

PRELIMINARY

TC-651

General Export Model



Set using ISO screws

SPECIFICATIONS

Power Requirements:	AC 100V, 110V, 117V, 120V, 125V, 220V and 240V (Changeable by using the voltage selector) 50/60 Hz, 85W	Two LINE INputs Impedance : 100 k Ω Maximum sensitivity: 70 mV (-22 dB)									
Track System:	Four-track stereo and mono	REC/PB connector Impedance : 80 k Ω Maximum sensitivity: 30.5 mV (-28 dB)									
Reel Size:	7" maximum	Outputs: Two LINE OUTputs Impedance : 100 k Ω Output level : 0.775 V (0 dB)									
Tape Speed:	7½ ips and 3¾ ips (19 cm/s and 9.5 cm/s)	REC/PB connector Impedance : 100 k Ω Output level : 0.775 V (0 dB)									
Recording Time: (with 1,800 ft. tape)	<table><thead><tr><th>Tape speed</th><th>4-track stereo</th><th>4-track mono</th></tr></thead><tbody><tr><td>7½ ips (19 cm/s)</td><td>1.5 hrs</td><td>3 hrs</td></tr><tr><td>3¾ ips (9.5 cm/s)</td><td>3 hrs</td><td>6 hrs</td></tr></tbody></table>	Tape speed	4-track stereo	4-track mono	7½ ips (19 cm/s)	1.5 hrs	3 hrs	3¾ ips (9.5 cm/s)	3 hrs	6 hrs	HEADPHONE output Impedance : 8 Ω load Output level : 0.038 V (-26 dB) with 8 Ω load (when line output level is 0 dB.)
Tape speed	4-track stereo	4-track mono									
7½ ips (19 cm/s)	1.5 hrs	3 hrs									
3¾ ips (9.5 cm/s)	3 hrs	6 hrs									
Frequency Response: (with standard tape)	20 ~ 25,000 Hz at 7½ ips (19 cm/s) 30 ~ 18,000 Hz at 3¾ ips (9.5 cm/s)	Semiconductors: 74 transistors and 92 diodes									
Signal-to-Noise Ratio: (with standard tape)	54 dB	Dimensions: 16 ⁵ / ₈ (W) x 18 (H) x 9 ⁹ / ₁₆ " (D) (422 x 457 x 243 mm)									
Flutter and Wow:	0.04% at 7½ ips (19 cm/s) 0.08% at 3¾ ips (9.5 cm/s)	Weight: 44 lb 8 oz (20.2kg)									
Recording Bias Frequency:	Approx. 120 kHz										
Inputs:	Two MIC inputs Impedance : 600 Ω Maximum sensitivity: 0.2 mV (-72 dB)										

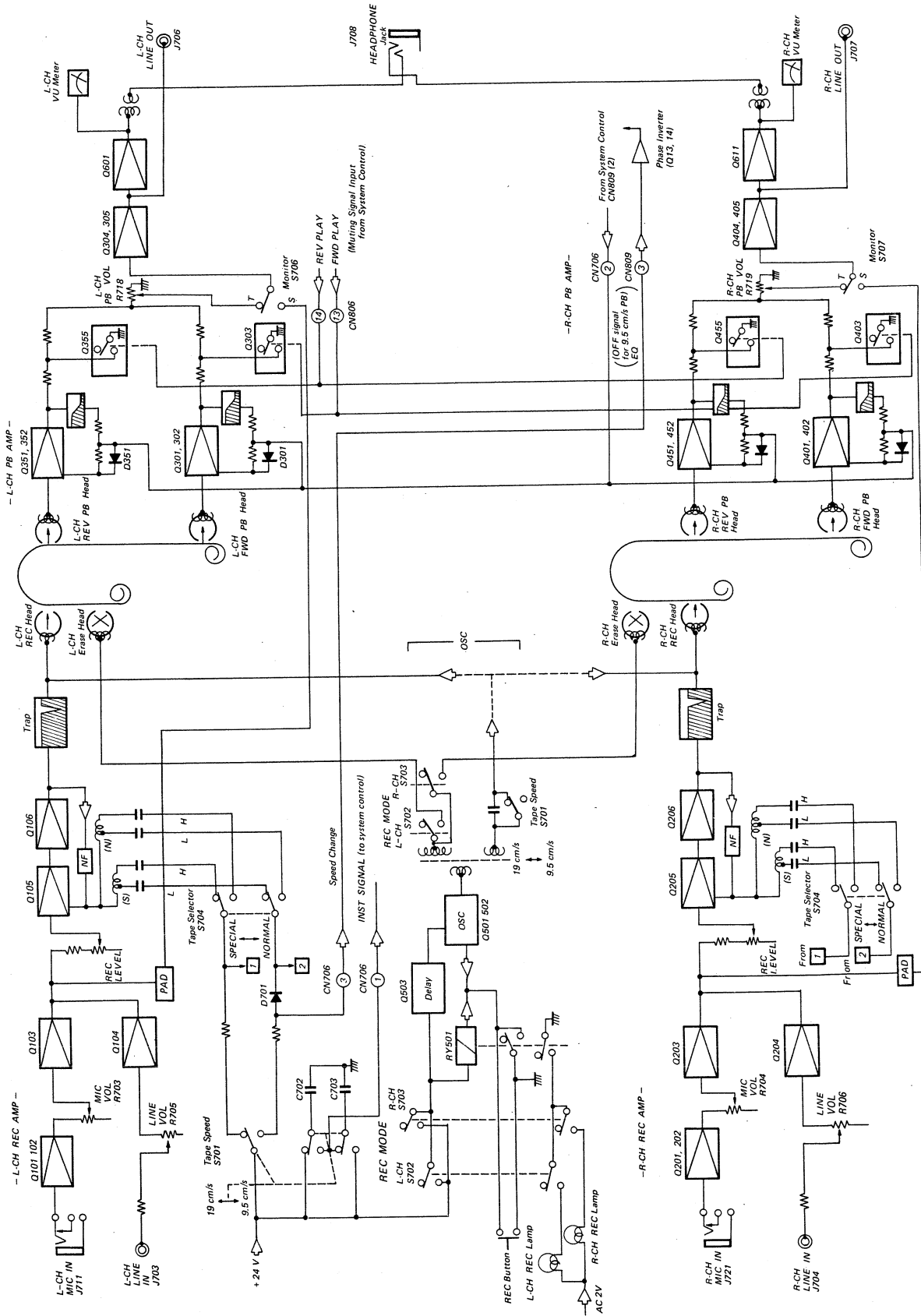
SONY®
SERVICE MANUAL

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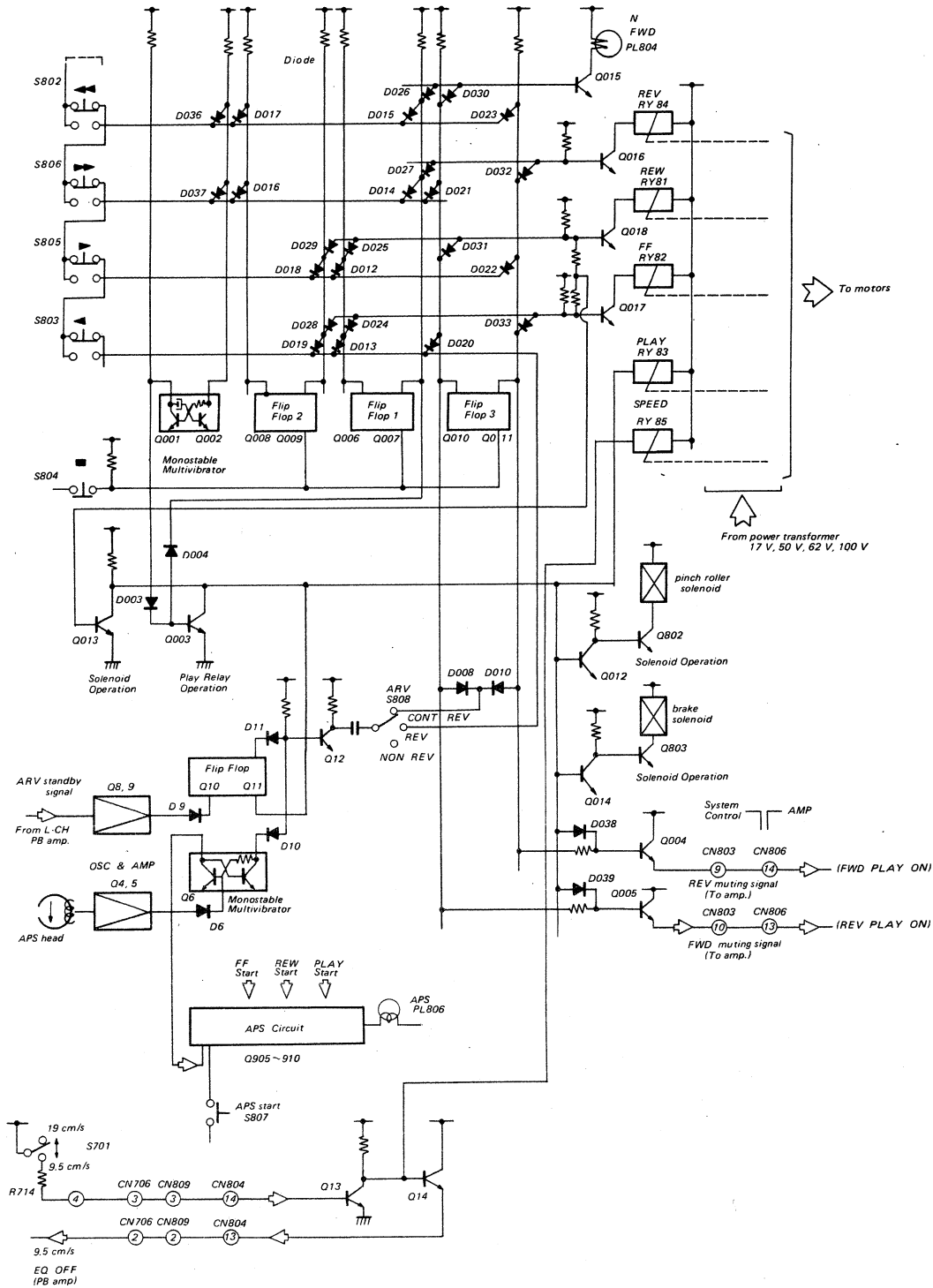
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1. BLOCK DIAGRAMS

1-1. Audio Amp. & Bias OSC Circuit

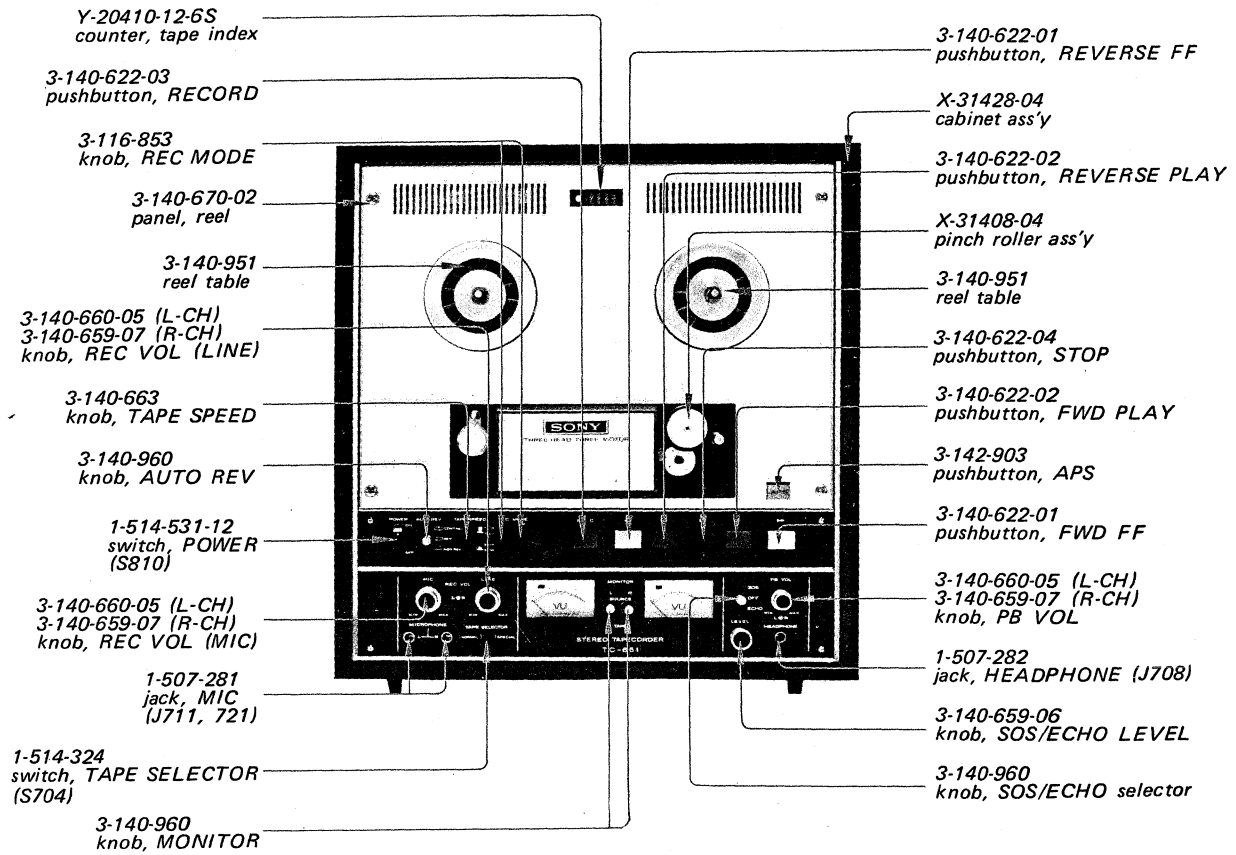


1-2. System Control Circuit

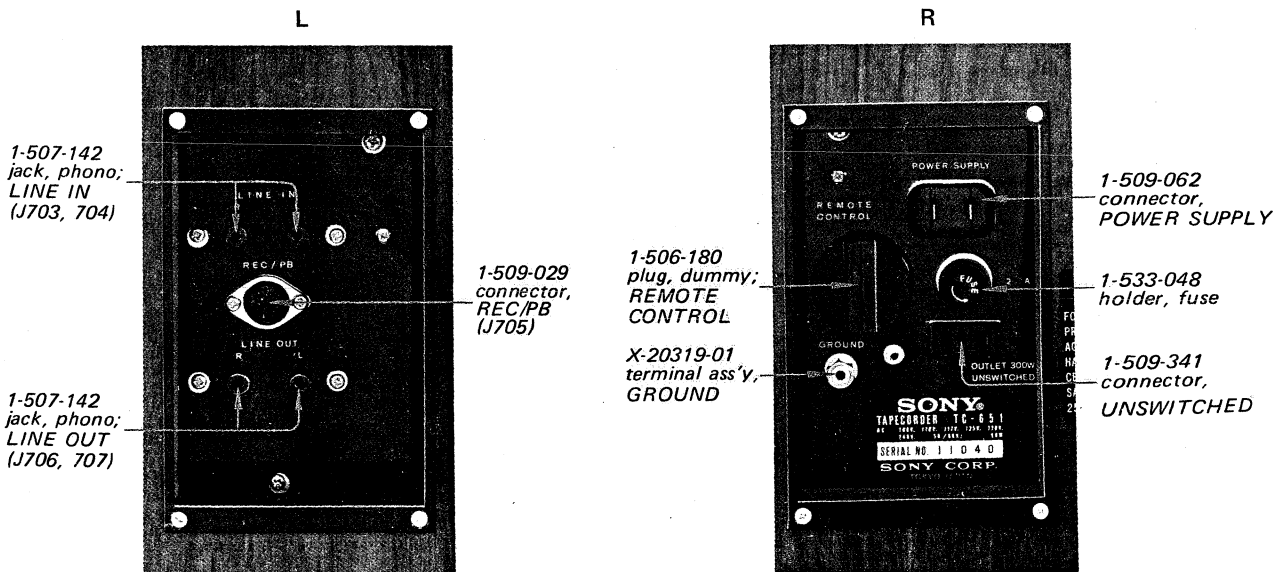


2. MAJOR PARTS LOCATIONS

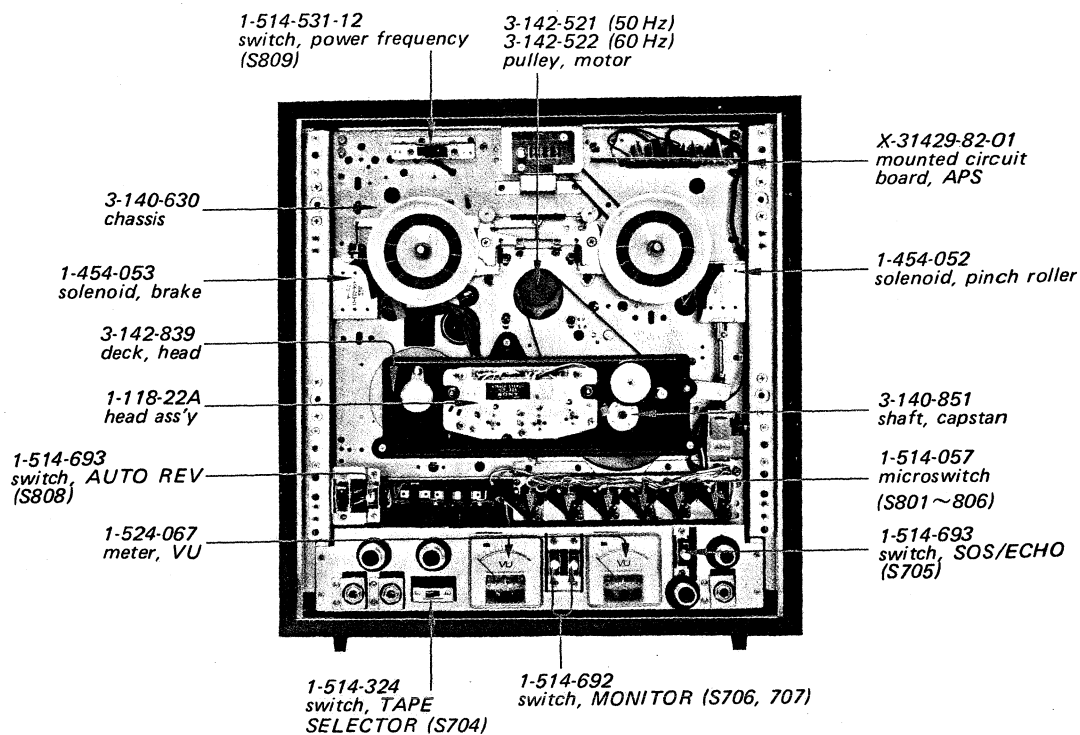
2-1. Cabinet Front View



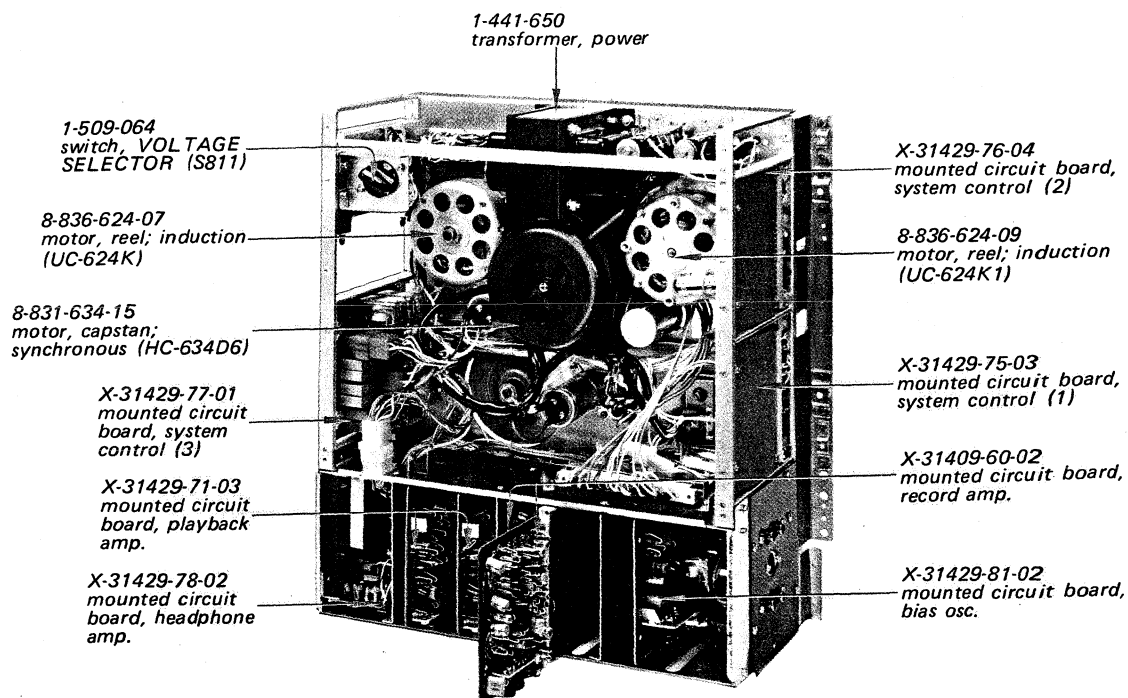
2-2. Cabinet Side Views



2-3. Chassis Top View



2-4. Chassis Bottom View



3. DISASSEMBLY

3-1. Cabinet Removal

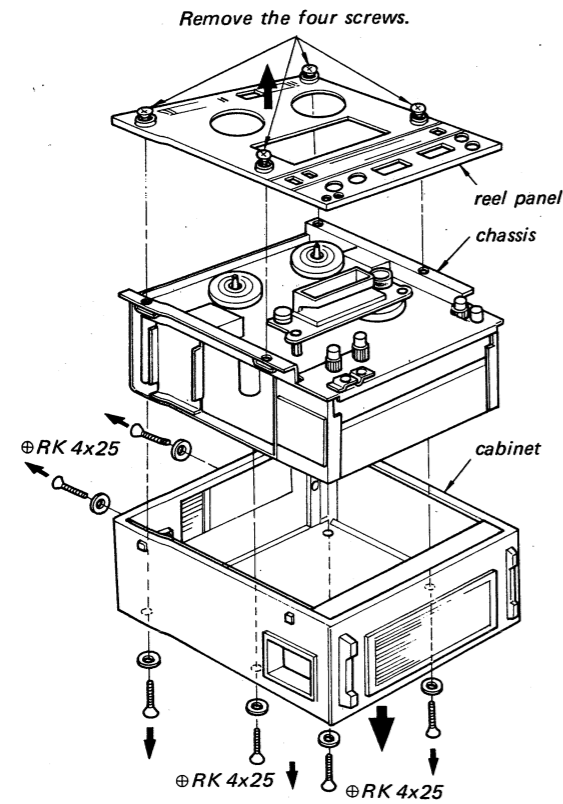


Fig. 3-1. Cabinet removal

3-2. Printed Circuit Board Removal

1. Remove the Cabinet.
2. Pull off the printed circuit boards, PB AMP, REC AMP and BIAS OSC.

Note: The voltage check can be made by using the special jig (Part No. X-31400-99).

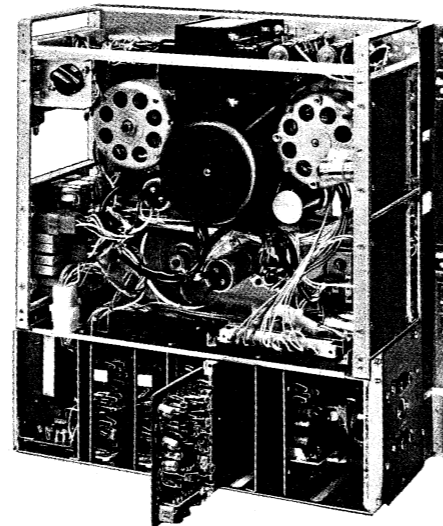
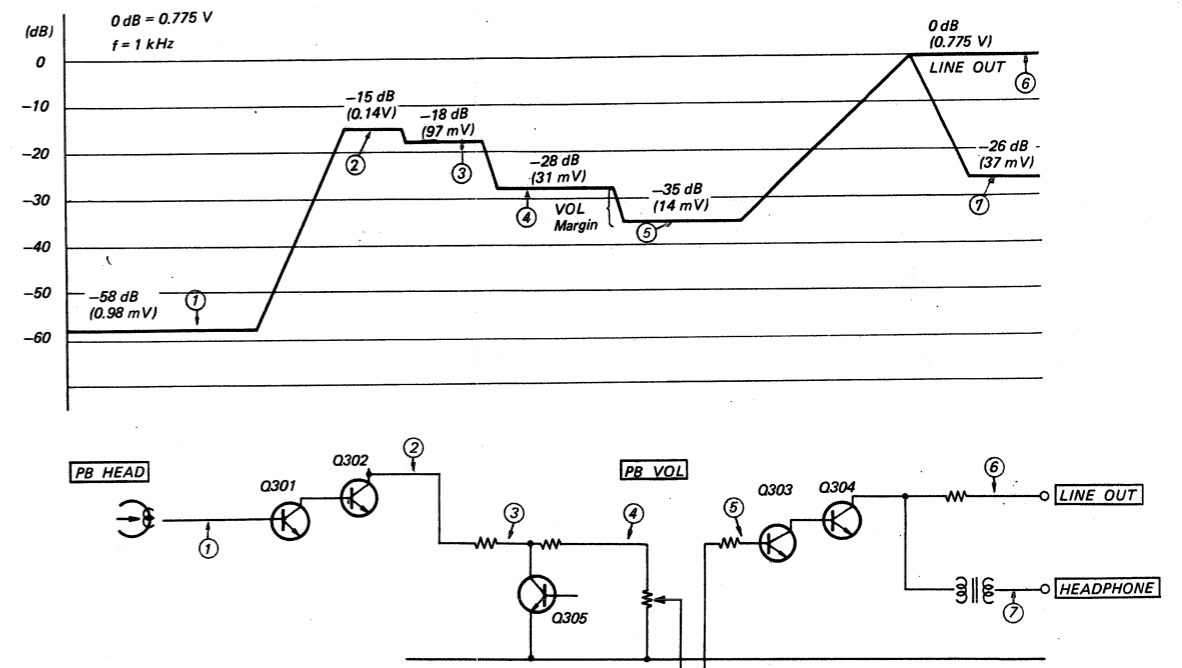


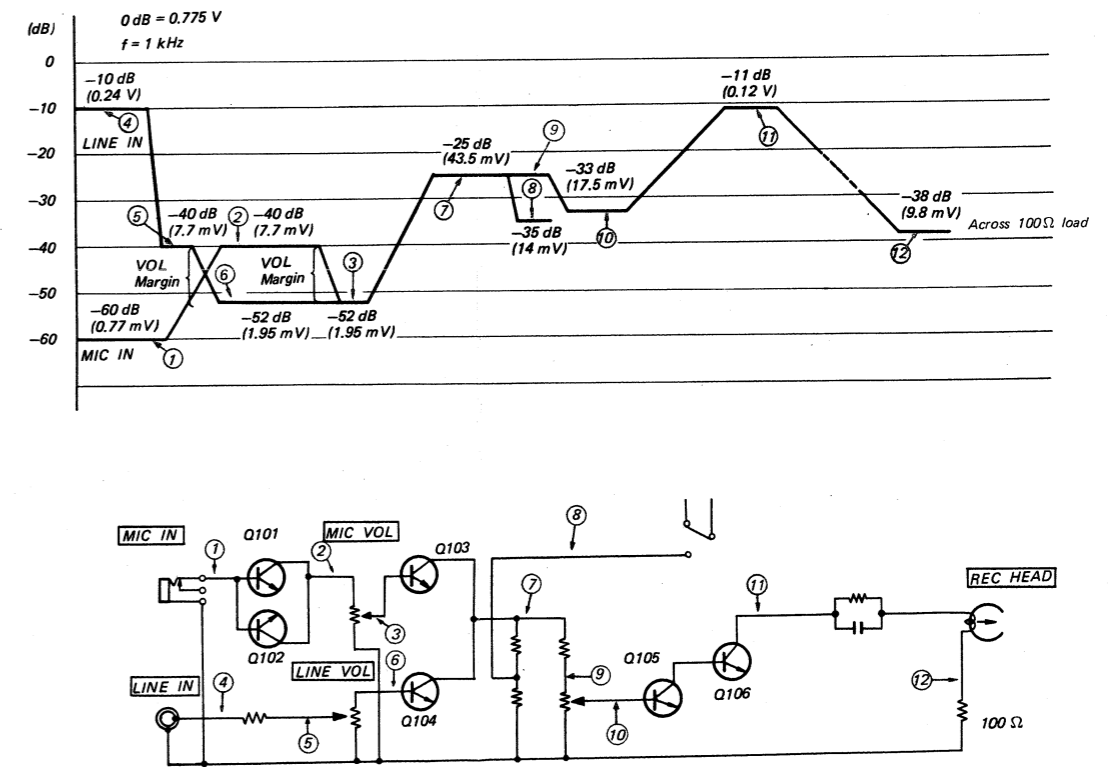
Fig. 3-2. Printed circuit board removal

4. LEVEL DIAGRAMS

4-1. Playback

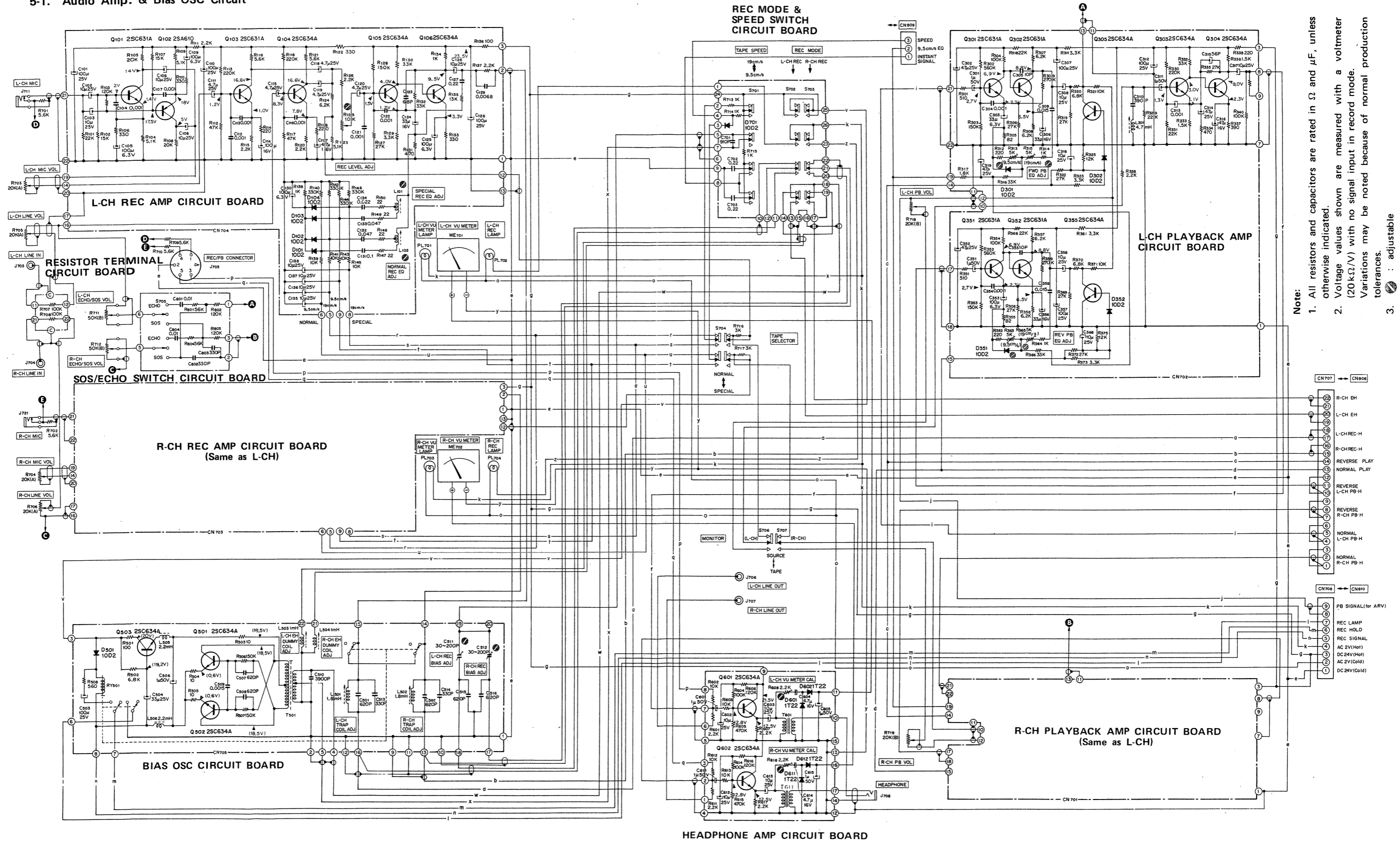


4-2. Record



5. SCHEMATIC DIAGRAMS

5-1. Audio Amp. & Bias OSC Circuit

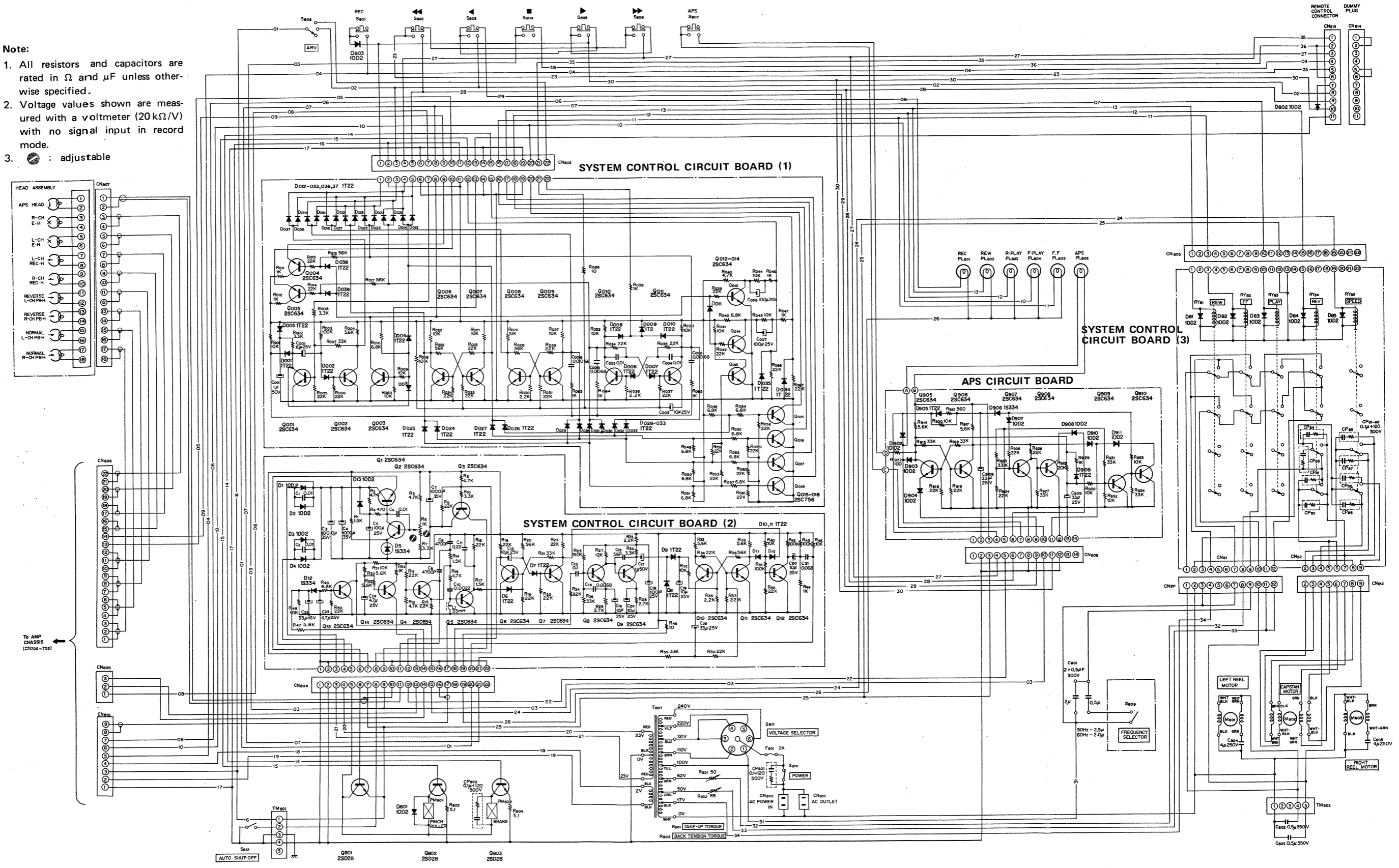


- Note:
1. All resistors and capacitors are rated in Ω and μF , unless otherwise indicated.
 2. Voltage values shown are measured with a voltmeter (20k Ω/V) with no signal input in record mode. Variations may be noted because of normal production tolerances.
 3. : adjustable

TC-651 TC-651

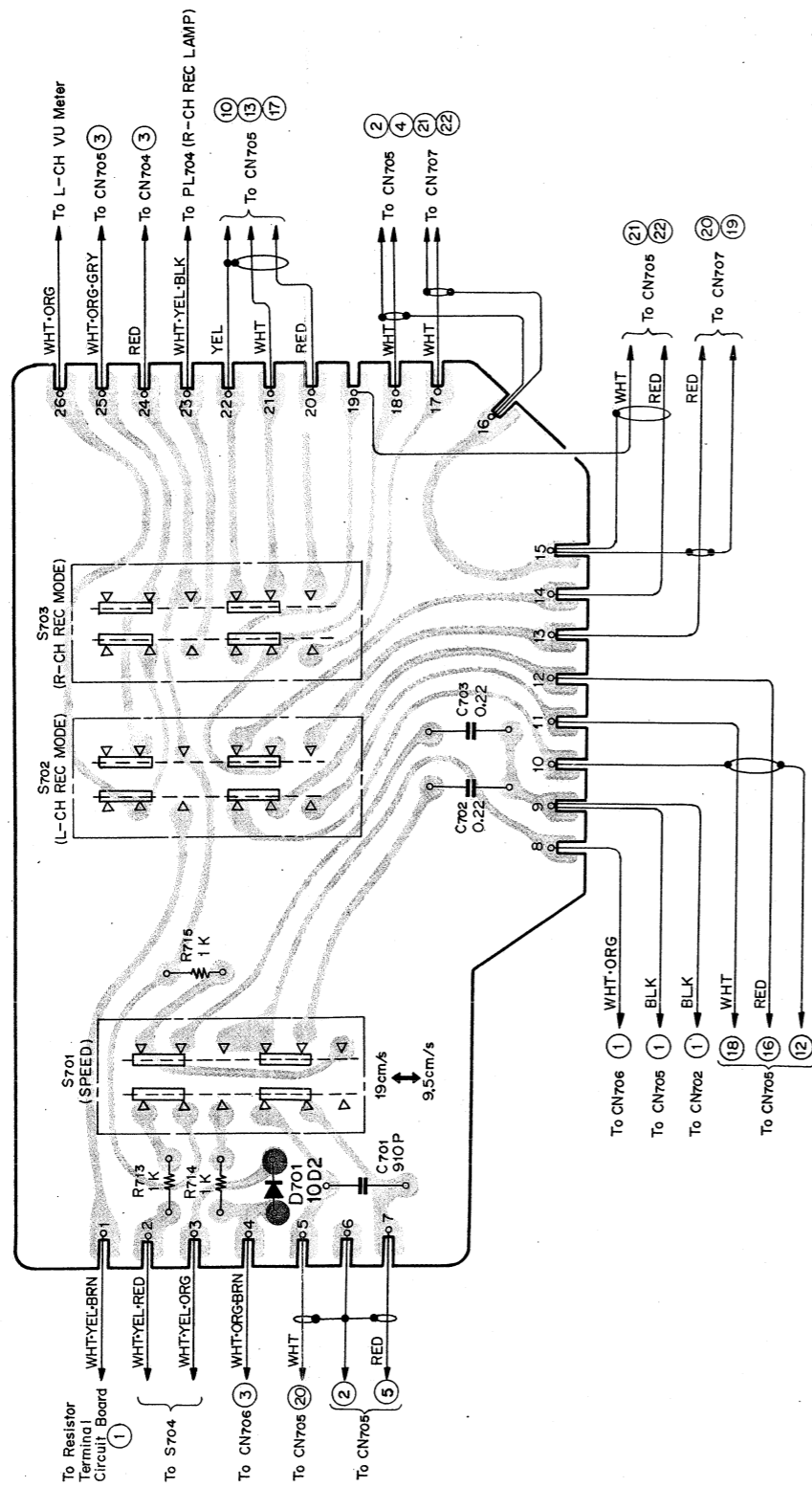
5-2. System Control Circuit

- Note:**
1. All resistors and capacitors are rated in Ω and μF unless otherwise specified.
 2. Voltage values shown are measured with a voltmeter (20 k Ω/V) with no signal input in record mode.
 3. : adjustable



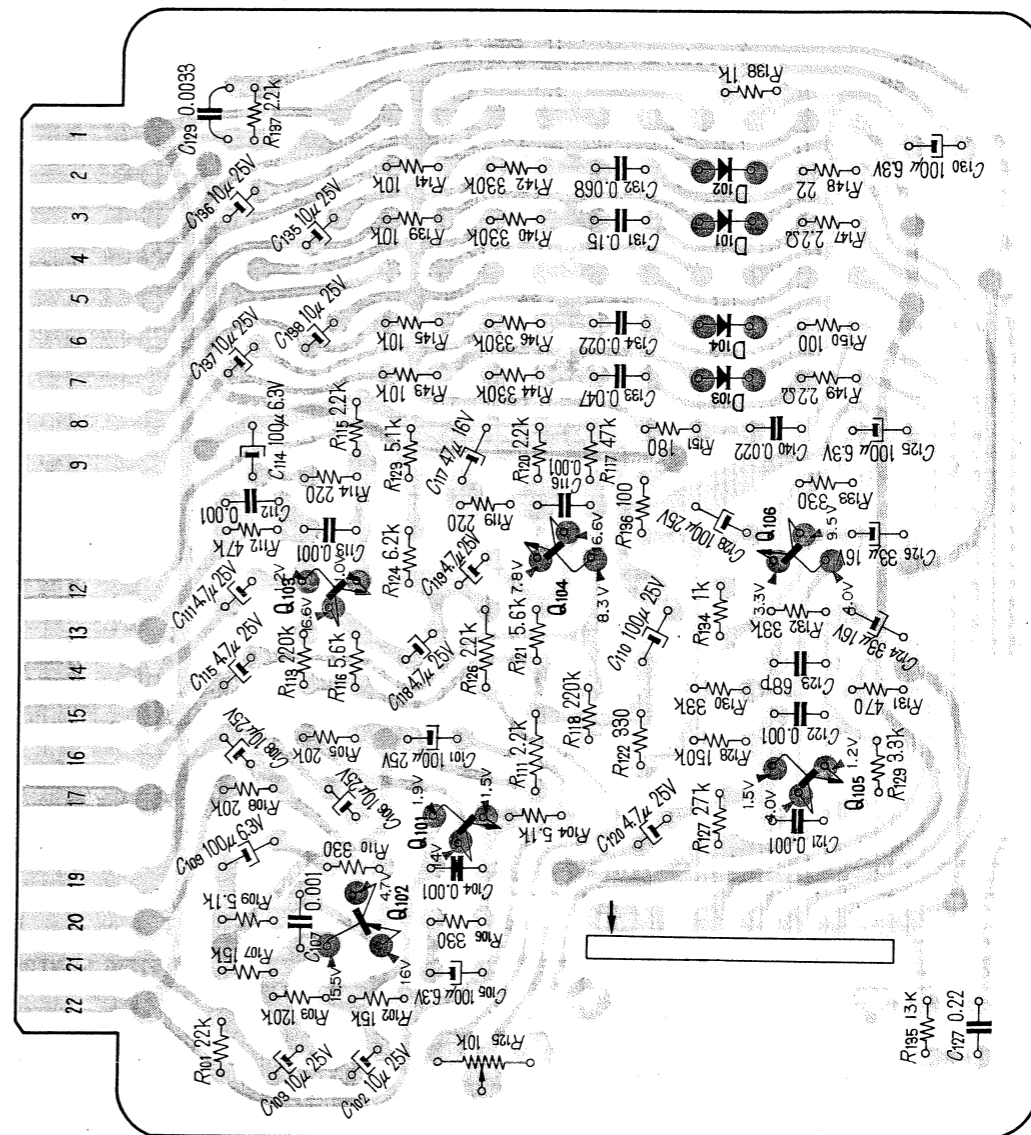
6. MOUNTING DIAGRAMS

6-1. REC MODE & SPEED Switch Circuit Board
 - Conductor Side -

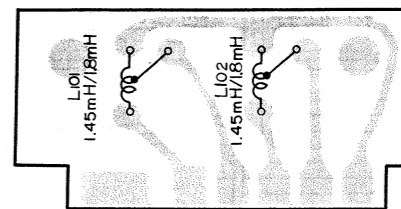


Printed Circuit Board
 Part No. 1-539-565-11

6-2. Record Amplifier Circuit Board
 - Conductor Side -

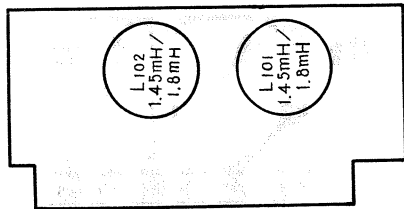
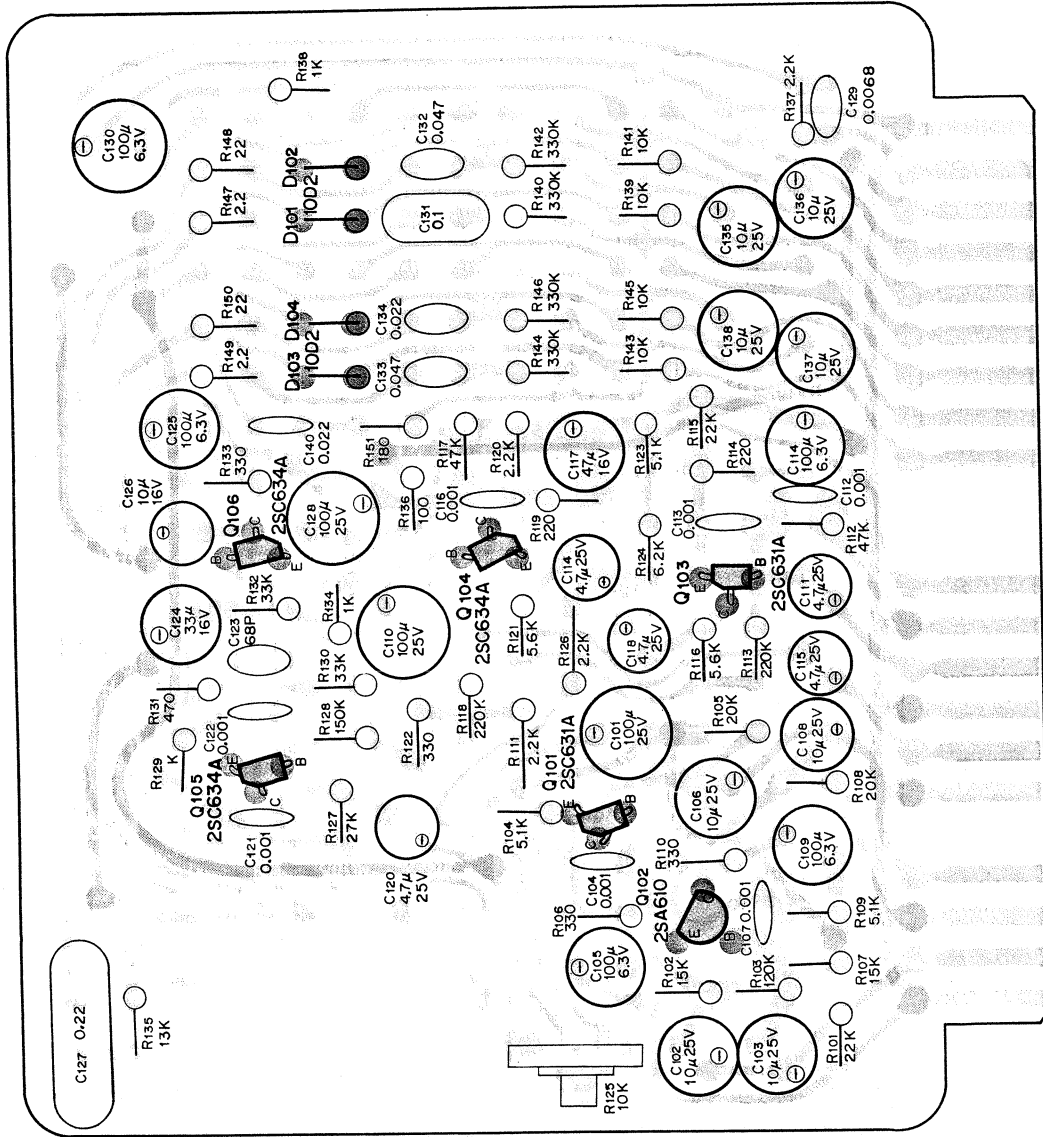


Printed Circuit Board
 Part No. 1-539-431-14

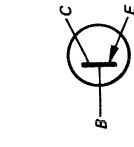


Printed Circuit Board
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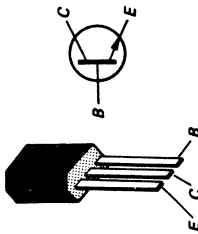
6-2. Record Amplifier Circuit Board
 - Component Side -



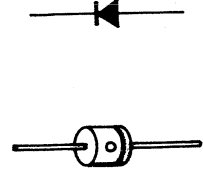
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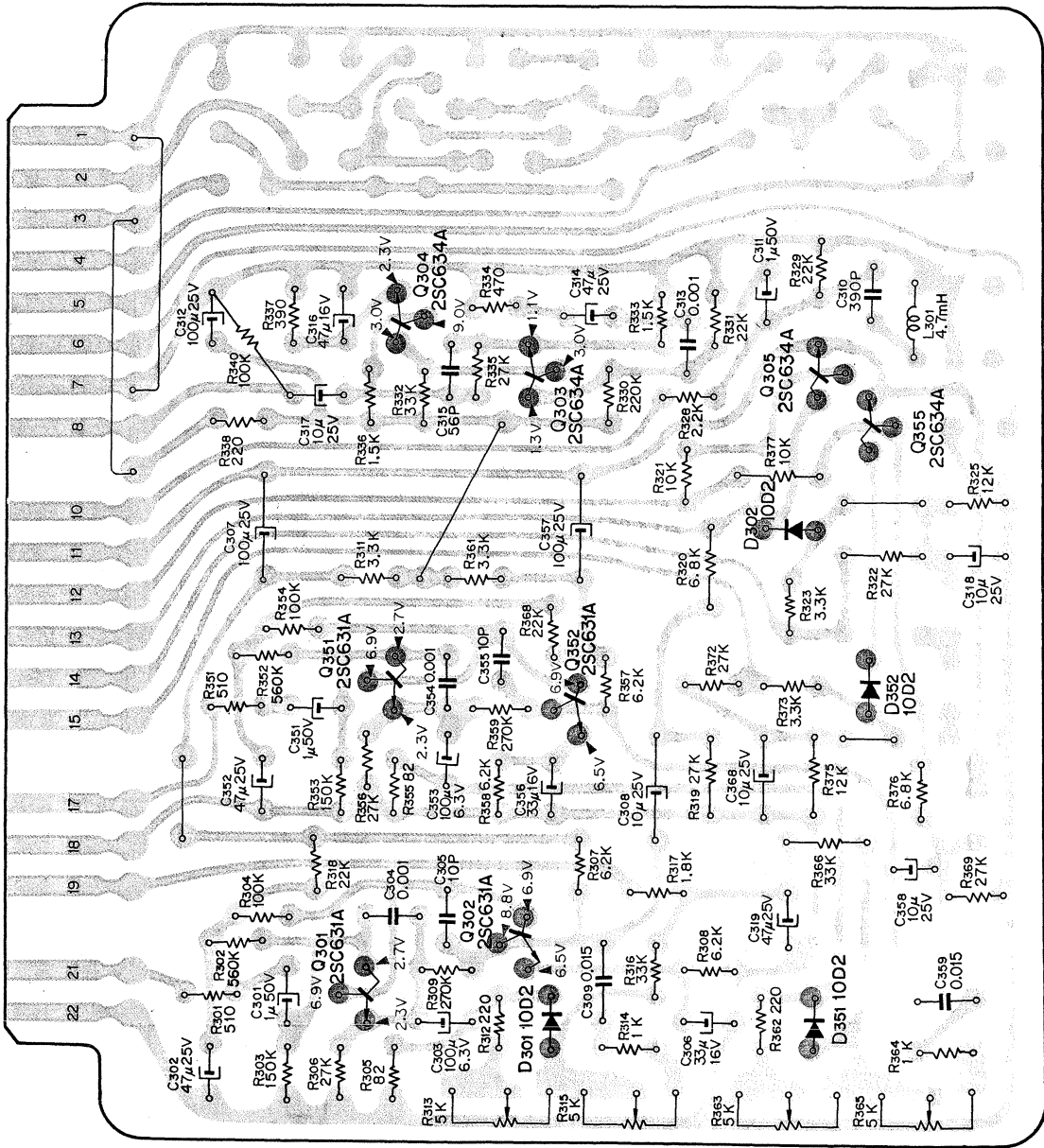
2SC631A, 2SC634A



10D2

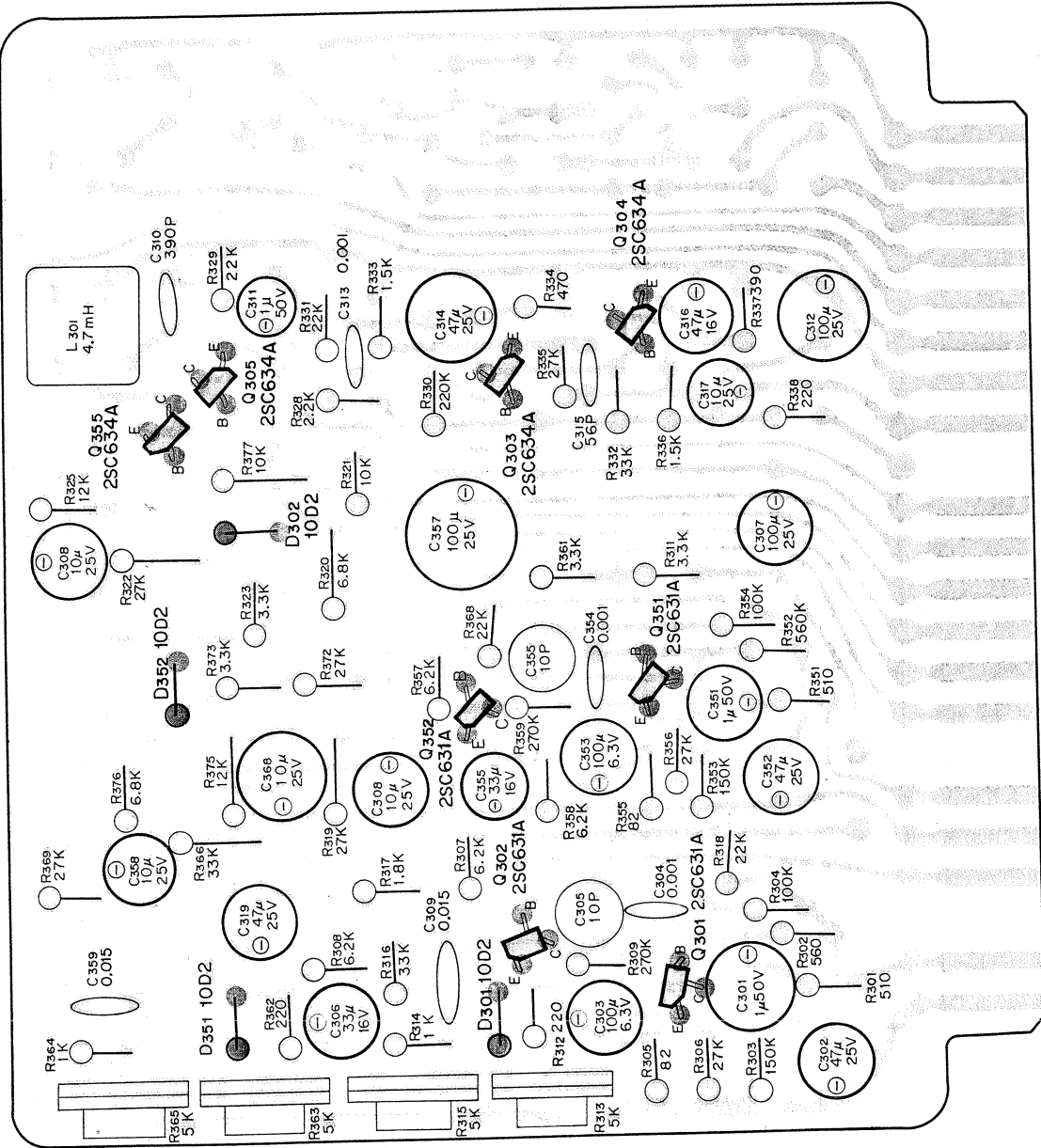


6-3. Playback Amplifier Circuit Board
- Conductor Side -

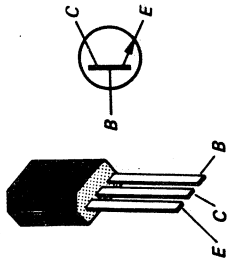


Printed Circuit Board
Part No. 1-539-641-11

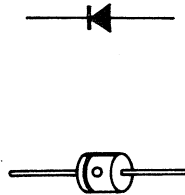
6-3. Playback Amplifier Circuit Board
 - Component Side -



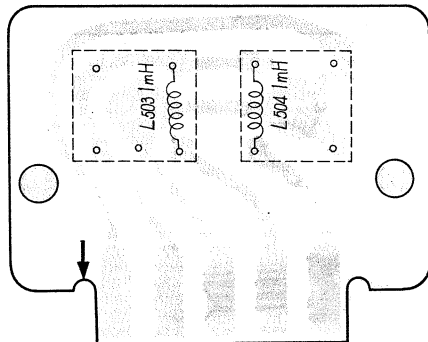
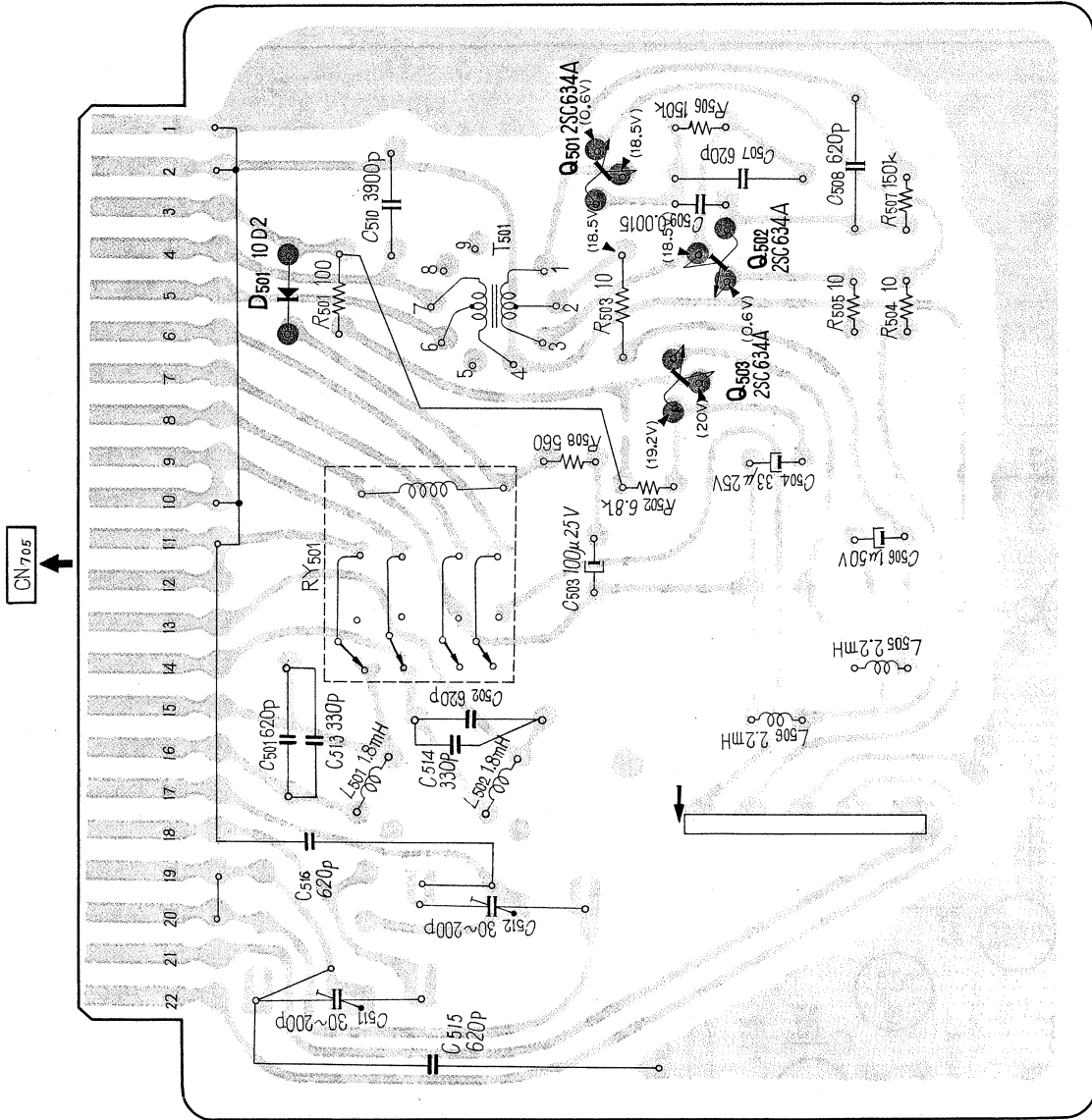
2SC631A, 2SC634A



10D2



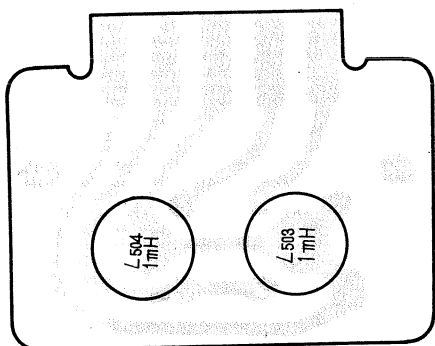
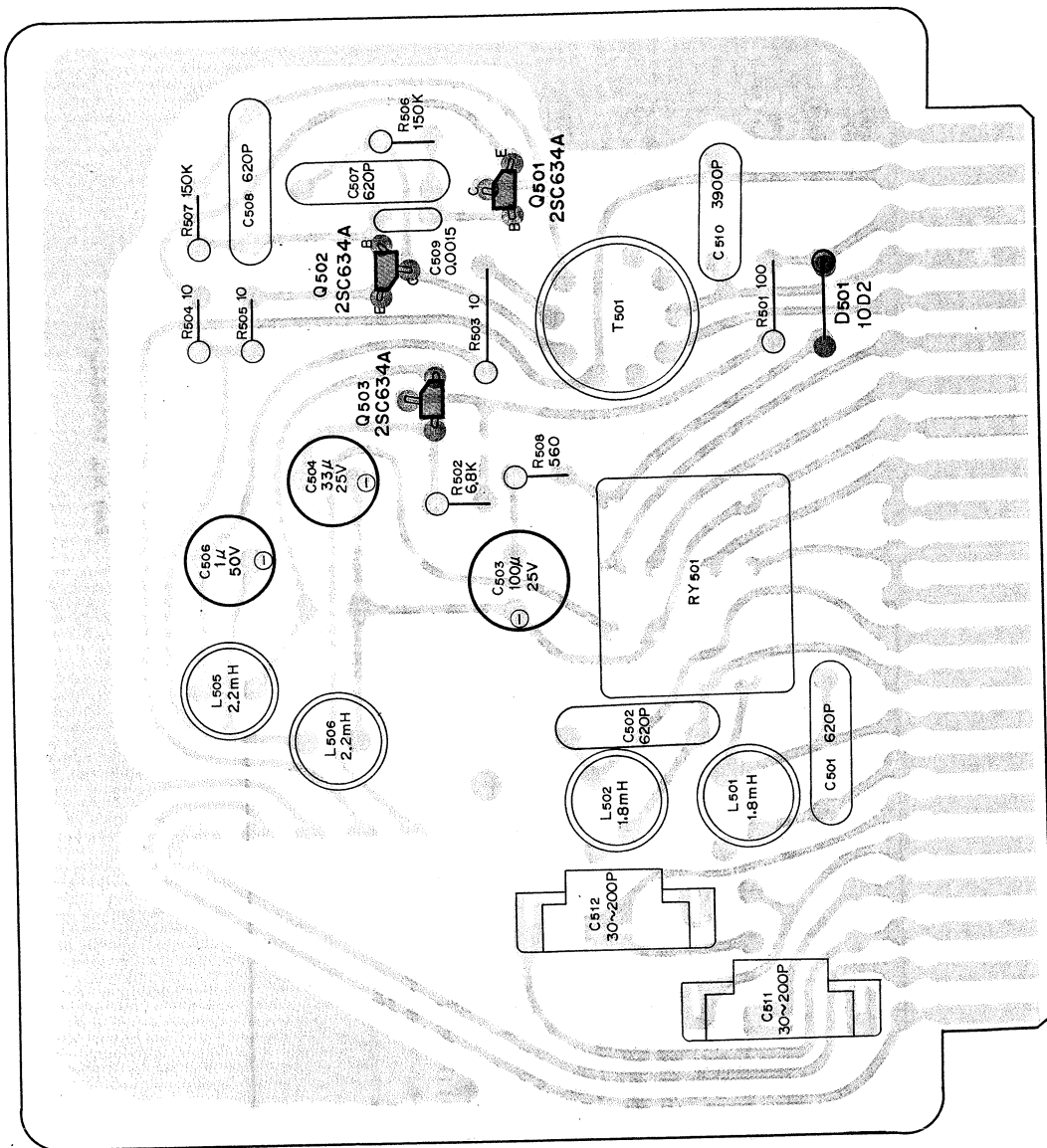
6-4. BIAS OSC Circuit Board
 - Conductor Side -



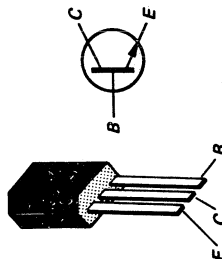
Printed Circuit Board
 Part No. 1-539-563-12

Printed Circuit Board
 Part No. 1-539-558-12

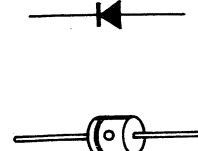
6-4. BIAS OSC Circuit Board
 - Component Side -



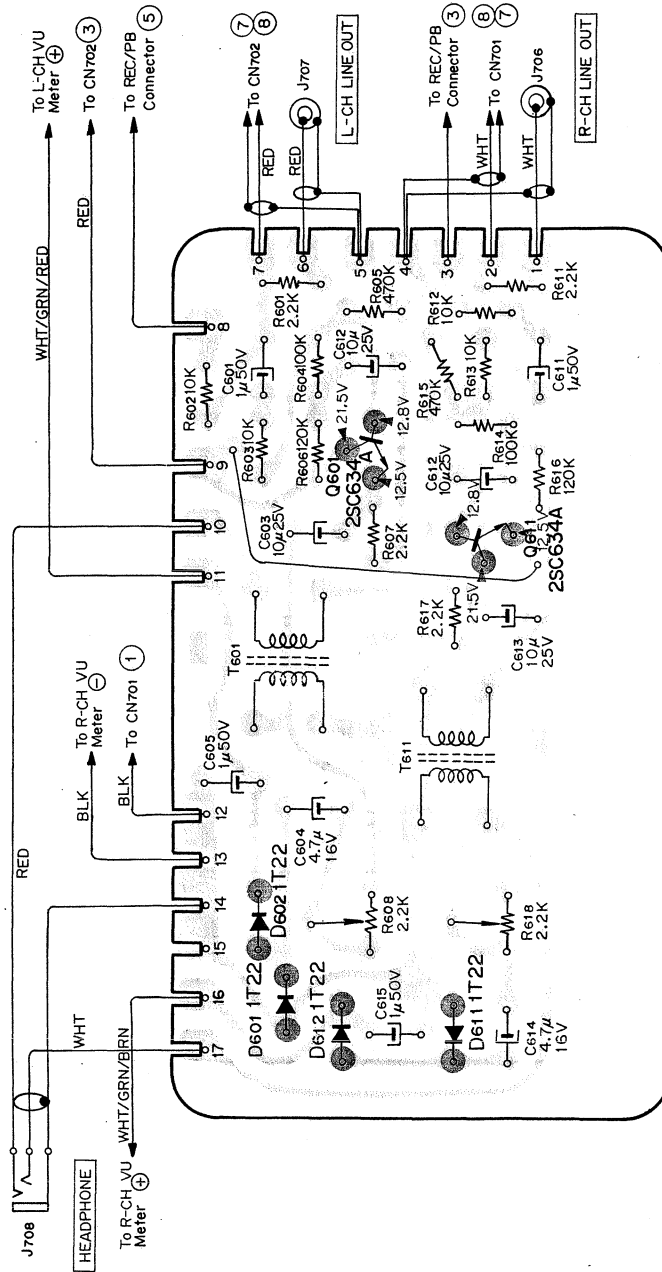
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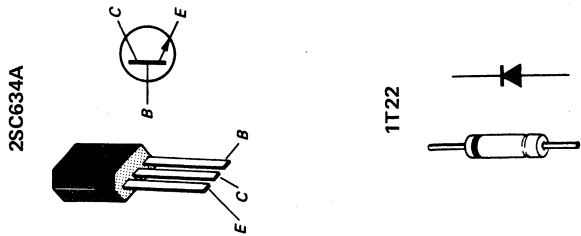
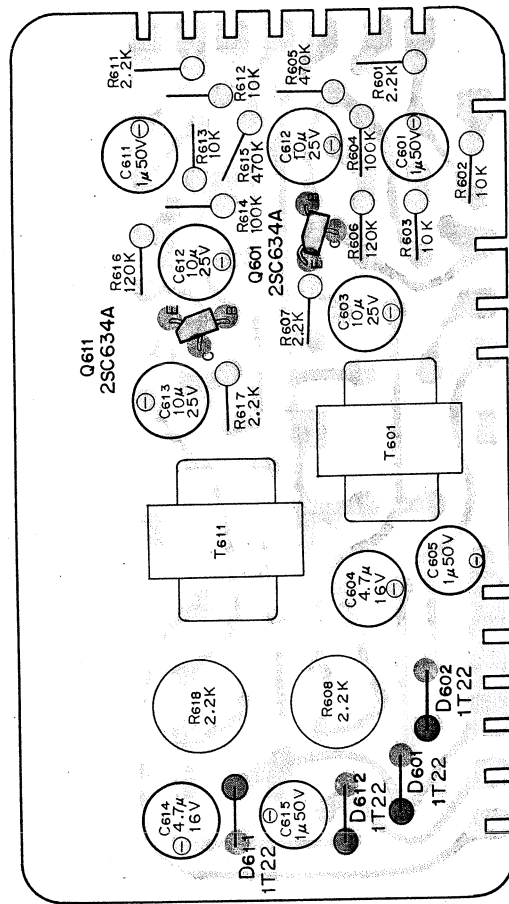


6-5. Headphone Amplifier Circuit Board
 - Conductor Side -

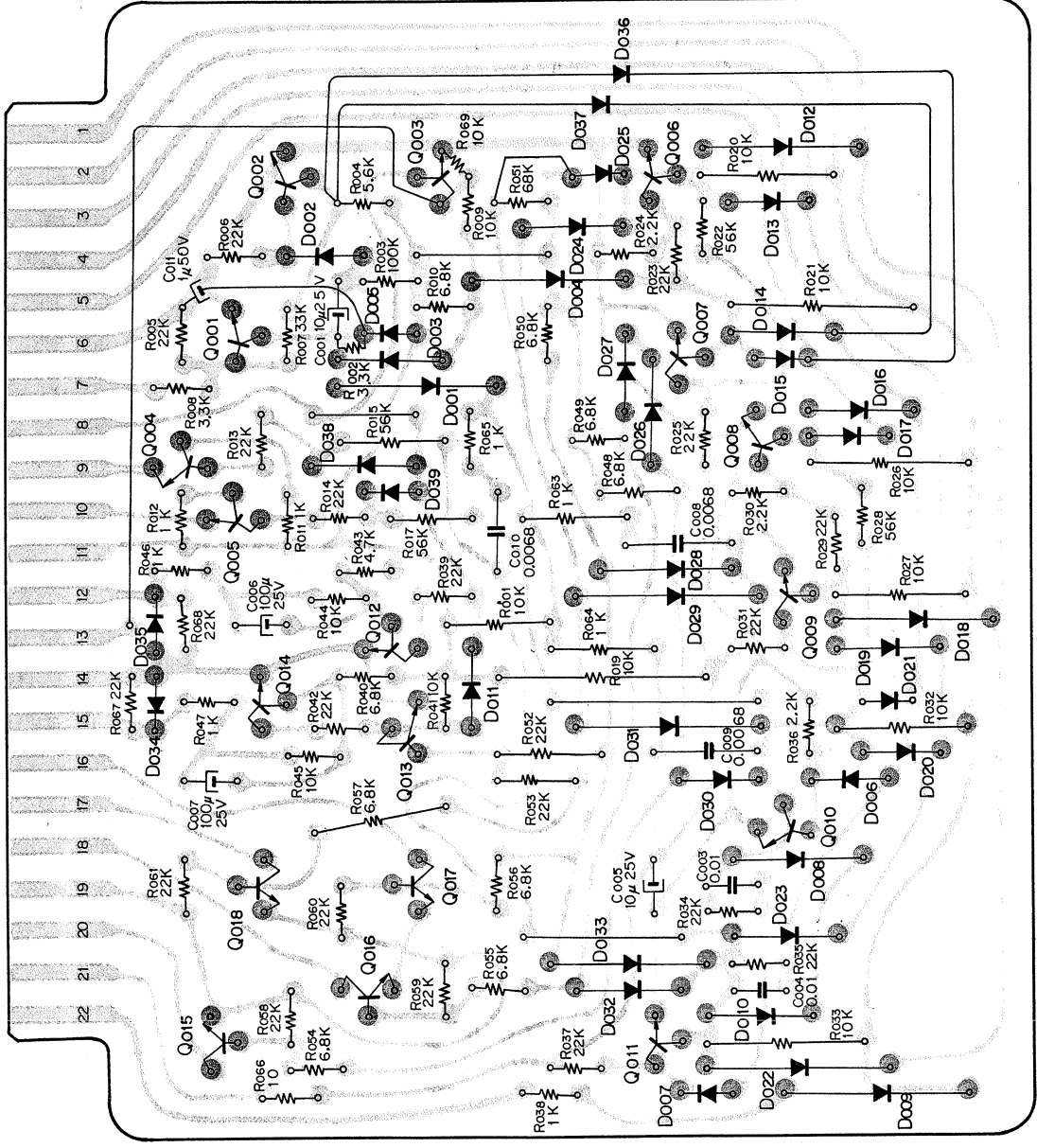


Printed Circuit Board
 Part No. 1-539-642-11

6-5. Headphone Amplifier Circuit Board
 - Component Side -

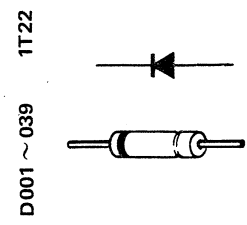
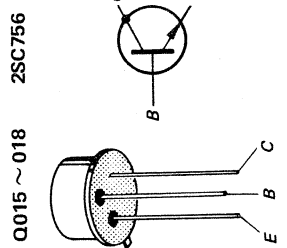
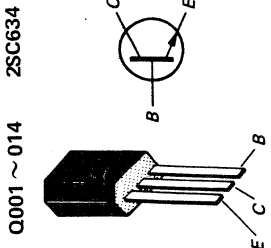
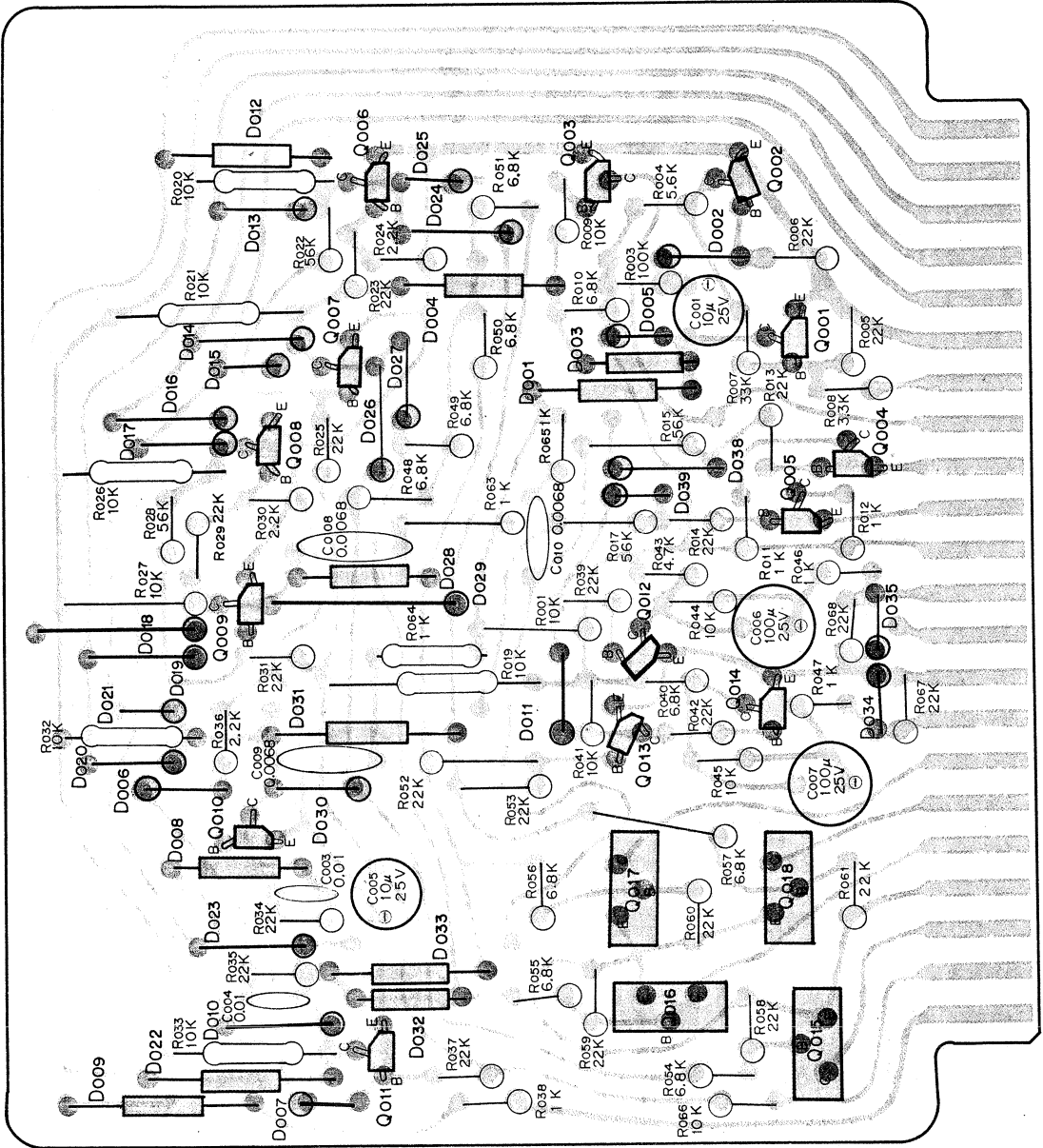


6-6. System Control Circuit Board (1)
- Conductor Side -

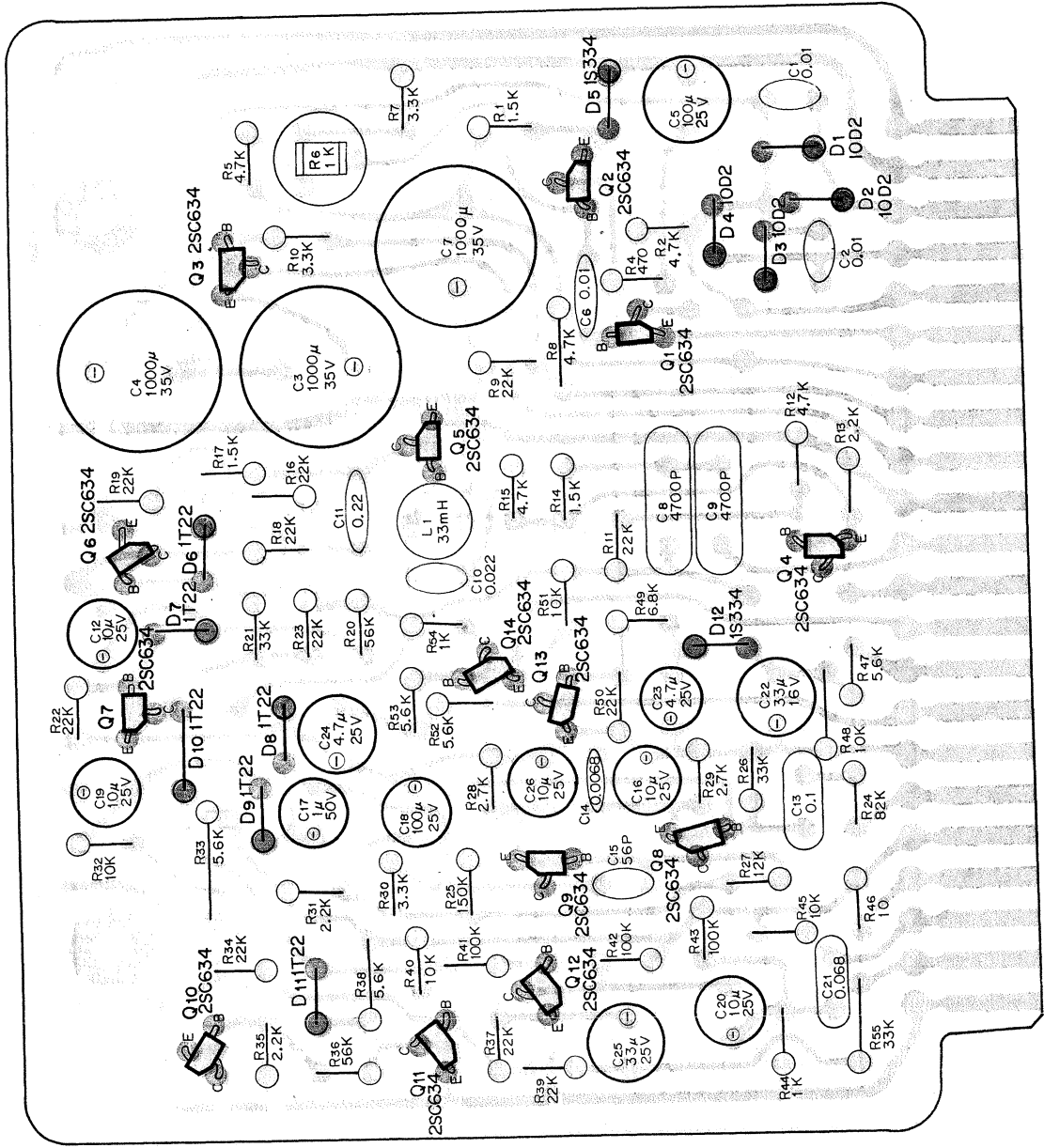


Printed Circuit Board
Part No. 1-539-633-12

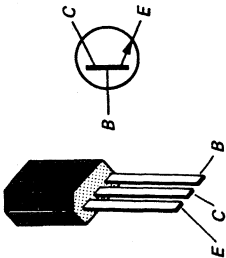
6-6. System Control Circuit Board (1)
 - Component Side -



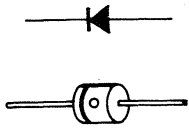
6-7. System Control Circuit Board (2)
 - Component Side -



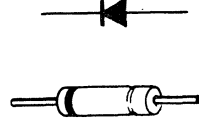
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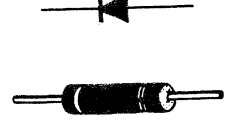
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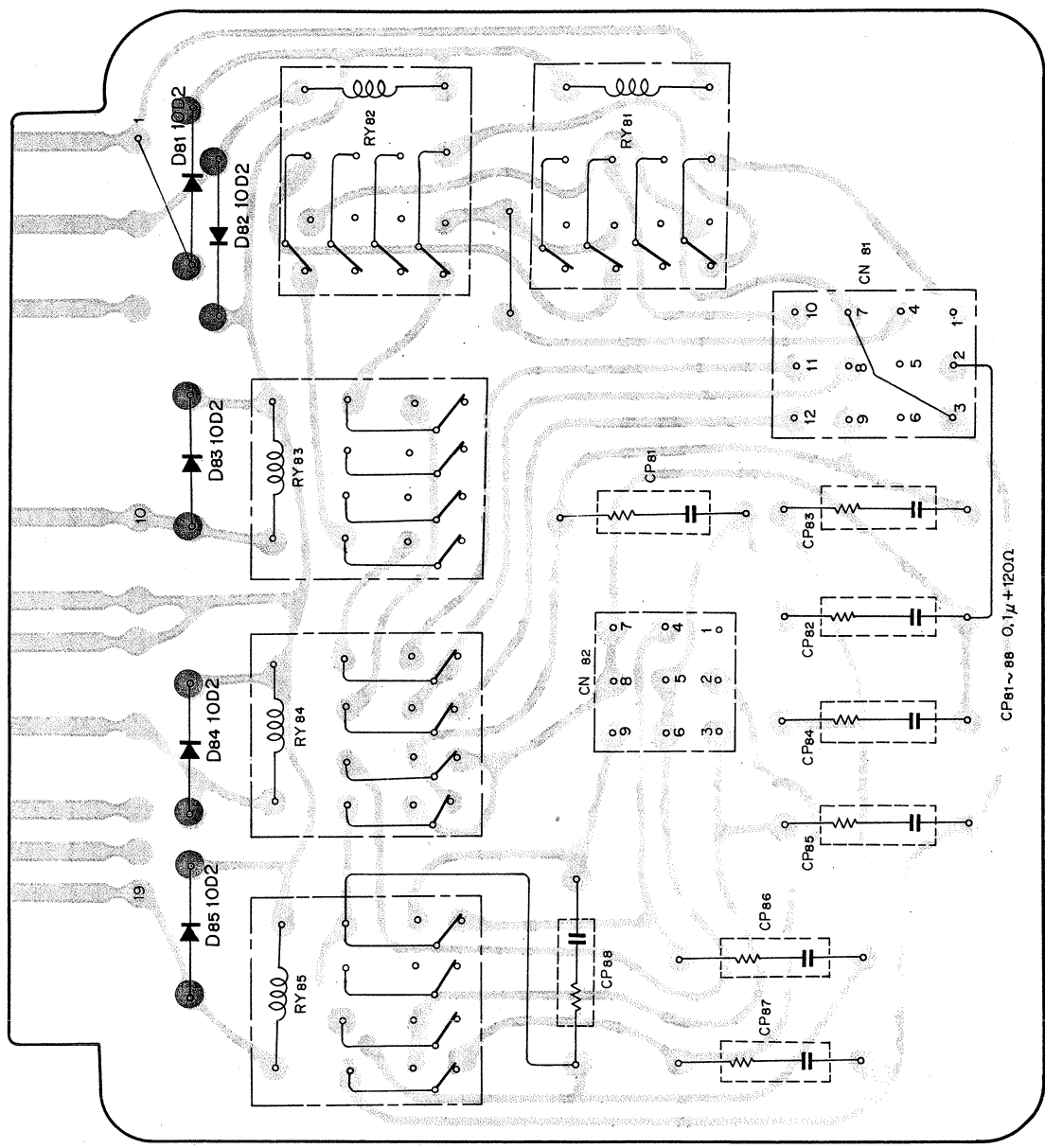
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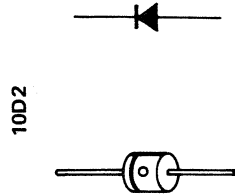
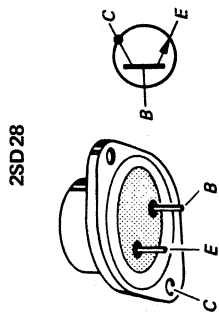
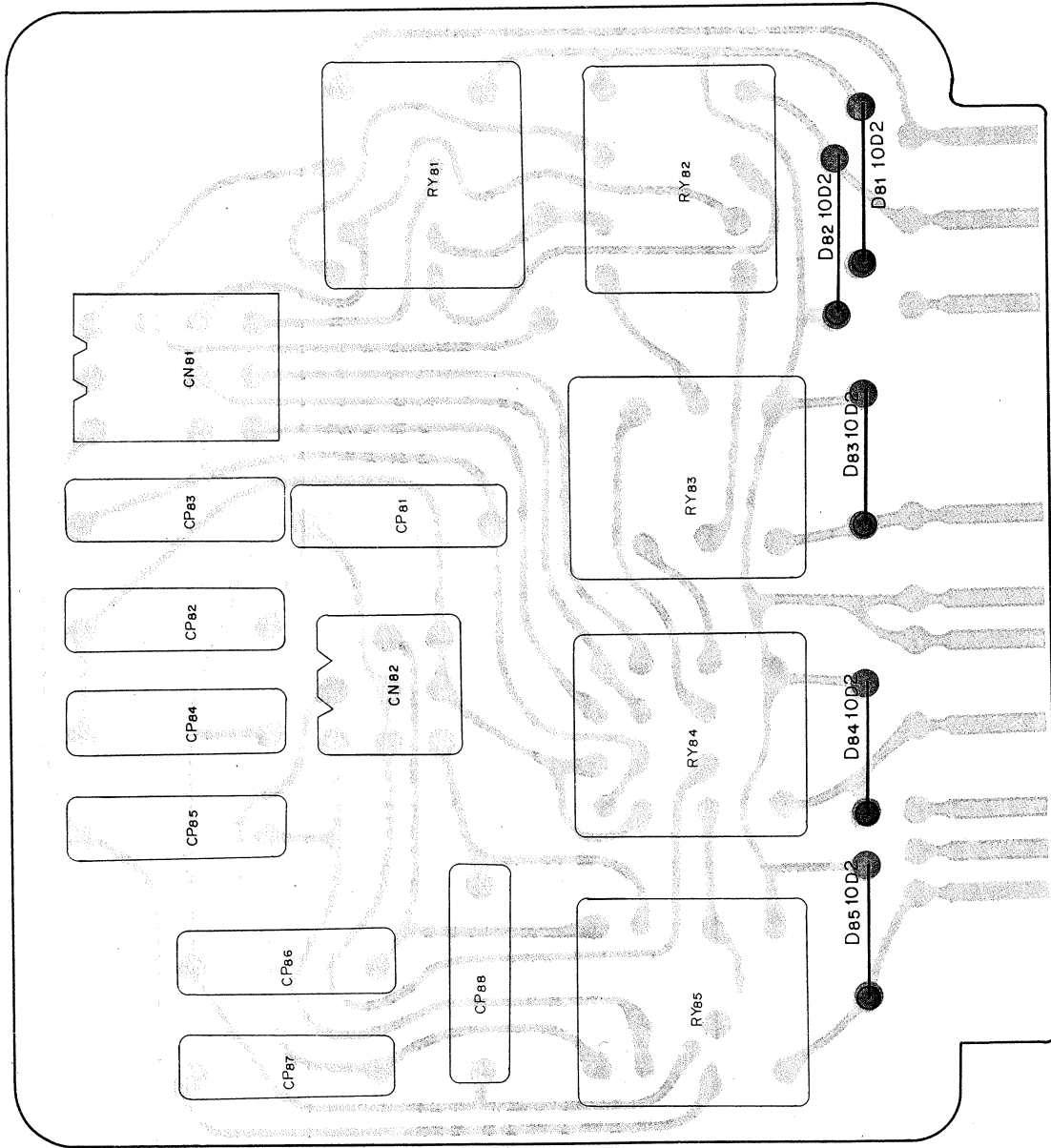


6-8. System Control Circuit Board (3)
 - Conductor Side -

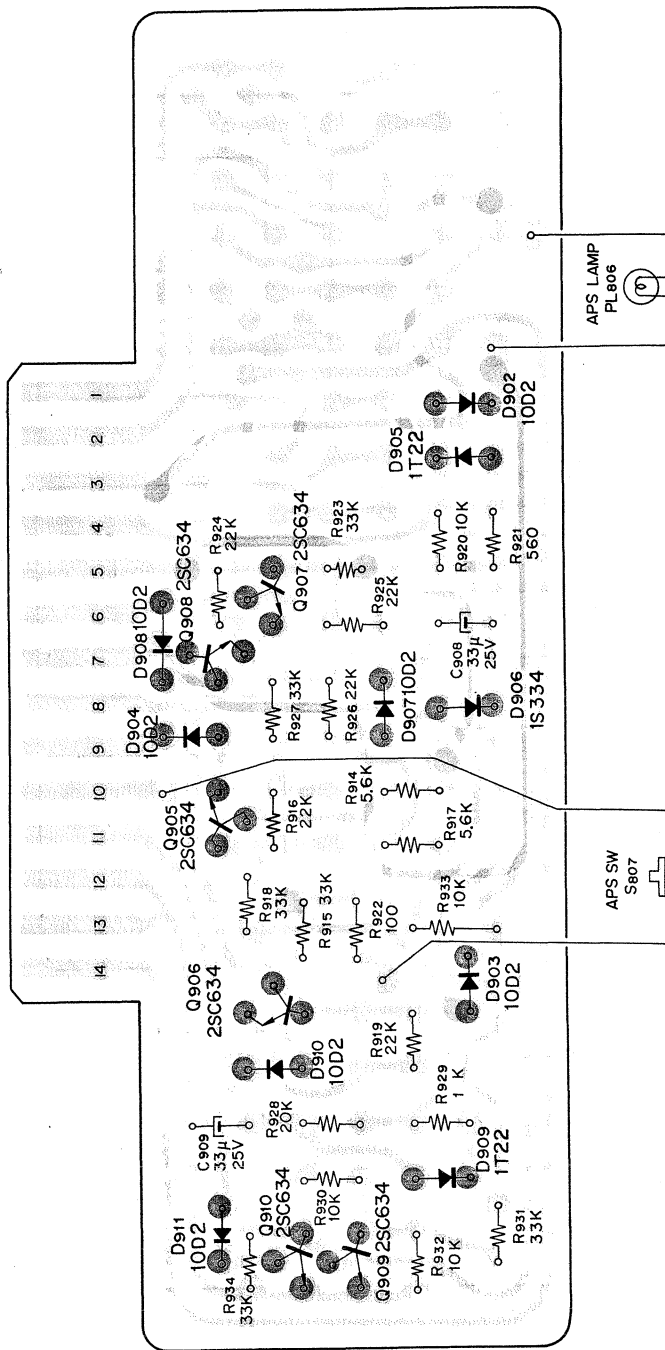


Printed Circuit Board
 Part No. 1-539-635-11

6-8. System Control Circuit Board (3)
- Component Side -

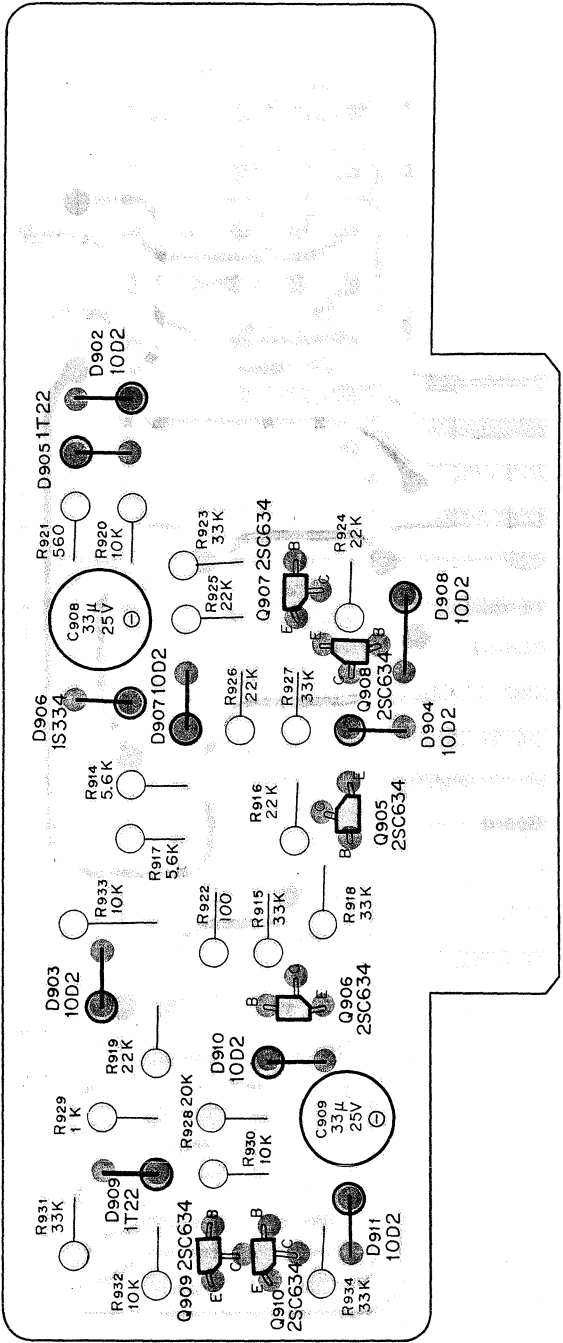


6-9. APS Circuit Board
 - Conductor Side -

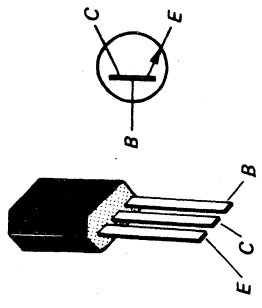


Printed Circuit Board
 Part No. 1-539-568-11

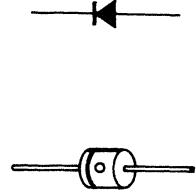
6-9. APS Circuit Board
 - Component Side -



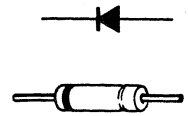
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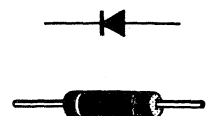
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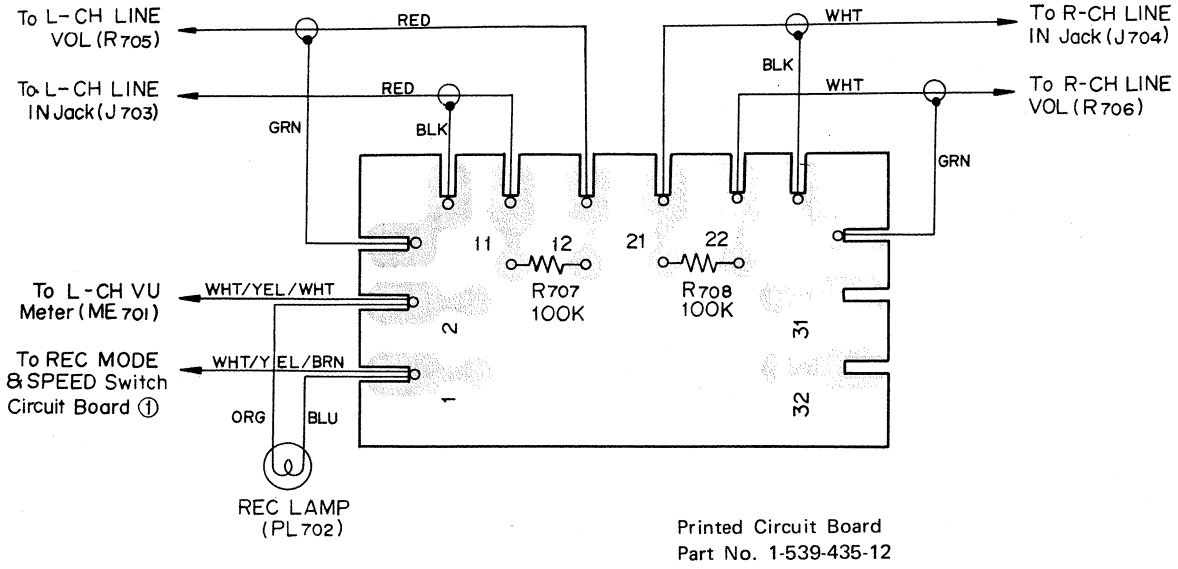
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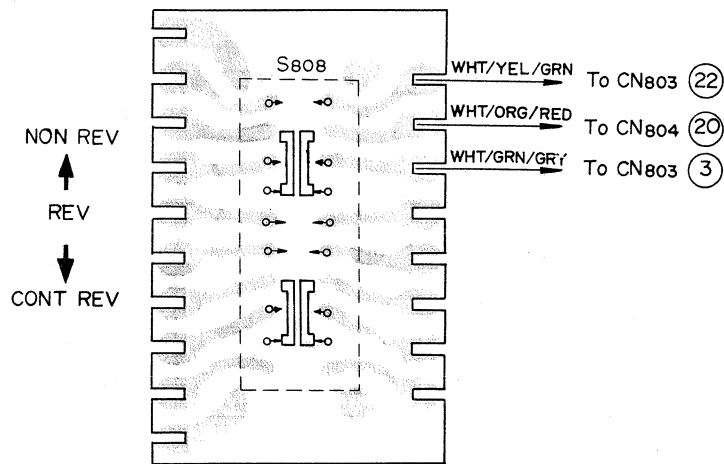
1S334



6-10. Resistor Terminal Circuit Board
 — Conductor Side —



6-11. ARV Switch Circuit Board
 — Conductor Side —



Printed Circuit Board
 Part No. 1-539-443-11

7. ELECTRICAL PARTS LIST

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
MOUNTED CIRCUIT BOARDS		
X-31409-60-02	REC amp.	
X-31429-71-03	PB amp.	
X-31429-81-02	bias osc.	
X-31429-78-02	headphone amp.	
X-31429-82-01	REC mode & speed switch	
X-31429-57-01	resistor terminal	
X-31409-65-01	ECHO & SOS	
X-31429-75-03	system control (1)	
X-31429-76-04	system control (2)	
X-31429-77-01	system control (3)	
X-31429-82-01	APS	
X-31429-58-01	ARV switch	

PRINTED CIRCUIT BOARDS		
1-539-431-14	REC amp.	
1-539-432-12	sub. (REC amp.)	
1-539-641-11	PB amp.	
1-539-558-12	bias osc.	
1-539-563-12	sub. (bias osc.)	
1-539-642-11	headphone amp.	
1-539-565-11	REC mode & speed switch	
1-539-435-12	resistor terminal	
1-539-560-11	ECHO & SOS	
1-539-633-12	system control (1)	
1-539-634-12	system control (2)	
1-539-635-11	system control (3)	
1-539-568-11	APS	
1-539-443-11	ARV switch	
1-539-436-11	head connector	
1-539-437-11	docking	
1-539-663-11	pilot lamp holding	

RECORD AMP CIRCUIT

SEMICONDUCTORS			
Q101, 201	transistor	2SC631A	
Q102, 202	transistor	2SA610	
Q103, 203	transistor	2SC631A	
Q104, 204	transistor	2SC634A	
Q105, 205	transistor	2SC634A	
Q106, 206	transistor	2SC634A	
D101, 201	diode	10D-2	
D102, 202	diode	10D-2	
D103, 203	diode	10D-2	
D104, 204	diode	10D-2	
COILS			
L101, 201	1-231-069	equalizer	1.45/1.8 mH
L102, 202	1-231-069	equalizer	1.45/1.8 mH

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
CAPACITORS		
C101, 201	1-121-416	100μF 25V electrolytic
C102, 202	1-121-398	10μF 25V electrolytic
C103, 203	1-121-398	10μF 25V electrolytic
C104, 204	1-105-661-12	0.001μF 50V mylar
C105, 205	1-121-413	100μF 6.3V electrolytic
C106, 206	1-121-398	10μF 25V electrolytic
C107, 207	1-105-661-12	0.001μF 50V mylar
C108, 208	1-121-398	10μF 25V electrolytic
C109, 209	1-121-413	100μF 6.3V electrolytic
C110, 210	1-121-416	100μF 25V electrolytic
C111, 211	1-121-395	4.7μF 25V electrolytic
C112, 212	1-105-661-12	0.001μF 50V mylar
C113, 213	1-105-661-12	0.001μF 50V mylar
C114, 214	1-121-413	100μF 6.3V electrolytic
C115, 215	1-121-395	4.7μF 25V electrolytic
C116, 216	1-105-661-12	0.001μF 50V mylar
C117, 217	1-121-409	47μF 16V electrolytic
C118, 218	1-121-395	4.7μF 25V electrolytic
C119, 219	1-121-395	4.7μF 25V electrolytic
C120, 220	1-121-395	4.7μF 25V electrolytic
C121, 221	1-105-661-12	0.001μF 50V mylar
C122, 222	1-105-661-12	0.001μF 50V mylar
C123, 223	1-107-127	68pF 50V silvered mica
C124, 224	1-121-403	33μF 16V electrolytic
C125, 225	1-121-413	100μF 6.3V electrolytic
C126, 226	1-121-398	10μF 25V electrolytic
C127, 227	1-105-689-12	0.22μF 50V mylar
C128, 228	1-121-416	100μF 25V electrolytic
C129, 229	1-105-671-12	0.0068μF 50V mylar
C130, 230	1-121-413	100μF 6.3V electrolytic
C131, 231	1-105-685-12	0.1μF 50V mylar
C132, 232	1-105-681-12	0.047μF 50V mylar
C133, 233	1-105-681-12	0.047μF 50V mylar
C134, 234	1-105-677-12	0.022μF 50V mylar
C135, 235	1-121-398	10μF 25V electrolytic
C136, 236	1-121-398	10μF 25V electrolytic
C137, 237	1-121-398	10μF 25V electrolytic
C138, 238	1-121-398	10μF 25V electrolytic

RESISTORS		
All resistors are 1/4W, carbon type, unless otherwise specified.		
R101, 201	1-242-705	22kΩ
R102, 202	1-242-701	15kΩ
R103, 203	1-242-723	120kΩ
R104, 204	1-242-690	5.1kΩ
R105, 205	1-242-704	20kΩ
R106, 206	1-242-661	330Ω
R107, 207	1-242-701	15kΩ
R108, 208	1-242-704	20kΩ
R109, 209	1-242-690	5.1kΩ
R110, 210	1-242-661	330Ω

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
R111, 211	1-242-681	2.2kΩ
R112, 212	1-242-713	47kΩ
R113, 213	1-242-729	220kΩ
R114, 214	1-242-657	220Ω
R115, 215	1-242-681	2.2kΩ
R116, 216	1-242-691	5.6kΩ
R117, 217	1-242-713	47kΩ
R118, 218	1-242-729	220kΩ
R119, 219	1-242-657	220Ω
R120, 220	1-242-681	2.2kΩ
R121, 221	1-242-691	5.6kΩ
R122, 222	1-242-661	330Ω
R123, 223	1-242-690	5.1kΩ
R124, 224	1-242-692	6.2kΩ
R125, 225	1-221-383	10kΩ (B) semi-fixed
R126, 226	1-242-681	2.2kΩ
R127, 227	1-242-707	27kΩ
R128, 228	1-242-725	150kΩ
R129, 229	1-242-685	3.3kΩ
R130, 230	1-242-709	33kΩ
R131, 231	1-242-665	470Ω
R132, 232	1-242-709	33kΩ
R133, 233	1-242-661	330Ω
R134, 234	1-242-673	1kΩ
R135, 235	1-242-700	13kΩ
R136, 236	1-242-649	100Ω
R137, 237	1-242-681	2.2kΩ
R138, 238	1-242-673	1kΩ
R139, 239	1-242-697	10kΩ
R140, 240	1-242-733	330kΩ
R141, 241	1-242-697	10kΩ
R142, 242	1-242-733	330kΩ
R143, 243	1-242-697	10kΩ
R144, 244	1-242-733	330kΩ
R145, 245	1-242-697	10kΩ
R146, 246	1-242-733	330kΩ
R147, 247	1-242-633	22Ω
R148, 248	1-242-633	22Ω
R149, 249	1-242-633	22Ω
R150, 250	1-242-633	22Ω

PLAYBACK AMP CIRCUIT

SEMICONDUCTORS

Q301, 351 Q401, 451	transistor	2SC631A
Q302, 352 Q402, 452	transistor	2SC631A
Q303, 403	transistor	2SC634A
Q304, 404	transistor	2SC634A
Q305, 355 Q405, 455	transistor	2SC634A

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
D301, 351 D401, 451		diode 10D-2
D302, 352 D402, 452		diode 10D-2
COIL		
L301, 401	1-407-298	trap 4.7mH
CAPACITORS		
C301, 351 C401, 451	1-121-391	1μF 50V electrolytic
C302, 352 C402, 452	1-121-410	47μF 25V electrolytic
C303, 353 C403, 453	1-121-413	100μF 6.3V electrolytic
C304, 354 C404, 454	1-105-661-12	0.001μF 50V mylar
C305, 355 C405, 455	1-107-107	10pF 50V silvered mica
C306, 356 C406, 456	1-121-403	33μF 16V electrolytic
C307, 357 C407, 457	1-121-416	100μF 25V electrolytic
C308, 358 C408, 458	1-121-398	10μF 25V electrolytic
C309, 359 C409, 459	1-105-675-12	0.015μF 50V mylar
C310, 410	1-107-242	390pF 50V silvered mica
C311, 411	1-121-391	1μF 50V electrolytic
C312, 412	1-121-416	100μF 25V electrolytic
C313, 413	1-105-661-12	0.001μF 50V mylar
C314, 414	1-121-410	47μF 25V electrolytic
C315	1-107-125	56pF 50V silvered mica
C316	1-121-409	47μF 16V electrolytic
C317, 417	1-121-398	10μF 25V electrolytic
C318, 368 C418, 468	1-121-398	10μF 25V electrolytic
C319, 419	1-121-410	47μF 25V electrolytic

RESISTORS

All resistors ¼W, carbon type, unless otherwise specified.

R301, 351 R401, 451	1-242-666	510Ω
R302, 352 R402, 452	1-242-739	560kΩ
R303, 353 R403, 453	1-242-752	150kΩ
R304, 354 R404, 454	1-242-721	100kΩ

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	
R305, 355 R405, 455	1-242-647	82 Ω	
R306, 356 R406, 456	1-242-707	27k Ω	
R307, 357 R407, 457	1-242-692	6.2k Ω	
R308, 358 R408, 458	1-242-692	6.2k Ω	
R309, 359 R409, 459	1-242-731	270k Ω	
R310, 360 R410, 460		- discarded -	
R311, 361 R411, 461	1-242-685	3.3k Ω	
R312, 362 R412, 462	1-242-657	220 Ω	
R313, 363 R413, 463	1-221-311	5k Ω (B)	semi-fixed
R314, 364 R414, 464	1-242-673	1k Ω	
R315, 365 R415, 465	1-221-311	5k Ω (B)	semi-fixed
R316, 366 R416, 466	1-242-709	33k Ω	
R317, 417	1-242-679	1.8k Ω	
R318, 368 R418, 468	1-242-705	22k Ω	
R319, 369 R419, 469	1-242-707	27k Ω	
R320, 370 R420, 470	1-242-693	6.8 Ω	
R321, 371 R421, 471	1-242-697	10k Ω	
R322, 372 R422, 472	1-242-707	27k Ω	
R323, 373 R423, 473	1-242-685	3.3k Ω	
R324, 374 R424, 474		- discarded -	
R325, 375 R425, 475	1-242-699	12k Ω	
R326, 376 R426, 476		- discarded -	
R327, 377 R427, 477		- discarded -	
R328, 428	1-242-681	2.2k Ω	
R329, 429	1-242-705	22k Ω	
R330, 430	1-242-729	220k Ω	
R331, 431	1-242-705	22k Ω	
R332, 432	1-242-709	33k Ω	
R333, 433	1-242-677	1.5k Ω	
R334, 434	1-242-665	470 Ω	
R335, 435	1-242-707	27k Ω	

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	
R336, 436	1-242-677	1.5k Ω	
R337, 437	1-242-663	390 Ω	
R338, 438	1-242-657	220 Ω	
R339, 439		- discarded -	
R340, 440	1-242-721	100k Ω	

BIAS OSC CIRCUIT

SEMICONDUCTORS

Q501		transistor	2SC634A
Q502		transistor	2SC634A
Q503		transistor	2SC634A
D501		diode	10D-2

COILS

L501	1-231-069	equalizer	1.8 mH
L502	1-231-069	equalizer	1.8 mH
L503	1-409-038	dummy	1 mH
L504	1-409-038	dummy	1 mH

MICROINDUCTORS

L505	1-407-198	2.2 mH
L506	1-407-198	2.2 mH

TRANSFORMER

T501	1-433-145	bias osc.
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CAPACITORS

C501	1-107-188	620pF	500V	silvered mica
C502	1-107-188	620pF	500V	silvered mica
C503	1-121-416	100 μ F	25V	electrolytic
C504	1-121-404	33 μ F	25V	electrolytic
C505		- discarded -		
C506	1-121-391	1 μ F	50V	electrolytic
C507	1-107-188	620pF	500V	silvered mica
C508	1-107-188	620pF	500V	silvered mica
C509	1-105-663-12	0.0015 μ F	50V	mylar
C510	1-109-508	3,900pF	500V	dipped mica
C511	1-141-076	30~200pF		trimmer
C512	1-141-076	30~200pF		trimmer
C513	1-107-181	330pF	500V	silvered mica
C514	1-107-181	330pF	500V	silvered mica
C515	1-107-188	620pF	500V	silvered mica
C516	1-107-188	620pF	500V	silvered mica

RESISTORS

R501	1-242-649	100 Ω	$\frac{1}{4}$ W	carbon
R502	1-242-693	6.8k Ω	$\frac{1}{4}$ W	carbon
R503	1-242-625	10 Ω	$\frac{1}{4}$ W	carbon
R504	1-242-625	10 Ω	$\frac{1}{4}$ W	carbon
R505	1-242-625	10 Ω	$\frac{1}{4}$ W	carbon

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	
R506	1-242-725	150k Ω	¼W carbon
R507	1-242-725	150k Ω	¼W carbon
R508	1-242-667	560 Ω	¼W carbon

MISCELLANEOUS

RY501	1-515-127	relay, 650 Ω	24V
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HEADPHONE AMP CIRCUIT

SEMICONDUCTORS

Q601, 602		transistor	2SC634A
D601, 602		diode	1T22
D611, 612		diode	1T22

TRANSFORMERS

T601, 611	1-427-284	headphone	
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CAPACITORS

C601, 611	1-121-442	1 μ F	50V electrolytic
C602, 612	1-121-472	10 μ F	25V electrolytic
C603, 613	1-121-472	10 μ F	25V electrolytic
C604, 614	1-121-396	4.7 μ F	50V electrolytic
C605, 615	1-121-442	1 μ F	50V electrolytic

RESISTORS

R601, 611	1-242-681	2.2k Ω	¼W carbon
R602, 612	1-242-697	10k Ω	¼W carbon
R603, 613	1-242-697	10k Ω	¼W carbon
R604, 614	1-242-721	100k Ω	¼W carbon
R605, 615	1-242-737	470k Ω	¼W carbon
R606, 616	1-242-723	120k Ω	¼W carbon
R607, 617	1-242-681	2.2k Ω	¼W carbon
R608, 618	1-221-997	2.2k Ω (B)	semi-fixed

RECORD MODE & SPEED SWITCH CIRCUIT

SEMICONDUCTORS

D701		diode	10D-2
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CAPACITORS

C701	1-109-501	910pF	500V dipped mica
C702	1-105-689-12	0.22 μ F	50V mylar
C703	1-105-689-12	0.22 μ F	50V mylar

RESISTORS

R713	1-242-673	1k Ω	¼W carbon
R714	1-242-673	1k Ω	¼W carbon
R715	1-242-673	1k Ω	¼W carbon

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	
SWITCHES			
S701	1-514-482	1-key,	TAPE SPEED
S702, 703	1-514-728	2-key,	REC MODE

AMP CHASSIS CIRCUIT

RESISTORS

R701	1-242-691	5.6k Ω	¼W carbon
R702	1-242-691	5.6k Ω	¼W carbon
R703, 704	1-222-369	20k Ω (A)	variable (MIC)
R705, 706	1-222-369	20k Ω (A)	variable (LINE INPUT)
R707, R708		– described in resistor terminal circuit board unit –	
R709	1-242-691	5.6k Ω	¼W carbon
R710	1-242-691	5.6k Ω	¼W carbon
R711, 712	1-222-313	50k Ω (B)	variable (SOS & ECHO)
R716	1-242-684	3k Ω	¼W carbon
R717	1-242-684	3k Ω	¼W carbon
R718, 719	1-222-314	20k Ω (B)	variable (PB)

JACKS

J703	1-507-142	phono, LINE INPUT (L-CH)
J704	1-507-142	phono, LINE INPUT (R-CH)
J705	1-509-029	DIN CONNECTOR, REC/PB
J706	1-507-142	phono, LINE OUTPUT (L-CH)
J707	1-507-142	phono, LINE OUTPUT (R-CH)
J708	1-507-282	binaural, HEADPHONE
J709		– discarded –
J710		– discarded –
J711	1-507-281	miniature, MIC (L-CH)
J721	1-507-281	miniature, MIC (R-CH)

CONNECTORS

CN701~705	1-507-300	22P, printed circuit board
CN706	1-508-400	3P, nylon
CN707	1-539-437-11	22P, docking; printed circuit board
CN708	1-508-421	9P, nylon (male)

SWITCHES

S704	1-514-324	slide, TAPE SELECTOR
S705		– discarded –
S706	1-514-692	lever, MONITOR
S707	1-514-692	lever, MONITOR

METERS

ME701	1-524-067	VU
ME702	1-524-067	VU

MISCELLANEOUS

TM701	1-536-179	terminal strip, 1-L-1
	1-508-411	terminal, pin (male)

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
LAMPS		
PL701		L-CH VU meter – built in VU meter –
PL702		L-CH REC
PL703		R-CH VU meter – built in VU meter –
PL704		R-CH REC

RESISTOR TERMINAL CIRCUIT

RESISTORS				
R707	1-242-721	100kΩ	¼W	carbon
R708	1-242-721	100kΩ	¼W	carbon

ECHO & SOS CIRCUIT

CAPACITORS				
C801	1-105-673-12	0.01μF	50V	mylar
C802	1-103-863	330pF	50V	polystyrol
C803	1-103-863	330pF	50V	polystyrol
C804	1-105-673-12	0.01μF	50V	mylar

RESISTORS				
R801	1-242-715	56kΩ	¼W	carbon
R802	1-242-723	120kΩ	¼W	carbon
R803		– discarded –		
R804	1-242-715	56kΩ	¼W	carbon
R805	1-242-723	120kΩ	¼W	carbon

SWITCH		
S705	1-514-693	3 position lever, SOS/OFF/ECHO

SYSTEM CONTROL (1) CIRCUIT

SEMICONDUCTORS		
Q001~014	transistor	2SC634
Q015~018	transistor	2SC756
D001~039	diode	1T22 (A)

CAPACITORS				
C001	1-121-398	10μF	25V	electrolytic
C002		– discarded –		
C003	1-105-673-12	0.01μF	50V	mylar
C004	1-105-673-12	0.01μF	50V	mylar
C005	1-121-398	10μF	25V	electrolytic
C006	1-121-416	100μF	25V	electrolytic
C007	1-121-416	100μF	25V	electrolytic
C008	1-105-671-12	0.0068μF	50V	mylar
C009	1-105-671-12	0.0068μF	50V	mylar
C010	1-105-671-12	0.0068μF	50V	mylar
C011	1-121-391	1μF	50V	electrolytic

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
RESISTORS		
All resistors are ¼W, carbon type, unless otherwise specified.		
R001	1-242-697	10kΩ
R002	1-203-894	3.3kΩ
R003	1-242-721	100kΩ
R004	1-242-691	5.6kΩ
R005	1-242-705	22kΩ
R006	1-242-705	22kΩ
R007	1-242-709	33kΩ
R008	1-242-685	3.3kΩ
R009	1-242-697	10kΩ
R010	1-242-693	6.8kΩ
R011	1-242-673	1kΩ
R012	1-242-673	1kΩ
R013	1-242-705	22kΩ
R014	1-242-705	22kΩ
R015	1-244-715	56kΩ
R016		– discarded –
R017	1-242-715	56kΩ
R018		– discarded –
R019	1-244-697	10kΩ
R020	1-244-697	10kΩ
R021	1-244-697	10kΩ
R022	1-242-715	56kΩ
R023	1-242-705	22kΩ
R024	1-242-681	2.2kΩ
R025	1-242-705	22kΩ
R026	1-244-697	10kΩ
R027	1-244-697	10kΩ
R028	1-242-715	56kΩ
R029	1-242-705	22kΩ
R030	1-242-681	2.2kΩ
R031	1-242-705	22kΩ
R032	1-244-697	10kΩ
R033	1-244-697	10kΩ
R034	1-242-705	22kΩ
R035	1-242-705	22kΩ
R036	1-242-681	2.2kΩ
R037	1-242-705	22kΩ
R038	1-242-673	1kΩ
R039	1-242-705	22kΩ
R040	1-242-693	6.8kΩ
R041	1-242-697	10kΩ
R042	1-242-705	22kΩ
R043	1-242-689	4.7kΩ
R044	1-242-697	10kΩ
R045	1-242-697	10kΩ
R046	1-242-673	1kΩ
R047	1-242-673	1kΩ
R048	1-242-693	6.8kΩ
R049	1-242-693	6.8kΩ
R050	1-242-693	6.8kΩ

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
R051	1-242-693	6.8kΩ
R052	1-242-705	22kΩ
R053	1-242-705	22kΩ
R054	1-242-693	6.8kΩ
R055	1-242-693	6.8kΩ
R056	1-242-693	6.8kΩ
R057	1-244-693	6.8kΩ
R058	1-242-705	22kΩ
R059	1-242-705	22kΩ
R060	1-242-705	22kΩ
R061	1-242-705	22kΩ
R062		- discarded -
R063	1-244-673	1kΩ
R064	1-244-673	1kΩ
R065	1-242-673	1kΩ
R066		- discarded -
R067	1-242-705	22kΩ
R068	1-242-705	22kΩ

SYSTEM CONTROL (2) CIRCUIT

SEMICONDUCTORS

Q1~14	transistor	2SC634
D1~4	diode	10D-2
D5	diode, zener	1S334
D6	diode	10D-2
D7~11	diode	1T22 (A)
D12	diode, zener	1S334
D13	diode	10D-2

COIL

L1	1-407-212	33mH
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CAPACITORS

C1	1-105-753-12	0.01μF	200V	mylar
C2	1-105-753-12	0.01μF	200V	mylar
C3	1-121-388	1,000μF	35V	electrolytic
C4	1-121-388	1,000μF	35V	electrolytic
C5	1-121-416	100μF	25V	electrolytic
C6	1-105-673-12	0.01μF	50V	mylar
C7	1-121-388	1,000μF	35V	electrolytic
C8	1-103-791	4,700pF	50V	polystyrol
C9	1-103-791	4,700pF	50V	polystyrol
C10	1-105-677-12	0.022μF	50V	mylar
C11	1-105-689-12	0.22μF	50V	mylar
C12	1-121-398	10μF	25V	electrolytic
C13	1-105-685-12	0.1μF	50V	mylar
C14	1-105-671-12	0.0068μF	50V	mylar
C15	1-107-125	56pF	50V	silvered mica
C16	1-121-398	10μF	25V	electrolytic
C17	1-121-391	1μF	50V	electrolytic

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
C18	1-121-416	100μF 25V electrolytic
C19	1-121-398	10μF 25V electrolytic
C20	1-121-398	10μF 25V electrolytic
C21	1-105-683-12	0.068μF 50V mylar
C22	1-121-403	33μF 16V electrolytic
C23	1-121-395	4.7μF 25V electrolytic
C24	1-121-395	4.7μF 25V electrolytic
C25	1-121-404	33μF 25V electrolytic
C26	1-121-398	10μF 25V electrolytic

RESISTORS

All resistors are 1/4W, carbon type, unless otherwise specified.

R1	1-242-677	1.5kΩ
R2	1-242-689	4.7kΩ
R3		- discarded -
R4	1-242-665	470Ω
R5	1-242-689	4.7kΩ
R6	1-222-804	1kΩ (B) semi-fixed
R7	1-242-685	3.3kΩ
R8	1-242-689	4.7kΩ
R9	1-242-705	22kΩ
R10	1-242-685	3.3kΩ
R11	1-242-705	22kΩ
R12	1-242-683	2.7kΩ
R13	1-242-681	2.2kΩ
R14	1-242-677	1.5kΩ
R15	1-242-689	4.7kΩ
R16	1-242-705	22kΩ
R17	1-242-677	1.5kΩ
R18	1-242-705	22kΩ
R19	1-242-705	22kΩ
R20	1-242-715	56kΩ
R21	1-242-709	33kΩ
R22	1-242-705	22kΩ
R23	1-242-705	22kΩ
R24	1-242-719	82kΩ
R25	1-242-725	150kΩ
R26	1-242-709	33kΩ
R27	1-242-699	12kΩ
R28	1-242-683	2.7kΩ
R29	1-242-683	2.7kΩ
R30	1-242-685	3.3kΩ
R31	1-242-681	2.2kΩ
R32	1-242-697	10kΩ
R33	1-242-691	5.6kΩ
R34	1-242-705	22kΩ
R35	1-242-681	2.2kΩ
R36	1-242-715	56kΩ
R37	1-242-705	22kΩ
R38	1-242-691	5.6kΩ
R39	1-242-705	22kΩ
R40	1-242-697	10kΩ

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	
R41	1-242-721	100k Ω	
R42	1-242-721	100k Ω	
R43	1-242-721	100k Ω	
R44	1-242-673	1k Ω	
R45	1-242-697	10k Ω	
R46	1-257-825	10 Ω	½W
R47	1-242-691	5.6k Ω	
R48	1-242-697	10k Ω	
R49	1-242-693	6.8k Ω	
R50	1-242-705	22k Ω	
R51	1-242-697	10k Ω	
R52	1-242-691	5.6k Ω	
R53	1-242-691	5.6k Ω	
R54	1-242-673	1k Ω	
R55	1-242-709	33k Ω	
R56	1-242-705	22k Ω	

SYSTEM CONTROL (3) CIRCUIT

SEMICONDUCTORS

D81~85 diode 10D-2

RELAYS

RY81	1-515-127	REW,	680 Ω	29.5 mA	DC24V
RY82	1-515-127	F.F.,	680 Ω	29.5 mA	DC24V
RY83	1-515-127	PLAY,	680 Ω	29.5 mA	DC24V
RY84	1-515-127	REV,	680 Ω	29.5 mA	DC24V
RY85	1-515-127	SPEED,	680 Ω	29.5 mA	DC24V

ENCAPSULATED COMPONENTS

CP81~88 1-101-534 0.1 μ F + 120 Ω 500 V

CONNECTORS

CN81	1-508-417-21	12P (red)
CN82	1-508-418-21	9P (red)

MISCELLANEOUS

1-535-041 pin terminal

MECHA CHASSIS CIRCUIT

SEMICONDUCTORS

Q801	transistor	2SD28
Q802	transistor	2SD28
Q803	transistor	2SD28
D801	diode	10D-2
D802	diode	10D-2
D803	diode	10D-2

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
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TRANSFORMER

T801 1-441-650 power

CAPACITORS

C801	1-117-040	2 μ F + 0.5 μ F	300V, MP
C802	1-117-054	0.5 μ F	350V, MP
C803	1-117-054	0.5 μ F	350V, MP
C804	1-117-082	4 μ F	250V, MP
C805	1-117-082	4 μ F	250V, MP

WIRE WOUND RESISTORS

R801	1-205-447	50 Ω	25W
R802	1-205-503	68 Ω	40W
R803	1-207-273	5.1 Ω	1.5W
R804	1-207-273	5.1 Ω	1.5W

CONNECTORS

CN801	1-509-341	POWER OUTPUT, UNSWITCHED
CN802	1-509-062	POWER SUPPLY
CN803	1-507-300	22P, system control circuit board (1)
CN804	1-507-300	22P, system control circuit board (2)
CN805	1-507-300	22P, system control circuit board (3)
CN806		- included in mechanical parts -
CN807	1-507-301	18P, head assembly
CN808	1-507-307	14P
CN809	1-509-371	3P
CN810	1-509-377	9P, DOCKING, (white)
CN811	1-509-379	12P, POWER SUPPLY, (red)
CN812	1-509-381	9P, CAPSTAN MOTOR, (red)
CN813	1-507-255	11P (socket), REMOTE CONTROL
CN814	1-506-180	dummy plug, REMOTE CONTROL

SWITCHES

S801	1-514-057	micro, REC
S802	1-514-057	micro, REVERSE FF
S803	1-514-057	micro, REWIND
S804	1-514-057	micro, STOP
S805	1-514-057	micro, PLAY
S806	1-514-057	micro, FORWARD FF
S807	1-514-057	micro, APS
S808	1-514-693	3-position, lever; AUTO REV
S809	1-514-531-12	POWER FREQUENCY
S810	1-514-531-12	POWER
S811	1-509-064	VOLTAGE SELECTOR
S812	1-514-530	micro, AUTO SHUT-OFF

ENCAPSULATED COMPONENTS

CP801	1-101-534	0.1 μ F + 120 Ω	500V
CP802	1-101-534	0.1 μ F + 120 Ω	500V

SOLENOIDS

PM801	1-454-052	pinch roller
PM802	1-454-053	brake

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
MOTORS		
M801	8-836-624-09	reel; induction; left (UC-624K1)
M802	8-831-634-15	capstan; synchronous (HC-634D6)
M803	8-836-624-07	reel; induction; right (UC-624K)

SOCKETS		
PLB1	1-517-018	lamp
PLB2	1-517-018	lamp
PLB3	1-517-018	lamp
PLB4	1-517-018	lamp
PLB5	1-517-018	lamp

LAMPS		
PL801	1-518-053-11	RECORD
PL802	1-518-053-11	REWIND
PL803	1-518-053-11	REVERSE PLAY
PL804	1-518-053-11	FORWARD PLAY
PL805	1-518-053-11	FF
PL806	1-518-053-11	APS

TERMINAL STRIP		
TM801	1-536-151	2-L-2
TM802	1-536-213	5P
TM803	1-536-179	1-L-1, C type

MISCELLANEOUS		
	1-533-048	holder, fuse
F	1-532-100	fuse, 2A
	1-509-372	pin terminal
	3-140-900	cord, ribbon

HEAD DECK UNIT

HEADS		
PBH1	8-829-142-20	playback (PP102-4202)
PBH2	8-829-142-20	playback (PP102-4202)
REC-H	8-824-629-20	record (RP102-2902)
ERASE-H	8-826-629-25	erase (EF18-2902A1)
S-H	1-459-051	sensing

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
APS CIRCUIT		

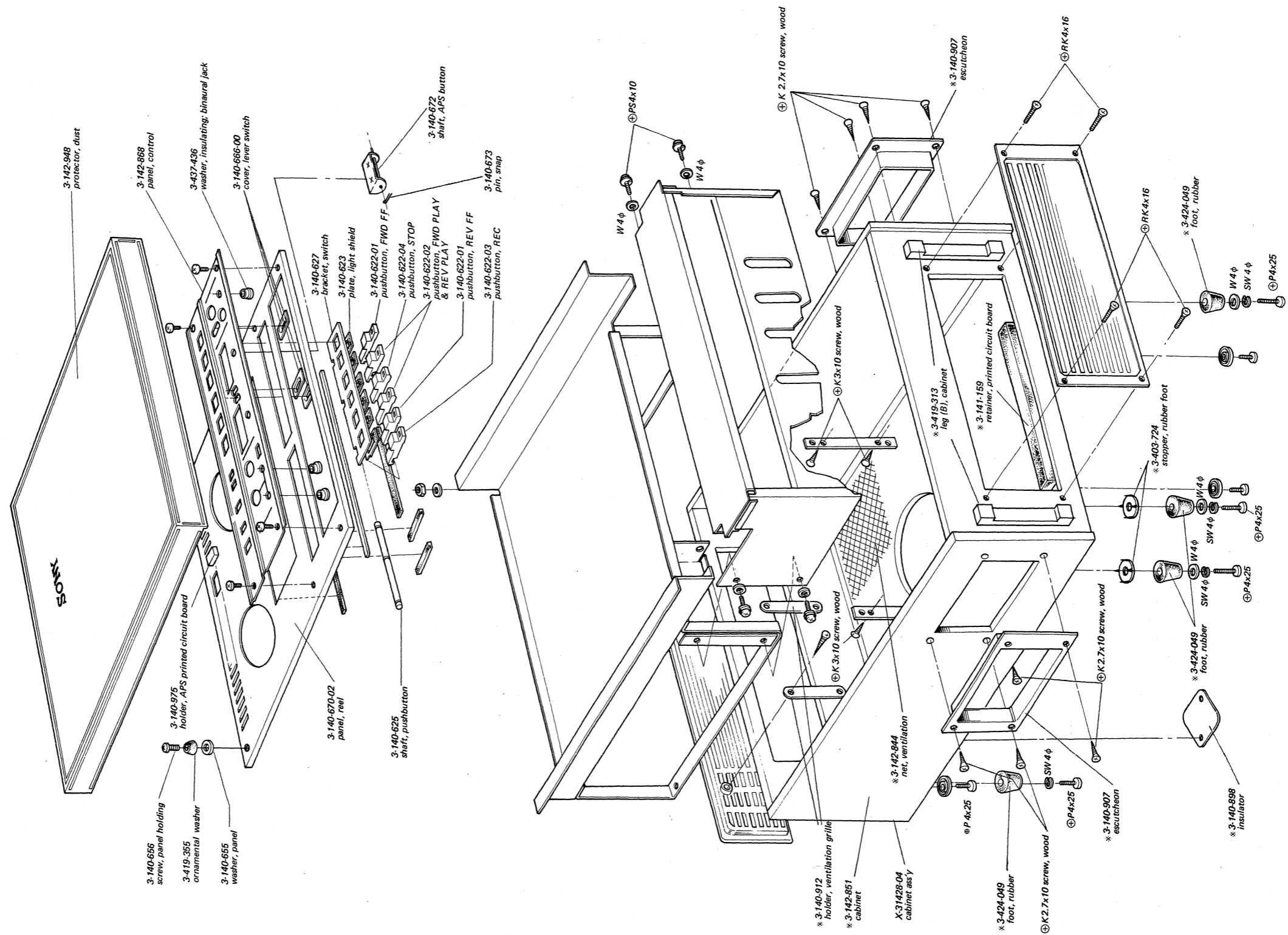
SEMICONDUCTORS		
Q905~910		transistor 2SC634A
D902		diode 10D-2
D903		diode 10D-2
D904		diode 10D-2
D905		diode 1T22 (A)
D906		diode, zener 1S334
D907		diode 10D-2
D908		diode 10D-2
D909		diode 1T22 (A)
D910		diode 10D-2
D911		diode 10D-2

CAPACITORS			
C908	1-121-286	33 μ F	25 V electrolytic
C909	1-121-286	33 μ F	25 V electrolytic

RESISTORS		
All resistors are 1/4W, carbon type, unless otherwise specified.		
R914	1-242-691	5.6k Ω
R915	1-242-709	33k Ω
R916	1-242-705	22k Ω
R917	1-242-691	5.6k Ω
R918	1-242-709	33k Ω
R919	1-242-705	22k Ω
R920	1-242-697	10k Ω
R921	1-242-667	560 Ω
R922	1-242-649	100 Ω
R923	1-242-709	33k Ω
R924	1-242-705	22k Ω
R925	1-242-705	22k Ω
R926	1-242-705	22k Ω
R927	1-242-709	33k Ω
R928	1-242-704	20k Ω
R929	1-242-673	1k Ω
R930	1-242-697	10k Ω
R931	1-242-709	33k Ω
R932	1-242-697	10k Ω
R933	1-242-697	10k Ω
R934	1-242-709	33k Ω

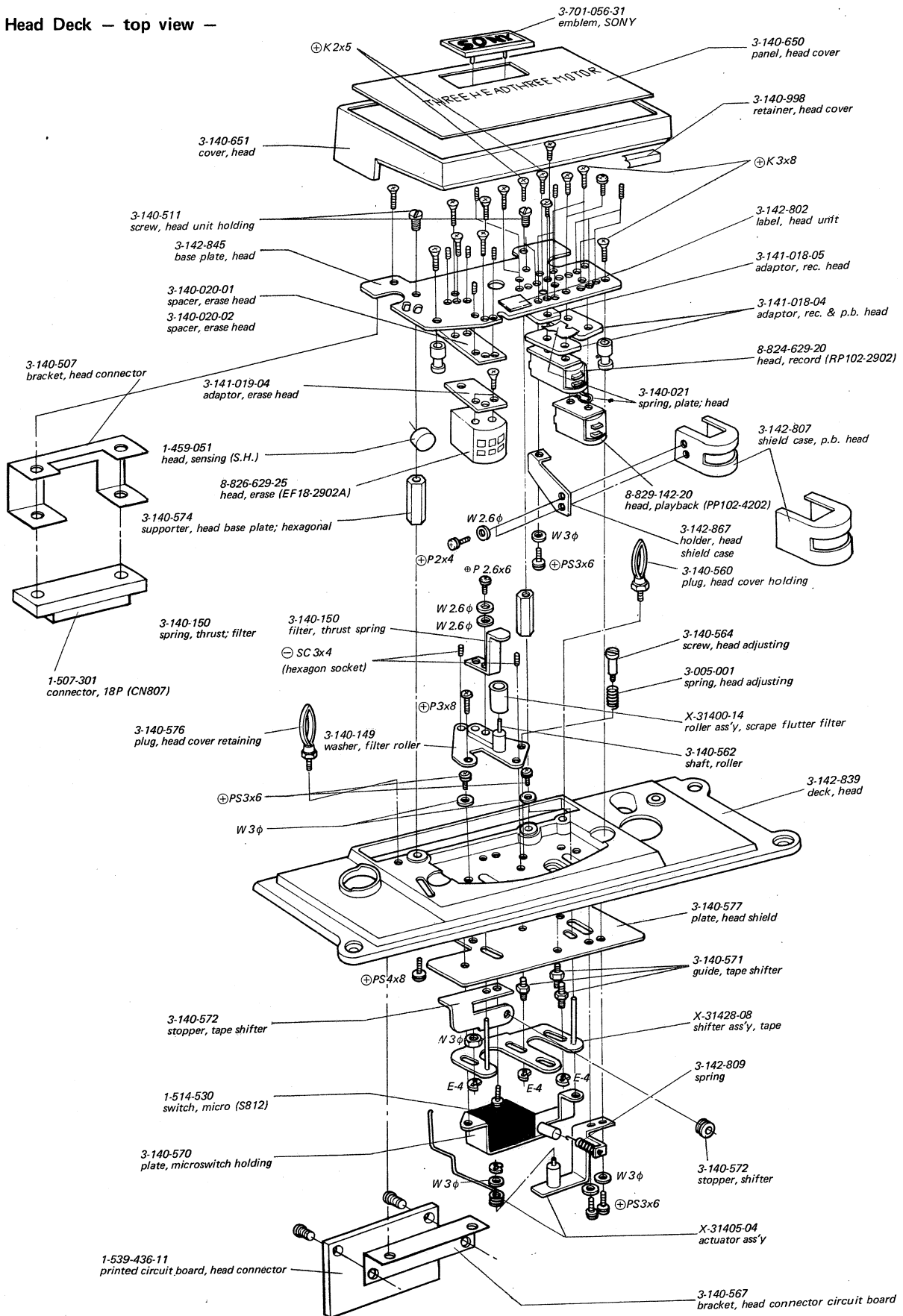
TC-651 TC-651

8. EXPLODED VIEWS
8-1. Cabinet — top view —

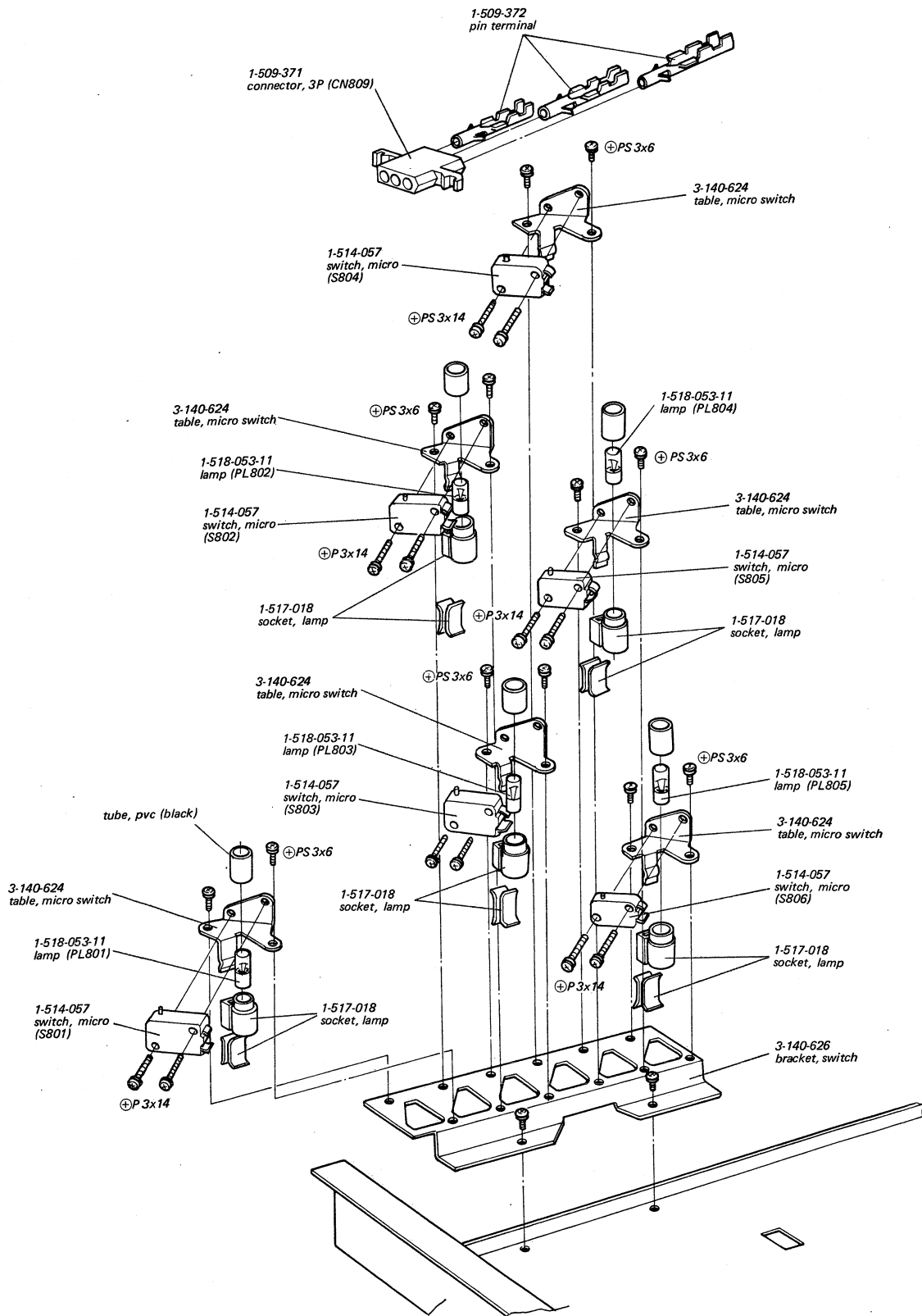


Parts marked with * are included in cabinet ass'y (X-31428-04).

8-3. Head Deck — top view —

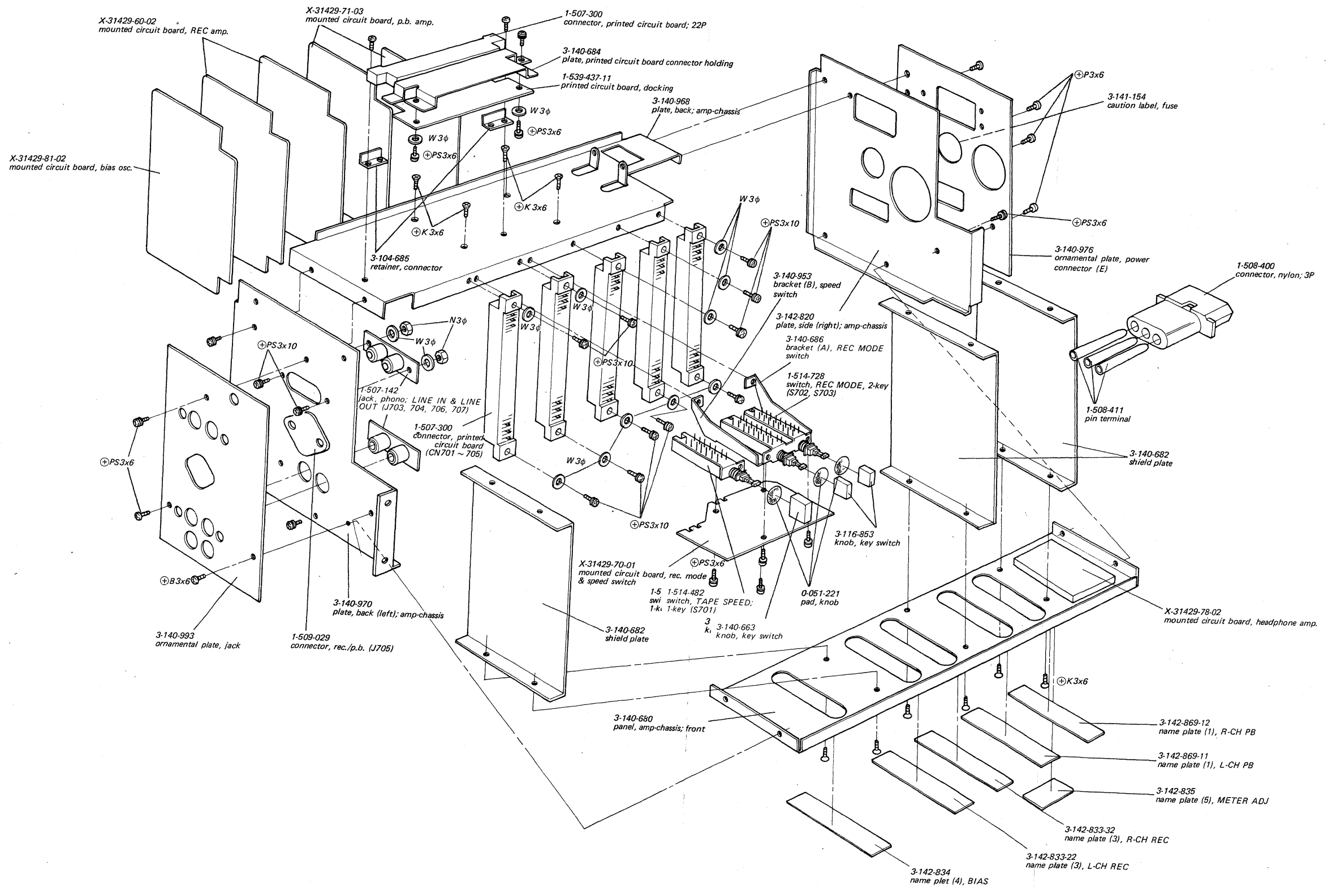


8-4. Microswitches View

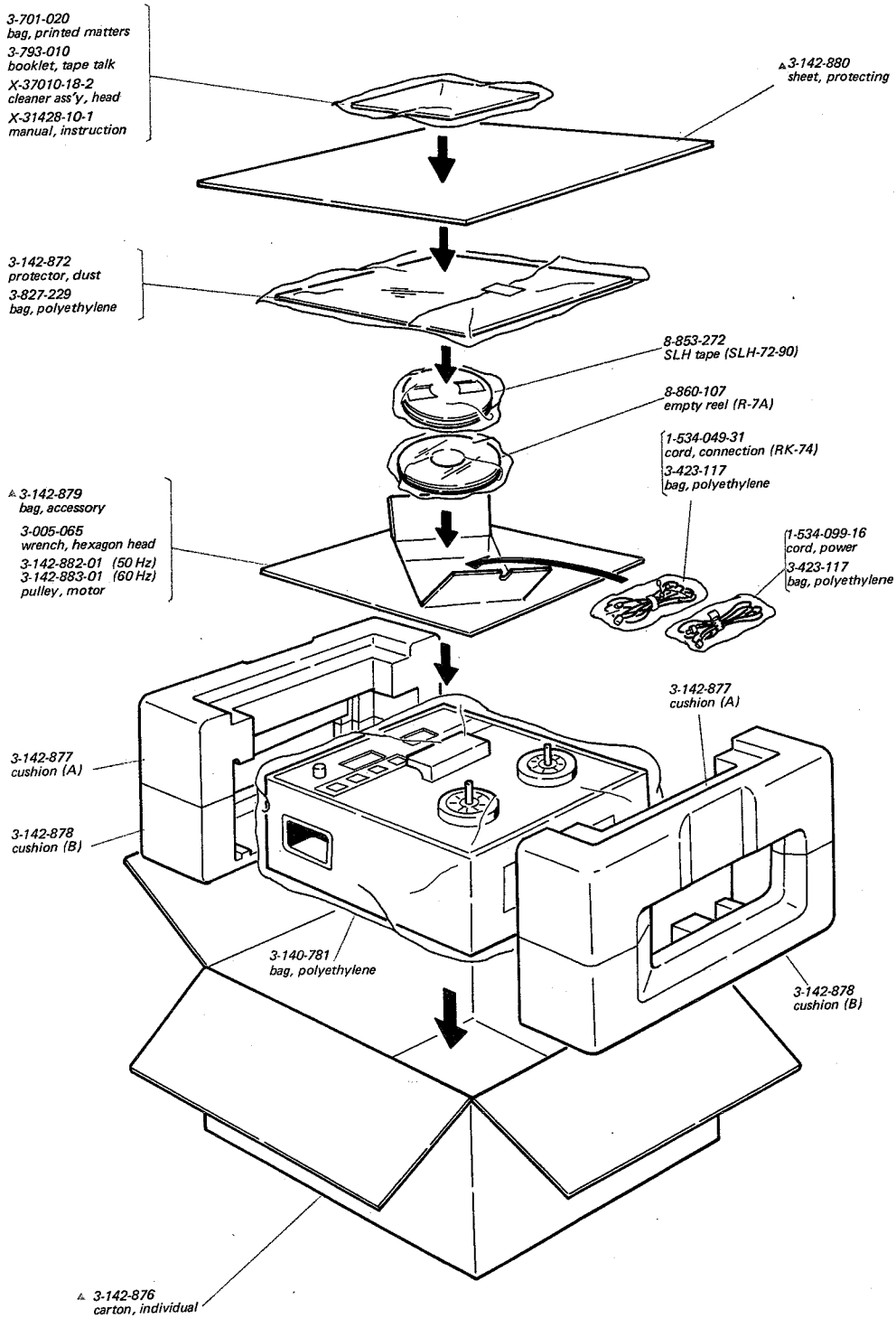


TC-651 TC-651

8-7. Amp. Chassis Panel — top view —



8-10. Packing



Parts marked with ▲ are included in carton ass'y (X-31428-15).