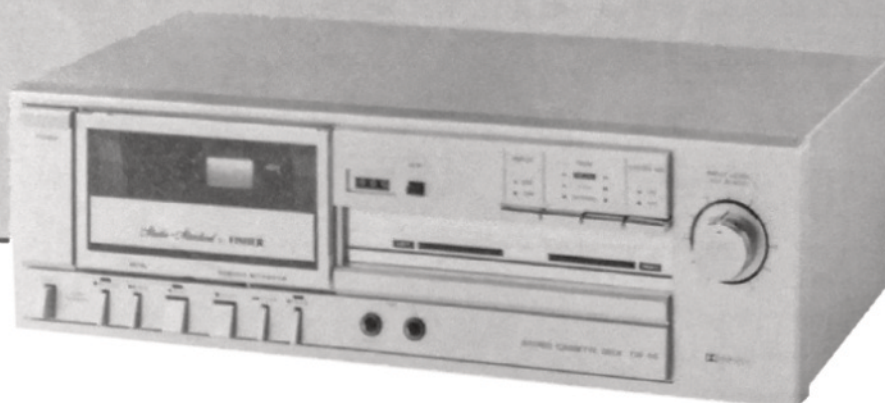


SERVICE MANUAL

FISHER

CR-115

Stereo Cassette Deck
(EUROPE)

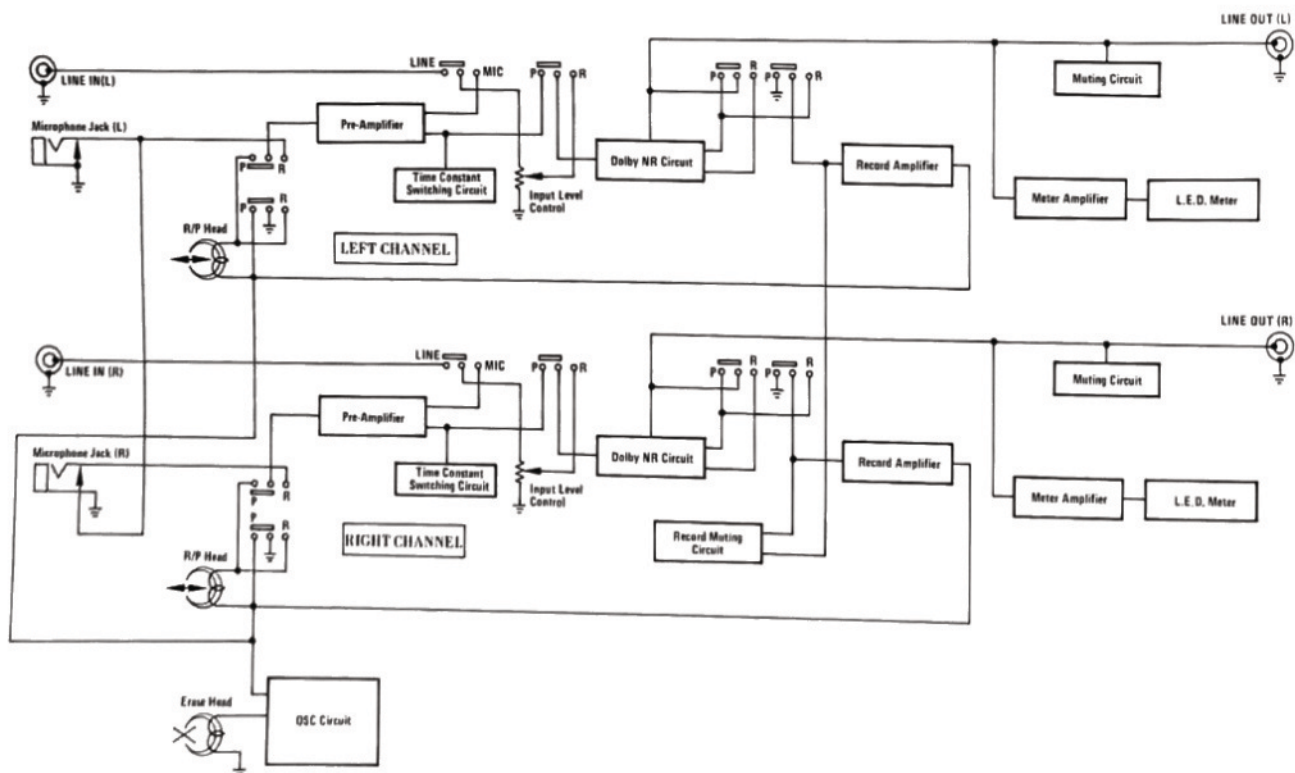


The first name in high fidelity

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FUNCTIONAL BLOCK DIAGRAM



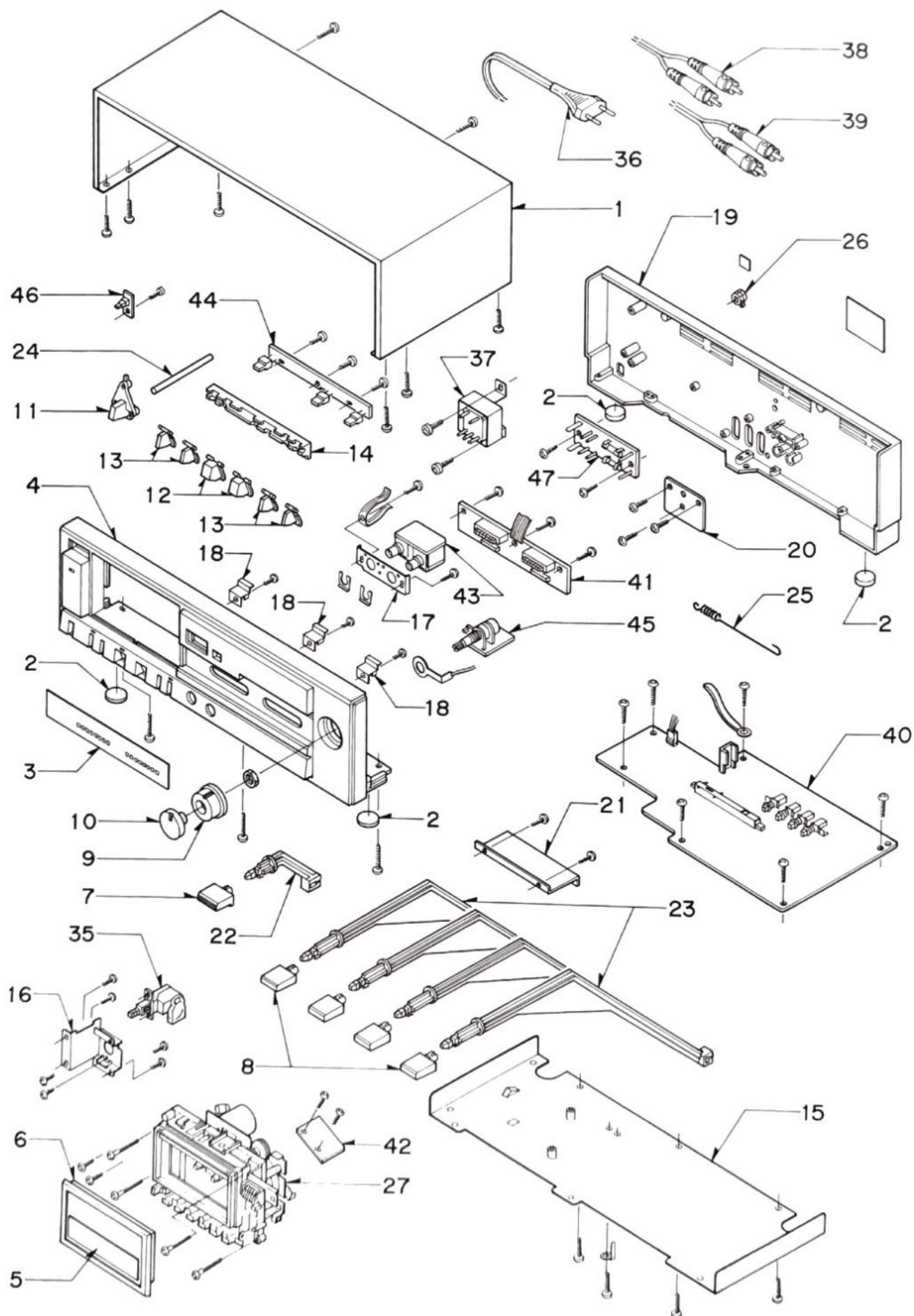
SPECIFICATIONS

CASSETTE DECK	CR-115
Motor	DC Governor
Cassette Loading	Front
Drive System	1 Capstan
Number of Heads	2
Head Material	Hard Permalloy/Ferrite
Operation	Powered Mechanism
Wow & Flutter	0.06 % WRMS
Signal-to-Noise Ratio (CCIR Weighted)	
Dolby* Off	52 dB
Dolby* On	60 dB
Erase Ratio	70 dB
Channel Separation	40 dB
Signal Crosstalk	70 dB
Frequency Response	
Normal Tape (± 3 dB)	30 Hz – 14 kHz
CrO ₂ Equivalent Tape (± 3 dB)	30 Hz – 15 kHz
Metal Tape (± 3 dB)	30 Hz – 15 kHz
Total Harmonic Distortion	
at 0 VU	1.5 %
Fast Forward/Rewind Time	
(C-60)	100 sec.
Level Indicators	2 L.E.D. Meters
Inputs (Sensitivity/Impedance)	Microphone 1.0 mV/10 k Ω Line 70 mV/50 k Ω
Output (Level at 0 VU/Impedance)	Line 500 mV/5 k Ω
Tape Select Buttons	Normal, CrO ₂ , Metal
Tape Counter	Mechanical
Power Requirements	220 V AC, 50 Hz
Power Consumption	8 W
Dimensions (W x H x D)	402 x 120 x 211 mm
Weight (approx.)	3.2 kg

***Dolby is registered trademark of Dolby Laboratories.**

Because its products are subject to continuous improvement, Fisher Corporation reserves the right to modify product designs and specifications without notice and without incurring any obligation.

CABINET & CHASSIS EXPLODED VIEW



PARTS LIST

PACKING PARTS LIST

Ref. No.	Parts Number	Description
	131 6 1169 03000	Box Corrugate-EXP
	131 6 2119 02131	Bag Polyethylene-EXP
	131 6 3009 33080	Pad (Right)
	131 6 3009 33090	Pad (Left)

ACCESSORIES PARTS LIST

Ref. No.	Parts Number	Description
	131 6 2719 10801	Bag Fan
	131 6 4169 00700	Explanatory Booklet
	131 6 4519 15700	Guarantee Certificate

CABINET PARTS LIST

Ref. No.	Parts Number	Description
1	131 2 1410 27500	Cover
2	131 2 1801 16200	Leg

APPEARANCE PARTS LIST

Ref. No.	Parts Number	Description
3	131 2 1201 37900	Plate Dial
4	131 2 1203 55400	Panel Control
5	131 2 1107 24500	Lid Cassette (Clear)
6	131 2 1107 24600	Lid Cassette (Base)
7	131 2 1601 78600	Knob (Power)
8	131 2 1601 78700	Knob (Push)
9	131 2 1601 79000	Knob (Input)
10	131 2 1601 79100	Knob (Input)
11	131 2 1601 79400	Knob (Eject)
12	131 2 1601 79500	Knob (Cassette L)
13	131 2 1601 79600	Knob (Cassette S)
14	141 2 3529 29200	Holder Knob Select

CHASSIS PARTS LIST

Ref. No.	Parts Number	Description
15	131 2 1105 28800	Plate Bottom
16	* 131 2 3101 82100	Metal Mount (Switch)
17	* 131 2 3101 82200	Metal Mount (Mic)
18	* 131 2 3101 84500	Metal Mount (Cover)
19	* 131 2 3306 35200	Panel Rear
20	* 131 2 3310 17100	Metal Support
21	* 131 2 3310 17400	Metal Support
22	131 2 4219 15700	Shaft (Power)
23	131 2 4219 15800	Shaft (Function)
24	131 2 4219 16300	Shaft (Eject)
25	131 2 5101 21400	Spring (Record)
26	131 2 6111 21300	Bushing (SR-4P-4)
27	4 1412 00050	Cassette Deck Unit

ELECTRICAL PARTS LIST

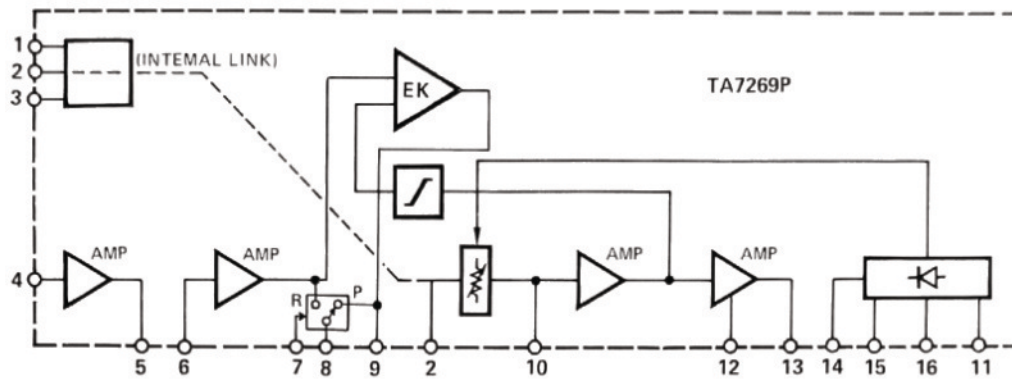
Ref. No.	Parts Number	Description
35	△ 4 2312 05060	Switch Push Power
36	△ 4 2432 00070	Line Cord
37	△ 4 2512 18320	Power Transformer
38	131 0 4004 15103	Wire Shield Assy
39	131 0 4004 15104	Wire Shield Assy
40	* 131 0 4001 09270	Cassette Amp P.C.B. Assy
41	* 131 0 4001 09280	Meter P.C.B. Assy
42	* 131 0 4001 09290	Control P.C.B. Assy
43	* 131 0 4001 09300	Mic P.C.B. Assy
44	* 131 0 4001 09310	Indicator P.C.B. Assy
45	* 131 0 4001 09320	Volume P.C.B. Assy
46	* 131 0 4001 09330	Power Ind. P.C.B. Assy
47	* 131 0 4001 09610	Fuse P.C.B. Assy
C01	△ C2GYDP103A-S	Ceramic 0.01 μ F 400V +100,-0%
D101	DOO-SLP-151B	L.E.D., SLP-151B (Red)
D102	DOO-SLP-251B	L.E.D., SLP-251B (Green)
D103	DOO-SLP-151B	L.E.D., SLP-151B (Red)

*—Not a service part.

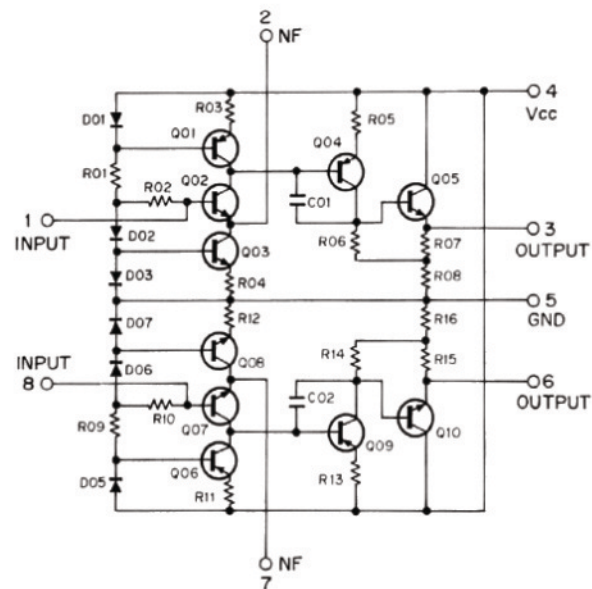
PRODUCT SAFETY NOTICE

PRODUCT SAFETY SHOULD BE CONSIDERED WHEN A COMPONENT REPLACEMENT IS MADE IN ANY AREA OF AN UNIT. COMPONENTS INDICATED BY A MARK △ IN THIS PARTS LIST AND THE SCHEMATIC DIAGRAM SHOW COMPONENTS WHOSE VALUE HAS SPECIAL SIGNIFICANCE TO PRODUCT SAFETY. IT IS PARTICULARLY RECOMMENDED THAT ONLY PARTS SPECIFIED ON THE FOLLOWING PARTS LIST BE USED FOR COMPONENT REPLACEMENT POINTED OUT BY THE MARK.

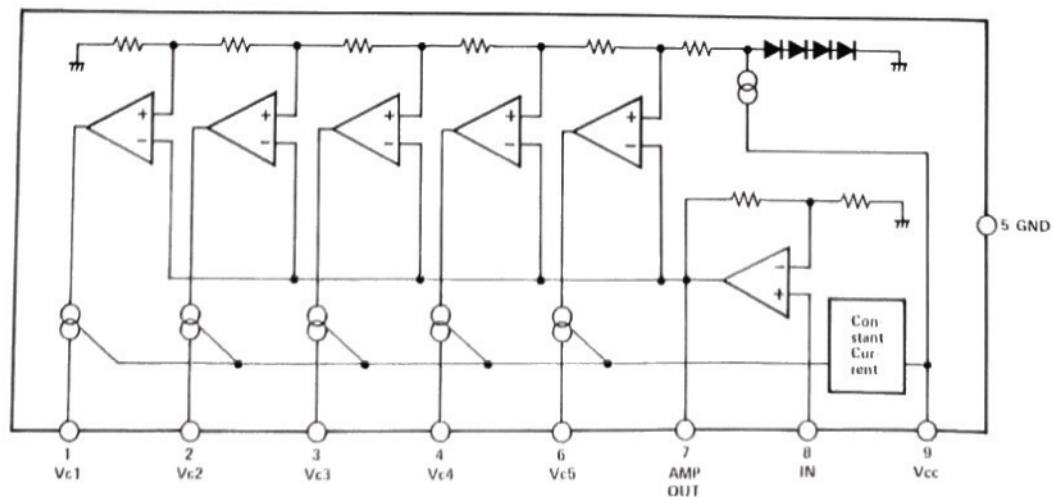
DOLBY IC TA7629P SIGNAL FLOW



R/P AMP IC LA3160 EQUIVALENT CIRCUIT



LEVEL METER IC BA6137 SIGNAL FLOW



CASSETTE DECK ELECTRICAL ADJUSTMENT

CLEANING AND DEMAGNITIZATION OF THE HEAD

If the tape-contacting surfaces of the parts such as the head, the capstan and the pinch roller are dirty, it results to irregular tape running, imperfect recording and erasing, tone deterioration, and the curling of the tape at the capstan.

● Cleaning Method

1. Remove the Cassette Lid. (Fig. 1)
2. Wipe the head, the capstan, and the pinch roller clean with a cleaning cotton swab. If they are extremely dirty, use a cotton swab moistened in absolute alcohol or cleaning liquid.
3. Insert the head cover.

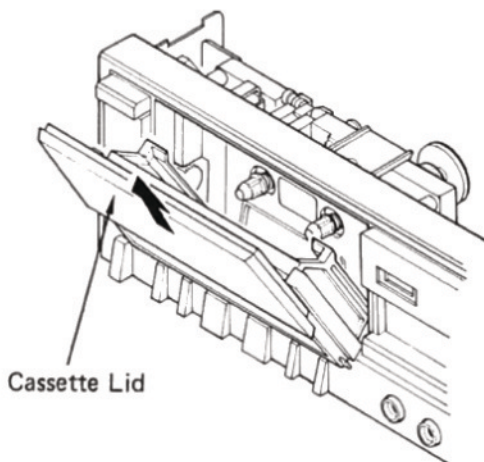


Fig. 1

Pull out the Cassette Lid in the direction of the arrow.

● Head Demagnetization

The head is magnetized after long usage and it results to noise and tone deterioration. Therefore, demagnetize the head with a demagnetizer. Be sure to turn off the power source.

TAPE SPEED ADJUSTMENT

Play back a 3 kHz test tape (Example: TEAC MTT-111 or its equivalent) and adjust the speed adjusting volume inside the motor to obtain the playback frequency of 3000 – 3090 Hz.(Fig. 2)

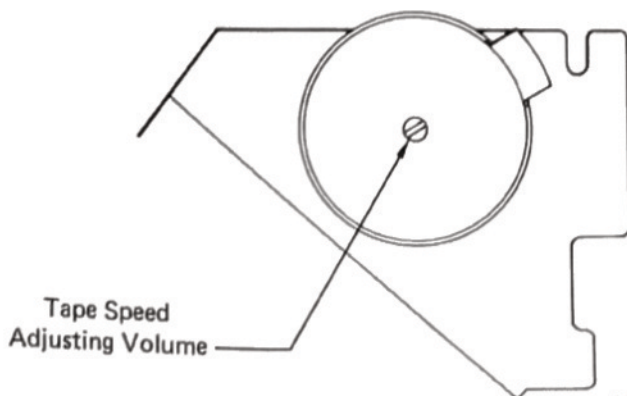


Fig. 2

HEAD AZIMUTH ADJUSTMENT

1. Play back the test tape (Example: TEAC MTT-115C 10 kHz/333 Hz) to adjust the head azimuth. Observe the output wave forms of the LEFT and RIGHT channels. First of all, play back the 10 kHz signal. Turn the azimuth adjusting screw for the R/P Head until the phase of the Left and Right channels becomes identical and their output levels are maximized. Then, play back the 333 Hz signal and check to see that the phase is identical to the phase of the 10 kHz signal. If necessary, repeat the adjustment. (Fig. 3,4)

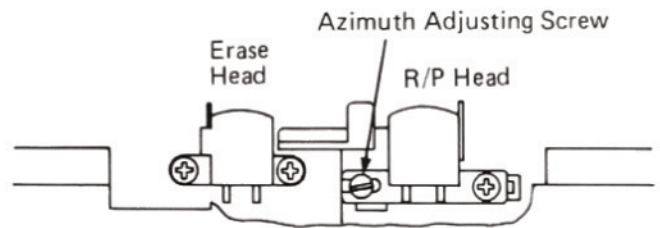
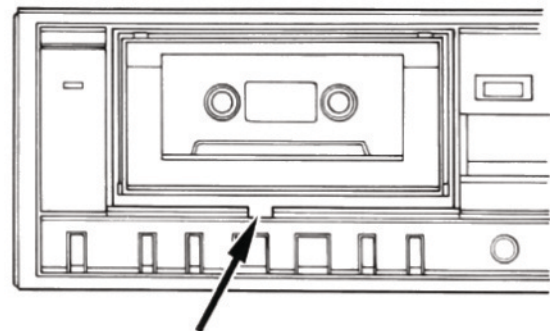


Fig. 3



Azimuth Adjusting Hole

Insert a screwdriver into this hole and perform the adjustment.

Fig. 4

CASSETTE DECK ELECTRICAL ADJUSTMENT (Continued)

PLAYBACK GAIN ADJUSTMENT

1. Set the Dolby Switch to "OFF", and the Tape Select Switch to "NORMAL".
2. Play back the test tape (TEAC MTT-150) and connect the AC VTVM to TP1. Then, adjust VR05 until the voltage becomes 580 mV.

Connect the AC VTVM to TP2 and adjust VR201 until the voltage becomes 580 mV.

BIAS FREQUENCY ADJUSTMENT

1. Set the unit in the recording mode.
2. Turn the core of the OSC Coil until the bias frequency becomes 85 kHz. (TP23)

BIAS CURRENT ADJUSTMENT

1. Set the Tape Select Switch to "METAL".
2. Set the unit in the recording mode.
3. Connect the AC VTVM to TP4 and adjust VR104 until the voltage becomes 8.0 mV.
4. Adjust VR204 to obtain 8.0 mV at TP9 in the same manner as in Item 3.

LEVEL METER ADJUSTMENT

1. Feed the 400 Hz signal through LINE IN Jack at the level so as to obtain 490 mV at TZ1 and TP2.
2. Adjust VR103 and VR203, so that the fourth LEDs for the right and left meters light dimly.

RECORDING CURRENT ADJUSTMENT

1. Set the Tape Select Switch to "METAL".
2. Short TP23 and the ground.
3. Set the unit in the recording mode.
4. Feed the 400 Hz signal through LINE IN Jack at the level so as to obtain 580 mV at TP1 and TP2.
5. Connect the AC VTVM to TP4 and adjust VR102, so that 0.85 mV is obtained at TP4.
6. Adjust VR202 to obtain 0.85 mV at TP9 in the same manner as in Item 5.

FREQUENCY ADJUSTMENT

1. Set the DOLBY Switch to "OFF" and the Tape Select Switch to "NORMAL".
2. Set the unit in the recording mode.
3. Feed the signals of 250 Hz, 1 kHz, and 12.5 kHz through LINE IN Jack at the level so as to obtain 32 mV at TP1 and TP2. Then, record the signals on the tape.
4. Set the unit in the playback mode and check that each output relative to 1 kHz, 0 dB is $250 \text{ Hz} \pm 1.5 \text{ dB}$ and $12.5 \text{ kHz} \pm 2.5 \text{ dB}$.
5. Perform the above checking with the DOLBY Switch "ON".
6. When the above specified recording and playback frequency characteristic response is not obtained, adjust VR104 and VR204 to obtain the specified values ($250 \text{ Hz} \pm 1.5 \text{ dB}$ and $12.5 \text{ kHz} \pm 2.5 \text{ dB}$).

CASSETTE AMP P.C.BOARD ALIGNMENT POINTS (TOP VIEW)



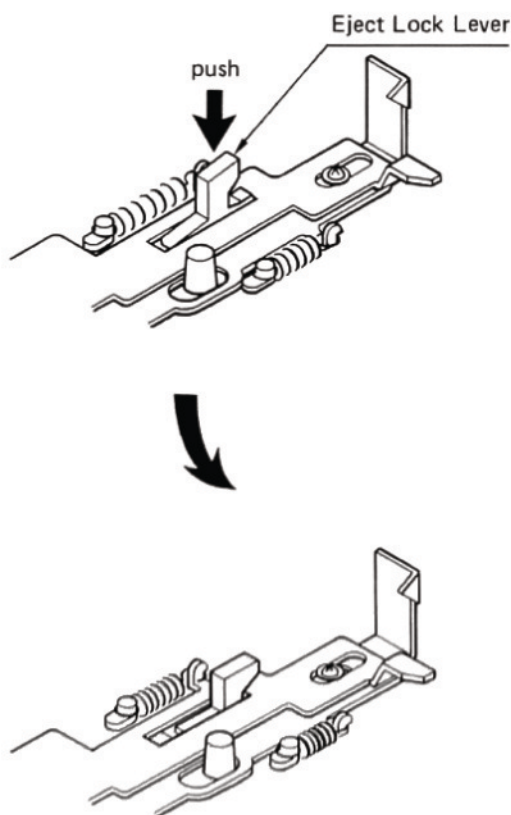
CASSETTE DECK MECHANICAL ADJUSTMENT

EQUIPMENT REQUIRED

- Cassette-type Torquemeter (100g-cm/160g-cm)
- Silicone Grease (SHIN-ETSU SILICONE: KS-64)
- Round-nose Pliers
- Plus Screwdriver
- Paint or glue

GENERAL REMARKS

- Before adjusting the mechanism of the unit, clean the tape contacting surfaces with a soft cloth soaked in alcohol. Trouble may occur because of oil and grease stains.
- The belts must be kept clean while an adjustment or repair work is performed.
Silicone grease (SHINE-ETSU SILICONE KS-64) is applied to the Wind Belt to protect it from abrasion.
- Silicone grease is not applied to the wind belt for servicing.
- If the Pinch Roller or belt has quality deterioration such as scratches, replace it with a new one.
- This mechanism does not function when power is not supplied and any one of the buttons is pressed.
- The mechanism stops functioning soon when the cassette holder is opened and one of the select buttons (except for the Pause button) is pressed because the Eject Plate and the Lock Plate are locked by the Eject Lock Lever. If the mechanism is required to function under this condition, push the Eject Lock Lever as illustrated, so that the Lever is released and the mechanism functions



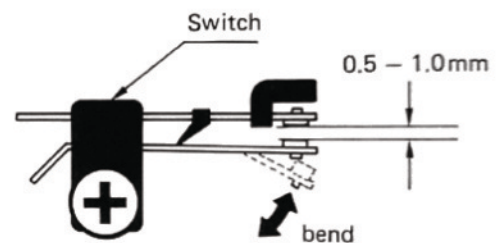
Position Adjustment of Leaf Switches

This model has the following four leaf switches. Checking and adjustment for each switch shall be conducted in accordance with each adjusting items. The unit should be set in the stop mode at each adjustment.

- * Trigger Switch
- * Motor Switch
- * Muting Switch
- * Pause Switch

NOTE:

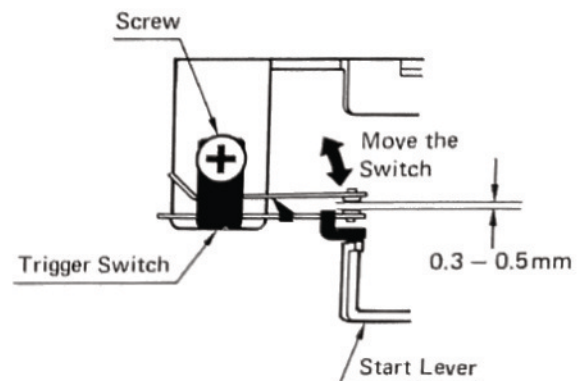
The clearance of the switch contacts should be 0.5 – 1.0mm when the switch is not mounted on the unit. If not, adjust the clearance by carefully bending the contacts.



1. Trigger Switch

This switch works as a trigger to make the mechanism function. When one of the select buttons (except for the Record button) is pressed, the trigger switch is turned on by the Start Lever, so that the Motor starts rotating. After that, this switch is turned off when the mechanism has completely finished its function.

- * Check that the clearance of the switch contacts is 0.3 – 0.5mm with the Motor Start Switch in contact with the Start Lever as illustrated.

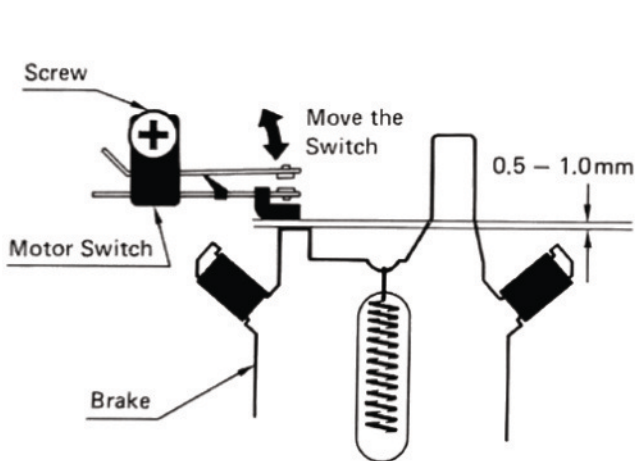


CASSETTE DECK MECHANICAL ADJUSTMENT (Continued)

2. Motor Switch

This switch is connected in parallel to the Trigger Switch. The driving motor rotates the Flywheel and the rotational force transferred by the Actuate Gear makes the mechanism function. Then, the motor switch is turned on by the brake.

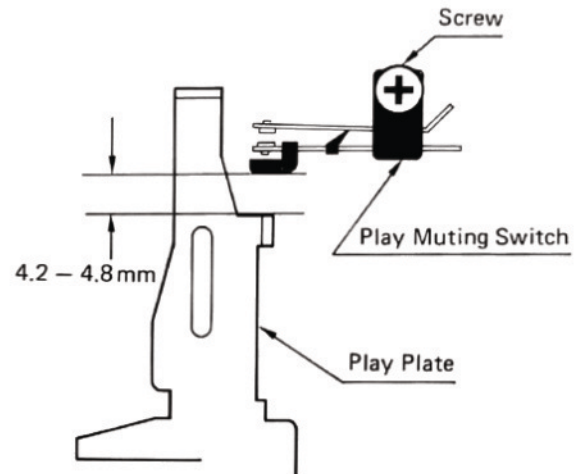
- * Check that the clearance between the Motor Switch and the Brake is 0.5 – 1.0mm as illustrated.



4. Muting Switch

This switch is turned on by the Play Plate when the unit is set in the recording or playback mode, and it turns off the muting circuit.

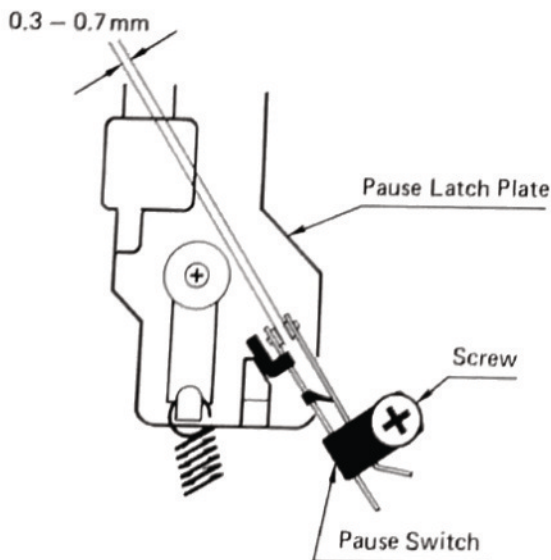
- * Check that the clearance between the Play Muting Switch and the Play Plate is 4.2 – 4.8mm as illustrated.



3. Pause Switch

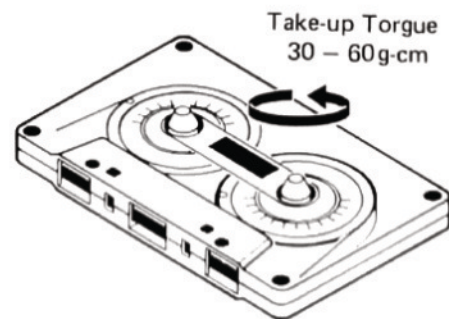
This switch is used to light the LED which indicates the pause mode and is turned on or off by the Pause Latch Plate when the Pause button is pressed.

- * Check that the clearance of the switch contacts is 0.3 – 0.7mm with the Pause Switch in contact with the Pause Latch Plate as illustrated.



Take-up Torque

1. Insert a cassette-type torquemeter (100g-cm) into the cassette compartment and set the unit in the playback mode. Then, check that the take-up torque is 30 – 60g-cm.
2. If not, replace the Friction with a new one.

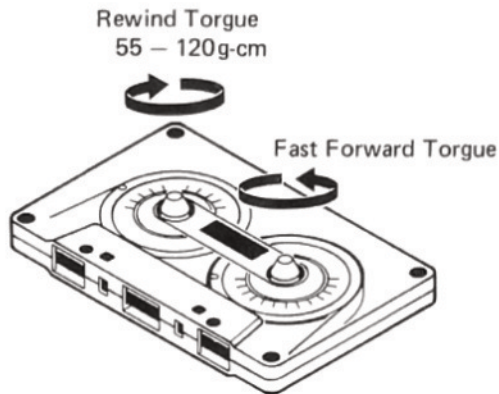


Cassette Type Torque Meter

CASSETTE DECK MECHANICAL ADJUSTMENT (Continued)

F.FWD and Rewind Torques

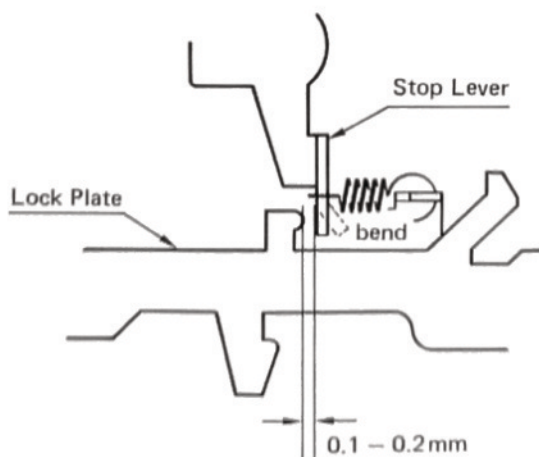
1. Insert a cassette-type torquemeter into the cassette compartment and measure the fast forward and rewind torques. Check that each torque is 55 – 120g-cm.



2. If more than the specified torque is obtained, apply a little amount of silicone grease (Example: KS-64) into the groove of the belt engaged in the Fast Wind Gear, rotate the Fast Wind Gear, and apply silicone grease to the Wind Belt.
3. If less than the specified torque is obtained, replace the Wind Belt with a new one and apply a little amount of silicone grease (Example: KS-64) to the Wind Belt in the same manner as in item 2.

Multifunction of Automatic Shut-off Mechanism

1. If the unit is set in the stop mode while the tape is running, check that the clearance between the Stop Lever and the Lock Plate is 0.1 – 0.2mm as illustrated.
2. If necessary, adjust the clearance by bending the Stop Lever as illustrated.

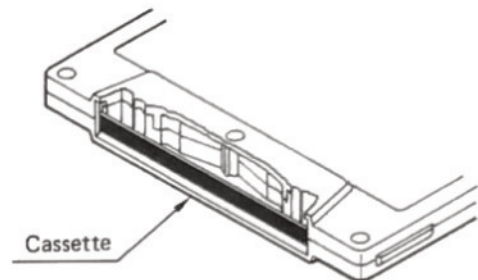


3. When the unit still malfunctions after the above adjustment, replace the Take-up Reel with a new one.

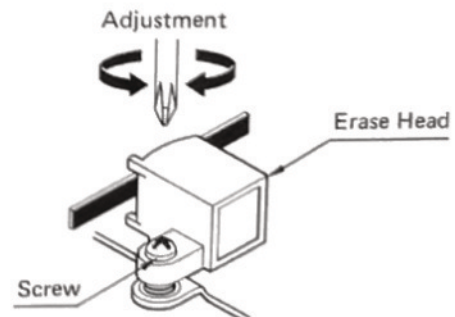
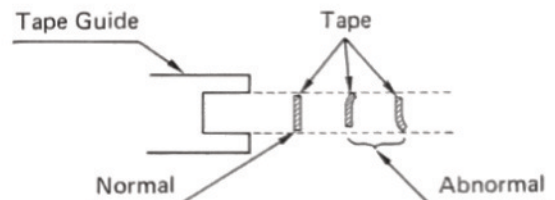
Tape Running Condition Adjustment

Whenever the Erase Head has been removed or replaced, perform the tape running condition adjustment as follows:

1. Cut the cassette half (Example: TDK C-120) as illustrated and use it for the adjustment.



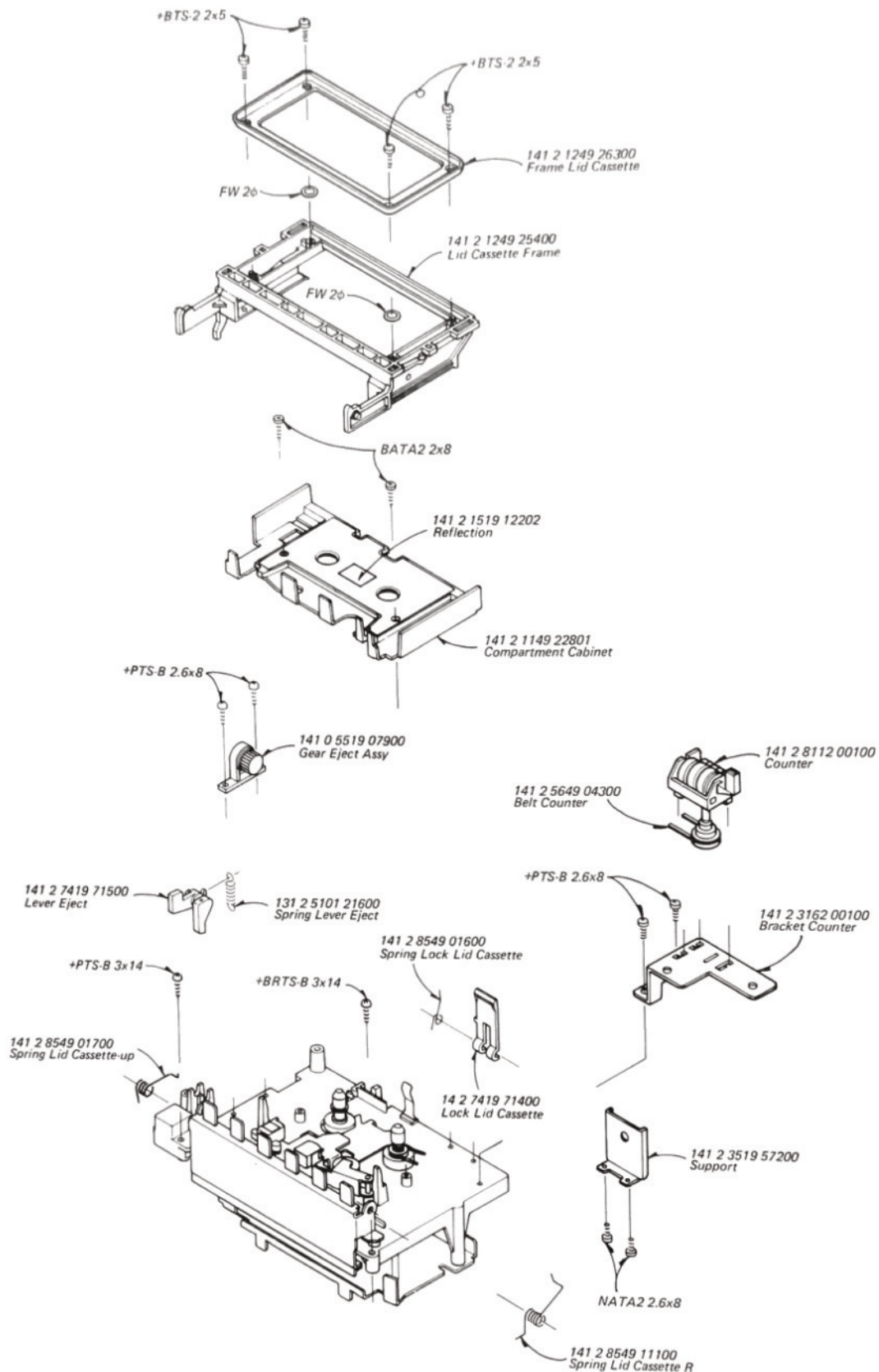
2. Insert the cassette half into the cassette compartment. Then, turn the adjusting screw while the tape is running, so that the tape does not curl along the Tape Guide of the Erase Head as illustrated.



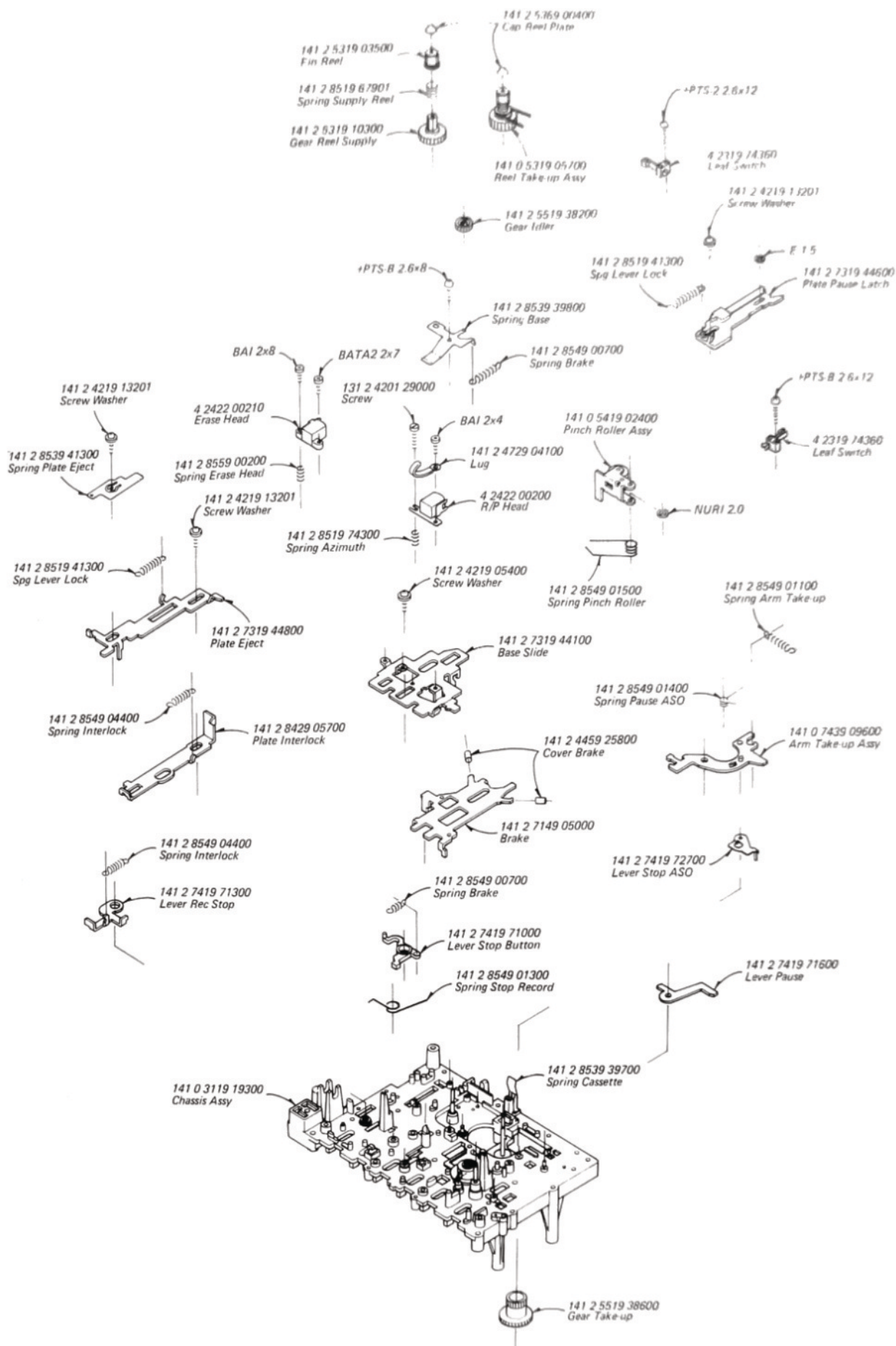
3. If necessary, adjust the screw until the tape is exactly centered in the Tape Guide of the Erase Head.
4. After the adjustment, secure the adjusting screw with paint or glue.

CASSETTE DECK EXPLODED VIEW

(TOP VIEW 2 - 1)

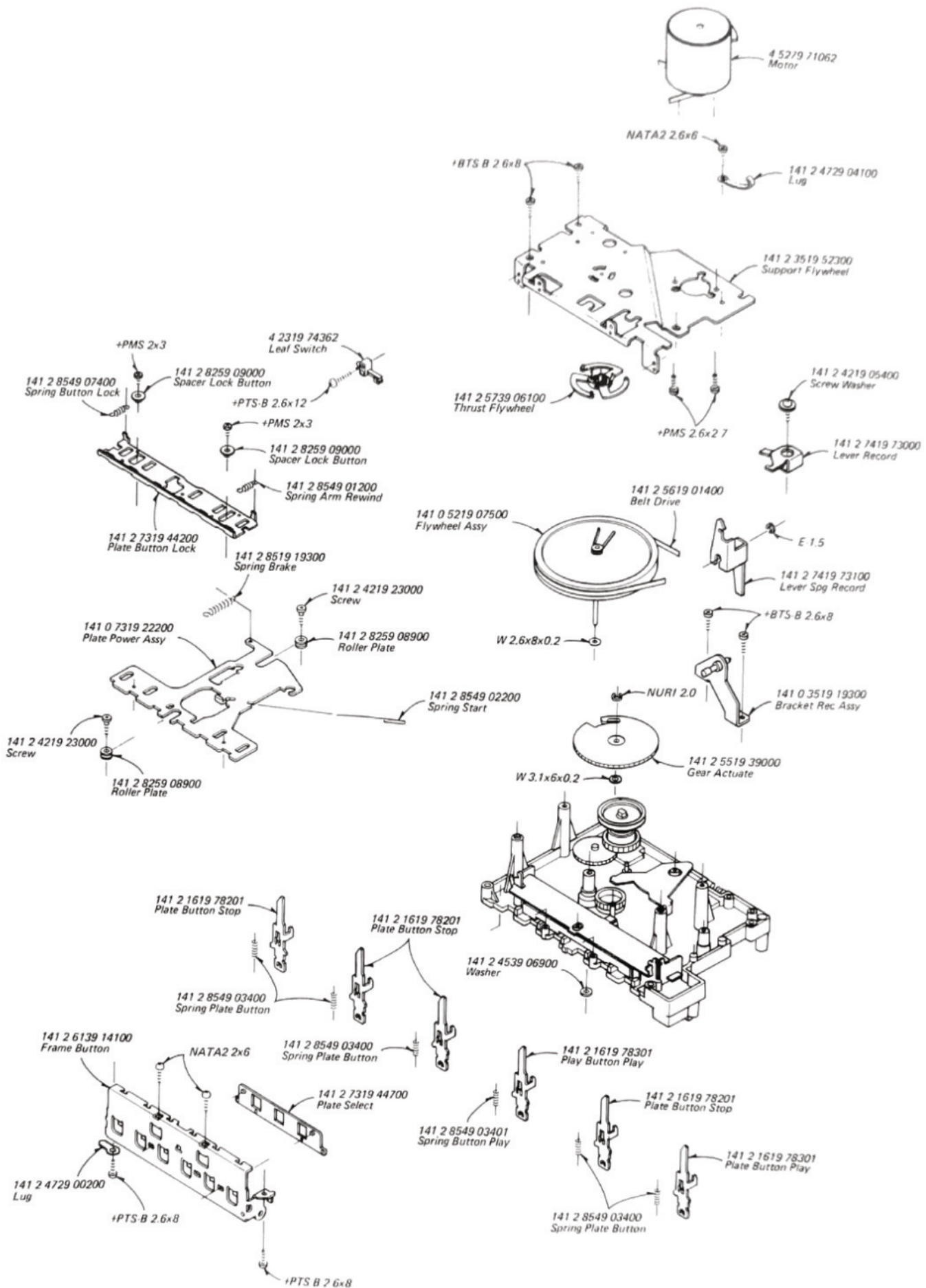


CASSETTE DECK EXPLODED VIEW (Continued)
(TOP VIEW 2 - 2)

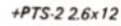


CASSETTE DECK EXPLODED VIEW (Continued)

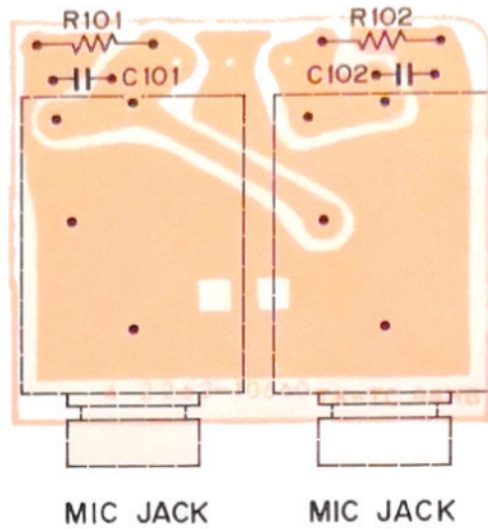
(BOTTOM VIEW 2 - 1)



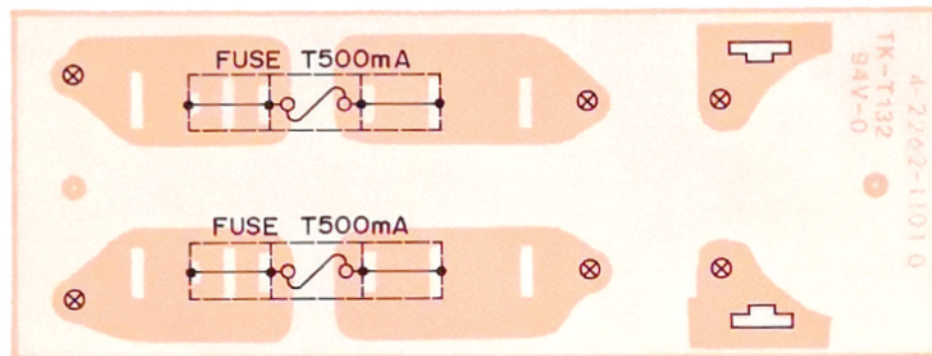
(BOTTOM VIEW 2 - 2)



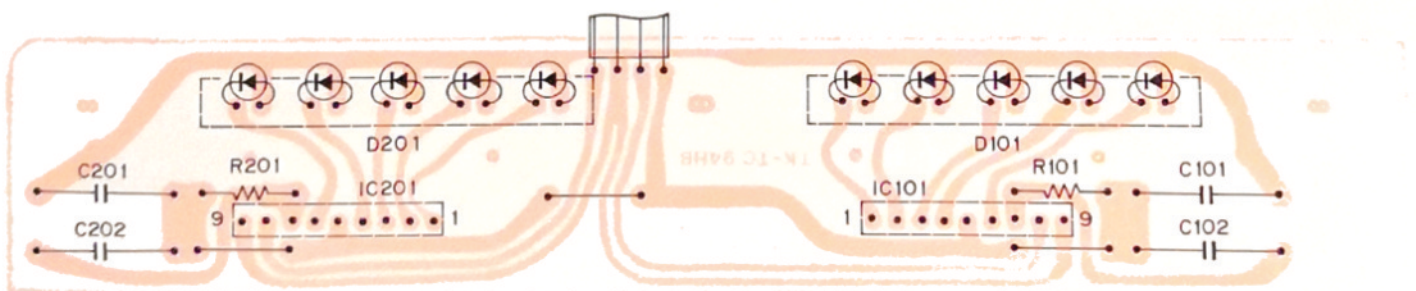
MIC P.C.BOARD (BOTTOM VIEW)



FUSE P.C.BOARD (BOTTOM VIEW)

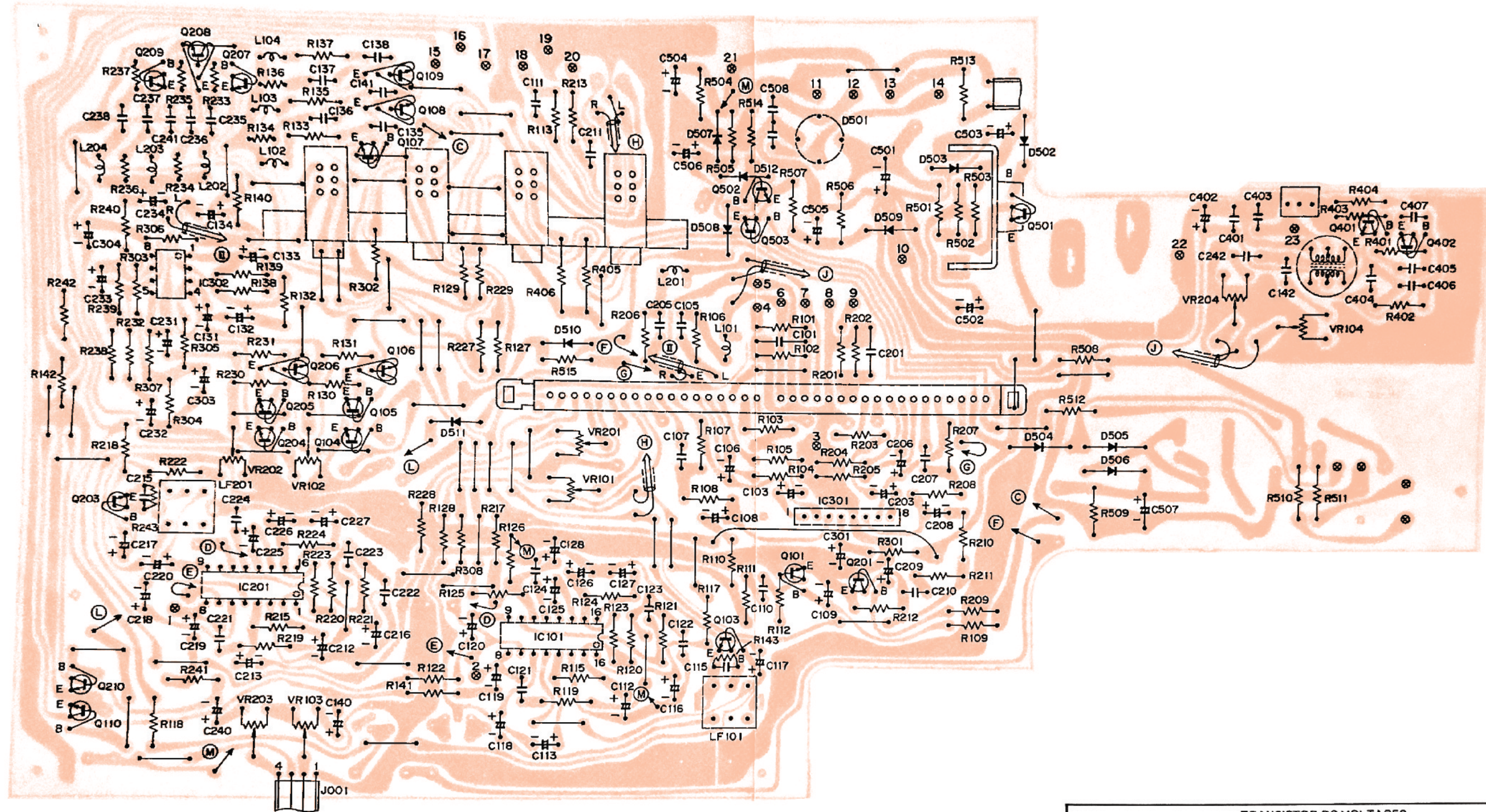


METER P.C.BOARD (BOTTOM VIEW)



CASSETTE AMP P.C.BOARD

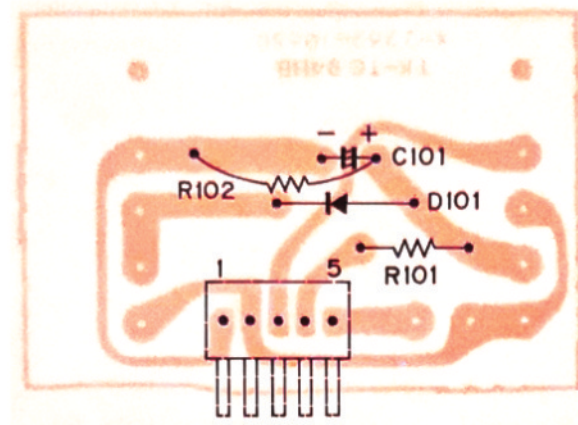
(BOTTOM VIEW)



IC PIN NUMBERS VOLTAGES																	
SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
IC101,201	TA7629	11.3V	5.6V	0V	5.6V	5.5V	5.7V	9.3V	5.7V	5.7V	5.7V	9.9V	5.6V	5.6V	6.1V	0V	0V
IC301	LA3160	—	—	—	12.5V	—	0V	—	—	—	—	—	—	—	—	—	—
IC302	NJM4558	—	—	—	0V	—	—	—	13.5V	—	—	—	—	—	—	—	—

TRANSISTOR DC VOLTAGES									
SYMBOL No.	DEVICE	B	C	E	SYMBOL No.	DEVICE	B	C	E
Q101,201	2SC536	0V	0V	0V	Q109,209	2SC536	0V	0V	0V
Q103,203	2SC536	0V	0V	0V	Q110,210	2SD1012	0.6V	0V	0V
Q104,204	2SD1012	0.7V	0V	0V	Q401,402	2SC1815	0V	0V	0V
Q105,205	2SC536	0V	0V	0V	Q501	2SD330	14.9V	24.5V	14.3V
Q106,206	2SC536	0.7V	0V	0V	Q502	2SC1815	1.4V	1.9V	0.9V
Q107,207	2SC536	0.7V	0V	0V	Q503	2SC1815	0V	0.9V	0V
Q108,208	2SC536	0V	0V	0V					

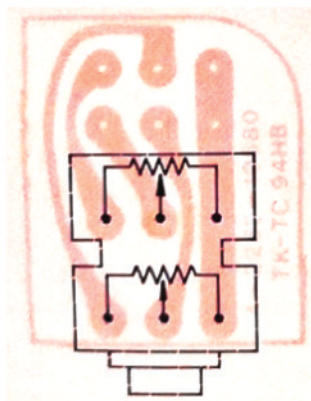
CONTROL P.C.BOARD (BOTTOM VIEW)



INDICATOR P.C.BOARD (BOTTOM VIEW)



VOLUME P.C.BOARD (BOTTOM VIEW)



INPUT LEVEL

50KA x 2

POWER IND. P.C.BOARD (BOTTOM VIEW)



PARTS LIST

CASSETTE AMP P.C.B. Assy
131 0 4001 09270

Ref. No.	Parts Number	Description
	4 2312 03380	Switch Push 4Key
	4 2312 03390	Switch Slide 12
	4 2362 00080	Plug 3P
	4 2362 00660	Pin 1P
	4 2582 00490	OSC Coil (85 kHz)
	131 0 4006 29700	Cord Assy
L101,201	4 2552 00630	AF Coil
L102,202	4 2552 00200	Coil
L103,104 203,204	4 2552 00610	AF Coil
LF101,201	4 2522 00170	AF Filter
VR101	4 2222 01010	VR 50k-B
VR102	4 2222 01400	VR 10k-B
VR103	4 2222 01400	VR 10k-B
VR104	4 2222 00960	VR 100k-B
VR201	4 2222 01010	VR 50k-B
VR202	4 2222 01400	VR 10k-B
VR203	4 2222 01400	VR 10k-B
VR204	4 2222 09600	VR 100k-B

CAPACITORS

C101,201	C1HCZK821BPA	Ceramic 820 pF 50V ±10%
C103,203	C1CRY-106APA	Electrolytic 10 μF 16V
C105,205	C1HFYK222APA	Mylar 0.0022 μF 50V ±10%
C106,206	C1CRE-107A	Electrolytic 100 μF 16V
C107,207	C1HFYK333APA	Mylar 0.033 μF 50V ±10%
C108,208	C1CRY-106APA	Electrolytic 10 μF 16V
C109,209	C1HRE-474A	Electrolytic 0.47 μF 50V
C110,210	C1HFYK153APA	Mylar 0.015 μF 50V ±10%
C111,211	C1HCYK101APA	Ceramic 100 pF 50V ±10%
C112,212	C1CRE-227A	Electrolytic 220 μF 16V
C113,213	C1HRY-105APA	Electrolytic 1 μF 50V
C115,215	C1HFYK272APA	Mylar 0.0027 μF 50V ±10%
C116,216	C1CRE-227A	Electrolytic 220 μF 16V
C117,217	C1HRY-474APA	Electrolytic 0.47 μF 50V
C118,218	C1CRY-106APA	Electrolytic 10 μF 16V
C119,219	C1CRY-475APA	Electrolytic 4.7 μF 16V
C120,220	C1CRY-106APA	Electrolytic 10 μF 16V
C121,221	C1HFYK562A	Mylar 0.0056 μF 50V ±10%
C122,222	C1HFYK273APA	Mylar 0.027 μF 50V ±10%
C123,223	C1HFRK472A	Mylar 0.0047 μF 50V ±10%
C124,224	C1HFRK473A	Mylar 0.047 μF 50V ±10%
C125,225	C1CRY-106APA	Electrolytic 10 μF 16V
C126,226	C1CUEX104A	Sint. Alu. 0.1 μF 16V +40,-20%
C127,227	C1CUYX334APA	Sint. Alu. 0.33 μF 16V +40,-20%
C128	C1CRY-476APA	Electrolytic 47 μF 16V
C131,231	C1ERE-475A	Electrolytic 4.7 μF 25V
C132,232	C1CRY-106APA	Electrolytic 10 μF 16V
C133,233	C1HRY-224LPA	Electrolytic 0.22 μF 50V
C134,234	C1CRY-106APA	Electrolytic 10 μF 16V
C135,235	C1HFYK123APA	Mylar 0.012 μF 50V ±10%
C136,236	C1HFRK183A	Mylar 0.018 μF 50V ±10%
C137,237	C1HFRJ333A	Mylar 0.033 μF 50V ±5%
C138,238	C1HFYK123APA	Mylar 0.012 μF 50V ±10%
C140,240	C1HRY-225APA	Electrolytic 2.2 μF 50V

Ref. No.	Parts Number	Description
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CAPACITORS

C141,241	C1HFYK153APA	Mylar 0.015 μF 50V ±10%
C142,242	C1HCYK221APA	Ceramic 220 pF 50V ±10%
C301	C1CRE-227A	Electrolytic 220 μF 16V
C303	C1ARY-226APA	Electrolytic 22 μF 10V
C304	C1CRE-476A	Electrolytic 47 μF 16V
C401	C1HFYK103APA	Mylar 0.01 μF 50V ±10%
C402	C1CRE-106A	Electrolytic 10 μF 16V
C403	C2ANRJ153N	Polypropylene 0.015 μF 100V ±5%
C404	C1HFYK223APA	Mylar 0.022 μF 50V ±10%
C405,406	C1HFYK332APA	Mylar 0.0033 μF 50V ±10%
C407	C1HFYK103APA	Mylar 0.01 μF 50V ±10%
C501	C1VRE-108A	Electrolytic 1000 μF 35V
C502	C1VRE-227A	Electrolytic 220 μF 35V
C503	C1CRY-106APA	Electrolytic 10 μF 16V
C504	C1CRY-107APA	Electrolytic 100 μF 16V
C505	C1CRY-106APA	Electrolytic 10 μF 16V
C506	C1ERE-107A	Electrolytic 100 μF 25V
C507	C1CRE-477A	Electrolytic 470 μF 16V
C508	Δ 4 2232 00430	Ceramic 0.01 μF x2 250V

SEMICONDUCTORS

D501	DGG-W02	Bridge Diode, W02
D502	205 5 9040 44210	Diode, DS-442
D503	202 5 3210 15020	Zener Diode, GZA15U
D504	202 5 2500 13541	Diode, DS135D
	505,506	
D507	205 5 9040 44210	Diode, DS-442
	508	
D509	202 5 3210 10020	Zener Diode, GZA10U
D510	205 5 9040 44210	Diode, DS-442
	511	
D512	202 5 3210 05120	Zener Diode, GZA5.1U
IC101	ITT-TA7629P	IC, TA7629P
	201	
IC301	206 5 0793 16010	IC, LA3160
IC302	IJJ-NJM4558DX	IC, NJM4558D
Q101,103	TTT-2SC1815-GR	TR 2SC1815GR
Q104	203 5 4921 01270	TR 2SD1012G
Q105,106	TTT-2SC1815-GR	TR 2SC1815GR
	107,108	
	109	
Q110	203 5 4921 01270	TR 2SD1012G
Q201,203	TTT-2SC1815-GR	TR 2SC1815GR
Q204	203 5 4921 01270	TR 2SD1012G
Q205,206	TTT-2SC1815-GR	TR 2SC1815GR
	207,208	
	209	
Q210	203 5 4921 01270	TR 2SD1012G
Q401,402	TTT-2SC1815-GR	TR 2SC1815 GR
Q501	203 5 8570 33050	TR 2SD330E
Q502,503	TTT-2SC1518-GR	TR 2SC1815 GR

PARTS LIST (Continued)

Ref. No.	Parts Number	Description
RESISTORS		
R101,201	R2EDZJ100APA	Carbon 10 1/4W ±5%
R102,202	R2EDZJ104APA	Carbon 100k 1/4W ±5%
R103,203	R2EDZJ102APA	Carbon 1k 1/4W ±5%
R104,204	R2EDZJ680APA	Carbon 68 1/4W ±5%
R105,205	R2EDZJ182APA	Carbon 1.8k 1/4W ±5%
R106,206	R2EDZJ682APA	Carbon 6.8k 1/4W ±5%
R107,207	R2EDZJ104APA	Carbon 100k 1/4W ±5%
R108,208	R2EDZJ332APA	Carbon 3.3k 1/4W ±5%
R109,209	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R110,210	R2EDZJ332APA	Carbon 3.3k 1/4W ±5%
R111,211	R2EDZJ392APA	Carbon 3.9k 1/4W ±5%
R112,212	R2EDZJ224APA	Carbon 220k 1/4W ±5%
R113,213	R2EDZJ393APA	Carbon 39k 1/4W ±5%
R115,215	R2EDZJ104APA	Carbon 100k 1/4W ±5%
R117,217	R2EDBJ221A	Carbon 220 1/4W ±5%
R118,218	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R119,219	R2EDZJ181APA	Carbon 180 1/4W ±5%
R120,220	R2EDZJ332APA	Carbon 3.3k 1/4W ±5%
R121,221	R2EDZJ473APA	Carbon 47k 1/4W ±5%
R122,222	R2EDZJ822APA	Carbon 8.2k 1/4W ±5%
R123,223	R2EDZJ154APA	Carbon 150k 1/4W ±5%
R124,224	R2EDZJ274APA	Carbon 270k 1/4W ±5%
R125	R2EDZJ273APA	Carbon 27k 1/4W ±5%
R126	R2EDZJ683APA	Carbon 68k 1/4W ±5%
R127,227	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R128,228	R2EDZJ102APA	Carbon 1k 1/4W ±5%
R129,229	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R130,230	R2EDZJ822APA	Carbon 8.2k 1/4W ±5%
R131,231	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R132,232	R2EDZJ222APA	Carbon 2.2k 1/4W ±5%
R133,233	R2EDZJ181APA	Carbon 180 1/4W ±5%
R134,234	R2EDUJ562A	Carbon 5.6k 1/4W ±5%
R135,235	R2EDZJ121APA	Carbon 120 1/4W ±5%
R136,236	R2EDUJ562A	Carbon 5.6k 1/4W ±5%
R137,237	R2EDUJ121A	Carbon 120 1/4W ±5%
R138,238	R2EDZJ153APA	Carbon 15k 1/4W ±5%
R139,239	R2EDZJ393APA	Carbon 39k 1/4W ±5%
R140,240	R2EDZJ122APA	Carbon 1.2k 1/4W ±5%
R141,241	R2EDZJ272APA	Carbon 2.7k 1/4W ±5%
R142,242	R2EDZJ104APA	Carbon 100k 1/4W ±5%
R143,243	R2EDUJ224A	Carbon 220k 1/4W ±5%
R301	R2EDBJ391A	Carbon 390 1/4W ±5%
R302	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R303	R2EDZJ822APA	Carbon 8.2k 1/4W ±5%
R304	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R305	R2EDZJ273APA	Carbon 27k 1/4W ±5%
R306	R2EDBJ221A	Carbon 220 1/4W ±5%
R307	R2EDZJ273APA	Carbon 27k 1/4W ±5%
R308	R2EDZJ222APA	Carbon 2.2k 1/4W ±5%
R401,402	R2EDZJ223APA	Carbon 22k 1/4W ±5%
R403,404	R2EDZJ100APA	Carbon 10 1/4W ±5%
R405,406	R2HXB221A	Oxide Metal Film 220 1/2W ±5%
R501	R2EDBJ3R3A	Carbon 3.3 1/4W ±5%
R502	R2EDZJ102APA	Carbon 1k 1/4W ±5%
R503	R2EDZJ331APA	Carbon 330 1/4W ±5%
R504	R2EDZJ152APA	Carbon 1.5k 1/4W ±5%
R505	R2EDZJ823APA	Carbon 82k 1/4W ±5%

Ref. No.	Parts Number	Description
RESISTORS		
R506	R2EDZJ332APA	Carbon 3.3k 1/4W ±5%
R507	R2EDZJ562APA	Carbon 5.6k 1/4W ±5%
R508	R2EDZJ103APA	Carbon 10k 1/4W ±5%
R509	R2EDZJ472APA	Carbon 4.7k 1/4W ±5%
R510	R2EDZJ681APA	Carbon 680 1/4W ±5%
R511,512	R2EDZJ102APA	Carbon 1k 1/4W ±5%
R513	R2EDZJ681APA	Carbon 680 1/4W ±5%
R514	R2EDZJ183APA	Carbon 18k 1/4W ±5%
R515	R2EDZJ103APA	Carbon 10k 1/4W ±5%

METER P.C.B. Assy 131 0 4001 09280

Ref. No.	Parts Number	Description
CAPACITORS		
C101	C1HRT-105A	Electrolytic 1 μF 50V
C102	C1ERT-106A	Electrolytic 10 μF 25V
C201	C1HRT-105A	Electrolytic 1 μF 50V
C202	C1ERT-106A	Electrolytic 10 μF 25V

SEMICONDUCTORS		
D101,201	DOO-SLP-167B	L.E.D., SLP-167B (Red)
IC101	IYY-BA6137	IC, BA6137
201		

RESISTORS		
R101,201	R2EDZJ103APA	Carbon 10k 1/4W ±5%

CONTROL P.C.B. Assy 131 0 4001 09290

Ref. No.	Parts Number	Description
	4 2369 22740	Plug 5P
CAPACITOR		
C101	C1HRY-226APA	Electrolytic 22 μF 50V
SEMICONDUCTOR		
D101	202 5 2470 13540	Diode, DS135D
RESISTOR		
R101	R2EDZJ472APA	Carbon 4.7k 1/4W ±5%
R102	R2EDPJ273A	Carbon 27k 1/4W ±5%

PARTS LIST (Continued)

MIC P.C.B. Assy 131 0 4001 09300

Ref. No.	Parts Number	Description
	4 2352 01210	Jack 4P

CAPACITORS

C101,102 C1HYYZ102APA Ceramic 0.001 μ F 50V +80,—20%

RESISTORS

R101,102 R2EDZJ103APA Carbon 10k 1/4W $\pm$ 5%

INDICATOR P.C.B. Assy 131 0 4001 09310

Ref. No.	Parts Number	Description
	4 2262 10670	P.C.B.

VOLUME P.C.B. Assy 131 0 4001 09320

Ref. No.	Parts Number	Description
	4 2222 02430	VR 50k-Ax2

POWER IND. P.C.B. Assy 131 0 4001 09330

Ref. No.	Parts Number	Description
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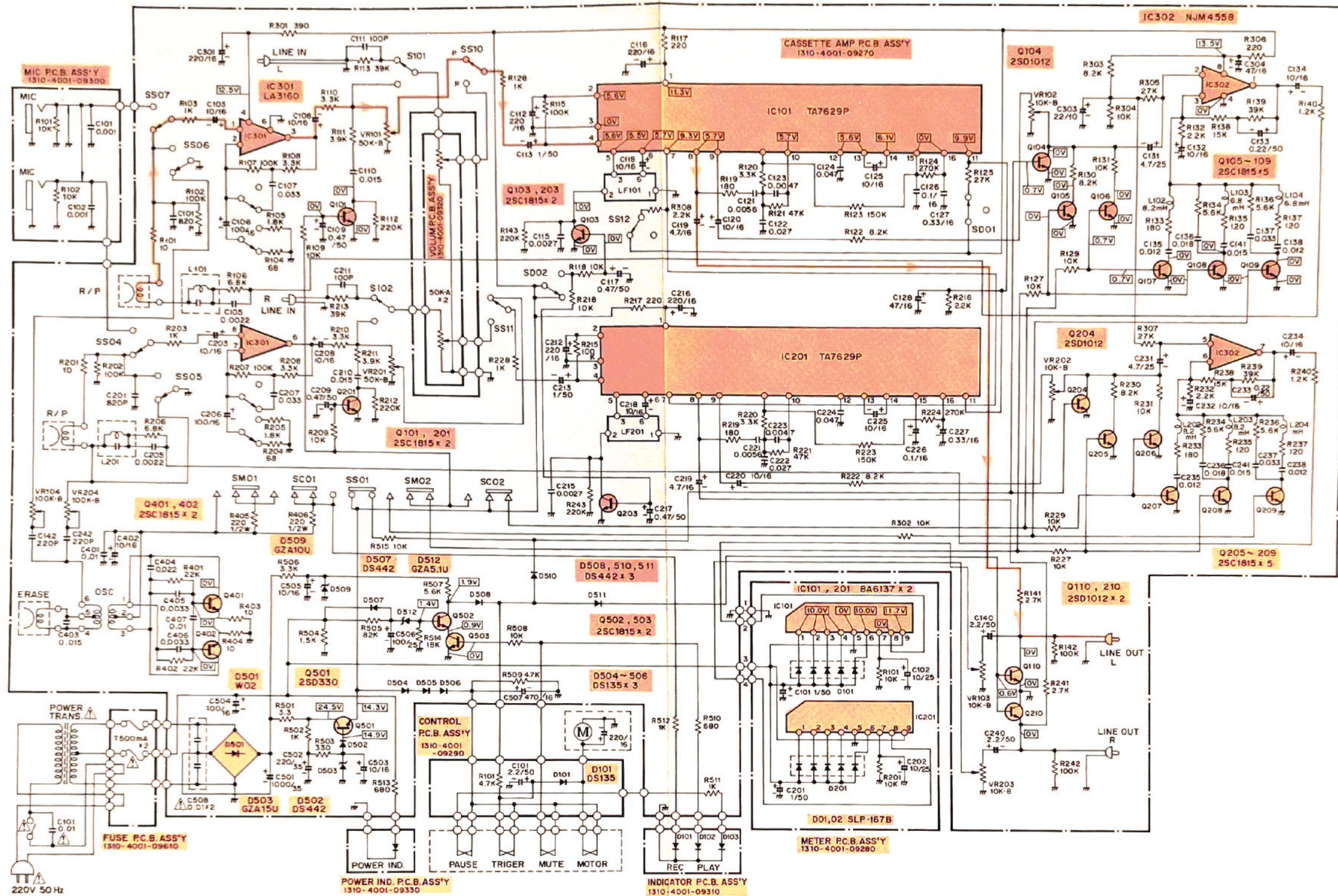
SEMICONDUCTOR

DWW-LN224RP L.E.D , LN224RP (Red)

FUSE P.C.B. Assy 131 0 4001 09610

Ref. No.	Parts Number	Description
$\triangle$	4 2349 20310	Fuse T 500 mA
	4 2359 23080	Socket

SCHEMATIC DIAGRAM



NOTES:

1. All resistors values are indicated in "ohm" (K=10³, M=10⁶).
2. All capacitors values are indicated in "μF" (P=10⁻¹²).
3. All voltages indicated on the schematics are measured under the following conditions.
 - a. Use a V.T.V.M.
 - b. All voltages ±10% with respect to chassis ground
 - c. No signals at input terminals
 - d. AC input at 220 volts 50Hz
4. This is a basic schematic diagram.

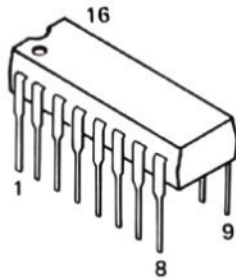
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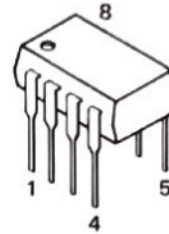
PRODUCT SAFETY SHOULD BE CONSIDERED WHEN A COMPONENT REPLACEMENT IS MADE IN ANY AREA OF AN UNIT. COMPONENTS INDICATED BY A MARK  IN THIS SCHEMATIC DIAGRAM SHOW COMPONENTS WHOSE VALUE HAS SPECIAL SIGNIFICANCE TO PRODUCT SAFETY. IT IS PARTICULARLY RECOMMENDED THAT ONLY PARTS SPECIFIED ON THE ATTACHED PARTS LIST BE USED FOR COMPONENT REPLACEMENT POINTED OUT BY THE MARK.

SEMICONDUCTOR LEAD IDENTIFICATION

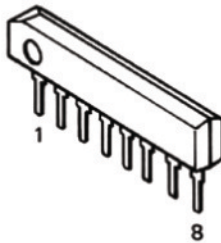
INTEGRATED CIRCUIT



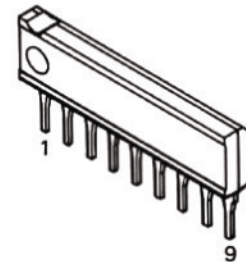
• TA7629P



• NJM4558



• LA3160



• BA6137

TRANSISTORS



• 2SC1518
• 2SC1815



• 2SD1012



• 2SD330

DIODES



• W02



• DS135D
• DS442
• GZA5.1U
• GZA10U
• GZA15U

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