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THE HARMAN KARDON CSP-1

Manual No. CSP1-1

AUTOMOTIVE SURROUND PREAMPLIFIER

Technical Manual



harman/kardon

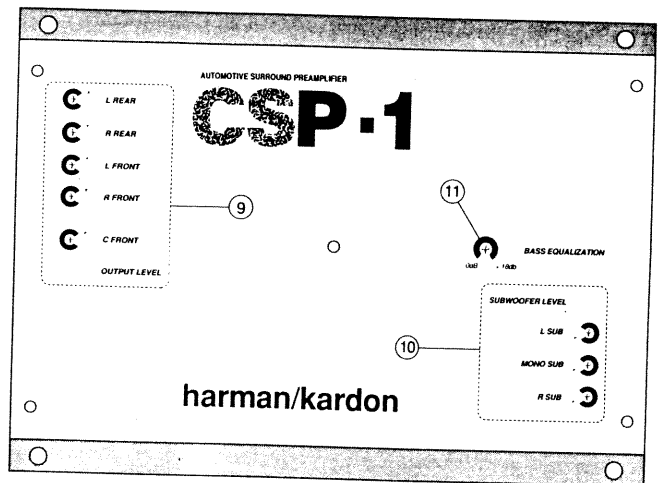
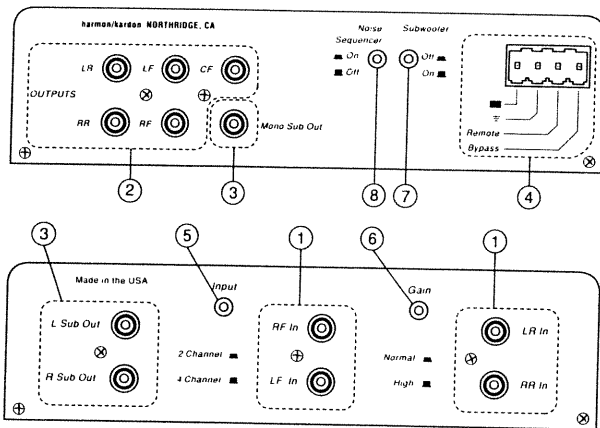
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CONTENTS

COMPONENTS AND THEIR FUNCTION	2
SPECIFICATIONS	3
DISASSEMBLY PROCEDURES	3
CONNECTION DIAGRAM	4
PARTS LIST	5
SCHEMATIC DIAGRAM	8
WIRING DIAGRAM	13

COMPONENTS AND THEIR FUNCTION



- | | |
|--------------------------------------|-----------------------------------|
| (1) Signal Input Connectors | (7) Subwoofer Switch |
| (2) Signal Output Connectors | (8) Noise Sequencer Switch |
| (3) Subwoofer Output Connectors | (9) Output Level Adjustment |
| (4) Power Input Connector Receptacle | (10) Subwoofer Level Adjustment |
| (5) Input Parallel Switch | (11) Bass Equalization Adjustment |
| (6) Gain Selection Switch | |

SPECIFICATIONS

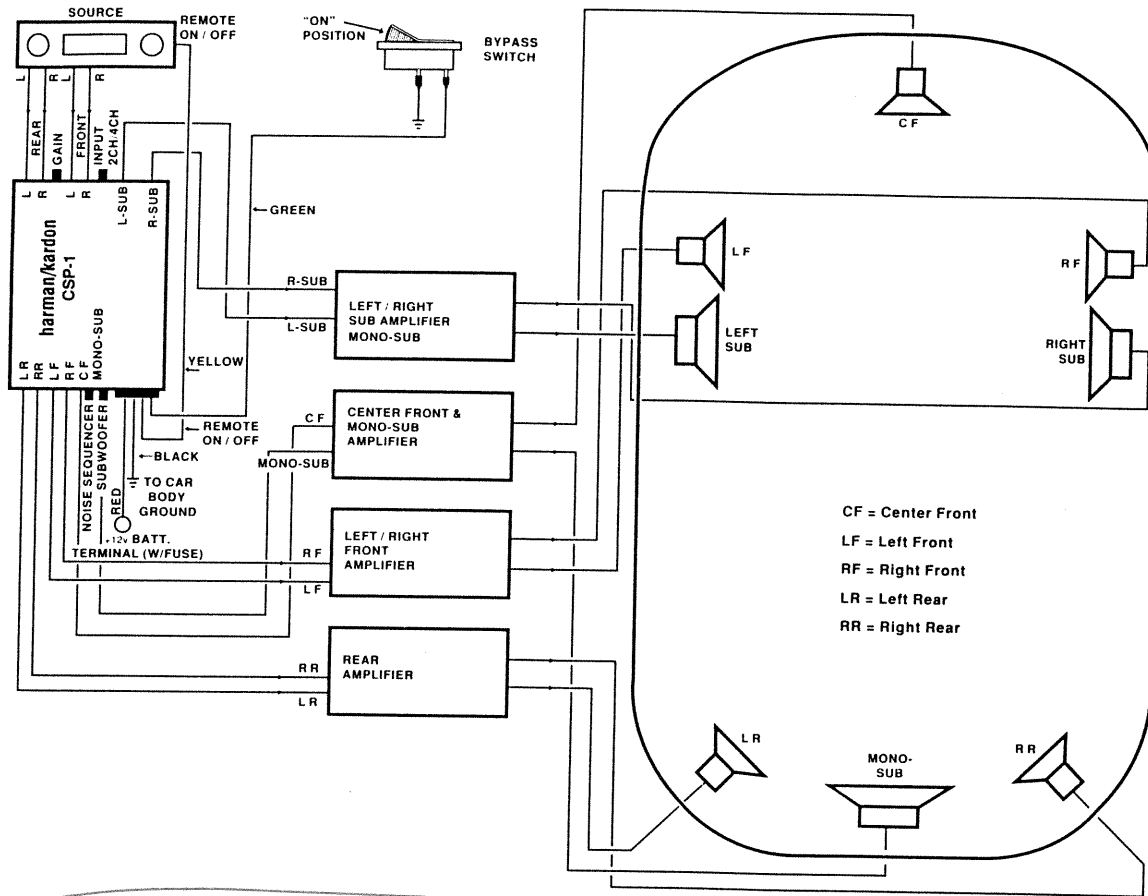
Automotive Surround Preamp	CSP-1
Subwoofer Channels Low-Pass Frequencies	*250 Hz, 18 dB/octave rolloff (can be varied from 55 Hz - 300 Hz)
High Channel High-Pass Frequencies	*250 Hz 18, dB/octave rolloff (can be varied from 55 Hz - 300 Hz)
Input/Output Gain	+20 dB (gain switch on High)
Maximum Output Level (0.2% THD)	2 Volts RMS
THD at 2 Volts, 1 kHz	Less than 0.2 %
Frequency Response	10 Hz - 100 kHz \pm 2 dB (sub-woofer switch in the off position)
Bass Eq	0 to + 18 dB boost @ 45 Hz
Signal to Noise Ratio (A-WTD, 2.0 Volts)	>95 dB
Input Impedance	34 k Ω
Output Impedance	100 Ω
Static Inter-channel Separation	35 dB minimum: typically better than 40 dB
Fuse Size and Type	1.5 amp, Type 3AG Fast Blow
Mechanical Size/Weight	10 ¹ / ₈ "x 7 ¹ / ₈ "x 1 ¹ / ₂ "/3 lbs 5 oz

* denotes factory setting

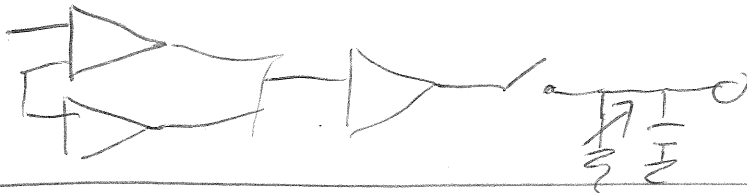
DISASSEMBLY INSTRUCTIONS

- 1) Take off the bottom cover of the enclosure by first removing 3 screws from the input signal end plate
- 2) Then remove 2 screws from the bottom corners of the output signal endplate.
- 3) Next, remove 3 screws from each blank side of the case. The screws are located toward each end of the panel. There are two extra screws next to each other on the side near the harman/kardon logo that should not be removed.
- 4) Finally, slide the bottom cover backwards until the endplate clears the input jacks and then lift the cover off.

CONNECTION DIAGRAM



Circuit Block Diagram



Circuit Description

IC Block Diagram



CSP-1 Parts List

Qty.	Reference Designator	Part	Part #	Part Description
8	C1, C17, C19, C21, C23, C43, C47, C48	.10PET	62-1017	0.10 Box Cap., 10% 100V, 10mm Poly. Film
6	C2, C3, C8, C13, C41, C42	.047PET	62-1013-03	0.047 Box Cap., 10% 100V, 5mm Poly. Film
16	C4, C5, C9, C10, C11, C12, C30, C31, C36, C38, C59, C60, C84, C85, C86, C90	.22PET	62-1019	0.22 Box Cap., 10% 100V, 10mm Poly. Film
2	C6, C7	.50	62-0098	0.50 uF Capacitor 10% 100V Polyester Film
2	C14, C44	.068PET	62-1015	0.068 Box Cap., 10% 100V, 10mm Poly. Film
2	C15, C45	.68PET	62-1025-03	0.68 Box Cap., 10% 100V, 10mm Poly. Film
10	C16, C18, C20, C22, C49, C50, C51, C52, C53, C54	.010PET	62-1008-03	0.010 Box Cap., 10% 100V, 5mm Poly. Film
34	C24, C25, C26, C29, C34, C35, C37, C39, C46, C57, C58, C62, C64, C66, C68, C72, C73, C74, C76, C78, C80, C83, C87, C88, C92, C94, C97, C98, C106, C107, C108, C109, C110, C111	BP	62-0067	0.047 uF Capacitor 20% 50V Axial Monolithic
2	C27, C28	2.2U	60-0072	2.2 uF Capacitor +80%, -20% 50V Electrolytic
5	C32, C33, C61, C63, C91	47PF	62-0019	47 pF Capacitor
1	C40	.0047PET	62-1006-03	0.0047 Box Cap., 10% 100V, 5mm Poly. Film
2	C55, C56	1 NP	60-0046-01	1.0 uF Capacitor +80%, -20% 16V Electrolytic, N.P.
1	C65	25PF	62-0001	25 pF Capacitor 5% 50V Ceramic Disc
2	C67, C89	10U 25V	60-0050-01	10.0 uF Capacitor +80%, -20% 25V Electrolytic
1	C69	180PF	62-0021	180 pF Capacitor 20% 50V Ceramic Disc
8	C75, C77, C79, C93, C95, C96, C100, C103	100U 25V	60-0055-01	100.0 uF Capacitor +80%, -20% 25V Electrolytic
2	C81, C99	1000U 25V	60-0070	1000.0 uF Capacitor +80%, -20% 25V Electrolytic
1	C102	1U	60-0044-01	1.0 uF Capacitor +80%, -20% 50V Electrolytic
1	C104	.10D	62-0030	0.10 uF Capacitor 10% 50V Ceramic Disc
9	D1, D2, D3, D4, D7, D8, D12, D13, D16	1N4148	70-0002	1N4148 Silicon Switching Diode, 75 Volts PIV
1	D5	1N5237B	70-0013	1N5237B Zener Diode 8.2V
4	D6, D9, D10, D15	FR103	70-0080	FR103
3	D11, D17, D18	1N4735	70-0020	1N4735 Zener Diode 6.2V
1	D14	1N4003	70-0007	1N4003 Silicon Rectifier
1	D19	1N5239B	70-0155	1N5239B, Zener Diode 9.1V, 1/2 Watt
1	F1	FUSE1.5A	32-0009	Fuse 1.50 AMP, CAB 250V
1	H1	HDR4_.2	32-0122	4 Pin Header, 0.2" spacing
3	J1, J2, J3	RCAX2 PC1	32-0111	RCA X 2, PCB Mount Jack, Gold
1	J4	RCAX6 PC1	32-0112	RCA X 6, PCB Mount Jack, Gold
1	L1	GAVTOR	26-0030	
2	L2, L3	FBEAD	42-1000	Ferrite Bead
4	Q1, Q2, Q3, Q4	2N5951	70-1070	2N5951 N-Channel JFET
2	Q5, Q6	MJE15028	70-1048	MJE15028 NPM High Volt. Transistor
1	Q7	2N3906	70-1006	2N3906 PNP Gen. Purp. Amplifier/Switching Transistor
1	Q8	2N3904	70-1004	
4	R1, R10, R85, R92	34.0K 1% 1/4 Watt Metal Film	52-0081-01	34.0 KOhm Resistor 1% 1/4 Watt Metal Film
2	R2, R99	13.3K 1% 1/4 Watt Metal Film	52-0053-01	13.3 KOhm Resistor 1% 1/4 Watt Metal Film
17	R3, R4, R15, R16, R67, R71, R72, R73, R119, R120, R123, R124, R133, R147, R223, R231, R241	49.9K 1% 1/4 Watt Metal Film	52-0020-01	49.9 KOhm Resistor 1% 1/4 Watt Metal Film

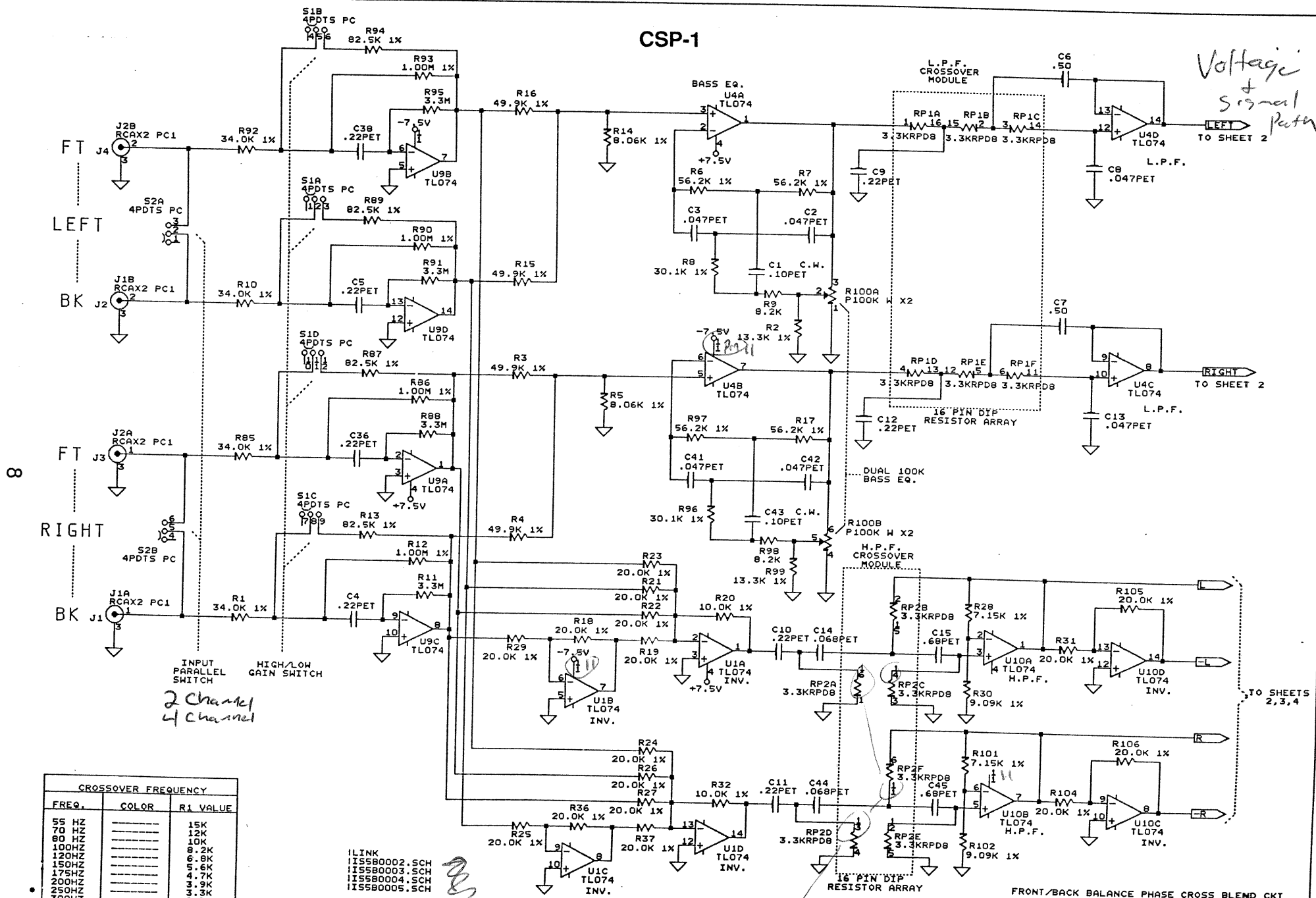
CSP-1 Parts List

Qty.	Reference Designator	Part	Part #	Part Description
2	R5,R14	8.06K 1%	52-0111-01	8.06 KOhm Resistor 1% 1/4 Watt Metal Film
6	R6,R7,R17,R39,R40,R97	56.2K 1%	52-0065-01	56.2 KOhm Resistor 1% 1/4 Watt Metal Film
2	R8,R96	30.1K 1%	52-0083-01	30.1 KOhm Resistor 1% 1/4 Watt Metal Film
4	R9,R98,R196,R197	8.2K	50-0222-01	8.2 KOhm Resistor 5% 1/4 Watt Carbon Film
12	R11,R75,R79,R82,R88,R91, R95,R142,R190,R192,R194, R203	3.3M	50-0049-01	3.3 MOhm Resistor 5% 1/4 Watt Carbon Film
5	R12,R86,R90,R93,R140	1.00M 1%	52-0705-01	1.00 MOhm Resistor 1% 1/4 Watt Metal Film
4	R13,R87,R89,R94	82.5K 1%	52-0006-01	82.5 KOhm Resistor 1% 1/4 Watt Metal Film
35	R18,R19,R21,R22,R23,R24, R25,R26,R27,R29,R31,R33, R34,R35,R36,R37,R38,R56, R57,R104,R105,R106,R152, R153,R163,R164,R165,R177, R205,R206,R217,R218,R219, R232,R240	20.0K 1%	52-0091	20.0 KOhm Resistor 1% 1/4 Watt Metal Film
3	R20,R32,R239	10.0K 1%	52-0107	10.0 KOhm Resistor 1% 1/4 Watt Metal Film
2	R28,R101	7.15K 1%	52-0113-01	7.15 KOhm Resistor 1% 1/4 Watt Metal Film
2	R30,R102	9.09K 1%	52-0109-01	9.09 KOhm Resistor 1% 1/4 Watt Metal Film
5	R41,R42,R46,R47,R131	121K 1%	52-0297-01	121 KOhm Resistor 1% 1/4 Watt Metal Film
8	R43,R44,R48,R50,R51,R59, R64,R66	169K 1%	52-0283-01	169 KOhm Resistor 1% 1/4 Watt Metal Film
2	R45,R63	60.4K 1%	52-0073-01	60.4 KOhm Resistor 1% 1/4 Watt Metal Film
4	R49,R61,R127,R244	69.8K 1%	52-0012-01	69.6 KOhm Resistor 1% 1/4 Watt Metal Film
6	R52,R53,R107,R111,R113, R114	3.01K 1%	52-0125-01	3.01 KOhm Resistor 1% 1/4 Watt Metal Film
2	R54,R55	10M	50-0060-01	10M MOhm Resistor 5% 1/4 Watt Carbon Film
5	R58,R60,R62,R65,R238	442K 1%	52-0243-01	442 KOhm Resistor 1% 1/4 Watt Metal Film
2	R69,R78	162K 1%	52-0285-01	162 KOhm Resistor 1% 1/4 Watt Metal Film
4	R70,R144,R176,R179	TP50K H	42-0222	50 kOhm Trim Pot, Horizontal Mount, 3/4 turn
9	R76,R80,R83,R135,R138, R143,R189,R191,R193	100	50-0003	100 Ohm Resistor 5% 1/4 Watt Carbon Film
8	R77,R81,R84,R136,R137, R139,R187,R188	TP25K H	40-0271	25 kOhm Trim Pot, Horizontal Mount, 3/4 turn
1	R100	P100K W X2	40-2011	100 KOhm "W" Taper Potentiometer, x2, Rack Leads
4	R103,R169,R204,R224	105K 1%	52-0303-01	105 KOhm Resistor 1% 1/4 Watt Metal Film
4	R108,R109,R110,R112	6.04K 1%	52-0115-01	6.04 KOhm Resistor 1% 1/4 Watt Metal Film
6	R115,R117,R155,R166,R208, R221	24.9K 1%	52-0039-01	24.9 KOhm Resistor 1% 1/4 Watt Metal Film
14	R116,R118,R128,R129,R130, R132,R157,R171,R199,R200, R201,R211,R227,R245	100K 1%	52-0305-01	100 KOhm Resistor 1% 1/4 Watt Metal Film
4	R121,R122,R125,R126	200K 1%	52-0276-01	200 KOhm Resistor 1% 1/4 Watt Metal Film
1	R134	2M	50-0046	2 MOhm Resistor 5% 1/4 Watt Carbon Film
1	R141	4.7K	50-0015	4.7 KOhm Resistor 5% 1/4 Watt Carbon Film
2	R145,R146	0	50-0050	0 Ohm Resistor 5% 1/4 Watt Carbon Film
1	R148	604K 1%	52-0230-01	604 KOhm Resistor 1% 1/4 Watt Metal Film
4	R151,R168,R209,R222	TP10K H	42-0211	10 KOhm Trim Pot, Horizontal Mount, 3/4 turn
4	R154,R167,R207,R220	28.7K 1%	52-0084-01	28.7 KOhm Resistor 1% 1/4 Watt Metal Film
4	R156,R170,R210,R226	39.2K 1%	52-0079-01	39.2 KOhm Resistor 1% 1/4 Watt Metal Film
4	R158,R172,R212,R225	1.50K 1%	52-0144-01	1.50 KOhm Resistor 1% 1/4 Watt Metal Film
4	R160,R175,R213,R228	TP200 H	42-0203	200 Ohm Trim Pot, Horizontal Mount

CSP-1 Parts List

Qty.	Reference Designator	Part	Part #	Part Description
4	R161,R173,R214,R229	21.0K 1%	52-0042-01	21.0 KOhm Resistor 1% 1/4 Watt Metal Film
4	R162,R174,R215,R230	6.81K 1%	52-0157-01	6.81 KOhm Resistor 1% 1/4 Watt Metal Film
2	R181,R233	560	50-0193-01	560 Ohm Resistor 5% 1/4 Watt Carbon Film
4	R183,R184,R185,R186	6.8K	50-0016	6.8 KOhm Resistor 5% 1/4 Watt Carbon Film
2	R195,R198	6.2K	50-0219-01	6.2 KOhm Resistor 5% 1/4 Watt Carbon Film
1	R216	27K	50-0027	27 KOhm Resistor 5% 1/4 Watt Carbon Film
1	R235	390	50-0189-01	390 Ohm Resistor 5% 1/4 Watt Carbon Film
1	R237	76.8K 1%	52-0008-01	76.8 KOhm Resistor 1% 1/4 Watt Metal Film
1	R242	4.7M	50-0291-01	4.7 MOhm Resistor 5% 1/4 Watt Carbon Film
1	R246	10 1/2	50-5150-01	10 Ohm Resistor 5% 1/2 Watt Carbon Film
2	RP1,RP2	3.3KRPD8	54-0394	16 Pin Dip, Resistor Network, 3.3 kOhm 2%
2	RP3,RP4	20KRP4	54-0369	4 Element Resistor Network, 20 kOhm 2%
4	S1,S2,S3,S4	4PDTS PC	44-0026	4 Pole Double Throw I/O Switch (small), PC Mount
4	TP1,TP2,TP3,TP4	HDR1	32-1050	1 Pin Header
12	U1,U2,U4,U8,U9,U10,U12, U13,U14,U15,U17,U18	TL074	72-4021	Quad JFet-Input Op-Amp
3	U3,U7,U11	4066	72-0037	CD4066, MC14066 Quad Bilateral Analog Switch
2	U5,U6	SLIC-1		
1	U16	4017A	72-0035	Decade Counter

CSP-1



Voltage
+
Signal Path
TO SHEET 2

8

INPUT PARALLEL SWITCH
HIGH/LOW GAIN SWITCH
2 channel
4 channel

CROSSOVER FREQUENCY		
FREQ.	COLOR	R1 VALUE
55 HZ	---	15K
70 HZ	---	12K
80 HZ	---	10K
100HZ	---	8.2K
120HZ	---	6.8K
150HZ	---	5.6K
175HZ	---	4.7K
200HZ	---	3.9K
250HZ	---	3.3K
300HZ	---	2.7K

■ RECOMMENDED

ILINK
I15580002.SCH
I15580003.SCH
I15580004.SCH
I15580005.SCH
DOCUMENT #

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Print Numbers Horiz.
Not Vert + Horiz.

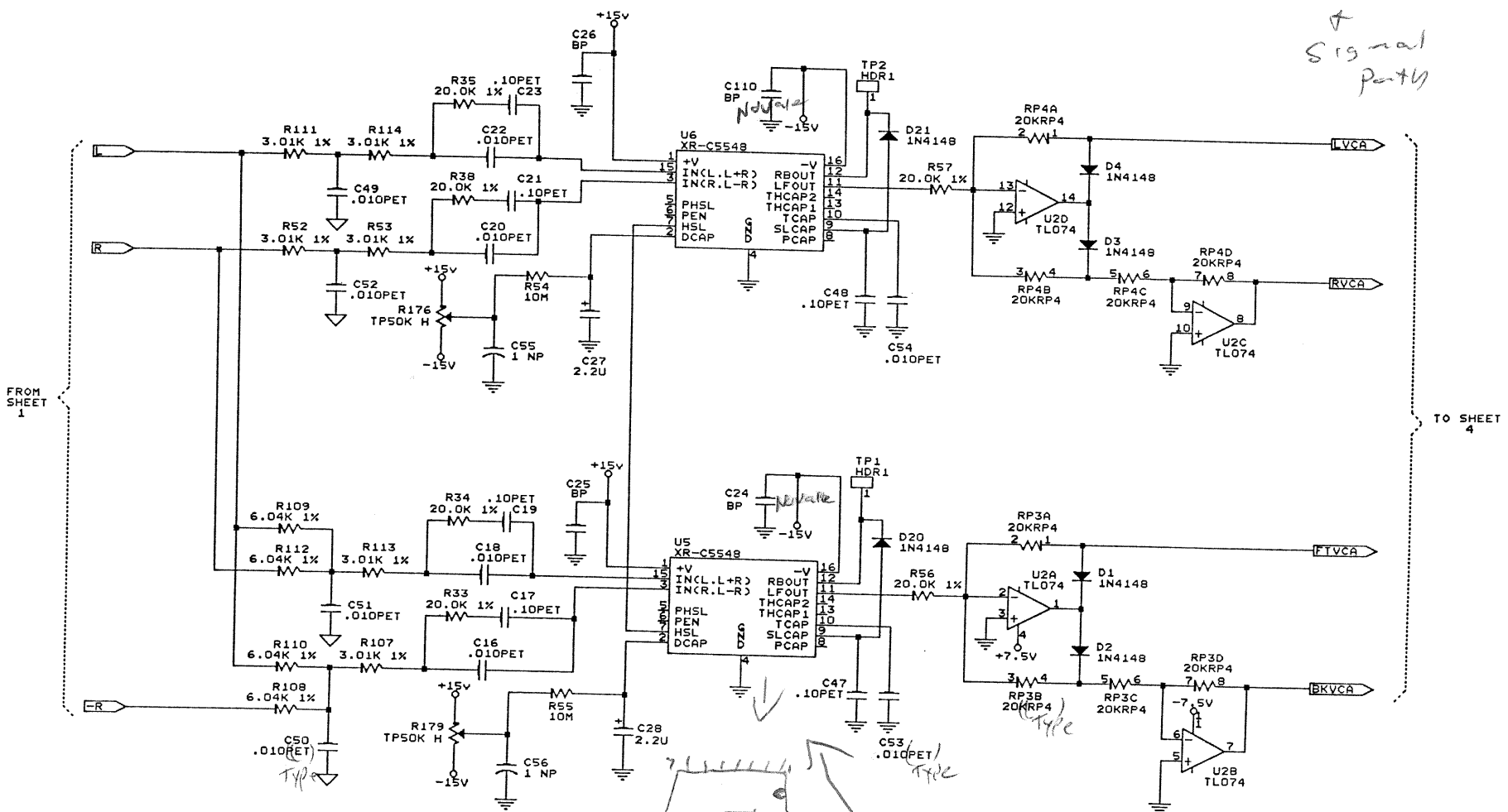
FRONT/BACK BALANCE PHASE CROSS BLEND CKT

harman/kardon	
Title	CSP1
Size Document Number	CSP1B001.SCH
Date:	July 7, 1992 Sheet 1 of 5

TO SHEETS 2,3,4

CSP-1

*Voltage
+
Signal
partly*



DETECTOR FILTER

NOTE: WHEN XR-C5548 IS USED, C53 AND C54 MUST BE CHANGED FROM .010PET TO .022PET.

why ?

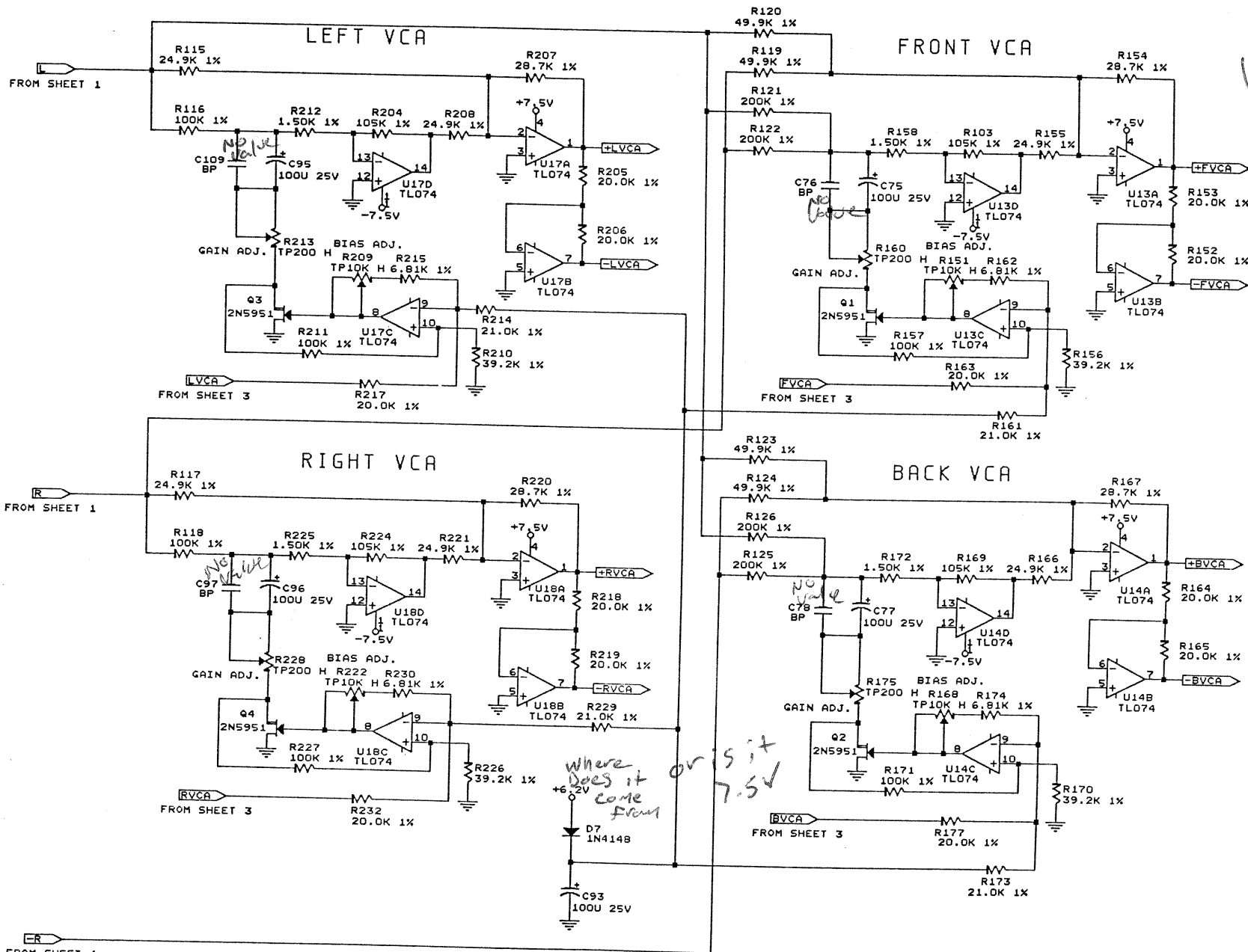
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FROM SHEET 1

TO SHEET 4

harman/kardon		
Title		
CONTROL VOLTAGE GENERATOR		
Size Document Number		
B	ISS80003.SCH	REV 80
Date:	July 7, 1992	Sheet 3 of 5

CSP-1



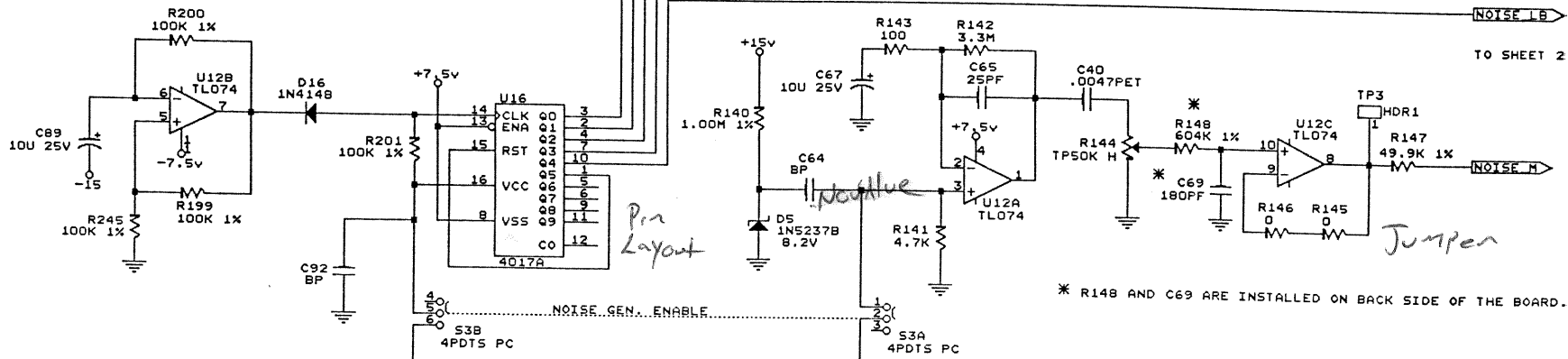
Voltage
+
Signal
Part 4

ALL OUTPUT SIGNALS
TO SHEET 2

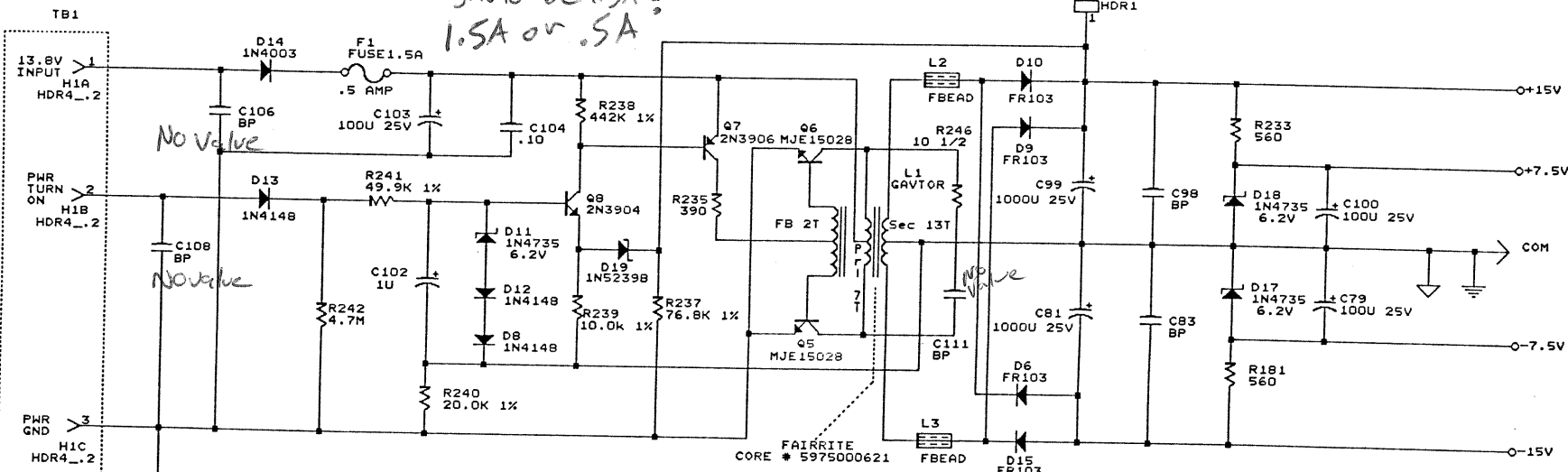
Where does it
come from
7.5V or 5V?

harman/kardon	
Title	R/L/F/B VOLTAGE CONTROL AMPLIFIERS
Size	Document Number
B	ISS80004.SCH
Date:	May 4, 1992 Sheet 4 of 5

CSP-1



NOISE SEQUENCER
 should be 1.5A?
 1.5A or .5A?



POWER SUPPLY

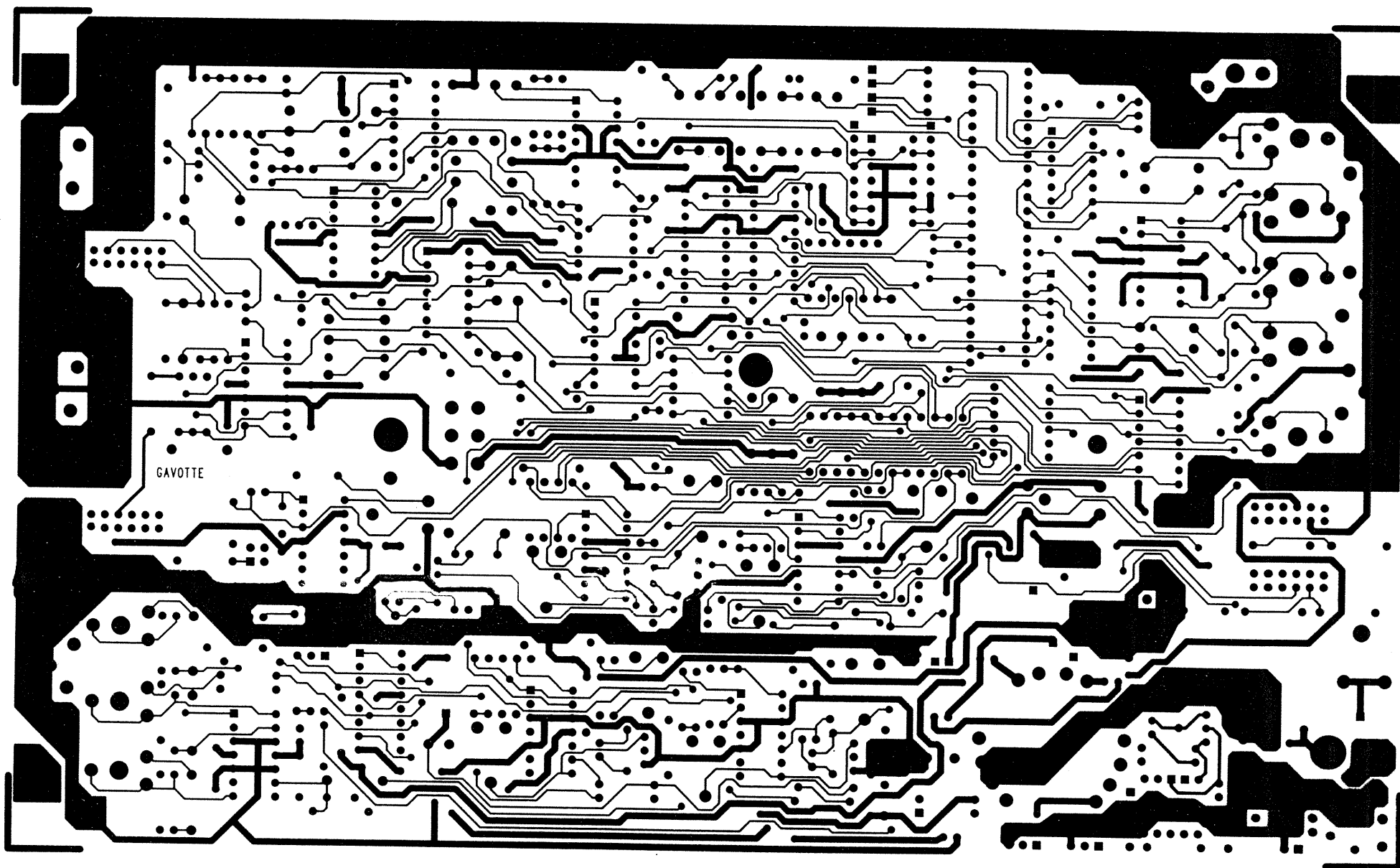
- C29 BP
- C34 BP
- C35 BP
- C37 BP
- C39 BP
- C46 BP
- C57 BP
- C58 BP
- C62 BP
- C66 BP
- C68 BP
- C72 BP
- C73 BP
- C74 BP
- C80 BP
- C87 BP
- C88 BP
- C94 BP

harman/kardon		
Title	POWER SUPPLY & NOISE SEQUENCER	
Size Document Number	ISSB0005.SCH	
B	REV	BO
Date:	June 1, 1992	Sheet 5 of 5

12

CSP-1

BOARD AS VIEWED FROM COMPONENTS SIDE

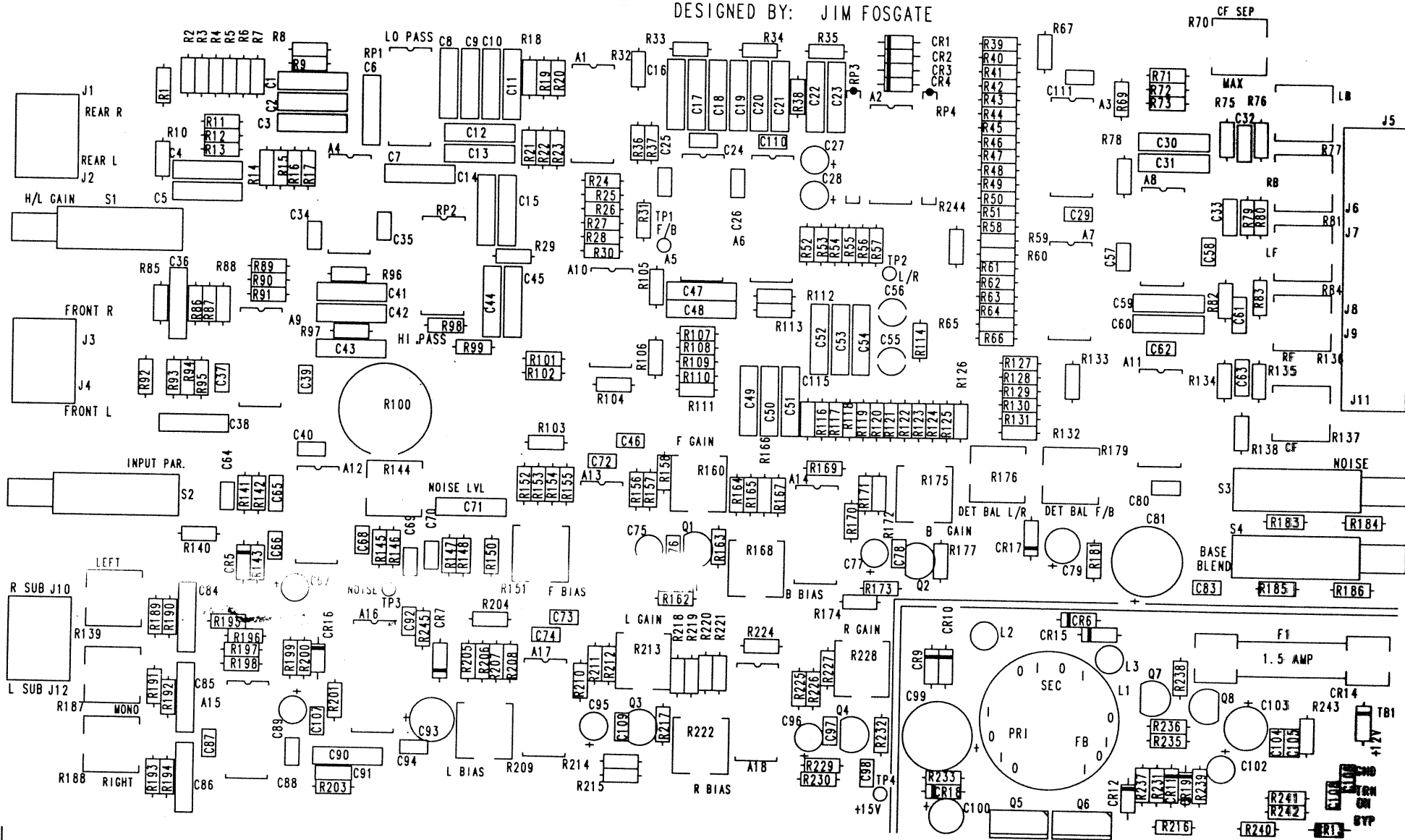


WIRING DIAGRAM

CSP-1

COMPONENT LOCATION AS VIEWED FROM COMPONENTS SIDE

DESIGNED BY: JIM FOSGATE



CSP-1

BOARD AS VIEWED FROM SOLDER SIDE

