

CASSETTE TAPE DECK

CT-F9191

<ART-213-0>

Additional

Service Manual

Employ this additional service manual for units with serial numbers indicated in Table A.

For detailed please refer to the Service Manual of CT-F 9191 / KCU, NB, DV, DP.

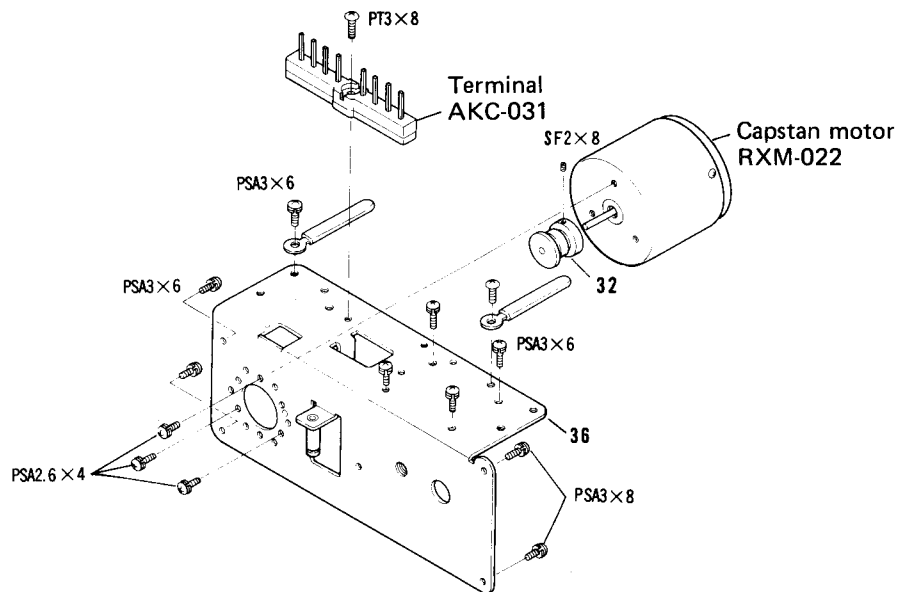
Table A

Type	Serial No.
KC	3612501 ~
KU	3401301 ~
FV	1308101 ~
FP	2501701 ~
NB	4200501 ~
CT-F9090 FV	1301201 ~

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Assembly Name	KC	KU	FV	FP	NB
REC/PB Amplifier assembly	RWF-054	←	←	←	←
Switch assembly	RWS-042	←	←	←	←
Control assembly	RWG-060	←	←	←	←
Transistor assembly	RWX-083	←	RWX-137	←	←
Power Supply assembly	RWR-026	←	RWR-038	←	←
Fuse assembly	RWX-080	←	←	←	RWX-111
Dolby processer assembly	RWX-078	←	←	←	←
Connector assembly	RWX-084	←	←	←	←
Indicator assembly	RWX-081	←	←	←	←
Capstan motor	RXM-022	←	←	←	←



1. SCHEMATIC DIAGRAMS, P.C. BOARD PATTERNS AND PART LISTS

FV type

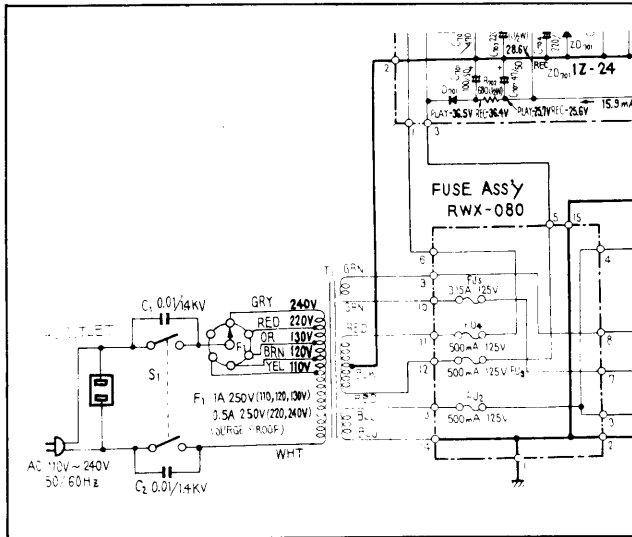


Fig. 1

FP type

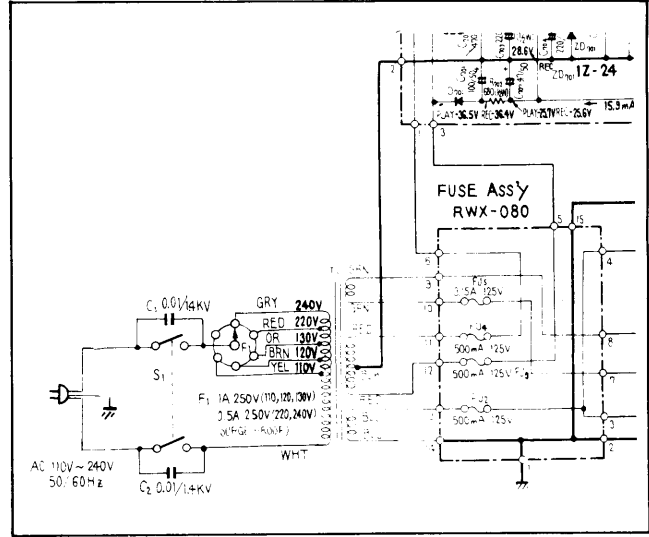


Fig. 2

NB type

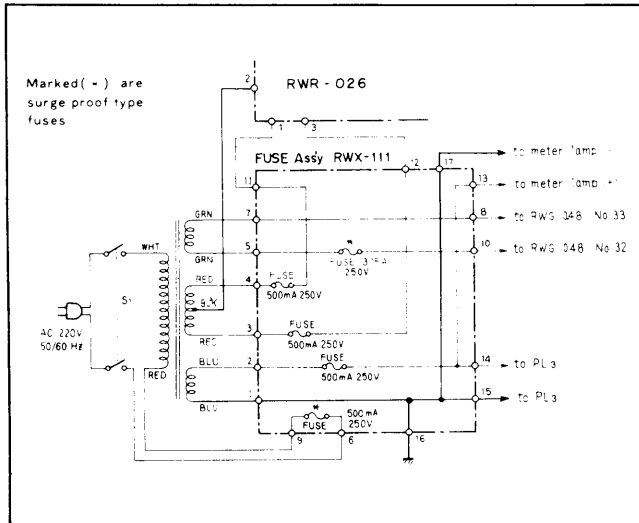


Fig. 3

1

2

3

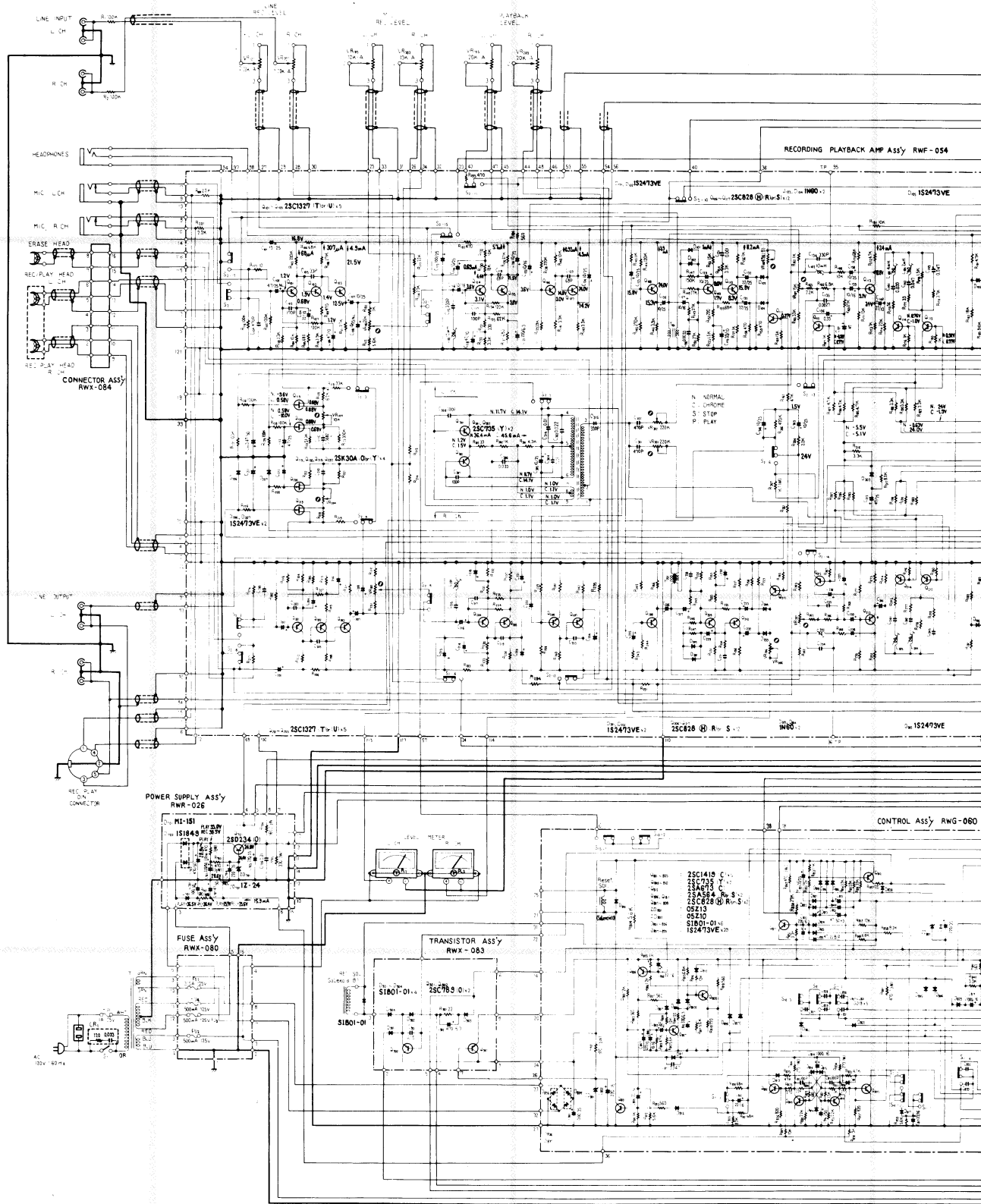
1.1 SCHEMATIC DIAGRAM (KC, KU type)

A

B

C

D



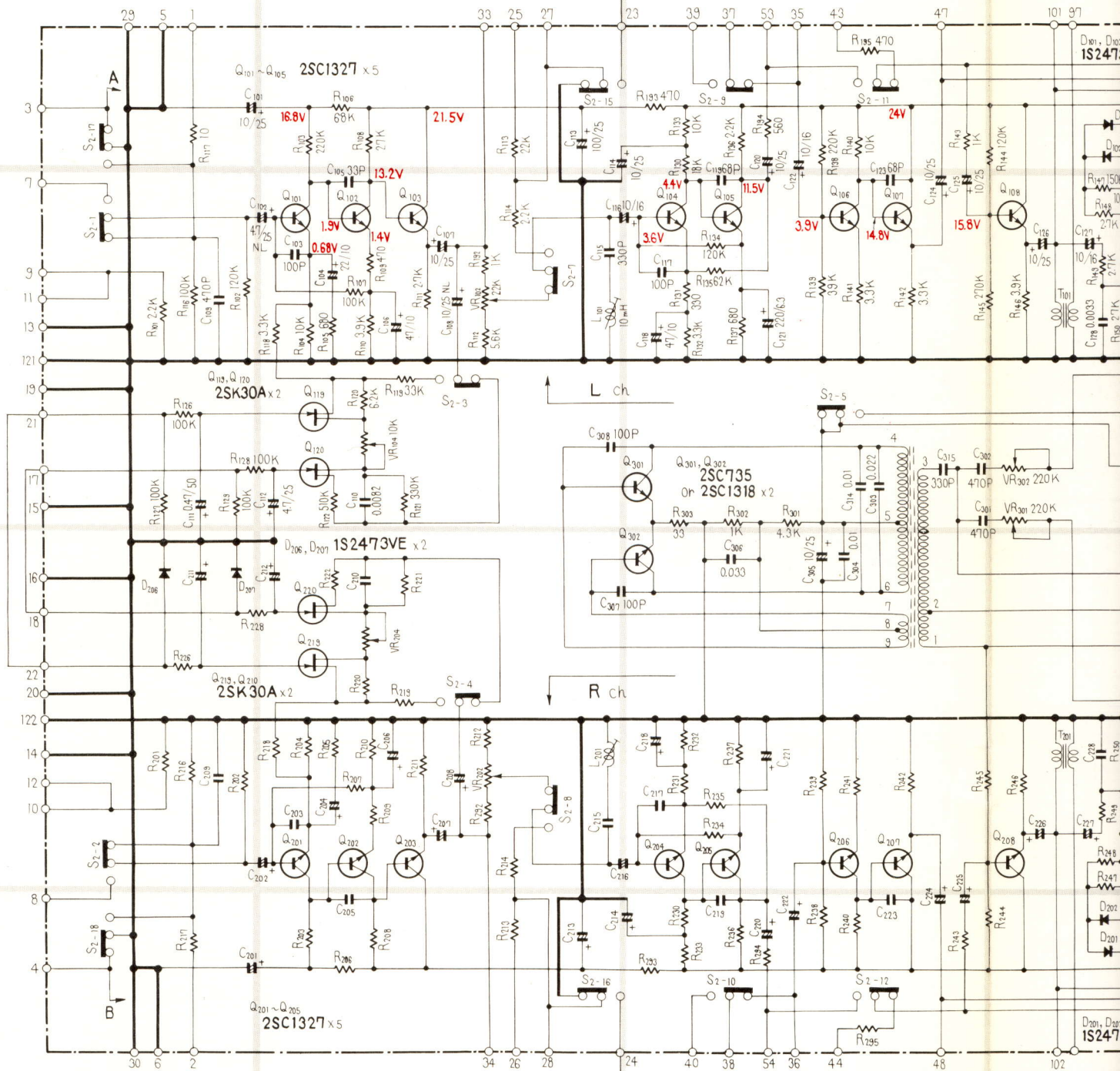


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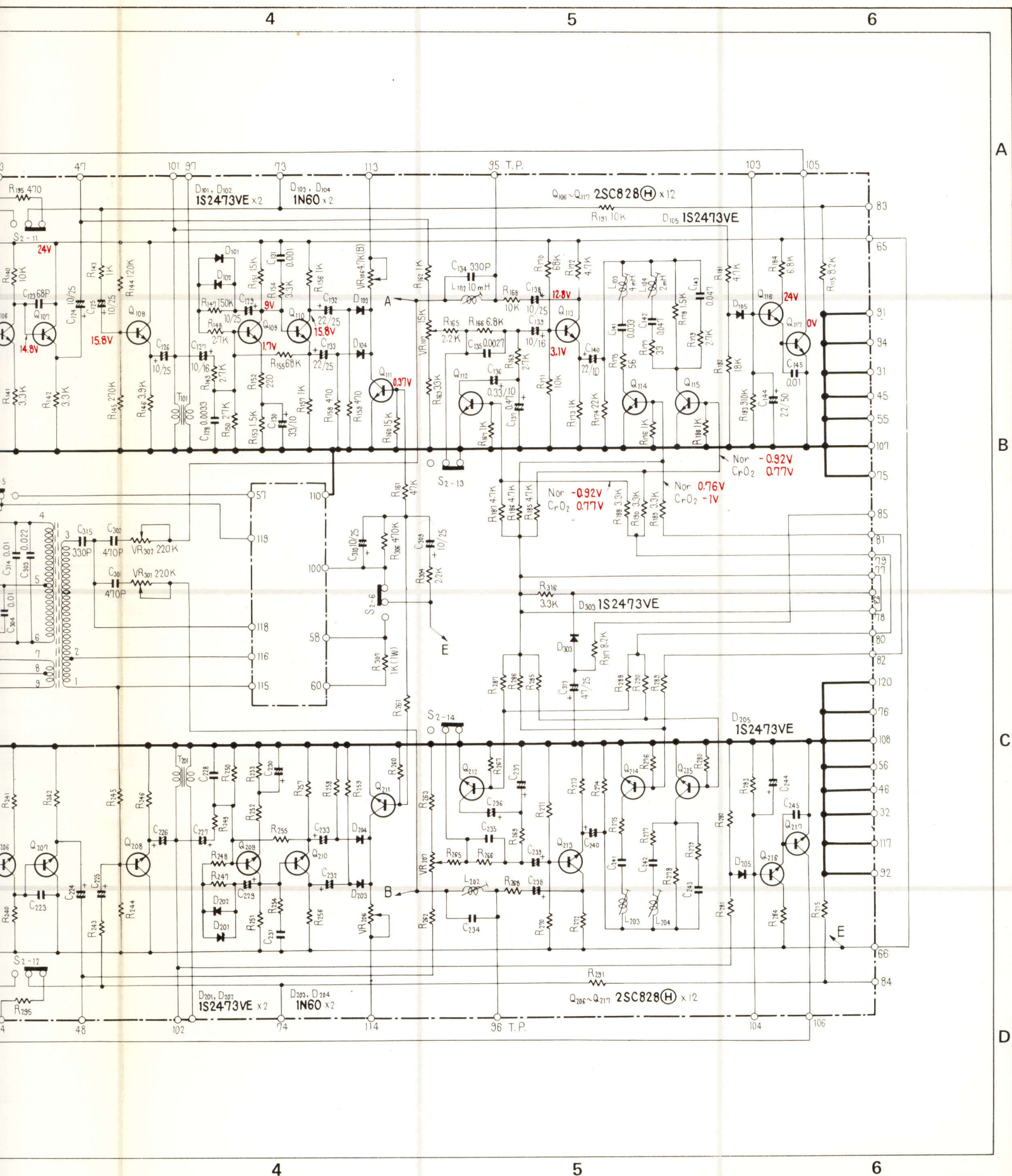
SWITCHES :
S1-1 : POWER SWITCH (OFF POSITION)
S1-1-2 : REC-PLAY SWITCH (PLAY POSITION)
S1-1-3 : EQ SWITCH (HORN POSITION)
S1-1-4 : SENSING CHROMA POSITION
S1-1-5 : LIMITER SWITCH (OFF POSITION)
S1-1-6 : DOLBY SWITCH (OFF POSITION)
S1-1-7 : CHROME TAPE DETECTOR (HOLE POSITION)
S1-1-8 : FILTER SWITCH (OFF POSITION)
S1-1-9 : MEMORY SWITCH (OFF POSITION)
S1-1-10 : PLAY SWITCH (OFF POSITION)
S1-1-11 : REW SWITCH (OFF POSITION)
S1-1-12 : FAST FORWARD SWITCH (OFF POSITION)
S1-1-13 : SENSING SWITCH (OFF POSITION)
S1-1-14 : CASSETTE DETECTOR SWITCH (NO HOLE POSITION)
S1-1-15 : SENSING SWITCH
S1-1-16 : COUNTER SWITCH
S1-1-17 : PAUSE SWITCH (OFF POSITION)
S1-1-18 : ERASE PRESENT DETECTOR SWITCH (NOT
RECORDING POSITION)

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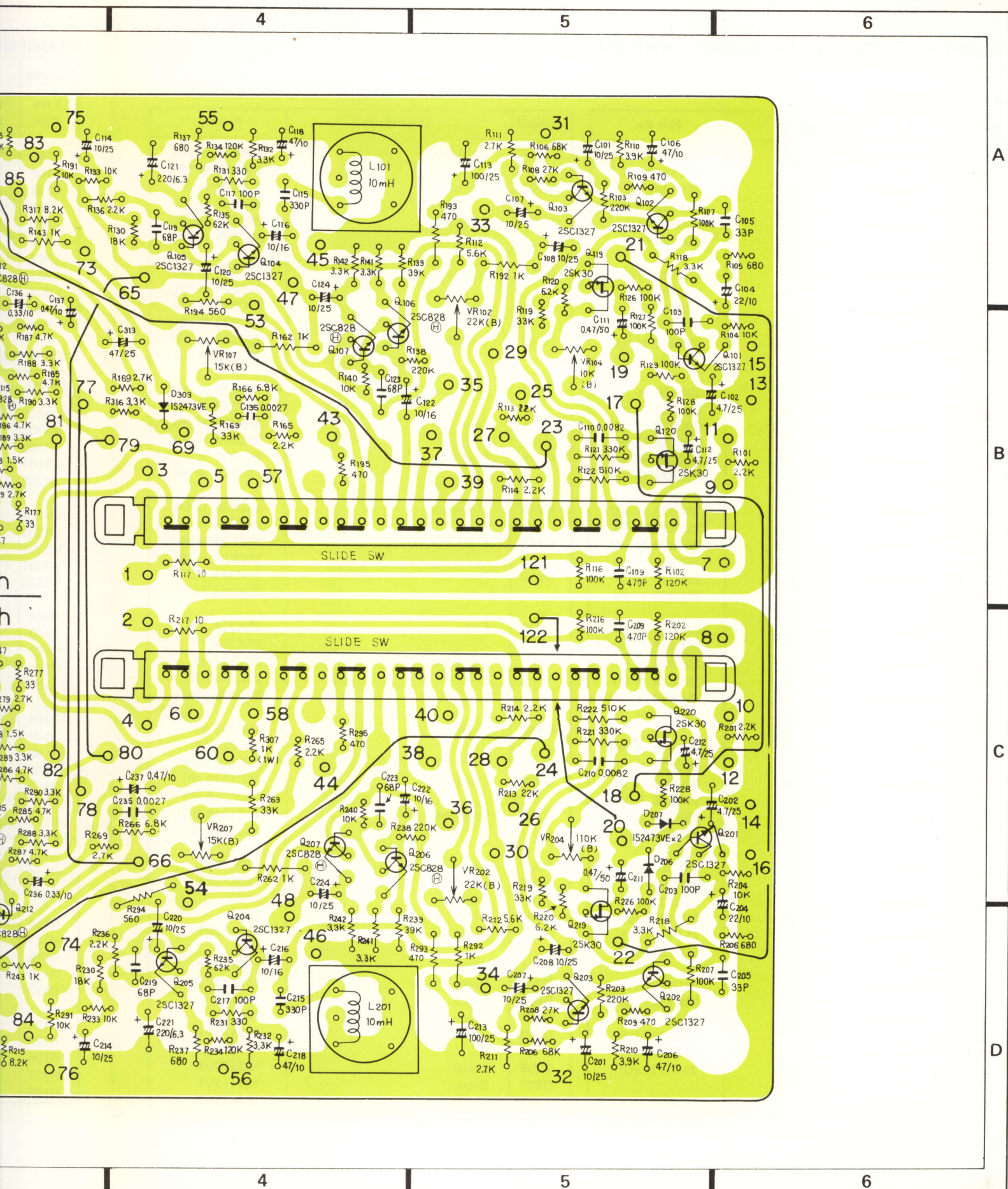
1.2 REC/PB AMPLIFIER ASSEMBLY (RWF-054)



S₂-1 ~ 18 REC-PLAY SW. (PLAY POSI.)







Part List of REC/PB Amplifier Assembly (RWF-054)

SEMICONDUCTORS

Symbol	Description	Part No.	Symbol	Description	Part No.
Q101	Transistor	2SC1327 (T) 2SC1327 (U)	Q207	Transistor	2SC828 H (R) 2SC828 H (S)
Q102	Transistor	2SC1327 (T) 2SC1327 (U)	Q208	Transistor	2SC828 H (R) 2SC828 H (S)
Q103	Transistor	2SC1327 (T) 2SC1327 (U)	Q209	Transistor	2SC828 H (R) 2SC828 H (S)
Q104	Transistor	2SC1327 (T) 2SC1327 (U)	Q210	Transistor	2SC828 H (R) 2SC828 H (S)
Q105	Transistor	2SC1327 (T) 2SC1327 (U)	Q211	Transistor	2SC828 H (R) 2SC828 H (S)
Q106	Transistor	2SC828 H (R) 2SC828 H (S)	Q212	Transistor	2SC828 H (R) 2SC828 H (S)
Q107	Transistor	2SC828 H (R) 2SC828 H (S)	Q213	Transistor	2SC828 H (R) 2SC828 H (S)
Q108	Transistor	2SC828 H (R) 2SC828 H (S)	Q214	Transistor	2SC828 H (R) 2SC828 H (S)
Q109	Transistor	2SC828 H (R) 2SC828 H (S)	Q215	Transistor	2SC828 H (R) 2SC828 H (S)
Q110	Transistor	2SC828 H (R) 2SC828 H (S)	Q216	Transistor	2SC828 H (R) 2SC828 H (S)
Q111	Transistor	2SC828 H (R) 2SC828 H (S)	Q217	Transistor	2SC828 H (R) 2SC828 H (S)
Q112	Transistor	2SC828 H (R) 2SC828 H (S)	Q219	FET	2SK30A (O) 2SK30A (r)
Q113	Transistor	2SC828 H (R) 2SC828 H (S)	Q220	FET	2SK30A (O) 2SK30A (r)
Q114	Transistor	2SC828 H (R) 2SC828 H (S)	Q301	Transistor	2SC735 (r) 2SC735 (O) 2SC735 (GR)
Q115	Transistor	2SC828 H (R) 2SC828 H (S)	Q302	Transistor	2SC735 (r) 2SC735 (O) 2SC735 (GR)
Q116	Transistor	2SC828 H (R) 2SC828 H (S)	Q301	Transistor	2SC1318 (R) 2SC1318 (S)
Q117	Transistor	2SC828 H (R) 2SC828 H (S)	Q302	Transistor	2SC1318 (R) 2SC1318 (S)
Q119	FET	2SK30A (O) 2SK30A (R)	D101	Diode	1S2473VE
Q120	FET	2SK30A (O) 2SK30A (R)	D102	Diode	1S2473VE
Q201	Transistor	2SC1327 (T) 2SC1327 (U)	D103	Diode	1N60
Q202	Transistor	2SC1327 (T) 2SC1327 (U)	D104	Diode	1N60
Q203	Transistor	2SC1327 (T) 2SC1327 (U)	D105	Diode	1S2473VE
Q204	Transistor	2SC1327 (T) 2SC1327 (U)	D201	Diode	1S2473VE
Q205	Transistor	2SC1327 (T) 2SC1327 (U)	D202	Diode	1S2473VE
Q206	Transistor	2SC828 H (R) 2SC828 H (S)	D203	Diode	1N60
			D204	Diode	1N60
			D205	Diode	1S2473VE
			D206	Diode	1S2473VE
			D207	Diode	1S2473VE
			D303	Diode	1S2473VE

TRANSFORMERS AND COILS

Symbol	Description	Part No.
T101	Matching coil	T61-408
T201	Matching coil	T61-408
L101	Trap coil	RTF-024
L102	Trap coil	RTF-024
L103	Peaking coil	RTF-026
L104	Peaking coil	RTF-025
L201	Trap coil	RTF-024
L202	Trap coil	RTF-024
L203	Peaking coil	RTF-026
L204	Peaking coil	RTF-025
L301	Oscillator coil	T64-001

RESISTORS

Symbol	Description	Part No.
VR102	Semi-fixed 22k-B	C92-857
VR104	Semi-fixed 10k-B	C92-049
VR106	Semi-fixed 4.7k	C92-051
VR107	Semi-fixed VR	RCP-006
VR202	Semi-fixed 22k-B	C92-857
VR204	Semi-fixed 10k-B	C92-049
VR206	Semi-fixed 4.7k	C92-051
VR207	Semi-fixed VR	RCP-006
VR301	Semi-fixed 220k-B	RCP-005
VR302	Semi-fixed 220k-B	RCP-005
R101	Carbon film 2.2k	RD%VS 222J
R102	Carbon film 120k	RD%VS 124J
R103	Carbon film 220k	RD%VS 224J
R104	Carbon film 10k	RD%VS 103J
R105	Carbon film 680	RD%VS 681J
R106	Carbon film 68k	RD%VS 683J
R107	Carbon film 100k	RD%VS 104J
R108	Carbon film 27k	RD%VS 273J
R109	Carbon film 470	RD%VS 471J
R110	Carbon film 3.9k	RD%VS 392J
R111	Carbon film 2.7k	RD%VS 272J
R112	Carbon film 5.6k	RD%VS 562J
R113	Carbon film 22k	RD%VS 223J
R114	Carbon film 2.2k	RD%VS 222J
R115	Carbon film 8.2k	RD%VS 822J
R116	Carbon film 100k	RD%VS 104J
R117	Carbon film 10	RD%VS 100J
R118	Carbon film 3.3k	RD%VS 332J
R119	Carbon film 33k	RD%VS 333J
R120	Carbon film 6.2k	RD%VS 622J
R121	Carbon film 330k	RD%VS 334J
R122	Carbon film 510k	RD%VS 514J
R126	Carbon film 100k	RD%VS 104J
R127	Carbon film 100k	RD%VS 104J
R128	Carbon film 100k	RD%VS 104J

Symbol	Description	Part No.
R129	Carbon film 100k	RD%VS 104J
R130	Carbon film 18k	RD%VS 183J
R131	Carbon film 330	RD%VS 331J
R132	Carbon film 3.3k	RD%VS 332J
R133	Carbon film 10k	RD%VS 103J
R134	Carbon film 120k	RD%VS 124J
R135	Carbon film 62k	RD%VS 623J
R136	Carbon film 2.2k	RD%VS 222J
R137	Carbon film 680	RD%VS 681J
R138	Carbon film 220k	RD%VS 224J
R139	Carbon film 39k	RD%VS 393J
R140	Carbon film 10k	RD%VS 103J
R141	Carbon film 3.3k	RD%VS 332J
R142	Carbon film 3.3k	RD%VS 332J
R143	Carbon film 1k	RD%VS 102J
R144	Carbon film 120k	RD%VS 124J
R145	Carbon film 270k	RD%VS 274J
R146	Carbon film 3.9k	RD%VS 392J
R147	Carbon film 150k	RD%VS 154J
R148	Carbon film 2.7k	RD%VS 272J
R149	Carbon film 2.7k	RD%VS 272J
R150	Carbon film 27k	RD%VS 273J
R151	Carbon film 15k	RD%VS 153J
R152	Carbon film 220	RD%VS 221J
R153	Carbon film 1.5k	RD%VS 152J
R154	Carbon film 3.3k	RD%VS 332J
R155	Carbon film 68k	RD%VS 683J
R156	Carbon film 1k	RD%VS 102J
R157	Carbon film 1k	RD%VS 102J
R158	Carbon film 470	RD%VS 471J
R159	Carbon film 470	RD%VS 471J
R160	Carbon film 15k	RD%VS 153J
R161	Carbon film 47k	RD%VS 473J
R162	Carbon film 1k	RD%VS 102J
R163	Carbon film 33k	RD%VS 333J
R165	Carbon film 2.2k	RD%VS 222J
R166	Carbon film 6.8k	RD%VS 682J
R167	Carbon film 1k	RD%VS 102J
R168	Carbon film 10k	RD%VS 103J
R169	Carbon film 2.7k	RD%VS 272J
R170	Carbon film 68k	RD%VS 683J
R171	Carbon film 10k	RD%VS 103J
R172	Carbon film 4.7k	RD%VS 472J
R173	Carbon film 1k	RD%VS 102J
R174	Carbon film 22k	RD%VS 223J
R175	Carbon film 56	RD%VS 560J
R176	Carbon film 1k	RD%VS 102J
R177	Carbon film 33	RD%VS 330J
R178	Carbon film 1.5k	RD%VS 152J
R179	Carbon film 2.7k	RD%VS 272J

Symbol	Description	Part No.
R180	Carbon film 1k	RD¼VS 102J
R181	Carbon film 470	RD¼VS 471J
R182	Carbon film 18k	RD¼VS 183J
R183	Carbon film 910k	RD¼VS 914J
R184	Carbon film 6.8k	RD¼VS 682J
R185	Carbon film 4.7k	RD¼VS 472J
R186	Carbon film 4.7k	RD¼VS 472J
R187	Carbon film 4.7k	RD¼VS 472J
R188	Carbon film 3.3k	RD¼VS 332J
R189	Carbon film 3.3k	RD¼VS 332J
R190	Carbon film 3.3k	RD¼VS 332J
R191	Carbon film 10k	RD¼VS 103J
R192	Carbon film 1k	RD¼VS 102J
R193	Carbon film 470	RD¼VS 471J
R194	Carbon film 560	RD¼VS 561J
R195	Carbon film 470	RD¼VS 471J
R201	Carbon film 2.2k	RD¼VS 222J
R202	Carbon film 120k	RD¼VS 124J
R203	Carbon film 220k	RD¼VS 224J
R204	Carbon film 10k	RD¼VS 103J
R205	Carbon film 680	RD¼VS 681J
R206	Carbon film 68k	RD¼VS 683J
R207	Carbon film 100k	RD¼VS 104J
R208	Carbon film 27k	RD¼VS 273J
R209	Carbon film 470	RD¼VS 471J
R210	Carbon film 3.9k	RD¼VS 392J
R211	Carbon film 2.7k	RD¼VS 272J
R212	Carbon film 5.6k	RD¼VS 562J
R213	Carbon film 22k	RD¼VS 223J
R214	Carbon film 2.2k	RD¼VS 222J
R215	Carbon film 8.2k	RD¼VS 822J
R216	Carbon film 100k	RD¼VS 104J
R217	Carbon film 10	RD¼VS 100J
R218	Carbon film 3.3k	RD¼VS 332J
R219	Carbon film 33k	RD¼VS 333J
R220	Carbon film 6.2k	RD¼VS 622J
R221	Carbon film 330k	RD¼VS 334J
R222	Carbon film 510k	RD¼VS 514J
R226	Carbon film 100k	RD¼VS 104J
R228	Carbon film 100k	RD¼VS 104J
R230	Carbon film 18k	RD¼VS 183J
R231	Carbon film 330	RD¼VS 331J
R232	Carbon film 3.3k	RD¼VS 332J
R233	Carbon film 10k	RD¼VS 103J
R234	Carbon film 120k	RD¼VS 124J
R235	Carbon film 62k	RD¼VS 623J
R236	Carbon film 2.2k	RD¼VS 222J
R237	Carbon film 680	RD¼VS 681J
R238	Carbon film 220k	RD¼VS 224J
R239	Carbon film 39k	RD¼VS 393J
R240	Carbon film 10k	RD¼VS 103J
R241	Carbon film 3.3k	RD¼VS 332J
R242	Carbon film 3.3k	RD¼VS 332J

Symbol	Description	Part No.
R243	Carbon film 1k	RD¼VS 102J
R244	Carbon film 120k	RD¼VS 124J
R245	Carbon film 270k	RD¼VS 274J
R246	Carbon film 3.9k	RD¼VS 392J
R247	Carbon film 150k	RD¼VS 154J
R248	Carbon film 2.7k	RD¼VS 272J
R249	Carbon film 2.7k	RD¼VS 272J
R250	Carbon film 27k	RD¼VS 273J
R251	Carbon film 15k	RD¼VS 153J
R252	Carbon film 220	RD¼VS 221J
R253	Carbon film 1.5k	RD¼VS 152J
R254	Carbon film 3.3k	RD¼VS 332J
R255	Carbon film 68k	RD¼VS 683J
R256	Carbon film 1k	RD¼VS 102J
R257	Carbon film 1k	RD¼VS 102J
R258	Carbon film 470	RD¼VS 471J
R259	Carbon film 470	RD¼VS 471J
R260	Carbon film 15k	RD¼VS 153J
R261	Carbon film 47k	RD¼VS 473J
R262	Carbon film 1k	RD¼VS 102J
R263	Carbon film 33k	RD¼VS 333J
R265	Carbon film 2.2k	RD¼VS 222J
R266	Carbon film 6.8k	RD¼VS 682J
R267	Carbon film 1k	RD¼VS 102J
R268	Carbon film 10k	RD¼VS 103J
R269	Carbon film 2.7k	RD¼VS 272J
R270	Carbon film 68k	RD¼VS 683J
R271	Carbon film 10k	RD¼VS 103J
R272	Carbon film 4.7k	RD¼VS 472J
R273	Carbon film 1k	RD¼VS 102J
R274	Carbon film 22k	RD¼VS 223J
R275	Carbon film 22k	RD¼VS 560J
R276	Carbon film 1k	RD¼VS 102J
R277	Carbon film 33	RD¼VS 330J
R278	Carbon film 1.5k	RD¼VS 152J
R279	Carbon film 2.7k	RD¼VS 272J
R280	Carbon film 1k	RD¼VS 102J
R281	Carbon film 4.7k	RD¼VS 472J
R282	Carbon film 18k	RD¼VS 183J
R283	Carbon film 910k	RD¼VS 914J
R284	Carbon film 6.8k	RD¼VS 682J
R285	Carbon film 4.7k	RD¼VS 472J
R286	Carbon film 4.7k	RD¼VS 472J
R287	Carbon film 4.7k	RD¼VS 472J
R288	Carbon film 3.3k	RD¼VS 332J
R289	Carbon film 3.3k	RD¼VS 332J
R290	Carbon film 3.3k	RD¼VS 332J
R291	Carbon film 10k	RD¼VS 103J
R292	Carbon film 1k	RD¼VS 102J
R293	Carbon film 470	RD¼VS 471J
R294	Carbon film 560	RD¼VS 561J
R295	Carbon film 560	RD¼VS 561J

Symbol	Description			Part No.
R301	Carbon film	4.3k		RD¼VS 432J
R302	Carbon film	1k		RD¼VS 102J
R303	Carbon film	33		RD¼VS 330J
R304	Carbon film	2.2k		RD¼VS 222J
R306	Carbon film	470k		RD¼VS 474J
R307	Metal oxide	1k	1W	RS1PSF 102J
R316	Carbon film	3.3k		RD¼VS 332J
R317	Carbon film	8.2k		RD¼VS 822J

CAPACITORS

Symbol	Description			Part No.
C101	Electrolytic	10	25V	CEA 100P 25
C102	Electrolytic	4.7	25V	RCH-017
C103	Ceramic	100p	50V	CCDSL 101K 50
C104	Electrolytic	22	10V	CEA 220P 10
C105	Ceramic	33p	50V	CCDSL 330K 50
C106	Electrolytic	47	10V	CEA 470P 10
C107	Electrolytic	10	25V	CEA 100P 25
C108	Electrolytic	10	25V	RCH-022
C109	Polystyrene	470p	50V	RCE-014
C110	Mylar	0.0082	50V	CQMA 822K 50
C111	Electrolytic	0.47	50V	CEA R47P 50
C112	Electrolytic	4.7	25V	CEA 4R7P 25
C113	Electrolytic	100	25V	CEA 101P 25
C114	Electrolytic	100	25V	CEA 100P 25
C115	Polystyrene	330p	50V	RCF-008
C116	Electrolytic	10	16V	CEA 100P 16
C117	Ceramic	100p	50V	CCDSL 101K 50
C118	Electrolytic	47	10V	CEA 470P 10
C119	Ceramic	68p	50V	CCDSL 680K 50
C120	Electrolytic	10	25V	CEA 100P 25
C121	Electrolytic	220	6.3V	CEA 221P 6R3
C122	Electrolytic	10	16V	CEA 100P 16
C123	Ceramic	68p	50V	CCDSL 680K 50
C124	Electrolytic	10	25V	CEA 100P 25
C125	Electrolytic	10	25V	CEA 100P 25
C126	Electrolytic	10	25V	CEA 100P 25
C127	Electrolytic	10	16V	CEA 100P 16
C128	Mylar	0.0033	50V	CQMA 332K 50
C129	Electrolytic	10	25V	CEA 100P 25
C130	Electrolytic	33	10V	CEA 330P 10
C131	Mylar	0.001	50V	CQMA 102K 50
C132	Electrolytic	22	25V	CEA 220P 25
C133	Electrolytic	22	25V	CEA 220P 25
C134	Polystyrene	330p	50V	CQSA 331K 50
C135	Mylar	0.0027	50V	CQMA 272K 50
C136	Electrolytic	0.33	10V	CSSA 0R33M 10
C137	Electrolytic	0.47	10V	CSSA 0R47M 10
C138	Electrolytic	10	25V	CEA 100P 25
C139	Electrolytic	10	16V	CEA 100P 16
C140	Electrolytic	22	10V	CEA 220P 10

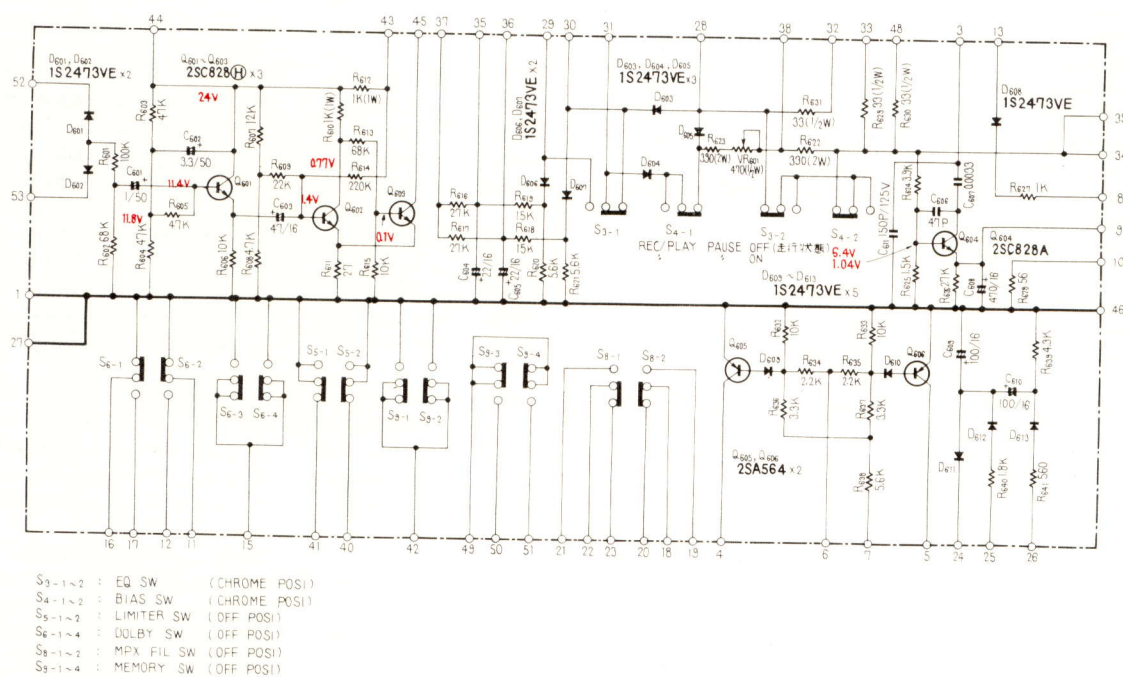
Symbol	Description			Part No.
C141	Mylar	0.033	50V	CQMA 333K 50
C142	Mylar	0.047	50V	CQMA 473K 50
C143	Mylar	0.047	50V	CQMA 473K 50
C144	Electrolytic	2.2	50V	CEA 2R2P 50
C145	Mylar	0.01	50V	CQMA 103K 50
C201	Electrolytic	10	25V	CEA 100P 25
C202	Electrolytic	4.7	25V	RCH-017
C203	Ceramic	100p	50V	CCDSL 101K 50
C204	Electrolytic	22	10V	CEA 220P 10
C205	Ceramic	33p	50V	CCDSL 330K 50
C206	Electrolytic	47	10V	CEA 470P 10
C207	Electrolytic	10	25V	CEA 100P 25
C208	Electrolytic	10	25V	RCH-022
C209	Polystyrene film	470p	50V	RCE-014
C210	Mylar	0.0082	50V	CQMA 822K 50
C211	Electrolytic	0.47	50V	CEA 0R47P 50
C212	Electrolytic	4.7	25V	CEA 4R7P 25
C213	Electrolytic	100	25V	CEA 101P 25
C214	Electrolytic	10	25V	CEA 100P 25
C215	Polystyrene film	330p	50V	RCF-008
C216	Electrolytic	10	16V	CEA 100P 16
C217	Ceramic	100p	50V	CCDSL 101K 50
C218	Electrolytic	47	10V	CEA 470P 10
C219	Ceramic	68p	50V	CCDSL 680K 50
C220	Electrolytic	10	25V	CEA 100P 25
C221	Electrolytic	220	6.3V	CEA 221P 6R3
C222	Electrolytic	10	16V	CEA 100P 16
C223	Ceramic	68p	50V	CCDSL 680K 50
C224	Electrolytic	10	25V	CEA 100P 25
C225	Electrolytic	10	25V	CEA 100P 25
C226	Electrolytic	10	25V	CEA 100P 25
C227	Electrolytic	10	25V	CEA 100P 25
C228	Mylar	0.0033	50V	CQMA 332K 50
C229	Electrolytic	10	25V	CEA 100P 25
C230	Electrolytic	33	10V	CEA 330P 10
C231	Mylar	0.01	50V	CQMA 102K 50
C232	Electrolytic	22	25V	CEA 220P 25
C233	Electrolytic	22	25V	CEA 220P 25
C234	Polystyrene	330p	50V	CQSA 331K 50
C235	Mylar	0.0027	50V	CQMA 272K 50
C236	Electrolytic	0.33	10V	CSSA 0R33M 10
C237	Electrolytic	0.47	10V	CSSA 0R47M 10
C238	Electrolytic	10	25V	CEA 100P 25
C239	Electrolytic	10	16V	CEA 100P 16
C240	Electrolytic	22	10V	CEA 220P 10
C241	Mylar	0.033	50V	CQMA 333K 50
C242	Mylar	0.047	50V	CQMA 473K 50
C243	Mylar	0.047	50V	CQMA 473K 50
C244	Electrolytic	2.2	50V	CEA 2R2P 50
C245	Mylar	0.01	50V	CQMA 103K 50
C301	Polystyrene	470p	50V	CQSA 471K 50

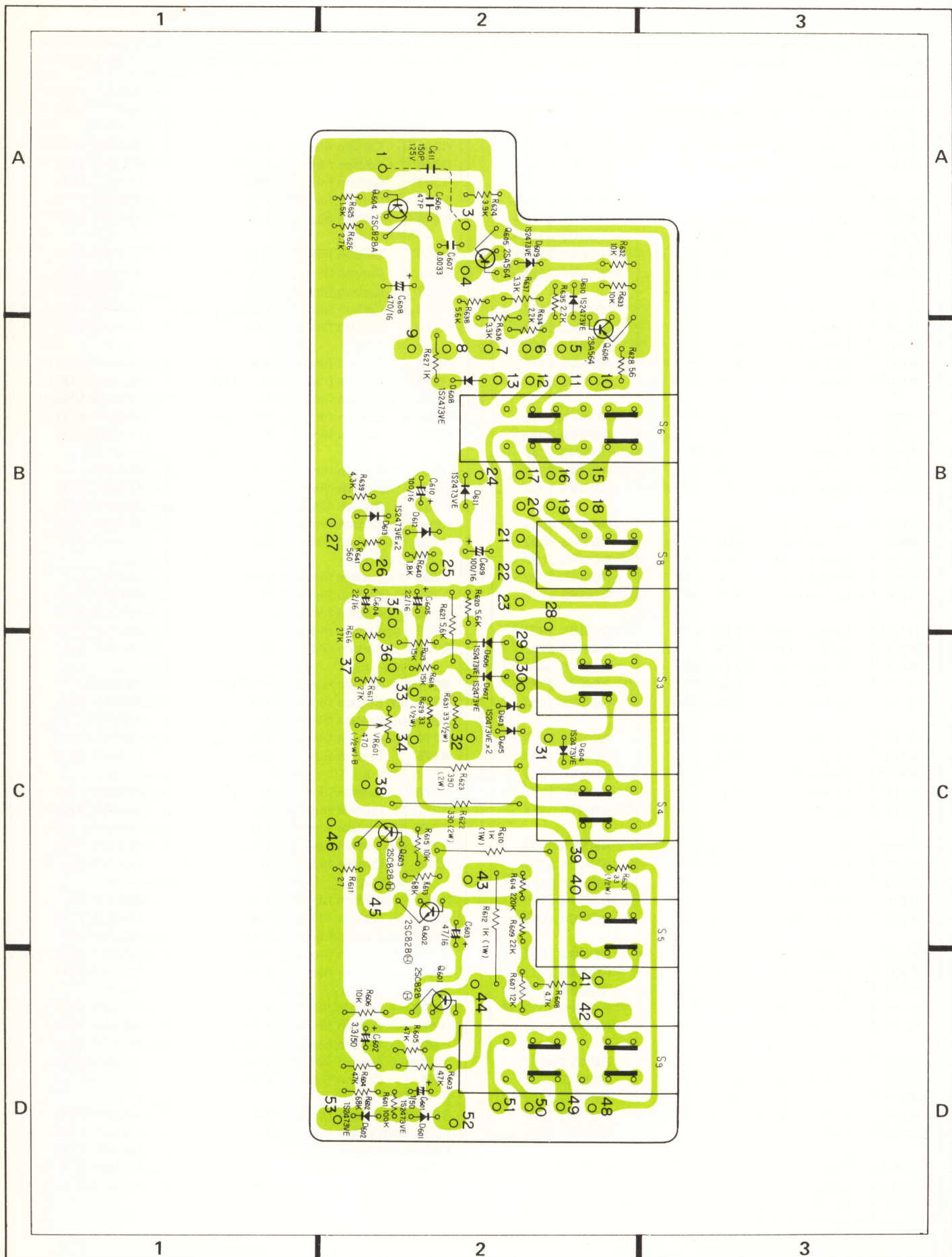
Symbol	Description			Part No.
C302	Polystyrene	470p	50V	CQSA 471K 50
C303	Polypropylene	0.022	50V	CQPA 223K 50
C304	Mylar	0.01	50V	CQMA 103K 50
C305	Electrolytic	10	25V	CEA 100P 25
C306	Mylar	0.033	50V	CQMA 333K 50
C307	Ceramic	100p	50V	CCDSL 101K 50
C308	Ceramic	100p	50V	CCDSL 101K 50
C309	Electrolytic	10	25V	CEA 100P 25
C310	Electrolytic	10	25V	CEA 100P 25
C311				
C312				
C313	Electrolytic	47	25V	CEA 470P 25
C314	Mylar	0.03	50V	CQMA 103K 50
C315	Polystyrene	330p	50V	CQSA 331K 50

OTHERS

Symbol	Description	Part No.
S1	REC/PB selector switch	RSH-011

1.3 SWITCH ASSEMBLY (RWS-042)





Part List of Switch Assembly (RWS-042)

SEMICONDUCTORS

Symbol	Description	Part No.
Q601	Transistor	2SC828 H (R) 2SC828 H (S)
Q602	Transistor	2SC828 H (R) 2SC828 H (S)
Q603	Transistor	2SC828 H (R) 2SC828 H (S)
Q604	Transistor	2SC828 A (R) 2SC828 A (S)
Q605	Transistor	2SA564 (R) 2SA564 (S)
Q606	Transistor	2SA564 (R) 2SA564 (S)
D601	Diode	1S2473VE
D602	Diode	1S2473VE
D603	Diode	1S2473VE
D604	Diode	1S2473VE
D605	Diode	1S2473VE
D606	Diode	1S2473VE
D607	Diode	1S2473VE
D608	Diode	1S2473VE
D609	Diode	1S2473VE
D610	Diode	1S2473VE
D611	Diode	1S2473VE
D612	Diode	1S2473VE
D613	Diode	1S2473VE

Symbol	Description	Part No.
R621	Carbon film 5.6k	RD¼VS 562J
R622	Metal oxide 330 2W	RS2P 331J
R623	Metal oxide 390 2W	RS2P 391J
R624	Carbon film 3.9k	RD¼VS 392J
R625	Carbon film 1.5k	RD¼VS 152J
R626	Carbon film 2.7k	RD¼VS 272J
R627	Carbon film 1k	RD¼VS 102J
R628	Carbon film 56	RD¼VS 560J
R629	Carbon film 33 ½W	RD½PSF 330J
R630	Carbon film 33 ½W	RD½PSF 330J
R631	Carbon film 33 ½W	RD½PSF 330J
R632	Carbon film 10k	RD¼VS 103J
R633	Carbon film 10k	RD¼VS 103J
R634	Carbon film 2.2k	RD¼VS 222J
R635	Carbon film 2.2k	RD¼VS 222J
R636	Carbon film 3.3k	RD¼VS 332J
R637	Carbon film 3.3k	RD¼VS 332J
R638	Carbon film 5.6k	RD¼VS 562J
R639	Carbon film 4.3k	RD¼VS 432J
R640	Carbon film 4.3k	RD¼VS 182J
R641	Carbon film 560	RD¼VS 561J
VR601	Semi-fixed	RCP-022-0

CAPACITORS

Symbol	Description	Part No.
C601	Electrolytic 1 50V	CEA 010P 50
C602	Electrolytic 3.3 50V	CEA 3R3P 50
C603	Electrolytic 47 16V	CEA 470P 16
C604	Electrolytic 22 16V	CEA 220P 16
C605	Electrolytic 22 16V	CEA 220P 16
C606	Ceramic 47p 50V	CCDSL 470K 50
C607	Mylar 0.0033 50V	CQMA 332K 50
C608	Electrolytic 470 16V	CEA 471P 16
C609	Electrolytic 100 16V	CEA 101P 16
C610	Electrolytic 100 16V	CEA 101P 16
C611	Polystyrene 150p 125V	RCE-007

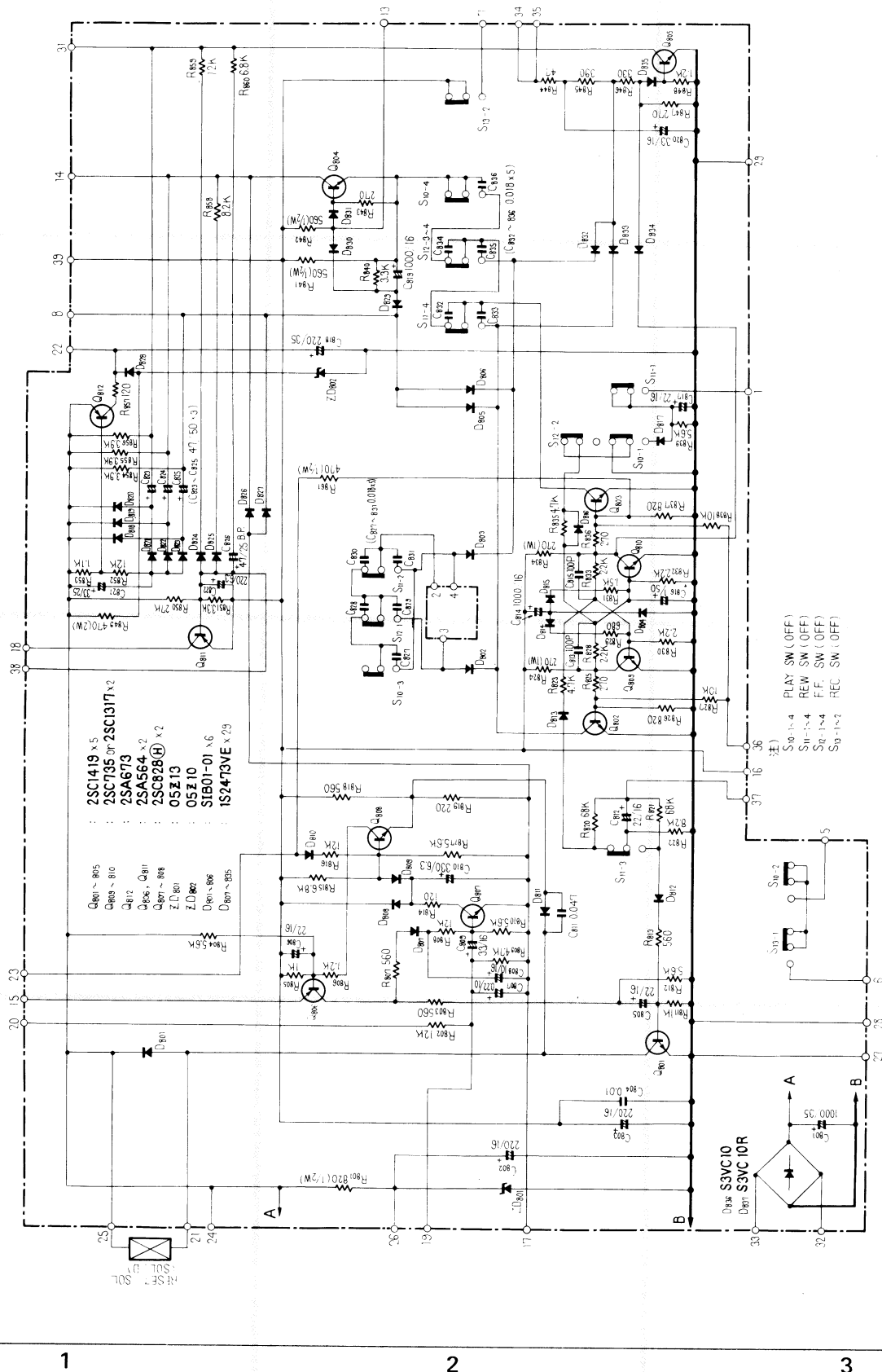
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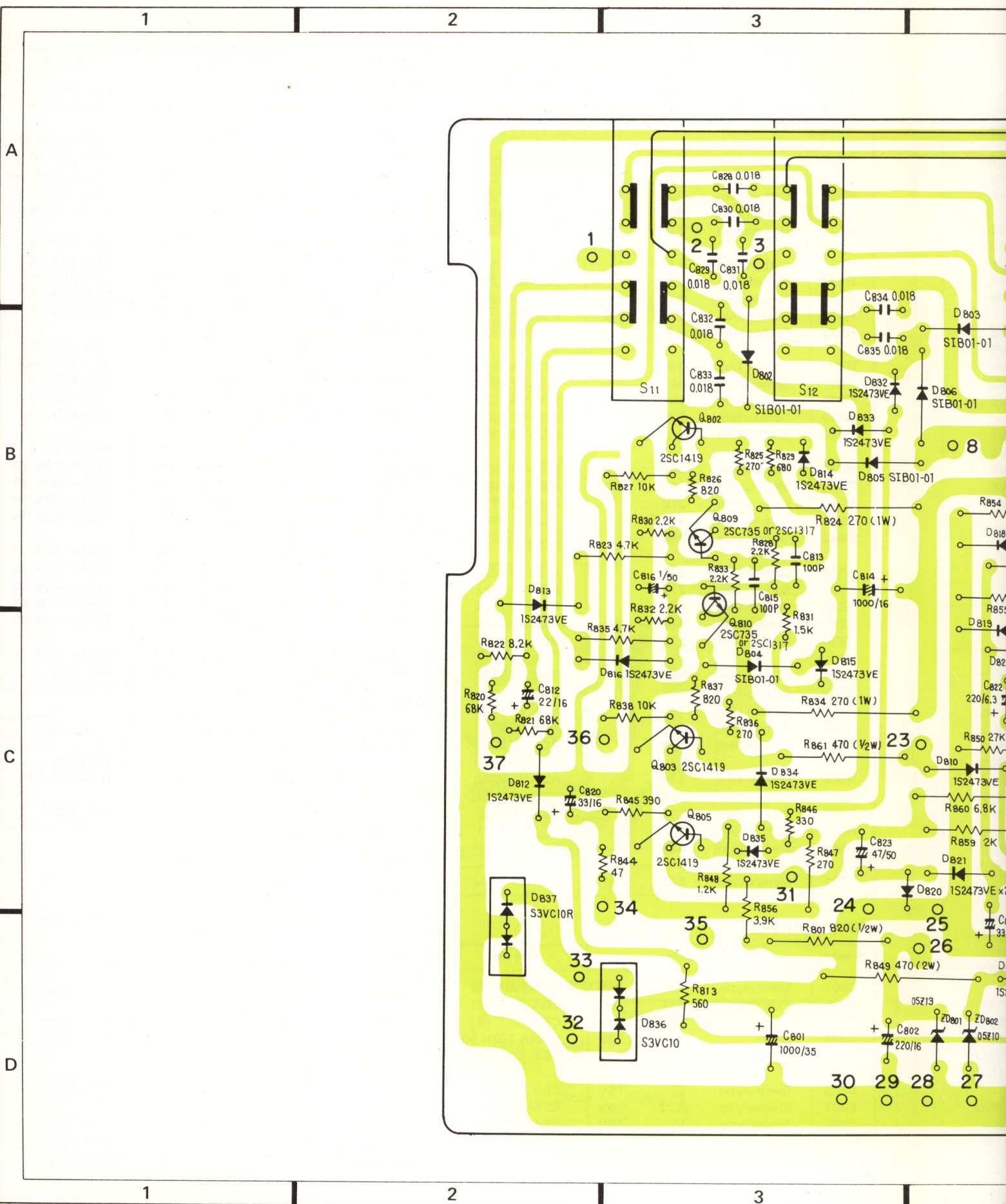
Symbol	Description	Part No.
	Push switch assembly (S3, 4, 5, 6, 8, 9)	RSG-029

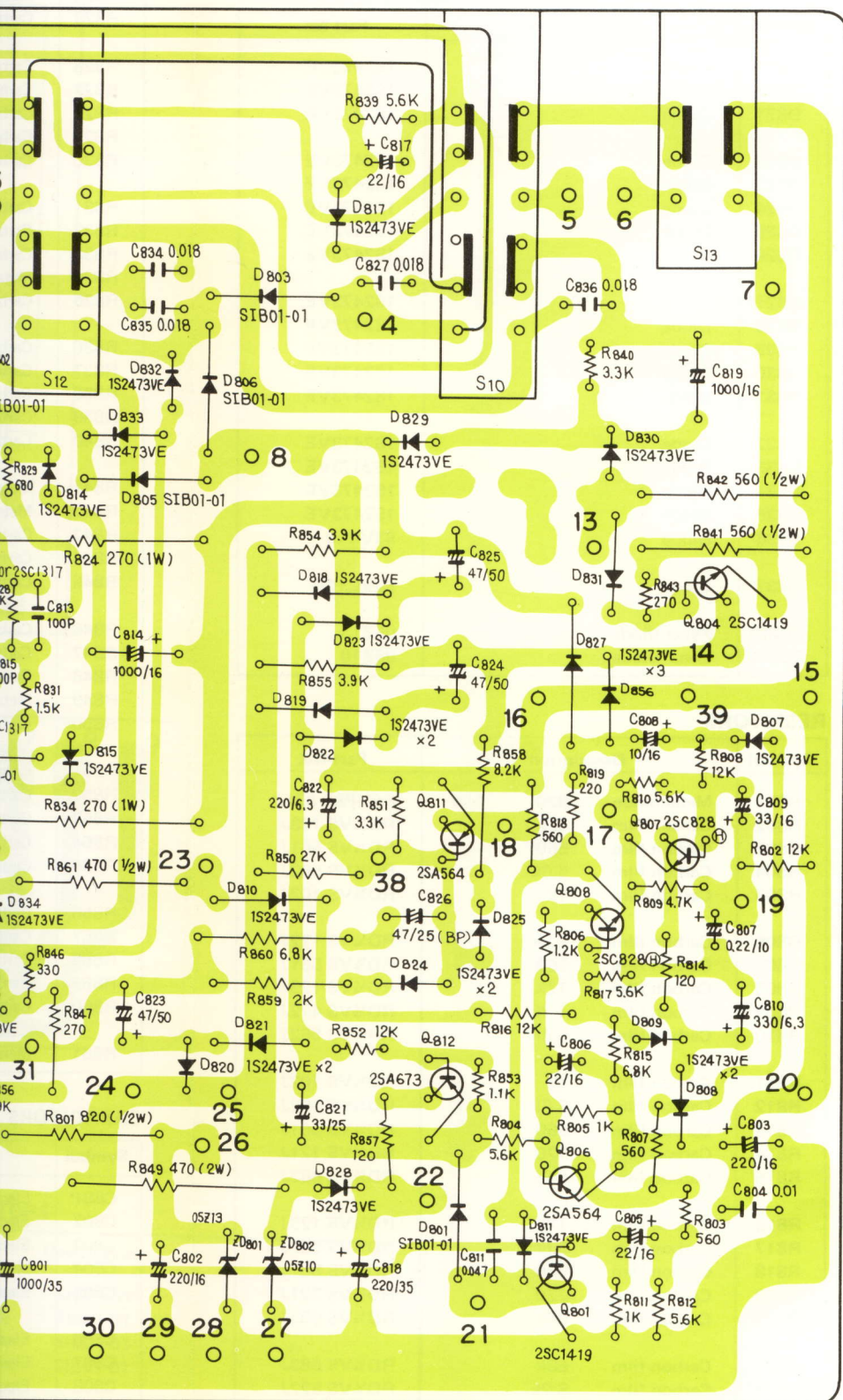
RESISTORS

Symbol	Description	Part No.
R601	Carbon film 100k	RD¼VS 104J
R602	Carbon film 68k	RD¼VS 683J
R603	Carbon film 47k	RD¼VS 473J
R604	Carbon film 47k	RD¼VS 473J
R605	Carbon film 47k	RD¼VS 473J
R606	Carbon film 10k	RD¼VS 103J
R607	Carbon film 12k	RD¼VS 123J
R608	Carbon film 4.7k	RD¼VS 472J
R609	Carbon film 22k	RD¼VS 223J
R610	Metal oxide 1k 1W	RS1PSF 102J
R611	Carbon film 27	RD¼VS 270J
R612	Metal oxide 1k 1W	RS1PSF 102J
R613	Carbon film 68k	RD¼VS 683J
R614	Carbon film 220k	RD¼VS 224J
R615	Carbon film 10k	RD¼VS 103J
R616	Carbon film 27k	RD¼VS 273J
R617	Carbon film 27k	RD¼VS 273J
R618	Carbon film 15k	RD¼VS 153J
R619	Carbon film 15k	RD¼VS 153J
R620	Carbon film 5.6k	RD¼VS 562J

1.4 CONTROL ASSEMBLY (RWG-060)







A

B

C

D

Part List of Control Assembly (RWG-060)

SEMICONDUCTORS

Symbol	Description	Part No.
Q801	Transistor	2SC1419 (C) 2SC1419 T
Q802	Transistor	2SC1419 (C) 2SC1419 T
Q803	Transistor	2SC1419 (C) 2SC1419 T
Q804	Transistor	2SC1419 (C) 2SC1419 T
Q805	Transistor	2SC1419 (C) 2SC1419 T
Q806	Transistor	2SA564 (R) 2SA564 (S)
Q807	Transistor	2SC828 H (R) 2SC828 H (S)
Q808	Transistor	2SC828 H (R) 2SC828 H (S)
Q809	Transistor	2SC735 (Y) 2SC735 (GR) or 2SC1317 (R)
Q810	Transistor	2SC735 (Y) 2SC735 (GR) or 2SC1317 (R)
Q811	Transistor	2SA564 (R) 2SA564 (S)
Q812	Transistor	2SA673 (C)
D801	Diode	SIB01-01 or W03B
D802	Diode	SIB01-01 or W03B
D803	Diode	SIB01-01 or W03B
D804	Diode	SIB01-01 or W03B
D805	Diode	SIB01-01 or W03B
D806	Diode	SIB01-01 or W03B
D807	Diode	1S2473VE
D808	Diode	1S2473VE
D809	Diode	1S2473VE
D810	Diode	1S2473VE
D811	Diode	1S2473VE
D812	Diode	1S2473VE
D813	Diode	1S2473VE
D814	Diode	1S2473VE
D815	Diode	1S2473VE
D816	Diode	1S2473VE
D817	Diode	1S2473VE
D818	Diode	1S2473VE

Symbol	Description	Part No.
D819	Diode	1S2473VE
D820	Diode	1S2473VE
D821	Diode	1S2473VE
D822	Diode	1S2473VE
D823	Diode	1S2473VE
D824	Diode	1S2473VE
D825	Diode	1S2473VE
D826	Diode	1S2473VE
D827	Diode	1S2473VE
D828	Diode	1S2473VE
D829	Diode	1S2473VE
D830	Diode	1S2473VE
D831	Diode	1S2473VE
D832	Diode	1S2473VE
D833	Diode	1S2473VE
D834	Diode	1S2473VE
D835	Diode	1S2473VE
D836	Diode	S3VC10
D837	Diode	S3VC10R
ZD801	Zener diode	05Z13
ZD802	Zener diode	05Z10

RESISTORS

Symbol	Description	Part No.
R801	Metal oxide 820 $\frac{1}{2}W$	RS $\frac{1}{2}$ PSF 821J
R802	Carbon film 12k	RD $\frac{1}{4}$ VS 123J
R803	Carbon film 560	RD $\frac{1}{4}$ VS 561J
R804	Carbon film 5.6k	RD $\frac{1}{4}$ VS 562J
R805	Carbon film 1k	RD $\frac{1}{4}$ VS 102J
R806	Carbon film 1.2k	RD $\frac{1}{4}$ VS 122J
R807	Carbon film 560	RD $\frac{1}{4}$ VS 561J
R808	Carbon film 12k	RD $\frac{1}{4}$ VS 123J
R809	Carbon film 4.7k	RD $\frac{1}{4}$ VS 472J
R810	Carbon film 5.6k	RD $\frac{1}{4}$ VS 562J
R811	Carbon film 1k	RD $\frac{1}{4}$ VS 102J
R812	Carbon film 5.6k	RD $\frac{1}{4}$ VS 562J
R813	Carbon film 560	RD $\frac{1}{4}$ VS 561J
R814	Carbon film 120	RD $\frac{1}{4}$ VS 121J
R815	Carbon film 6.8k	RD $\frac{1}{4}$ VS 682J
R816	Carbon film 12k	RD $\frac{1}{4}$ VS 123J
R817	Carbon film 5.6k	RD $\frac{1}{4}$ VS 562J
R818	Carbon film 560	RD $\frac{1}{4}$ VS 561J
R819	Carbon film 220	RD $\frac{1}{4}$ VS 221J
R820	Carbon film 68k	RD $\frac{1}{4}$ VS 683J
R821	Carbon film 68k	RD $\frac{1}{4}$ VS 683J
R822	Carbon film 8.2k	RD $\frac{1}{4}$ VS 822J

Symbol	Description			Part No.
R823	Carbon film	4.7k	1W	RD¼VS 472J
R824	Metal oxide	680		RS1PSF 271J
R825	Carbon film	680		RD¼VS 271J
R826	Carbon film	820	1W	RD¼VS 821J
R827	Carbon film	10k		RD¼VS 103J
R828	Carbon film	2.2k		RD¼VS 222J
R829	Carbon film	680		RD¼VS 681J
R830	Carbon film	2.2k		RD¼VS 222J
R831	Carbon film	1.5k		RD¼VS 152J
R832	Carbon film	2.2k		RD¼VS 222J
R833	Carbon film	2.2k		RD¼VS 222J
R834	Metal oxide	270		RS1PSF 271J
R835	Carbon film	4.7k		RD¼VS 472J
R836	Carbon film	270	2W	RD¼VS 271J
R837	Carbon film	820		RD¼VS 821J
R838	Carbon film	10k		RD¼VS 103J
R839	Carbon film	5.6k		RD¼VS 562J
R840	Carbon film	3.3k		RD¼VS 332J
R841	Metal oxide	560		RS½PSF 561J
R842	Metal oxide	560		RS½PSF 561J
R843	Carbon film	270		RD¼VS 271J
R844	Carbon film	47		RD¼VS 470J
R845	Carbon film	390		RD¼VS 391J
R846	Carbon film	330	½W	RD¼VS 331J
R847	Carbon film	270		RD¼VS 271J
R848	Carbon film	1.2k		RD¼VS 122J
R849	Metal oxide	470		RS2PSF 471J
R850	Carbon film	27k		RD¼VS 273J
R851	Carbon film	3.3k		RD¼VS 332J
R852	Carbon film	12k		RD¼VS 123J
R853	Carbon film	1.1k		RD¼VS 112J
R854	Carbon film	3.9k		RD¼VS 392J
R855	Carbon film	3.9k		RD¼VS 392J
R856	Carbon film	3.9k	¼W	RD¼VS 392J
R857	Carbon film	120		RD¼VS 121J
R858	Carbon film	8.2k		RD¼VS 822J
R859	Carbon film	12k		RD¼VS 123J
R860	Carbon film	6.8k		RD¼VS 682J
R861	Metal oxide	470		RS½PSF 471J

Symbol	Description			Part No.
C809	Electrolytic	33	16V	CEA 330P 16
C810	Electrolytic	330	6.3V	CEA 331P 6R3
C811	Mylar	0.047	50V	CQMA 473K 50
C812	Electrolytic	22	16V	CEA 220P 16
C813	Ceramic	100p	50V	CCDSL 101K 50
C814	Electrolytic	1,000	16V	CEA 102P 16
C815	Ceramic	100p	50V	CCDSL 101K 50
C816	Electrolytic	1	50V	CEA 010P 50
C817	Electrolytic	22	16V	CEA 220P 16
C818	Electrolytic	220	35V	CEA 221P 35
C819	Electrolytic	1,000	16V	CEA 102P 16
C820	Electrolytic	33	16V	CEA 330P 16
C821	Electrolytic	33	25V	CEA 330P 25
C822	Electrolytic	220	6.3V	CEA 221P 6R3
C823	Electrolytic	47	50V	CEA 470P 50
C824	Electrolytic	47	50V	CEA 470P 50
C825	Electrolytic	47	50V	CEA 470P 50
C826	Bi-poler	47	25V	RCH-021
C827	Mylar	0.018	50V	CQMA 183K 50
C828	Mylar	0.018	50V	CQMA 183K 50
C829	Mylar	0.018	50V	CQMA 183K 50
C830	Mylar	0.018	50V	CQMA 183K 50
C831	Mylar	0.018	50V	CQMA 183K 50
C832	Mylar	0.018	50V	CQMA 183K 50
C833	Mylar	0.018	50V	CQMA 183K 50
C834	Mylar	0.018	50V	CQMA 183K 50
C835	Mylar	0.018	50V	CQMA 183K 50
C836	Mylar	0.018	50V	CQMA 183K 50
C837	Bi-poler	4.7	50V	RCH-026

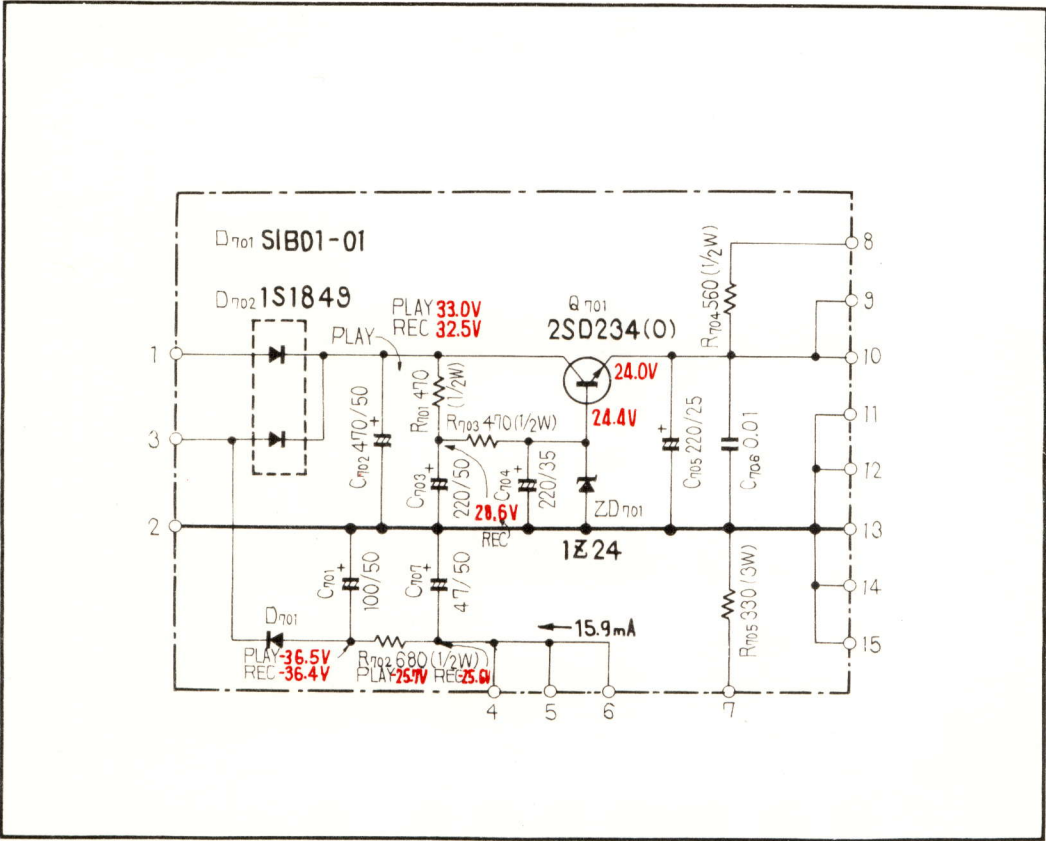
OTHERS

Symbol	Description	Part No.
	Spring Solenoid D	RBH-152 RXP-032
	Switch	RSG-030

CAPACITORS

Symbol	Description			Part No.
C801	Electrolytic	1,000	35V	CEA 102P 35
C802	Electrolytic	220	16V	CEA 221P 16
C803	Electrolytic	220	16V	CEA 221P 16
C804	Mylar	0.01	50V	CQMA 103K 50
C805	Electrolytic	22	16V	CEA 220P 16
C806	Electrolytic	22	16V	CEA 220P 16
C807	Electrolytic	0.22	10V	CSSA R22M 10
C808	Electrolytic	10	16V	CEA 100P 16

1.5 POWER SUPPLY ASSEMBLY (RWR-038)



Parts List

CAPACITORS

Symbol	Description			Part No.
C701	Electrolytic	100	50V	CEA 101P 50
C702	Electrolytic	470	50V	CEA 471P 50
C703	Electrolytic	220	50V	CEA 221P 50
C704	Electrolytic	220	35V	CEA 221P 35
C705	Electrolytic	220	25V	CEA 221P 25
C706	Ceramic	0.01	50V	CKDYF 103Z 50
C707	Electrolytic	47	50V	CEA 470P 50

SEMICONDUCTORS

Symbol	Description		Part No.
Q701	Transistor	2SD234-0	
D701	Diode	SIB01-01	
D702	Diode	1S1849	
ZD701	Zener diode	1Z24	

RESISTORS

Symbol	Description			Part No.
R705	Metal oxide	330	3W	RS3P 331K
R701	Metal oxide	470	1/2W	RS1/2PSF 471J
R702	Metal oxide	680	1/2W	RS1/2PSF 681J
R703	Metal oxide	470	1/2W	RS1/2PSF 471J
R704	Metal oxide	560	1/2W	RS1/2PSF 561J

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2

3

A

A

B

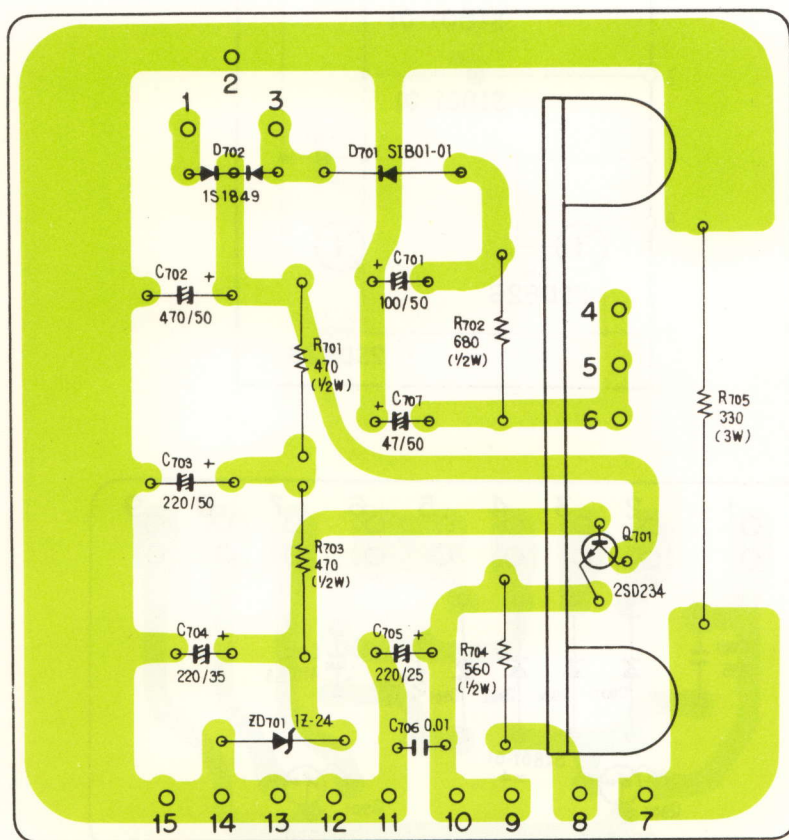
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C

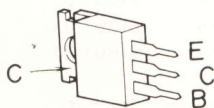
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D

D



2SD234

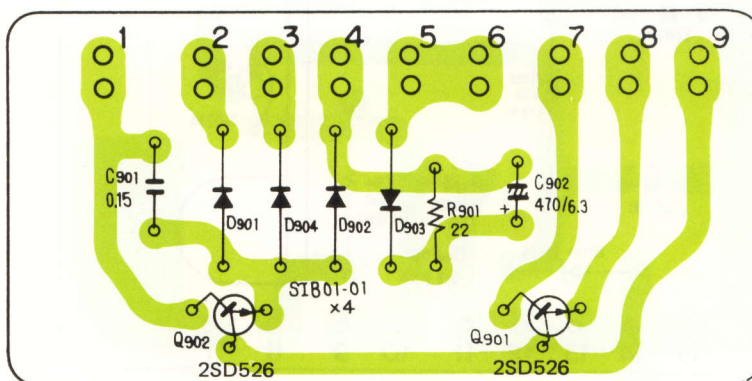
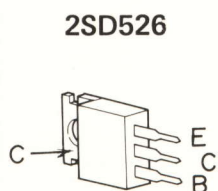
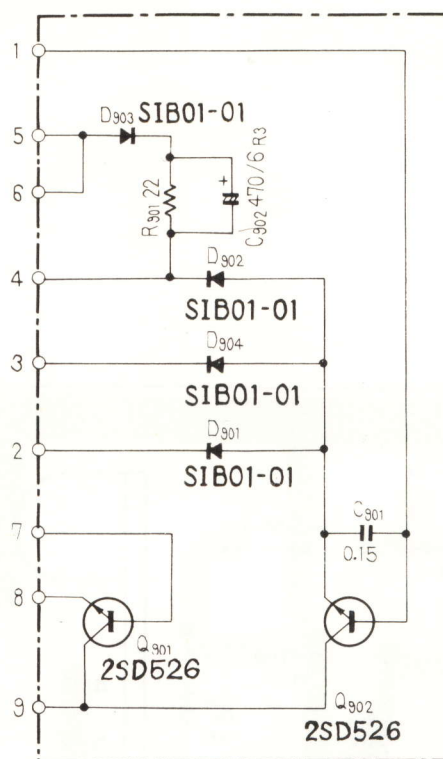


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2

3

1.6 TRANSISTOR ASSEMBLY (RWX-137)



Parts List

CAPACITORS

Symbol	Description	Part No.
C901	Mylar 0.15 50V	CQMA 154K 50
C902	Electrolytic 470 6.3V	CEA 471P 6R3

RESISTORS

Symbol	Description	Part No.
R901	Carbon film 22	RD4VS 220J

SEMICONDUCTORS

Symbol	Description	Part No.
D901	Diode SIB01-01	
R902	Diode SIB01-01	
R903	Diode SIB01-01	
R904	Diode SIB01-01	
Q901	Transistor 2SD526	
Q902	Transistor 2SD526	

CASSETTE TAPE DECK **CT-F9191**

ADJUSTMENT MANUAL

Suggestions For Adjusting Cassette Tape Decks

- A. When adjusting, please follow the order given below.
1. Mechanism
 2. Electronic circuits (Playback)
 3. Electronic circuits (Recording)

You will not be able to adjust properly if you skip steps. For example, if you want to adjust the recording circuit, confirm 1, (Tape speed and Wow/Flutter) and 2. (Playback levels and Playback Frequency Characteristics) before you begin adjusting the recording circuit.

- B. After the adjustment, confirm that the equipment is within specifications.

1. PINCH ROLLER PRESSURE ADJUSTMENT

Information

Varying pinch roller pressure causes Wow & Flutter. Refer to Fig. 1. W & F first decreases and then starts increasing at a certain point as the pressure increases. The correct pressure for the CT-F9191 (350—450g) was determined by experiments. The adjustment is required after replacing the pinch roller.

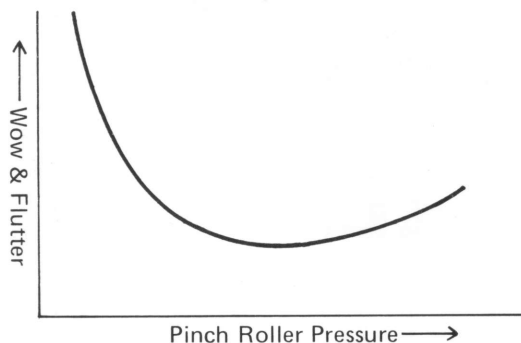


Fig-1

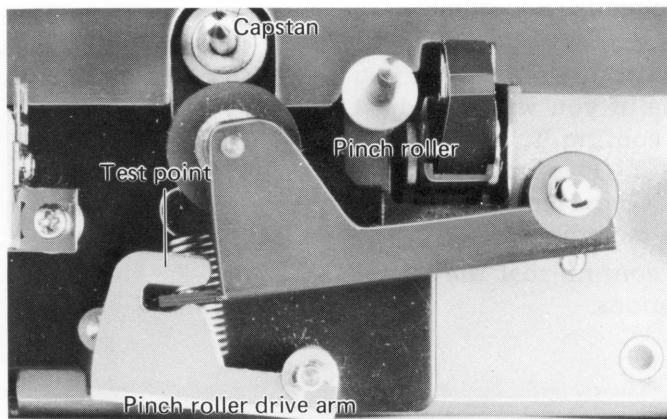


Photo 1

Adjustment

- Move out the transport mechanism ass'y so that you can see the pinch roller. Supply power.
- Depress the PLAY lever. Apply a 500g tension gauge at the measuring point. Push the Gauge so that the pinch roller is moved out 1 or 2mm from the capstan. Then, decrease the manual pressure slowly. Read the value of the gauge when the pinch roller starts rotating and see if it is in the range of 350—450g. At this time there should be a gap between the pinch roller and the head base.
- If the pressure is not in the range of 350—450g, adjust it by changing the hooking position of the pinch roller spring drive arm.

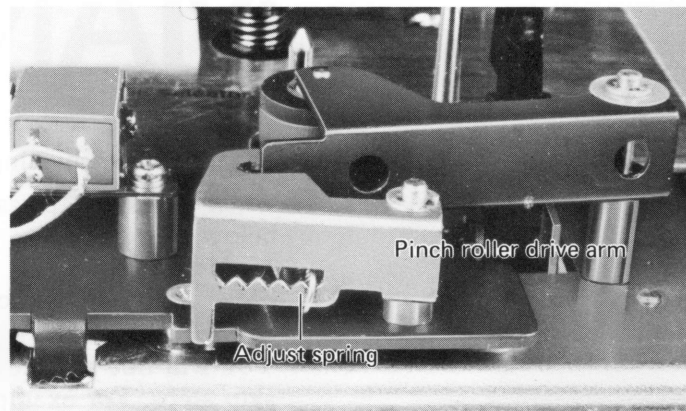


Photo 2

2. REEL-BASE TORQUE ADJUSTMENT

Information

The take-up reel should wind up the tape without twisting or tangling in Play or Fast Forward and provides back tension so that it does not slack during Rewind. The supply reel base also should provide a bit of back tension so that the tape does not slack and runs closely on the head surface during Play. If the torque of the reel base is improper, there will be troubles such as high W & F, rough rotation, high tape wear, etc.

Adjustment

As CT-F9191 has no reel base torque adjustment mechanism, measure the torque of both bases. If the values are outside of the tolerances shown in Fig. 1, clean the idlers, reel bases, rollers, etc. with a cotton-headed stick soaked in absolute alcohol and measure them again. If there is no improvement, replace the reel bases.

Required Torque of Reel Bases

Take-up reel base	
Take-up torque when Playing	40 – 65 gcm
Take-up torque when Fast Forwarding	75 – 130 gcm
Back tension when Rewinding	less than 8 gcm
Supply reel base	
Back tension when Playing	4 – 8 gcm
Back tension when Rewinding	more than 8 gcm
Take-up torque	75 – 130 gcm

Table 1



Photo 3



Photo 4

3. TAPE SPEED ADJUSTMENT

Information

The cassette tape speed is usually said to be 4.8 cm/sec. However, the precise speed is 4.76 cm/sec. Correct tape speed is a must for compatibility. Tape speed is determined mainly by the capstan, and the speed varies with the pinch roller pressure, the tension or the line voltage variations. It is inevitable that the take-up speed slows as the diameter of the wound-up tape increases. The speed difference between start and finish shall be within $\pm 2 \sim 3\%$ with decks of ordinary grade and within $\pm 0.2 \sim 1\%$ for those of high grade.

$$\text{Tape speed deviation (\%)} = \frac{f_1 - f_0}{f_0} \times 100$$

f_0 = Recorded signal frequency (Hz)

f_1 = Reproduced signal frequency (Hz)

Adjustment

- Connect a frequency counter to the output of the subject deck.
- Playback the center portion of the tape (3kHz) on the subject deck.
- Adjust the speed by turning the semi-fixed resistor provided for tape speed adjustment so that the frequency counter shows a value closest to 3kHz.

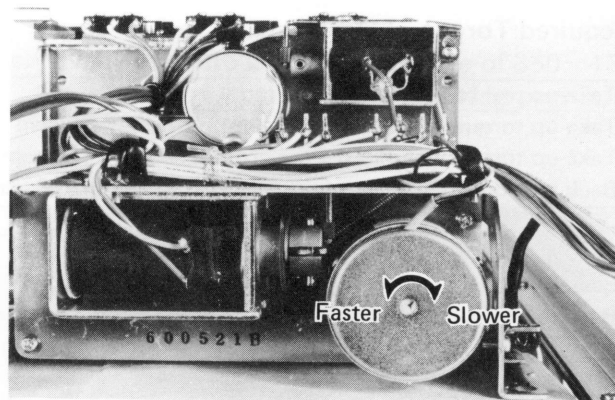


Photo 5

4. HEAD AZIMUTH ADJUSTMENT

Information

This alignment is one of the most important among the mechanical adjustments. It affects equalization and recording bias.

Effect of improper alignment.

- Mis-alignment causes a loss in output at short wavelengths especially when playing tapes which were recorded by other decks.
- When adjusting the playback equalizer leaving the azimuth improper, the loss of azimuth should be compensated by the equalizer which will deteriorate S/N. Fig. 3 shows the relations among equalizer curve, frequency characteristics and S/N.

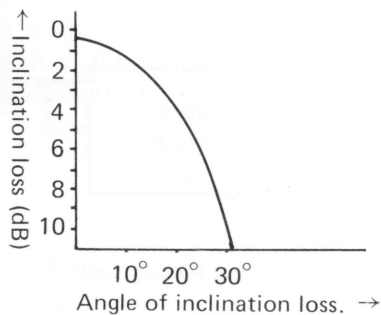
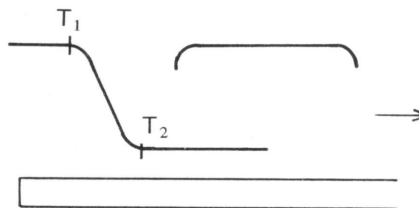


Fig. 2

With azimuth properly adjusted.



Hiss noise proper to tapes

Fig. 3-a

not properly adjusted

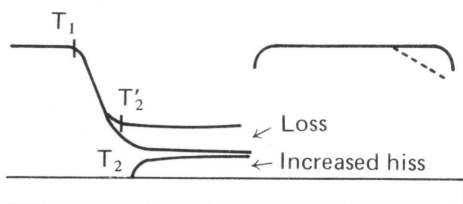


Fig. 3-b

Adjustment

While reproducing the 10kHz signal on the azimuth alignment test tape (STD-341), adjust the output level to maximum. The tape selector should be set to STD. Be sure to lock with paint after adjustment.

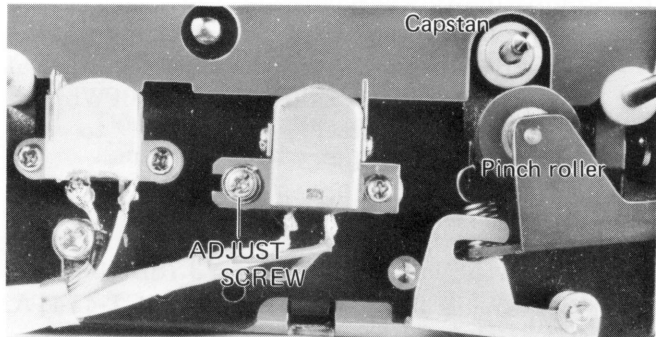


Photo 6

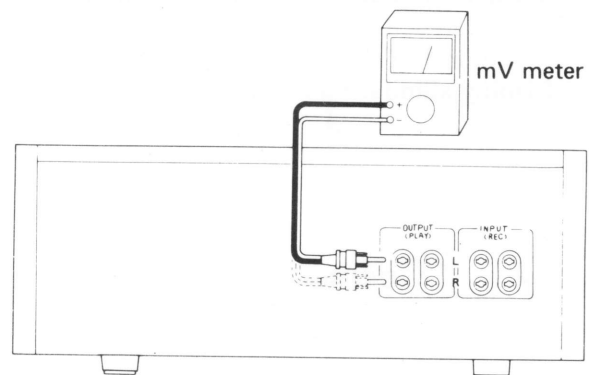


Fig. 4

5. PLAYBACK LEVEL ADJUSTMENT

Information

As this is the standard for adjusting the electro-magnetic system, improper adjustment will cause the following problems.

- Adjustments in the recording block will be incorrect and will be deteriorated and distortion will be increased.
 - The Dolby standard level will be affected.
 - Compatibility will be lost.
- Dolby output level shall be adjusted to 580m (-4.7dBv) when playing the tape recorded at 200PWb/mm. But, as there is no 200PWb/mm test tape at present, we have to use 250PWb/mm test tapes.
 - When using a 250PWb/mm test tape, adjust the results referring to Fig. 5-a (New).
 $-4.7\text{dBv}(580\text{mV}) - (-1\text{dBv}) = -3.7\text{dBv}(653\text{mV})$
 - Use Fig. 5-b (Old) when adjusting CT-4141A, CT-F7171 & CT-F6161.
 $-4.7\text{dBv} - (-2\text{dB}) = -2.7\text{dBv}(732\text{mV})$
 - The difference between the New and Old is in the method of measuring magnetic flux density of Dolby standard level(200PWb).

Adjustment

- Connect an AC voltmeter to the output terminal (No.15 & Ground or No.16 & Ground) of the Dolby ass'y.
- Turn the Dolby NR switch on.
- Reproduce the signal of 333Hz (0dB) on the test tape STD-341(250PWb/mm) and adjust the output with VR-102 and VR-202 so that the AC voltmeter indicates -3.7dBv(653mV).
 L-ch No.15. VR-102
 R-ch No.16. VR-202

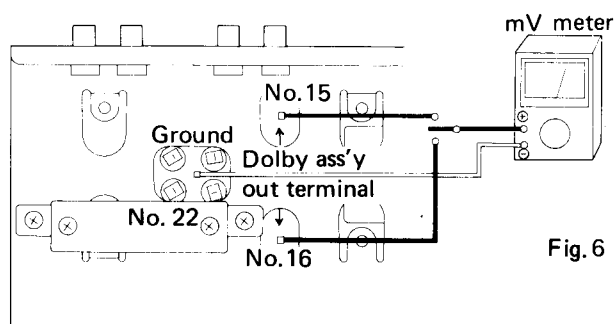


Fig. 6

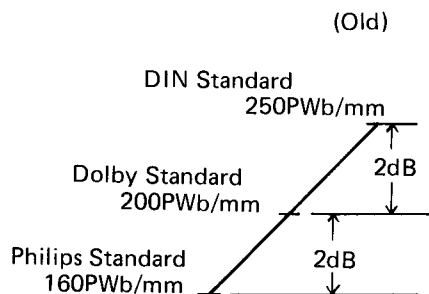


Fig. 5-a

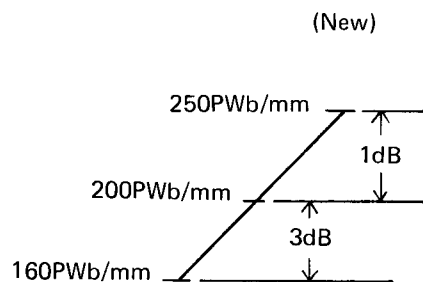


Fig. 5-b

6. PLAYBACK EQUALIZER ADJUSTMENT

Information

Theoretically, the output voltage increases by 6dB/oct in proportion to the frequency.

Practically, it decreases in the high frequency range.

Fig. 7 shows the relation between frequency and response.

Losses in response

- Eddy-current loss: This is caused by Eddy-current which flows in head core. Eddy-current loss is proportionate to the frequency.
- Spacing loss: This is caused by a space between surface of head and that of tape coating. This loss is also proportionate to the frequency.
- Gap loss: This loss is attributable to a gap of the playback head, and is maximized when the length of the head is equal to the wavelength of the recorded signal.

Playback equalizer compensates these losses.

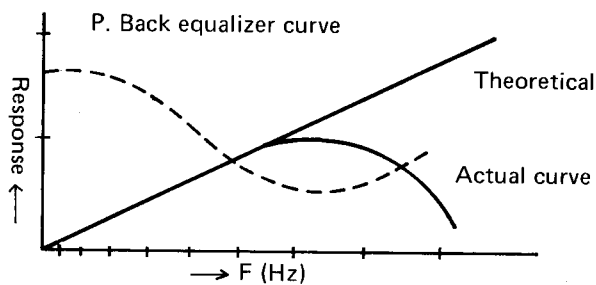


Fig. 7

Adjustment

- Connect an AC voltmeter to the output terminal. This time, be sure to connect a load resistor. (50kil ohm)
- Turn the equalizer selector to STD.
- Playback the signals of 333Hz and 6.3kHz on the test tape STD-341 and adjust the output with the semi-fixed resistor for playback equalizer adjustment so that the difference becomes 0.
L-ch VR-104
R-ch VR-204
- Depress the Equalizer Selector to Chrome and confirm that the reproduced level at 6.3kHz is $-4.5\text{dB} \pm 1.5\text{dB}$ compared with that at 333Hz.

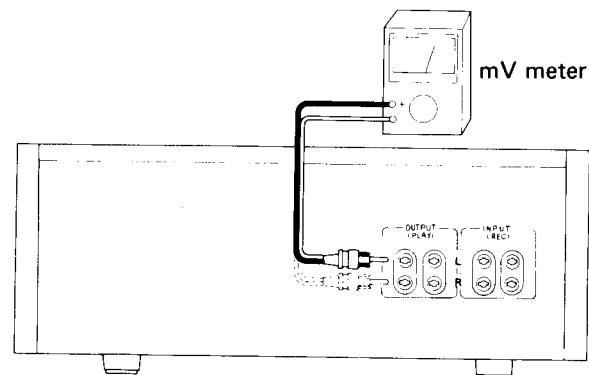


Fig. 8

7. OVU ADJUSTMENT

Information

This adjustment is to keep compatibility between decks. This is to determine the level of VU meter so that the tape is magnetized in the 160 PWb/mm magnetic flux density when OVU input is supplied. Then, the VU meter reading will be OVU when playing a tape record by 160PWb/mm.

- When the OVU adjustment is deviated.

- When the OVU level is adjusted too low, the level distortion will increase because the level approaches close to the saturation point.
- When the level is too high, S/N will decrease because level difference between the signal and hissing noise of tape becomes smaller.

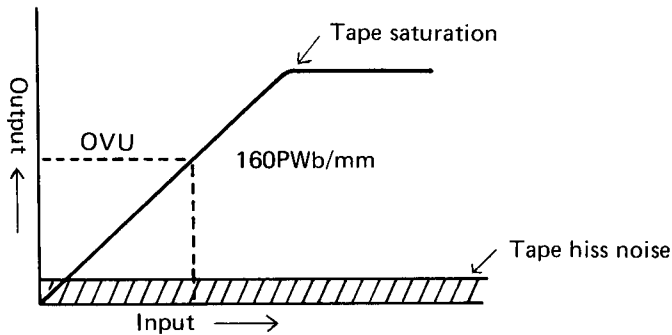


Fig-6 Input and Output characteristic.

Adjustment

- Connect an AC volt meter to the output terminal (No.15, 16 and Ground) of the Dolby ass'y.
- Apply the signal of 333Hz to INPUT and set REC, to REC.
- Adjust the recording level control so that AC voltmeter reading become $-7.7\text{dBv}(412\text{mV})$. At this time, Adjust the semi-fixed resistor (VR-106, VR-206) so that the reading of the level meter becomes -OVU.

L-ch No.15 VR-106

$-7.7\text{dBv}(412\text{mV}) = -4.7\text{dBv} (-3\text{dBv})$

200PWb/mm difference between 200Wb/mm and 160PWb/mm.

Fig. 9

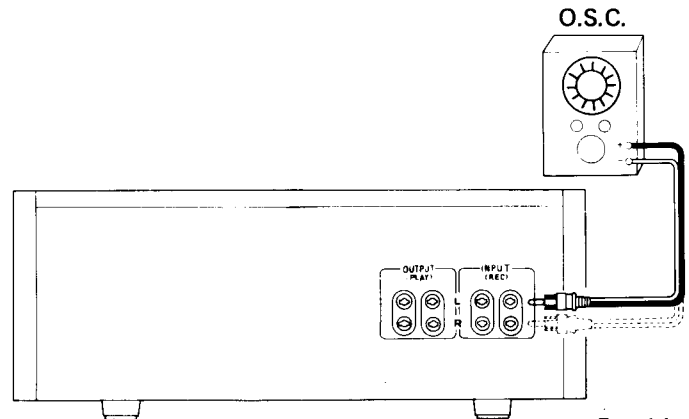


Fig. 11

8. BIAS TRAP ADJUSTMENT

Information

A trap coil is inserted between the oscillator and recording amplifier. Appropriate bias current should be supplied to the recording head, but it should not affect the Oscillator, and the bias current must not "leak" into the amplifier block.

- Effect of detuned bias trap
 - a. Beat signal is produced between the bias and the 19kHz broadcast pilot signal.
 - b. Dolby works improperly and high level decreases.
- Fig.12 shows the Dolby curves at various levels. When a signal of -40dB is recorded with a "leaked signal" of -20dB, the Dolby circuit works with the curve of -20dB. During playback, the Dolby unit operates at the level of -40dB because no "leaking" bias signal is applied. As a result, high frequency range is decreased.

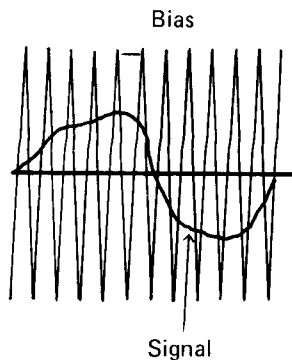


Fig. 12-a

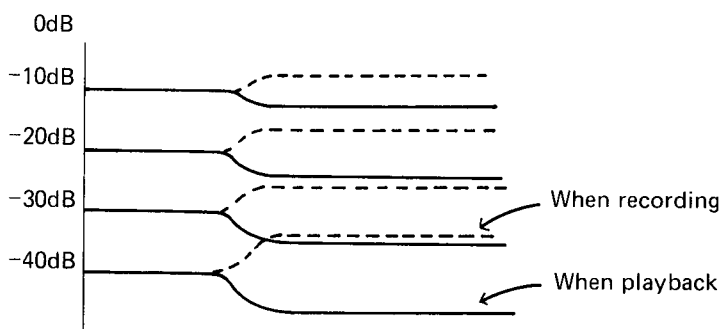


Fig. 12-b

Adjustment

- a. Depress Recording and turn the playback volume level to the maximum.
- b. Connect an AC voltmeter and oscilloscope to the test point (No.95 or 96 and Ground) Adjust the bias trap coil (L-102, L-202) so that the bias waveform becomes minimum.
 L-ch L-102 No.95
 R-ch L-202 No.96
 Fig. 21-E, F on page
- c. In every case with the bias selector set at STD or Chrome and with the recording level control set at max or min, the bias leakage should be within -45dBv.
 If not, adjust L-101 and L-201.
 L-ch L-101
 R-ch L-201

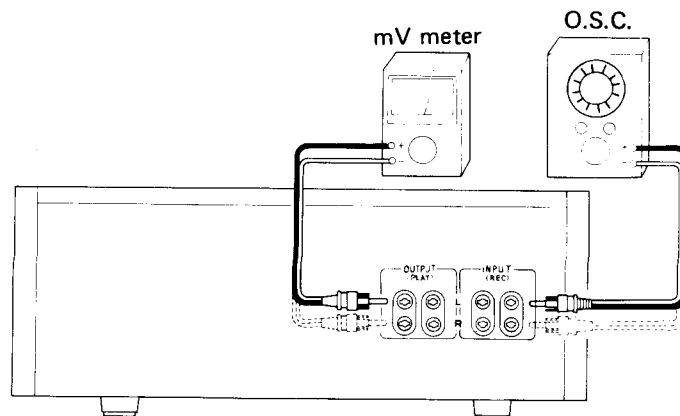


Fig. 13

9. RECORDING BIAS ADJUSTMENT

When recording, if only the recording signal is applied to the head, the recorded signal distorts because of the hysteresis characteristic. This can be improved by applying a bias along with the recording signal. There are two kinds of biasing, DC biasing and AC biasing.

AC bias is superior to DC biasing in all important factors such as recording sensitivity, distortion figures, S/N and dynamic range.

- Bias frequency should be over five times that of the highest recording frequency.

Fig. 17 shows the relation between biasing degree, output level, distortion and frequency response. As the biasing degree increases.

1. The output level increases gradually, and reaches the saturation level at a certain point.
2. When biasing more, the output level and distortion decrease.
3. Frequency response varies according to the biasing degree. High range increases with over-biasing, and decreases with underbiasing. With a proper amount of bias, it becomes flat.

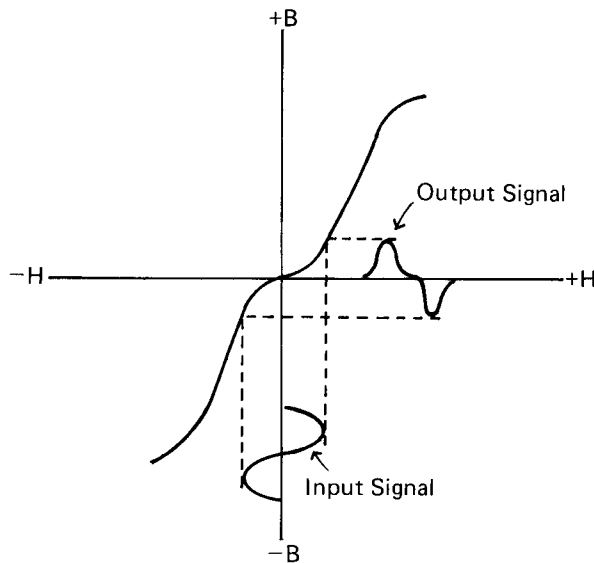


Fig-8 Zero bias system

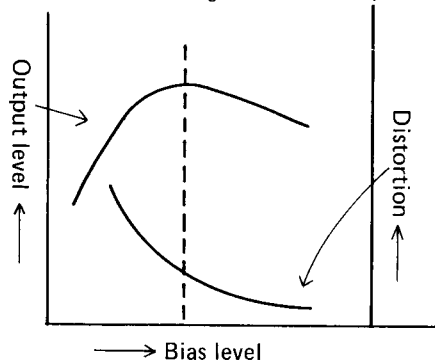


Fig. 17-a

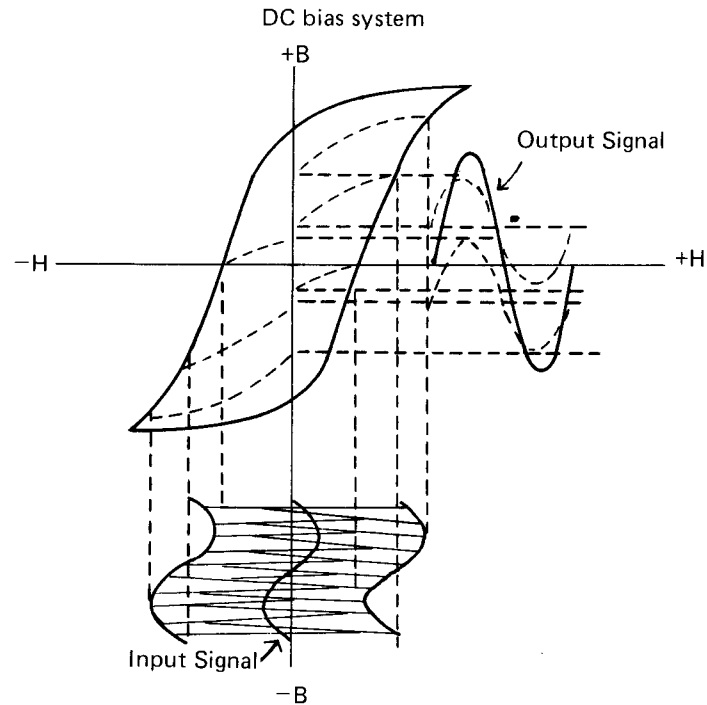
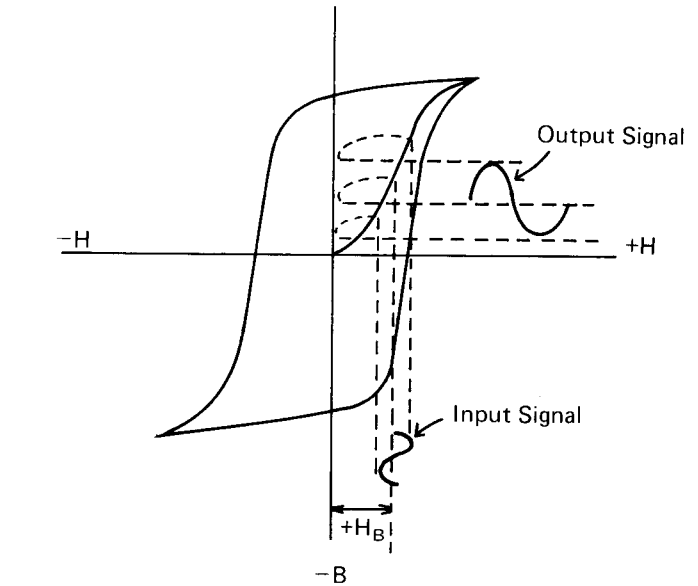


Fig. 16

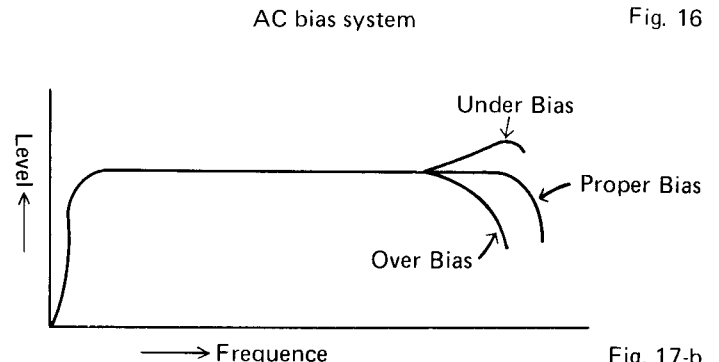


Fig. 17-b

A. Standard Tape

1. Connect a mV meter as shown in Photo 7.
2. Depress the REC lever and set the REC level control at min, with bias and EQ buttons set at STD.
3. Adjust the semi-fixed resistor VR301: L-ch, VR302: R-ch so that the voltage between both ends of the 10 ohm is resistor connected between the P/B head and ground is 1.5 mV. Usually, this adjustment will be enough. If adjustment for a particular type of tape is required, adjust according to the following procedure(Fig. 21-E, F on page)
4. Apply 333Hz signal to input jacks. Record at the level of -20dB on the VU meters. (Use STD-601)
5. Change the frequency to 6.3kHz and record in the same manner as above.
6. Reproduce the recorded signal, and compare the levels. If the level of the 6.3kHz signal is 1.5dB higher than that of the 333Hz signal, the bias is adjusted correctly.
7. If the level of the 333Hz signal is higher than the 6.3kHz signal, it means that the adjustment is set for over-biased.
In this case, decrease the bias current. If the level of the 333Hz signal is more than 1.5dB lower than the 6.3kHz signal, increase the bias current.
8. Repeat the above steps 4-7 till the correct value is obtained.

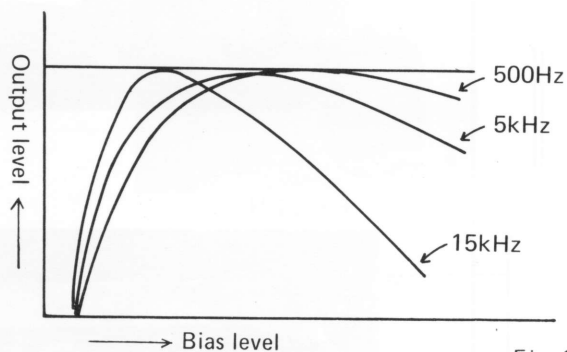


Fig. 18

B. CHROME TAPE

1. Connect a mV meter as shown in Photo 7.
2. Set bias and EQ buttons to CHROME.
3. Record 333Hz and 6.3kHz signals at the level of -20dB on the VU meters.
4. Playback the recorded signals and measure them.
5. Confirm that the output level of the 6.3kHz signal is 0-2dB higher than that of the 333Hz signal.
6. If it is more than 2dB higher than the level of the 333Hz signal, increase the bias current. If it is lower than the level of the 333Hz signal, decrease the bias current.
7. Confirm that the output level of the 6.3kHz signal is 0-2dB higher than that of the 333Hz.

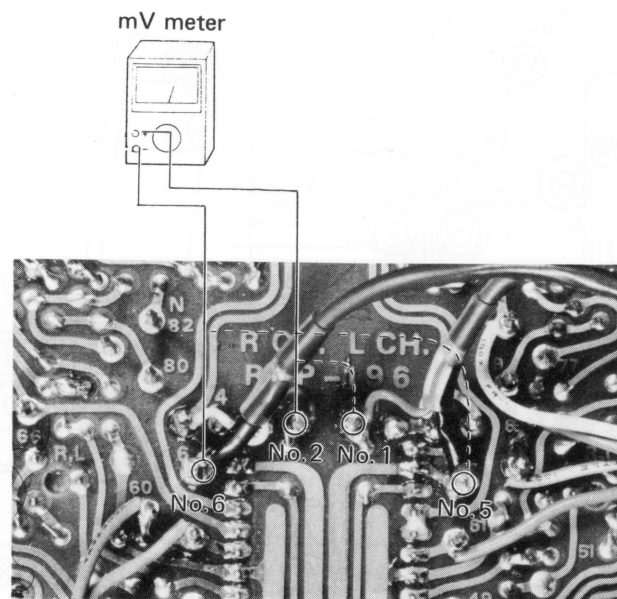


Photo 7

10. RECORDING LEVEL ADJUSTMENT

- Do this adjustment after the 0VU adjustment in Item No.7.
- This is to enable tapes to be magnetized by 160PWb/mm at the recording level of 0VU.

1. With BIAS and EQ Tape Selectors at STD, set Dolby NR to ON.
2. Apply 333Hz/-10dB to the Input jacks and connect mV meter to Dolby Ass'y OUT terminals (No.15, 16). Adjust Line controls for -7.7dB indication.
3. Record 333Hz/-10dB on STD-601 (SONY C-90HF or equiv.) and adjust VR_{107, 207} for -7.7dB playback level at the Dolby Ass'y OUT terminals (No.15, 16).
4. Set BIAS and EQ Tape Selectors to Chrome. Record and playback 333Hz/-10dB on STD-602A (TDK C-60KR or equiv.). Confirm that the signal at Dolby Ass'y OUT terminals is $-7.7 \pm 1.5\text{dB}$.

L-ch No.15 VR-107

R-ch No.16 VR-207

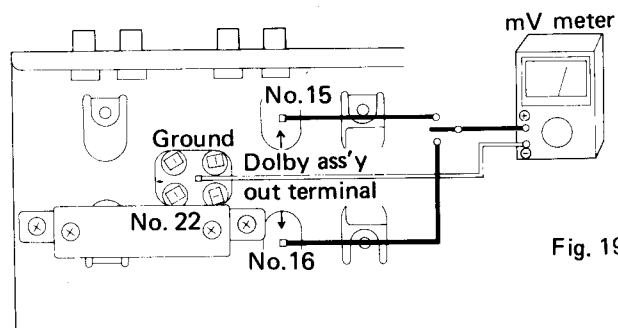


Fig. 19

11. DOLBY ADJUSTMENT

- This is for the Dolby operation. If this is improper, it will cause low S/N and poor frequency characteristics.

1. Connect mV meter to terminals No.15 and 16 of the Dolby Ass'y.
2. Set Dolby NR button to ON.
3. Turn VR_{401, 501} (L & R channels) of Dolby Ass'y to maximum.
4. While in record mode, apply 5kHz signal to the Input jacks.
5. Adjust Input level controls for 4.7dBv indication on mV meter.
6. Reduce the Input jack level by 40dB.
7. Adjust VR_{402, 502} for -34.7dBv indication on mV meter.
8. Reduce level applied in Step 4 by 30dB.
9. Adjust VR_{401, 501} for 26.7dBv indication on mV meter.

L-ch No.15 VR-401, VR-402

R-ch No.16 VR-501, VR-502

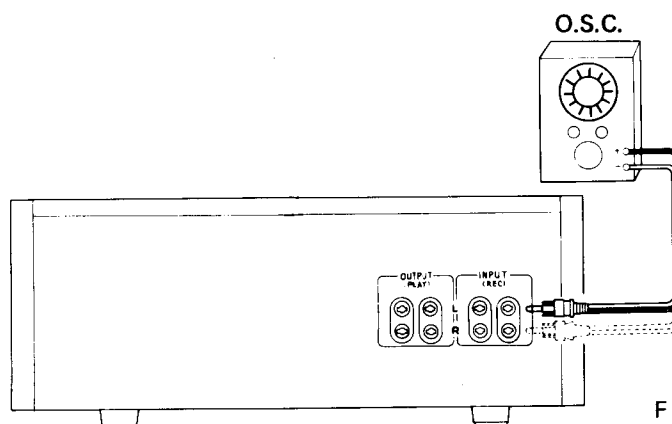


Fig. 20

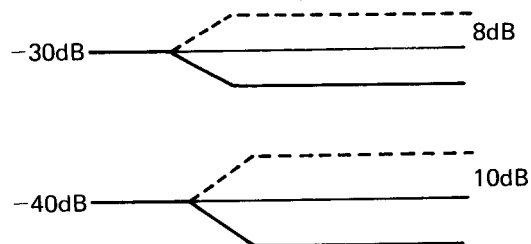


Fig. 21

ELECTRICAL ADJUSTMENT POSITIONS

Fig. 22-C

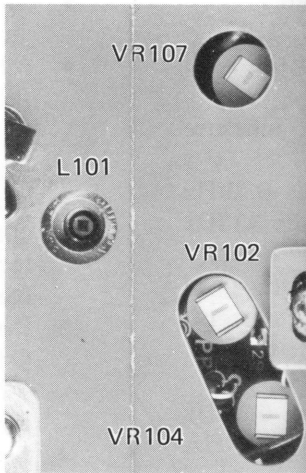
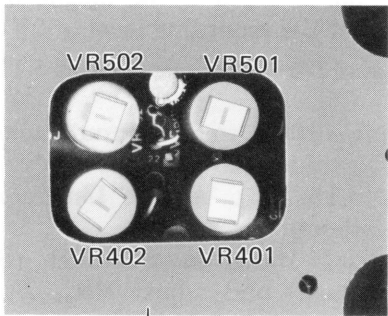


Fig. 22-B

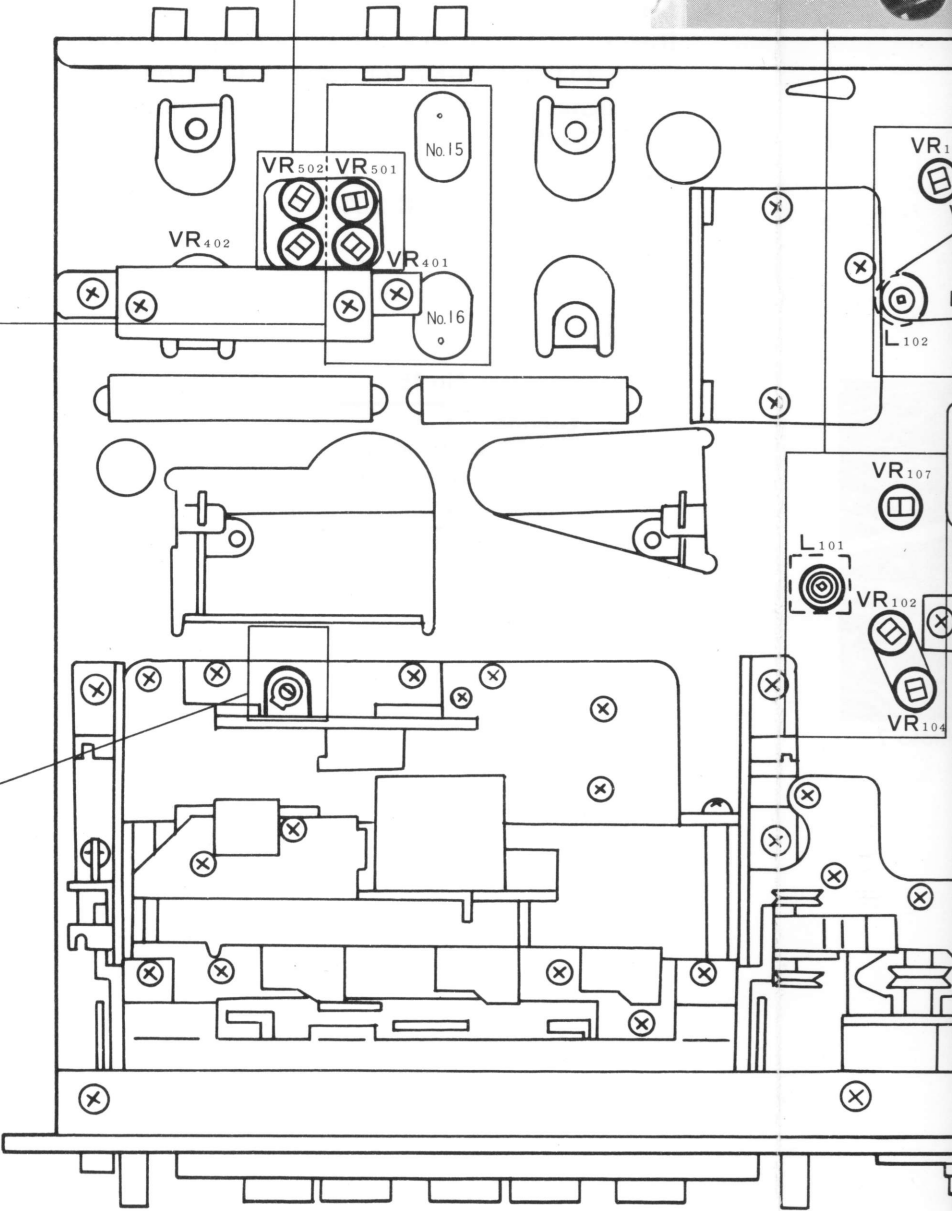
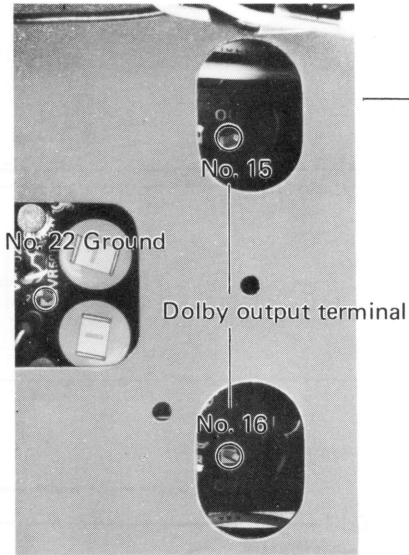


Fig. 22-A

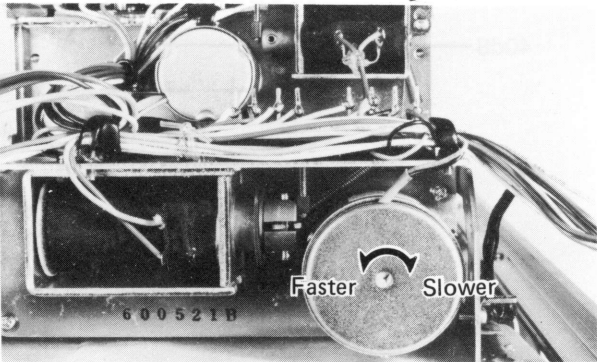


Fig. 22-D

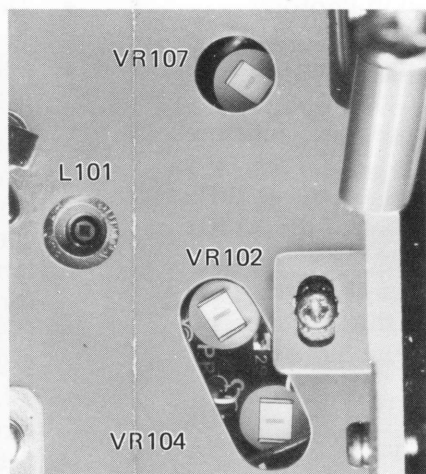


Fig. 22-E

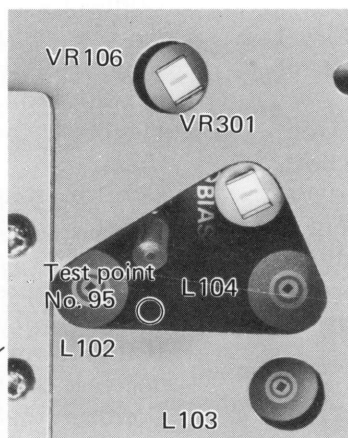


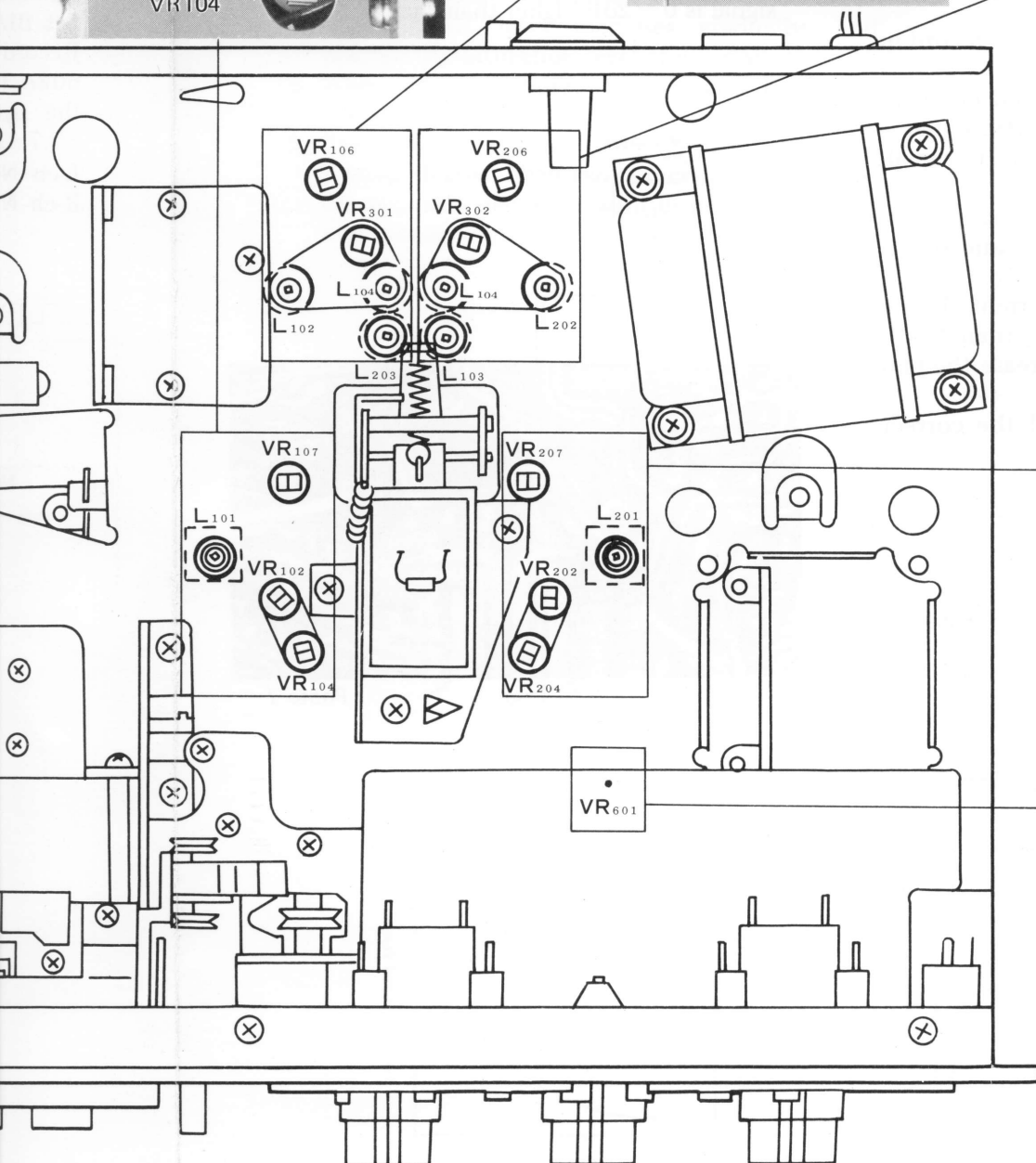
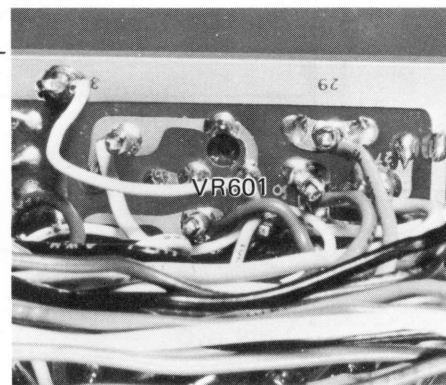
Fig. 22-F



Fig. 22-G



Fig. 22-H



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