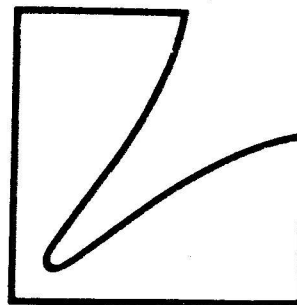
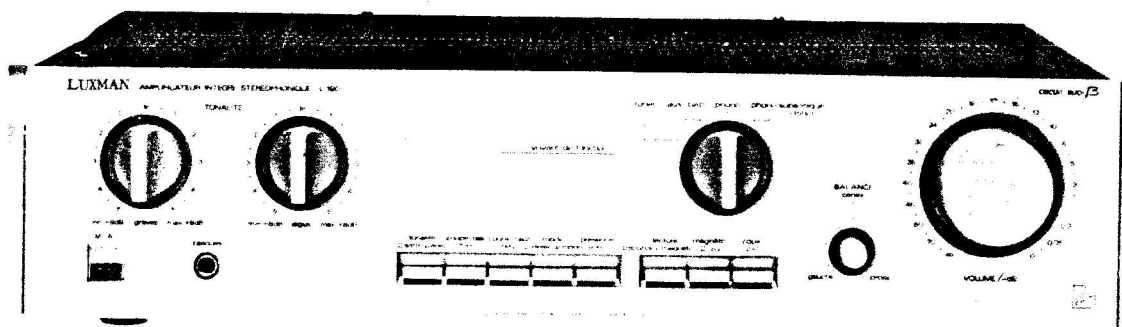


SERVICE MANUAL



DUO-BETA CIRCUIT STEREO
INTEGRATED AMPLIFIER

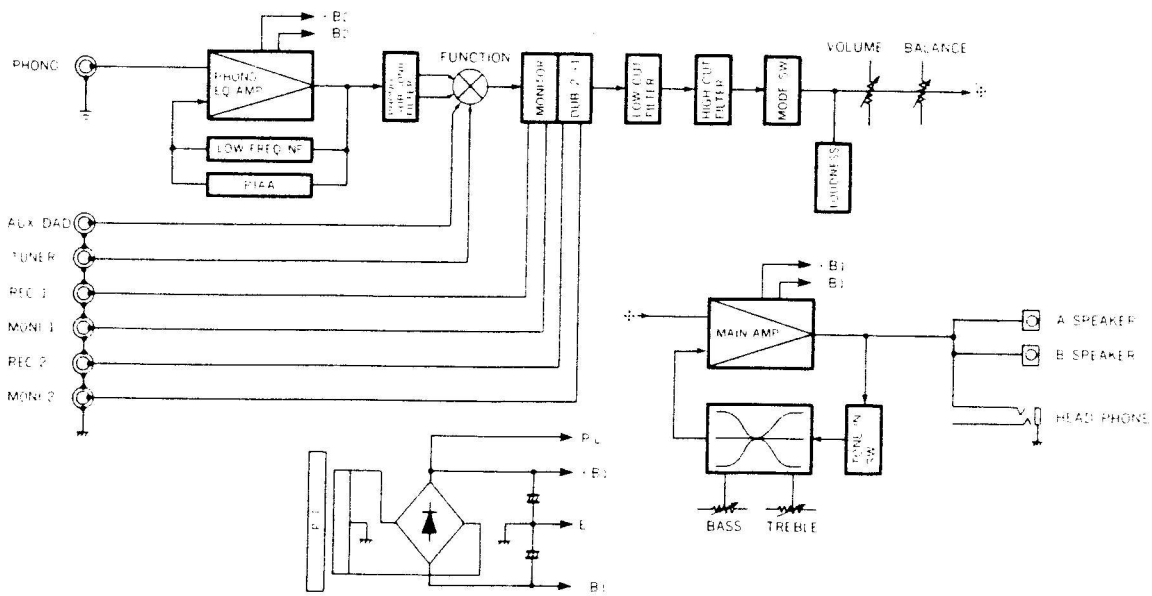
L-190A



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Block Diagram

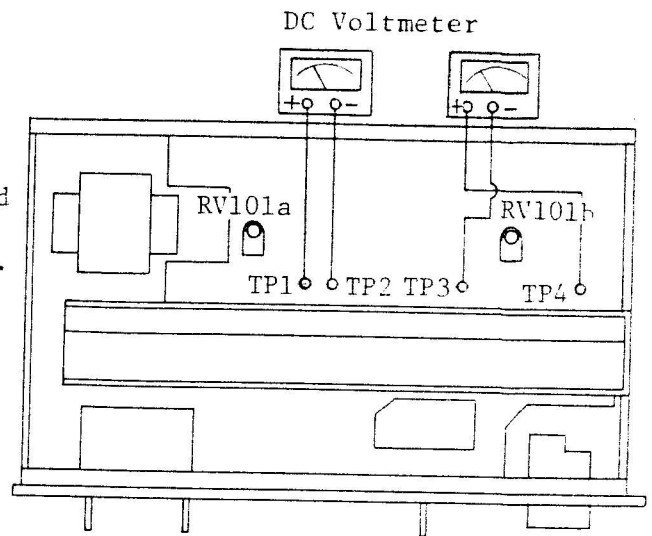


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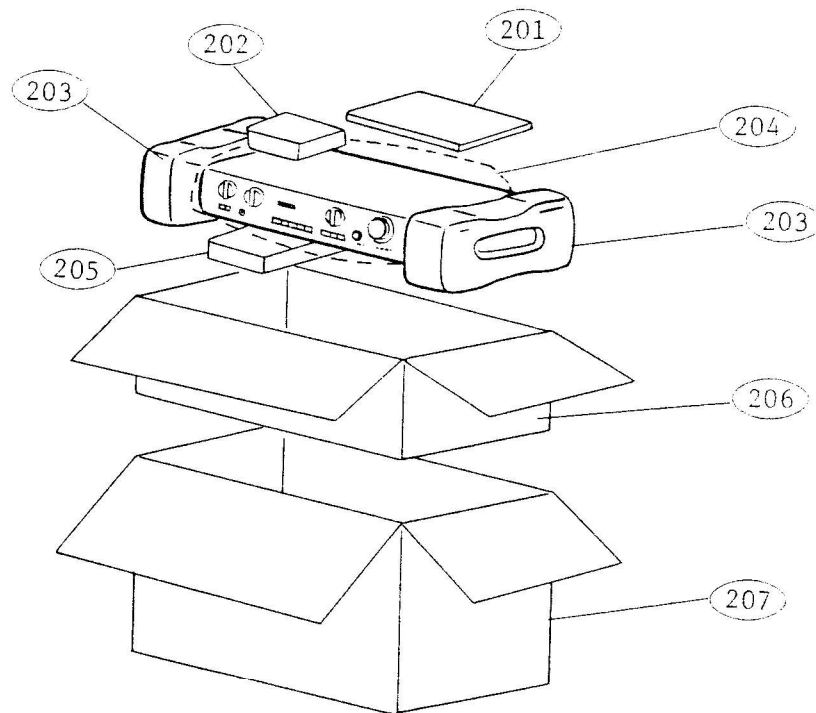
Adjustment Procedure

Bias (Idle) Current Adjustment

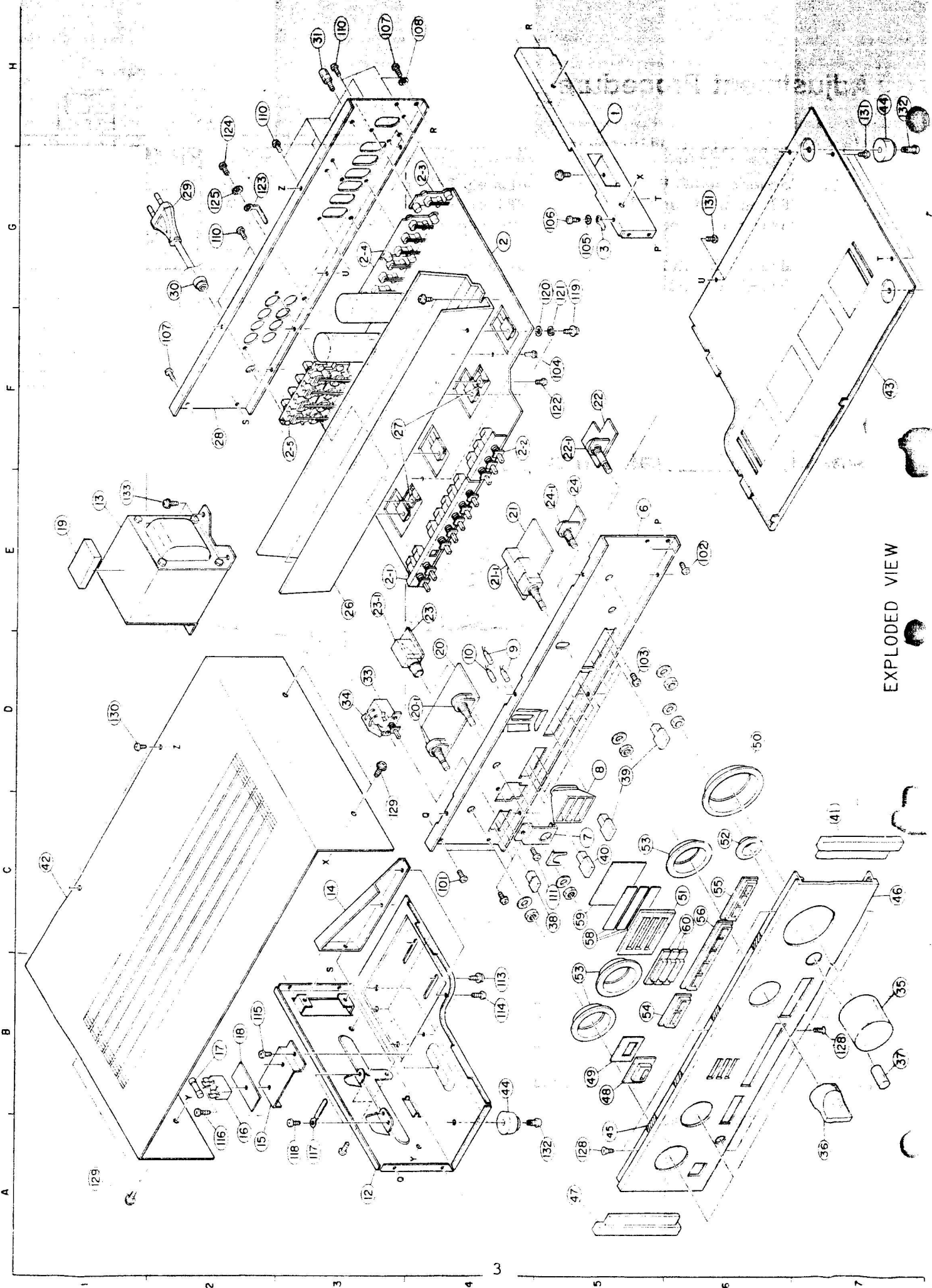
1. Connect a DC Voltmeter in between TP1 and TP2 on L-ch and or TP4 and TP3 on R-ch, Making TP1 and TP4 positive respectively.
2. Adjust the RV101a and RV101b to obtain 15mV+5mA reading on the meter.



Packing Material Parts List



Symbol No.	Stock No.	Description
201	ME0253	Owner's Manual
202	56A58581F01	Pad, Spacer
203	56C56637F01	Packing, Tray
204	56B40230G23	Sack, Poly
205	56A57423F04	Pad, Packing
206	56C53420F49	Carton, Packing
207	56C53420F26	Carton, Bulk Packing



EXPLODED VIEW

A B C D E F G H

1 2 3 4 5 6 7

Exploded Parts List

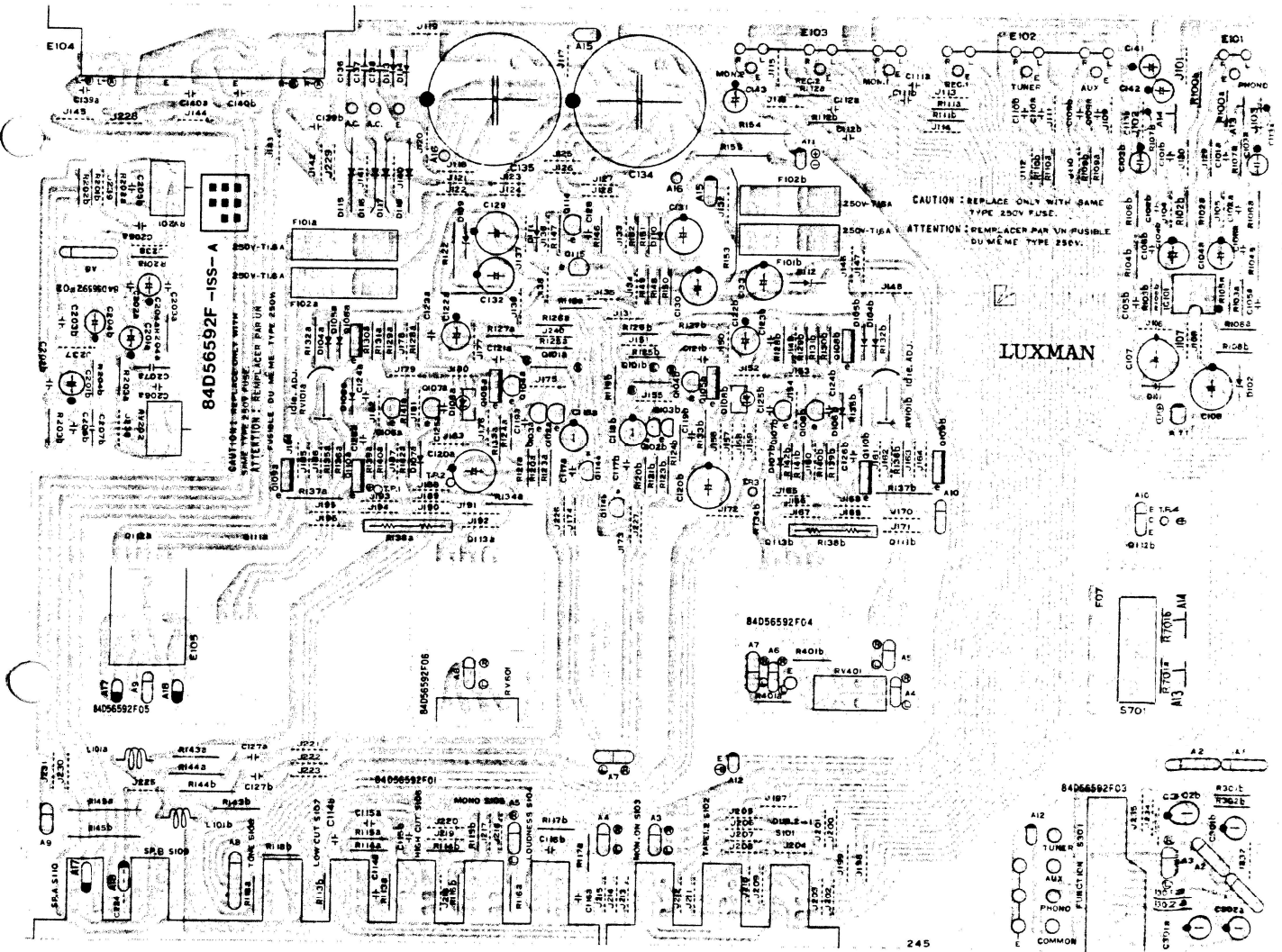
Index	Symbol No.	Stock No.	Description
H-5	1	07B56633F01	Bkt, R
G-4	2	01V59300F91	Ass'y, Pre/Main PCB
E-3	2-1	40T56652F01	SW, Push SUN53 (SW104-108)
F-3	2-2	40T56653F01	SW, Push SUN33 (SW101-103)
G-4	2-3	09T57203F01	Plate, Phone 2P (E101)
G-3	2-4	09T57203F02	Plate, Phone 6P (E102,103)
F-3	2-5	09T51101F01	Terminal, SP (E104)
G-5	3	29A41814G01	Lug
E-5	6	27C56631F01	Chassis, Front
C-5	7	07A57048F01	Bkt, Phones
D-5	8	43A56651F01	Bushing, Rubber
		91A57951F01	Filter, 1035
D-4	9	65T56669F01	Lamp, Pilot (aux,tuner)
D-4	10	Non Use	
A-3	12	07C56632F01	Bkt, Trans
E-1	13	25T60748F01	Trans, Power
C-3	14	07B57267F01	Bkt, Trans
A-2	15	07A56634F01	Bkt, Fuse
A-2	16	09T51074F01	Holder, Fuse
B-2	17	65T57086F07	Fuse, 51NM 2.0-250
B-2	18	Non Use	
E-1	19	43A51798F02	Spacer, 1154-2
D-4	20	01V58100F06	Ass'y, Tone Cont. PCB
D-4	20-1	18T56663F01	VR, Rotary 50KCx2 (RV201,202)
E-4	21	01V58100F07	Ass'y, Function SW PCB
E-4	21-1	40T56664F01	SW, Rotary SRZ (S301)
F-5	22	01V58100F08	Ass'y, VR Cont. PCB
F-5	22-1	18T56666F01	VR, Rotary 250KW (RV601)
E-4	23	01V58600F19	Ass'y, Head Phone PCB
E-3	23-1	09T55174F01	Jack, Head Phone (E105)
E-5	24	01V58100F10	Ass'y, Balance Cont. PCB
E-5	24-1	18T56665F01	VR, Rotary 100KBx2 (RV401)
E-3	26	07C60750F01	Heat Sink
F-3	27	07R51146F01	Support, Tr.
F-2	28	15C56636F10	Cover, Rear
G-2	29	28T43812P02	Plug, AC Cord
G-2	30	43B41625J02	Support, Cord
H-3	31	09T51075F01	Terminal, GND
D-3	33	40T56950F01	SW, Power SDL1P (ASF)
D-3	34	08T57437F09	Cap, MP 0.01
B-7	35	36B56627F01	Knob, Rotary VR C
A-7	36	36B56626F01	Knob, Rotary VR B
B-7	37	36A56625F01	Knob, Rotary VR A
C-5	38	36A56639F02	Knob, Push 1171
D-5	39	36A56640F01	Knob, Push 1189
C-5	40	Non Use	
C-7	41	07B56624F02	Frame, Panel-R
C-1	42	15C56629F01	Cover, Top

Index	Symbol No.	Stock No.	Description
F-7	43	15C56630F01	Cover, Bottom
B-4/F-7	44	75A52969F01	Pad, Trannleg
A-5	45	14S53018F42	Insulator, 50x5
C-7	46	64C56623F06	Panel, Front
A-5	47	07B56624F01	Frame, Panel Side-L
B-5	48	61A56641F01	Crystal, Indicator
B-5	49	43A56628F01	Spacer, Power
D-6	50	07B56643F01	Frame, Knob 1140
C-6	51	43A56644F01	Spacer, Frame Knob
C-6	52	07A56645F01	Frame, Knob 1156
B-5/C-5	53	07A56648F01	Frame, Knob
B-5	54	Non Use	
C-6	55	07B56646F01	Frame, Knob 1154
C-6	56	01V56647F01	Frame, Knob 1155
C-5	58	61A56649F01	Filter, Lamp
C-5	59	43A56650F01	Spacer, Lamp
C-6	60	61A56642F01	Crystal, Indicator
C-4	101	03S44205G01	Scr, T-Tite M3x6
E-6	102	03S44205G01	Scr, T-Tite M3x6.
D-5	103	03C40014G04	Scr, Mch M3x6
F-5	104	03S40036U02	Scr, T-Tite M3x8
G-5	105	04S40072G16	Wsr, T.L. M3
G-5	106	03C42723U01	Scr, Cup M3x6
F-2/H-3	107	03S44205G02	Scr, T-Tite M3x6
H-4	108	04S40072G16	Wsr, T.L. M3
G-2/H-3	110	03S40012G41	Scr, Tpg. M3x8
C-5	111	03S44205G01	Scr, T-Tite M3x6
E-5	112	03C40014G04	Scr, Mch. M3x6
B-4	113	03S40036U01	Scr, T-Tite M4x8
B-4	114	03S44205G01	Scr, T-Tite M3x6
B-2	115	03S44205G01	Scr, T-Tite M3x6
A-2	116	03S44205G03	Scr, T-Tite M3x8
A-3	117	29C41045P03	Lug, W. Around
A-3	118	03S44205G01	Scr, T-Tite M3x6
G-5	119	03S40011G32	Scr, Mch M3x12
G-5	120	04S40070G05	Wsr, 3.3x8x0.5
G-5	121	04S40071G05	Wsr, 3.1x5.9x0.7
F-5	122	03S40012G28	Scr, Tpg. M3x8
G-2	123	29A737272-A	Lug, W. Around
H-2	124	03S44205G02	Scr, T-Tite M3x6
G-2	125	04S40072G16	Wsr, T.L. M3
A-5/B-7	128	03S44205G16	Scr, T-Tite M3x6
A-1/C-3	129	03S40036U01	Scr, T-Tite M4x8
D-1	130	03S44205G38	Scr, T-Tite M3x6
G-6/H-7	131	03S44205G02	Scr, T-Tite M3x6
A-5/H-7	132	03S44205G25	Scr, T-Tite M4x10
E-1	133	03S40036U01	Scr, T-Tite M4x8

Remarks

Capacitor: El...Electrolytic, Ce...Ceramic, Pe...Polyethylene
My...Mylar
Resistor : Rd...Carbon, Rm...Metal Film, Rc...Cement

Pre Main AMP PCB Parts List



Pre Main AMP PCB Parts List

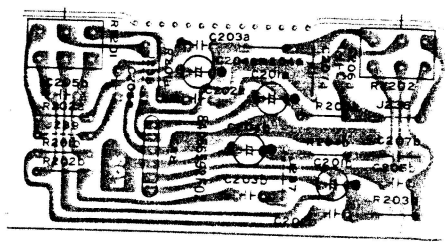
Symbol No.	Stock No.	Description	Symbol No.	Stock No.	Description
(Switch, Push)			(Capacitor)		
SW101-103	40T56653F01	SUN33	C101a,b	08T42081U01	100pF Pe
SW104-108	40T56652F01	SUN53	C103a,b	23T51235F24	22uF 16V E1
(Terminal)			C104a,b	23T44501P08	3.3uF 25V E1
E101	09T57203F01	Plate, Phono 2P	C105a,b	08S40656F22	0.056uF My
E102	09T57203F02	Plate, Phono 6P	C106a,b	08S40656F15	0.015uF My
E103	09T57203F02	Plate, Phono 6P	C107	23T51234F54	220uF 25V E1
E104	09T51101F01	Terminal, SP	C108	23T51234F54	220uF 25V E1
(Fuse)			C114a,b	08S40656F22	0.056uF My
F101a,b	65T57086F09	3A 250V	C115a,b	08S40656F10	0.0056uF My
F102a,b	65T57086F09	3A 250V	C116a,b	08S40656F21	0.047uF My
(Holder, Fuse)			C117a,b	08T42081U01	100pF Pe
F101a,b	09T51410F01	Holder, Fuse	C118a,b	23T44501P08	3.3uF 25V E1
F102a,b	09T51410F01	Holder, Fuse	C119a,b	08S40656F06	0.0027uF My
(Coil)			C120a,b	23T51234F48	100uF 50V E1
L101a,b	24T51105F02	Coil, Choke	C121a,b	08C42195G15	33pF 125V Pe
(Resistor, Variable)			C122a,b	23T51235F43	100uF 10V E1
RV101a,b	18C42061J28	470-B	C123a,b	21S40655F06	5pF Ce
(Transistor, FET)			C124a,b	08S40656F05	0.0022uF My
Q101a,b	48T53430F01	2SA979 G	C125a,b	08S40656F05	0.0022uF My
Q102a,b	48S43525F02	2SC1815 Y	C126a,b	08S40656F01	0.001uF My
Q103a,b	48S43525F02	2SC1815 Y	C127a,b	08S40656F21	0.047uF My
Q104a,b	48S43525F02	2SC1815 Y	C128	08S40656F01	0.001uF My
Q105a,b	48T60752F01	2SC2705 O,Y	C129	23T51234F48	100uF 50V E1
Q106a,b	48S43525F02	2SC1815 Y	C130	23T51235F40	47uF 35V E1
Q107a,b	48T51118F01	2SA1015 Y	C131	23T51235F26	22uF 35V E1
Q108a,b	48T60751F01	2SA1145	C132	23T51235F39	47uF 25V E1
Q109a,b	48T51120F01	2SC2235	C133	23T51235F40	47uF 35V E1
Q110a,b	48T51119F01	2SA965	C134	23T60741F01	4700uF 35V E1
Q111a,b	48T47682F02	2SC1845 F,A	C135	23T60741F01	4700uF 35V E1
Q112a,b	48T57130F03	2SC3180 O,R	C141	23T51235F16	10uF 16V E1
Q113a,b	48T57129F03	2SA1263 O,R	C142	23T51235F16	10uF 16V E1
Q114a,b	48T51539F01	FET, 2SK117 Y	C143	23T51235F16	10uF 16V E1
Q114	48T57682F02	2SC1845 F,A	(Resistor)		
Q115	48S43525F02	2SC1815 Y	R102a,b	06S44594P08	56K 1/4W Rd
(Diode)			R103a,b	06S44594P08	56K 1/4W Rd
D101	48T52741F54	HZ18-3L Zener	R104a,b	06S44593P81	4.7K 1/4W Rd
D102	48T52741F54	HZ18-3L Zener	R105a,b	06S44594P38	1M 1/4W Rd
D104a,b	48T51117F01	1S1553	R106a,b	06S44593P29	33 1/4W Rd
D105a,b	48T51117F01	1S1553	R107a,b	06S44593P37	68 1/4W Rd
D106a,b	48T51117F01	1S1553	R108a,b	06S44593P57	470 1/4W Rd
D107a,b	48T51117F01	1S1553	R109a,b	06S44593P38	1M 1/4W Rd
D108a,b	48T40955T01	TLR124 red LED	R110a,b	06S44594P38	1M 1/4W Rd
D109	48T52741F62	HZ24-2L Zener	R111a,b	06S44594P38	1M 1/4W Rd
D110	48T51117F01	1S1553	R112a,b	06S44594P38	1M 1/4W Rd
D111	48T44992F01	DS135D	R113a,b	06S44594P38	1M 1/4W Rd
D112	48T52741F59	HZ22-2L Zener	R114a,b	06S44594P38	1M 1/4W Rd
D113	48T44992F01	DS135D	R115a,b	06S44593P75	2.7K 1/4W Rd
D114	48T44992F01	DS135D	R116a,b	06S44593P75	2.7K 1/4W Rd
D115	48T51115F02	S3V20	R117a,b	06S44593P89	10K 1/4W Rd
D116	48T51115F02	S3V20	R118a	06S40151T36	820K 1/4W Rd
D117	48T51115F02	S3V20	R118b	06S44594P36	820K 1/4W Rd
D118	48T51115F02	S3V20	R119a,b	06S44594P36	820K 1/4W Rd
(IC)			R120a,b	06S44593P49	220 1/4W Rd
IC101	51T52153F01	NJM2043D-D	R121a,b	06S44593P49	220 1/4W Rd

Symbol No.	Stock No.	Description
R122	06T55175F67	1.2K 1/2W Rm
R123a,b	06S44594P18	150K 1/4W Rd
R124a,b	06S44593P53	330 1/4W Rd
R125a,b	06S44594P08	56K 1/4W Rd
R126a,b	06S44593P87	8.2K 1/4W Rd
R127a,b	06S44593P59	560 1/4W Rd
R128a,b	06S44593P87	8.2K 1/4W Rd
R129a,b	06S44594P06	47K 1/4W Rd
R130a,b	06S44593P95	18K 1/4W Rd
R131a,b	06S44593P95	18K 1/4W Rd
R132a,b	06T55175F47	180 1/2W Rm
R133a,b	06T55175F17	10 1/2W Rm
R134a,b	06T55175F27	27 1/2W Rd
R135a,b	06S44593P73	2.2K 1/4W Rd
R136a,b	06S44593P61	680 1/4W Rd
R137a,b	06T55175F55	390 1 W Rm
R138a,b	06T51107F01	0.22 5Wx2 Rc

Symbol No.	Stock No.	Description
R139a,b	06S44593P65	1K 1/4W Rd
R140a,b	06S44593P73	2.2K 1/4W Rd
R141a,b	06S44593P73	2.2K 1/4W Rd
R142a,b	06S44593P65	1K 1/4W Rd
R143a,b	06T55175F17	10 1/2W Rm
R144a,b	06T55177F17	10 1 W Rm
R145a,b	06T55179F55	390 2 W Rm
R146	06S44593P85	6.8K 1/4W Rd
R147	06S44593P33	47 1/4W Rd
R148	06S44593P93	15K 1/4W Rd
R149	06S44594P18	150K 1/4W Rd
R150	06S44594P08	56K 1/4W Rd
R151	06S44594P08	56K 1/4W Rd
R153	06T55179F43	120 2 W Rm
R154	06T55177F69	1.5K 1 W Rm
R155	06T55177F69	1.5K 1 W Rm

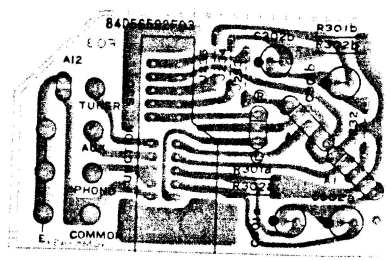
Tone Control PCB Parts List

Symbol No.	Stock No.	Description
(Variable Resistor)		
RV201	18T56663F01	Rotary, 50Kx2
RV202	18T56663F01	Rotary, 50Kx2
(Capacitor)		
C201a,b	23T51235F11	4.7uF 25V E1
C202a,b	08S40656F11	0.0068uF My
C203a,b	08S40656F20	0.039uF My
C204a,b	23T51235F24	22uF 16V E1
C205a,b	21S40655F31	560pF Ce
C206a,b	08S40656F22	0.056uF My
C207a,b	08S44503P30	0.27uF 50V My
(Resistor)		
R201a,b	06S44593P71	1.8K 1/4W Rd
R202a,b	06S44593P53	330 1/4W Rd
R203a,b	06S44593P87	8.2K 1/4W Rd
R204a,b	06S44593P69	1.5K 1/4W Rd



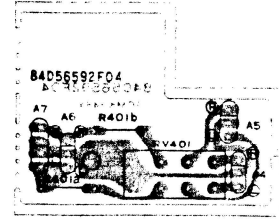
Function SW PCB Parts List

Symbol No.	Stock No.	Description
(Switch)		
S301	40T56664F01	Rotary, SRZ
(Capacitor)		
C301a,b	23T44501P06	2.2uF 35V E1
C302a,b	23T44501P03	0.33uF 50V E1
(Resistor)		
R301a,b	06S44594P30	470K 1/4W Rd
R302a,b	06S44594P30	470K 1/4W Rd



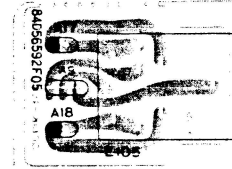
VR Control PCB Parts List

Symbol No.	Stock No.	Description
(Variable Resistor)		
RV401	18T56665F01	Rotary, 100KBx2
(Resistor)		
R401a,b	06S44593P57	470 1/4W Rd



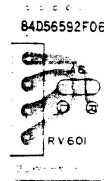
HD Phone PCB Parts List

Symbol No.	Stock No.	Description
(Jack)		
E105	09T55174F01	Head Phone

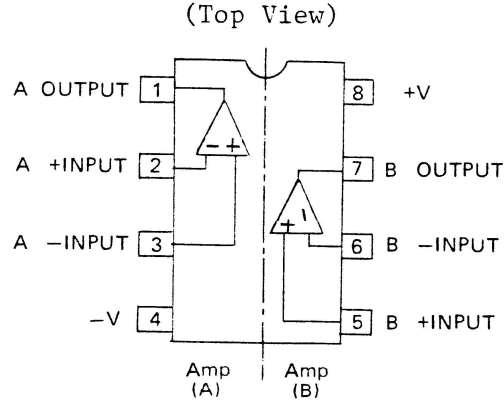


Balance Control PCB Parts List

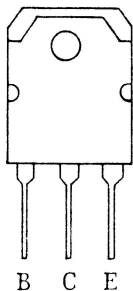
Symbol No.	Stock No.	Description
(Variable Resistor)		
RV601	18T56666F01	Rotary, 250KW



IC Handling Guide (NJM2043D-D)



Power Transistor
 2SA1263 & 2SC3180 (Complementary Pair)



Type	MAX. RATING			CHARACTERISTICS			
	Pc	Vceo	Ic	hFE		Ic	Vce
2SA1263	60W	-80V	-6A	min	max	-1A	-5V
2SC3180	60W	80V	6A	55	110	1A	5V

(Tc=25°C)

Specifications

Power Output:	8 ohms, 1KHz	30Wx2
Distortion:		0.02%
Input Sensitivity:		
Phono (MM)		1.8mV
Tuner		160mV
Aux/DAD		160mV
Monitor		160mV
Input Impedance:		
Phono (MM)		50K ohms
Tuner		40K ohms
Aux/DAD		40K ohms
Monitor		40K ohms
S/N Ratio:		
Phono (MM)		90dB
(IHF-A weighted, 5mV)		
Tuner		107dB
(IHF-A weighted)		
Aux/DAD		107dB
(IHF-A weighted)		
Residual Noise:		
(IHF-A weighted)		0.5mV
Filter:		
High cut		7KHz (-6dB/oct.)
Low cut		70Hz (-6dB/oct.)
Phono-Subsonic		15Hz (-6dB/oct.)
Phono (MM) Overload:		130mV
Frequency Response:		
Phono (MM)		20Hz-20KHz (within +0.5dB)
Tuner		10Hz-100KHz (within +0, -1.5dB)
Aux/DAD		10Hz-100KHz (within +0, -1.5dB)
Monitor		10Hz-100KHz (within +0, -1.5dB)
Tone Control:		
Treble		+8dB at 10KHz
Bass		-8dB at 100Hz
Loudness:		+8dB at 100Hz
Volume-30dB		
Dimensions:		
Weight:		453(W) x 317(D) x 111(H) mm
Net		(17.8" x 12.5" x 4.4")
Gross		6.7kgs
Power Consumption:		8.0kGS
		120V 2A
		(CSA rated)

Specifications and appearance design subject to change without notice.