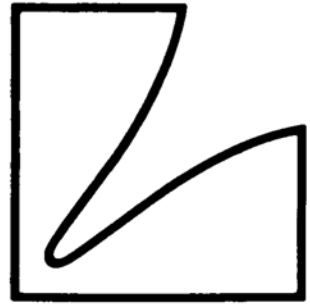


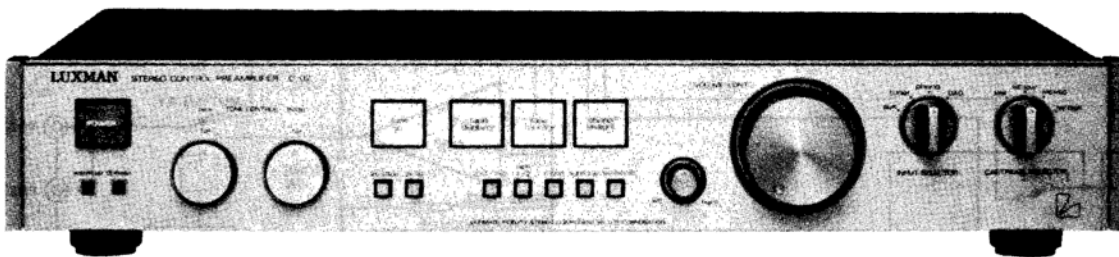
# SERVICE MANUAL



C-02

Duo-Beta Circuit/S Separate Pre-Amplifier

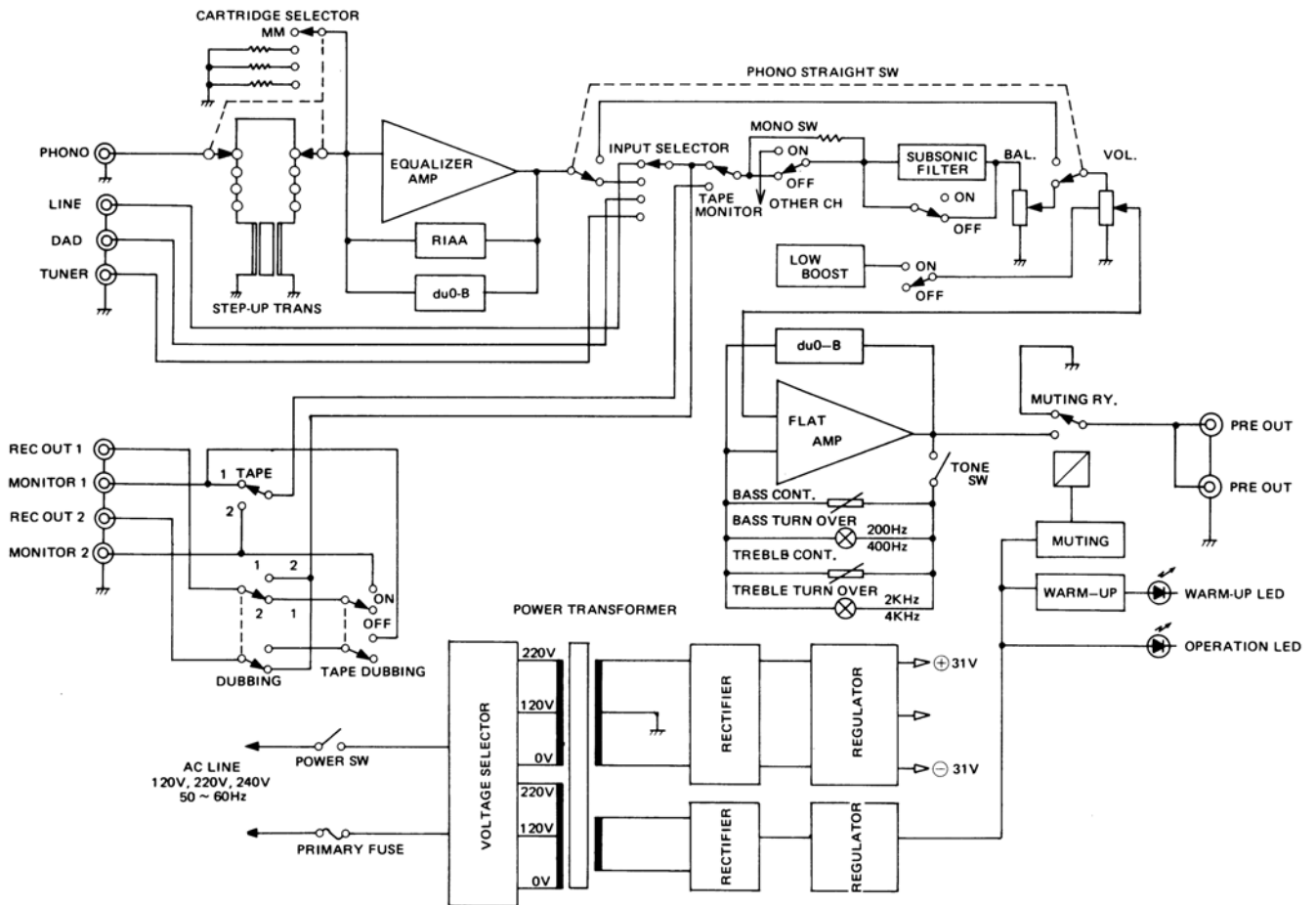
# C-02



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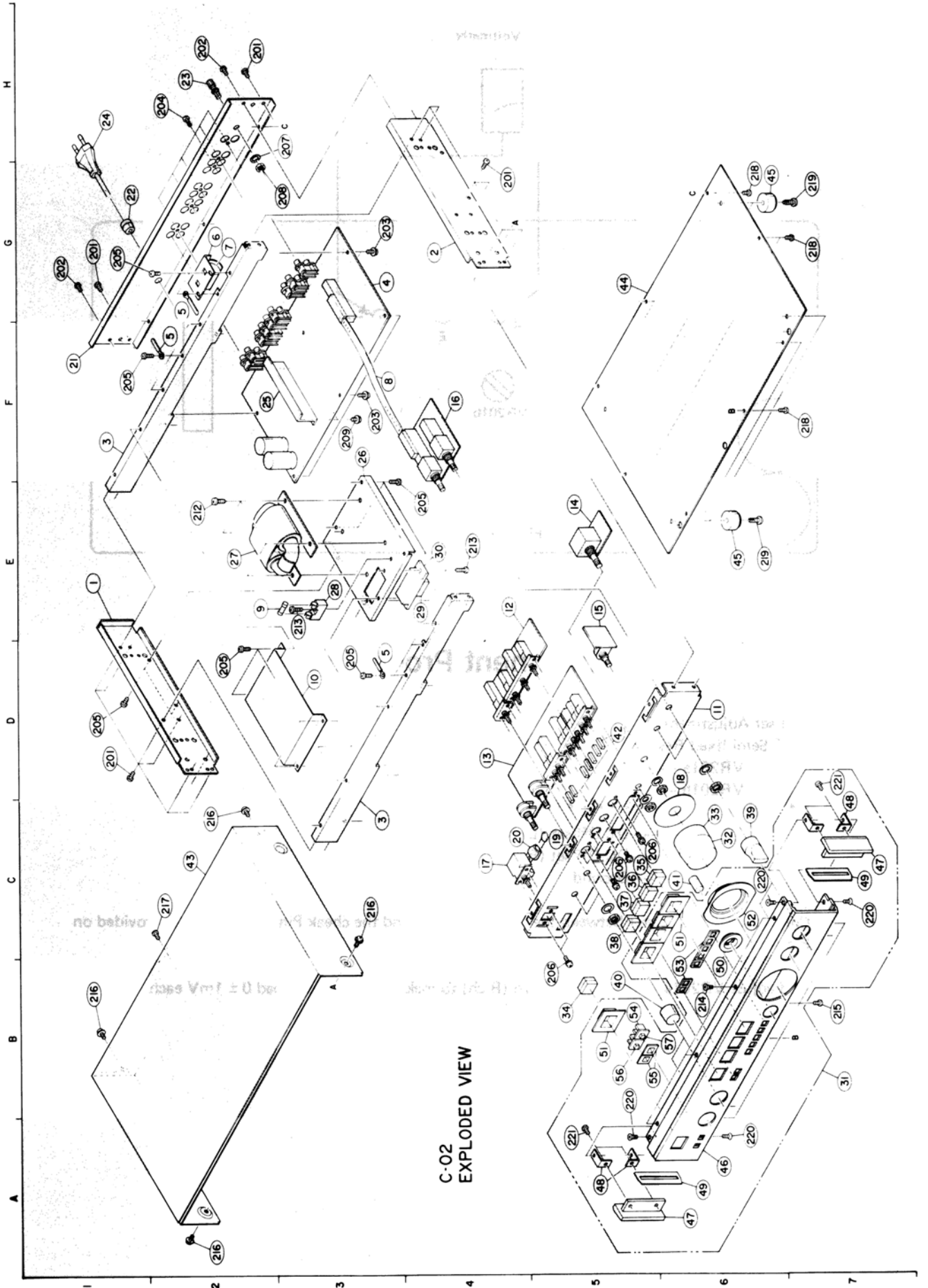
## Block Diagram





# Exploded View

C-02



C-02  
EXPLODED VIEW



## Exploded View Parts List

Index	Symbol No.	Stock No.	Description	Remarks
E1	1	07C61687F01	Bracket, Side 1063-1	
G4	2	07C61687F02	Bracket, Side 1063-2	
C3, F1	3	07C61688F01	Bracket, Channel 1059	
G3	4	01V63200F10	Ass'y PCB, Pre Amp	
D3, F5	5	29C41045P03	Lug Wrap Around	
G2	6	07A61689F01	Bracket, 1446	
G2	7	25T61680F01	Trans MC. TR-8B	
F3	8	45T61656F01	Cable, Remote SWR596	
E2	9	65T42077U11	Fuse Semko T315MA	
D3	10	26B62699F01	Shield, Trans 1148	
D6	11	27C61690F01	Chassis, Front 1088	
E4	12	01V63200F04	Ass'y PCB Monitork	
D4	13	01V63200F05	Ass'y PCB, Tone Control	
E5	14	01V63200F06	Ass'y PCB, Volume	
E5	15	01V63200F07	Ass'y PCB, Balance Volume	
F4	16	01V63200F08	Ass'y PCB, Function	
C4	17	40T57580F01	Switch Power SDGA1P	
D6	18	14A61692F01	Insulator 3030	
C5	19	08T57437F09	Capacitor (Ac) 0.01uF	
C4	20	43T53136F01	Bushing, Capacitor TP150-301	
F1	21	15C61693F01	Cover, Rear	
G1	22	43B41625J04	Support, Cord	AG
		43B41625J02	Support, Cord	AK
H2	23	09R61713F01	Terminal, GND 1260	
H1	24	28T55003F01	Plug, AC Cord (SAA)	AG
		28T43812P01	Plug, AC Cord	AK
F3	25	07A61694F01	Heat Sink, 1104	
F3	26	07B61695F01	Bracket, Trans 1445	
E2	27	25T61679F01	Trans Power	
E3	28	09T51074F01	Fuse Holder	
E4	29	09T51830F01	Plug, Switch P-2120	
E4	30	09T51831F01	Socket, Switch M-1615	
B7	31	01V63200F14	Ass'y Panel, Front	
C6	32	36R61696F01	Knob, Main 1163 Metal	
C6	33	36A61760F01	Knob, Rotary VR1163	
B5	34	36B61434F01	Knob, Push 1161	
C5	35	36B61434F04	Knob, Push 1161	
C5	36	36B61434F05	Knob, Push 1161	
C5	37	36B61434F06	Knob, Push 1161	
C5	38	36B61434F07	Knob, Push 1161	
C6	39	36A61698F01	Knob, Control 1162	
B5	40	36A61701F01	Knob, Control 1163	
C6	41	36A61435F01	Knob, Volume. (1164)	
D5	42	36A57180F02	Knob, Push "B"	
C2	43	15C60393F01	Cover, Top	
G5	44	15B60394F01	Cover, Bottom	
E6, G6	45	75A52969F01	Pad, Trann-leg	
A6	46	64C61702F01	Panel, Front 1283	
A6, C7	47	64B61703F01	Panel, Side 1060	
A5, C7	48	07A61443F01	Bracket, Panel Side(1440)	
A6, C7	49	43A61704F01	Spacer, Panel Side	
B6	50	07A56645F01	Frame, Knob 1156	
B5, C6	51	07B61445F01	Frame, Knob (1186)	
C6	52	07B61705F01	Frame, Knob 1187	
B6	53	07A61706F01	Frame, Knob 1188	
B5	54	61A61446F01	Crystal, Indicator (1126)	

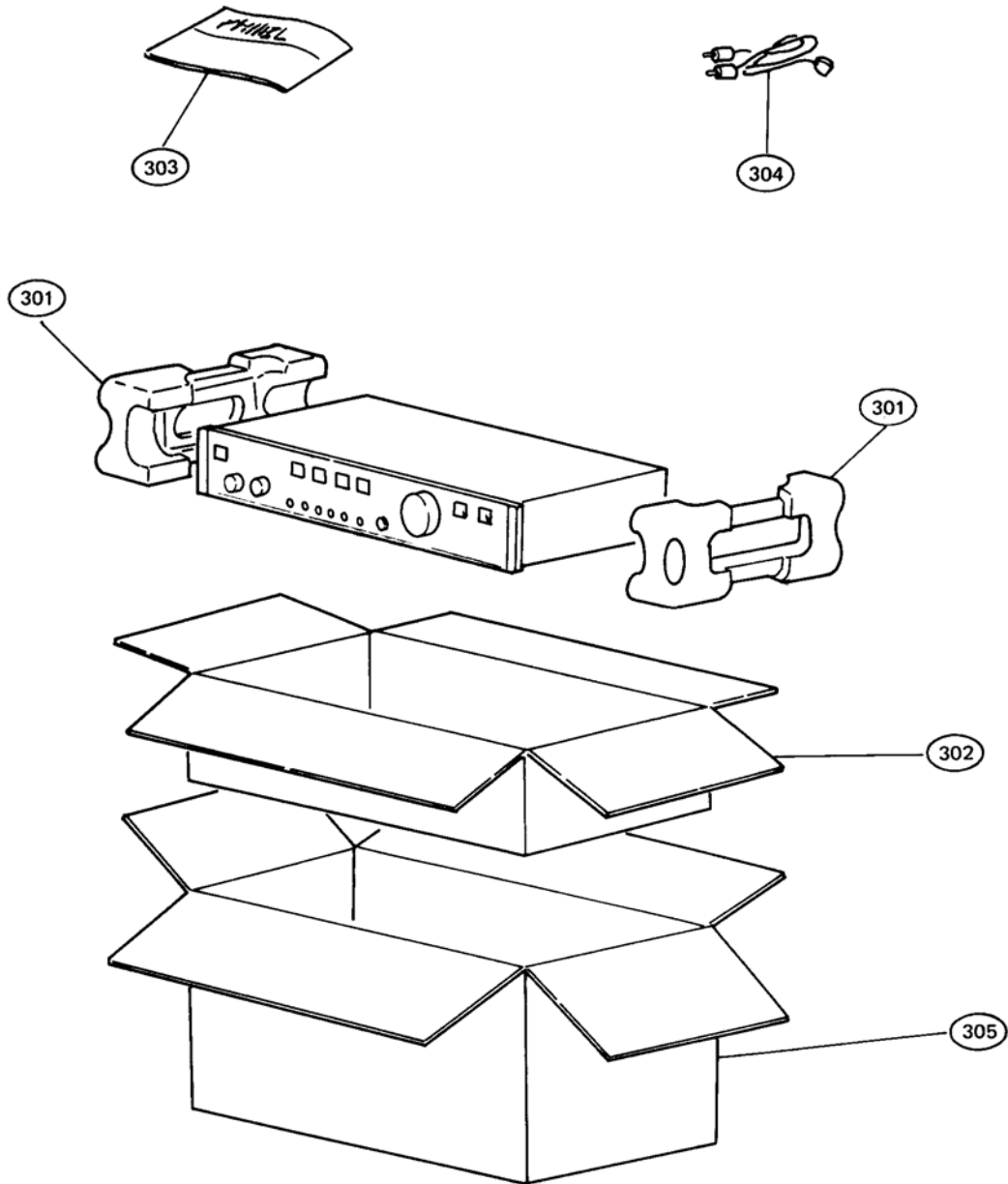
C-02

Index	Symbol No.	Stock No.	Description	Remarks
B5	55	07A61712F01	Frame,1212	
B5	56	48T60388F01	LED LD101MG	
B6	57	48T60388F03	LED LD-101 YY	
D1,G1	201	03S40036U18	Screw,T-Tite M3X8 T.L	
G1,H2	202	03S44205G02	Screw,T-Tite M3X6	
F3,G3	203	03C42723U01	Screw,CUP M3X6	
H2	204	03S40012G41	Screw,Tapping M3X8	
D1,D2	205	03S44205G01	Screw,T-Tite M3X6	
B5,C5	206	03C40014G04	Screw,MCH M3X6	
H3	207	04S40072G06	Washer,Tooth Lock	
G3	208	02S40000G46	Nut M6X0.75	
F3	209	03C40014G10	Screw,MCH M3X8	
E2	212	03S40036U02	Screw,T-Tite M3X8	
E3,E4	213	03S44205G03	Screw,T-Tite M3X8	
B6	214	03S44205G16	Screw,T-Tite M3X6	
B7	215	03S44205G01	Screw,T-Tite M3X6	
A2,B1	216	03S40036U01	Screw,T-Tite M4X8	
C2	217	03S44205G02	Screw,T-Tite M3X6	
F7,G6	218	03S44205G01	Screw,T-Tite M3X6	
E6,G7	219	03S44205G49	Screw,T-Tite M4X8 Bind	
A6,B5	220	03S44205G16	Screw,T-Tite M3X6	
A5,D7	221	03S40012G03	Screw,Tapping M3X6	

### Destination's Parts List

Symbol No	Description	AK	AG
		Europe Etc.	England Australia
		220V	240V
22	Support, Cord	43B41625J02	43B41625J04
24	Plug, AC Cord	28T43812P01	28T55003F01

## Packing Material Parts List



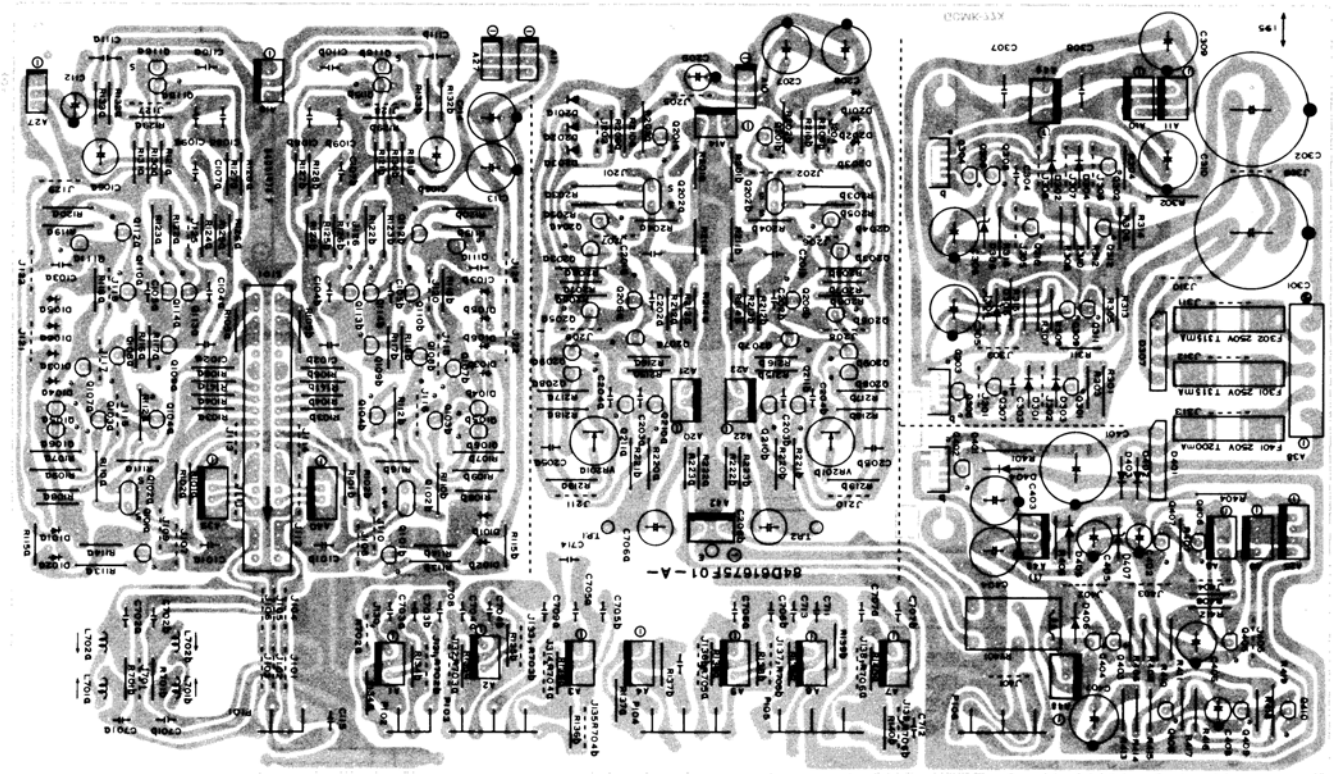
### Packing Material Parts List

Index	Symbol No.	Stock No.	Description	Remarks
	301	56C60411F01	Packing Tray	
	302	56C58368F16	Carton, Packing	
	303	68R61707F01	Owner's Manual	
	304	28T58909F01	Plug, Audio Cable	
	305	56C58368F07	Carton, Outer	

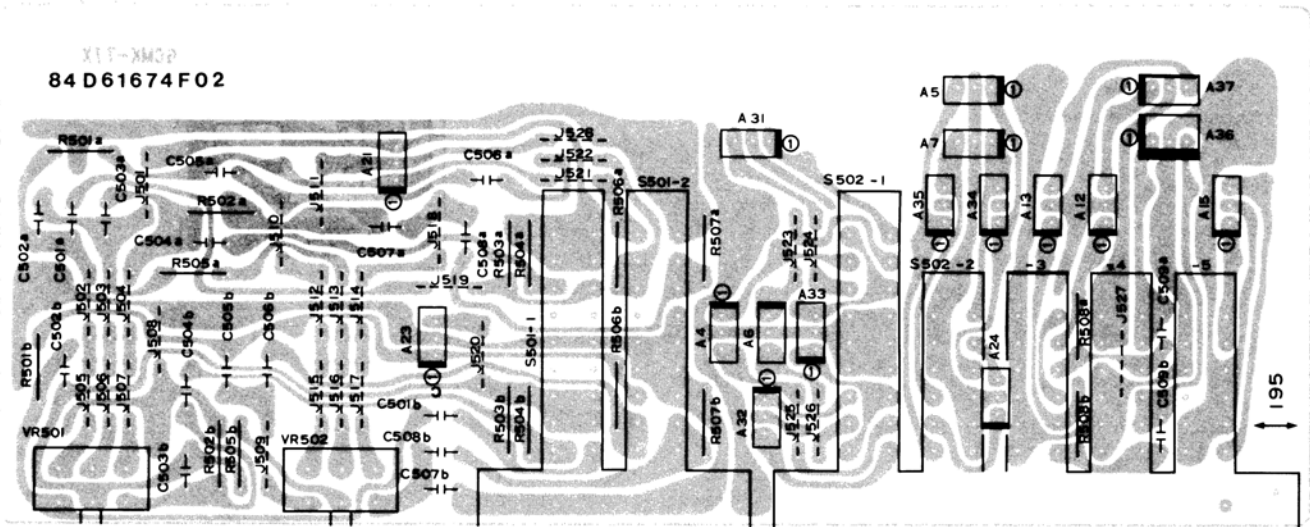


# PCB

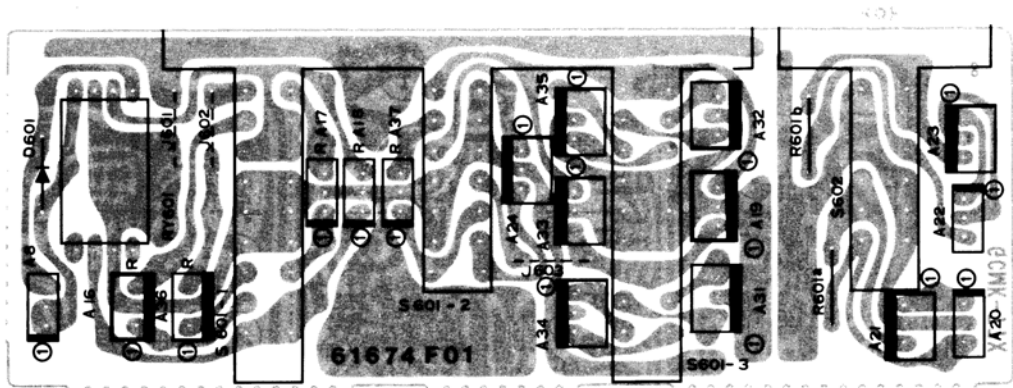
## Pre-Amp PCB



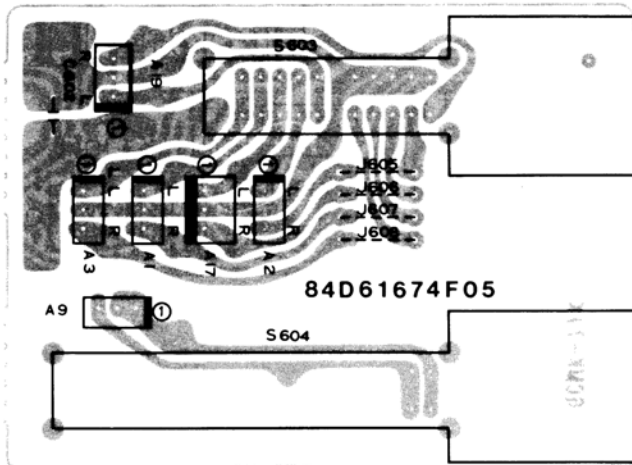
## Tone Control PCB



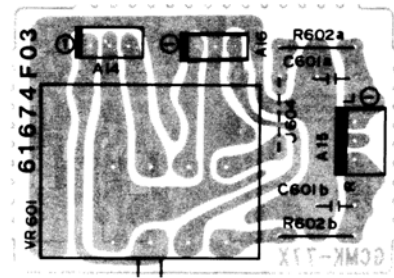
• Monitor PCB



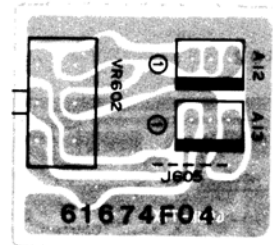
Function PCB



Volume PCB



Balance Volume PCB



Resistor: Rd... Carbon, Rm... Metal Film  
 Capacitor: El... Electrolytic, Pp... Polypropylene, Mi... Mica,  
 Ac... AC, Tf... TF, St... Styrol

# PCB Parts List

## Pre-Amp PCB Parts List

Symbol No.	Stock No.	Description
<b>(Jack &amp; Terminal)</b>		
P101	09T62111F01	T5855-AAAB
P102	09T62111F01	T5855-AAAB
P103	09T61714F01	T5858-AA
P104	09T61714F01	T5858-AA
P105	09T61714F01	T5858-AA
P106	09T61714F02	T5858-BA
<b>(Fuse)</b>		
F301	65T42077U11	Semko T315MA
F302	65T42077U11	Semko T315MA
F401	65T42077U09	Semko T200MA
<b>(Relay)</b>		
RY401	80T61677F01	FBR244D012/2CE
<b>(Switch)</b>		
S101	40T61655F01	SLD.SSR284
<b>(Variable Resistor)</b>		
VR201a,b	18C41732G03	4.7K-B
<b>(Transistor &amp; FET)</b>		
Q101a,b	48T51120F01	2SC2235
Q102a,b	48T60558F03	2SK240-BL,V
Q103a,b	48T47682F03	2SC1845 EA
Q104a,b	48T47682F03	2SC1845 EA
Q105a,b	48T52545F03	2SA970 BL,GR
Q106a,b	48T52545F03	2SA970 BL,GR
Q107a,b	48T60751F01	2SA1145 O,Y
Q108a,b	48T60751F01	2SA1145 O,Y
Q109a,b	48T60752F01	2SC2705 O,Y
Q110a,b	48T60752F01	2SC2705 O,Y
Q111a,b	48S43525F02	2SC1815-Y
Q112a,b	48S43525F02	2SC1815-Y
Q113a,b	48T60752F01	2SC2705 O,Y
Q114a,b	48T60751F01	2SA1145 O,Y
Q115a,b	48T47682F03	2SC1845 EA
Q116a,b	48T56281F01	2SK170 BL
Q201a,b	48T51120F01	2SC2235
Q202a,b	48T60558F03	2SK240-BL,V
Q203a,b	48T47682F03	2SC1845 EA
Q204a,b	48T47682F03	2SC1845 EA
Q205a,b	48T60751F01	2SA1145 O,Y
Q206a,b	48T60751F01	2SA1145 O,Y
Q207a,b	48T60752F01	2SC2705 O,Y
Q208a,b	48T60752F01	2SC2705 O,Y
Q210a,b	48T60752F01	2SC2705 O,Y
Q211a,b	48T60751F01	2SA1145 O,Y
Q301	48T51118F01	2SA1015-Y
Q302	48S43525F02	2SC1815-Y
Q303	48T58614F01	2SD1406
Q304	48T60590F01	2SB1015-O,Y
Q305	48S43525F02	2SC1815-Y
Q306	48T51118F01	2SA1015-Y
Q307	48S43525F02	2SC1815-Y
Q308	48T51118F01	2SA1015-Y
Q309	48T51118F01	2SA1015-Y
Q310	48S43525F02	2SC1815-Y
Q311	48T51118F01	2SA1015-Y
Q312	48S43525F02	2SC1815-Y

Symbol No.	Stock No.	Description
Q401	48S43525F02	2SC1815-Y
Q403	48S43525F02	2SC1815-Y
Q404	48T45274F01	2SC2120 O
Q405	48S43525F02	2SC1815-Y
Q405	48T58614F01	2SD1406
Q406	48S43525F02	2SC1815-Y
Q407	48T45274F01	2SC2120 O
Q408	48T51118F01	2SA1015-Y
Q409	48S43525F02	2SC1815-Y
Q410	48S43525F02	2SC1815-Y
<b>(Diode &amp; Zenner &amp; LED)</b>		
D101a,b	48T40955T01	TLR124 RED
D102a,b	48T40955T01	TLR124 RED
D103a,b	48T40955T01	TLR124 RED
D104a,b	48T40955T01	TLR124 RED
D105a,b	48T40955T01	TLR124 RED
D106a,b	48T40955T01	TLR124 RED
D201a,b	48T40955T01	TLR124 RED
D202a,b	48T40955T01	TLR124 RED
D203a,b	48T40955T01	TLR124 RED
D301	48T43189F01	1S1555
D302	48T43189F01	1S1555
D303	48T43189F01	1S1555
D304	48T43189F01	1S1555
D305	48T52739F71	HZ12A-2 -AX
D306	48T52739F71	HZ12A-2 -AX
D307	48T61415F02	1D4B41
D401	48T61415F01	1B4B41
D402	48T55186F01	GP10D -AX
D403	48T55186F01	GP10D -AX
D404	48T52739F71	HZ12A-2 -AX
D405	48T51117F01	1S1553
D406	48T55186F01	GP10D -AX
D407	48T52741F14	HZ7B-2L
<b>(Capacitor)</b>		
C101a,b	08C42195G15	(St) 33pF 125V
C102a,b	08T42081U01	(Pp) 100pF
C103a,b	08T42081U25	(Pp) 1000pF
C104a,b	08T55119F14	(Mi) 22pF 50V
C105a,b	08T55119F14	(Mi) 22pF 50V
C106a,b	23T61177F04	(EI) 2.2uF 50V
C107a,b	08T42081U49	(Pp) 0.01uF
C108a,b	08T42081U03	(Pp) 120pF
C109a,b	08T42081U37	(St) 3300pF
C110a,b	08T42081U17	(Pp) 470pF
C111a,b	08T61407F07	(Ac) 2.2uF 125V
C112	23S40657F19	(EI) 33uF 25V
C113	23T00029L55	(EI) 220uF 35V
C114	23T00029L55	(EI) 220uF 35V
C115	08T42081U25	(Pp) 1000pF
C201a,b	08T50579F25	(Tf) 1.0uF
C202a,b	08T55119F14	(Mi) 22pF 50V
C203a,b	08T55119F06	(Mi) 10pF 50V
C204a,b	08T55119F06	(Mi) 10pF 50V
C205a,b	08T42081U25	(Pp) 1000pF
C206a,b	23T61177F05	(EI) 4.7uF 50V
C207	23T00029L55	(EI) 220uF 35V
C208	23T00029L55	(EI) 220uF 35V

Symbol No.	Stock No.	Description	Symbol No.	Stock No.	Description
C209	23S40657F14	(EI) 100uF 16V	R140a,b	06S44594P38	(Rd) 1M $\Omega$ 1/4W
C301	23T61678F01	(EI) 1000uF 50V	R141a,b	06S40151T06	(Rd) 47K $\Omega$ 1/4W
C302	23T61678F01	(EI) 1000uF 50V	R201a,b	06S44594P30	(Rd) 470K $\Omega$ 1/4W
C303	08T42081U40	(Pp) 4300pF	R202a,b	06T55175F47	(Rm) 180 $\Omega$ 1/2W
C304	08T42081U40	(Pp) 4300pF	R203a,b	06T55175F45	(Rm) 150 $\Omega$ 1/2W
C305	23S40657F52	(EI) 220uF 16V	R204a,b	06S44594P02	(Rd) 33K $\Omega$ 1/4W
C306	23S40657F52	(EI) 220uF 16V	R205a,b	06T55175F45	(Rm) 150 $\Omega$ 1/2W
C307	08T61407F05	(Ac) 1.0uF 125V	R206a,b	06T55175F57	(Rm) 470 $\Omega$ 1/2W
C308	08T61407F05	(Ac) 1.0uF 125V	R207a,b	06S44594P14	(Rd) 100K $\Omega$ 1/4W
C309	23T00029L56	(EI) 220uF 50V	R208a,b	06T55175F57	(Rm) 470 $\Omega$ 1/2W
C310	23T00029L56	(EI) 220uF 50V	R209a,b	06S44593P99	(Rd) 27K $\Omega$ 1/4W
C402	23S40657F17	(EI) 10uF 25V	R210a,b	06S44593P83	(Rd) 5.6K $\Omega$ 1/4W
C403	23S40657F52	(EI) 220uF 16V	R211a,b	06S44593P69	(Rd) 1.5K $\Omega$ 1/4W
C404	23S40657F52	(EI) 220uF 16V	R212a,b	06S44594P38	(Rd) 1M $\Omega$ 1/4W
C405	23S40657F11	(EI) 22uF 16V	R213a,b	06S44593P57	(Rd) 470 $\Omega$ 1/4W
C406	23S40657F14	(EI) 100uF 16V	R214a,b	06S44593P89	(Rd) 10K $\Omega$ 1/4W
C407	23S40657F52	(EI) 220uF 16V	R215a,b	06S44593P67	(Rd) 1.2K $\Omega$ 1/4W
C408	23S40657F28	(EI) 1.0uF 50V	R216a,b	06S44593P65	(Rd) 1K $\Omega$ 1/4W
C410	23S41198U65	(EI) 1000uF 25V	R217a,b	06T55175F49	(Rm) 220 $\Omega$ 1/2W
(Resistor)			R218a,b	06T55175F49	(Rm) 220 $\Omega$ 1/2W
R101a,b	06S44593P33	(Rd) 47 $\Omega$ 1/4W	R219a,b	06T55175F61	(Rm) 680 $\Omega$ 1/2W
R103a,b	06S44593P35	(Rd) 56 $\Omega$ 1/4W	R220a,b	06T55175F25	(Rm) 22 $\Omega$ 1/2W
R104a,b	06S44593P49	(Rd) 220 $\Omega$ 1/4W	R221a,b	06T55175F25	(Rm) 22 $\Omega$ 1/2W
R105a,b	06S44593P47	(Rd) 180 $\Omega$ 1/4W	R222a,b	06S44594P14	(Rd) 100K $\Omega$ 1/4W
R106a,b	06S44593P47	(Rd) 180 $\Omega$ 1/4W	R223a,b	06S44593P41	(Rd) 100 $\Omega$ 1/4W
R107a,b	06T55175F43	(Rm) 120 $\Omega$ 1/2W	R301	06T55175F59	(Rm) 560 $\Omega$ 1/2W
R108a,b	06S44594P14	(Rd) 100K $\Omega$ 1/4W	R302	06T55175F59	(Rm) 560 $\Omega$ 1/2W
R109a,b	06T55175F43	(Rm) 120 $\Omega$ 1/2W	R303	06S44594P04	(Rd) 39K $\Omega$ 1/4W
R110a,b	06T55175F45	(Rm) 150 $\Omega$ 1/2W	R304	06S44594P04	(Rd) 39K $\Omega$ 1/4W
R111a,b	06S44594P02	(Rd) 33K $\Omega$ 1/4W	R305	06S44593P99	(Rd) 27K $\Omega$ 1/4W
R112a,b	06T55175F45	(Rm) 150 $\Omega$ 1/2W	R306	06S44593P99	(Rd) 27K $\Omega$ 1/4W
R113a,b	06T55175F43	(Rm) 120 $\Omega$ 1/2W	R307	06S44593P71	(Rd) 1.8K $\Omega$ 1/4W
R114a,b	06S44593P99	(Rd) 27K $\Omega$ 1/4W	R308	06S44593P71	(Rd) 1.8K $\Omega$ 1/4W
R115a,b	06S44593P83	(Rd) 5.6K $\Omega$ 1/4W	R309	06S44593P87	(Rd) 8.2K $\Omega$ 1/4W
R116a,b	06S44593P67	(Rd) 1.2K $\Omega$ 1/4W	R310	06S44593P87	(Rd) 8.2K $\Omega$ 1/4W
R117a,b	06S44593P65	(Rd) 1K $\Omega$ 1/4W	R311	06S44593P95	(Rd) 18K $\Omega$ 1/4W
R118a,b	06S44593P95	(Rd) 18K $\Omega$ 1/4W	R312	06S44593P95	(Rd) 18K $\Omega$ 1/4W
R119a,b	06T55175F49	(Rm) 220 $\Omega$ 1/2W	R313	06S44593P91	(Rd) 12K $\Omega$ 1/4W
R120a,b	06T55175F49	(Rm) 220 $\Omega$ 1/2W	R314	06S44593P91	(Rd) 12K $\Omega$ 1/4W
R121a,b	06S44593P81	(Rd) 4.7K $\Omega$ 1/4W	R315	06T55175F59	(Rm) 560 $\Omega$ 1/2W
R122a,b	06T55175F19	(Rm) 12 $\Omega$ 1/2W	R316	06T55175F59	(Rm) 560 $\Omega$ 1/2W
R123a,b	06T55175F19	(Rm) 12 $\Omega$ 1/2W	R401	06T55175F57	(Rm) 470 $\Omega$ 1/2W
R124a,b	06S44594P22	(Rd) 220K $\Omega$ 1/4W	R404	06T51015F30	(Rd) 680 $\Omega$ 1/2W
R125a,b	06S44594P06	(Rd) 47K $\Omega$ 1/4W	R405	06S44594P26	(Rd) 330K $\Omega$ 1/4W
R126a,b	06S44594P14	(Rd) 100K $\Omega$ 1/4W	R406	06S44593P81	(Rd) 4.7K $\Omega$ 1/4W
R127a,b	06S44593P31	(Rd) 39 $\Omega$ 1/4W	R407	06S44593P81	(Rd) 4.7K $\Omega$ 1/4W
R128a,b	06S44593P97	(Rd) 22K $\Omega$ 1/4W	R408	06S44593P89	(Rd) 10K $\Omega$ 1/4W
R129a,b	06S44594P38	(Rd) 1M $\Omega$ 1/4W	R409	06S44593P81	(Rd) 4.7K $\Omega$ 1/4W
R130a,b	06S44594P02	(Rd) 33K $\Omega$ 1/4W	R410	06S44593P81	(Rd) 4.7K $\Omega$ 1/4W
R131a,b	06S44593P89	(Rd) 10K $\Omega$ 1/4W	R411	06S44594P14	(Rd) 100K $\Omega$ 1/4W
R132a,b	06S44594P24	(Rd) 270K $\Omega$ 1/4W	R412	06S44593P25	(Rd) 22 $\Omega$ 1/4W
R133a,b	06S44593P49	(Rd) 220 $\Omega$ 1/4W	R413	06S44594P42	(Rd) 1.5M $\Omega$ 1/4W
R134a,b	06S44593P57	(Rd) 470 $\Omega$ 1/4W	R414	06S44594P42	(Rd) 1.5M $\Omega$ 1/4W
R135a,b	06S44594P38	(Rd) 1M $\Omega$ 1/4W	R415	06S44593P81	(Rd) 4.7K $\Omega$ 1/4W
R136a,b	06S44594P38	(Rd) 1M $\Omega$ 1/4W	R416	06S44593P73	(Rd) 2.2K $\Omega$ 1/4W
R137a,b	06S44594P38	(Rd) 1M $\Omega$ 1/4W	R417	06S44593P89	(Rd) 10K $\Omega$ 1/4W
R138a,b	06S44594P38	(Rd) 1M $\Omega$ 1/4W	R418	06S44593P91	(Rd) 12K $\Omega$ 1/4W
R139a,b	06S44594P38	(Rd) 1M $\Omega$ 1/4W	R419	06T51015F29	(Rd) 560 $\Omega$ 1/2W

### Tone Control PCB Parts List

Symbol No.	Stock No.	Description
(Switch)		
S501	40T61658F01	SUN211A
S502	40T61660F01	SUN511
(Variable Resistor)		
VR501	18T61652F01	10KC-2
VR502	18T61652F01	10KC-2
(Capacitor)		
C501a,b	08T57851F17	(Tf) 0.22uF
C502a,b	08T57851F17	(Tf) 0.22uF
C503a,b	08T50579F25	(Tf) 1.0uF
C504a,b	08T50579F25	(Tf) 1.0uF
C505a,b	08T57851F05	(Tf) 0.022uF
C506a,b	08T57851F05	(Tf) 0.022uF
C507a,b	08T57851F14	(Tf) 0.12uF
C508a,b	08T57851F14	(Tf) 0.12uF
C509a,b	08T57851F17	(Tf) 0.22uF
(Resistor)		
R501a,b	06S44593P71	(Rd) 1.8KΩ 1/4W
R502a,b	06S44593P53	(Rd) 330Ω 1/4W
R503a,b	06S44594P38	(Rd) 1MΩ 1/4W
R504a,b	06S44594P38	(Rd) 1MΩ 1/4W
R505a,b	06S44593P41	(Rd) 100Ω 1/4W
R506a,b	06S44594P38	(Rd) 1MΩ 1/4W
R507a,b	06S44594P38	(Rd) 1MΩ 1/4W
R508a,b	06S44593P81	(Rd) 4.7KΩ 1/4W

### Balance Volume PCB Parts List

Symbol No.	Stock No.	Description
(Variable Resistor)		
VR602	18T61651F01	250K-MN [Balance]

### Monitor PCB Parts List

Symbol No.	Stock No.	Description
(Relay)		
RY601	80T61676F01	FRL-644D12/2AS
(Switch)		
S601-1,2,3	40T61659F01	SUN311A [Monitor]
S602	40T61657F01	SUN121A [Tone in]
(Diode)		
D601	48T55186F01	GP10D -AX
(Resistor)		
R601a,b	06S44594P38	(Rd) 1MΩ 1/4W

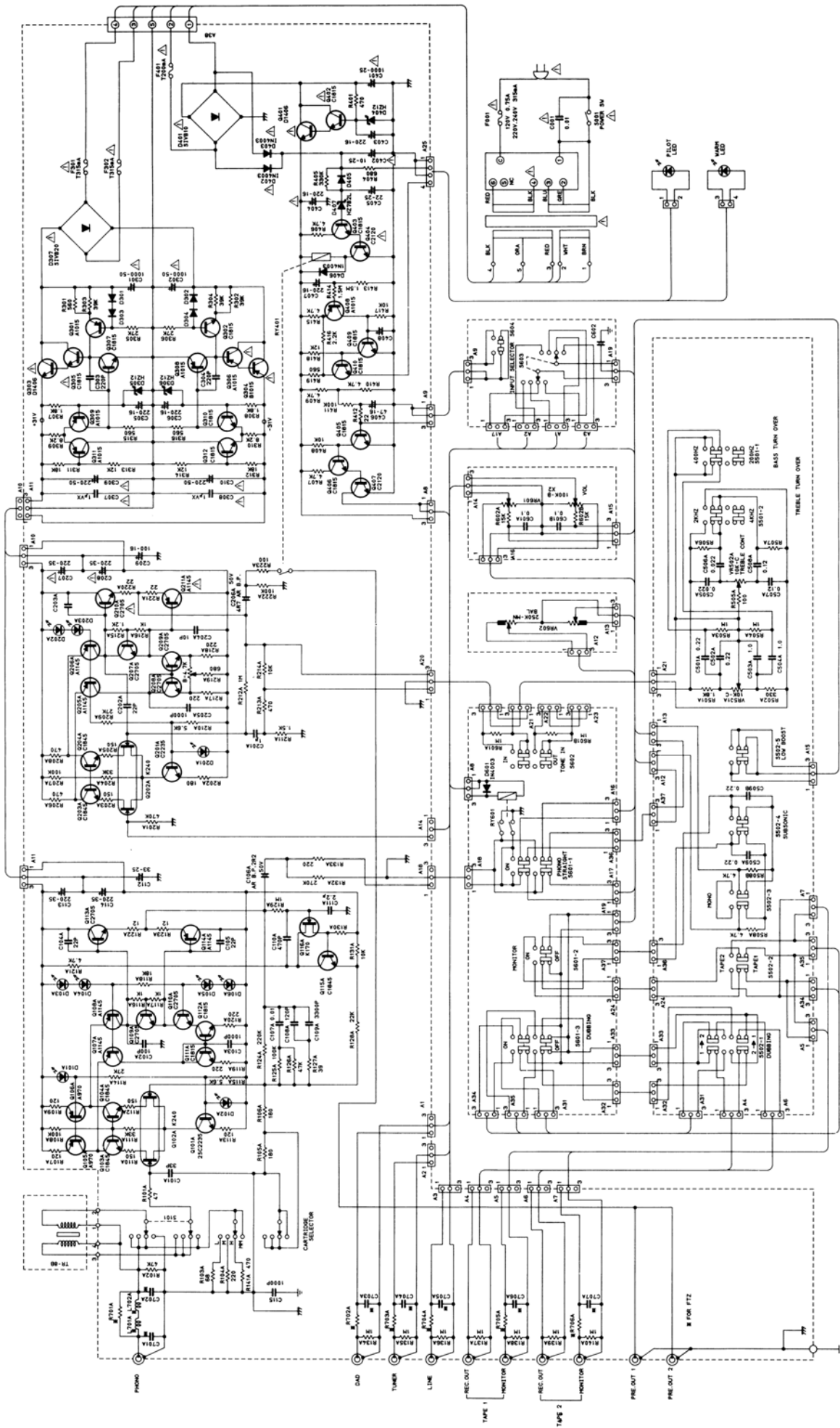
### Function PCB Parts List

Symbol No.	Stock No.	Description
(Switch)		
S603	40T61653F01	SLD.SRZW44S
S604	40T61654F01	SLD.SRZW24A

### Volume PCB Parts List

Symbol No.	Stock No.	Description
(Variable Resistor)		
VR601	18T61650F01	100KBX2 [Volume]
(Capacitor)		
C601a,b	08T57851F13	(Tf) 0.1uF
(Resistor)		
R602a,b	06S44593P93	(Rd) 15KΩ 1/4W

# Schematic Diagram



REMARKS:  
 1 UNLESS OTHERWISE SPECIFIED, ALL RESISTORS ARE IN OHM 1/4 WATT  
 2 ALL CAPACITORS IN MICRO FARAD  
 3 ALL VACUUM TUBES ARE 90% RECOMMENDED BY THE MANUFACTURER  
 4 AFTER SERVICING THIS APPLIANCE AND BEFORE RETURNING TO THE CUSTOMER, CONFIRM THE INSULATION RESISTANCE BETWEEN EACH BLADE (OR PIN) OF POWER CORD PLUG AND CHASSIS IS MORE THAN 10 MEGOHMS.  
 5 ON SPECIFICATIONS



## Specifications

Output Voltage:	Pre. Out;	typical 1V	max. 18V
	Rec. Out;	typical 130mV	
Total Harmonic Distortion:	phono;	no more than 0.005%	
	DAD, line, tuner;	no more than 0.005%	
Frequency Response:	phono;	20Hz–20,000Hz ± 0.3 dB (Rec. Out)	
	DAD, line, tuner;	10Hz–100,000Hz – 0.5 dB	
Signal-to-Noise Ratio:	phono MC;	77 dB (IHF-A weighted, input short-circuited)	
	phono MM;	90 dB (IHF-A weighted, 5 mV input)	
	DAD, line, tuner;	108 dB (IHF-A weighted input short-circuited)	
Input Sensitivity: (Pre. Out; 1V)	phono MC;	100μV	
	phono MM;	2.0mV	
	DAD, line, tuner;	130mV	
Input Impedance:	phono MC;	50, 100, 300 ohms	
	phono MM;	50K ohms	
	DAD, line, tuner;	40K ohms	
	monitor;	40K ohms	
Output Impedance:	Pre. Out;	100 ohms	
	Rec. Out;	220 ohms	
Phono Overload Voltage:	270 mV		
Tone Control:	Bass Turnover Frequencies; 200Hz, 400Hz Treble Turnover Frequencies; 2kHz, 4kHz		
Low Boost:	70Hz (3 dB)		
Subsonic Filter:	15Hz 6 dB/oct.		
Additional Features:	Dual Tape Monitoring Circuit, Tape Dubbing Circuit, Built-in Step Up Transformer and High-Gain Amp for MC cartridge, Tone Bypass Switch		
Dimensions:	metal cabinet 453(W) x 315(D) x 81(H) mm (17-3/4" x 12-3/8" x 3-3/16")		
Weight:	metal cabinet Net 5.5 kgs (12.1 lbs.)		

Specifications and appearance design subject to change without notice.