

P102

COMPUTER DIRECT-LINE™ PREAMPLIFIER

SAE

SERVICE
MANUAL

SCIENTIFIC AUDIO ELECTRONICS INC

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Specifications

Audio Section

Sensitivity

Input: 1000Hz
Output: 1V
PHONO(MC)..... 0.2mV/0.2mV ± 2dB
 (MM)..... 2.5mV/2.5mV ± 2dB
AUX/VIDEO/CD. TUNER. 150mV/150mV ± 2dB
TAPE MONITOR..... 150mV/150mV ± 2dB

Sensitivity Channel Difference

Volume Maximumless than 1dB

Output Capability

Input: AUX/CD, 20Hz–20KHz
Output: 0.1% T. H. D. 7.2V

Headphone Output

Input: AUX/VIDEO/
CD, 1000Hz
Output: LINE Output 1V
Headphone 500mV/500mV ± 2dB

Recording Output

Input: 1000Hz, Phono 2.5mV,
AUX/VIDEO/CD 150mV ± 2dB

I. M. Distortion Factor

Input: VIDEO/AUX/CD 60Hz
7000Hz/4: 1 less than 0.03%
Output: 1V

Frequency Response

Input: VIDEO/AUX/CD,
Tape Monitor 20Hz–20KHz
Output: 1000Hz, 1V ± 1.0dB

Phono, Equalization Response

Input: Phono
Output: Tape Output, RIAA ± 0.5dB
RIAA ± 0.5dB 20Hz–20KHz

Tone Control Action

Input: VIDEO/AUX/CD
Output: 1000Hz, 1V
Boost 100Hz + 8dB ± 2dB
Cut 100Hz/10KHz - 8dB ± 2dB

Maximum Input Signal

Input: 1000Hz
Output: Record Output
Phono(MM) more than 65mV

Signal-to-Noise Ratio(Volume Max.)(IHF-A)

PHONO 1(MC) more than 72dB
PHONO 2(MM) more than 82dB
AUX/CD(input shorted) more than 90dB

LOW Filter

Input: VIDEO/AUX/CD
Output: 30Hz(-6dB/oct) - 3dB ± 1dB

Input/Output Impedance at 1000Hz

PHONO(MM) 47K/142 ohms
AUX/CD 47K/142 ohms
TAPE 47K/142 ohms

Volume Control Tracking Error

Input: VIDEO/AUX/CD
Output: - 1dB ~ - 60dB less than 1dB

Crosstalk

Input: VIDEO/AUX/CD 150mV
PHONO(MC) 0.2mV(input shorted)
 (MM) 2.5mV(input shorted)
a. Between the channels of stereo equipment
Output: 1000Hz more than 60dB
b. Tape Monitor Crosstalk
Output: 1000Hz more than 60dB

Output Level Difference

Input: VIDEO/AUX/CD: 150mV at 1000Hz
Input: PHONO(MC) 0.2mV at 1000Hz
 (MM) 2.5mV at 1000Hz

Output: 40dB Position of Volume
Control less than 3dB

Input Capacitance at 1000Hz,

Phono 200pF

Electrical Adjustment Procedure

● To make the adjustments the following instruments are necessary;

- * Audio Signal Generator.
- * Frequency counter

1. FREQUENCY COUNTER (Fig1)

- a. Set the STAND BY switch touch on.
- b. Connect Frequency Counter to P8, P9 of Main B'D assembly.
- c. Adjust potentiometer VR801 until the frequency indicates 2MHz

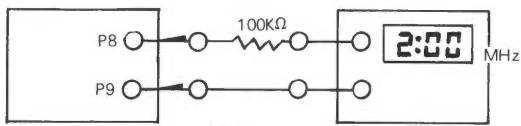


Fig. 1

2. LED OUTPUT VOLTAGE METER ALIGNMENT

- a. Set the Volume Control at maximum and adjust the output level Control of AUDIO SIGNAL GENERATOR so that the output Voltage is 1V.
- b. Adjust VR401L/R until 9 dot(0dB) LED'S are ON.

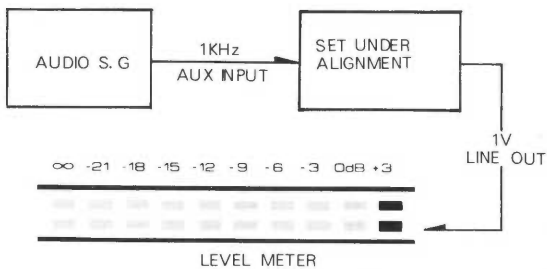
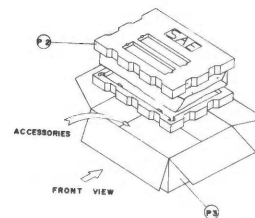
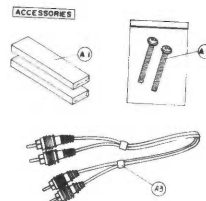
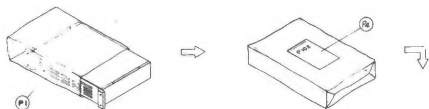


Fig. 2

Packing

NO.	PARTS NO.	DESCRIPTION	Q'ty
P1	9705000610	BAG POLY	1
P2	9721000110	CUSHION POLY	2
P3	049605047906	BOX CARTON	1
P4	9007010620	MANUAL INSTRUCTION	1
A1	9097000801	SAFETY INSTRUCTION	1
A2	9705001310	BAG POLY	1
	8683000510	WOODEN CAP	2
	8159535203	SCREW # 3 WPT 3.5 · 20B	2



Parts List Top View of P.C Boards

MAIN BOARD 4002114401

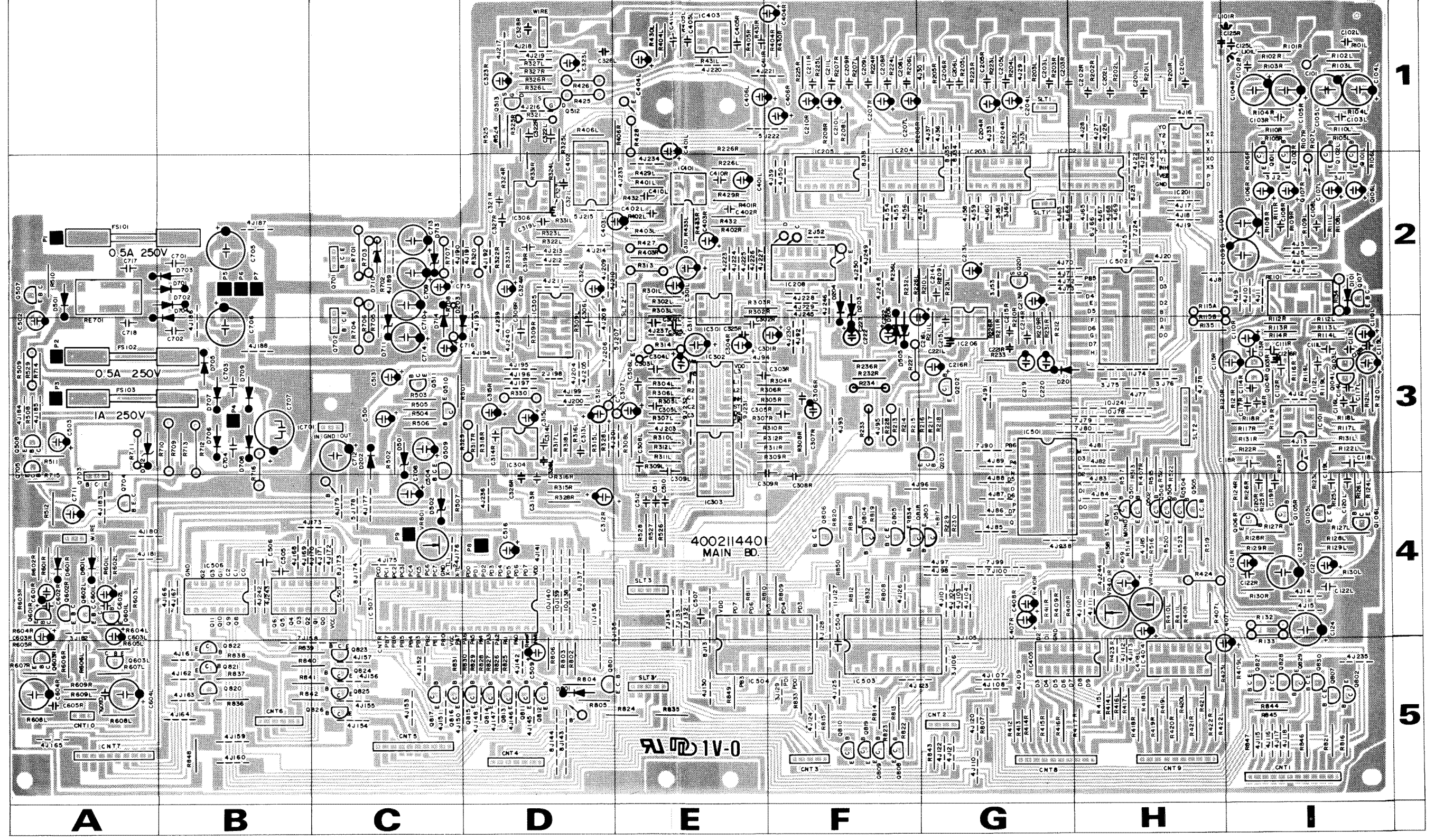
Ref No.	Parts No.	Description	Position
●IC			
IC101	2168220104	IC NJM45580D	3I
IC201	2138011108	IC HD14052B	2H
IC202	"	"	2H
IC203	"	"	2G
IC204	"	"	2F
IC205	"	"	2F
IC402	"	"	2D
IC305	"	"	3D
IC208	2138007112	IC TC9154P	2F
IC302	2138007113	IC TC9156P	3E
IC303	"	"	3E
IC301	2168220103	IC NJM4560	2E
IC304	"	"	3D
IC306	"	"	2D
IC401	"	"	2E
IC403	"	"	1E
IC206	"	"	3G
IC501	2138011107	IC HD145081B	4G
IC502	"	"	2H
IC504	"	"	5E
IC503	"	"	5F
IC505	2108011107	IC SN74LS138	4B
IC506	"	"	4B
IC507	"	IC CPU R6500	4C
IC701	"	IC MA 17805	3C
●TRANSISTOR			
Q101L/R	2008606108	TR 2SC 2240BL	2I
Q105L/R	"	"	4I
Q102L/R	2008206104	TR 2SA 970BL	2I
Q106L/R	"	"	4I
Q103L/R	2008609107	TR MPS 9633C	3I
Q104L/R	"	"	3I
Q601L/R	"	"	4A
Q107	2008609101	TR MPS A05	2I
Q507	"	"	2A
Q508	"	"	3A
Q603L/R	"	"	5A
Q704	"	"	4A
Q602L/R	2008209101	TR MPS A55	4A
Q501	2008606104	TR KTC 1815	4H
Q502, 503	"	"	4H
Q504, 505	"	"	4H
Q506	"	"	"
Q812	"	"	5D
Q815	"	"	"
Q816, 817	"	"	5C
Q808	"	"	5F
Q810	"	"	"
Q511	"	"	3C
Q801	"	"	5D
Q705	"	"	3A
Q802, 807	"	"	5I
Q803, 804	"	"	4F
Q805, 806	"	"	"
Q818	"	"	"
Q509	208206105	TR KTA 1015	3C
Q510	"	"	3C
Q203	"	"	3G
Q820	"	"	4B
Q822	"	"	"
Q823	"	"	4C
Q826	"	"	"
Q827	"	"	4I
Q830	"	"	"
Q201	2018207106	FET 2SK 117	2G
Q512	"	"	1D
Q513	"	"	1D
●DIODE			
D101	2058106100	Diode 1N 4002	2I
D501	"	"	2A
D701	"	"	2B
D704	"	"	"
D705	"	"	3B
D709	"	"	3B
D201	"	"	3G
D202	2058306101	Diode 1N4148	3F

Ref. No.	Parts No.	Description	Position
D206	"	"	3F
D601L/R	"	"	4A
D203, D204	"	"	2F
D801	"	"	5D
D501	2058513120	Diode Zener RD1,8EB1	3C
D710	"	Diode Zener RD1,8EB1	2C
D711	"	Diode Zener RD1,8EB1	2C
D712	2058513105	Diode Zener RD6, EB1	3A
D502	2058513100	Diode Zener RD3, 3EB1	4C
D713	2058513121	Diode Zener RD6, 8EB2	2C
D714	"	"	2C
D203	2058513107	Diode Zener RD9, 1EB3	2F
D205	"	"	3F
●RESISTOR			
R701	3039100372	Resistor M.O 10ohm(1/2 W)	
R704	"	"	
R709, R712	3039339372	Resistor M.O 3.3ohm(1/2 W)	
VR401L/R	3248310320	Semi Fixed Resistor 10KB	4H
VR801	3248347220	Semi Fixed Resistor 4.7KB	4C
R110L/R	3069470270	Resistor C.F 4.7ohm(1/4 W)	
R101L/R	3069100270	Resistor C.F 100ohm(1/4 WJ)	
R608L/R	"	"	
R803	"	"	
R103L/R	3069270270	Resistor C.F 22ohm(1/4 WJ)	
R847	"	"	
R848	"	"	
R529	3069330270	Resistor C.F 33ohm(1/4 WJ)	
R606L/R	"	"	
R607L/R	"	"	
R505	3069470270	Resistor C.F 47ohm(1/4 WJ)	
R111L/R	"	"	
R127L/R	3069680270	Resistor C.F 68ohm(1/4 WJ)	
R128L/R	"	"	
R134	3069820270	Resistor C.F 82ohm(1/4 WJ)	
R113L/R	3069101270	Resistor C.F100ohm(1/4 WJ)	
R219L/R	"	"	
R227	"	"	
R228	"	"	
R313	"	"	
R314	"	"	
R315L/R	"	"	
R320	"	"	
R321	"	"	
R322L/R	"	"	
R329, 330	"	"	
R424	"	Resistor C.F 220ohm(1/4 WJ)	
R426, 427	"	"	
R425, 428	"	"	
R509	"	"	
R609L/R	"	"	
R325L/R	"	"	
R132	3069221270	Resistor C.F220ohm(1/4 WJ)	
R133	"	"	
R412L/R	"	"	
R413L/R	"	"	
R414L/R	"	"	
R415L/R	"	"	
R416L/R	"	"	
R417L/R	"	"	
R418L/R	"	"	
R419L/R	"	"	
R420L/R	"	"	
R707	3069240270	Resistor C.F 240ohm(1/4 WJ)	
R708	"	"	
R201L/R	3069330270	Resistor C.F330ohm(1/4 WJ)	
R202L/R	"	"	
R203L/R	"	"	
R207L/R	"	"	
R523	"	"	
R834	"	"	
R835	"	"	
R205L/R	"	"	
R223L/R	"	"	
R224L/R	"	"	
R225L/R	"	"	
R502	"	"	
R129L/R	3069391270	Resistor C.F 390ohm(1/4 WJ)	
R716	"	"	
R421L/R	3069561270	Resistor D.F 560ohm(1/4 WJ)	
R422L/R	"	"	

Ref. No.	Parts No.	Description	Position
R703	3069681270	Resistor C.F.680ohm(±WJ)	
R706	"	"	
R711	"	"	
R104L/R	3069910270	Resistor C.F.910ohm(±WJ)	
R211L/R	3069102270	Resistor C.F.1Kohm(±WJ)	
R302L/R	"	"	
R317L/R	"	"	
R405L/R	"	"	
R429L/R	"	"	
R514	"	"	
R516	"	"	
R518	"	"	
R520	"	"	
R604L/R	"	"	
R702	"	"	
R705	"	"	
R710	"	"	
R802	"	"	
R816	"	"	
R824	"	"	
R836	"	"	
R846	"	"	
R402L/R	3069122270	Resistor C.F.1.2K ohm(±WJ)	
R102L/R	"	"	
R302L/R	"	"	
R305L/R	3069152270	Resistor C.F.1.5K ohm(±WJ)	
R806	"	"	
R115L/R	"	"	
R116L/R	"	"	
R433L/R	"	"	
R204L/R	3069222270	Resistor C.F.2.2K ohm(±WJ)	
R206L/R	"	"	
R208L/R	"	"	
R409L/R	3069272270	Resistor C.F.2.7K ohm(±WJ)	
R125L/R	3069392270	Resistor C.F.3.9K ohm(±WJ)	
R126L/R	"	"	
R312L/R	"	"	
R121L/R	3069472270	Resistor C.F.4.7K ohm(±WJ)	
R511	"	"	
R108L/R	3069562270	Resistor C.F.5.6K ohm(±WJ)	
R109L/R	"	"	
R307L/R	"	"	
R105L/R	3069103270	Resistor C.F.10Kohm(±WJ)	
R217	"	"	
R218	"	"	
R526	"	"	
R528	"	"	
R430L/R	"	"	
R326L/R	"	"	
R512	"	"	
R804	"	"	
R807	"	"	
R815	"	"	
R825	"	"	
R831	"	"	
R832,833	"	"	
R131L/R	"	"	
R135	"	"	
R407L/R	3409247971	Cap Elect 4.7µF/50WV	
R715	"	"	
R410L/R	3069223270	Resistor C.F.22K ohm(±WJ)	
R423L/R	"	"	
R517	"	"	
R519	"	"	
R521,522	"	"	
R213	"	"	
R308L/R	3069273270	Resistor C.F.27K ohm(±WJ)	
R311L/R	3069393270	Resistor C.F.39K ohm(±WJ)	
R106L/R	3069473270	Resistor C.F.47K ohm(±WJ)	
R107L/R	"	"	
R117L/R	"	"	
R118L/R	"	"	
R210L/R	"	"	
R122L/R	3069563270	Resistor C.F.56K ohm(±WJ)	
R119L/R	3069753270	Resistor C.F.75K ohm(±WJ)	
R411L/R	"	"	
R310L/R	3069823270	Resistor C.F.82K ohm(±WJ)	
R503	"	"	
R506	"	"	
R214	"	"	
R215	"	"	

Ref. No.	Parts No.	Description	Position
R216	"	"	
R112L/R	3069104270	Resistor C.F.100K ohm(±WJ)	
R114L/R	"	"	
R123L/R	"	"	
R124L/R	"	"	
R130L/R	"	"	
R226L/R	"	"	
R301L/R	"	"	
R303L/R	"	"	
R316L/R	"	"	
R318L/R	"	"	
R323L/R	"	"	
R327L/R	"	"	
R231L/R	"	"	
R401L/R	"	"	
R403L/R	"	"	
R406L/R	"	"	
R408L/R	"	"	
R431L/R	"	"	
R510	"	"	
R713	"	"	
R714	"	"	
R801	"	"	
R805	"	"	
R828	"	"	
R233	3069224270	Resistor C.F.22K ohm(±WJ)	
R501	"	"	
R601L/R	"	"	
R603L/R	"	"	
R508	"	"	
R304L/R	3069474270	Resistor C.F.47K ohm(±WJ)	
R309L/R	3069564270	Resistor C.F.56K ohm(±WJ)	
R305L/R	3069824270	Resistor C.F.82K ohm(±WJ)	
R229	3069105270	Resistor C.F.1M ohm(±WJ)	
R230	"	"	
R849	"	"	
R850	"	"	
R620L/R	"	"	
R524	3069335270	Resistor C.F.3.3M ohm(±WJ)	
R525	"	"	
R212	3069106270	Resistor C.F.10M ohm(±WJ)	
R504	3069123270	Resistor C.F.12K ohm(±WJ)	
R311L/R	3009911275	Resistor C.F.910 ohm(±WJ)	
R324L/R	3009122275	Resistor C.F.1.2K ohm(±WJ)	
R234	3069821270	Resistor C.F.820 ohm(±WJ)	
R235	"	"	
R232L/R	3069123270	Resistor C.F.12K ohm(±WJ)	
R233L/R	3069153270	Resistor C.F.15K ohm(±WJ)	

Ref. No.	Parts No.	Description	Position
C513	"	"	
C516	"	"	
C711	"	"	
C715	"	"	
C716	"	"	
C310	3409250131	Cap Elect 100µF/16WV	
C311	"	"	
C409	"	"	
C502	"	"	
C511L/R	3409222121	Cap Elect 220µF/100WV	
C712	"	"	
C123	3409222131	Cap Elect 220µF/16WV	
C124	"	"	
C709	"	"	
C710	"	"	
C713	"	"	
C714	"	"	
C104L/R	"	"	
C105L/R	"	"	
C109A/B	3409233131	Cap Elect 330µF/16WV	
C804L/R	3409247121	Cap Elect 470µF/16WV	
C705	340927121	Cap Elect 470µF/25WV	
C706	"	"	
C707	3409210231	Cap Elect 1000µF/16WV	
C708	3409210141	Cap Elect 100µF/25WV	
C514	"	"	
C602L/R	3509450130	Cap Ceramic 47pF/50WV	
C113L/R	3509101130	Cap Ceramic 100pF/50WV	
C114L/R	"	"	
C201L/R	"	"	
C202L/R	"	"	
C206L/R	"	"	
C208L/R	"	"	
C209L/R	"	"	
C211L/R	"	"	
C218L/R	"	"	
C314L/R	3069335270	Resistor C.F.3.3M ohm(±WJ)	
C321L/R	"	"	
C402L/R	"	"	
C405L/R	"	"	
C119L/R	3509151130	Cap Ceramic 150pF/50WV	
C120L/R	"	"	
C111L/R	3509221130	Cap Elect 220pF/50WV	
C122L/R	"	"	
C214L/R	"	"	
C217L/R	"	"	
C302L/R	"	"	
C319L/R	"	"	
C112L/R	3509681130	Cap Elect 680pF/50WV	
C223	3509560130	Cap Elect 56pF/50WV	
C101	3509473530	Cap Elect 0.047µF/50WV	
C504	"	"	
C507	"	"	
C108L/R	3609102120	Cap Mylar 0.001µF/100WV	
C116L/R	3509152120	Cap Mylar 0.0015µF/100WV	
C306L/R	3509272120	Cap Mylar 0.0027µF/100WV	
C102L/R	3509472120	Cap Mylar 0.0047µF/100WV	
C103L/R	"	"	
C510	"	"	
C512	"	"	
C306L/R	3509123120	Cap Mylar 0.012µF/100WV	
C117L/R	3509153120	Cap Mylar 0.015µF/100WV	
C118L/R	3509563120	Cap Mylar 0.056µF/100WV	
C309L/R	3509683120	Cap Mylar 0.068µF/100WV	
C307L/R	3509103120	Cap Mylar 0.01µF/100WV	
C312L/R	"	"	
C315L/R	"	"	
C320L/R	"	"	
C323L/R	"	"	
C324L/R	"	"	
C601L/R	3509223220	Cap Mylar 0.022µF/100WV	
C603L/R	3509473120	Cap Mylar 0.047µF/100WV	
C701	"	"	
C704	"	"	
FS101,102	5508211631	Fuse 0.5A/250V(UL)	
FS103	5508210031	Fuse 1A/250V(UL)	
C501,512	3409210071	Cap Elect 10µF/50WV	
C503	3409247021	Cap Elect 47µF/50WV	
C106L/R	3409222041	Cap Elect 22µF/25WV	
C107L/R	"	"	
C509	"	"	
C701	3409210121	Cap Elect 100µF/100V	



Parts List & Top View of P.C Boards

FRONT BOARD 4002114600

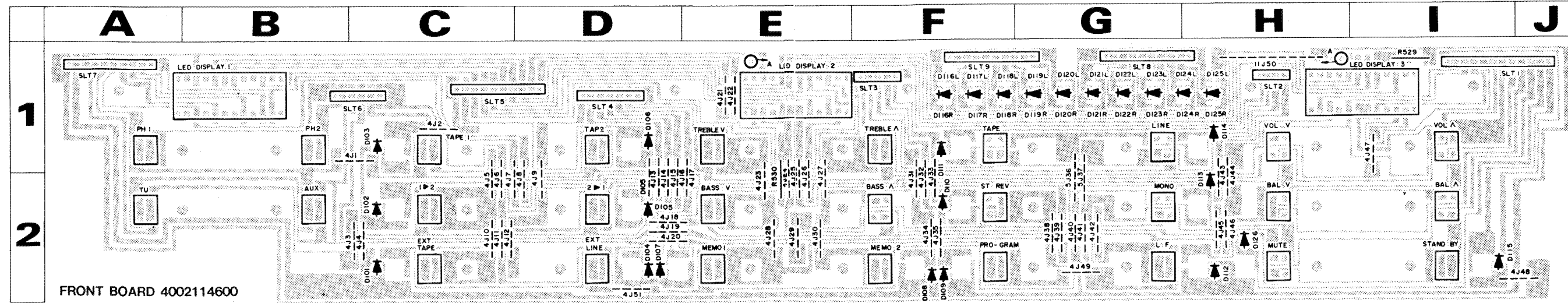
Ref. No.	Parts No.	Description	Position
Display 1	2318100104	LED Display LN543RA	1B
Display 2	"	"	1E
Display 3	"	"	1H
R529	3069272270	Resistor C.F 2.7K ohm(1 WJ)	
R530	"	"	
D101 D103	2308170101	LED SLP 137B(RED)	2C

Ref. No.	Parts No.	Description	Position
D103	2308170101	LED SLP 137B(RED)	1C
D104	"	"	2D
~107	"	"	2D
D108	"	"	2F
~D111	"	"	
D112, 113	"	"	2H
D115	"	"	2J
D124L/R	"	"	1G

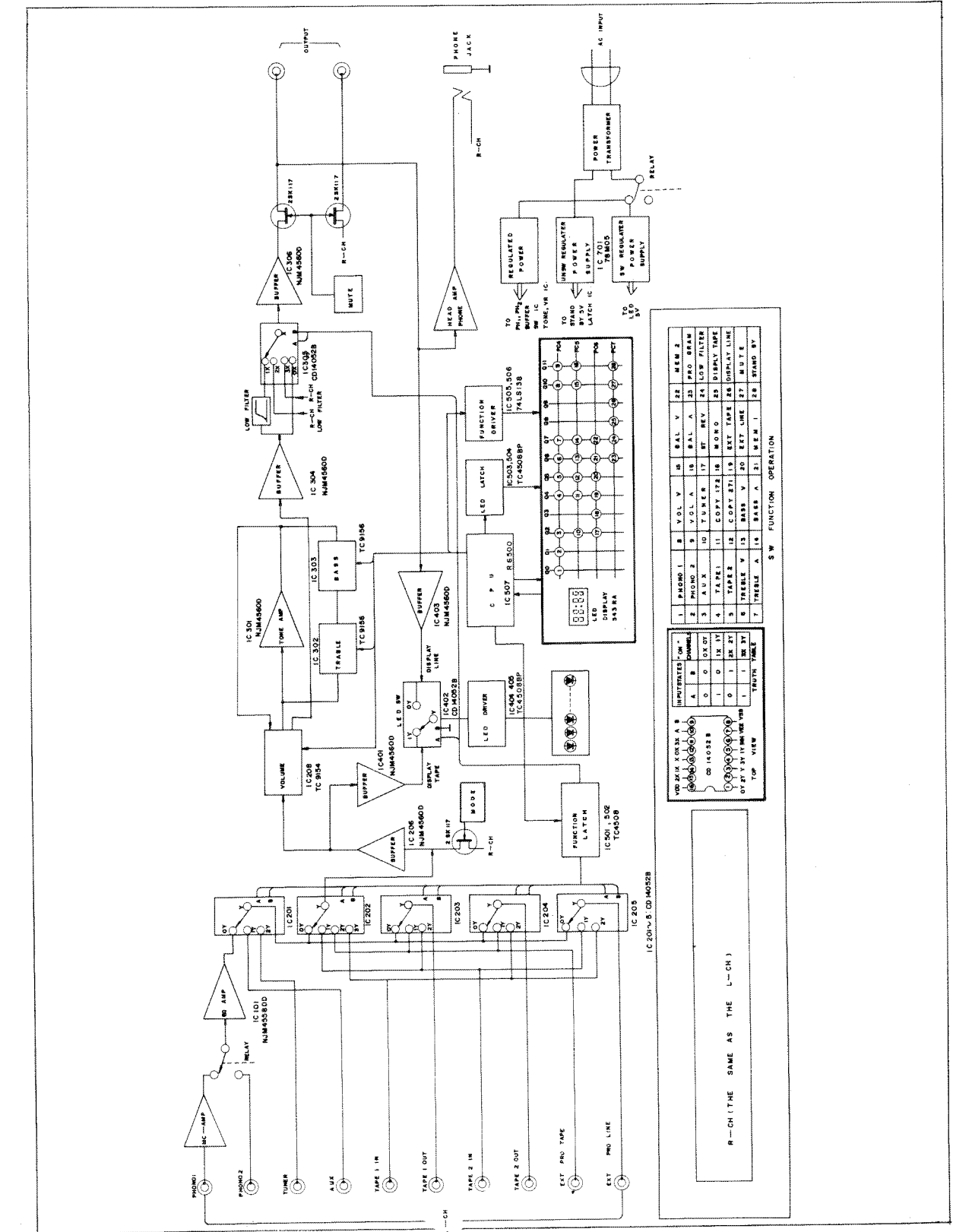
Ref. No.	Parts No.	Description	Position
D125L/R	2308170101	LED SLP137B(RED)	1H
D126	"	"	2H
D114	2308170301	LED SLP 237B(Green)	
D104	"	"	2D
D105	"	"	2D
D116L/R	"	"	1F
D123L/R	"	"	1G

FEATURE CHASSIS

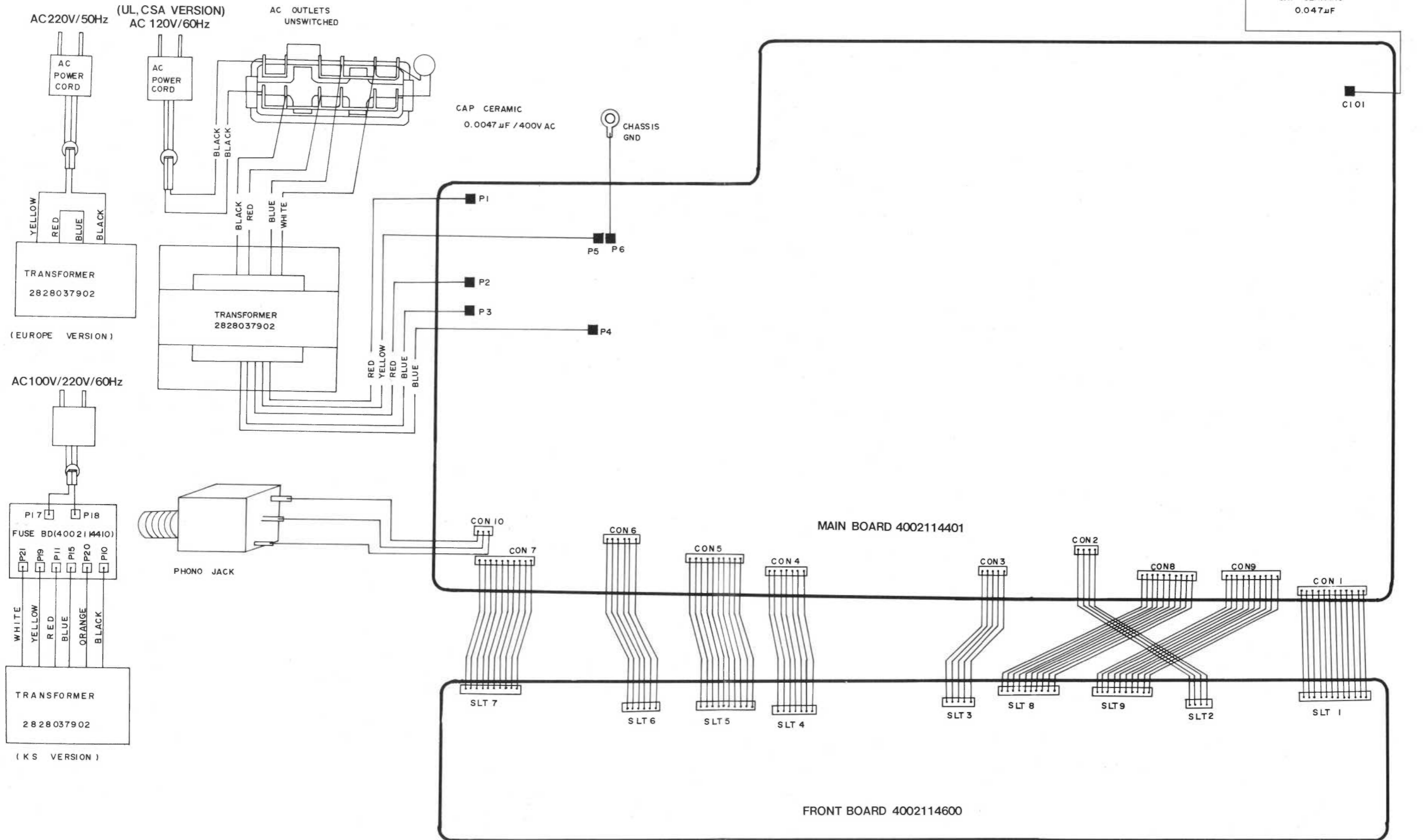
Ref. No.	Parts No.	Description	Position
	2828035702	Power TRANSFORMER	
	3549472407	Cap. Ceramic 0.0047rF/400 VAC	



Block Diagram

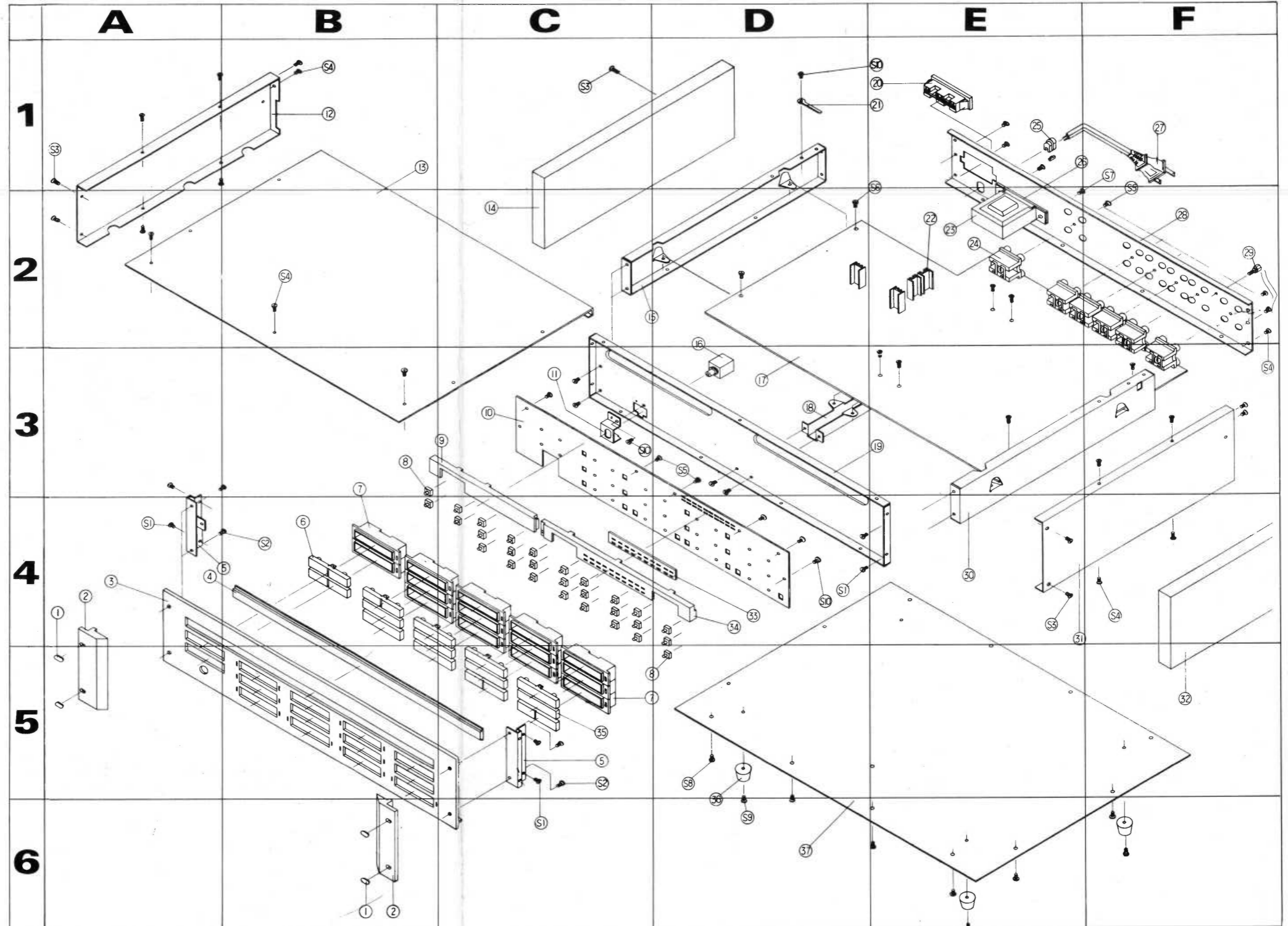


Point to Point Wiring Diagram



Parts List & Exploded View of Cabinet & Chassis

No.	Part No.	Description	Position
1	8585004010	Cap Handle Hole	4A, 6B
2	048663000111	Base Rack Mount	4A, 6B
3	048602012711	Panel Front	4A
4	8555007710	Window Display	4B
5	6503005910	BKT Panel	4A, 5C
6	8543002810	Button See-Saw	4B
7	8523005410	Base Button	4B
8	4658001810	Switch Tact	3B
9	6063000210	Holder Display	3B
10	4003114500	PCB Front	3C
11	6505046110	BKT Jack Phone	3C
12	046123003112	Cover Side "L"	1B
13	046122008611	Cover Top	1B
14	8683000510	Wooden End Cap	2C
15	6123615220	Frame Main "L"	2D
16	4438000420	Jack Phone	3D
17	4002114400	PCB Main	3D
18	6123615310	Frame Center	3D
19	6122210210	Chassis Front	3E
20	4448100810	Receptacle	1E
21	6525000120	Clamper Wire	1E
22	7505200710	Heat Sink	2E
23	2828035702	Transformer	2E
24	4438101910	Jack RCA(4P)	2E
25	6513001610	Cord Stopper	1E
26	6505058710	BKT Trans	1F
27	4308001410	AC Cord	1F
28	046102015211	Chassis Back	2F
29	4463100110	Terminal GND System	2F
30	6123615210	Frame Main "R"	4E
31	046123003111	Cover Side "R"	5F
32	8683000510	Wooden End Cap	5F
33	6063000220	Holder LED Guide	4D
34	6063000310	Holder LED	4D
35	8543002820	Button See-Saw	5C
36	6035100710	Foot	5D
37	046122408411	Cover Bottom	6D
S1	8109535081	Screw # 3 BT 3.5 x 8Y	4A, 4D
S2	8069140121	Screw WPM 4 x 12Y	4B, 6C
S3	8159535203	Screw # 3 WPT 3.5 x 20B	1A, 1C, 3E
S4	8109535083	Screw # 3 BT 3.5 x 8B	2E, 3F
S5	8119130083	Screw # 1 PT 3 x 8B	4D
S6	8159230081	Screw # 2 WPTC 3 x 8Y	2E
S7	8069140083	Screw WPM 4 x 8B	1F
S8	8109535063	Screw # 3 BT 3.5 x 6B	6D
S9	8159340103	Screw # 3 WPTC 4 x 10B	6D
S10	8109230081	Screw # 2 BTC 3 x 8Y	1E, 4D



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