458028009	CORD HOLDER	
273	4428166108	BIAS VOL. PLATE	
274	KU-52003	BIAS ADJ PWB	
⚠ 275	2123315023	VOLTAGE SELECTOR	E1 only
301	4737500015	3x8 CBTS (P)	
302	4737501001	3x10 CBTS (P)	
303	4713303016	3x6 CBS	
304	4737002005	3x6 CBTS (S)	
305	4737004003	4x8 CBTS (S)	
306	4737505007	2.6x8 CBTS (P)	
307	4737003004	3x8 CFTS (S)	
308	4737500044	3x8 CBTS (P) BK	
309	4737503025	4x8 CTTS (P)	
310	4713305014	3x10 CBS	
311	4751106000	3W	
312	4730359014	3x16 CRTS (2)	E1 only

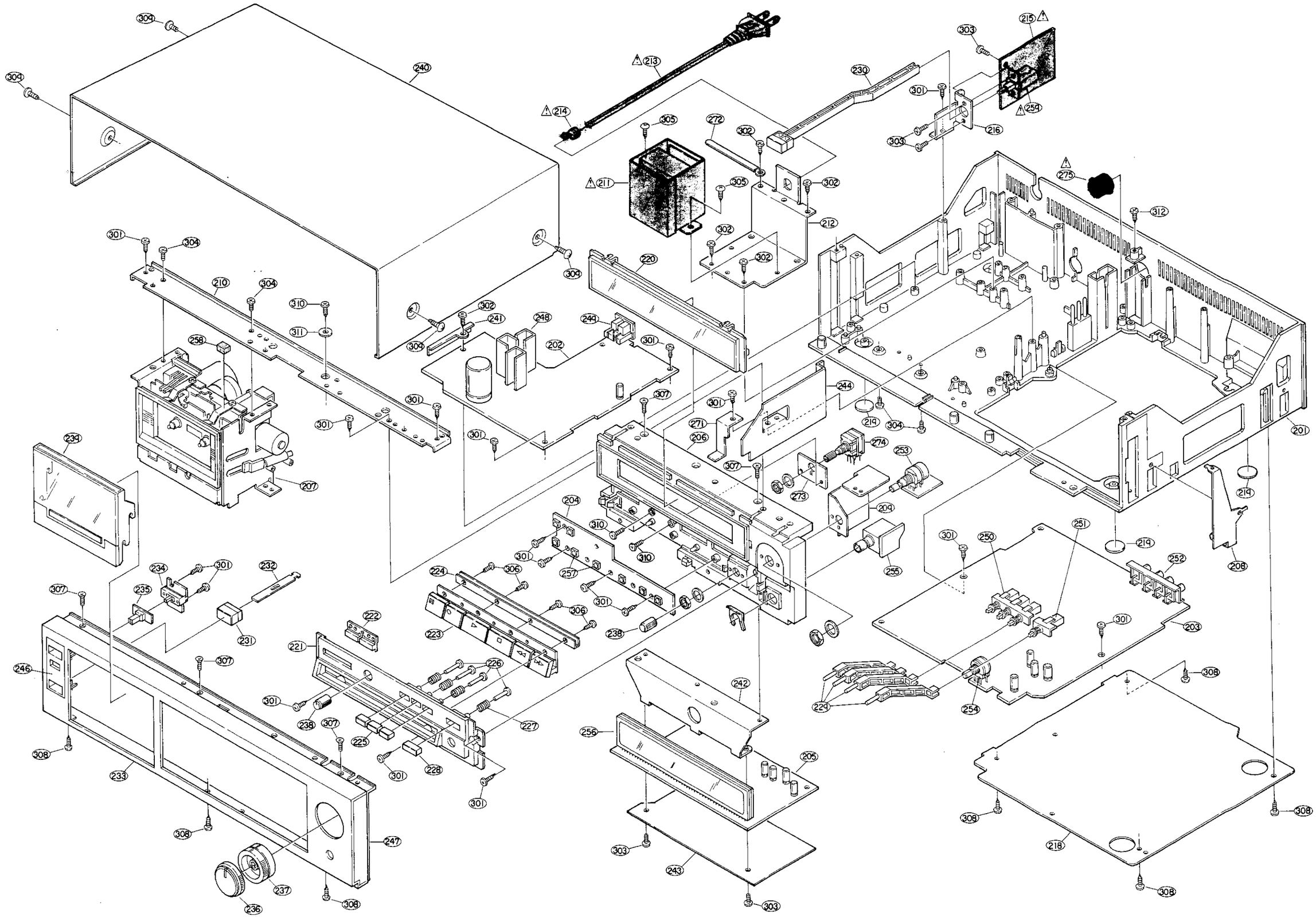
WARNING:
Parts marked with ⚠ and/or shading have special characteristics important to safety. Be sure to use the specified parts for replacement.

Remarks symbols in the parts list refer to the following countries and areas.

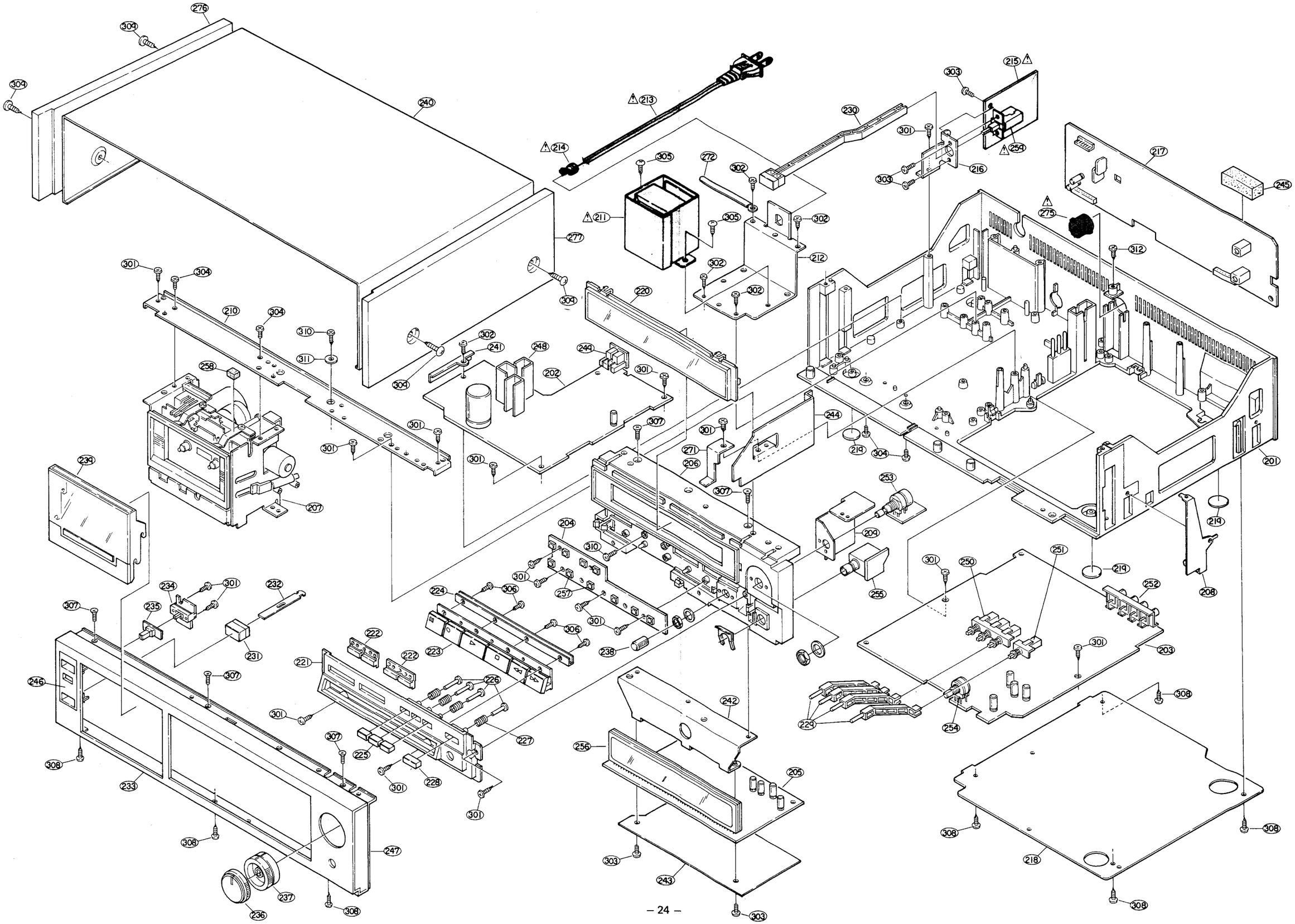
EA: Australia
EK: United Kingdom
EU: U.S.A.
E1: Multiple voltage model
E2: European continent
EF: French
EG: German
EC: Canada

* Remarks symbols (BK) in the parts list means that the color of the front panel is Black.

EXPLODED VIEW OF CABINET AND CHASSIS GROUP (DR-M33)



EXPLODED VIEW OF CABINET AND CHASSIS GROUP (DR-M44)



PARTS LIST OF EXPLODED VIEW (DR-M44)

Ref. No.	Part No.	Part Name	Remarks
201	4118341602	CHASSIS	
	4118341615	CHASSIS	BK, E1 only
202	KU-5210	PWR LOGIC UNIT	
203	KU-5200	AUDIO PWB UNIT	
204	KU-5221	CONTROL UNIT	
205	KU-5231	COUNTER/METER UNIT	
206	1038244303	FRONT CHASSIS	
207	3388016001	V. MECHA 55	
208	4118347101	EARTH PLATE (A)	
209	4148198003	SHIELD BRACKET	
210	4118346115	ANGLE	
⚠ 211	2339082001	POWER TRANS	
	2339084009	POWER TRANS	E1 only
	2339083107	POWER TRANS	EU only
212	4118342410	TRANS BRACKET	
	4118342407	TRANS BRACKET	E1, EU only
⚠ 213	2062002031	AC CORD	E2
	2006031026	AC CORD	E1
	2006019310	AC CORD	EA
	2062024006	AC CORD WITH LABEL	EK
	2062019008	AC CORD	EU
⚠ 214	4450018004	CORD BUSH	
	MD-3802	CORD BUSH	E1, EU only
	MD-2982H	CORD BUSH	EA only
215	KU-52102	POWER SW PWB	
216	4118343202	POWER SW BRACKET	
217	KU-04511	CTS UNIT	
218	1058089108	BOTTOM COVER	
219	4610162004	FELT PAD	
220	1438041009	METER WINDOW	
221	1038246000	FRONT ESC	BK
	1038246039	FRONT ESC	
222	1138174108	PUSH KNOB (A)	BK
	1138174111	PUSH KNOB (A)	
223	1138175204	CONTROL BUTTON	BK
	1138175217	CONTROL BUTTON	
224	4118421001	PRESS BAR	
225	1138179006	PUSH BUTTON (A)	BK
	1138179019	BUSH BUTTON (A)	
226	1138180008	BUTTON SHAFT	
227	4638623004	SPRING	
228	1138181007	PUSH BUTTON (B)	BK
	1138181018	PUSH BUTTON (B)	
229	4318098108	PUSH SW LEVER	
230	4318101008	P.S. LEVER ASS'Y	BK
	4318101011	P.S. LEVER ASSY	
231	4318102007	EJECT KNOB ASS'Y	BK
	4318102010	EJECT KNOB ASS'Y	
232	4318104102	EJECT PLATE	
233	1038247135	FRONT PANEL ASS'Y	BK
	1038247151	FRONT PANEL ASS'Y	
234	KU-52101	TIMER SW PWB	
235	1138155130	SLIDE KNOB (B)	BK
	1138155143	SLIDE KNOB (B)	

Ref. No.	Part No.	Part Name	Remarks
236	1128112109	VOL. KNOB (A)	BK
	1128112112	VOL. KNOB (A)	
237	1128113108	VOL. KNOB (B)	BK
	1128113111	VOL. KNOB (B)	
238	1128114000	VOL. KNOB (C)	BK
	1128114013	VOL. KNOB (C)	
239	1038253116	C. WINDOW ASS'Y	BK
	1038253132	C. WINDOW ASS'Y	
240	1028319251	TOP COVER	BK
	1028319248	TOP COVER	
	1028319277	TOP COVER	BK, EA
	1028319235	TOP COVER	EA
241	4428055002	P.W.B. SUPPORT	
242	4428141000	METER HOLDER	
243	4118420109	SHIELD SHEET	
244	4128747102	SHIELD BRACKET	
245	4618135004	CUSHION (C)	
246	1038249104	SIDE FRAME (L)	BK
	1038249117	SIDE FRAME (L)	
247	1038250106	SIDE FRAME (R)	BK
	1038250119	SIDE FRAME (R)	
248	4170140207	RADIATOR	
249	2048110002	8P DIN JACK	
250	2129223009	PUSH SWITCH	
251	2129224008	PUSH SWITCH	
252	2048114008	4P PIN JACK	
253	2118075006	V1611V..503KA	
254	2118076005	V2620V..103KA	
255	2048109013	HEADPHONE JACK	
256	3934013005	FL METER	
257	2124388004	TACT SWITCH	
258	1290024073	SOFT TAPE	
259	2129136028	POWER SW	
271	4428230005	PWB GUIDE	
272	4458028009	CORD HOLDER	
⚠ 275	2123315023	VOLTAGE SELECTOR	E1 only
276	1018418007	WOOD BOARD (L)	E1, EA, EU
277	1018419006	WOOD BOARD (R)	E1, EA, EU
301	4737500015	3x8 CBTS (P)	
302	4737501001	3x10CBTS (P)	
303	4713303016	3x6 CBS	
304	4737002005	3x6 CBTS (S)	
305	4737004003	4x8 CBTS (S)	
306	4737505007	2.6x8 CBTS (P)	
307	4737003004	3x8 CFTS (S)	
308	4737500044	3x8 CBTS (P) BK	
309	4737503025	4x8 CTTS (P)	
310	4713305014	3x10 CBS	
311	4751106000	3W	

Remarks symbols in the parts list refer to the following countries and areas.

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EU: U.S.A.
E1: Multiple voltage model
E2: European continent
EF: French
EG: German
EC: Canada

★ Remarks symbols (BK) in the parts list means that the color of the front panel is Black.

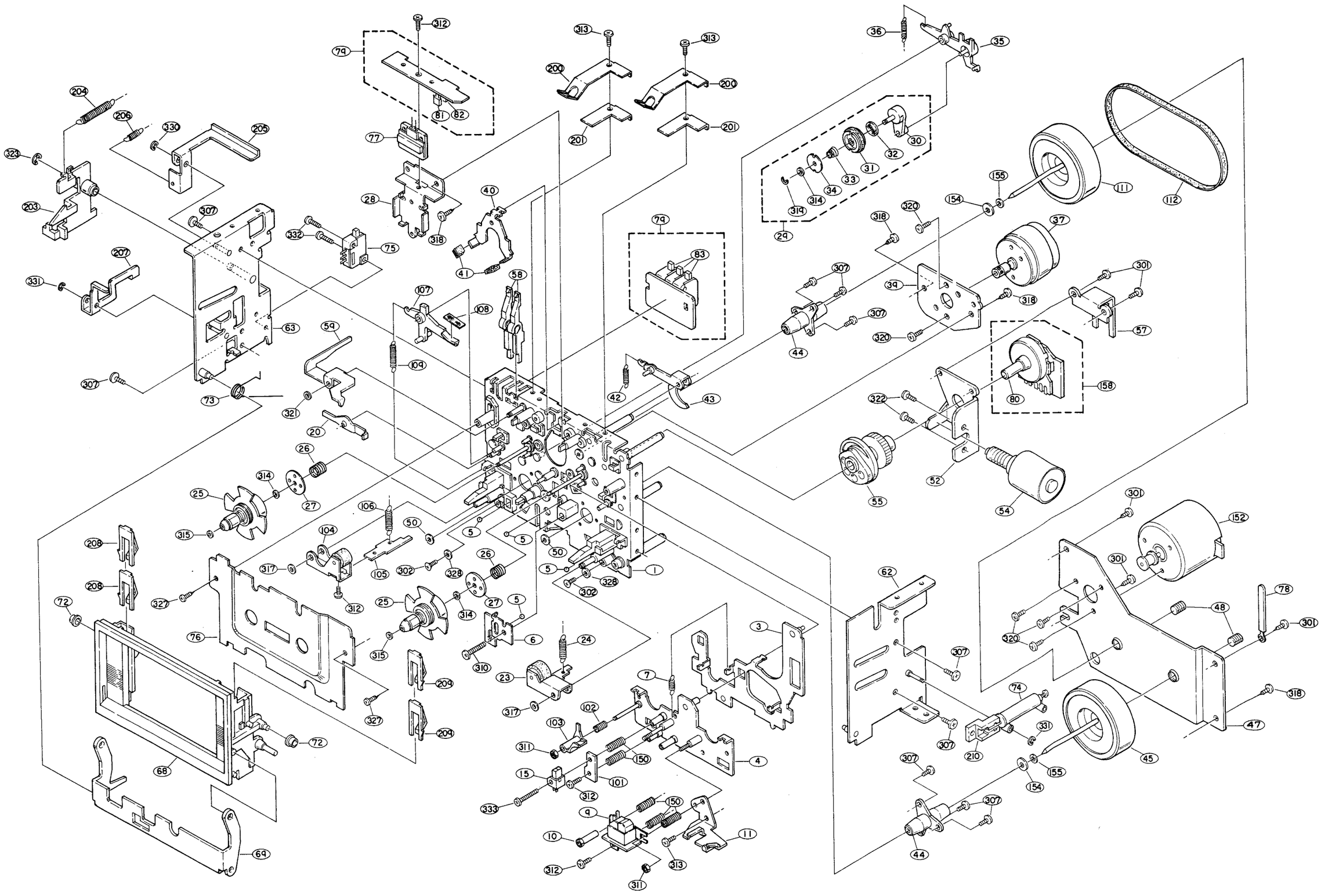
WARNING:
Parts marked with ⚠ and/or shading have special characteristics important to safety. Be sure to use the specified parts for replacement.

PARTS LIST OF MECHANISM 81 UNIT (DR-M33)

Ref. No.	Part No.	Part Name	Remarks
1	4118339300	MECHA BASE ASS	
3	4318076308	HEAD SLIDER ASS	
4	4318106003	HEAD PLATE ASS	
5	4258011009	STEEL BALL D3	
6	4318080200	BALL GUIDE PLATE	
7	4638230002	SPRING	
9	3918076107	R/P HEAD	
10	4438671104	SPECIAL NUT	
11	4418994102	CORD HOLDER	
15	3918825002	ERASE HEAD	
20	4338224208	STOPPER	
23	4338194105	P ROLLER ARM ASS	
24	4638231108	SPRING	
25	4218400003	REEL ASS	
26	4638261000	SPRING	
27	4338199003	FRICTION PLATE	
28	4418961300	LAMP HOLDER	
29	4338238414	I. ARM (B) G ASS	
30	4338239109	IDLER ARM (B) ASS	
31	4218324312	IDLER ASS	
32	4618126107	FRICTION FELT	
33	4638625206	SPRING	
34	4428029106	THRUST WASHER	
35	4338236209	IDLER ARM (A) ASS	
36	4638244108	SPRING	
37	2178088101	DC MOTOR ASS	
39	4418962309	DC MOTOR FIX PLATE	
40	4318081306	BRAKE	
41	4618127106	BRAKE SHOE	
42	4638234105	SPRING	
43	4338232203	BRAKE ARM ASS	
44	4438648302	METAL HOUSING ASS	
45	4218381203	C. WHEEL (S) ASS	
47	4128784217	BACK PLATE	
48	4438771004	CAPSTAN STOPPER	
50	4770090074	WASHER	
52	4418966208	CAM MOTOR HOLDER	
54	2178080206	CAM MOTOR ASS	
55	4248027304	CAM	
57	4428018104	ENCODER BRACKET	
58	4338225304	HOLE SENSOR (1)	
59	4338226400	HOLE SENSOR (2)	
62	4428147208	RIGHT STAY ASS	
63	4428145200	LEFT STAY ASS	
68	1038242208	C. BOX (A)	
69	4338270304	CASSETTE BOX	
72	4318097002	COLLAR	
73	4638236116	BOX SPRING	
74	4698013104	AIR DUMPPER	
75	2129200006	SLIDE SWITCH	
76	1448508105	ESC PLATE	
77	3939179009	LN0105 GP3	
78	4458028009	CORD HOLDER	
79	KU-5100	R PULSE SENS PWB	
80	2123331201	ROTARY ENCODER	
81	3939178000	LN25RCP	
82	3939026000	PN150	
83	2129201005	SLIDE SWITCH	

Ref. No.	Part No.	Part Name	Remarks
101	4428167000	E HEAD BASE	
102	4638621103	SPRING	
103	4338193009	TAPE GUIDE	
104	4338196103	P-ROLLER ARM L	
105	4338198101	P-ROLLER ARM PLATE	
106	4638260001	SPRING	
107	4338201205	BACK TENSION ARM	
108	4618125108	FRICTION FELT	
109	4638234105	SPRING	
111	4218381229	C WHEEL (S) ASS	
112	4238028106	BELT	
150	4638819012	SPRING	
152	2178083106	CP MOTOR SUB ASS	
154	4770090087	WASHER	
155	4770090016	WASHER	
158	KU-5100	ENCODER PWB	
200	4638829206	CASSETTE SPRING	
201	4428154107	CP SUPPORT	
203	4338269302	HOOK	
204	4638256002	SPRING	
205	4128829004	ANGLE	
206	4638257001	SPRING	
207	4318103006	SW LEVER	
208	1038243304	CASSETTE SUPPORT (L)	
209	1038243317	CASSETTE SUPPORT (R)	
210	4338271109	DAMPER GUIDE	
301	4737002005	3x6 CBTS (S)	
302	4737500028	3x8 CFTS (P)	
307	4713202010	2.6x5 CBS	
310	4713802025	2.6x14 CBS	
311	4756020000	2N	
312	4713102013	2x5 CBS	
313	4713201011	2.6x4 CBS	
314	4770090003	WASHER	
315	4751119107	SLIT WASHER	
317	4751121108	SLIT WASHER	
318	4737500002	3x6 CBTS (P)	
319	4761000002	1.5E RING	
320	4713802012	2.6x3 CBS	
321	4751120109	SLIT WASHER	
322	4713801039	2x3 CBS	
323	4761003009	3E RING	
327	4730154028	2x8 CRTS	
328	4751005004	4W	
330	4761002000	2.5E RING	
331	4761001001	2E RING	
332	4713204018	2.6x8 CBS	
333	4712804008	2x10 CPS	

EXPLODED VIEW OF MECHANISM 81 UNIT (DR-M33)

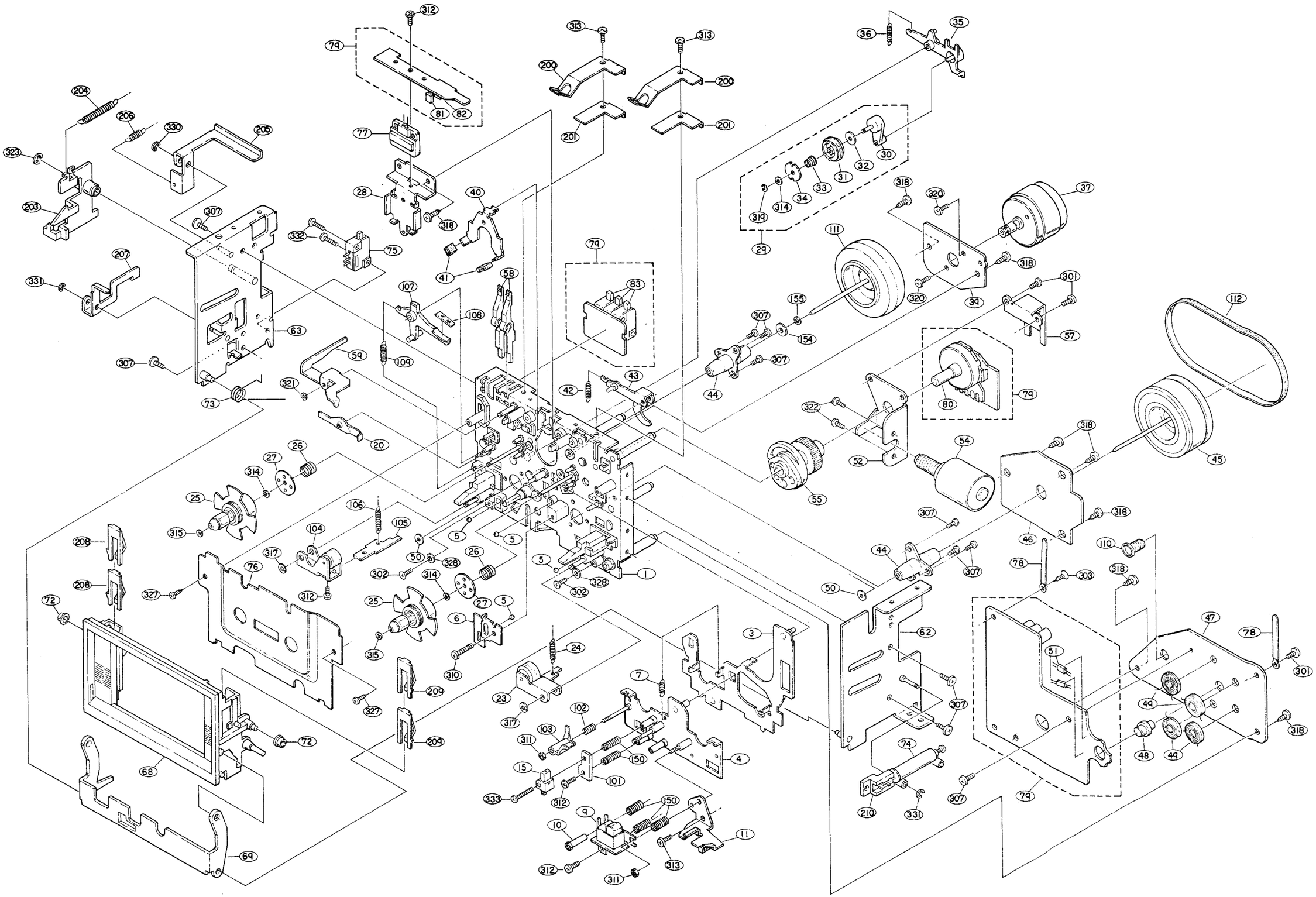


PARTS LIST OF MECHANISM 55 UNIT (DR-M44)

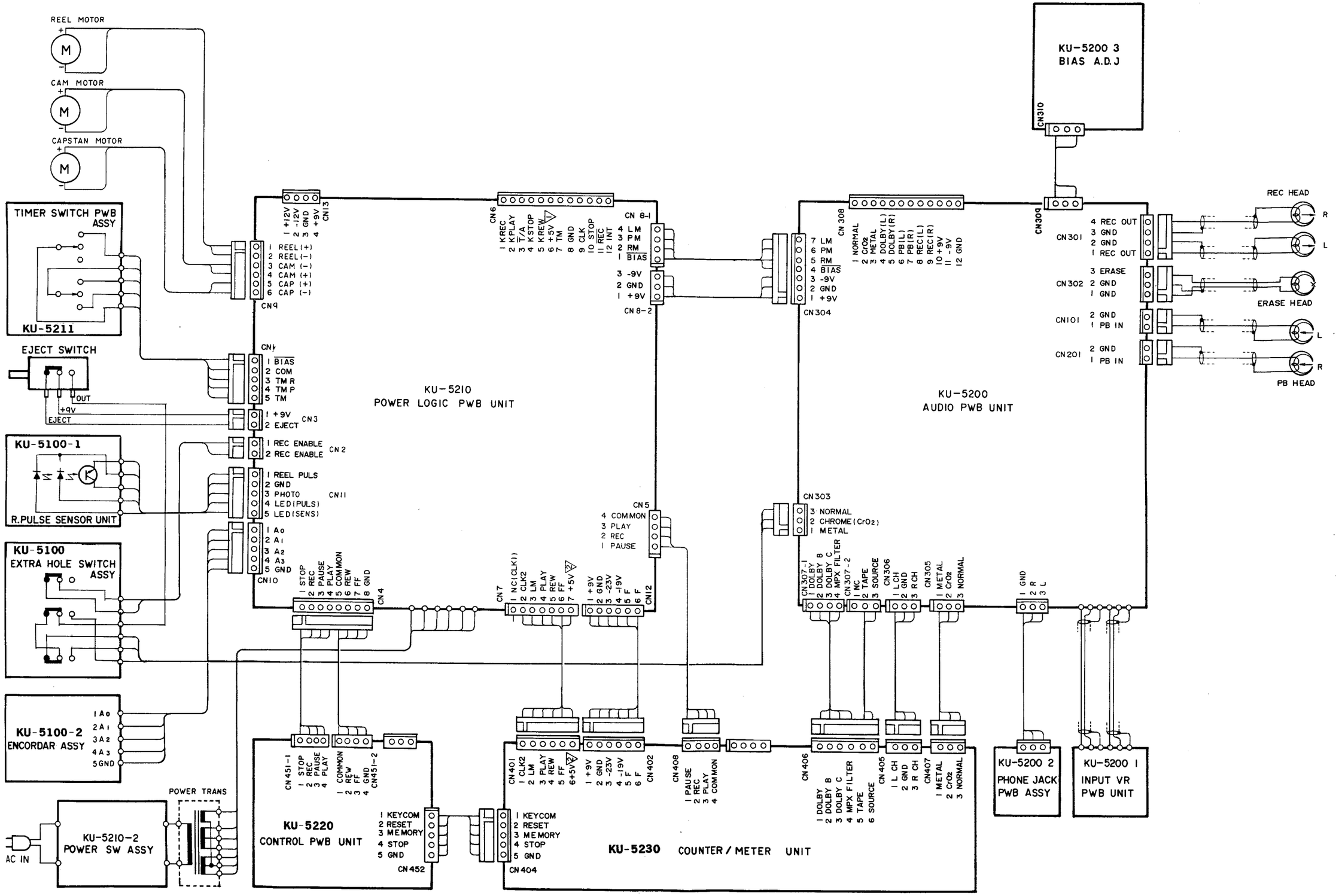
Ref. No.	Part No.	Part Name	Remarks
1	4118339300	MECHA BASE ASS	
3	4318076308	HEAD SLIDER ASS	
4	4318106003	HEAD PLATE ASS'Y	
5	4258011009	STEEL BALL D3	
6	4318080200	BALL GUIDE PLATE	
7	4638230002	SPRING	
9	3918076107	R/P HEAD	
10	4438671104	SPECIAL NUT	
11	4418994102	CORD HOLDER	
15	3918825002	ERASE HEAD	
20	4338224208	STOPPER	
23	4338194105	P ROLLER ARM ASS	
24	4638237008	SPRING	
25	4218400003	REEL ASS	
26	4638261000	SPRING	
27	4338199003	FRICTION PLATE	
28	4418961300	LAMP HOLDER	
29	4338238414	I. ARM (B) G ASS	
30	4338239109	IDLER ARM (B) ASS	
31	4218324312	IDLER ASS'Y	
32	4618126107	FRICTION FELT	
33	4638625206	SPRING	
34	4428029106	THRUST WASHER	
35	4338236209	IDLER ARM (A) ASS	
36	4638244108	SPRING	
37	2178088101	DC MOTOR ASS	
39	4418962309	DC MOTOR FIX PLATE	
40	4318081306	BRAKE	
41	4618127106	BRAKE SHOE	
42	4638234105	SPRING	
43	4338232203	BRAKE ARM ASS	
44	4438648302	METAL HOUSING	
45	4218355116	CAPSTAN W SUB	
46	2228530004	CIRCUIT BOARD	
47	4428041003	BACK PLATE	
48	4438650400	CAPSTAN STOPPER	
49	3468148307	STATOR COIL	
50	4770090074	WASHER	
51	2760303016	HL-300	
52	4418966208	CAM MOTOR HOLDER	
54	2178080206	CAM MOTOR ASS	
55	4248027304	CAM	
57	4428018104	ENCODER BRACKET	
58	4338225304	HOLE SENSOR (1)	
59	4338226400	HOLE SENSOR (2)	
62	4428147208	RIGHT STAY ASS	
63	4428145200	LEFT STAY ASS	
68	1038242208	C. BOX (A)	
69	4338270304	CASSETTE BOX (B)	
72	4318097002	COLLAR	
73	4638236116	BOX SPRING	
74	4698013104	AIR DUMPPER	
75	2129200006	SLIDE SWITCH	
76	1448508105	ESC PLATE	
77	3939179009	LN0105 GP3	

Ref. No.	Part No.	Part Name	Remarks
78	4458028009	CORD HOLDER	
79	KU-0455B	ENCORDER ASS	
80	2123331201	ROTARY ENCODER	
81	3939178000	LN25RCP	
82	3939026000	PN150	
83	2129201005	SLIDE SWITCH	
101	4428167000	E HEAD BASE	
102	4638621103	SPRING	
103	4338193009	TAPE GUIDE	
104	4338196103	P-ROLLER ARM L	
105	4338198101	P-ROLLER ARM PLATE	
106	4638260001	SPRING	
107	4338201205	BACK TENSION ARM	
108	4618125108	FRICTION FELT	
109	4638234105	SPRING	
110	4258009008	CAPSTAN SUPPORT (B)	
111	4218365300	CAPSTAN WHEEL ASS	
112	4238026108	BELT	
150	4638819012	SPRING	
154	4770090087	WASHER	
155	4770090016	WASHER	
200	4638829206	CASSETTE SPRING	
201	4428154107	CP SUPPORT	
203	4338269302	HOOK	
204	4638256002	SPRING	
205	4128829004	ANGLE	
206	4638257001	SPRING	
207	4318103006	SW LEVER	
208	1038243304	CASSETTE SUPPORT (L)	
209	1038243317	CASSETTE SUPPORT (R)	
210	4338271109	DAMPER GUIDE	
301	4737002005	3x6 CBTS (S)	
302	4737500028	3x8 CFTS (P)	
303	4737003004	3x8 CFTS (S)	
307	4713202010	2.6x5 CBS	
310	4713802025	2.6x14 CBS	
311	4756020000	2N	
312	4713102013	2x5 CBS	
313	4713201011	2.6x4 CBS	
314	4770090003	WASHER	
315	4751119107	SLIT WASHER	
317	4751121108	SLIT WASHER	
318	4737500002	3x6 CBTS (P)	
319	4761000002	1.5E RING	
320	4713802012	2.6x3 CBS	
321	4751120109	SLIT WASHER	
322	4713801039	2x3 CBS	
323	4761003009	3E RING	
327	4730154028	2x8 CRTS	
328	4751005004	4W	
330	4761002000	2.5E RING	
331	4761001001	2E RING	
332	4713204018	2.6x8 CBS	
333	4712804008	2x10 CPS	

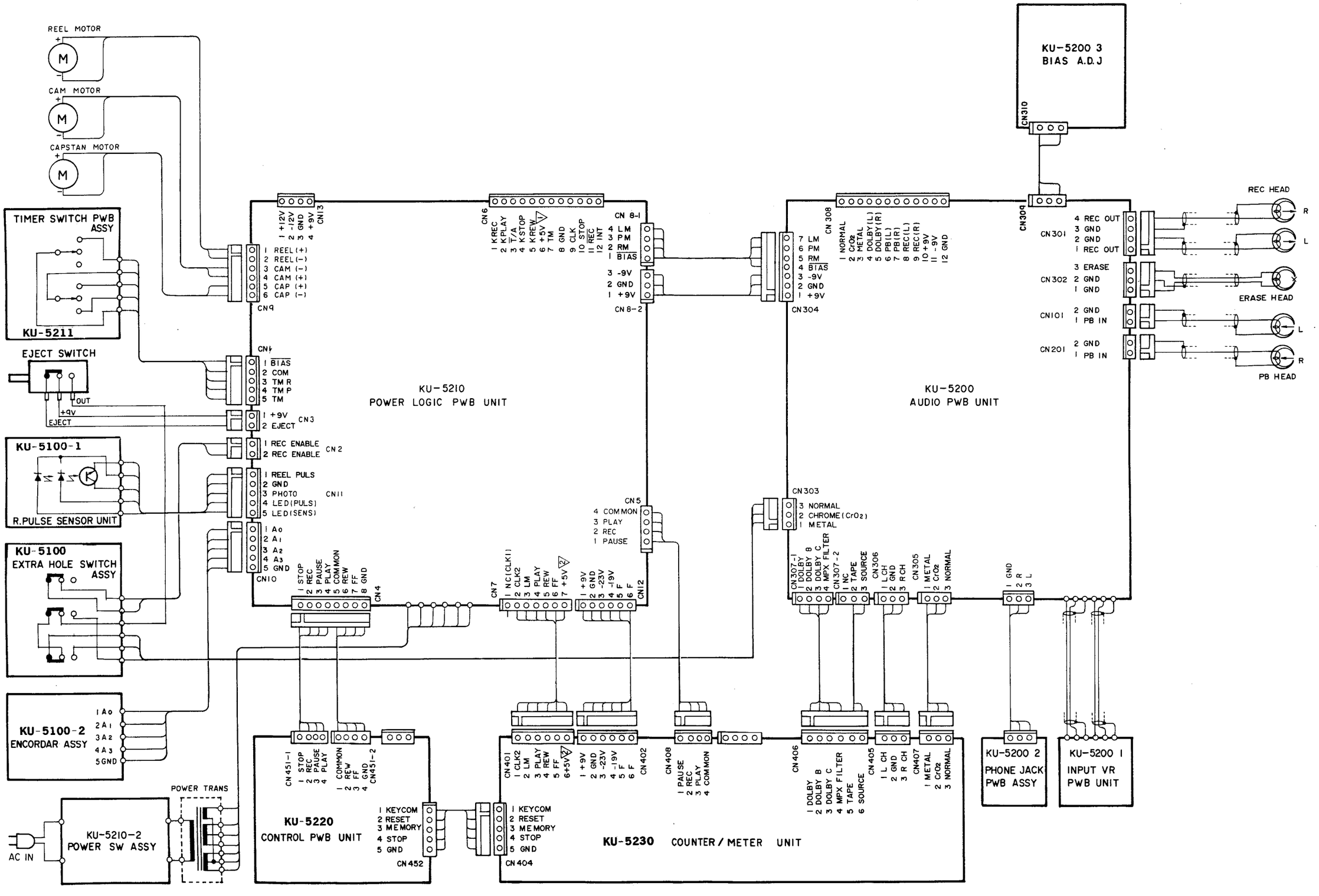
EXPLODED VIEW OF MECHANISM 55 UNIT (DR-M44)



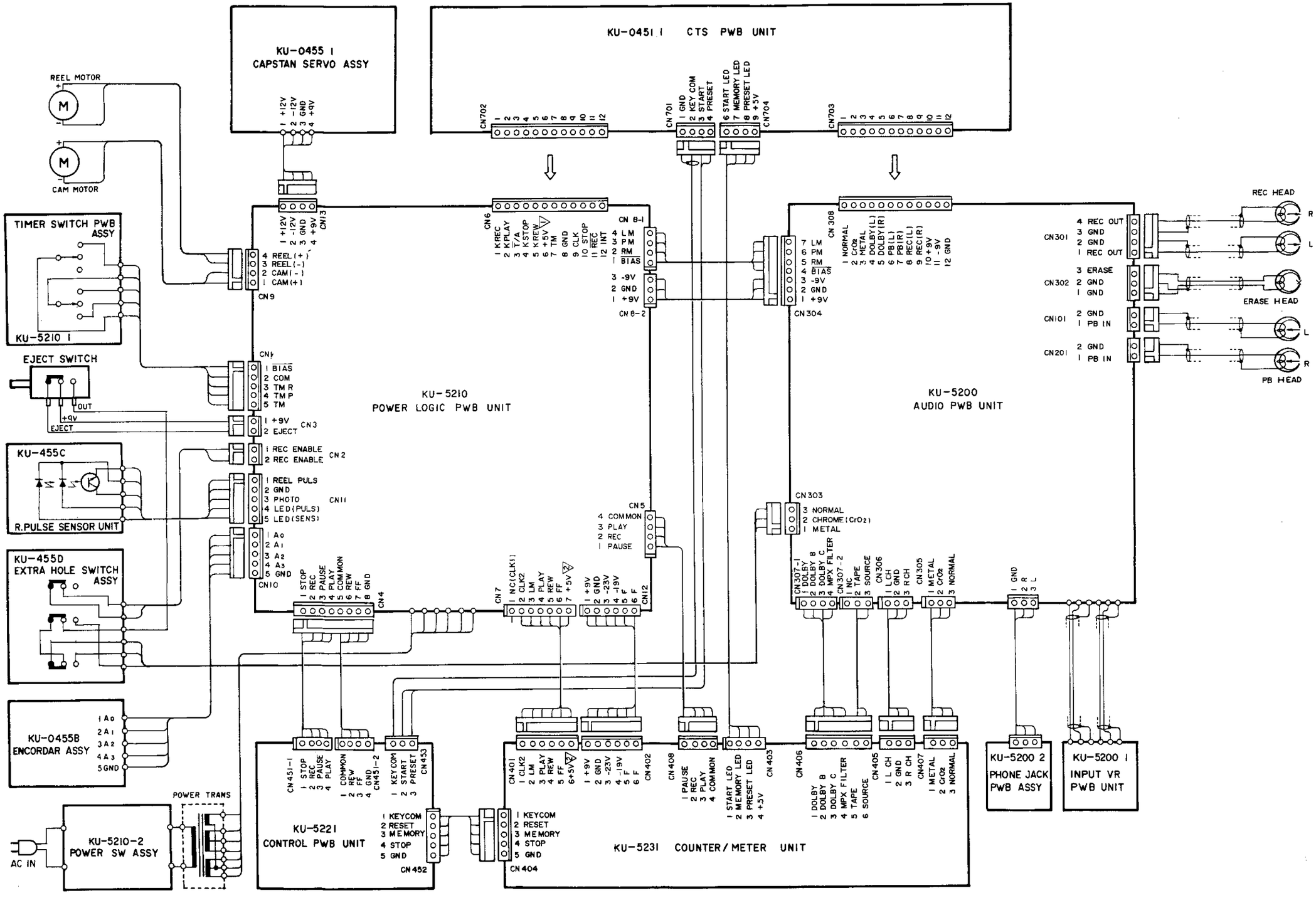
CONNECTIONS OF P.W. BOARD (DR-M33)



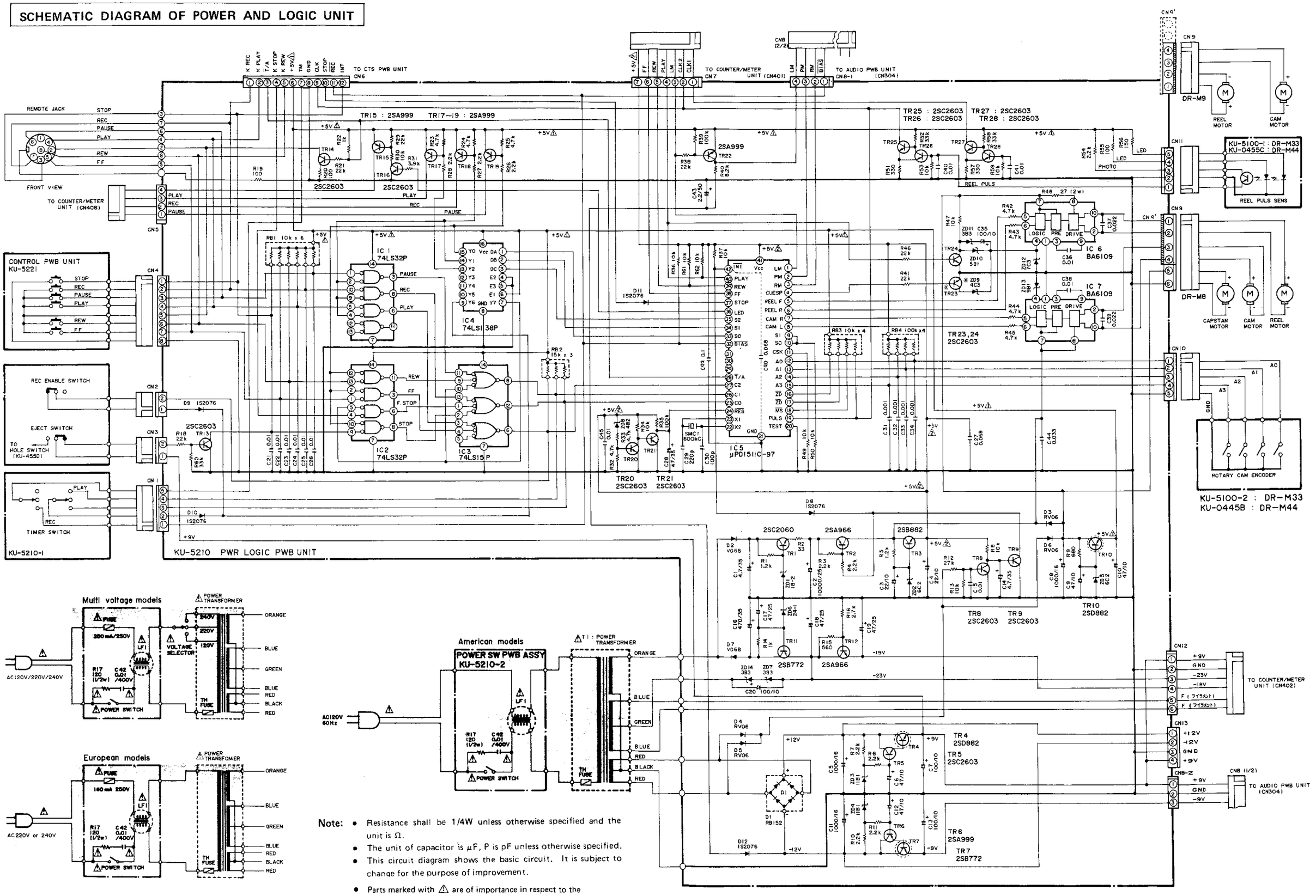
CONNECTIONS OF P.W. BOARD (DR-M33)



CONNECTIONS OF P.W. BOARD (DR-M44)



SCHEMATIC DIAGRAM OF POWER AND LOGIC UNIT

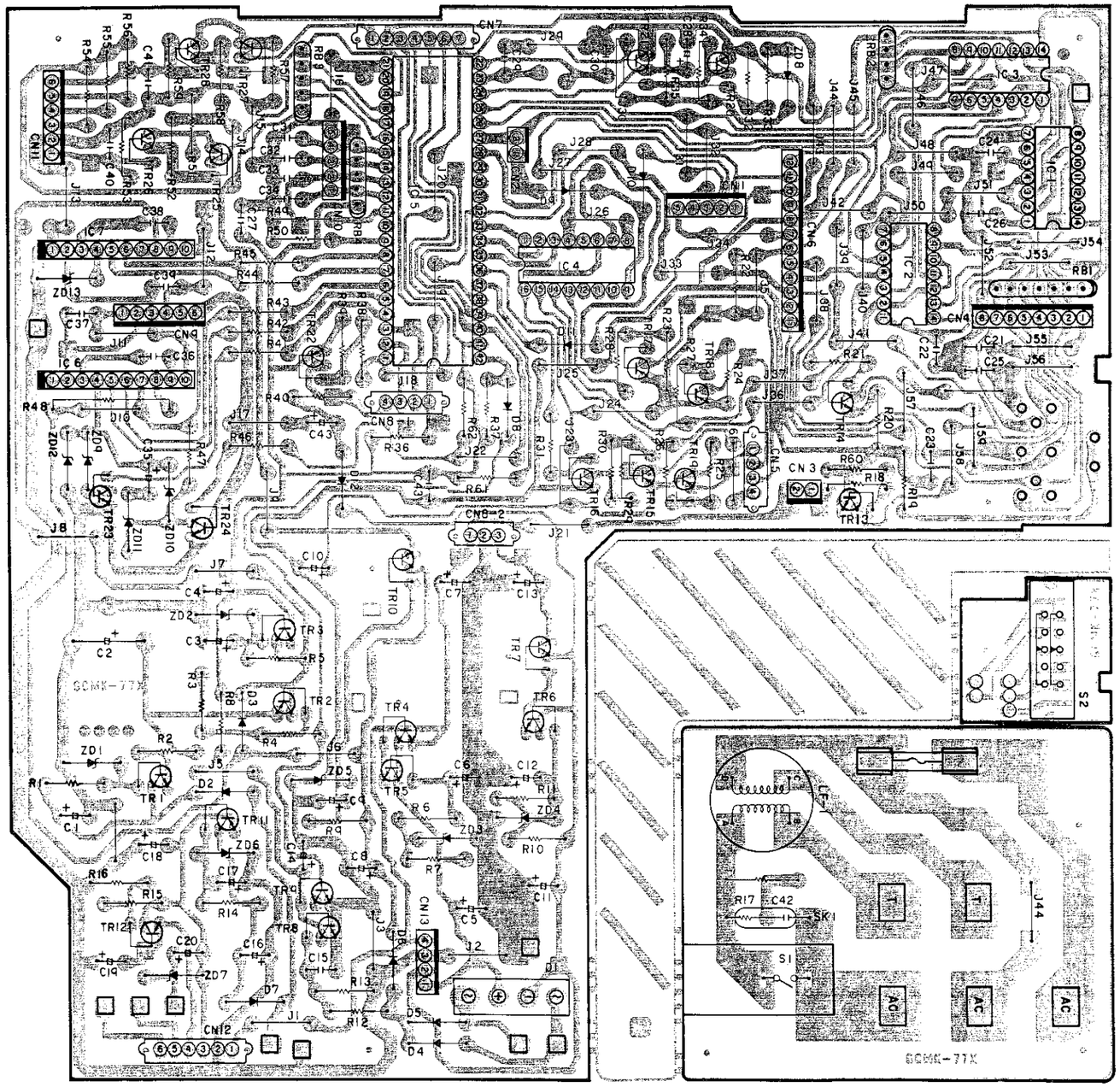


Note:

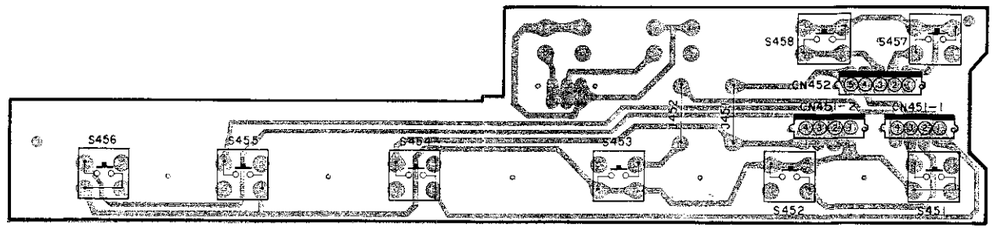
- Resistance shall be 1/4W unless otherwise specified and the unit is Ω.
- The unit of capacitor is μF, P is pF unless otherwise specified.
- This circuit diagram shows the basic circuit. It is subject to change for the purpose of improvement.
- Parts marked with ⚠ are of importance in respect to the safety, use the specified type without fail.

P.W. BOARD

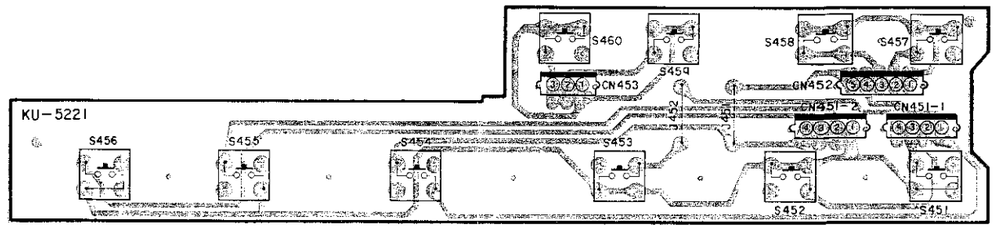
KU-5210 POWER AND LOGIC UNIT



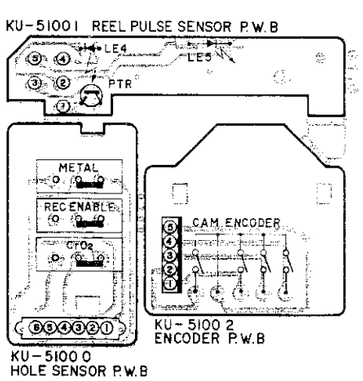
KU-5220 CONTROL UNIT (DR-M33)

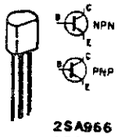


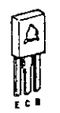
KU-5221 CONTROL UNIT (DR-M44)

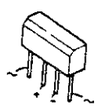


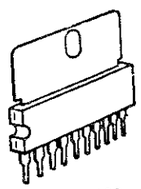
KU-5100 MECHANISM UNIT

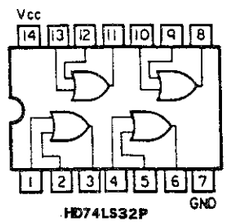


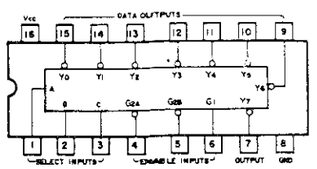




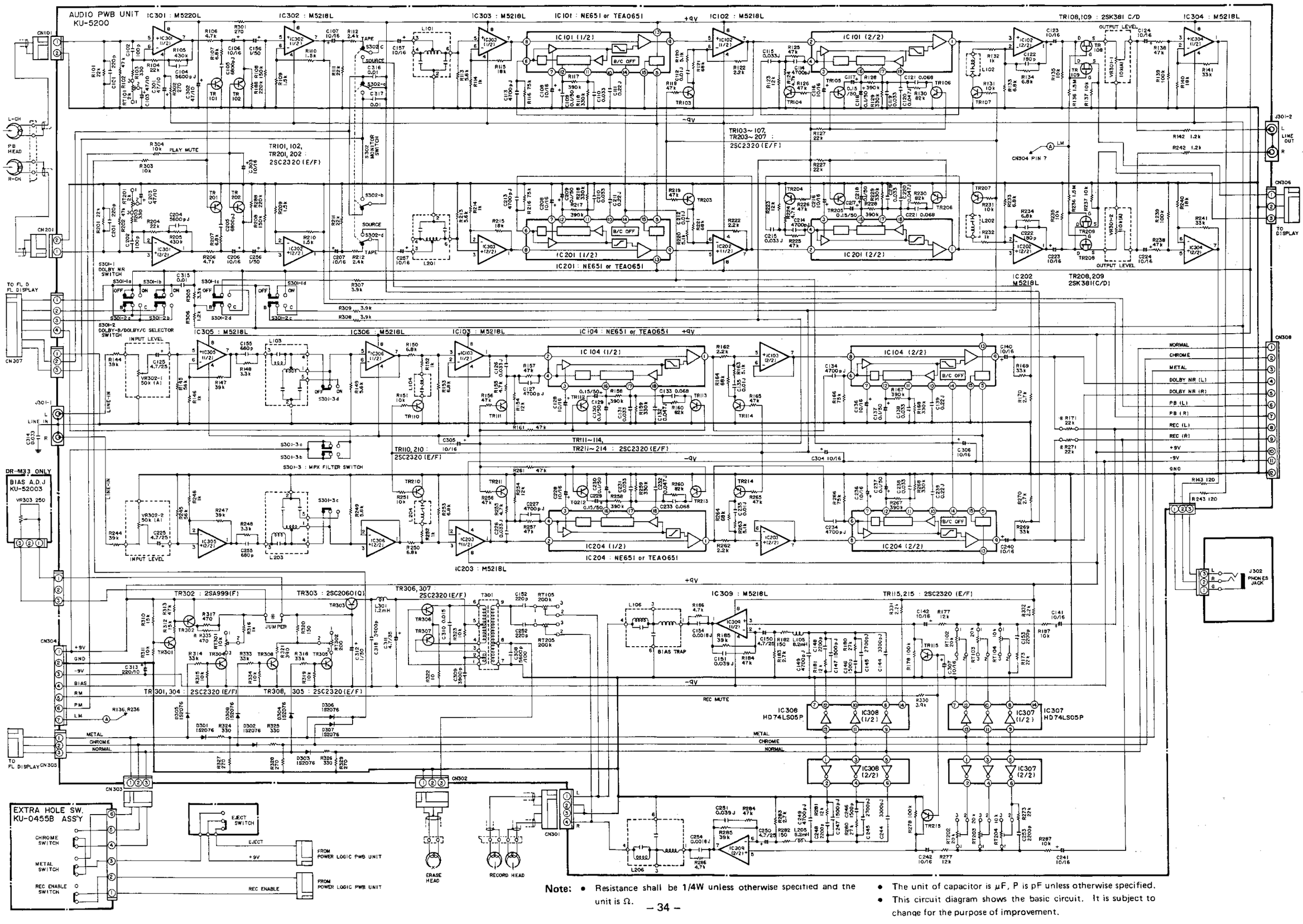








SCHEMATIC DIAGRAM OF AUDIO AMP UNIT

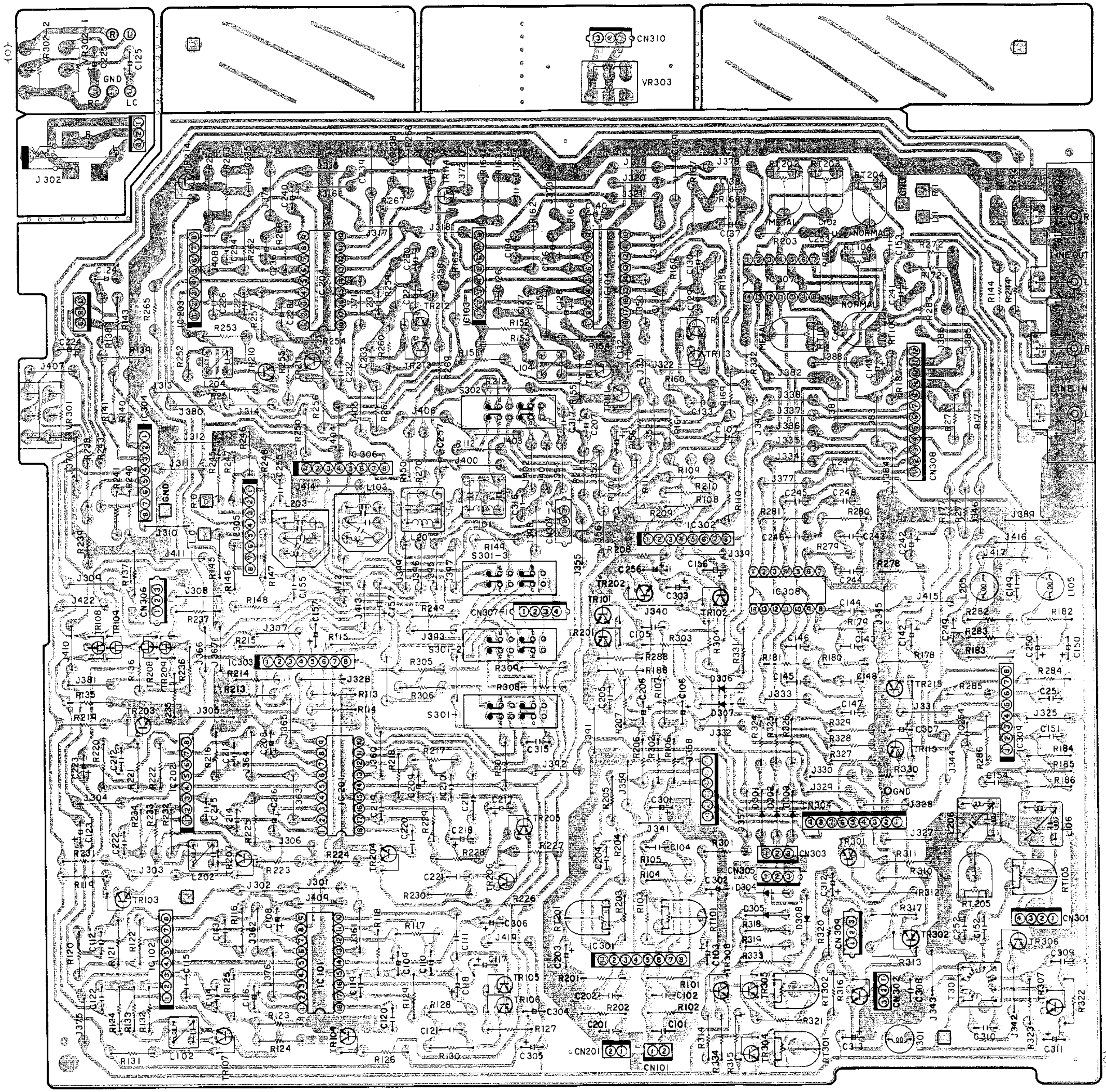


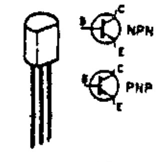
Note: • Resistance shall be 1/4W unless otherwise specified and the unit is Ω.

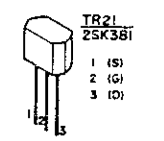
• The unit of capacitor is μF, P is pF unless otherwise specified.

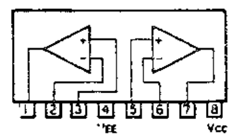
• This circuit diagram shows the basic circuit. It is subject to change for the purpose of improvement.

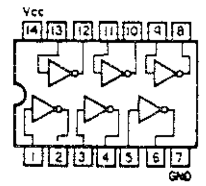
P.W. BOARD KU-5200 AUDIO AMP UNIT



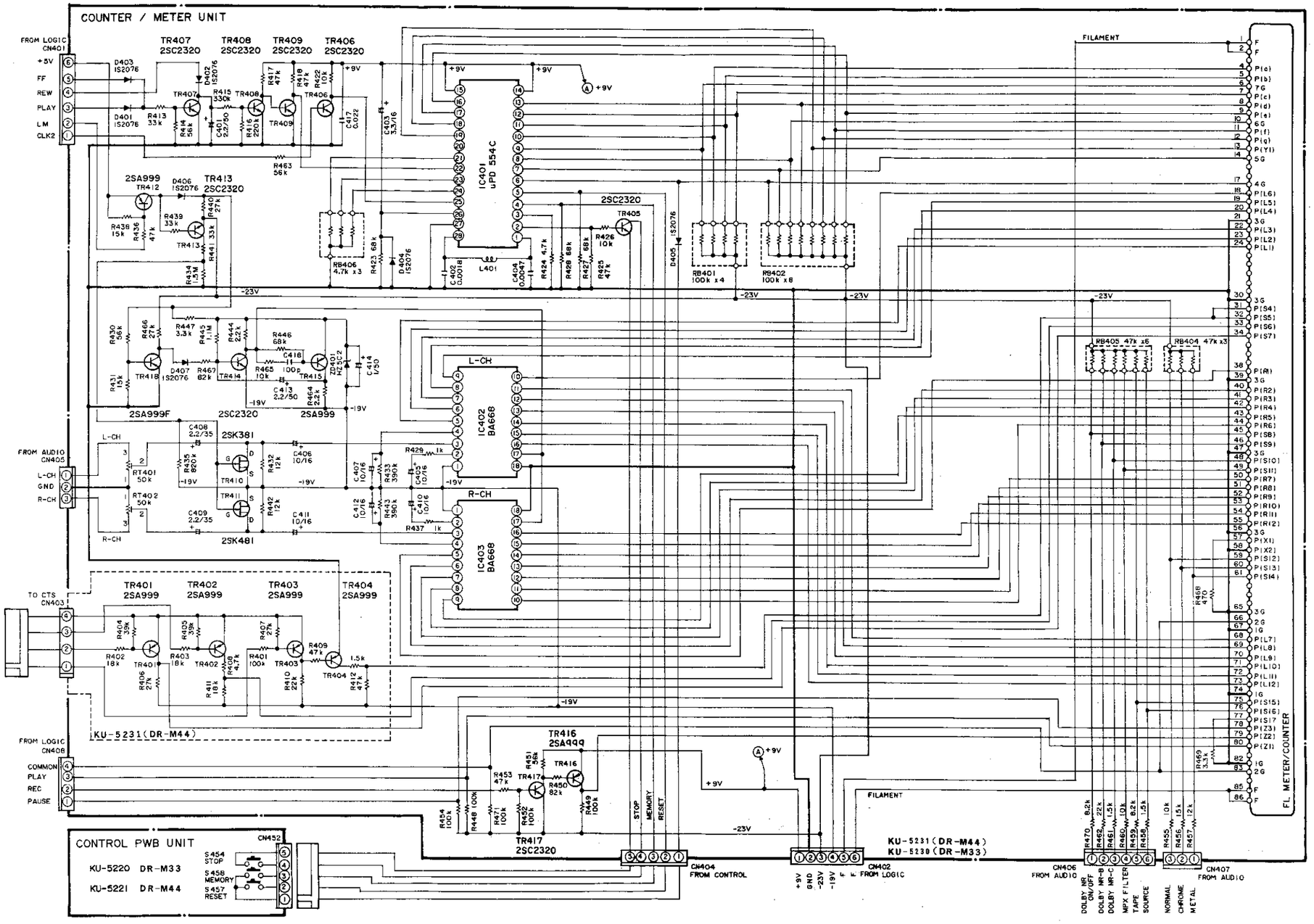


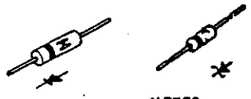


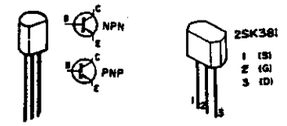




SCHEMATIC DIAGRAM OF FL COUNTER UNIT

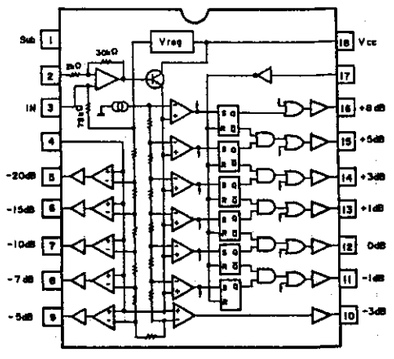






2SA999(F)

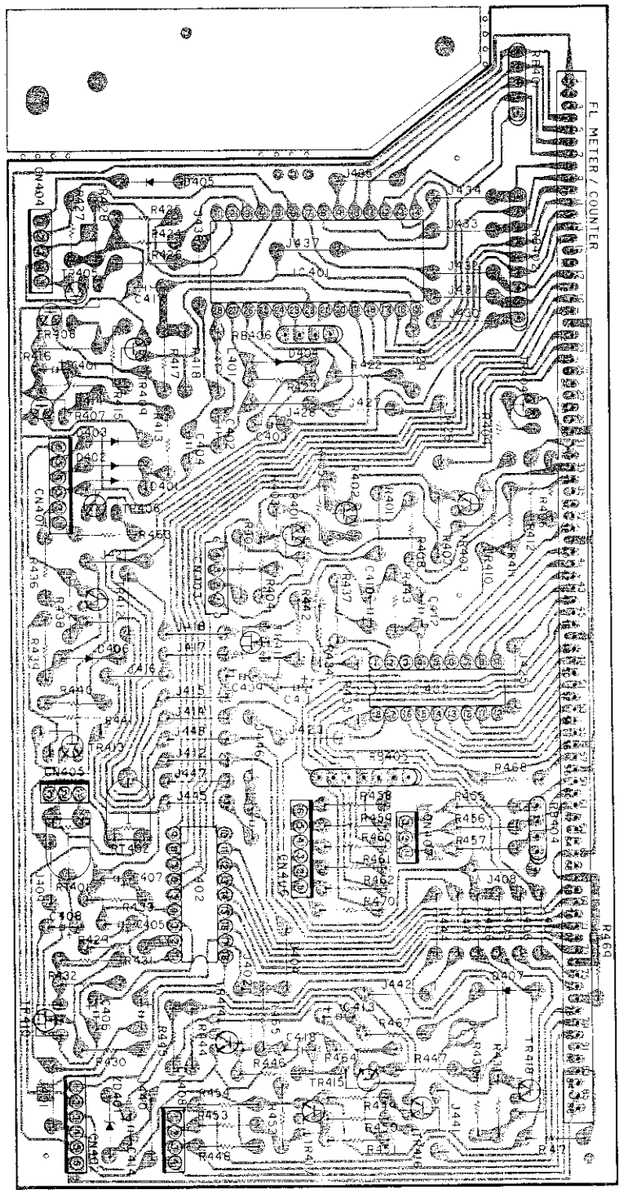
2SC2320 (E/F)



BA668

P.W. BOARD

KU-5230/5231 FL COUNTER UNIT



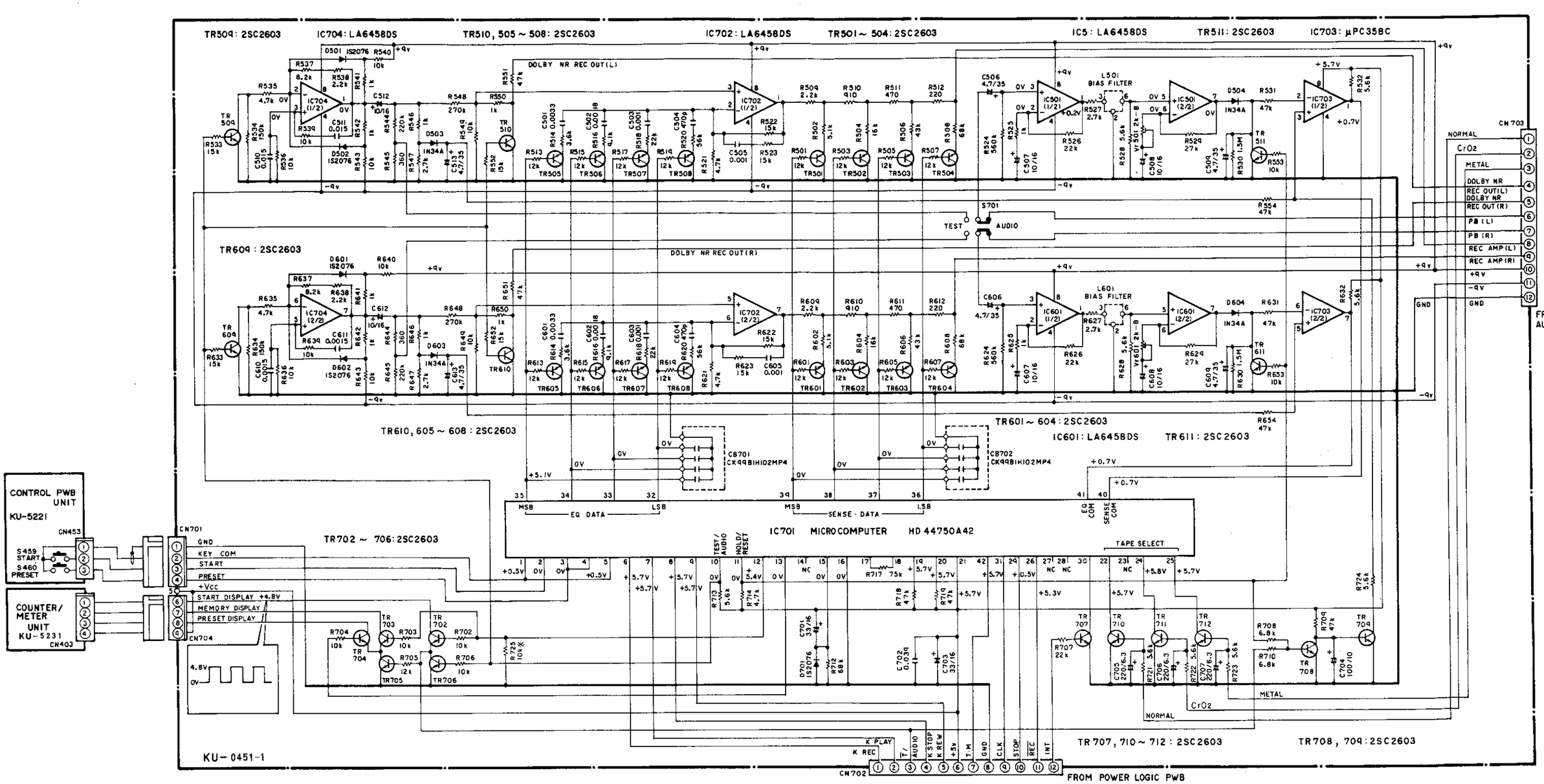
KU-5230 (DR-M33)

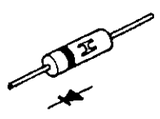
KU-5231 (DR-M44)

FL COUNTER METER TERMINAL FUNCTION TABLE

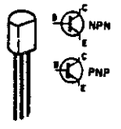
Terminal Number	Name	Function
1	F	Filament
2	F	Filament
3	NP	–
4	P(a)	Plate (a)
5	P(b)	Plate (b)
6	7G	Counter-4 digit counter
7	P(c)	Plate (c)
8	P(d)	Plate (d)
9	P(e)	Plate (e)
10	6G	Counter-3 digit counter
11	P(f)	Plate (f)
12	P(g)	Plate (g)
13	P(Y1)	MEMORY STOP display plate
14	5G	counter-2 digit grid
15	P(Y2)	min display plate
16	P(Y3)	sec display plate
17	4G	Counter-1 digit counter
18	P(L6)	Lch –3 dB display plate
19	P(L5)	Lch –5 dB display plate
20	P(L4)	Lch –7 dB display plate
21	3G	–
22	P(L3)	Lch –10 dB display plate
23	P(L2)	Lch –15 dB display plate
24	P(L1)	Lch –20 dB display plate
25	NP	–
26	P(S1)	BIAS display plate
27	P(S2)	LEVEL display plate
28	P(S3)	CALIBRATION display plate
29	NP	–
30	3G	–
31	P(S4)	AUTO TUNING display plate
32	P(S5)	——— display plate
33	P(S6)	MEMORY display plate
34	P(S7)	REFERENCE display plate
35	NP	–
36	NP	–
37	NP	–
38	P(R1)	Rch –20 dB display plate
39	3G	–
40	P(R2)	Rch –15 dB display plate
41	P(R3)	Rch –10 dB display plate
42	P(R4)	Rch –7 dB display plate
43	P(R5)	Rch –5 dB display plate
44	P(R6)	Rch –3 dB display plate
45	P(S8)	DOLBY NR display plate
46	P(S9)	B display plate
47	3G	–
48	P(S10)	C display plate
49	P(S11)	FILTER display plate
50	P(R7)	Rch –1 dB display plate
51	P(R8)	Rch 0 dB display plate
52	P(R9)	Rch +1 dB display plate
53	P(R10)	Rch +3 dB display plate
54	P(R11)	Rch +5 dB display plate
55	P(R12)	Rch +8 dB display plate
56	3G	–
57	P(X1)	Blue illumination level meter display and TAPE display plate
58	P(X2)	Red illumination level meter display
59	P(S12)	NORMAL tape transcription limit display plate
60	P(S13)	CrO_2 tape transcription limit display plate
61	P(S14)	METAL tape transcription limit display plate
62	NP	–
63	NP	–
64	NP	–
65	3G	–
66	2G	–
67	1G	–
68	P(L7)	Lch –1 dB display plate
69	P(L8)	Lch 0 dB display plate
70	P(L9)	Lch +1 dB display plate
71	P(L10)	Lch +3 dB display plate
72	P(L11)	Lch +5 dB display plate
73	P(L12)	Lch +8 dB display plate
74	1G	–
75	P(S15)	TAPE display plate
76	P(S16)	SOURCE display plate
77	P(S17)	MONITOR display plate
78	P(Z3)	PAUSE/MUTE display plate
79	P(Z2)	REC display plate
80	P(Z1)	PLAY display plate
81	NP	–
82	1G	–
83	2G	–
84	NP	–
85	F	Filament
86	F	Filament

SCHEMATIC DIAGRAM OF CTS UNIT





1S2076
1N34A



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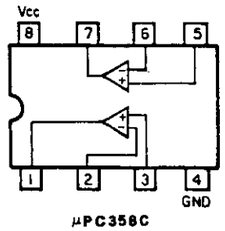
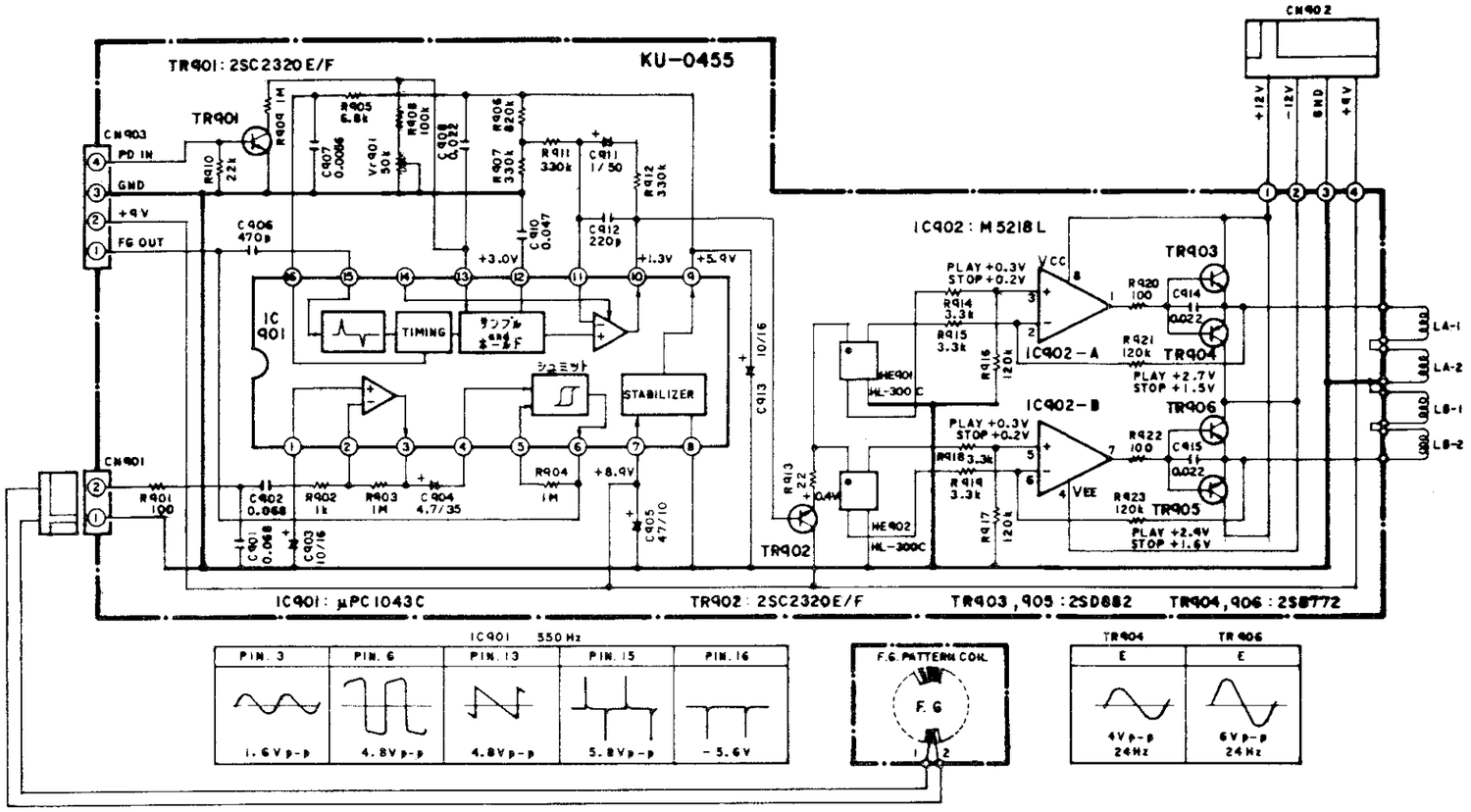
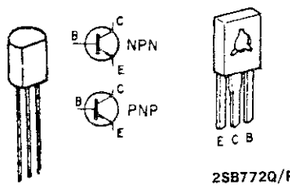


μPC358C
LA6458DS

Note:
- Resistance shall be 1/4W unless otherwise specified and the unit is Ω.
- The unit of capacitor is μF, P is pF unless otherwise specified.
- This circuit diagram shows the basic circuit. It is subject to change for the purpose of improvement.

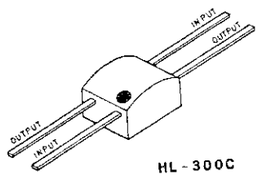
SCHEMATIC DIAGRAM OF CAPSTAN SERVO UNIT



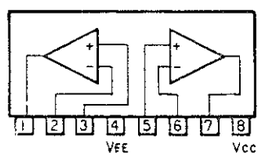


2SC2320E/F

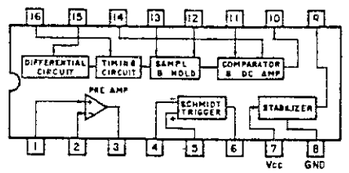
2SB772Q/P
2SD882Q/P



HL-300C



M5218L

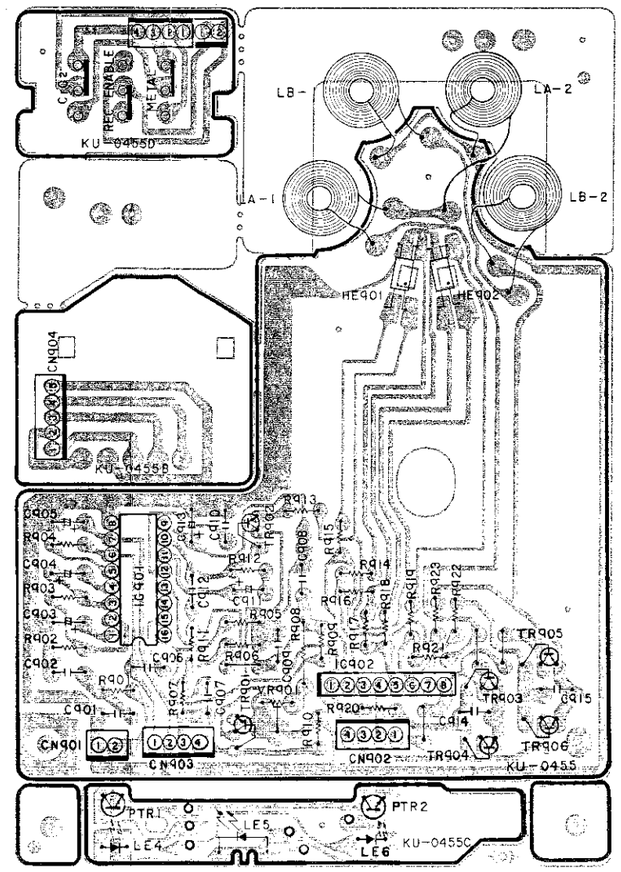


μPC1043C

Note:
- Resistance shall be 1/4W unless otherwise specified and the unit is Ω.
- The unit of capacitor is μF, P is pF unless otherwise specified.
- This circuit diagram shows the basic circuit. It is subject to change for the purpose of improvement.

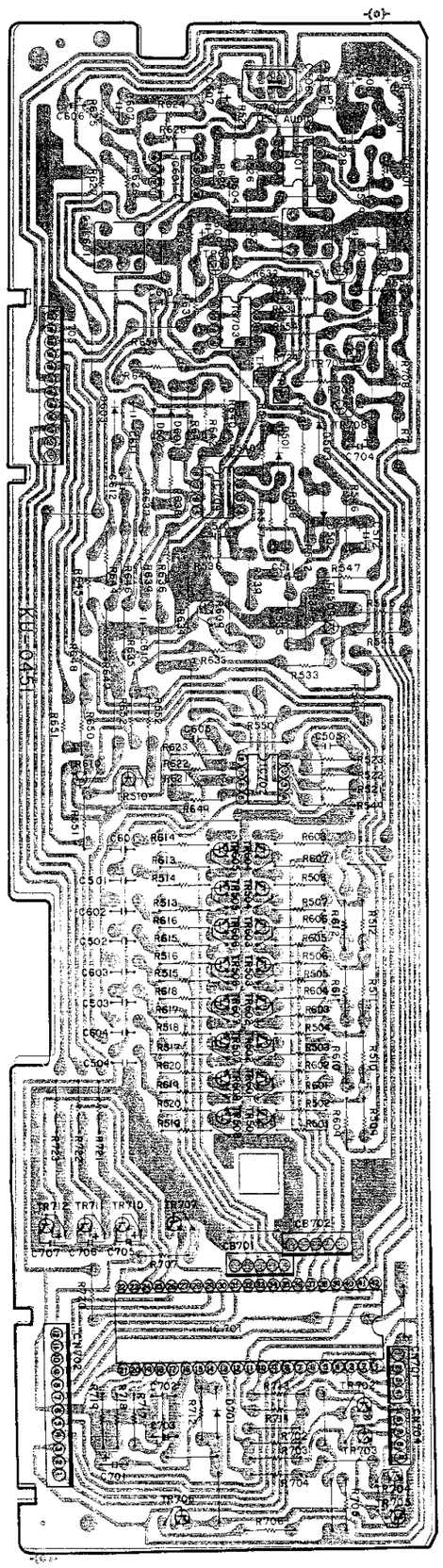
P.W. BOARD

KU-0455-1 CAPSTAN SERVO UNIT



P.W. BOARD

KU-0451-1 CTS UNIT



ACCESSORIES GROUP

Ref. No.	Part No.	Part Name	Remarks
	2032101001	2P CONNECTOR CORD	
	5118276006	INS. MANUAL	
	5118274105	INS. MANUAL	EU only
	2033667007	PLUG ADAPTER	E1 only

CARTON CASE GROUP

Ref. No.	Part No.	Part Name	Remarks
	5018291042	CARTON CASE	DR-M33
	5018308045	CARTON CASE	DR-M33 EA only
	5038054007	PACKING	
	5038049009	SUB PACKING	EA only
	5018291055	CARTON CASE	DR-M44
	5018346007	CARTON CASE	EA only
	5018298016	CARTON CASE	E1, EU only
	5038054007	PACKING	
	5038048107	PACKING	E1, EA, EU only
	5038049009	SUB PACKING	EA only
	5058006048	ENVELOPE	

Remarks symbols in the parts list refer to the following countries and areas.

EA: Australia
EK: United Kingdom
EU: U.S.A.
E1 : Multiple voltage model
E2 : European continent
EF : French
EG: German
EC: Canada

KU-5100 MECHANISM P.W.B UNIT

Ref. No.	Part No.	Part Name	Remarks
OTHER PARTS GROUP			
	2031638054	2P E1 CON WITH WIRE	
	2035691000	3P E1 CON WITH WIRE	
	2050185067	6P WIRE HOLDER	
	2129201005	SLIDE SWITCH	
	3939178000	LN25RCP	
	3939026000	PN150	
	2041630026	5P EI CON WITH WIRE	
	2123331201	ROTARY ENCORDER	

• The carbon resistors rated at ¼W are not listed herein.

KU-0455-1 CAPSTAN SERVO UNIT

Ref. No.	Part No.	Part Name	Remarks
SEMICONDUCTOR GROUP			
IC901	2630224005	μPC1043C	
IC902	2630189001	M5218L	
TR904,906	2720055029	2SB772Q/P	
TR901,902	2730204035	2SC2320E/F	
TR902,905	2740078031	2SD882Q/P	
HE901,902	2760303016	HL-300C	
RESISTOR GROUP			
R908	2452231001	RN14K2E104G	Metal film 100KΩ
VR901	2116020011	K08Q06MB503	Variable resistor 50KΩB
CAPACITOR GROUP			
C906	2533643000	CC45SL1H471J	470PF 50V
C910	2539013003	CK45=1E473M	0.047μF 25V
C901,902	2539014002	CK45=1E683M	0.068μF 25V
C912	2531055056	CK45B1H221K	220PF 50V
C905	2544129005	CE04W1A470=	Electrolytic 47μF 10V
C903,913	2544132005	CE04W1C100=	10μF 16V
C904	2544140000	CE04W1V4R7=	4.7μF 35V
C911	2544146004	CE04W1H010=	1μF 50V
C907	2551069006	CQ93M1H562K	Film 0.0056μF 50V
C914,915	2551076002	CQ93M1H223K	0.022μF 50V
C908	2554194046	CQ93P1H223J	0.022μF 50V
OTHER PARTS GROUP			
CN901	2032075001	2P CONNECTOR BASE	
CN902	2031639008	4P EI CON WITH WIRE	
CN903	2035622024	4P MINI CONN. PIN	
CN904	2041630000	5P EI CON WITH WIRE	KU-0455B
CN905	2041632008	6P EI CONNE WIRE	KU-0455C
LE4, 6	3939178000	LN25RCP	〃
PTR1,2	3939026000	PN150	〃
CN906	2031638038	2P EI CON WITH WIRE	KU-0455D
CN907	2031639024	4P EI CON WITH WIRE	〃

• The carbon resistors rated at ¼W are not listed herein.