<ART-038-0>

SERVICE MANUAL

CASSETTE TAPE DECK

CT-5151

KCU, PBV

NOTE:

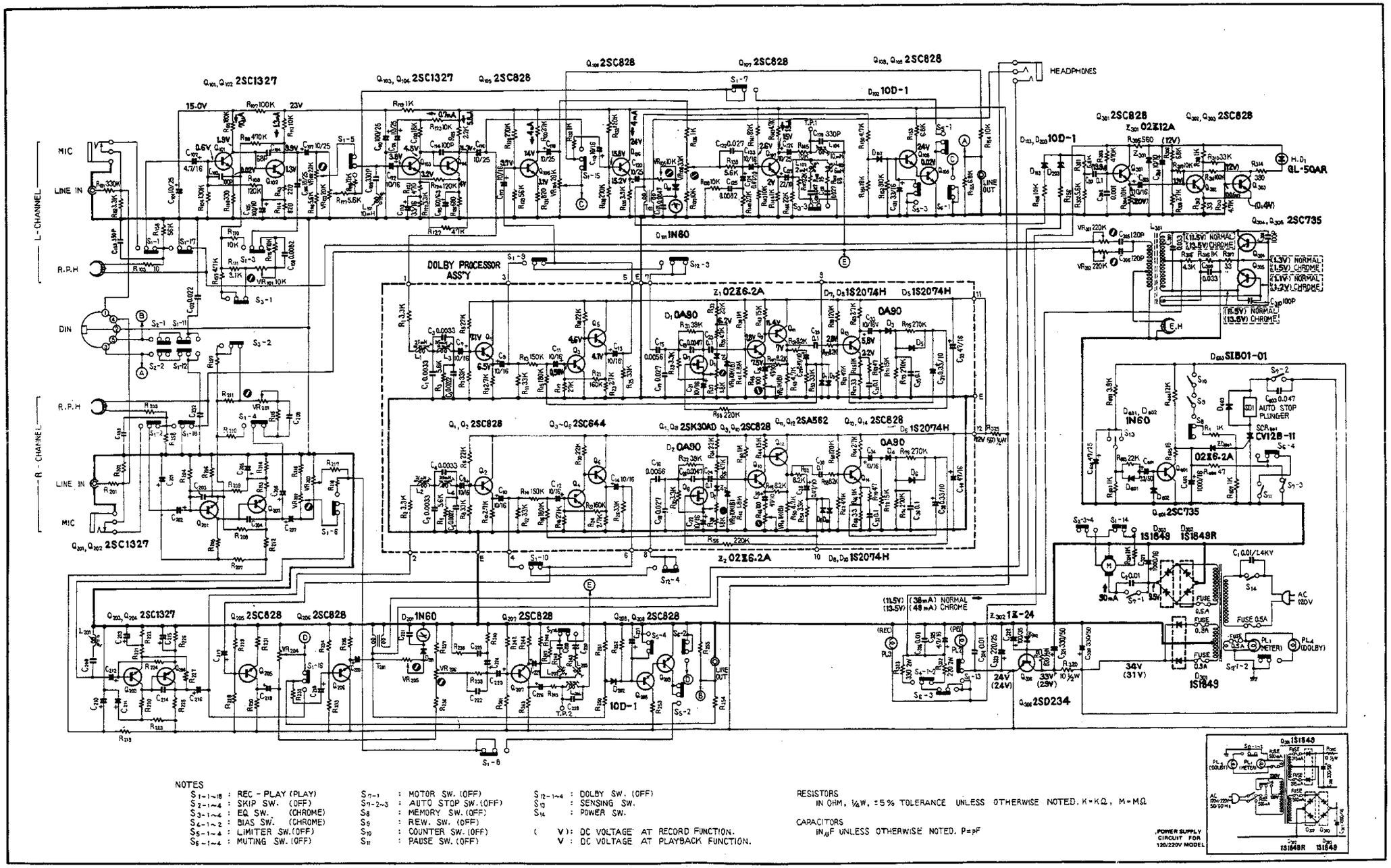
MODEL CT-5151 COMES IN TWO VERSIONS DISTINGUISHED AS FOLLOWS:

Round label on rear panel	Voltage	Type
KCU	120V only	CSA (Canada) and UL (U.S.A.) approved
PBV	120V/220V	SEMCO (Sweden), NEMCO (Norway), DEMCO (Denmark) and SEV (Switzerland) approved

<74A02Y31H>

PIONEER®

9.2 SCHEMATIC DIAGRAM



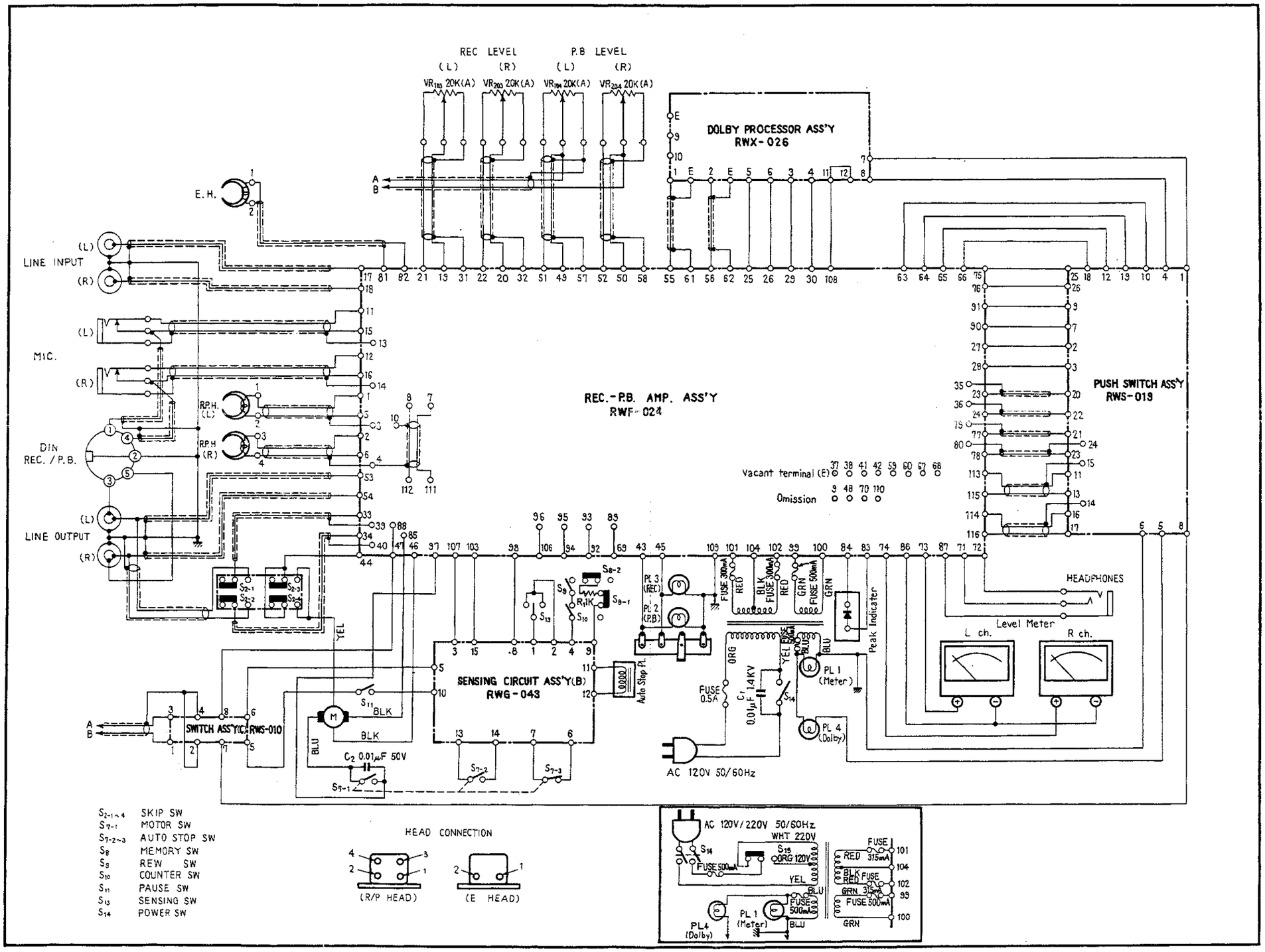
NOTES

$S_{1-1\sim18}$	: REC - PLAY (PLAY)	S_{7-1}	: MOTOR SW. (OFF)	$S_{12-1\sim4}$	: DOLBY SW. (OFF)
$S_{2-1\sim4}$	: SKIP SW. (OFF)	$S_{7-2\sim3}$	: AUTO STOP SW. (OFF)	S_{13}	: SENSING SW.
$S_{3-1\sim4}$	: EQ SW. (CHROME)	S_8	: MEMORY SW. (OFF)	S_{14}	: POWER SW.
$S_{4-1\sim2}$	: BIAS SW. (CHROME)	S_9	: REW. SW. (OFF)		
$S_{5-1\sim4}$	: LIMITER SW. (OFF)	S_{10}	: COUNTER SW. (OFF)	( )	: DC VOLTAGE AT RECORD FUNCTION.
$S_{6-1\sim4}$	: MUTING SW. (OFF)	S_{11}	: PAUSE SW. (OFF)		: DC VOLTAGE AT PLAYBACK FUNCTION.

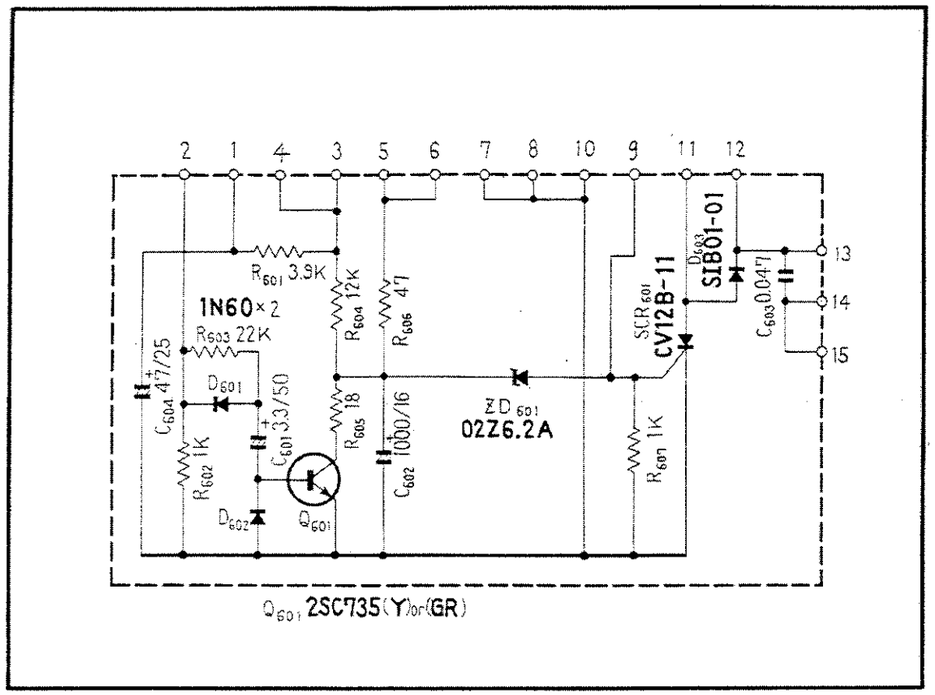
RESISTORS
IN OHM, 1/4W, ±5% TOLERANCE UNLESS OTHERWISE NOTED. K=KΩ, M=MΩ

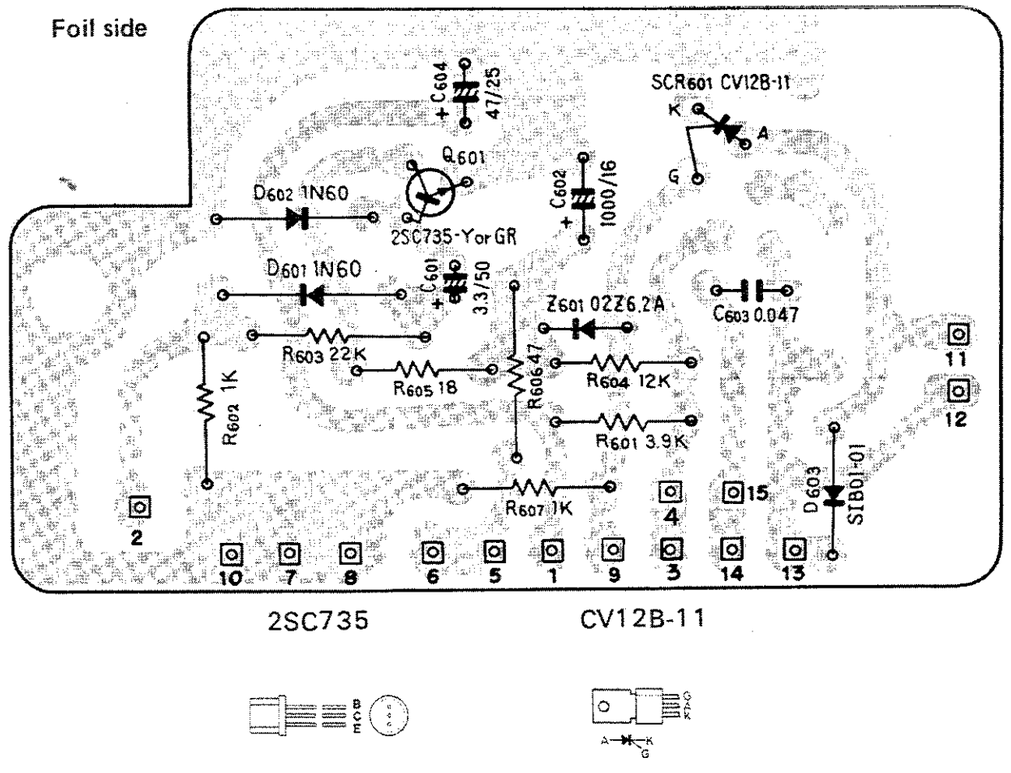
CAPACITORS
IN μF UNLESS OTHERWISE NOTED. P=pF

9.3 CONNECTION DIAGRAM



9.4 SENSING CIRCUIT ASSEMBLY (B) (RWG-043-A)





2SC735 CV12B-11

- CAPACITORS: IN μF UNLESS OTERWISE NOTED p: pF
- RESISTORS: INΩ, ¼W UNLESS OTHERWISE NOTED k: kΩ, M: MΩ

Parts List of Sensing Circuit Assembly (B)

CAPACITORS

Symbol	Description			Part No.	
C601	Electrolytic	3.3	50V	CEA 3R3P 50	
C602	Electrolytic	1,000	16V	CEA 102P 16	
C603	Mylar	0.04⁻	50V	CQMA 473K 50	
C604	Electrolytic	47	25V	CEA 470P 25	

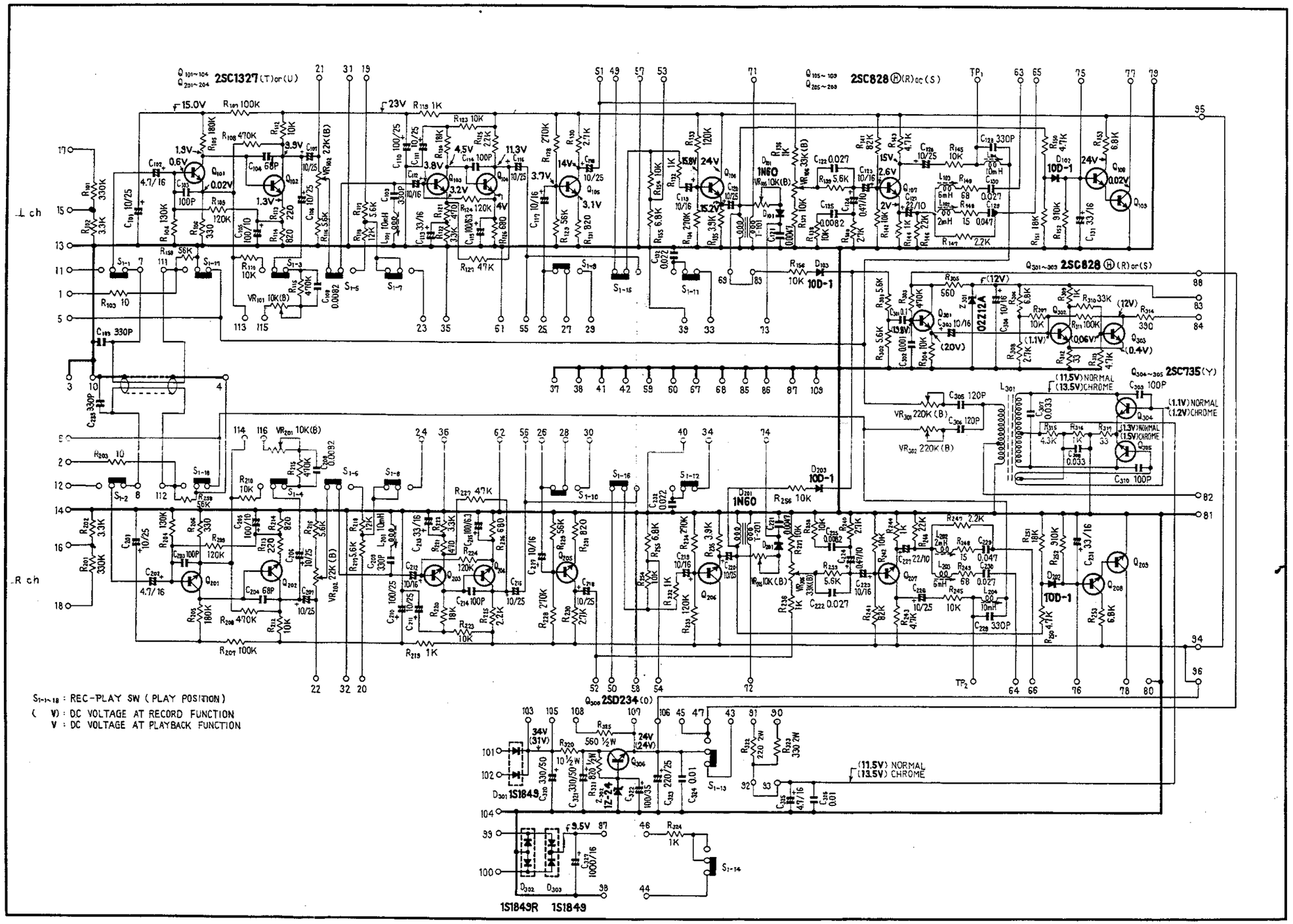
RESISTORS

Symbol	Description		Part No.	
R601	Carbon film	3.9k	RD¼PS 392J	
R602	Carbon film	1k	RD¼PS 102J	
R603	Carbon film	22k	RD¼PS 223J	
R604	Carbon film	12k	RD¼PS 123J	
R605	Carbon film	18	RD¼PS 180J	
R606	Carbon film	47	RD¼PS 470J	
R607	Carbon film	1k	RD¼PS 102J	

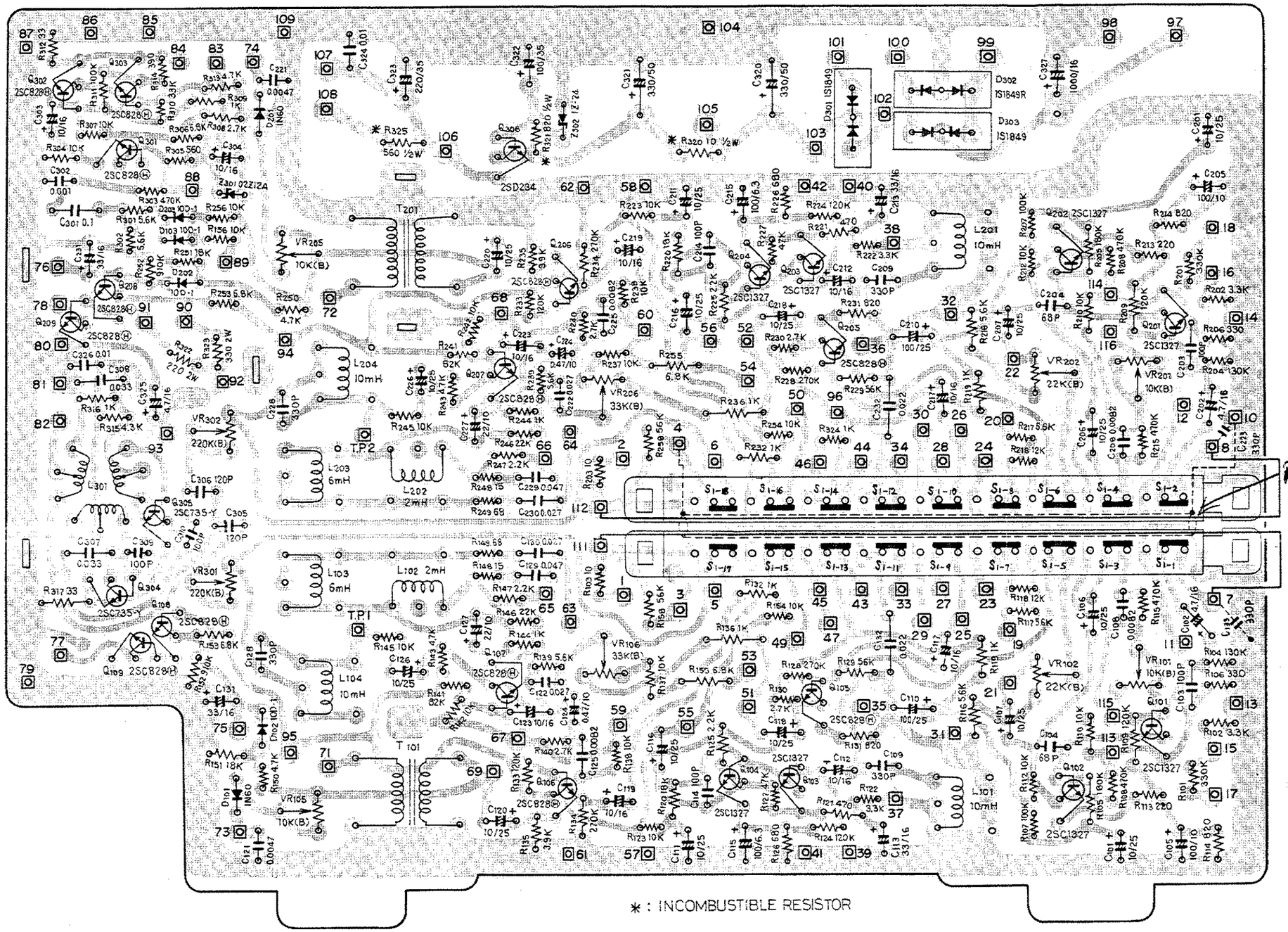
SEMICONDUCTORS

Symbol	Description		Part No.	
Q601	Transistor	2SC735-Y (or GR)		
SCR601	Thyristor	CV12B-11		
ZD601	Zener diode	02Z6.2A		
D601	Diode	1N60		
D602	Diode	1N60		
D603	Diode	SIB01-01		

9.5 REC/PB AMPLIFIER ASSEMBLY (RWF-024-0)



Foil side



2SC828
2SC1327

2SC735

2SD234

• CAPACITORS: IN μF UNLESS OTHERWISE NOTED p: pF
• RESISTORS: INΩ, ¼W UNLESS OTHERWISE NOTED k: kΩ, M: MΩ

Parts List of REC/PB Amplifier Assembly

CAPACITORS

Symbol	Description			Part No.	
C101	Electrolytic	10	25V	CEA 100P 25	
C102	Electrolytic	4.7	16V	RCH-014-0	Tantalum
C103	Ceramic	100p	50V	CCDSL 101K 50	
C104	Styrol	68p	50V	RCE-020-0	
C105	Electrolytic	100	10V	CEA 101P 10	
C106	Electrolytic	10	25V	CEA 100P 25	
C107	Electrolytic	10	25V	CEA 100P 25	
C108	Mylar	0.0082	50V	CQMA 822K 50	
C109	Styrol	330p	50V	RCE-008-0	
C110	Electrolytic	100	25V	CEA 101P 25	
C111	Electrolytic	10	25V	CEA 100P 25	
C112	Electrolytic	10	16V	CEA 100P 16	
C113	Electrolytic	33	16V	CEA 330P 16	
C114	Styrol	100p	50V	RCE-003-0	
C115	Electrolytic	100	6.3V	CEA 101P 6R3	
C116	Electrolytic	10	25V	CEA 100P 25	
C117	Electrolytic	10	16V	CEA 100P 16	
C118	Electrolytic	10	25V	CEA 100P 25	
C119	Electrolytic	10	16V	CEA 100P 16	
C120	Electrolytic	10	25V	CEA 100P 25	
C121	Mylar	0.0047	50V	CQMA 472K 50	
C122	Mylar	0.027	50V	CQMA 273K 50	
C123	Electrolytic	10	16V	CEA 100P 16	
C124	Electrolytic	0.47	10V	CSSA R47M 10	Aluminum solid
C125	Mylar	0.0082	50V	CQMA 822K 50	
C126	Electrolytic	10	25V	CEA 100P 25	
C127	Electrolytic	22	10V	CEA 220P 10	
C128	Styrol	330p	50V	RCE-008-0	
C129	Mylar	0.047	50V	CQMA 473K 50	
C130	Mylar	0.027	50V	CQMA 273K 50	
C131	Electrolytic	33	16V	CEA 330P 16	
C132	Mylar	0.022	50V	CQMA 223K 50	
C133	Styrol	330p	50V	RCE-008-0	
C134~ C200	Vacancies				
C201	Electrolytic	10	25V	CEA 100P 25	
C202	Electrolytic	4.7	16V	RCH-014-0	Tantalum
C203	Ceramic	100p	50V	CCDSL 101K 50	
C204	Styrol	68p	50V	RCE-020-0	
C205	Electrolytic	100	10V	CEA 101P 10	
C206	Electrolytic	10	25V	CEA 100P 25	
C207	Electrolytic	10	25V	CEA 100P 25	
C208	Mylar	0.0082	50V	CQMA 822K 50	
C209	Styrol	330p	50V	RCE-008-0	
C210	Electrolytic	100	25V	CEA 101P 25	

Symbol	Description			Part No.	
C211	Electrolytic	10	25V	CEA 100P 25	
C212	Electrolytic	10	16V	CEA 100P 16	
C213	Electrolytic	33	16V	CEA 330P 16	
C214	Styrol	100p	50V	RCE-003-0	
C215	Electrolytic	100	6.3V	CEA 101P 6R3	
C216	Electrolytic	10	25V	CEA 100P 25	
C217	Electrolytic	10	16V	CEA 100P 16	
C218	Electrolytic	10	25V	CEA 100P 25	
C219	Electrolytic	10	16V	CEA 100P 16	
C220	Electrolytic	10	25V	CEA 100P 25	
C221	Mylar	0.0047	50V	CQMA 472K 50	
C222	Mylar	0.027	50V	CQMA 273K 50	
C223	Electrolytic	10	16V	CEA 100P 16	
C224	Electrolytic	0.47	10V	CSSA R47M 10	Aluminum solid
C225	Mylar	0.0082	50V	CQMA 822K 50	
C226	Electrolytic	10	25V	CEA 100P 25	
C227	Electrolytic	22	10V	CEA 220P 10	
C228	Styrol	330p	50V	RCE-008-0	
C229	Mylar	0.047	50V	CQMA 473K 50	
C230	Mylar	0.027	50V	CQMA 273K 50	
C231	Electrolytic	33	16V	CEA 330P 16	
C232	Mylar	0.022	50V	CQMA 223K 50	
C233	Styrol	330p	50V	RCE-008-0	
C234~ C300	Vacancies				
C301	Mylar	0.1	50V	CQMA 104K 50	
C302	Mylar	0.001	50V	CQMA 102K 50	
C303	Electrolytic	10	16V	CEA 100P 16	
C304	Electrolytic	10	16V	CEA 100P 16	
C305	Styrol	120p	50V	RCE-009-0	
C306	Styrol	120p	50V	RCE-009-0	
C307	Mylar	0.033	50V	CQMA 333K 50	
C308	Mylar	0.033	50V	CQMA 333K 50	
C309	Ceramic	100p	50V	CCDSL 101K 50	
C310	Ceramic	100p	50V	CCDSL 101K 50	
C311~ C319	Vacancies				
C320	Electrolytic	330	50V	CEA 331P 50	
C321	Electrolytic	330	50V	CEA 331P 50	
C322	Electrolytic	100	35V	CEA 101P 35	
C323	Electrolytic	220	25V	CEA 221P 25	
C324	Mylar	0.01	50V	CQMA 103K 50	
C325	Electrolytic	4.7	16V	CEA 4R7P 16	
C326	Mylar	0.01	50V	CQMA 103K 50	
C327	Electrolytic	1,000	16V	CEA 102P 16	

RESISTORS

Symbol	Description		Part No.	
R101	Carbon film	330k	RD¼VS 334J	
R102	Carbon film	3.3k	RD¼VS 332J	
R103	Carbon film	10	RD¼VS 100J	
R104	Carbon film	130k	RD¼VS 134J	
R105	Carbon film	180k	RD¼VS 184J	
R106	Carbon film	330	RD¼VS 331J	
R107	Carbon film	100k	RD¼VS 104J	
R108	Carbon film	470k	RD¼VS 474J	
R109	Carbon film	120k	RD¼VS 124J	
R110	Carbon film	10k	RD¼VS 103J	
R111				
R112	Carbon film	10k	RD¼VS 103J	
R113	Carbon film	220	RD¼VS 221J	
R114	Carbon film	820	RD¼VS 821J	
R115	Carbon film	470k	RD¼VS 474J	
R116	Carbon film	5.6k	RD¼VS 562J	
R117	Carbon film	5.6k	RD¼VS 562J	
R118	Carbon film	12k	RD¼VS 123J	
R119	Carbon film	1k	RD¼VS 102J	
R120	Carbon film	18k	RD¼VS 183J	
R121	Carbon film	470	RD¼VS 471J	
R122	Carbon film	3.3k	RD¼VS 332J	
R123	Carbon film	10k	RD¼VS 103J	
R124	Carbon film	120k	RD¼VS 124J	
R125	Carbon film	2.2k	RD¼VS 222J	
R126	Carbon film	680	RD¼VS 681J	
R127	Carbon film	47k	RD¼VS 473J	
R128	Carbon film	270k	RD¼VS 274J	
R129	Carbon film	56k	RD¼VS 563J	
R130	Carbon film	2.7k	RD¼VS 272J	
R131	Carbon film	820	RD¼VS 821J	
R132	Carbon film	1k	RD¼VS 102J	
R133	Carbon film	120k	RD¼VS 124J	
R134	Carbon film	270k	RD¼VS 274J	
R135	Carbon film	3.9k	RD¼VS 392J	
R136	Carbon film	1k	RD¼VS 102J	
R137	Carbon film	10k	RD¼VS 103J	
R138	Carbon film	10k	RD¼VS 103J	
R139	Carbon film	5.6k	RD¼VS 562J	
R140	Carbon film	2.7k	RD¼VS 272J	
R141	Carbon film	82k	RD¼VS 823J	
R142	Carbon film	10k	RD¼VS 103J	
R143	Carbon film	4.7k	RD¼VS 472J	
R144	Carbon film	1k	RD¼VS 102J	
R145	Carbon film	10k	RD¼VS 103J	
R146	Carbon film	22k	RD¼VS 223J	
R147	Carbon film	2.2k	RD¼VS 222J	
R148	Carbon film	15	RD¼VS 150J	
R149	Carbon film	68	RD¼VS 680J	
R150	Carbon film	4.7k	RD¼VS 472J	

Symbol	Description	Part No.	
R151	Carbon film 18k	RD¼VS 183J	
R152	Carbon film 910k	RD¼VS 914J	
R153	Carbon film 6.8k	RD¼VS 682J	
R154	Carbon film 10k	RD¼VS 103J	
R155	Carbon film 6.8k	RD¼VS 682J	
R156	Carbon film 10k	RD¼VS 103J	
R157			
R158	Carbon film 56k	RD¼VS 563J	
R159~ R200	Vacancies		
R201	Carbon film 330k	RD¼VS 334J	
R202	Carbon film 3.3k	RD¼VS 332J	
R203	Carbon film 10	RD¼VS 100J	
R204	Carbon film 130k	RD¼VS 134J	
R205	Carbon film 180k	RD¼VS 184J	
R206	Carbon film 330	RD¼VS 331J	
R207	Carbon film 100k	RD¼VS 104J	
R208	Carbon film 470k	RD¼VS 474J	
R209	Carbon film 120k	RD¼VS 124J	
R210	Carbon film 10k	RD¼VS 103J	
R211			
R212	Carbon film 10k	RD¼VS 103J	
R213	Carbon film 220	RD¼VS 221J	
R214	Carbon film 820	RD¼VS 821J	
R215	Carbon film 470k	RD¼VS 474J	
R216	Carbon film 5.6k	RD¼VS 562J	
R217	Carbon film 5.6k	RD¼VS 562J	
R218	Carbon film 12k	RD¼VS 123J	
R219	Carbon film 1k	RD¼VS 102J	
R220	Carbon film 18k	RD¼VS 183J	
R221	Carbon film 470	RD¼VS 471J	
R222	Carbon film 3.3k	RD¼VS 332J	
R223	Carbon film 10k	RD¼VS 103J	
R224	Carbon film 120k	RD¼VS 124J	
R225	Carbon film 2.2k	RD¼VS 222J	
R226	Carbon film 680	RD¼VS 681J	
R227	Carbon film 47k	RD¼VS 473J	
R228	Carbon film 270k	RD¼VS 274J	
R229	Carbon film 56k	RD¼VS 563J	
R230	Carbon film 2.7k	RD¼VS 272J	
R231	Carbon film 820	RD¼VS 821J	
R232	Carbon film 1k	RD¼VS 102J	
R233	Carbon film 120k	RD¼VS 124J	
R234	Carbon film 270k	RD¼VS 274J	
R235	Carbon film 3.9k	RD¼VS 392J	
R236	Carbon film 1k	RD¼VS 102J	
R237	Carbon film 10k	RD¼VS 103J	
R238	Carbon film 10k	RD¼VS 103J	
R239	Carbon film 5.6k	RD¼VS 562J	
R240	Carbon film 2.7k	RD¼VS 272J	

Symbol	Description			Part No.	
R241	Carbon film	82k		RD¼VS 823J	
R242	Carbon film	10k		RD¼VS 103J	
R243	Carbon film	4.7k		RD¼VS 472J	
R244	Carbon film	1k		RD¼VS 102J	
R245	Carbon film	10k		RD¼VS 103J	
R246	Carbon film	22k		RD¼VS 223J	
R247	Carbon film	2.2k		RD¼VS 222J	
R248	Carbon film	15		RD¼VS 150J	
R249	Carbon film	68		RD¼VS 680J	
R250	Carbon film	4.7k		RD¼VS 472J	
R251	Carbon film	18k		RD¼VS 183J	
R252	Carbon film	910k		RD¼VS 914J	
R253	Carbon film	6.8k		RD¼VS 682J	
R254	Carbon film	10k		RD¼VS 103J	
R255	Carbon film	6.8k		RD¼VS 682J	
R256	Carbon film	10k		RD¼VS 103J	
R257					
R258	Carbon film	56k		RD¼VS 563J	
R259~ R300	Vacancies				
R301	Carbon film	5.6k		RD¼VS 562J	
R302	Carbon film	5.6k		RD¼VS 562J	
R303	Carbon film	470k		RD¼VS 474J	
R304	Carbon film	10k		RD¼VS 103J	
R305	Carbon film	560		RD¼VS 561J	
R306	Carbon film	6.8k		RD¼VS 682J	
R307	Carbon film	10k		RD¼VS 103J	
R308	Carbon film	2.7k		RD¼VS 272J	
R309	Carbon film	1k		RD¼VS 102J	
R310	Carbon film	33k		RD¼VS 333J	
R311	Carbon film	100k		RD¼VS 104J	
R312	Carbon film	33		RD¼VS 330J	
R313	Carbon film	4.7k		RD¼VS 472J	
R314	Carbon film	390		RD¼VS 391J	
R315	Carbon film	4.3k		RD¼VS 432J	
R316	Carbon film	1k		RD¼VS 102J	
R317	Carbon film	33		RD¼VS 330J	
R318~ R319	Vacancies				
R320	Carbon film	10	½W	RD½PSF 100J	Incombustibility
R321	Carbon film	820	½W	RD½PSF 821J	Incombustibility
R322	Metal oxide	220	2W	RS2P 221K	
R323	Metal oxide	330	2W	RS2P 331K	
R324	Carbon film	1k		RD¼VS 102J	
R325	Carbon film	560	½W	RD½PSF 561J	Incombustibility

POTENTIOMETERS

Symbol	Description		Part No.	
VR101	Semi-fixed	10K-B	C92-049-0	
VR102	Semi-fixed	22k-B	C92-857-0	
VR105	Semi-fixed	10k-B	C92-049-0	
VR106	Semi-fixed	33k-B	C81-426-0	
VR201	Semi-fixed	10k-B	C92-049-0	
VR202	Semi-fixed	22k-B	C92-857-0	
VR205	Semi-fixed	10k-B	C92-049-0	
VR206	Semi-fixed	33k-B	C81-426-0	
VR301	Semi-fixed	220k-B	RCP-005-0	
VR302	Semi-fixed	220k-B	RCP-005-0	

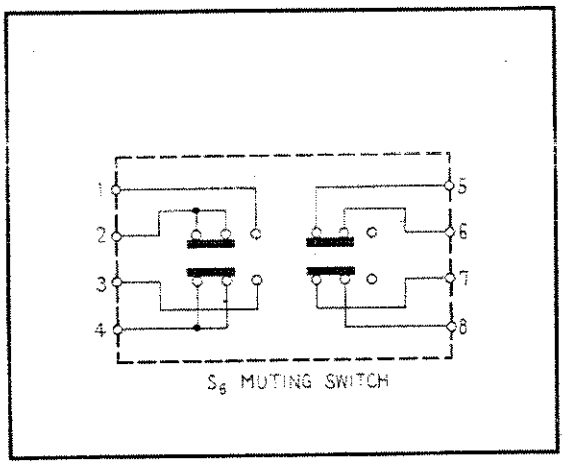
SEMICONDUCTORS

Symbol	Description		Part No.	
Q101	Transistor	2SC1327-T or U		
Q102	Transistor	2SC1327-T or U		
Q103	Transistor	2SC1327-T or U		
Q104	Transistor	2SC1327-T or U		
Q105	Transistor	2SC828Θ-R or S		
Q106	Transistor	2SC828Θ-R or S		
Q107	Transistor	2SC828Θ-R or S		
Q108	Transistor	2SC828Θ-R or S		
Q109	Transistor	2SC828Θ-R or S		
Q201	Transistor	2SC1327-T or U		
Q202	Transistor	2SC1327-T or U		
Q203	Transistor	2SC1327-T or U		
Q204	Transistor	2SC1327-T or U		
Q205	Transistor	2SC828Θ-R or S		
Q206	Transistor	2SC828Θ-R or S		
Q207	Transistor	2SC828Θ-R or S		
Q208	Transistor	2SC828Θ-R or S		
Q209	Transistor	2SC828Θ-R or S		
Q301	Transistor	2SC828Θ-R or S		
Q302	Transistor	2SC828Θ-R or S		
Q303	Transistor	2SC828Θ-R or S		
Q304	Transistor	2SC735-Y		
Q305	Transistor	2SC735-Y		
Q306	Transistor	2SD234-O		
D101	Diode	1N60		
D102	Diode	10D-1		
D103	Diode	10D-1		
D201	Diode	1N60		
D202	Diode	10D-1		
D203	Diode	10D-1		
D301	Diode	1S1849		
D302	Diode	1S1849R		
D303	Diode	1S1849		
Z301	Zener diode	02Z12A		
Z302	Zener diode	1Z24		

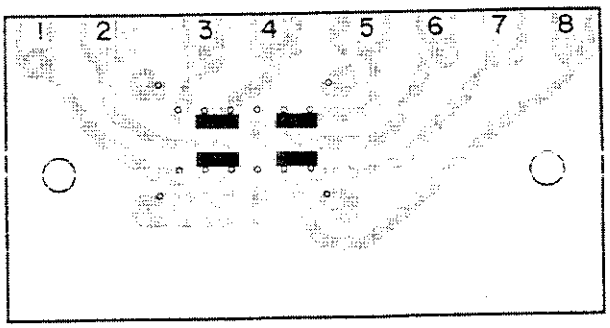
OTHERS

Symbol	Description	Part No.	
S1	Slide switch	RSH-~~011~~-C	
T101	Matching transformer	T61-408-A	
T201	Matching transformer	T61-408-A	
L101	Trap coil	T84-401-A	
L102	Peaking coil	RTF-007-0	
L103	Peaking coil (A)	RTF-002-0	
L104	Trap coil	T84-401-A	
L201	Trap coil	T84-401-A	
L202	Peaking coil	RTF-007-0	
L203	Peaking coil (A)	RTF-002-0	
L204	Trap coil	T84-401-A	
L301	Oscillator coil	T64-001-A	

9.6 SWITCH CIRCUIT ASSEMBLY (C) (RWS-010-0)



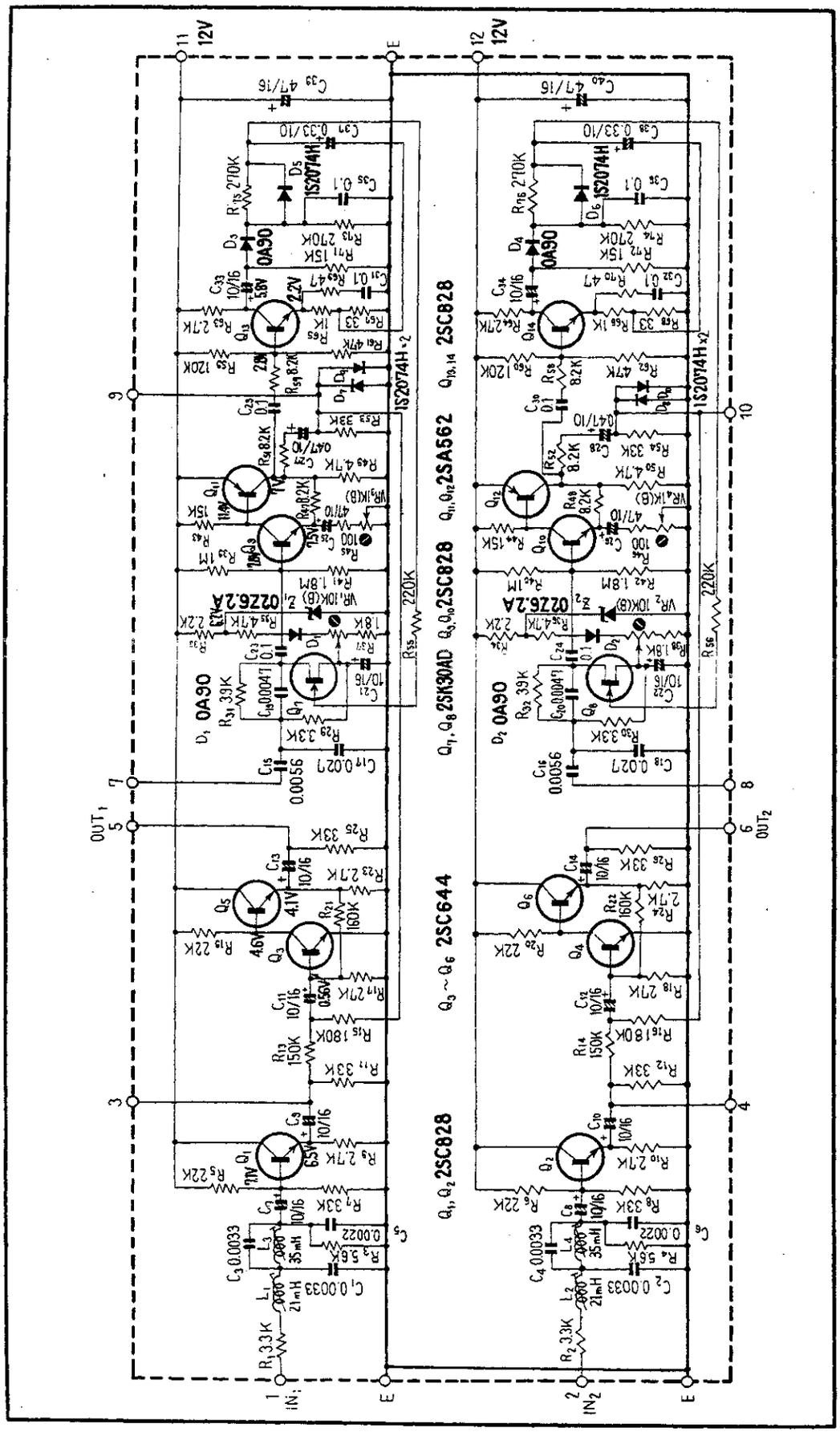
Foil Side



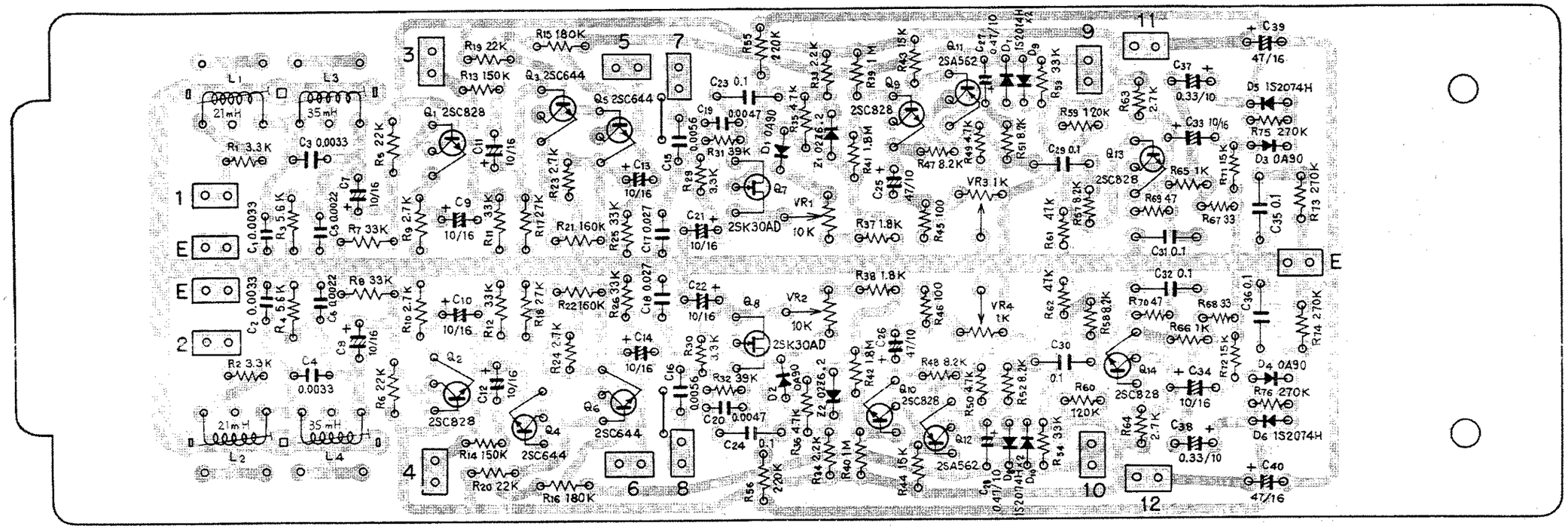
Part List of Switch Circuit Assembly (C)

Symbol	Description	Part No.	
S6	Slide switch (Muting)	RSH-009-A	

9.7 DOLBY PROCESSOR ASSEMBLY (RWX-026-E)



Foil side



2SC644
2SC828

2SA562

2SK30AD

Parts List of Dolby Processor Assembly

CAPACITORS

Symbol	Description			Part No.	
C1	Mylar	0.0033	50V	CQMA 332K 50	
C2	Mylar	0.0033	50V	CQMA 332K 50	
C3	Mylar	0.0033	50V	CQMA 332K 50	
C4	Mylar	0.0033	50V	CQMA 332K 50	
C5	Mylar	0.0022	50V	CQMA 222K 50	
C6	Mylar	0.0022	50V	CQMA 222K 50	
C7	Electrolytic	10	16V	CEA 100P 16	
C8	Electrolytic	10	16V	CEA 100P 16	
C9	Electrolytic	10	16V	CEA 100P 16	
C10	Electrolytic	10	16V	CEA 100P 16	
C11	Electrolytic	10	16V	CEA 100P 16	
C12	Electrolytic	10	16V	CEA 100P 16	
C13	Electrolytic	10	16V	CEA 100P 16	
C14	Electrolytic	10	16V	CEA 100P 16	
C15	Mylar	0.0056	50V	CQMA 562K 50	
C16	Mylar	0.0056	50V	CQMA 562K 50	
C17	Mylar	0.027	50V	CQMA 273K 50	
C18	Mylar	0.027	50V	CQMA 273K 50	
C19	Mylar	0.0047	50V	CQMA 472K 50	
C20	Mylar	0.0047	50V	CQMA 472K 50	
C21	Electrolytic	10	16V	CEA 100P 16	
C22	Electrolytic	10	16V	CEA 100P 16	
C23	Mylar	0.1	50V	CQMA 104K 50	
C24	Mylar	0.1	50V	CQMA 104K 50	
C25	Electrolytic	47	10V	CEA 470P 10	
C26	Electrolytic	47	10V	CEA 470P 10	
C27	Electrolytic	0.47	10V	CSSA R47M 10	Aluminum solid
C28	Electrolytic	0.47	10V	CSSA R47M 10	Aluminum solid
C29	Mylar	0.1	50V	CQMA 104K 50	
C30	Mylar	0.1	50V	CQMA 104K 50	
C31	Mylar	0.1	50V	CQMA 104K 50	
C32	Mylar	0.1	50V	CQMA 104K 50	
C33	Electrolytic	10	16V	CEA 100P 16	
C34	Electrolytic	10	16V	CEA 100P 16	
C35	Mylar	0.1	50V	CQMA 104K 50	
C36	Mylar	0.1	50V	CQMA 104K 50	
C37	Electrolytic	0.33	10V	CSSA R33M 10	Aluminum solid
C38	Electrolytic	0.33	10V	CSSA R33M 10	Aluminum solid
C39	Electrolytic	47	16V	CEA 470P 16	
C40	Electrolytic	47	16V	CEA 470P 16	

POTENTIOMETERS

Symbol	Description		Part No.	
VR1	Semi-fixed	10k-B	C92-049-0	
VR2	Semi-fixed	10k-B	C92-049-0	
VR3	Semi-fixed	1k-B	C92-404-0	
VR4	Semi-fixed	1k-B	C92-404-0	

RESISTORS

Symbol	Description		Part No.	
R1	Carbon film	3.3k	RD¼VS 332J	
R2	Carbon film	3.3k	RD¼VS 332J	
R3	Carbon film	5.6k	RD¼VS 562J	
R4	Carbon film	5.6k	RD¼VS 562J	
R5	Carbon film	22k	RD¼VS 223J	
R6	Carbon film	22k	RD¼VS 223J	
R7	Carbon film	33k	RD¼VS 333J	
R8	Carbon film	33k	RD¼VS 333J	
R9	Carbon film	2.7k	RD¼VS 272J	
R10	Carbon film	2.7k	RD¼VS 272J	
R11	Carbon film	33k	RD¼VS 333J	
R12	Carbon film	33k	RD¼VS 333J	
R13	Carbon film	150k	RD¼VS 154J	
R14	Carbon film	150k	RD¼VS 154J	
R15	Carbon film	180k	RD¼VS 184J	
R16	Carbon film	180k	RD¼VS 184J	
R17	Carbon film	27k	RD¼VS 273J	
R18	Carbon film	27k	RD¼VS 273J	
R19	Carbon film	22k	RD¼VS 223J	
R20	Carbon film	22k	RD¼VS 223J	
R21	Carbon film	160k	RD¼VS 164J	
R22	Carbon film	160k	RD¼VS 164J	
R23	Carbon film	2.7k	RD¼VS 272J	
R24	Carbon film	2.7k	RD¼VS 272J	
R25	Carbon film	33k	RD¼VS 333J	
R26	Carbon film	33k	RD¼VS 333J	
R27	.....		.....	
R28	.....		.....	
R29	Carbon film	3.3k	RD¼VS 332J	
R30	Carbon film	3.3k	RD¼VS 332J	
R31	Carbon film	39k	RD¼VS 393J	
R32	Carbon film	39k	RD¼VS 393J	
R33	Carbon film	2.2k	RD¼VS 222J	
R34	Carbon film	2.2k	RD¼VS 222J	
R35	Carbon film	4.7k	RD¼VS 472J	
R36	Carbon film	4.7k	RD¼VS 472J	
R37	Carbon film	1.8k	RD¼VS 182J	
R38	Carbon film	1.8k	RD¼VS 182J	
R39	Carbon film	1M	RD¼VS 105J	
R40	Carbon film	1M	RD¼VS 105J	
R41	Carbon film	1.8M	RD¼VS 185J	
R42	Carbon film	1.8M	RD¼VS 185J	
R43	Carbon film	15k	RD¼VS 153J	
R44	Carbon film	15k	RD¼VS 153J	
R45	Carbon film	100	RD¼VS 101J	
R46	Carbon film	100	RD¼VS 101J	
R47	Carbon film	8.2k	RD¼VS 822J	
R48	Carbon film	8.2k	RD¼VS 822J	
R49	Carbon film	4.7k	RD¼VS 472J	
R50	Carbon film	4.7k	RD¼VS 472J	

Symbol	Description		Part No.	
R51	Carbon film	8.2k	RD¼VS 822J	
R52	Carbon film	8.2k	RD¼VS 822J	
R53	Carbon film	33k	RD¼VS 333J	
R54	Carbon film	33k	RD¼VS 333J	
R55	Carbon film	220k	RD¼VS 224J	
R56	Carbon film	220k	RD¼VS 224J	
R57	Carbon film	8.2k	RD¼VS 822J	
R58	Carbon film	8.2k	RD¼VS 822J	
R59	Carbon film	120k	RD¼VS 124J	
R60	Carbon film	120k	RD¼VS 124J	
R61	Carbon film	47k	RD¼VS 473J	
R62	Carbon film	47k	RD¼VS 473J	
R63	Carbon film	2.7k	RD¼VS 272J	
R64	Carbon film	2.7k	RD¼VS 272J	
R65	Carbon film	1k	RD¼VS 102J	
R66	Carbon film	1k	RD¼VS 102J	
R67	Carbon film	33	RD¼VS 330J	
R68	Carbon film	33	RD¼VS 330J	
R69	Carbon film	47	RD¼VS 470J	
R70	Carbon film	47	RD¼VS 470J	
R71	Carbon film	15k	RD¼VS 153J	
R72	Carbon film	15k	RD¼VS 153J	
R73	Carbon film	270k	RD¼VS 274J	
R74	Carbon film	270k	RD¼VS 274J	
R75	Carbon film	270k	RD¼VS 274J	
R76	Carbon film	270k	RD¼VS 274J	

SEMICONDUCTORS

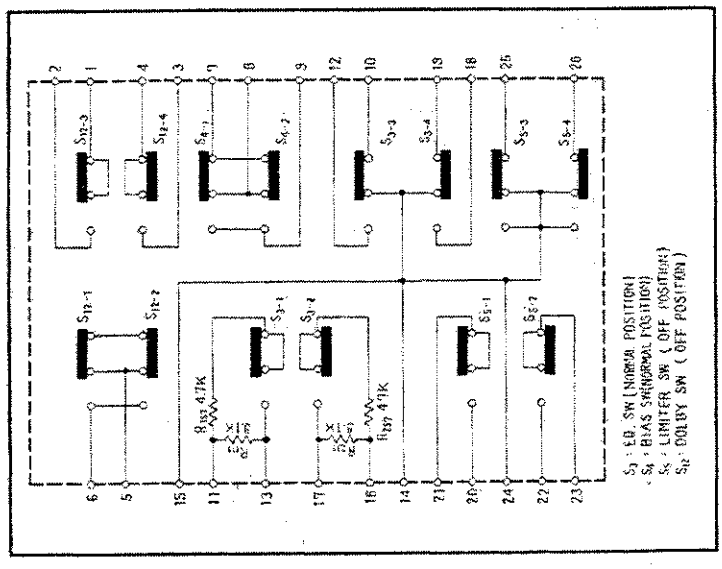
Symbol	Description		Part No.	
Q1	Transistor	2SC828-S		
Q2	Transistor	2SC828-S		
Q3	Transistor	2SC644-S		
Q4	Transistor	2SC644-S		
Q5	Transistor	2SC644-S		
Q6	Transistor	2SC644-S		
Q7	FET	2SK30AD		
Q8	FET	2SK30AD		
Q9	Transistor	2SC828-S		
Q10	Transistor	2SC828-S		
Q11	Transistor	2SA562-O		
Q12	Transistor	2SA562-O		
Q13	Transistor	2SC828-S		
Q14	Transistor	2SC828-S		
D1	Diode	OA90		
D2	Diode	OA90		
D3	Diode	OA90		
D4	Diode	OA90		
D5	Diode	1S2074H		

Symbol	Description		Part No.	
D6	Diode	1S2074H		
D7	Diode	1S2074H		
D8	Diode	1S2074H		
D9	Diode	1S2074H		
D10	Diode	1S2074H		
Z1	Zener Diode	02Z6.2A		
Z2	Zener Diode	02Z6.2A		

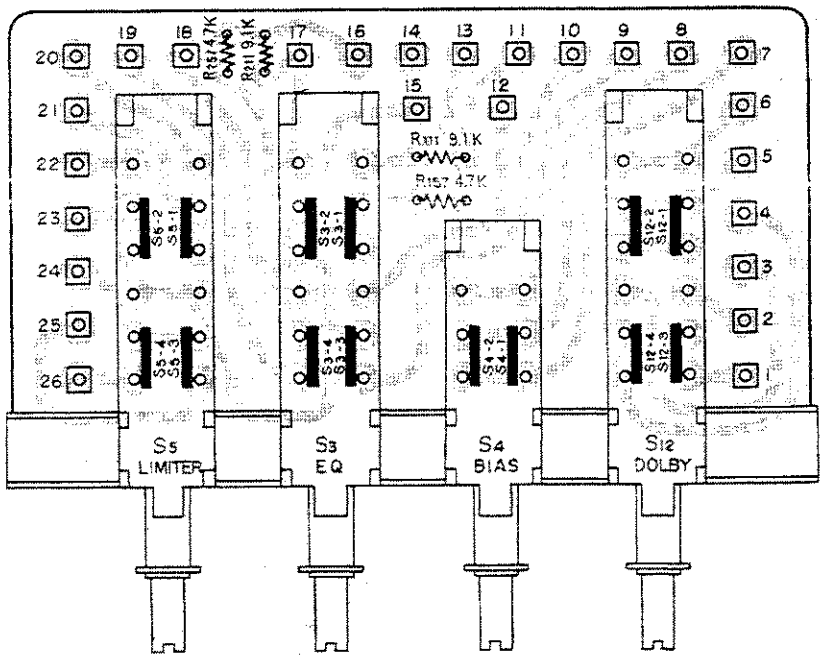
COILS

Symbol	Description	Part No.	
L1	Trap coil B	RTF-C05-A	
L2	Trap coil B	RTF-005-A	
L3	Trap coil A	RTF-004-A	
L4	Trap coil A	RTF-004-A	

9.8 PUSH SWITCH ASSEMBLY (RWS-019-0)



Foil side



Parts List of Push Switch Assembly

Symbol	Description		Part No.	
S3~S5, S12	Push switch		RSG-019-0	
R111	Carbon film resistor	9.1kΩ	RD¼VS 912J	
R211	Carbon film resistor	9.1kΩ	RD¼VS 912J	
R157	Carbon film resistor	4.7kΩ	RD¼VS 472J	
R257	Carbon film resistor	4.7kΩ	RD¼VS 472J	

10. EXPLODED VIEWS AND MECHANICAL PARTS LIST

The following symbols stand for screws, nuts, washers as shown in EXPLODED VIEWS.

P : Pan head screw
PS : Pan head sems screw
T : Tapping screw
S : Setscrew
N : Hexagon nut
E : Retaining washer
F : Flat washer
SW : Spring washer

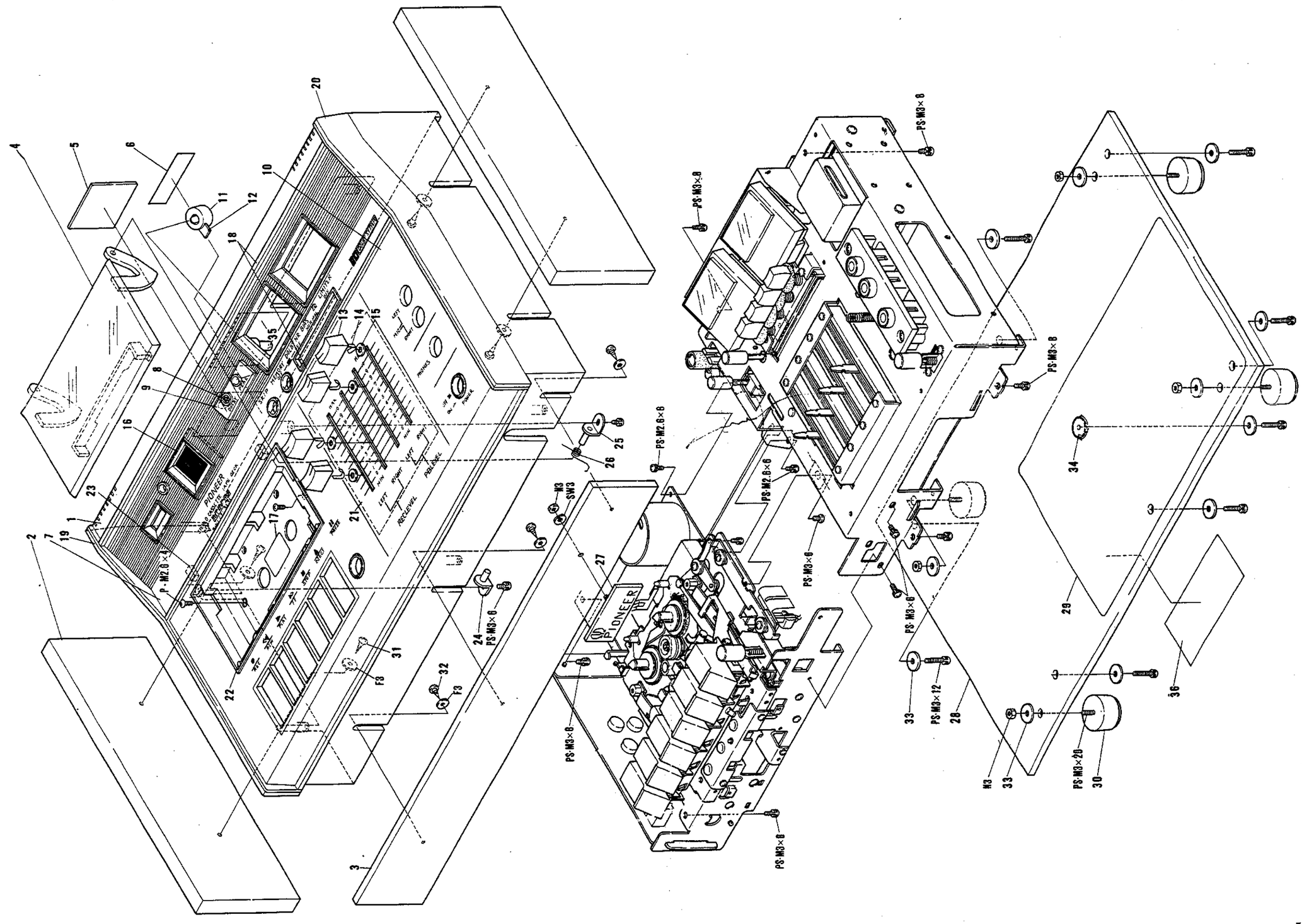
Note:
Parts number is subject to change for the purpose of improvement with notice of a service bulletin.
Service bulletin will be furnished whenever necessary and you are requested to amend parts number in this manual according to the instructions.

10.1 EXTERIOR

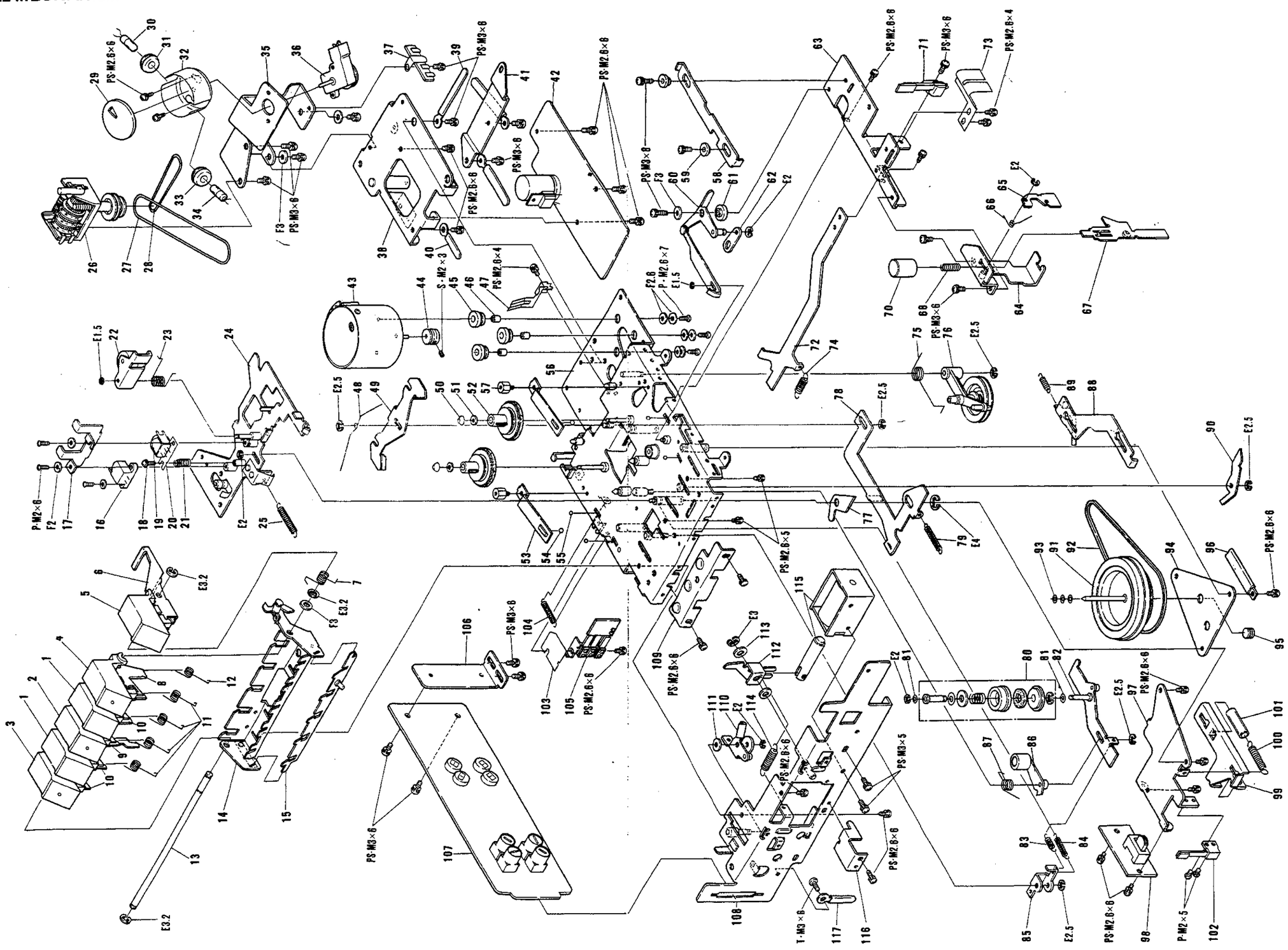
NOTICE: Any parts asterisked (*) are subject to being not supplied.

Key No.	Description	Part No.	
1	Case unit	RYM-023-A	Including 7~10, 16~26, 31, 32
2	Side board	RMS-027-A	
3	Front board	RMS-025-A	
4	Cassette cover	RNK-160-0	
5*	Model name plate	RAL-113-0	(KCU type)
		RAL-114-0	(PBV type)
6*	Dolby license label	RRW-025-0	
7	Switch panel	RNA-158-A	
8*	Indicator screen	RNA-091-0	
9*	Indicator board	RNA-090-0	
10	Top panel	RNA-129-0	
11	Rubber fitting	REB-071-A	
12	Lamp board	RNP-073-A	
13	Knob (LEVEL)	RAA-048-0	
14	Lock spring	RBK-042-B	
15	Nylon washer (8x4.2x0.5mm)	REC-157-0	
16*	Indicator screen	RNK-091-0	
17*	Paper	RAH-010-A	
18	Border bar	RAP-030-B	
19	Side panel (A)	RNA-079-B	
20	Side panel (B)	RNA-080-B	
21*	Mask	RED-004-0	
22	Cushion (B)	REB-059-A	
23	Cushion (A)	REB-058-0	
24*	Cassette cover shaft L assembly	RXA-404-0	
25*	Cassette cover shaft R assembly	RXA-403-0	
26	Cassette cover spring	RBH-172-0	
27*	Badge	RAM-052-0	
28*	Bottom cover	RMX-003-B	
29*	Shield foil	REH-003-A	
30	Foot assembly	RXA-441-0	
31	Wood screw (3φX13)	.....	
32	Tapping screw M3X10	.....	
33	Washer B	RBE-011-0	
34	Washer A	RBE-010-0	
35*	Fuse label	RRW-008-B	
36*	Caution sheet	AAX-001-0	(KCU type only)
13,14	Knob assembly	RXX-067	

Exterior



10.2 MECHANISM



Parts List of Mechanism

NOTICE: Any parts asterisked (*) are subject to being not supplied.

Key No.	Description	Part No.	
1	Operating button A	RNK-087-0	(FF REW)
2	Operating button C	RNK-098-0	(PLAY)
3	Operating button F	RNK-143-0	(REC)
4	Operating button D	RNK-099-0	(STOP)
5	Operating button B	RNK-086-0	(EJECT)
6*	Eject lever	RNE-346-0	
7	Spring for eject lever	RBH-177-0	
8*	Button lever B	RNE-577-0	
9*	Button lever P	RNE-476-0	
10*	Button lever A	RNE-576-0	
11	Spring for operating button	RBH-176-0	
12	Spring B	RBH-178-0	
13	Button shaft	RLA-342-0	
14*	Button frame sub-assembly	RXA-268-0	
15*	Lock plate sub-assembly	RXA-279-0	
16	Erasing head	RPB-014-0	
17*	Cassette protector	RNE-327-0	
18	Flat head screw M2X5		
19	Head label	RRW-007-0	
20	REC/PB head	RPB-027-A	Head RXX-083
21	Spring for head	RBH-183-0	
22	Pinch roller arm assembly	RXA-416-0	
23	Spring for pinch roller	RBH-183-0	
24	Head base assembly	RXA-415-0	
25	Spring for base releasing	RBH-181-0	
26	Tape counter assembly (A)	RAW-012-A	
27	Belt for counter	REB-114-B	
28	Belt for sensing	REB-115-B	
29	Tape run disk	RNK-085-B	
30	Lamp (PB)	REL-015-0	REL-009
31	Rubber bush	REB-070-0	
32	Reflector	RNE-588-0	
33	Rubber bush	REB-070-0	
34	Lamp (REC)	REL-014-0	
35*	Counter base	RNE-320-A	
36	Sensing switch assembly	RSX-032-A	
37	Terminal strip (3P)	RKC-009-0	
38*	Sensing assembly	RXA-253-B	
39*	Cord fixer B	RNE-513-0	
40*	Cord fixer D	RNE-605-0	
41*	Cross plate	RNE-651-0	
42	Sensing circuit assembly	RWG-043-A	
43	Motor	RXM-006-0	
44	Motor pulley	RLA-344-0	
45	Motor cushion	REB-117-0	
46	Collar	RLA-343-0	
47	Spring for cassette holder	RBK-056-0	
48	Spring for brake	RBH-182-0	
49*	Brake plate	RNE-579-0	
50	Shaft cap	RNK-153-0	

NOTICE: Any parts asterisked (*) are subject to being not supplied.

Key No.	Description	Part No.	
51	Polyethylene washer (1.8φX0.1t)	.....	
52	Reel base B assembly	RXA-433-0	
53	Spring for base hold	RBK-072-0	
54	Steel ball (2.5φ)	REF-010-0	
55	Steel ball (2φ)	REF-009-0	
56*	Chassis assembly	RXA-267-0	
57*	Stud screw	RBA-004-0	
58*	Pause operating lever I	RNE-335-A	
59	Stepped washer (A)	RLA-338-0	
60	Pause operating lever II assembly	RXA-385-0	
61	Stepped washer (B)	RLA-337-0	
62*	Pause operating lever IV	RNE-338-0	
63*	Pause chassis	RNE-565-B	
64*	Pause bracket assembly	RXA-410-A	
65	Pause ratchet	RNE-567-0	
66	Spring for ratchet	RBK-043-A	
67	Pause lever	RXA-411-0	
68	Spring for pause lever	RBH-113-C	
69	.....	.....	
70	Knob for PAUSE button	RAA-072-0	
71	Spring switch	RSK-014-0	
72*	Operating lever	RNE-564-A	
73	Plate spring	RBK-039-A	
74	Spring for operating lever	RBH-193-0	
75	Spring for tension arm	RBH-190-0	
76	Tension arm assembly	RXA-430-0	
77	Syl-lock prevention cam	RNE-578-0	
78*	Brake lever	RNE-580-0	
79	Spring for brake lever	RBH-184-0	
80	Idler A assembly	RXA-418-0	
81	Polyethylene washer (2.5X5X0.15t)	.....	
82	F.R. lever assembly	RXA-417-0	
83	Spring for REW lever	RBH-189-0	
84	Spring for F.R. lever	RBH-188-0	
85*	REW lever	RNE-582-0	
86*	Idler B lever assembly	RXA-421-0	
87	Spring for Idler B lever	RBH-185-0	
88*	FF lever assembly	RXA-431-0	
89	Spring for FF lever	RBH-187-0	
90*	FF cam	RNE-581-0	
91	Flywheel assembly B	RXA-432-0	
92	Drive belt	REB-116-0	
93	Polyethylene washer (2.5φX0.25t)	.....	
94*	Thrust holder	RNE-583-0	
95	Thrust screw	RNK-154-0	
96*	Cord fixer D	RNE-605-0	
97*	Muting bracket	RNE-325-0	
98	Switch circuit assembly C	RWS-010-0	
99*	Muting cam plate assembly	RXA-258-D	
100	Spring	RBH-110-B	

NOTICE: Any parts asterisked (*) are subject to being not supplied.

Key No.	Description	Part No.	
101*	Tube (5φX25mm)	.....	
102*	Spring switch	RSK-019-A	
103*	Insulated paper	REE-039-0	
104	Prevention plate spring	RBH-186-0	
105	Spring switch (C)	RSN-001-B	
106*	PC board mounting metal	RNE-367-0	
107	Dolby processor assembly	RWX-026-E	
108*	Bracket assembly	RXA-409-C	
109*	Button stopper	RNE-572-A	
110	Operating cam assembly	RXA-398-A	
111	Nylon washer 3.2X8X0.5mm	.....	
112	Release lever	RNE-568-A	
113	Nylon washer 4.2X8X0.3mm	.....	
114	Spring for return	RBH-174-0	
115	Solenoid	RXP-016-0	
116*	Wire guide	RNE-569-A	
117*	Cord fixer D	RNE-605-0	
1,10	Operating button A sub-assembly	RXA-424-0	(FF, REW)
2, 9	PLAY button sub-assembly	RXA-426-0	(PLAY)
3,10	Operating button F sub-assembly	RXA-427-0	(REC)
4, 8	STOP button sub-assembly	RXA-425-0	(STOP)
5, 6	Operating button B sub-assembly	RXA-428-0	(EJECT)
1~15	Operating button block assembly	RXA-422-0	
94,95	Thrust plate assembly	RXX-134-0	

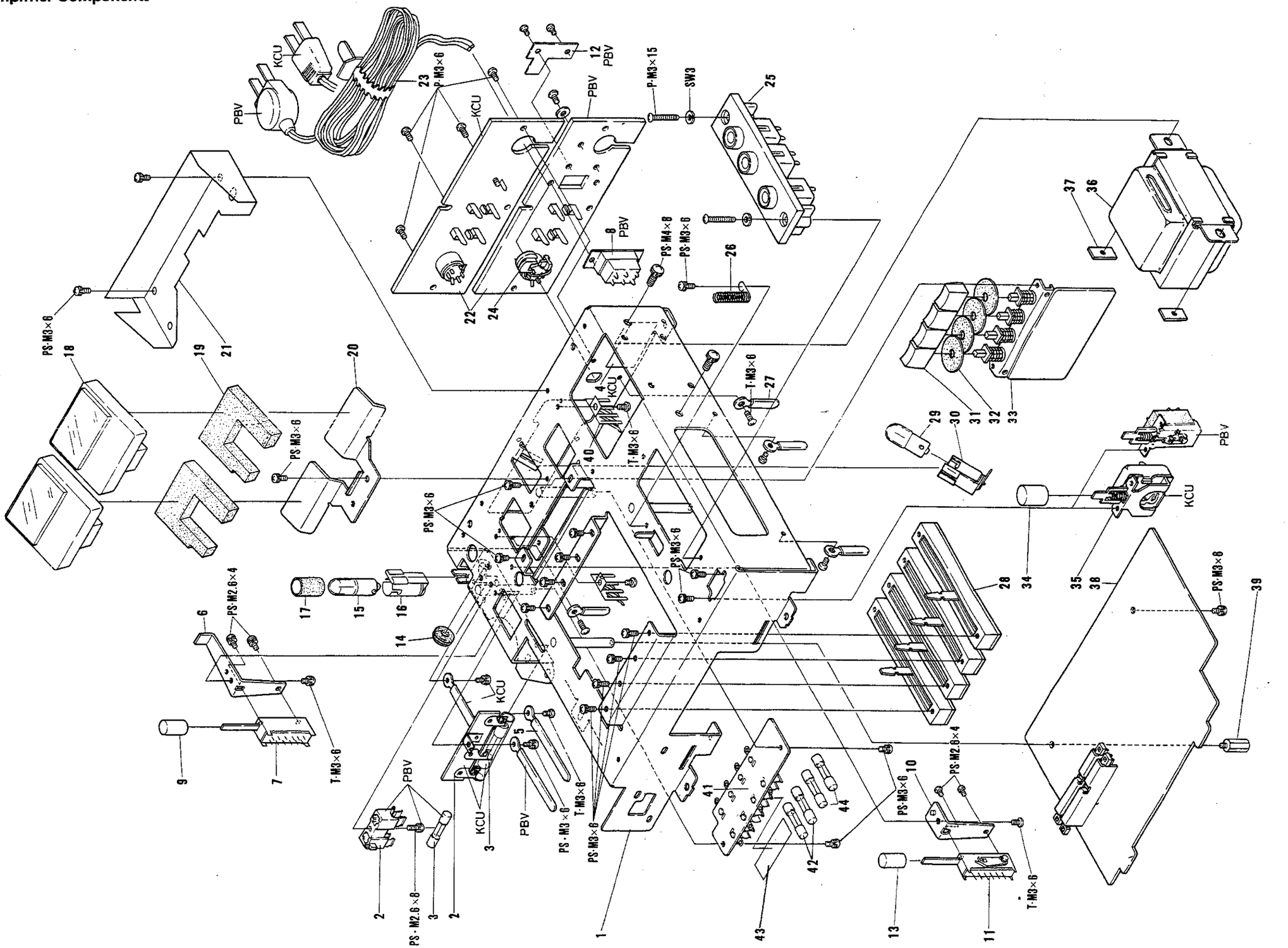
10.3 AMPLIFIER COMPONENTS

- Model CT-5151 comes in two versions distinguished as follows:
  KCU type . . . . . 120V only, CSA and UL approved
  PBV type . . . . . 120V/220V, SEMCO, NEMCO, DEMCO and SEV approved

NOTICE: Any parts asterisked (*) are subject to being not supplied.

Key No.	Description	Part No. (KCU type)	Part No. (PBV type)
1*	Amplifier chassis assembly (B)	RXA-474-0	RXA-474-0
2	Terminal strip (3P)	RKC-014-0	. . . . .
	Fuse holder (1P)	. . . . .	RKR-011-0
3	Fuse 0.5A (Primary)	AEK-005-0	REK-023-0
4*	Caution label	RRW-017-0	. . . . .
5*	Cord fixer B	RNE-513-0	RNE-513-0
6*	Bracket	RNE-643-0	RNE-643-0
7	Push switch (SKIP)	RSG-009-A	RSG-009-A
8	Slide switch (Line voltage selector)	. . . . .	RSH-010-0
9	Knob (SKIP)	RAA-049-0	RAA-049-0
10*	Bracket	RNE-644-0	RNE-644-0
11	Push switch (MEMORY)	RSG-018-0	RSG-018-0
12*	Marker plate	. . . . .	REC-076-A
13	Knob (MEMORY)	RAA-049-0	RAA-049-0
14	Rubber bush (6ϕ)	E31-413-0	E31-413-0
15	Lamp (Meter)	RKK-006-0	RKK-006-0
16	Socket	E22-020-0	E22-020-0
17	Lamp cover	E31-042-A	E31-042-A
18	Level meter	RAW-019-0	RAW-019-0
19	Meter cushion	REC-075-A	REC-075-A
20*	Meter stand	RNE-328-C	RNE-328-C
21	Shade	REE-047-0	REE-047-0
22	Jack board assembly (A)	RKN-012-0	. . . . .
	Jack board assembly (B)	. . . . .	RKN-014-A
23	AC power cord	D11-003-E	ADG-004-0
24	Cord stopper	E32-056-0	E32-056-0
25	Jack board assembly (C)	RKN-013-B	RKN-013-B
26*	Spring for ground	RBH-111-B	RBH-111-B
27*	Cord fixer D	RNE-605-0	RNE-605-0
28	Variable resistor (LEVEL) 20kΩ-A	RCW-001-0	RCW-001-0
29	Lamp (Dolby)	E22-020-0	E22-020-0
30	Socket	RKK-006-0	RKK-006-0
31	Knob (Dolby, Bias, EQ, Limiter)	RAA-056-0	RAA-056-0
32	Mask	RED-047-0	RED-047-0
33	Push switch assembly	RWS-019-0	RWS-019-0
34	Knob (Power)	RAA-072-0	RAA-072-0
35	Push switch (Power)	RSA-010-0	RSA-011-0
36	Power transformer	RTT-051-0	RTT-052-0
37	Square nut	RNE-364-0	RNE-364-0
38	REC/PB amplifier assembly	RWF-024-0	RWF-024-0
39*	Stud screw	RBA-006-0	RBA-006-0
40	Terminal strip for ground (4P)	K13-047-0	K13-047-0
41	Fuse holder (4P)	RKR-014-0	RKR-014-0
42	Fuse 0.5A (Secondary—Motor, Lamp)	REK-017-0	REK-023-0
43	Fuse label	RRW-020-0	RRW-027-0
44	Fuse 0.3A (Secondary—Amp.)	REK-018-0	. . . . .
	Fuse 0.315A (Secondary—Amp.)	. . . . .	REK-024-0

Amplifier Components



11. CIRCUIT DESCRIPTION

The CT-5151 is a two head cassette tape deck with one dual function recording/playback head and one for erasing. It features a number of special built-in functions, including a type B Dolby system noise-reduction circuit, an input level limiter, a peak level indicator, etc.

11.1 RECORDING/PLAYBACK CIRCUITS

The block diagram for the recording and playback amplifiers is given in Fig. 23. With certain exceptions the basic circuitry is common to both playback and recording amplifiers.

Tape selector

The tape selector has two positions: NORMAL and CHROME. The EQ button changes the peaking frequency of the recording amplifier while recording, and the BIAS button changes the voltage fed to the oscillator circuit, so affecting the depth of the tape bias. The EQ button also serves to select the playback equalizer characteristics in the playback mode.

11.2 SENSING CIRCUIT (Fig. 24)

This is the circuit whose current flows in the solenoid plunger whereby the auto-stop mechanism should come into operation when tape runs out. The rotary switch (S_{13}) detects the running or stopping of tape motion. S_{13} switches ON and OFF as shown in Fig. 22 under the action of a magnet which rotates while the tape is in motion. When the FF, REW or PLAY button is depressed S_{7-2} comes ON and S_{7-3} goes OFF.

As long as the tape is in motion S_{13} continues to operate, switching Q_{601} ON and OFF, alternately charging and discharging C_{602}. The point A is coupled to the thyristor gate (SCR_{601}) by the Zener diode (ZD_{601}). While Q_{601} is intermittently going ON and OFF, the potential at A is comparatively low, and no current flows through the gate of SCR_{601}.

When tape motion ceases, so does the operation of S_{13}, and Q_{601} cuts OFF. With this, charging of C_{602} continues uninterrupted, and the potential of point A increases. When the voltage at A exceeds the Zener potential of ZD_{601}, there is a gate current in SCR_{601}, which immediately goes conductive, so that current flows through the solenoid SD_1, releasing the mechanism. S_{6-4} goes ON only when the PLAY button is depressed: when the PAUSE button is depressed S_{11} comes ON and keeps the potential at A from rising, and the mechanism is not released.

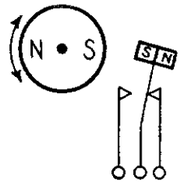


Fig. 22 Sensing switch (S_{13})

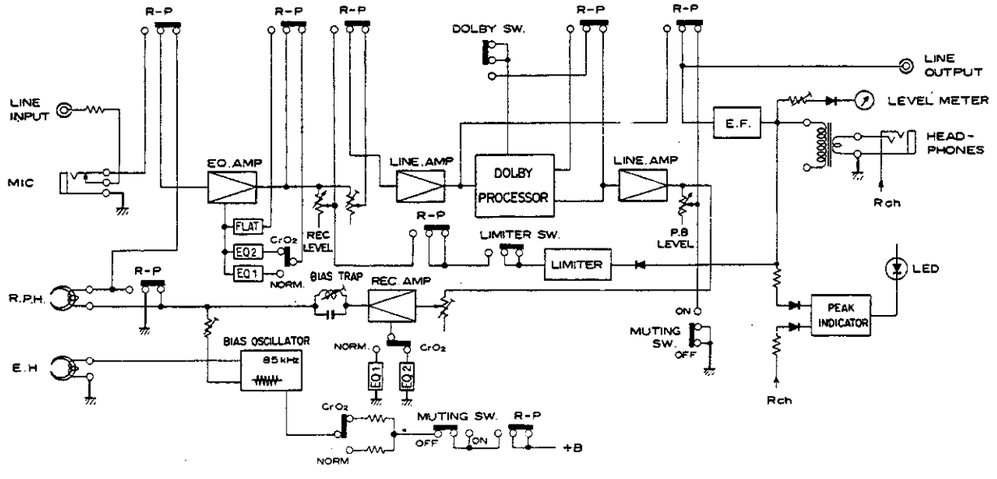


Fig. 23 Block diagram

11.3 POWER CIRCUIT (Fig. 25)

The CT-5151 is equipped with a DC motor, and has two power supplies.

Amplifier

Center-tapped full-wave rectification is used, and elimination of the ripple component and stabilization of the supply voltage is carried out by a transistor/Zener diode combination.

Motor

The motor is supplied via a bridge rectifier from a different winding to the amplifier. S_{7-1} comes ON when the FF, REW or PLAY button is depressed, and the motor commences to turn.

11.4 LIMITER CIRCUIT (Fig. 26)

The limiter built into the CT-5151 acts upon all high level signals above + 4 VU and compresses them to +4 VU. It does not affect the recording of signals below +4 VU.

Two transistors following the REC LEVEL control stage form a variable impedance circuit, the impedance of which is controlled by rectified portion of the signal. When the signal level increases, the impedance of the variable impedance circuit drops, and prevents the effective signal level from rising above the design value.

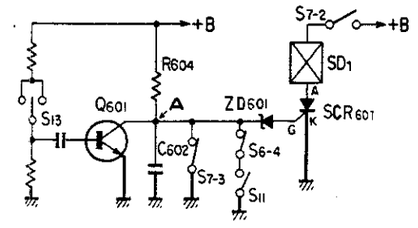


Fig. 24 Sensing circuit

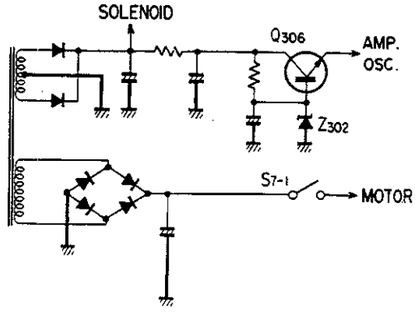


Fig. 25 Power circuit

11.5 PEAK LEVEL INDICATOR

Both music and the human voice comprise signals with wide variety, and a greater or lesser amount of pulse components. The usual level meters suffer from the disadvantage that their indicator needles are too slow to indicate pulse-type overloading instantaneously.

In the CT-5151 this condition is detected electrically and gives an accurate indication of all signals which exceed +4 VU.

Fig. 27 gives a simplified diagram of the peak level indicator circuit. In order to achieve a high input impedance Q_{301} is an emitter-follower and Q_{302}/Q_{303} form a Schmitt circuit. The base potential of Q_{302} is set so that it is ON under no-signal conditions. With small input signal levels the base potential of Q_{302} is above the trigger level, Q_{302} stays ON, Q_{303} remains OFF, and the light-emitting diode does not light. With high input signal levels, the base potential drops below the trigger level for certain peaks in the signal, Q_{302} goes OFF, Q_{303} comes ON, and the light-emitting diode lights.

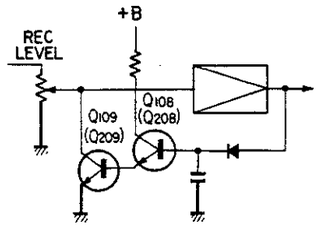


Fig. 26 Limiter circuit

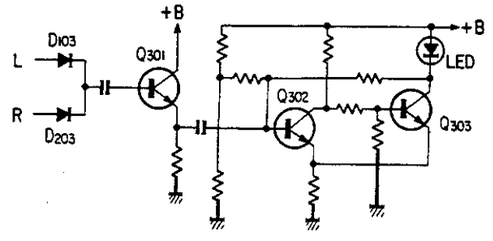


Fig. 27 Peak level indicator circuit

11.6 DOLBY PROCESSOR

The CT-5151 cassette tape deck is fitted with a B-type switchable processor. The B-type Dolby system is an effective means of applying the Dolby effect to middle and high frequencies alone. It gives a reduction in the tape hiss — the most objectionable phenomenon — on playback. Under this system, as soon as the input signal in the mid and high frequencies drops below a certain level — the Dolby level — the recording level is automatically raised, and automatically restored to the original level on playback. This operation is performed by a compressor circuit with certain standard characteristics in which the Dolby effect is obtained, which either adds or subtracts the signal derived from it to the main signal.

While recording, the output from the MPX filter is fed to the compressor. The output from the compressor is then added to the direct signal. In the playback mode, the input to the compressor is fed through amplifier 3, and the phase is reversed with respect to that during recording. By this reason that the output from the compressor is combined with the direct signal in the reverse phase, reversing the operation performed while recording (in effect subtracting the signal).

Compressor

The input to the compressor first passes through a high pass filter, and then is amplified by amplifier 1 to form the compressor output. The signal amplified by amplifier 2 is rectified by a diode, and fed back to the FET, which is used as an electronic attenuator.

The electronic attenuator utilizes the variations in impedance between drain and source due to the changes in the FET gate bias.

When the input signal level is low, a positive potential is applied to the FET source in order to obtain the maximum output signal from the compressor. With the reverse bias applied between source and gate, the FET impedance becomes very large (about 10MΩ). Under these conditions the potential between gate and source is set to equal the "pinch-off" potential of the FET (the bias potential at which it cuts off).

When the input signal level becomes high, the potential derived by rectifying the output of amplifier 2 increases, and the FET impedance between gate and source comes close to reading zero. Accordingly the electronic attenuator gives its maximum attenuation, and the compressor output drops to a lower level.

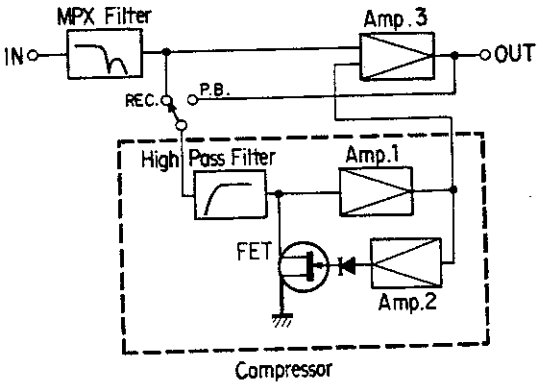


Fig. 28 Dolby processor circuit

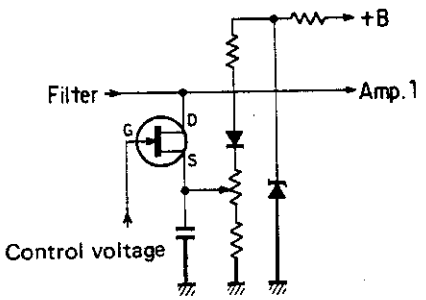


Fig. 29 Electronic attenuator

11.7 OTHER FEATURES

Memory rewind

When the MEMORY button is pressed, S_8 comes ON, and S_9 comes ON when the REW button is pressed. S_{10} is coupled to the counter, and comes ON when the counter indicates "999," so that current flows through the gate of the thyristor (SCR_{601}), which returns the mechanism.
Because S_9 comes ON only when the REW button is depressed, this circuit is only operative during rewinding.

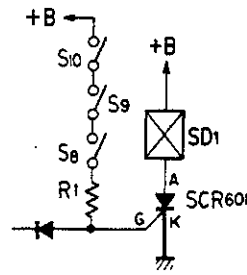
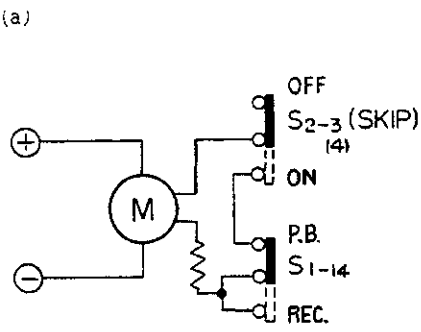


Fig. 30 Memory rewind circuit

Skip

When the SKIP button is pressed, S_{2-1}~S_{2-4} come ON, cutting out the electronic motor-governor circuit, so that the motor speed increases. At the same time C_{132} (C_{232}) is connected to the LINE OUTPUT terminal, counteracting the emphasis on high frequencies which would otherwise result from the increased tape speed. This circuit is only operative during playback.



S_2 SKIP swith
S_1 REC-PB swith

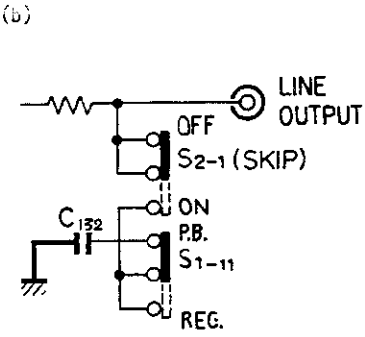
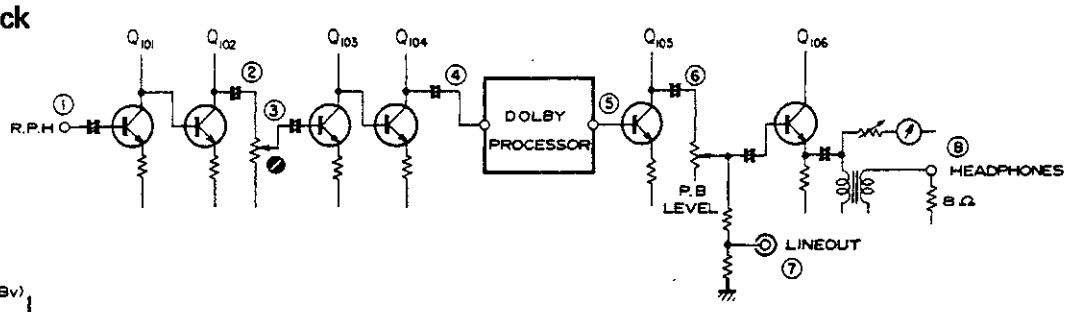
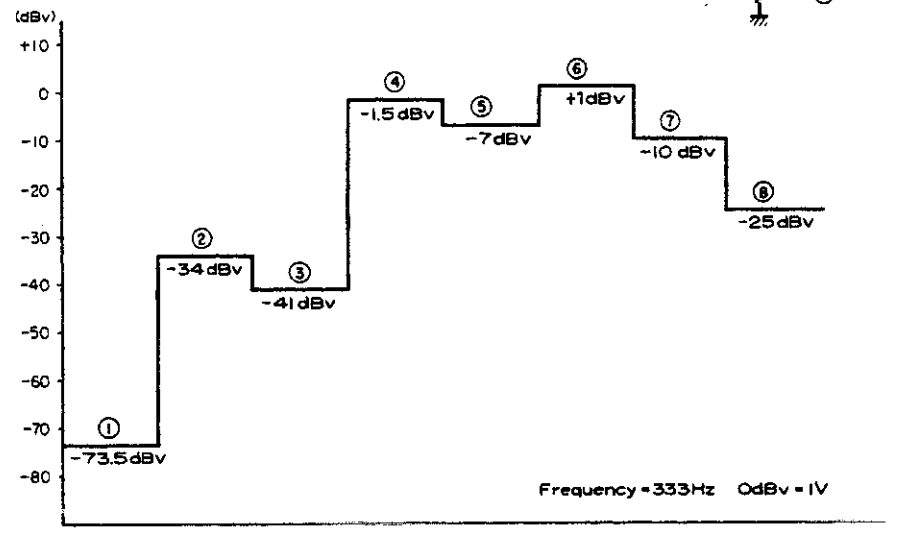


Fig. 31 SKIP circuit

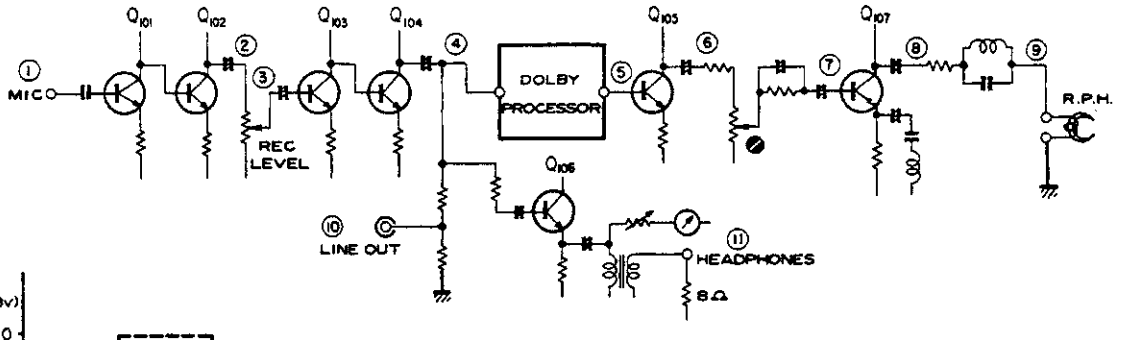
12. LEVEL DIAGRAMS

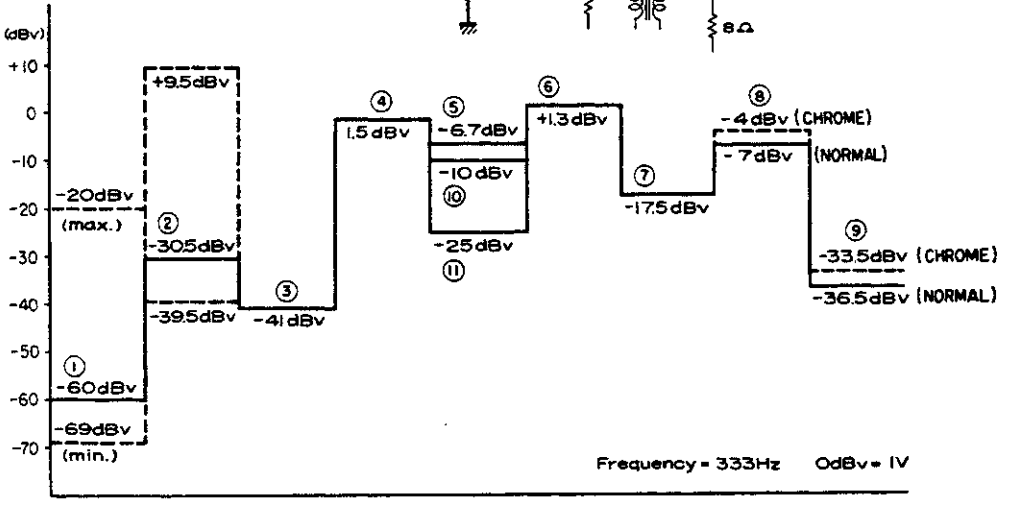
Playback



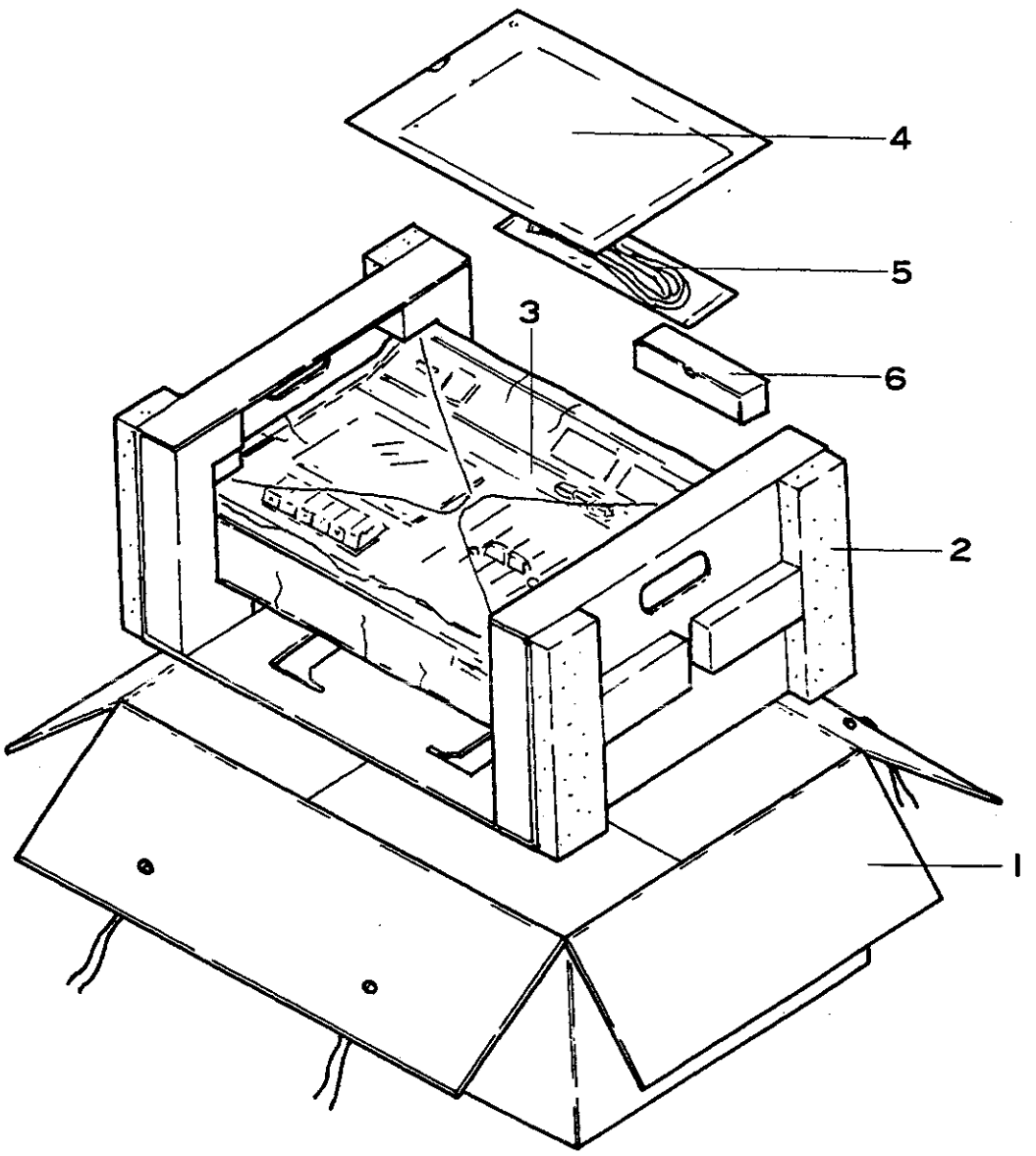


Recording



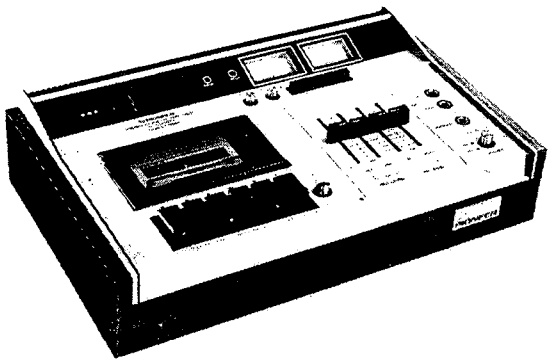


13. PACKING METHOD AND PARTS LIST



Key No.	Description	Part No.	
1,2	Packing case set	RHK-125-0	
1	Packing case	RHG-068-0	
2	Protector	RHA-065-0	
3	Vinyl bag	RHL-008-0	
4	Operating instructions (English)	RRB-038-0	
	Operating instructions (German/French)	RRD-005-0	PBV only
5	Connection cord	D53-851-0	
6	Head cleaning kit	REA-005-0	

CONTENTS



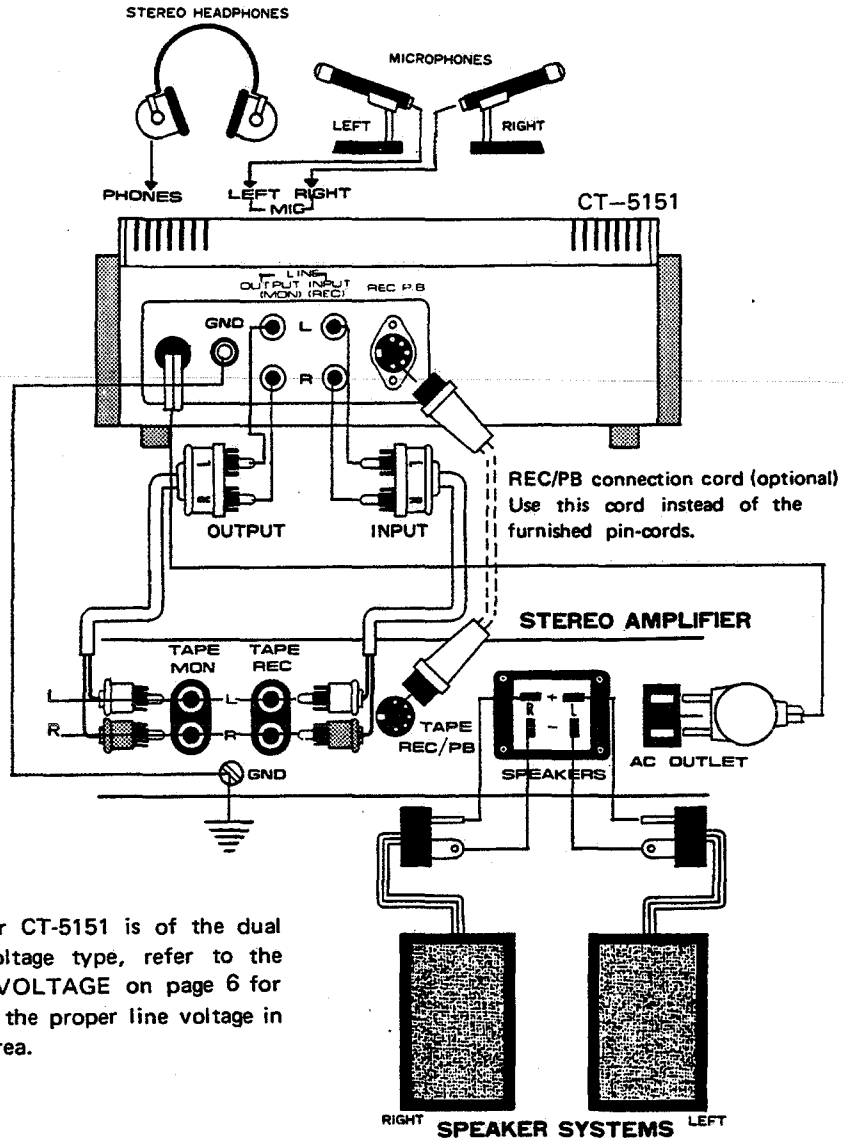
1. SPECIFICATIONS

System		Compact cassette, 2-channel stereo/mono
Recording System		AC bias, 85kHz
Erasing System		AC erasing push-pull
Heads		Solid ferrite REC/PB head x 1
		Solid ferrite erasing head x 1
Motor		Electronically controlled DC motor
Wow and Flutter		Less than 0.12% (WRMS)
Signal to Noise Ratio		48dB (Normal tape 333Hz, Max. rec. level, weighted)
		58dB (Normal tape 5kHz, max. rec. level, DOLBY NR ON, weighted)
Frequency response		30 to 13,000Hz (Normal tape) (63 to 12,000Hz, ±3dB)
		30 to 16,000Hz (Chrome tape) (63 to 13,000Hz, ±3dB)
Fast forward, Rewind time		Approx. 80 sec. (C-60)
Input Terminals	MIC INPUT:	0.5 to 90mV/50kΩ(Standard 1mV), 6φmm Jack
		Suitable microphone impedance 600 to 50kΩ
	LINE INPUT:	50mV to 9V/300kΩ(Standard 300mV), Pin Jack
	REC/PB connector:	15mV to 2.7V/10kΩ(Standard 30mV), DIN Jack
Output Terminals	LINE OUTPUT:	300mV/50kΩ, load impedance above 50kΩ Pin Jack
	REC/PB connector:	300mV/50kΩ load impedance above 50kΩ DIN Jack
	PHONES:	40mV/8Ω, load impedance 4 to 16Ω
Circuit Semi-Conductors		Transistors 39
		Thyristor 1
		Diodes 28
		(2 transistors, 1 diode for motor speed control)
Subfunctions		Tape selector switch (NORMAL/CHROME)
		(BIAS/EQ separate selector switches)
		Dolby B-system ON-OFF (With lamp-light indicator)
		Full auto-stop mechanisms
		SKIP button
		Recording peak level indicator
		Recording overload level limiter
		3-digit tape counter
		Memory rewind
		Large tape-running pilot indicator
		PAUSE button (ON, OFF)
Power Requirements		120V or 120V/220V (Switchable)
		AC 50Hz/60Hz
Power Consumption		16W (Maximum)
Overall Demensions		15-19/32(W) x 9-17/32(D) x 3-25/32(H) in.
		396(W) x 242(D) x 96(H)mm
Weight		10 lb. 5oz/4.7kg
Furnished Parts		Head cleaning kit x 1
		Stereo connection cords (Pin-plug type)

NOTE: Specifications and the design subject to possible modification without notice due to improvements.

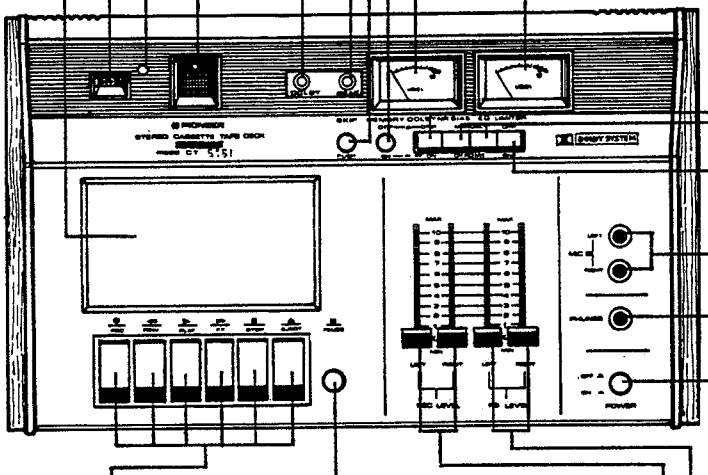
2. CONNECTIONS AND PARTS IDENTIFICATION

2.1 CONNECTIONS



NOTE:
If your CT-5151 is of the dual line voltage type, refer to the LINE VOLTAGE on page 6 for setting the proper line voltage in your area.

2.1 PARTS IDENTIFICATION



PEAK INDICATOR (PEAK)
Flashes when the recording level reaches +4dB overload. Adjust the level so that the indicator does not flash continually.

DOLBY INDICATOR (DOLBY)
The lamp lights when the Dolby system is operative.

CASSETTE COVER

TAPE COUNTER

RESET BUTTON
Push this button to reset the tape counter to "000."

TAPE RUNNING PILOT
The pilot-light pattern rotates as long as the tape is in motion. The pattern turns red when recording.

SKIP BUTTON (SKIP)
If this button is pushed while listening to a recording (in PLAYBACK), the sound will remain audible, but the tape speed will be increased.

MEMORY REWIND (MEMORY)
First set the tape counter to "000." With this button depressed, once recording (or playback) has been completed, the REWIND button will take the tape to "999" on the counter automatically, and then stop.

LEVEL METERS
These enable the input levels during recording and the output level during playback to be monitored.

DOLBY SWITCH (DOLBY)
Depress when recording with the Dolby system, or when playing back recordings which have been made using it.

TAPE SELECTOR SWITCH (BIAS, EQ)
The setting depends upon the kind of tape cassette being used. It should be depressed for normal use with chrome tape.

BIAS	– NORMAL:	Ordinary tape
		Low noise tape
	CHROME:	Chrome tape
EQ	– NORMAL:	Ordinary tape
		Low noise tape
	CHROME:	Chrome tape

LEVEL LIMITER (LIMITER)
When there are great variations in the recording level, so that overloading occurs and control is difficult, record with this button depressed.

MICROPHONE JACK (MIC)
These are the input jacks for use when recording from microphones. The left and right hand channels can be used independently.

HEADPHONE JACK (PHONES)
This is the jack for stereo headphone connection. Monitoring is possible both during recording and playback.

POWER SWITCH (POWER)

PLAYBACK LEVEL CONTROLS (PB LEVEL)
These are used to set the input level of the playback signal.

RECORDING LEVEL CONTROLS (REC LEVEL)
These are used to set the output level of the recording signal.

PAUSE BUTTON (PAUSE: ▮▮)
Pushing this button during playback or recording stops tape transport temporarily. To resume tape transport at the normal speed, depress a second time.

OPERATING BUTTONS

EJECT: ▲
Light pressure opens the cassette cover. Additional pressure ejects the cassette.

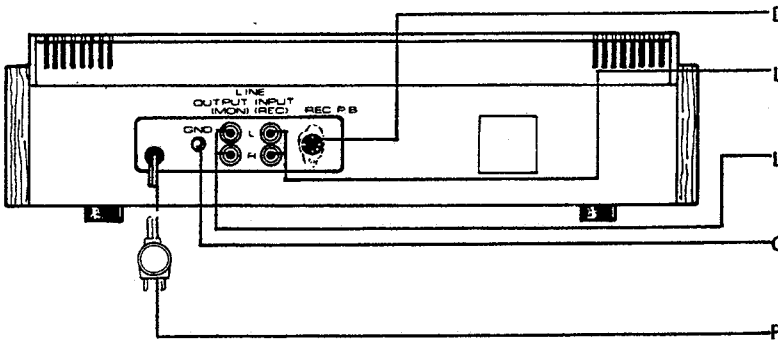
STOP: ■
Stops all tape transport and operations.

FF: ▶▶
Fast forward. Gives rapid tape transport from left to right.

PLAY: ▶
Depress for playback. For recording; recording commences as soon as the PLAY button is depressed if the REC button has first been depressed and held down.

REW: ◀◀
Rewind. Gives rapid tape transport from right to left.

REC: ●
Used in conjunction with the PLAY button to place the deck in the RECORD mode.



DIN CONNECTOR (REC/PB)
Used for both input and output connections.

LINE INPUT JACK
Used for individual jack-plug input connections.

LINE OUTPUT JACK
Used for individual jack-plug output connections.

GROUND TERMINAL (GND)
This terminal should be grounded if externally induced hum, etc., is obtrusive.

POWER CORD AND PLUG
If your CT-5151 has dual line voltage adjustment, refer to the instructions for setting the correct voltage for your area

Line Voltage

Two varieties of CT-5151 deck are sold, depending upon their intended destination of use. One has a dual-range voltage selector for 120V/220V operation, and the other is pre-set at the factory for 120V operation. If your unit is equipped with a voltage selector, please check that it is correctly set for the AC line voltage in your home. Reset, if necessary, as illustrated in Fig. 1.

To change from 120V to 220V operation, or vice versa:

1. Remove the lock plate (retained by two screws),
2. move the switch to the opposite position, and
3. turn the marker plate over and re-attach it.

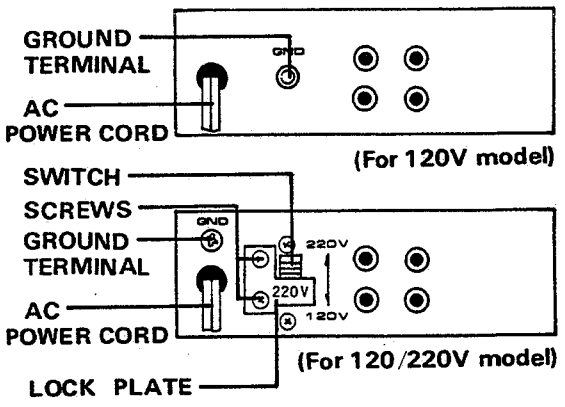


Fig. 1

3. DISASSEMBLY

Bottom Cover

Refer to Fig. 2 and remove the bottom screws (seven).

Case

Refer to Fig. 3. Remove the level control knobs. Depress the EJECT button and remove the two screws in the cassette well. Turn over the set and remove the six screws at the bottom (Fig. 4). Lift the set from the case.

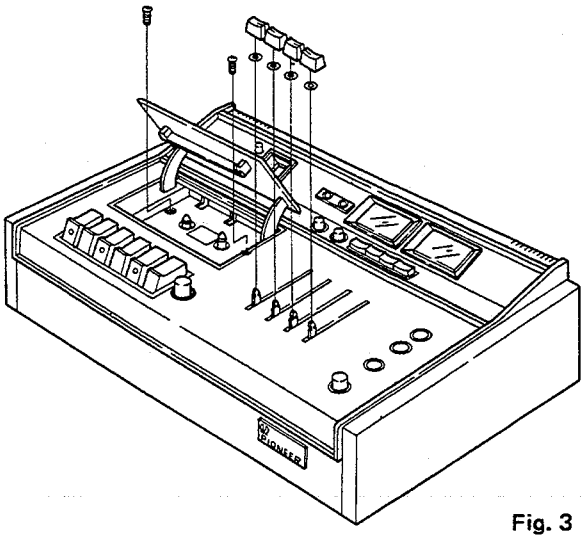


Fig. 3

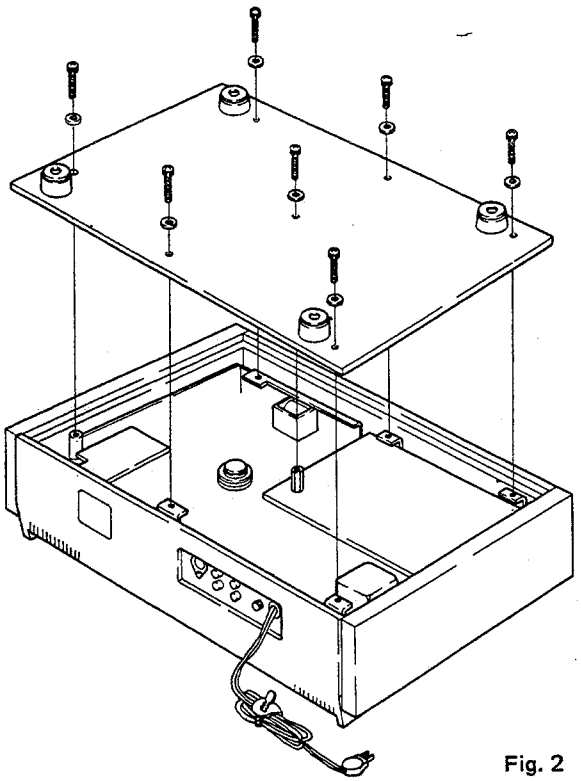


Fig. 2

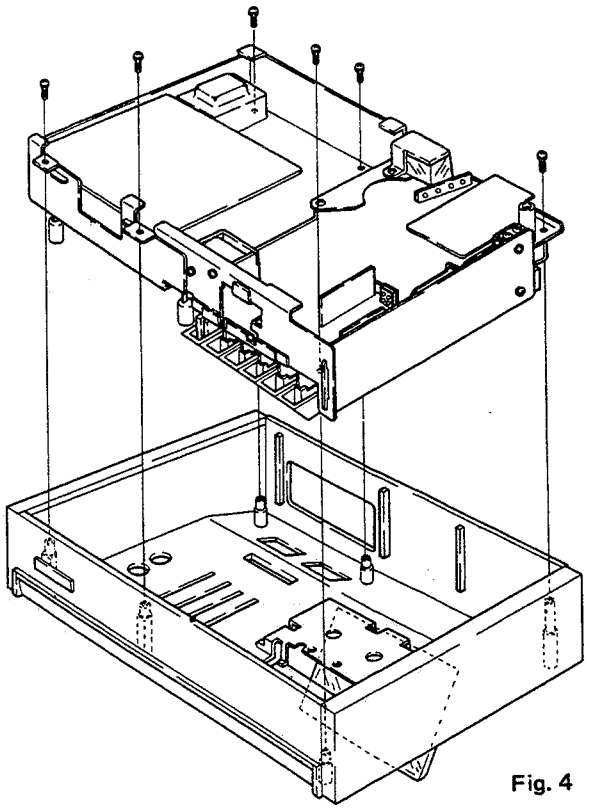


Fig. 4

4. TROUBLE-SHOOTING CHART

Power is not applied.

1. Check fuse.
   - Open power cord ..... Replace.
   - Faulty power switch ..... Replace.
   - Open power transformer ..... Replace.
2. Check power circuitry.
   - Shorted power circuit ..... Repair.
   - OK ..... Replace fuse.

Lamp does not light.

A. Meter (PL1) ..... AC source

Check lamp.
- Loose bulb ..... Tighten.
- Open bulb ..... Replace.
- Faulty socket ..... Replace.
- Poor connection ..... Repair.

B. Tape running pilot (PL2, PL3) ..... DC source

Is other operation normal ?
- Open bulb ..... Replace.
- Poor connection ..... Repair.
- Defective power circuit ..... Check and repair.

Motor does not operate.

Is voltage applied to motor ?
- Faulty motor ..... Replace.
- Defective motor switch operation
  1. Improper adjustment ..... Readjust (Refer to item 5.7).
  2. Faulty switch ..... Replace.
- Faulty motor power circuit ..... Check and repair.

Capstan does not turn. (Motor does operate.)

Check belt.
- Belt off pulleys ..... Re-install.
- Slipping belt
  1. Dirty belt ..... Clean with alcohol.
  2. Stretched belt ..... Replace.
  3. Seized flywheel bearing ..... Replace.
- Loosen motor pulley set screw ..... Tighten.

Tape wraps around pinch roller

Try another cassette.
- Faulty cassette.
  1. Broken tape ..... Replace.
  2. Adhesive substance on tape ..... Clean.
  3. Some substance sticking to capstan and pinch roller ..... Clean with alcohol.
- Insufficient take-up torque ..... Readjust (Refer to item 5. 2).

Pause button does not lock.

Improper ratchet operation.
1. Faulty ratchet ..... Replace.
2. Ratchet spring not in place ..... Hook spring in place.
3. Broken ratchet pin ..... Replace.

Tape transport trouble

A. Not feeding at proper speed

Check pressure at pinch roller.
- Faulty pinch roller spring ..... Replace.
- Improper adjustment ..... Readjust (Refer to item 5.1).
- Defective reel base brake ..... Check and repair.
- Defective take-up mechanism
  1. Defective tension arm assembly ..... Replace.
  2. Faulty drive roller arm spring ..... Replace.
- Defective cassette tape ..... Replace.
- Faulty motor ..... Replace.

Excessive (or insufficient) tape speed
- Adjust the tape speed ..... (Refer to item 5.6.)

B. Excessive wow.

1. Try another cassette.
   - Faulty cassette ..... Replace.
2. Measure pinch roller pressure.
   - Not correct ..... Readjust (Refer to item 5.1).
   - Deformed or worn roller ..... Replace.
   - Dirty roller ..... Clean with alcohol.
3. Check belt.
   - Stretched or deformed belt ..... Replace.
   - Oil or grease on belt ..... Clean with alcohol.
   - Bent or seized capstan ..... Replace.
   - Faulty motor ..... Replace.
   - Faulty tape counter ..... Replace.

C. No fast forward or rewind function

- Improper adjustment of motor switch ..... Readjust (Refer to item 5.7).
- Insufficient reel base torque ..... Readjust (Refer to item 5.2).

Sliding plate (Head base assembly) does not return.

Check head base spring.
- Not in place or broken ..... Repair or replace.
- Deformed sliding plate ..... Replace.
- Steel balls not in place ..... Repair.

Button does not lock.

Is cassette properly seated ?
- NG ..... Reseat.
- Deformed button frame ..... Replace.
- Faulty button operating plate.
  1. Not in place ..... Repair.
  2. Broken ..... Replace.

Counter does not operate.

Does tape running pilot operate ?
- Tape counter belt.
  1. Not in place ..... Place over pulleys.
  2. Stretched belt ..... Replace.
- Seized counter pulley shaft ..... Replace.
- Caught tape run disk ..... Repair.
- Supply reel base not turning ..... Check.
- Defective counter ..... Replace.

Tape height movement

Measure take-up torque.
- Excessive ..... Readjust (Refer to item 5.2).
- Deformed pinch roller arm ..... Repair or replace.
- Tilted pinch roller arm shaft ..... Repair.
- Faulty cassette ..... Replace.

Auto stop does not function properly.

A. Operating button release immediately.

1. Is counter operating ?
   - No ..... Refer to "Counter does not operate."
2. Does tape running pilot operate ?

   Sensing belt.
   - 1. Not in place ..... Place over pulleys.
   - 2. Stretched belt ..... Replace.

   Faulty sensing switch ..... Replace.

B. Release takes place during a pause.

Improper leaf switch operation.
- 1. Faulty switch ..... Replace.
- 2. Improper adjustment ..... Readjust (Refer to item 5.5).

C. Auto stop does not function.

Does solenoid operate ?
- Improper solenoid mounting position ..... Readjust (Refer to item 5.3).
- Caught function button ..... Check, repair, or replace.
- Faulty solenoid ..... Replace.
- Improper operation of S7 or S11 ..... Check.
- Defective sensing circuit ..... Repair or replace unit.

D. The memory rewind does not work.

Does the auto stop work?
- yes → Faulty S8 and S9 movement ..... Check, repair or replace.
- yes → Faulty counter (S10) ..... Check, repair or replace.

Excessive mechanical noise.
- Lack of lubricant at rotating parts ..... Lubricate.
- Faulty motor ..... Replace.
- Faulty tension arm assembly ..... Replace.
- Drive part touching other part ..... Check and repair.

Level meter pointer does not deflect (other items normal).
- Defective level meter ..... Replace.
- Defective diode (D101, D201) ..... Replace.
- Defective potentiometer (VR105, VR205) ..... Replace.

No skip function.

A. Tape speed does not rise.
- Faulty switch or poor switch connection (S2-3) ..... Replace.
- Faulty resistor (R324) ..... Replace.
- Faulty motor ..... Replace.

B. High-range level does not drop..
- Faulty switch or poor switch connection (S2-1, S2-2) ..... Replace.

No sound (mechanical parts function normally)

Do level meter pointers deflect ?

- Attempt to play unrecorded tape . . . . . Change cassette.
- Improper operation of muting switch
  1. Faulty switch . . . . . Replace.
  2. Improper adjustment . . . . . Readjust (Refer to item 5.8).
- Defective power circuit . . . . . Repair.
- Defective amplifier circuit . . . . . Repair or replace.
- Open head . . . . . Replace.
- Connecting cables
  1. Not connected. . . . . Reconnect.
  2. Poor connection . . . . . Repair or replace.
  3. Open . . . . . Repair or replace.

Low sound output

A. Playback

- Dirty head . . . . . Clean with alcohol.
- Worn head . . . . . Replace.
- Defective amplifier circuit . . . . . Repair or replace.
- Playback of tape recorded at a low level.

B. Recording and playback.

Check quality.

- Low recording level
  1. Improper settings of level controls . . . . . Raise levels.
  2. Low input level . . . . . Raise levels.
  3. Improper adjustment of record levels . . . . . Readjust (Refer to item 7.6).
  4. Improper adjustment of level meters . . . . . Readjust (Refer to item 7.5).
- Incorrect recording bias
  1. Improper operation of oscillator circuit . . . . . Check and repair.
  2. Improper adjustment of recording bias . . . . . Readjust (Refer to item 7.4).
  3. Defective capacitor (C305, C306) . . . . . Replace.
  4. Defective potentiometer (VR301, VR302) . . . . . Replace.

Excessive distortion

Try another tape.

- Excessive recording levels.
  1. Excessive settings . . . . . Reduce levels.
  2. Excessive input levels . . . . . Reduce levels.
- Low bias level . . . . . Readjust (Refer to item 7.4).
- Low power supply voltage . . . . . Check source.
- Defective amplifier circuit . . . . . Check and repair.

No recording function (playback okay).

Do level meter pointers deflect ?

- Connecting input cables
  1. Not connected . . . . . Reconnect.
  2. Poor connection . . . . . Repair or replace.
  3. Open . . . . . Repair or replace.
- No input signal (microphone, other input source) . . . . . Check.
  Note: Inserting a plug in a microphone opens the LINE INPUT connection.
- Improper operation of record-playback switches (S1-1 through S1-18)
  1. Defective switch . . . . . Replace.
  2. Improper adjustment . . . . . Readjust (Refer to item 5.4).
- Faulty oscillator circuit . . . . . Check and repair.

No low response

- Defective playback equalizer amplifier element . . . . . Replace.
- No low range in recorded information

No high response

A. Playback

Head
1. Improper adjustment of head slit angle ..... Readjust (Refer to item 6).
2. Worn ..... Replace.
3. Dirty ..... Clean with alcohol.

Dolby circuit used for playback of tape not recorded with Dolby process ..... Check

B. Record and playback

Improper recording bias ..... Readjust (Refer to item 7.4).
Improper use of tape selector switch

No erasing function

Erase head
1. Open ..... Replace.
2. Dirty ..... Clean with alcohol.

Defective oscillator circuit ..... Check and repair.

Excessive drop-out

Dirty head ..... Clean with alcohol.
Use of defective tape ..... Change cassette.

Poor signal-to-noise ratio

A. Excessive hum

Floating ground side of connecting cables ..... Repair.
Faulty power circuit ..... Check and repair.
Deck located in strong magnetic field ..... Relocate deck.

B. Excessive noise

Magnetized head ..... Demagnetize with suitable instrument.
Faulty circuit elements ..... Check and repair.
Poor solder connection ..... Check and repair.
Poor contact ..... Check and repair.
Faulty tape ..... Change cassette.

Dolby does not work.

Does Dolby indicator light?
Faulty switch (S12-1 through S12-4) ..... Repair or replace.
Faulty Dolby circuit
1. Faulty adjustment ..... Readjust (Refer to item 8).
2. Faulty circuit ..... Check and repair or replace.

Peak indicator does not light.

Is the level meter generating more than +4VU?
Input level too low ..... Raise the level and confirm.
Faulty peak indicator circuit ..... Check, repair or replace.

Over level limiter does not work.

Is the level meter generating more than +4VU?
Faulty switch (S5-1 through S5-4) ..... Repair or replace.
Faulty limiter circuit ..... Check, repair or replace.

5. MECHANICAL ADJUSTMENTS

Before proceeding with mechanical adjustments, make sure that all parts are clean, that is, that dirt is not interfering with proper operation. The function of the helical spring is very important. If for some reason adjustment appears in order, it is advisable to replace this spring.

5.1 ADJUSTMENT OF PINCH ROLLER PRESSURE

Adjustment is required following replacement of the roller or when slippage results in excessive wow.

1. Remove the wooden case and depress the PLAY button.
2. Refer to Fig. 5. Using the tension gauge, apply pressure to the pinch roller and note the reading when the roller separates from the capstan. This reading should be 300 ~ 400 grams. If the reading falls outside this range, shift the anchor end of the pinch roller spring to a different hole to effect adjustment.
3. With the roller in contact with the capstan, use pliers to bend the end of the lever shown in Fig. 6 so that the designated dimension (more than 0.5 mm) is obtained.
   If specified conditions cannot be obtained, replace the pinch roller spring.

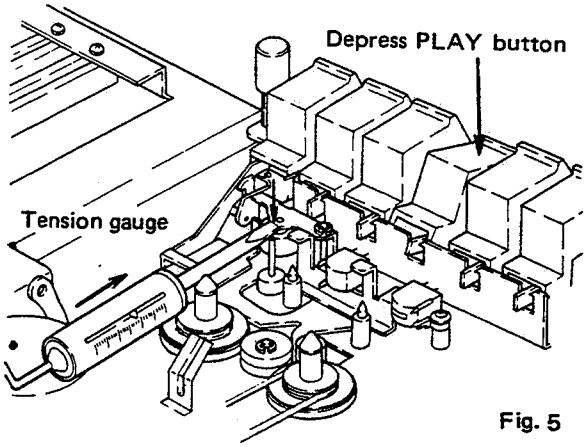


Fig. 5

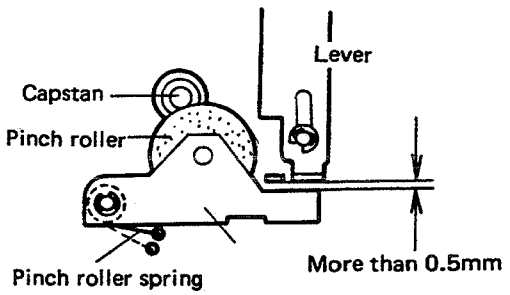


Fig. 6

5.2 REEL BASE TORQUE ADJUSTMENT

This adjustment is required when wow is excessive or tape transport is unstable.

Reel base torque should conform to the following values:

Take-up base:	PLAY	40 ~ 65 g-cm
	F-F	60 ~ 130 g-cm
Supply base:	REW	60 ~ 130 g-cm

Refer to Fig. 7 and verify that torques fall in these ranges.

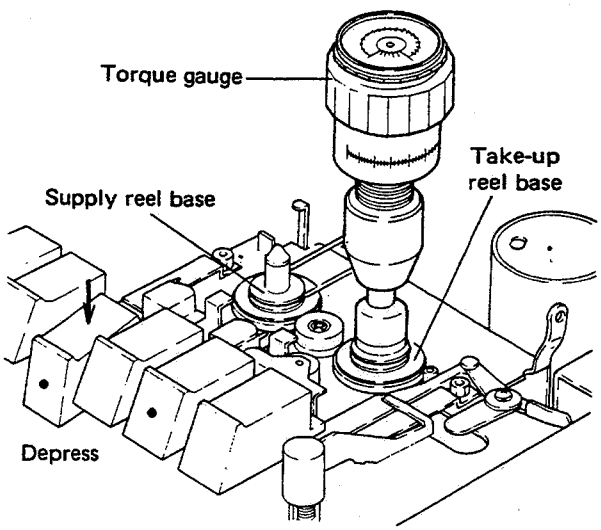


Fig. 7

TAKE-UP REEL (DURING PLAY)

Refer to Fig. 8(a) and (b). Make sure that the rubber ring is in firm contact with the pulley. Then clean respective surfaces, making sure that they are free of all traces of oil. If these steps do not yield the desired results, adjust tension exerted by spring A. If this action still does not yield desired results, replace the entire tension assembly.

TAKE-UP REEL (DURING F-F)

Refer to Fig. 9 and adjust the plate spring.

SUPPLY REEL (DURING REW)

If torque is not correct, refer to Fig. 10 and remove the muting assembly. Adjust tension of spring B.

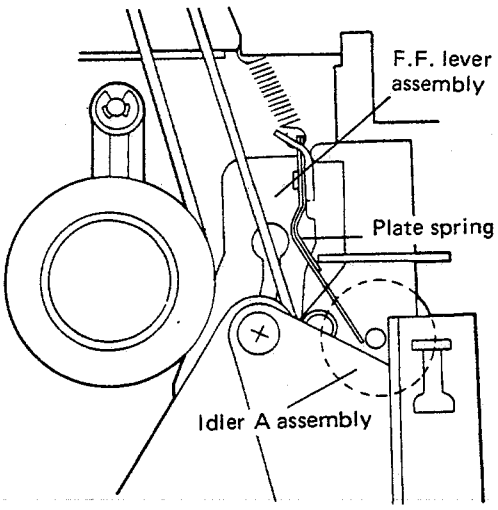


Fig. 9

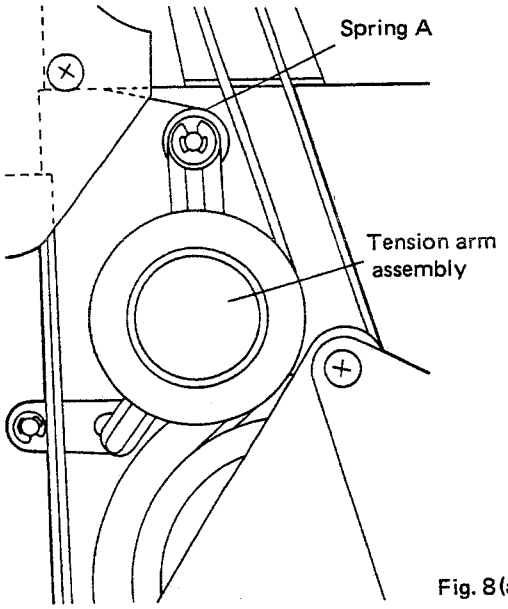


Fig. 8(a)

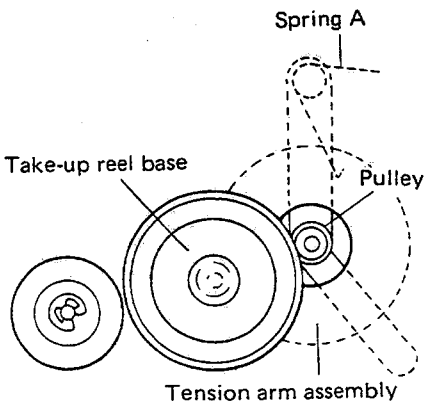


Fig. 8(b)

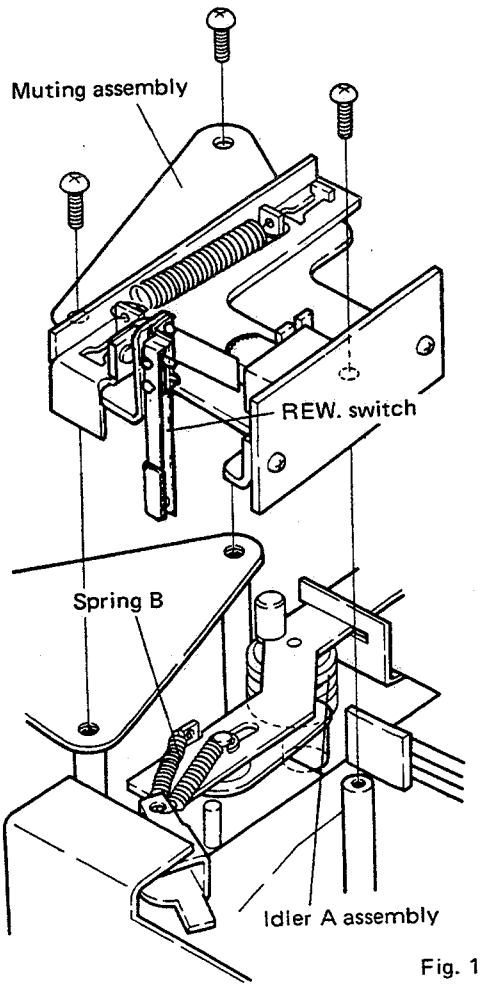


Fig. 10

5.3 AUTO STOP MECHANISM

The mechanism should not need adjustment, but the following points should be noted.
If the solenoid dose not function smoothly, refer to Fig. 11 and check that the plunger return spring is returning the plunger smoothly on the solenoid spindle. Also check that the push buttons are perfectly released after the solenoid operation.

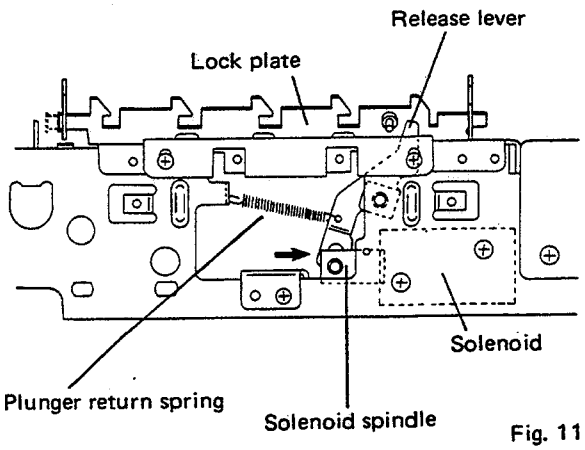


Fig. 11

5.4 OPERATION OF RECORD-PLAYBACK SWITCH

Adjustment is required in the event that the record function is not possible. Refer to Fig. 12. With the operating lever in the retracted position, loosen the two screws and shift its end piece so that the dimension indicated becomes 0~0.5mm.

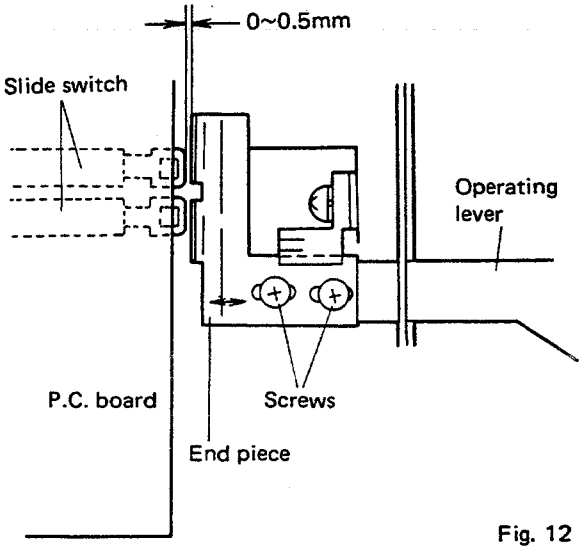


Fig. 12

5.5 PAUSE MECHANISM

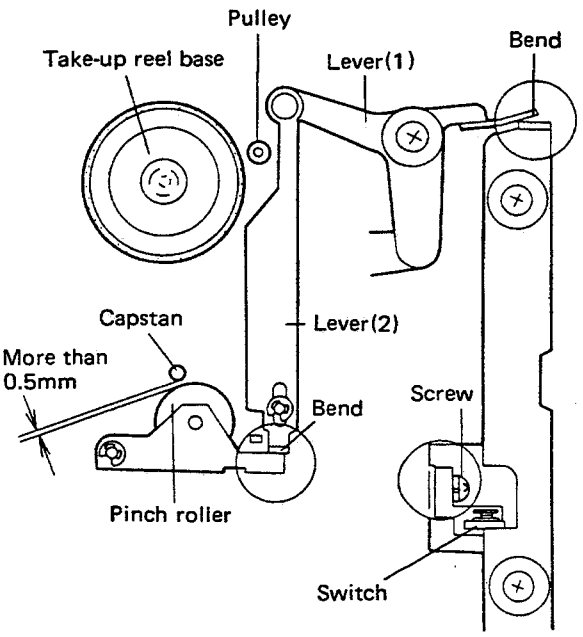
This adjustment is required when operation of the PAUSE button is not proper. Refer to Fig. 13. Check clearance between the capstan and pinch roller. This clearance should be at least 0.5 mm. Check the sequence of operation when the PAUSE button is released.

The following sequence should exist:

1. The pulley of the tension arm assembly contacts the reel base and the reel base begins to turn.
2. The pinch roller comes into contact with the capstan and the pinch roller begins to turn.
3. The switch contacts open.

The following steps are used to obtain the above sequence.

1. Bend the end of lever (1) to adjust timing of contact between the pulley of the tension arm assembly and reel base.
2. Bend the end of lever (2) to adjust timing of contact between the pinch roller and capstan.
3. Adjust the mounting angle of the switch to change timing of switch contact opening.



○mark is adjust point.

Fig.13

5.6 TAPE SPEED ADJUSTMENT

This adjustment is required only if the tape speed remains consistently incorrect after conducting steps to eliminate wow. The rated tape speed is 4.76 cm/sec ±3 %. To bring the motor speed to a corresponding value, refer to Fig. 14 and turn the screw in the end of the motor, to the right to increase speed and to the left to decrease speed.

5.7 MOTOR SWITCH TIMING

This adjustment is required when timing is not correct. The timing is early if the tape transport is rapid when the PLAY button is depressed slowly but then settles to the nominal value. The timing is late if sound is reproduced prior to reaching normal tape transport speed or the motor does not function in the fast forward or rewind mode.

ADJUSTMENT PROCEDURE

Refer to Fig. 15. Measure the stroke of the brake operating lever in the fast forward and rewind states. Adjust the mounting angle of the switch so that its contacts close at mid-stroke of the brake operating lever. Note that the contacts must be pushed up 1.5 mm following initial contact.

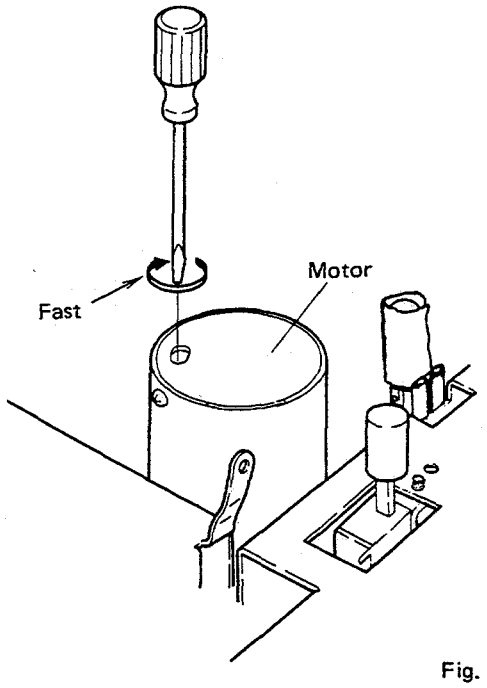


Fig. 14

5.8 MUTING SWITCH TIMING

This adjustment is required when noise appears in any mode other than playback or when sound is not produced during playback. Refer to Fig. 16.

1. Slowly depress the PLAY button. Adjust spring C so that the muting switch contacts close when clearance between the capstan and pinch roller reaches 0.5 mm.
2. Depress the STOP button and confirm that the muting switch contacts close.
3. If return of the cam plate does not close the switch contacts, bend the cam plate tabs to obtain proper switch operation.

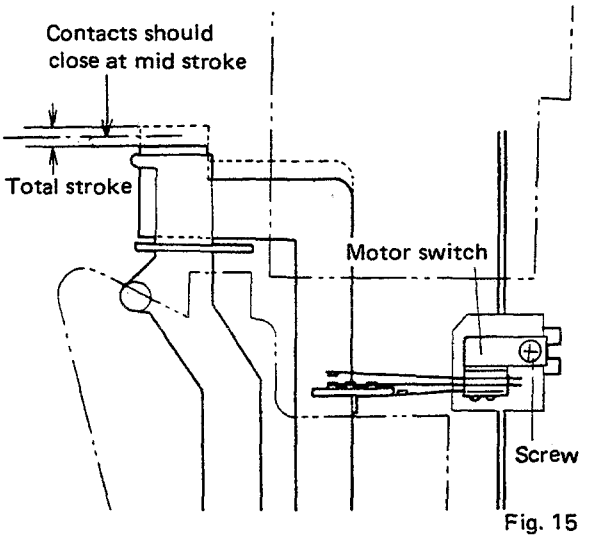


Fig. 15

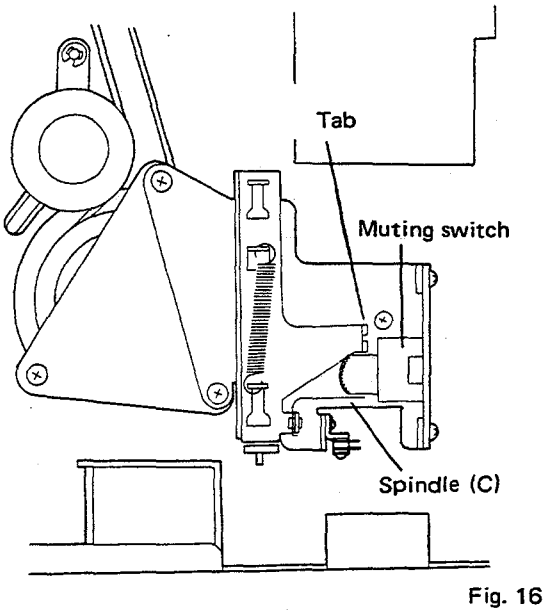


Fig. 16

6. TAPE HEAD ADJUSTMENT

Items required for this adjustment are a voltmeter and test tape (TEAC MTT-116L).

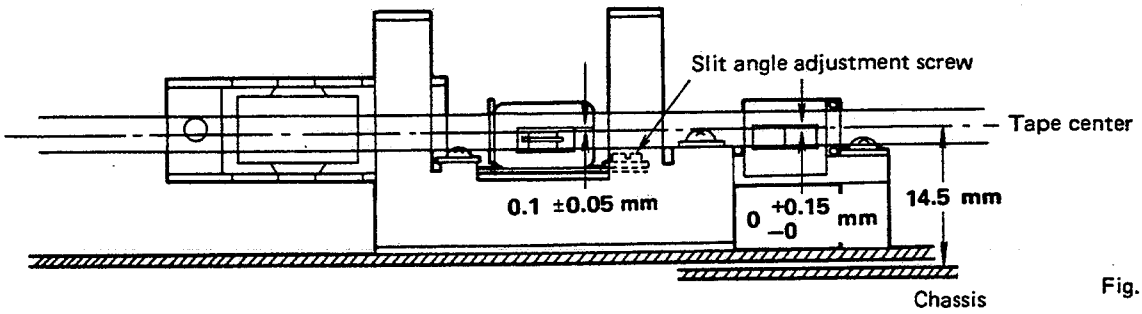


Fig. 17

PROCEDURE

1. Carefully clean head, capstan, and roller surfaces.
2. Connect the voltmeter to LINE OUTPUT.
3. Set the level control to maximum.
4. Play back the third section of the test tape (10 kHz, −10 dB).
5. Turn the adjusting screw on the head assembly to obtain maximum output as indicated on the voltmeter. Refer to Figs. 18 and 19.
6. Fig. 17 shows dimensional relationships of the tape and heads.
7. Note that removal of the chassis from the case is not necessary in order to make this adjustment. Refer to Fig. 19.

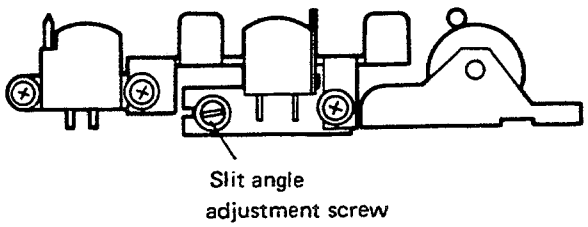


Fig. 18

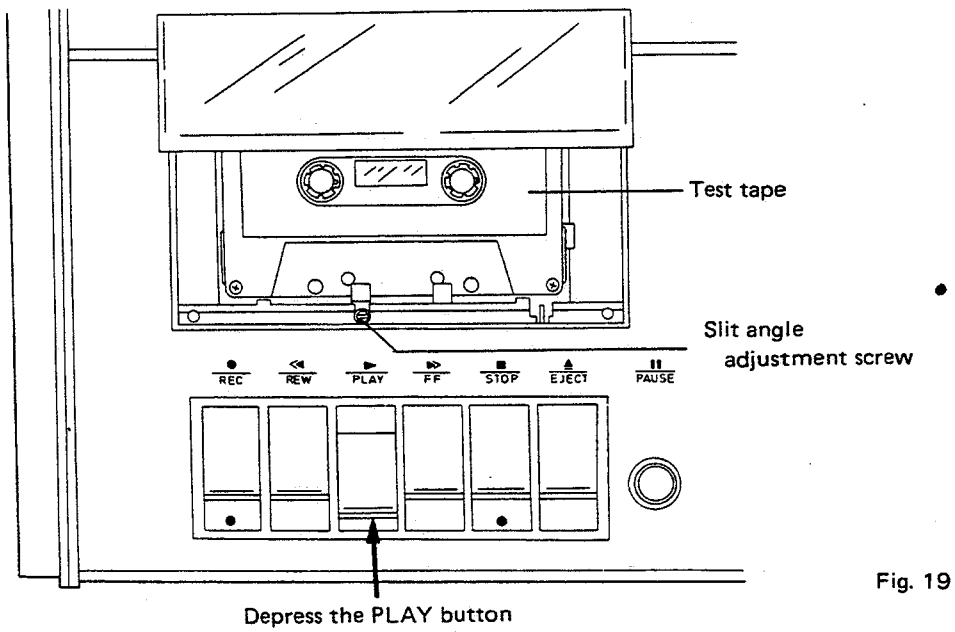


Fig. 19

7. ADJUSTING THE RECORDING/PLAYBACK CIRCUITS

The following adjustments should be carried out with the Dolby switch (DOLBY) and the input level limiter (LIMITER) each in the OFF position.

7.1 PLAYBACK LEVEL

1. Set the tape selector switch (EQ) to NORMAL.
2. Play back the first section of the test tape MTT-116L, and set the playback level controls (PB LEVEL) to its maximum position.
3. Adjust VR_{102} so that the voltage between terminal No. 25 on the REC/PB amplifier assembly and ground is equivalent to −2.7dBv (723mV) (L Channel).
4. Adjust VR_{202} so that the voltage between terminal No. 26 on the REC/PB amplifier assembly and ground is equivalent to −2.7dBv (723mV) (R Channel).

7.2 PLAYBACK EQUALIZER

1. Set the tape selector switch (EQ) to NORMAL.
2. Play back the second section of the test tape MTT-116L, and adjust the playback level controls (PB LEVEL) so that the playback level as measured at the LINE OUTPUT terminals is equivalent to −20dBv(100mV).
3. Play back the third section of the test tape (6.3kHz) and adjust VR_{101} (L Channel) and VR_{201} (R Channel) so that the playback level as measured at the LINE OUTPUT terminals is −20.5(±0.5)dBv.
4. When the equalizer adjustment is made it has a slightly effect on the circuit gain, so the instructions under 7.1 "Playback Level" should be followed out again.

7.3 BIAS TRAP

1. Set the deck in the recording mode, and set the recording level controls (REC LEVEL) to its maximum position.
2. Connect an oscilloscope to terminals TP_1 (L Channel) and TP_2 (R Channel) on the REC/PB amplifier assembly.
3. Adjust L_{104} so that the bias leakage waveform as indicated on the oscilloscope is at a minimum (L Channel).
4. In the same way as 3) above, adjust L_{204} (R Channel).
5. Switch the over level limiter switch (LIMITER) to ON.
6. Adjust L_{101} (L Channel) and L_{201} (R Channel) so that the bias leakage at the LINE OUTPUT terminals is at a minimum.

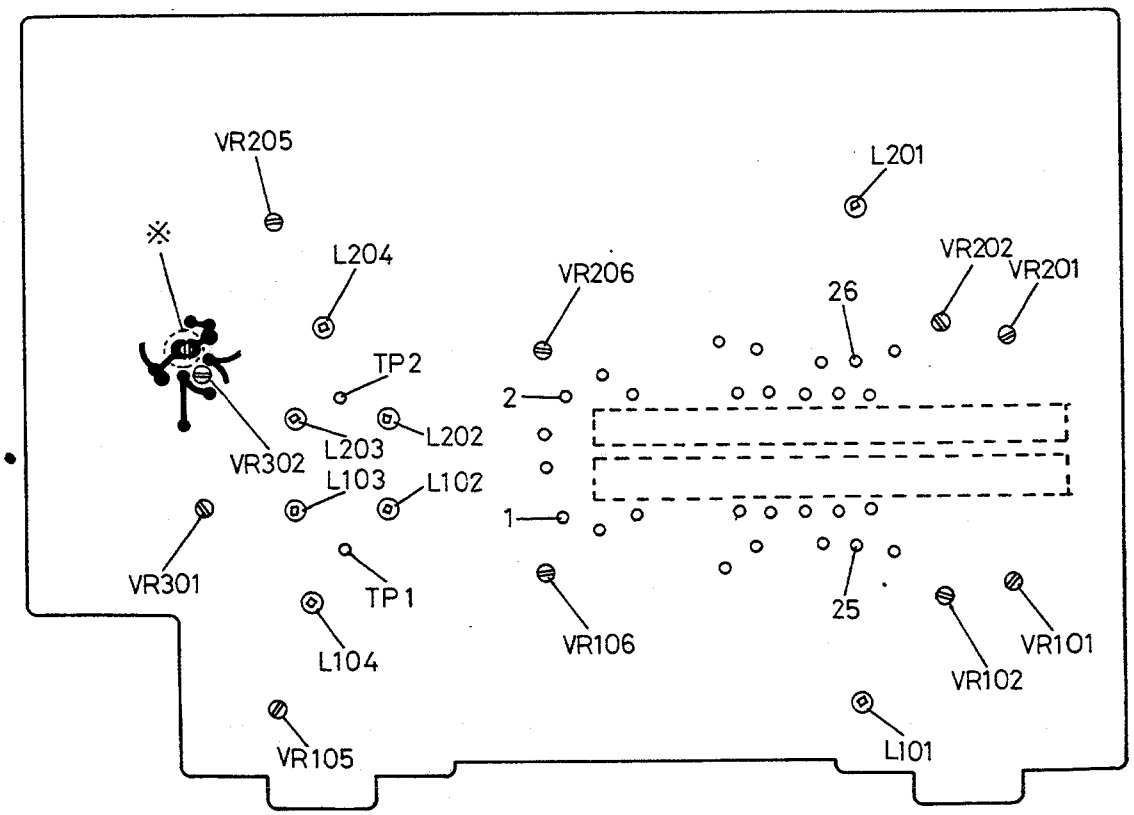


Fig. 20

7.4 RECORDING BIAS (ROUGH ADJUSTMENT)

1. Set the deck in the recording mode, and switch the tape selector switch (BIAS) to NORMAL.
2. Adjust VR_{301} so that the potential between terminal No. 1 on the REC/PB amplifier assembly and ground is 1.5mV (L Channel).
3. Adjust VR_{302} so that the potential between terminal No. 2 and ground is 1.5mV (R Channel).
   N.B.
   When the recording bias is changed, it can give rise to changes in the bias frequency, so adjustment of the trap coil should be repeated after-wards.

7.5 LEVEL METER CALIBRATION

1. Feed a 333Hz signal at −10dBv (316mV) to the LINE INPUT terminals, and set the deck in the recording mode.
2. Adjust the recording level controls (REC LEVEL) so that the potentials between both terminal No. 25 on the REC/PB amplifier assembly (L Channel) and ground and that between terminal No. 26 (R Channel) and ground are each equivalent to −6.7dBv (470mV).
3. Adjust VR_{105} (L Channel) and VR_{205} (R Channel) so that both the right-hand and left-hand meter indicator needles point to zero.

7.6 RECORDING LEVEL

First isolate the power supply to the oscillator circuit. Refer to Fig. 20. The connections for the oscillator circuit power supply is marked and soldered to the copper foil. This connections should be unsoldered (and of course it must be re-soldered on reconnection).

1. Switch the tape selector switch (EQ) to NORMAL, and feed a 333Hz signal at −10dBv (316mV) to the LINE INPUT terminals with the deck in the recording mode.
2. Adjust the recording level controls (REC LEVEL) so that the monitor level at the LINE OUTPUT terminals is −10dBv (316mV).
3. Adjust VR_{106} (L Channel) so that the potential between terminal No. 1 on the REC/PB amplifier assembly and earth is 0.4mV.
4. Adjust VR_{206} (R Channel) so that there is 0.4mV between terminal No. 2 and earth.
5. Reconnect the oscillator circuit power supply and switch the tape selector switches (EQ, BIAS) to NORMAL, and record on an MTT-502 tape (equivalent to BASF C-90 tape).
6. Confirm that, on playing back this tape, the potential at terminals No. 25 (L Channel) and No. 26 (R Channel) on the REC/PB amplifier assembly are both equivalent to −6.7dBv. (470mV).
7. If the measured value should be other than −6.7dBv, VR_{106} (L Channel) and VR_{206} (R Channel) should be readjusted repeatedly as many times as is necessary to bring the playback level following recording and playback to within 0.5dB of the specified value. In this case the figure of 0.4mV given in sections 3) and 4) above may be slightly changed without it mattering.

7.7 FREQUENCY CHARACTERISTICS IN RECORDING AND PLAYBACK

These are modified by fine adjustments to the bias current.

1. Set the tape selector switches (EQ, BIAS) to NORMAL.
2. Feed a 333Hz signal at −10dBv (316mV) to the LINE INPUT terminals, and adjust the recording level controls (REC LEVEL) so that the level meters indicate zero.
3. Reduce the input a further 20dB (down to −30dBv) and record at 333Hz and 6.3kHz on MTT-502 (equivalent to BASF C-90 tape).
4. Adjust VR_{301} (L Channel) and VR_{302} (R Channel) until the difference between the playback levels of the 333Hz and 6.3kHz signals is less than −0.5dB.
5. When the bias current is reduced, the high range frequency response tends to rise, but this is accompanied by an increase in distortion, so the adjustment should be performed with great care.

Concerning Recording Equalization

The peaking coils ($L_{102, 103, 202, 203}$) should not normally need adjustment, but if the recording and playback frequency characteristics fail to improve even after adjustment of the bias, check that the playback amplifier response peaks at 13kHz for NORMAL settings and at about 15kHz for CHROME. If measurements reveal any major deviation, and only if, the peaking coils should be retuned.

8. ADJUSTMENT OF THE DOLBY PROCESSOR

This adjustment is made only after all the adjustments under "ADJUSTING THE RECORDING/PLAYBACK CIRCUITS" have been completed.

8.1 FM MPX FILTER

1. Feed a 19kHz signal to the LINE INPUT terminals and set the deck in the recording mode.
2. Adjust L_3 so that the potential between terminal No. 5 and ground is at a minimum (L Channel).
3. Adjust L_4 so that the potential between terminal No. 6 and ground is at a minimum (R Channel).
4. Apply a 38kHz signal and adjust L_1 so that the potential between terminal 5 and earth is at a minimum.
5. In the same way, adjust L_2 so that the potential between terminal No. 6 and earth is at a minimum.

8.2 DOLBY LEVEL

1. Apply a 5kHz signal to the LINE INPUT terminals and set the deck in the recording mode.
2. Set the Dolby switch (DOLBY) OFF, and turn VR_1 and VR_2 to their maximum positions.
3. Adjust the recording level controls (REC LEVEL) so that the potential between terminal No. 5 (L Channel) on the Dolby processor assembly and ground and between terminal No. 6 (R Channel) and earth are both −4.7dBv (580mV).
4. Reduce the input level to 40dB below the initial input level, and measure the signal level between terminal No. 5 (L Channel) and ground and between terminal No. 6 (R Channel) and ground under these conditions.
5. Set the Dolby switch ON, and adjust VR_3 (L Channel) and VR_4 (R Channel) so that the measured level increases by 10dB with the switch ON over the level with it OFF.
6. In the same way, reduce the input level to 30dB below its initial level and switch the Dolby switch (DOLBY) OFF and ON, and adjust VR_1 (L Channel) and VR_2 (R Channel) so that the level with the switch ON is 8dB over that with it OFF.

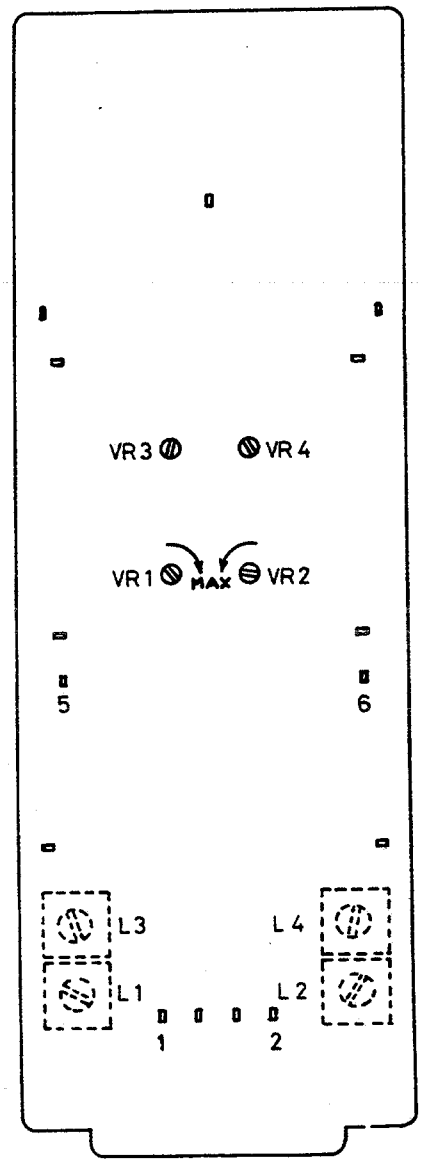


Fig. 21

9. SCHEMATIC DIAGRAMS, P.C.BOARD PATTERNS AND PARTS LIST

9.1 ELECTRO-PARTS LIST

- CAPACITORS: IN μF UNLESS OTHERWISE NOTED p: pF
- RESISTORS: IN Ω, ¼W UNLESS OTHERWISE NOTED k: kΩ, M: MΩ

Common Parts of PBV and KCU Type

CAPACITOR

Symbol	Description	Part No.	
C2	Mylar 0.01 50V	CQMA 103K 50	

POTENTIOMETERS

Symbol	Description	Part No.	
VR103	Slide type (REC LEVEL-L) 20kΩ-A	RCW-001-0	
VR104	Slide type (PB LEVEL -L) 20kΩ-A	RCW-001-0	
VR203	Slide type (REC LEVEL-R) 20kΩ-A	RCW-001-0	
VR204	Slide type (PB LEVEL-R) 20kΩ-A	RCW-001-0	

SWITCHES

Symbol	Description	Part No.	
S2	Push switch (SKIP)	RSG-009-A	
S7	Push switch (Stop)	RSN-001-B	
S8	Push switch (MEMORY)	RSG-018-0	
S9	Spring switch (Rewind)	RSK-019-0	
S11	Spring switch (Pause)	RSK-014-0	
S13	Sensing switch assembly	RSX-032-A	

OTHERS

Symbol	Description	Part No.	
	REC/PB amplifier assembly	RWF-024-0	
	Dolby processor assembly	RWX-026-E	
	Sensing circuit assembly (B)	RWG-043-A	
	Switch circuit assembly (C)	RWS-010-0	
	Push switch assembly	RWS-019-0	
R.P.H.	REC/PB head	RPB-027-A	
E.H.	Erasing head	RPB-014-0	
M	Motor	RXM-006-0	
	Level meter	RAW-019-0	
SD1	Solenoid	RXP-016-0	
	Connection cord	D53-851-0	

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Symbol	Description	Part No.	
H.D1	Light-emitting diode GL-50AR		
	Lamp socket (Meter, Dolby)	E22-020-0	
PL1	Lamp (Meter)	E22-020-0	
PL2	Lamp (PB)	REL-015-0	
PL3	Lamp (REC)	REL-014-0	
PL4	Lamp (Dolby)	E22-020-0	
	Jack board assembly (C)	RKN-013-B	
	Fuse holder (4P)	RKR-014-0	
R1	Carbon film resistor 1kΩ	RD¼PS 102J	

Distinguishing Parts

- Model CT-5151 comes in two versions distinguished as follows:
  KCU type . . . . . 120V only, CSA and UL approved
  PBV type . . . . . 120V/220V, SEMCO, NEMCO, DEMCO and SEV approved

Symbol	Description	Part No. (KCU type)	Part No. (PBV type)
C1	Ceramic capacitor 0.01μF 1.4kV	C43-003-0	. . . . .
	Power transformer	RTT-051-0	RTT-052-0
S14	Push switch (Power)	RSA-010-0	RSA-011-0
S15	Slide switch (Line voltage selector)	. . . . .	RSH-010-0
	Fuse holder (1P)	. . . . .	RKR-011-0
F1	Fuse (Primary) 0.5A	AEK-005-0	REK-023-0
	Fuse (Secondary) Amp. 0.315A	. . . . .	REK-024-0
	Amp. 0.3A	REK-018-0	. . . . .
	Motor 0.5A	REK-017-0	REK-023-0
	Lamp 0.5A	REK-017-0	REK-023-0
	Jack board assembly (A)	RKN-012-0	. . . . .
	Jack board assembly (B)	. . . . .	RKN-014-A
	AC power cord	D11-003-E	ADG-004-0