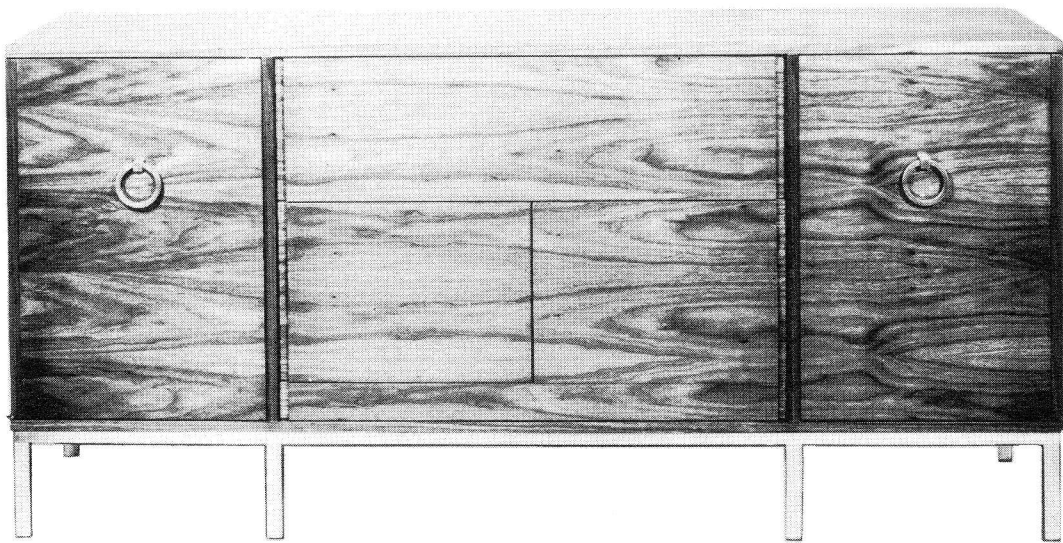


Stereophonic



**THE FISHER
PRESIDENT V
SERVICE
MANUAL**



PRESIDENT V

PRICE: \$1.00

Chas 4000

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THE FISHER PRESIDENT V

VOLTAGE MEASUREMENTS

FM-AM TUNER-4000R

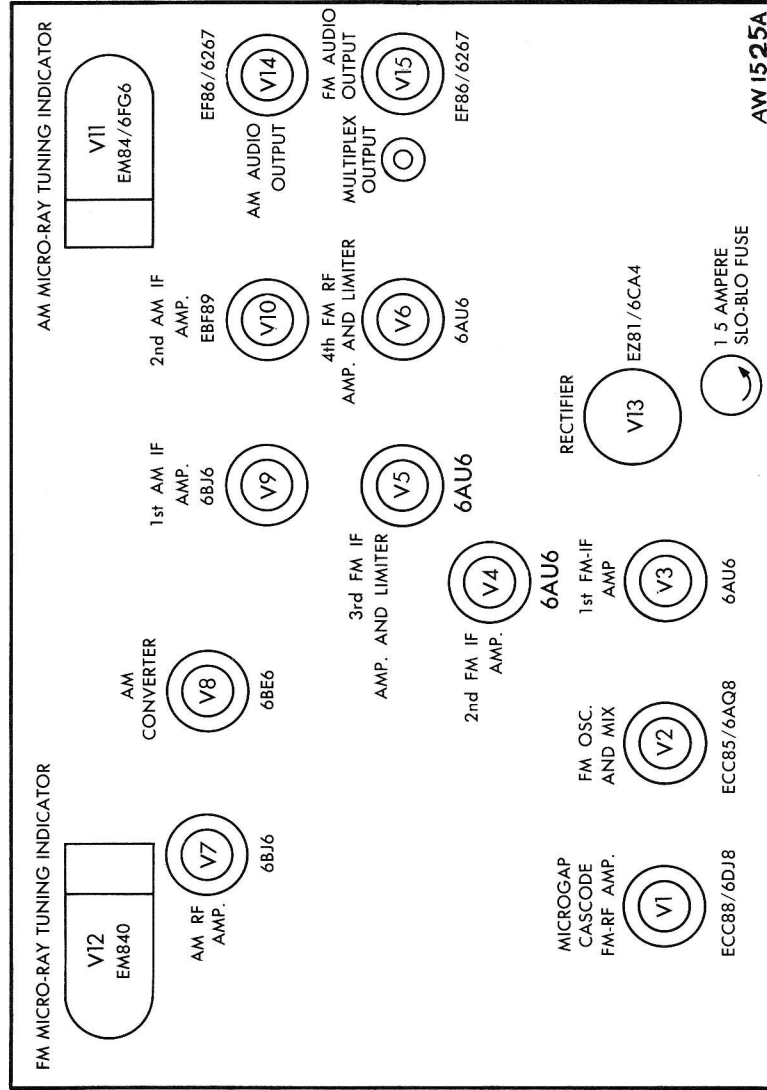
All readings taken with vacuum-tube voltmeter with respect to chassis ground, subject to 10% normal variation unless otherwise noted. Set dial pointer at extreme low end of scale. AM Selector at SHARP, FM Selector at LISTEN. Set line voltage at 117 volts AC, 50-60 cycles. Readings are in DC volts with respect to chassis ground, unless otherwise noted. Use vacuum-tube voltmeter.

SYMBOL	TUBE	TUBE SOCKET PIN NUMBER												
		1	2	3	4	5	6	7	8	9				
V1	ECC88/6DJ8	190	95	96	0	6.3AC	98	-0.3	1.5	0				
V2	ECC85/6AQ8	175	-2.1	0	6.3AC	0	170	-2.7	0	0				
V3	6AU6	-0.3	0	6.3AC	0	205	77	0.5	-	-				
V4	6AU6	0	0	6.3AC	0	205	70	0.6	-	-				
V5	6AU6	0.5	0	6.3AC	0	205	76	0	-	-				
V6	6AU6	6	0	6.3AC	0	205	90	0	-	-				
V7	6BJ6	-0.1	0.9	6.3AC	0	203	80	0	-	-				
V8	6BE6	-7.5	0	6.3AC	0	207	90	-0.4	-	-				
V9	6BJ6	-0.4	0.6	6.3AC	0	205	68	0	-	-				
V10	6BF89	95	0	2.1	6.3AC	0	200	1.9	-0.1	0				
V11	EM84/6FG6	0.6	NC	2.1	0	6.3AC	209	38	NC	38				
V12	EM840	0.6	NC	0	0	6.3AC	209	46	NC	46				
V13	EF86/6Z67	240AC	NC	290	0	6.3AC	NC	240AC	NC	NC				
V14	EZ81/6CA4	105	1.5	1.5	6.3AC	0	78	1.5	1.5	0				
V15	EF86/6Z67	90	1.5	1.5	6.3AC	0	90	1.5	1.5	0				

ELECTROLYTIC CAPACITOR	TERMINAL VOLTAGE SYMBOL	NOTES	
		AC=AC volts	NC=No Connection
C25	280		
C25	255		
C36	230		
C36	210		
C36	190		

TUBE LAYOUT

FM-AM TUNER-4000R



AW 1525A

ALIGNMENT INSTRUCTIONS

Read These Instructions With Extreme Care Before Attempting Alignment.

CHASSIS: Turn the station selectors completely counterclockwise, without forcing. Dial pointers should be at zero index mark on logging scale. If not, reset the dial pointers. Disconnect the external antennas and the antenna link. When using an oscilloscope for alignment, set the output level controls for no overload, as shown by the proper waveform shape.

SIGNAL GENERATORS: The signal generator equipment must be able to supply the following: AM RF modulated 30% at 400 cps, FM RF modulated 30% (± 22.5 KC deviation) at 400 cps, accurately

calibrated 10 KC audio output for adjusting the 10 KC AM whistle filter, AM IF with 30 KC sweep for AM bandwidth adjustment.

INDICATOR: DC VTVM and scope for alignment. AC VTVM for 10 KC AM whistle filter adjustment. **ALIGNMENT:** Allow the chassis and test instruments to warm up for at least fifteen minutes. Adjust the line voltage for 117 volts AC, 50-60 cycles. Use fully insulated tools; a small screwdriver for all capacitors and L17; a K-Tran tool for Z1, Z2, Z3, Z6, Z7, Z8 and Z9; a hex tool for Z4, Z5, L2, L8 and L9.

AM ALIGNMENT

STEPS	CHASSIS		SIGNAL GENERATOR				INDICATOR		ALIGNMENT	
	AM SELECTOR	FM SELECTOR	STATION SELECTOR	COUPLING	FREQ.	MOD.	TYPE	CONNECTION	ADJUST	INDICATION
1	BROAD	FM OFF	Point of no signal and no interference	Audio Gen. connected to Pin 7 of V10	10 KC	None	AC VTVM	to AM Stereo Output	C52	Minimum output
2	SHARP	FM OFF	Point of no signal and no interference	.01-uF cap. in series with hot lead to V8, Pin 7	455 KC	30% AM at 400 cps	DC VTVM	to Pin 1 of V11	Z7, Z8, Z9 top and bottom	Maximum negative voltage
3	BROAD	FM OFF	Point of no signal and no interference	.01-uF cap. in series with hot lead to V8, Pin 7	455 KC	30 KC sweep	Scope	to AM Stereo Output	Z9 top	Adjust slightly for symmetrical curve
4	SHARP	FM OFF	600 KC	220-uF cap. in series with hot lead to antenna terminal 3	600 KC	30% AM at 400 cps	DC VTVM	to Pin 1 of V11	L17, Z6	Maximum negative voltage
5	SHARP	FM OFF	1400 KC	220-uF cap. in series with hot lead to antenna terminal 3	1400 KC	30% AM at 400 cps	DC VTVM	to Pin 1 of V11	C6F, C6D, C6B	Maximum negative voltage

6 Repeat steps 4 and 5 at least once for proper dial calibration and maximum output.

FM ALIGNMENT

7	AM OFF	LISTEN	Point of no signal and no interference	Ungrounded tube shield of V2	10.7 MC	None	DC VTVM	to the junction of R67 and C82	Z1, Z2, Z3 top & bottom & Z4 bottom	Maximum negative voltage
8	AM OFF	LISTEN	Point of no signal and no interference	Ungrounded tube shield of V2	10.7 MC	None	DC VTVM	to C93 negative terminal	Z5 bottom	Maximum negative voltage
9	AM OFF	LISTEN	Point of no signal and no interference	Ungrounded tube shield of V2	10.7 MC	None	Connect two matched 47K resistors across C93. Connect DC VTVM to the junction of the two 47K Res. Ground side of VTVM to the junction of R75 and C87.			Zero reading on zero center scale
10	AM OFF	LISTEN	106 MC	Two 120-ohm carbon resistors in series with lead to antenna terminals 4 and 5	106 MC	30% FM (22.5 KC Dev.) at 400 cps	DC VTVM	to the junction of R67 and C82 and scope to FM Stereo Output	C32	Check for sine waveform and adjust for maximum negative voltage
11	AM OFF	LISTEN	90 MC	Two 120-ohm carbon resistors in series with lead to antenna terminals 4 and 5	90 MC	30% FM (22.5 KC Dev.) at 400 cps	DC VTVM	to the junction of R67 and C82 and scope to FM Stereo Output	L9	Check for sine waveform and adjust for maximum negative voltage
12	AM OFF	LISTEN	106 MC	Two 120-ohm carbon resistors in series with lead to antenna terminals 4 and 5	106 MC	30% FM (22.5 KC Dev.) at 400 cps	DC VTVM	to the junction of R67 and C82 and scope to FM Stereo Output	C3 and C20	Check for sine waveform and adjust for maximum negative voltage
13	AM OFF	LISTEN	90 MC	Two 120-ohm carbon resistors in series with lead to antenna terminals 4 and 5	90 MC	30% FM (22.5 KC Dev.) at 400 cps	DC VTVM	to the junction of R67 and C82 and scope to FM Stereo Output	L2 & L8	Check for sine waveform and adjust for maximum negative voltage

14 Repeat steps 10 through 13 at least once for proper dial calibration and maximum output.

NOTE: For calibrating both the RF and IF, use as low an output voltage as possible from your signal generator.

PARTS DESCRIPTION LIST • FM-AM TUNER-4000R

CAPACITORS

20% tolerance for all fixed capacitors, unless otherwise noted or marked GMV (guaranteed minimum value.)

Symbol	Description	Part No.
C1	Ceramic, 24uuf 5% N150, 1000V	C50070-8
C2	Ceramic, 8uuf ±.5uuf NPO, 500V	CC20CJ080D5
C3	Ceramic Trimmer	C662-123
C4	Ceramic, 10uuf NPO, 500V	CC20CH100G5
C5	Ceramic, 100uuf 10% N1500, 1000V	C50070-6
C6	Variable, AM	C684-127
C7	Variable, FM	C662-113
C8	Ceramic, 100uuf GMV N1500, 1000V	C50070-5
C9	Ceramic, 100uuf 10% N1500, 1000V	C50070-6
C10, 11,	Ceramic, Feedthru, 1000uuf GMV	C592-187
C12		C50089-4
C13	Ceramic, .02uf +80—20%, 500V	C2747
C14	Molded, .01uf, 600V	C592-187
C15	Ceramic, Feedthru, 1000uuf GMV	C50089-4
C16	Ceramic, .02uf +80—20%, 500V	C50089-1
C17	Ceramic, .005uf, 500V	C592-187
C18	Ceramic, Feedthru, 100uuf GMV	C50089-1
C19	Ceramic, .005uf, 500V	C662-123
C20	Ceramic Trimmer	C50077-6N
C21	Ceramic, .68uf, 500V	CC20CJ050D5
C22	Ceramic, 5uuf ±.5uuf NPO, 500V	C50070-6
C23	Ceramic, 100uuf 10% N1500, 100V	CC20CH100G5
C24	Ceramic, 10uuf NPO, 500V	C684-122
C25	Electrolytic, two sections: 40uf, 350V 40uf, 300V	C592-187
C26	Ceramic, Feedthru, 100uuf GMV	CC20UJ680K5
C27	Ceramic, 68uuf 10% N750, 500V	C50070-6
C28	Ceramic, 100uuf 10% N1500, 1000V	CC20RH100D5
C29	Ceramic, 100uuf ±.5uuf N220, 500V	C50070-4
C30	Ceramic, 47uuf 10% N750, 1000V	C592-187
C31	Ceramic, Feedthru, 1000uuf GMV	C662-123
C32	Ceramic Trimmer	C50070-8
C33	Ceramic, 24uuf 5% N150, 1000V	C50070-6
C34	Ceramic, 100uuf 10% N1500, 1000V	C50070-5
C35	Ceramic, 100uuf GMV N1500, 1000V	C684-119
C36	Electrolytic, three sections: 40uf, 300V 40uf, 300V 20uf, 250V	C50089-1
C37	Ceramic, .005uf, 500V	C50072-3
C38	Ceramic, 1000uuf 10%, 1000V	CC20VK080C5
C39	Ceramic, 8uuf ±.25uuf	C50089-4
C40	Ceramic, .02uf +80—20%, 500V	C592-187
C41	Ceramic, .005uf, 500V	C50089-4
C42	Ceramic, Feedthru, 1000uuf GMV	C3334
C43	Ceramic, .02uf +80—20%, 500V	C50089-1
C44	Mica, 470uuf 5%, 300V	C50071-5
C45, 46	Ceramic, .005uf, 500V	C3334
C47	Ceramic, .0027uf, 1000V	C50089-1
C48	Mica, 470uuf 5%, 300V	C50074-27
C49	Ceramic, .005uf, 500V	C629-151-5
C50, 51	Molded, .047uf 10%, 250V	C50072-14
C52	Mica, Trimmer, 160uuf-500uuf	C50089-4
C53	Ceramic, 47uuf 10% N750, 1000V	C50089-1
C54	Ceramic, 560uuf 10%, 1000V	C3334
C55	Ceramic, .02uf +80—20%, 500V	C50089-1
C56	Ceramic, .005uf, 500V	C3334
C57	Mica, 470uuf 5%, 300V	C50074-28
C58	Ceramic, .005uf, 500V	C50074-28
C59	Molded, .1uf 10%, 250V	C639-114
C60	Molded, .1uf 10%, 250V	C639-114
C61	Electrolytic, 25uf, 6V	C50071-5
C62	Ceramic, .0027uf, 1000V	C3334
C63	Mica, 470uuf 5%, 300V	C50089-1
C64	Ceramic, .005uf, 500V	CC20CH100G5
C65	Ceramic, 10uuf NPO, 500V	C50089-4
C66	Ceramic, .02uf +80—20%, 500V	

RESISTORS AND POTENTIOMETERS

In ohms, 10% tolerance, 1/2 watt, unless otherwise noted. K = kilohm, M = megohm.

Symbol	Description	Part No.
R1	Composition, 1K	RC20BF102K
R2	Composition, 270	RC20BF271K
R3	Composition, 4.7	RC20BF47K
R4	Composition, 100K	RC20BF104K
R5	Composition, 1.8M	RC20BF185K
R6	Composition, 1.2K	RC20BF122K
R7	Composition, 4.7M	RC20BF475K
R8	Composition, 100	RC20BF101K
R9	Composition, 330K	RC20BF334K
R10	Composition, 47K	RC20BF473K
R11	Composition, 330K	RC20BF334K
R12	Composition, 1K	RC20BF102K
R13	Composition, 4.7	RC20BF47K
R14	Composition, 2.2K	RC20BF22K
R15	Composition, 22	RC20BF220K
R16	Wirewound, 7.5, 5W	R684-140
R17	Composition, 820K	R684-141
R18, 19	Wirewound, 270, 5W	R684-141
R20	Composition, 470K	RC20BF474K
R21	Composition, 22K	RC20BF223K
R22	Composition, 100	RC20BF101K
R23	Wirewound, 270, 5W	R684-141
R24	Composition, 1K	RC20BF102K
R25	Composition, 22K, 1W	RC20BF223K
R26	Composition, 2.2K, 1W	RC20BF223K
R27	Composition, 1K	RC20BF102K
R28	Composition, 100	RC20BF101K
R29	Composition, 1K	RC20BF102K
R30	Composition, 82K	RC20BF823K
R31	Composition, 47K	RC20BF473K
R32	Potentiometer, 500K 20%	R520-139
R33	Composition, 1K	RC20BF102K
R34	Composition, 100	RC20BF101K
R35	Composition, 330K	RC20BF334K
R36	Composition, 5.6K	RC20BF562K
R37	Composition, 2.2M	RC20BF225K
R38	Composition, 1M	RC20BF105K
R39	Composition, 82K	RC20BF823K
R40	Composition, 1K	RC20BF102K
R41	Composition, 47K	RC20BF473K
R42	Composition, 560	RC20BF561K

R43	Composition, 120	RC20BF121K
R44	Composition, 150K	RC20BF154K
R45	Composition, 82K	RC20BF823K
R46	Composition, 1K	RC20BF102K
R47	Composition, 2.2M	RC20BF225K
R48	Composition, 1.8M	RC20BF185K
R49	Composition, 820K	RC20BF824K
R50	Composition, 1.8M	RC20BF185K
R51	Composition, 120K	RC20BF124K
R52	Composition, 47K	RC20BF473K
R53	Composition, 1K	RC20BF102K
R54	Composition, 3.3M	RC20BF335K
R55, 56	Composition, 56K	RC20BF563K
R57	Composition, 22K	RC20BF223K
R58	Composition, 330K	RC20BF334K
R59	Composition, 470K	RC20BF474K
R60, 61	Composition, 22K	RC20BF223K
R62	Composition, 10M	RC20BF106K
R63	Composition, 39K	RC20BF393K
R64	Composition, 560	RC20BF561K
R65	Composition, 2.2M	RC20BF225K
R66	Composition, 1.8M	RC20BF185K
R67	Composition, 1.8M	RC20BF185K
R68	Composition, 1M	RC20BF105K
R69	Composition, 1K	RC20BF102K
R70	Composition, 470K	RC20BF474K
R71	Composition, 330K	RC20BF334K
R72	Composition, 270	RC20BF271K
R73	Composition, 33K	RC20BF333K
R74	Composition, 1K	RC20BF102K
R75	Composition, 22K	RC20BF223K
R76	Potentiometer, 500K 20%	RS20-139
R77	Composition, 1.5K	RC20BF153K
R78	Composition, 1.5K	RC20BF153K
R79	Composition, 1.5K	RC20BF153K
R80	Composition, 1.5K	RC20BF153K

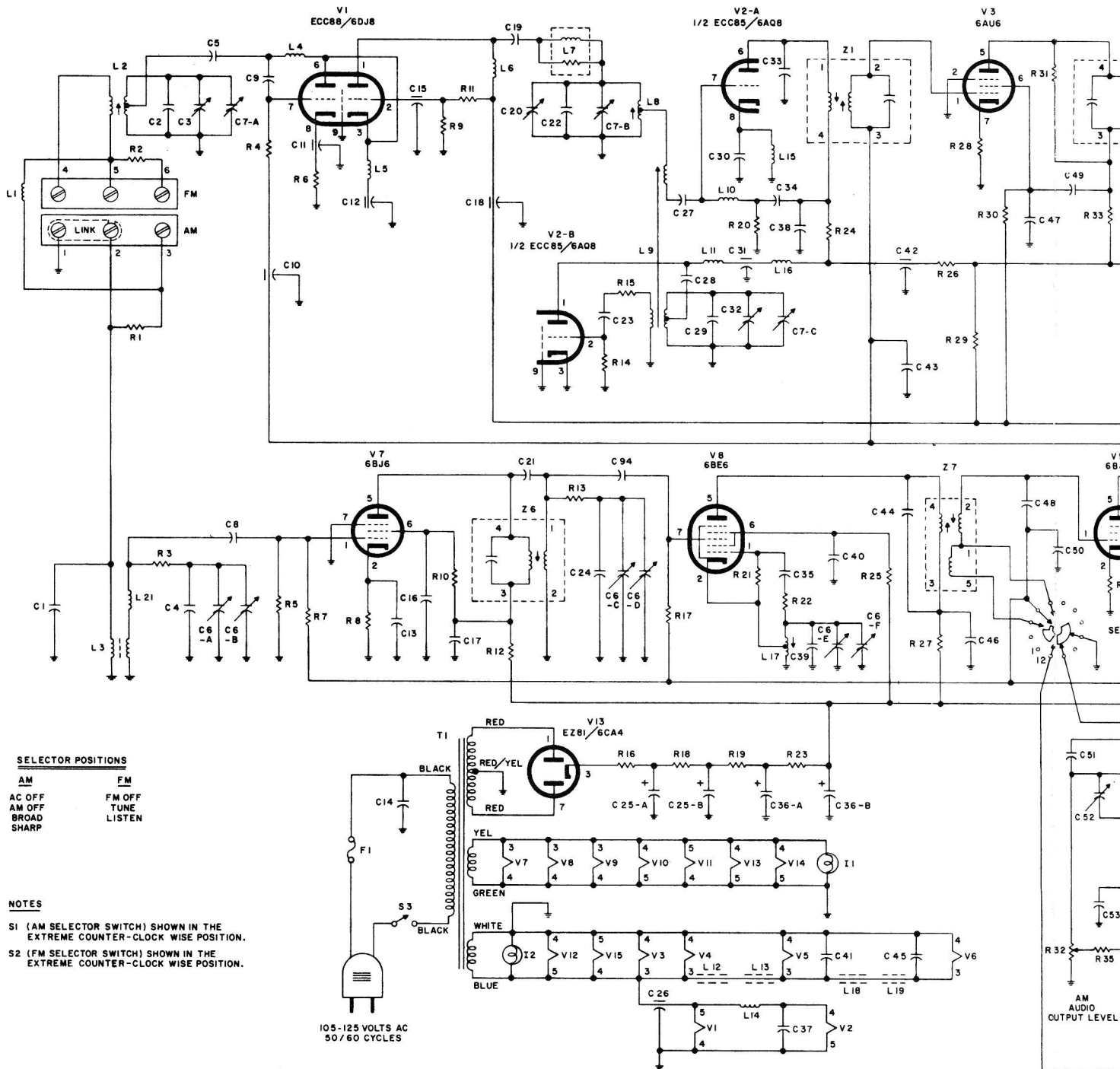
COILS, TRANSFORMERS, CHOICES

Symbol	Description	Order No.
L1	Choke, RF 3.3 Micro Henriess	L50066-8
L2	Coil, Tuned, FM Antenna	L62-124
L3	Coil, AM Antenna	L721-139
L4	Choke, RF 1.2 Micro Henriess	L50066-3
L5	Choke, RF .56 Micro Henriess	L50066-19
L6	Choke, RF	L629-180
L7	Coil, Tuned, FM-RF	L662-125
L8	Coil, Tuned, FM Oscillator	L662-126
L10, 11	Choke, RF 1.2 Micro Henriess	L50066-3
L12, 13	Choke, Ferrite Bead, Filament	L592-189
L14	Choke, RF 1.2 Micro Henriess	L50066-3
L15	Choke, RF .56 Micro Henriess	L50066-19
L16	Choke, RF 1.2 Micro Henriess	L50066-3
L17	Coil, AM Oscillator	L550-122
L18, 19	Choke, Ferrite Bead, Filament	L592-189
L20	Coil, 10K Filter	L644-120
L21	Loop, AM	L721-136
T1	Transformer, Power	T684-124
T2	Transformer, FM-IF	ZZ662-117
Z2, 3	Transformer, FM-IF	ZZ629-142
Z4	Coil, FM Limiter	L670-145
Z5	Transformer, FM Detector	ZZ592-170
Z6	Transformer, AM-RF	L670-151
Z7, 8	Transformer, AM-IF	ZZ509-132
Z9	Transformer, AM-IF	ZZ2984

MISCELLANEOUS

CR1, 2	Crystal Diodes, Matched Pair, FM Detector	V-1N542
F1	Fuse, 1 1/2 Ampere, Slo-Blo	F684-143
L1, 2	Lamp, Dial Edge Lighting	150082
S1	Switch, AM Selector	S684-123
S2	Switch, FM Selector	S684-120
S3	Switch, AC Power	Part of S1

SCHEMATIC DIAGRAM • FM-AM TUNER-4000R



SELECTOR POSITIONS

AM	FM
AC OFF	FM OFF
AM OFF	TUNE
BROAD	LISTEN
SHARP	

NOTES

S1 (AM SELECTOR SWITCH) SHOWN IN THE EXTREME COUNTER-CLOCK WISE POSITION.

S2 (FM SELECTOR SWITCH) SHOWN IN THE EXTREME COUNTER-CLOCK WISE POSITION.

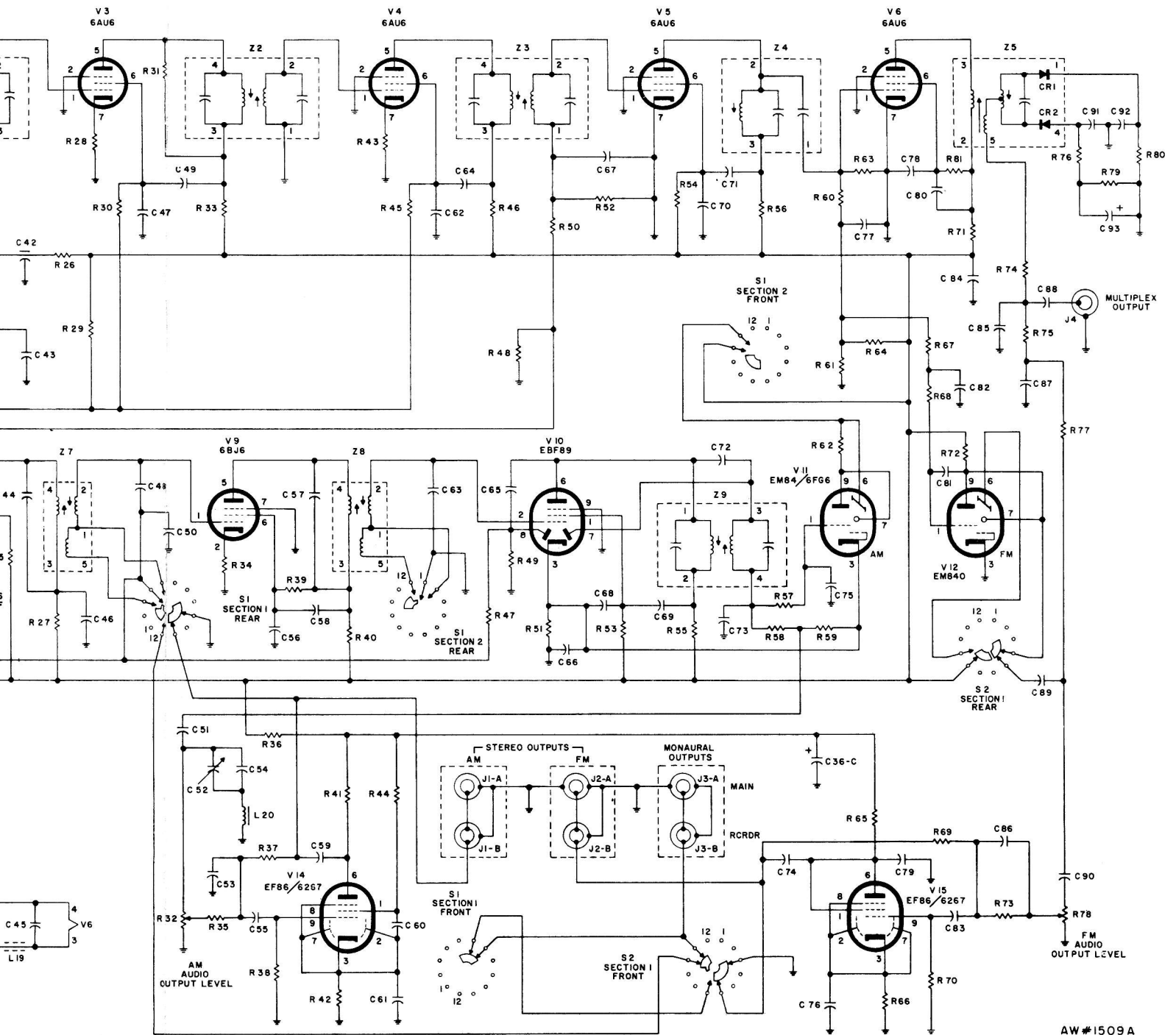
105-125 VOLTS AC
50/60 CYCLES

RESISTORS

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15	R16	R17	R18	R19	R20	R21	R22	R23	R24	R25	R26	R27	R28	R29	R30	R31	R32	R33	R34	R35
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CAPACITORS

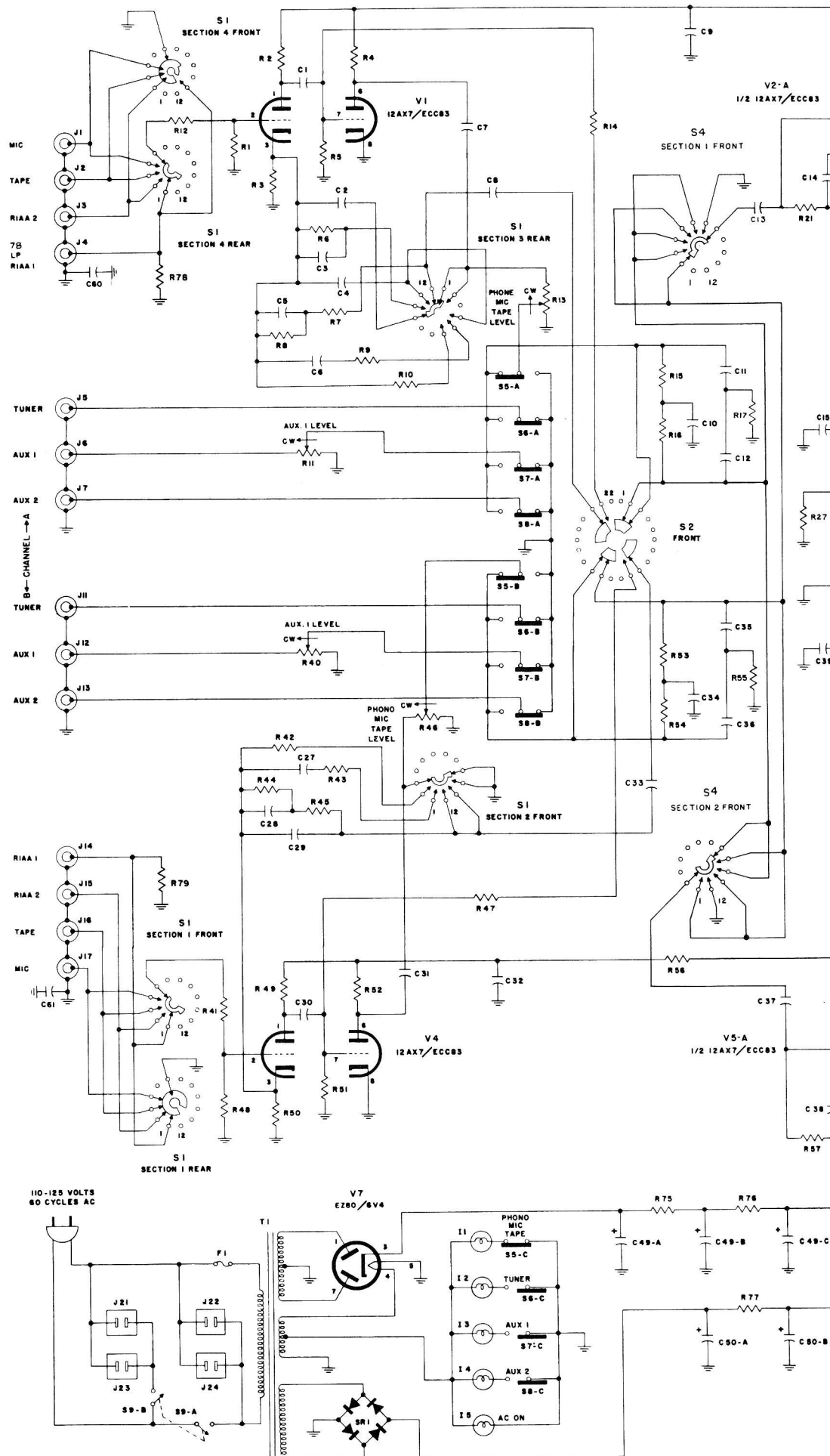
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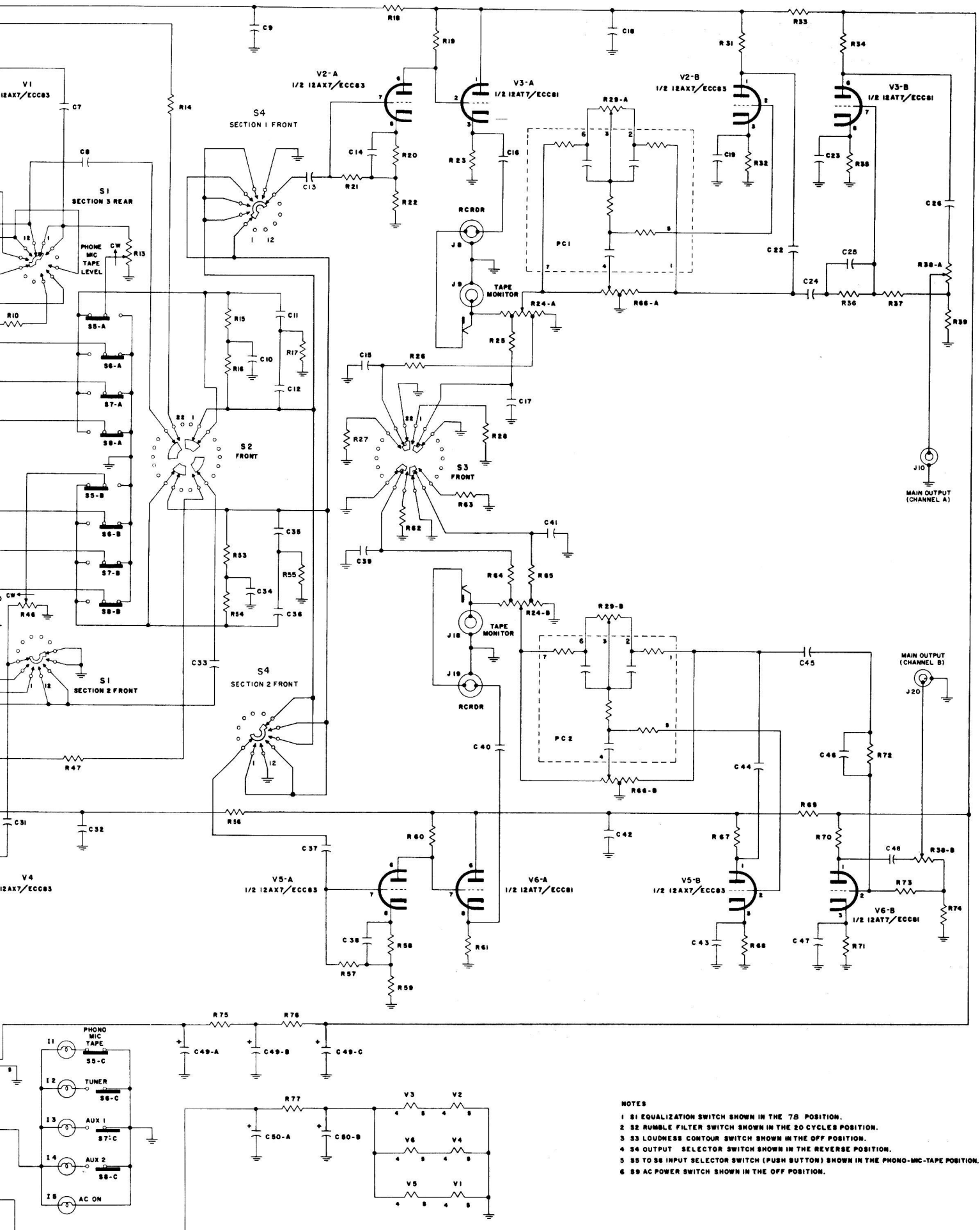


AW#1509A

R25	R26	R27	R28	R29	R30	R31	R32	R33	R34	R35	R36	R37	R38	R39	R40	R41	R42	R43	R44	R45	R46	R47	R48	R49	R50	R51	R52	R53	R54	R55	R56	R57	R58	R59	R60	R61	R62	R63	R64	R65	R66	R67	R68	R69	R70	R71	R72	R73	R74	R75	R76	R77	R78	R79	R80
F	C42	C43	C44	C45	C46	C47	C48	C49	C50	C51	C52	C53	C54	C55	C56	C57	C58	C59	C60	C61	C62	C63	C64	C65	C66	C67	C68	C69	C70	C71	C72	C73	C74	C75	C76	C77	C78	C79	C80	C81	C82	C83	C84	C85	C86	C87	C88	C89	C90	C91	C92	C93			

SCHEMATIC DIAGRAM • MASTER AUDIO CONTROL-4000C





NOTES

- 1 S1 EQUALIZATION SWITCH SHOWN IN THE 7B POSITION.
- 2 S2 RUMBLE FILTER SWITCH SHOWN IN THE 20 CYCLES POSITION.
- 3 S3 LOUDNESS CONTOUR SWITCH SHOWN IN THE OFF POSITION.
- 4 S4 OUTPUT SELECTOR SWITCH SHOWN IN THE REVERSE POSITION.
- 5 S5 TO S8 INPUT SELECTOR SWITCH (PUSH BUTTON) SHOWN IN THE PHONO-MIC-TAPE POSITION.
- 6 S9 AC POWER SWITCH SHOWN IN THE OFF POSITION.

PARTS DESCRIPTION LIST • MASTER AUDIO CONTROL-4000C

CAPACITORS

20% tolerance for all capacitors, unless noted otherwise.

Symbol	Description	Order No.
C1	Two in parallel; Ceramic disc, .005 uf, 500V	C-50089-1
C2	Ceramic, 220 uf, 10%, 1000V	C-50072-20
C3	Ceramic disc, 820 uf, 10%, 1000V	C-50072-7
C4	Ceramic disc, 390 uf, 10%, 1000V	C-50072-6
C5	Ceramic disc, 1800 uf, 10%, 1000V	C-50072-8
C6	Ceramic disc, 560 uf, 10%, 1000V	C-50072-14
C7	Molded, .022 uf, 10%, 125V	C-50074-18
C8	Ceramic disc, .005 uf, 500V	C-50089-1
C9	Electrolytic, four section: C9: 10 uf, 200V C18: 30 uf, 300V C32: 10 uf, 200V C42: 30 uf, 300V	C-657-126
C10	Molded, .01 uf, 10%, 250V	C-50074-25
C11, 12	Ceramic disc, .005 uf, 500V	C-50089-1
C13, 14	Molded, .01 uf, 10%, 250V	C-50074-25
C15	Molded, .047 uf, 10%, 250V	C-50074-27
C16	Molded, .047 uf, 250V	C-50074-29
C17	Molded, .022 uf, 10%, 250V	C-50074-26
C18	Electrolytic section, 30 uf	Part of C9
C19	Electrolytic, 25 uf, 6V	C-639-114
C20	Not used	—
C21	Not used	—
C22	Molded, 0.1 uf, 10%, 250V	C-50074-28
C23	Electrolytic, 25 uf, 6V	C-639-114
C24	Molded, .027 uf, 10%, 250V	C-50074-22
C25	Ceramic, 15 uf, NPO, 10%, 500V	CC20C159K5
C26	Molded, .047 uf, 250V	C-50074-29
C27	Ceramic disc, 560 uf, 10%, 1000V	C-50072-14
C28	Ceramic disc, 1800 uf, 10%, 1000V	C-50072-8
C29	Ceramic disc, 390 uf, 10%, 1000V	C-50072-6
C30	Two in parallel; Ceramic disc, .005 uf, 500V	C-50089-1
C31	Molded, .022 uf, 10%, 250V	C-50074-26
C32	Electrolytic section, 10 uf	Part of C9
C33	Ceramic disc, .005 uf, 500V	C-50089-1
C34	Molded, .01 uf, 10%, 250V	C-50074-25
C35, 36	Ceramic disc, .005 uf, 500V	C-50089-1
C37, 38	Molded, .01 uf, 10%, 250V	C-50074-25
C39	Molded, .022 uf, 10%, 250V	C-50074-26
C40	Molded, .047 uf, 250V	C-50074-29
C41	Molded, .047 uf, 10%, 250V	C-50074-27
C42	Electrolytic section, 30 uf	Part of C9
C43	Electrolytic, 25 uf, 6V	C-639-114
C44	Molded, 0.1 uf, 10%, 250V	C-50074-28
C45	Molded, .027 uf, 10%, 250V	C-50074-22
C46	Ceramic, 8 uf ±0.5 uf, NPO, 500V	CC30C10K005
C47	Electrolytic, 25 uf, 6V	C-639-114
C48	Molded, .047 uf, 250V	C-50074-29
C49	Electrolytic, three-section: C49 A: 30 uf, 400V C49 B: 30 uf, 350V C49 C: 30 uf, 350V	C-657-125
C50	Electrolytic, two-section: C50 A: 1000 uf, 30V C50 B: 1000 uf, 30V	C-546-116
C51-59	Not used	—
C60, 61	Ceramic, 100 uf, NI500, 10%, 1000V	C-50070-6

Note: Use C-546-116 to replace C-552-106 used on some units.

RESISTORS AND POTENTIOMETERS

In ohms, 10% tolerance, 1/2 watt, unless otherwise noted. K = Kiloohm, M = Megohm.

Symbol	Description	Order No.
R1	Composition, 100K	RC20BF104K
R2	Composition, 330K, 1W	RC30BF34K
R3	Composition, 220K, 1W	RC30BF272K
R4	Composition, 220K	RC20BF224K
R5	Composition, 10M	RC20BF104K
R6	Composition, 1.2M	RC20BF125K
R7	Composition, 270K	RC20BF274K
R8	Composition, 2.2M	RC20BF225K
R9	Composition, 120K	RC20BF124K
R10	Composition, 390K	RC20BF394K
R11	Potentiometer, 250K, level set	R-657-134
R12	Composition, 10K	RC20BF103K
R13	Potentiometer, 250K, level set	R-657-134
R14	Composition, 3.3M	RC20BF335K
R15, 16	Composition, 2.2M	RC20BF225K
R17	Composition, 1M	RC20BF105K
R18	Composition, 100K	RC20BF104K
R19	Composition, 220K	RC20BF224K
R20	Composition, 270K	RC20BF272K
R21	Composition, 2.2M	RC20BF225K
R22	Composition, 27K	RC20BF273K
R23	Composition, 56K, 1W	RC30BF563K
R24	Potentiometer, dual, volume: R24-A: 100K R24-B: 100K	R-730-118
R25	Composition, 10K	RC20BF103K
R26	Composition, 4700	RC20BF472K
R27	Composition, 8200	RC20BF822K
R28	Composition, 18K	RC20BF183K
R29	Potentiometer, dual, bass: R29-A: 1M R29-B: 1M	RS0160-5
R30	Composition, 470K	RC20BF474K
R31	Composition, 100K	RC20BF104K
R32	Composition, 1500	RC20BF152K
R33	Composition, 10K	RC20BF103K
R34	Composition, 47K, 1W	RC30BF473K
R35	Composition, 330	RC20BF331K
R36	Composition, 470K	RC20BF474K
R37	Composition, 330K	RC20BF334K
R38	Potentiometer, dual channel balance: R38-A: 25K R38-B: 25K	R-657-154
R39	Composition, 8200	RC20BF822K
R40	Potentiometer, 250K level set	R-657-134
R41	Composition, 10K	RC20BF103K
R42	Composition, 390K	RC20BF394K
R43	Composition, 120K	RC20BF124K
R44	Composition, 2.2M	RC20BF225K
R45	Composition, 270K	RC20BF274K
R46	Potentiometer, 250K, level set	R-657-134
R47	Composition, 3.3M	RC20BF335K
R48	Composition, 100K	RC20BF104K
R49	Composition, 330K, 1W	RC30BF34K
R50	Composition, 2700, 1W	RC30BF272K
R51	Composition, 10M	RC20BF104K
R52	Composition, 220K	RC20BF224K
R53	Composition, 2.2M	RC20BF225K
R54	Composition, 1M	RC20BF104K
R55	Composition, 100K	RC20BF103K
R56	Composition, 100K	RC20BF104K
R57	Composition, 2.2M	RC20BF225K
R58	Composition, 2700	RC20BF272K
R59	Composition, 27K	RC20BF273K
R60	Composition, 220K	RC20BF224K
R61	Composition, 56K, 1W	RC30BF563K
R62	Composition, 18K	RC20BF183K

R63	Composition, 8200	RC20BF822K
R64	Composition, 10K	RC20BF103K
R65	Composition, 4700	RC20BF472K
R66	Potentiometer, dual, treble: R66-A: 500K R66-B: 500K	RS0160-4
R67	Composition, 100K	RC20BF104K
R68	Composition, 1500	RC20BF152K
R69	Composition, 10K	RC20BF103K
R70	Composition, 47K, 1W	RC30BF473K
R71	Composition, 330	RC20BF331K
R72	Composition, 470K	RC20BF474K
R73	Composition, 330K	RC20BF334K
R74	Composition, 8200	RC20BF822K
R75, 76	Composition, 1200, 1W	RC30BF122K
R77	Composition, 10, 2W	RC40BF100K
R78, 79	Composition, 100K	RC20BF104K

MISCELLANEOUS

Symbol	Description	Order No.
F1	Fuse, 0.5 ampere	F-3297
I1-5	Lamp, channel indicator, AC pilot	A-50118
J1-4	Jack, dual	J-50081-1
J5-7	Jack, triple	J-50081-3
J8, 10	Jack, dual	J-50081-1
J9	Jack, shorting, monitor	J-50088
J11-13	Jack, triple	J-50081-3
J14-17	Jack, dual	J-50081-1
J18	Jack, shorting, monitor	J-50088
J19, 20	Jack, dual	J-50081-1
J21-24	Receptacle, auxiliary AC	J-546-129
PC1, 2	Printed kfi, tone control	P-657-140
S1	Switch, equalization selector	S-657-131
S2	Switch, rumble, filter	S-657-132
S3	Switch, loudness contour	S-657-138
S4	Switch, output selector	S-657-150
S5-8	Switch assembly, four pushbuttons, input channel selector	S-657-129
SR	Part of R24	—
SR-50093	Selenium rectifier, filament supply	SR-50093
T1	Transformer, power	T-657-115
AS-50004-1	Shielded cable, 4 feet, with molded plugs	AS-50004-1
P-1031	Plug, standard RETMA	P-1031

MECHANICAL PARTS

Symbol	Description	Order No.
Jewel, red, AC pilot	1-50147-1	
Jewel, green, channel indicator	1-50147-4	
Retaining ring, jewel	A-50007	
Knob, with gold triangle	E-50108-2	
Knob, pushbutton	E-546-108	
Knob, lever	E-546-135	
Knob, dual rear	E50152	
Knob, dual front	E50153-1	
Fuse holder, with cover	X-1036	
Tube shield	E-3287	
Bottom cover	AS-657-143	

MOUNTING HARDWARE

Symbol	Description	Order No.
1/2-inch shelf mounting:	H1215383AA	
Machine screw, 1-inch/8-32/RH, four required	H1215383AA	
Stand-off washer, 1/4-inch, four required	A-657-147	
3/4-inch self mounting:	H1215383AA	
Machine screw, 1-inch/8-32/RH, four required	H1215383AA	
Flat washer, four required	H101W106AA	
Leg mounting, without cabinet:	H101W106AA	
Plastic leg, four required	H-657-145	
Machine screw, 1/2-inch/8-32/RH, four required	H1215378AA	

VOLTAGE AND RESISTANCE MEASUREMENTS

MASTER AUDIO CONTROL-4000C

All readings below taken with a vacuum-tube voltohmmeter with respect to chassis ground. All input selector pushbuttons out, and level set adjustments at minimum. Volume control at minimum. Bass, treble, and channel balance controls at mid-position. Loudness contour control off. Rumble filter at 20 cycles. Equalization selector at RIAA 1. Output selector at STANDARD.

Voltage Reference Chart

Set line voltage at 117 volts AC, 50-60 cycles. All readings are in DC volts with respect to chassis ground. Allow 15-minute instrument warm-up before taking measurements.

SYMBOL TUBES	TUBE SOCKET TERMINAL NUMBERS								
	1	2	3	4	5	6	7	8	9a
V1	85	0	P	12.6	0	90	N	0	6.3
V2	170	0	1.3	12.6	0	155	N	15	6.3
V3	265	155	155	25.2	12.5	125	0	1.3	18.9
V4	85	0	P	12.6	0	90	N	0	6.3
V5	170	0	1.3	25.2	12.6	155	6.3	15	18.9
V6	125	0	1.3	25.2	12.6	265	155	155	18.9
V7	300 AC	X	365	6.3 AC	0	X	300 AC	X	X
SUPPLY CAPACITORS	TERMINAL SYMBOLS		VOLTAGE		CHART NOTES AC Reading in AC volts N Less than 1 volt DC, negative P Less than 1 volt DC, positive X No connection a Dual-filament junction, V1-V6 c Sections of C9 (See parts list)				
C9	▲		185						
C18c	■		265						
C32c	—		185						
C42c	◐		265						
C49-A	◑		365						
C49-B	■		340						
C49-C	▲		320						
C50-A	▲		30						
C50-B	◐		25						

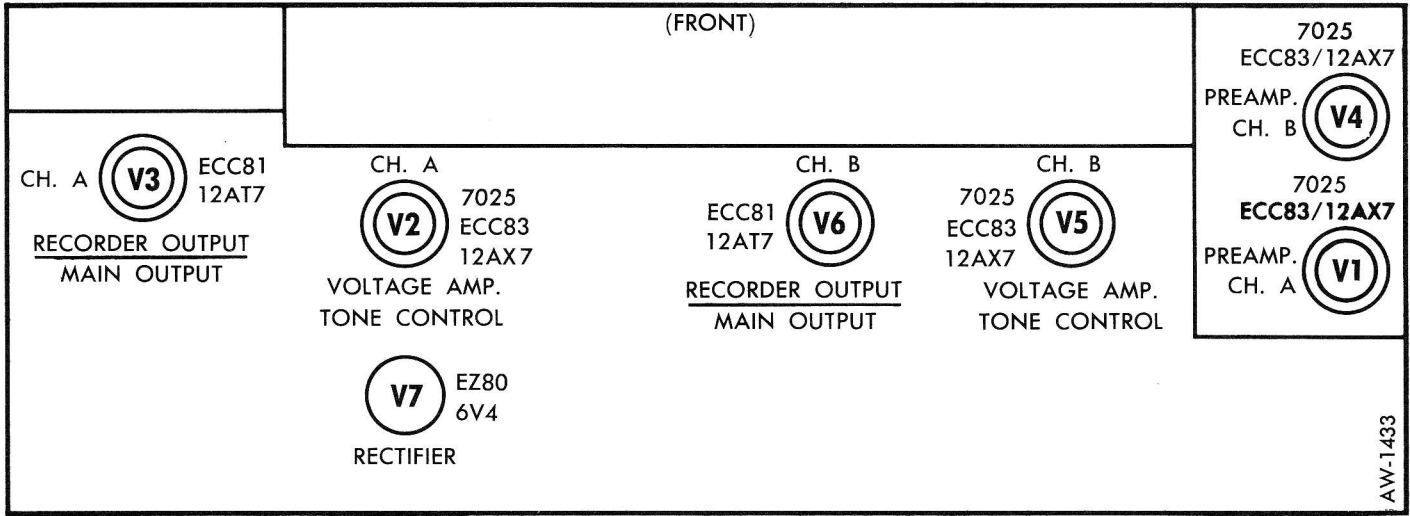
Resistance Reference Chart

Disconnect the chassis AC power cord. Discharge all electrolytic capacitors to chassis ground through a 100-ohm resistor. Disconnect all cables to associated equipment. Readings are in ohms with respect to chassis ground.

SYMBOL TUBES	TUBE SOCKET TERMINAL NUMBERS								
	1	2	3	4	5	6	7	8	9a
V1	350K+	100K	2700	12+	0	350K+	10M	0	8+
V2	350K+	450K	1500	12+	0	350K+	2.2M	30K	8+
V3	350K+	350K+	56K	12+	12+	350K+	340K	330	12+
V4	350K+	100Kb	2700	12+	0	350K+	10M	0	8+
V5	350K+	450K	1500	12+	12+	350K+	2.2M	30K	12+
V6	350K+	340K	330	12+	12+	350K+	350K+	56K	12+
V7	135	X	350K+	L	0	X	135	X	X
SUPPLY CAPACITORS	TERMINAL SYMBOLS		RESISTANCE		CHART NOTES K Kilohm L Less than 1 ohm M Megohm X No connection + Minimum reading, rising as electrolytic capacitors charge. a Dual-filament junction, V1-V6 b 9K reading with equalization selector in EUR or LP position. c Sections of C9 (See parts list)				
C9	▲		350K+						
C18c	■		350K+						
C32c	—		350K+						
C42c	◐		350K+						
C49-A	◑		350K+						
C49-B	■		350K+						
C49-C	▲		350K+						
C50-A	▲		21+						
C50-B	◐		12+						

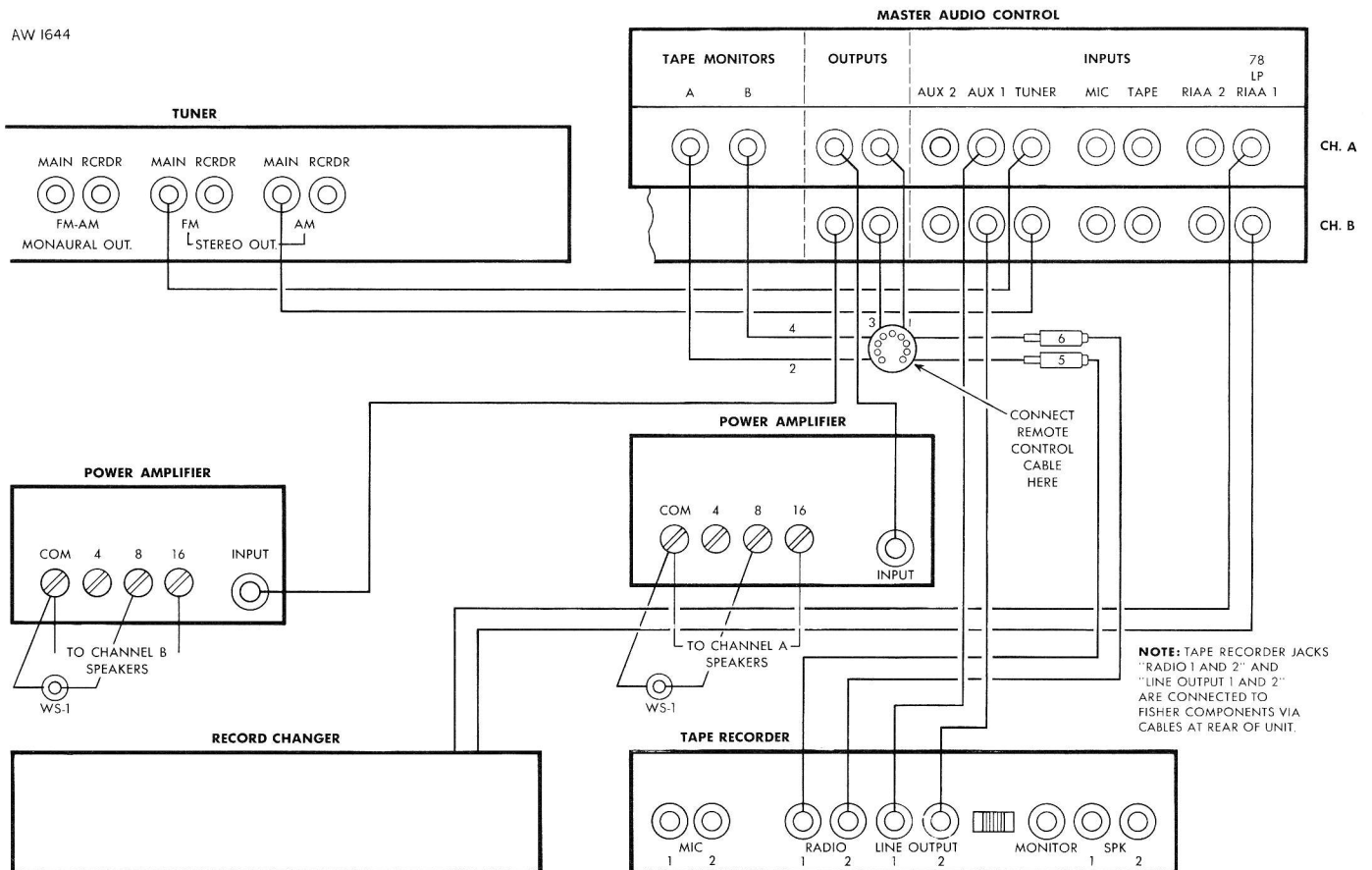
TUBE LAYOUT

MASTER AUDIO CONTROL-4000C



COMPONENT HOOK-UP CHART

AW 1644



AW 1644

PARTS DESCRIPTION LIST AMPLIFIER 100

TUBE LAYOUT AMPLIFIER 100

CAPACITORS

20 % tolerance for all capacitors, unless otherwise noted.

Symbol	Description	Part No.
C1	Mylar, .022uf, 10 %, 250V	C50197-49
C2	Ceramic, 300uuf, 10 %, 500V	CC21GP301K5
C3	Ceramic, 120uuf, 10 %, 500V	CC21GP121K5
C4, 5	Molded tubular, .022uf, 400V	C68P223M4
C6, 7	Molded tubular, .047uf, 400V	C68P473M4
C8	Electrolytic, 50uf, 50V	C-508-115
C9	Molded tubular, .01uf, 600V	C-2747
C10	Electrolytic, two-section, each 40uf, 500V	C-522-114
C11	Electrolytic, two-section, each 40uf, 450V	C-1798
C12	Mylar, .01uf, 10 %, 250V	C50197-48

RESISTORS

Values in ohms, 10 % tolerance, 1/2 watt, unless otherwise noted. K=Kilohms. M=Megohms.

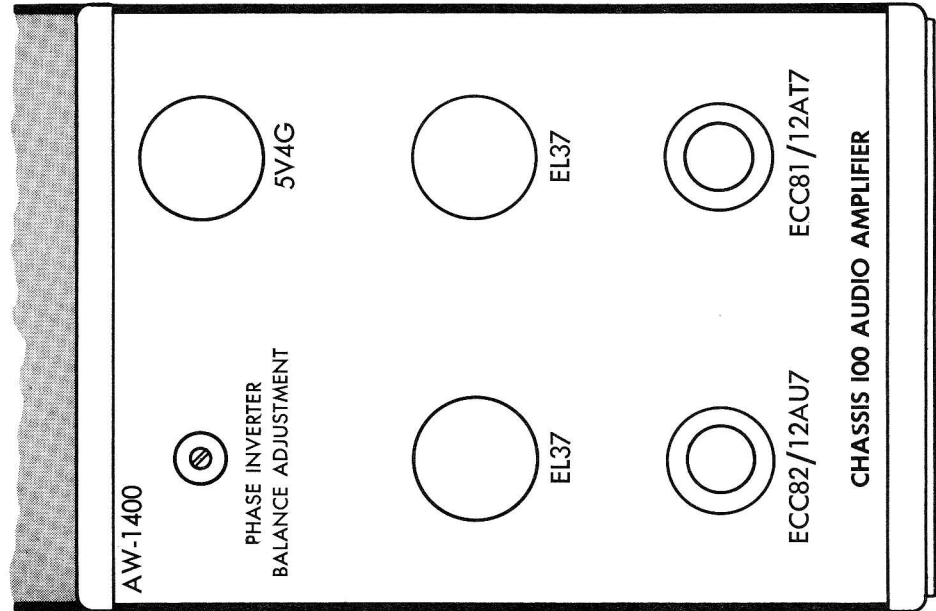
Symbol	Description	Part No.
R1	Potentiometer, composition, 500K, 1/4 W, input level	R-2815-9
R2	Composition, 1500	RC20BF152K
R3	Composition, 220K	RC20BF224K
R4	Composition, 470K	RC20BF474K
R5	Composition, 82K	RC20BF823K
R6	Potentiometer, composition, 50K, 1/4 W, phase inverter balance	R-50000-5
R7	Composition, 100K	RC20BF104K
R8, 9	Composition, 470K	RC20BF474K
R10	Composition, 270K	RC20BF272K
R11, 12	Composition, 150K	RC20BF154K
R13, 14	Composition, 470K	RC20BF474K
R15, 16	Composition, 68	RC20BF680K
R18	Composition, 4700	RC20BF472K
R19	Composition, 2200	RC20BF222K
R20	Composition, 330	RC20BF331K
R23, 24	Composition, 10K, 1W	RC30BF103K

TRANSFORMERS

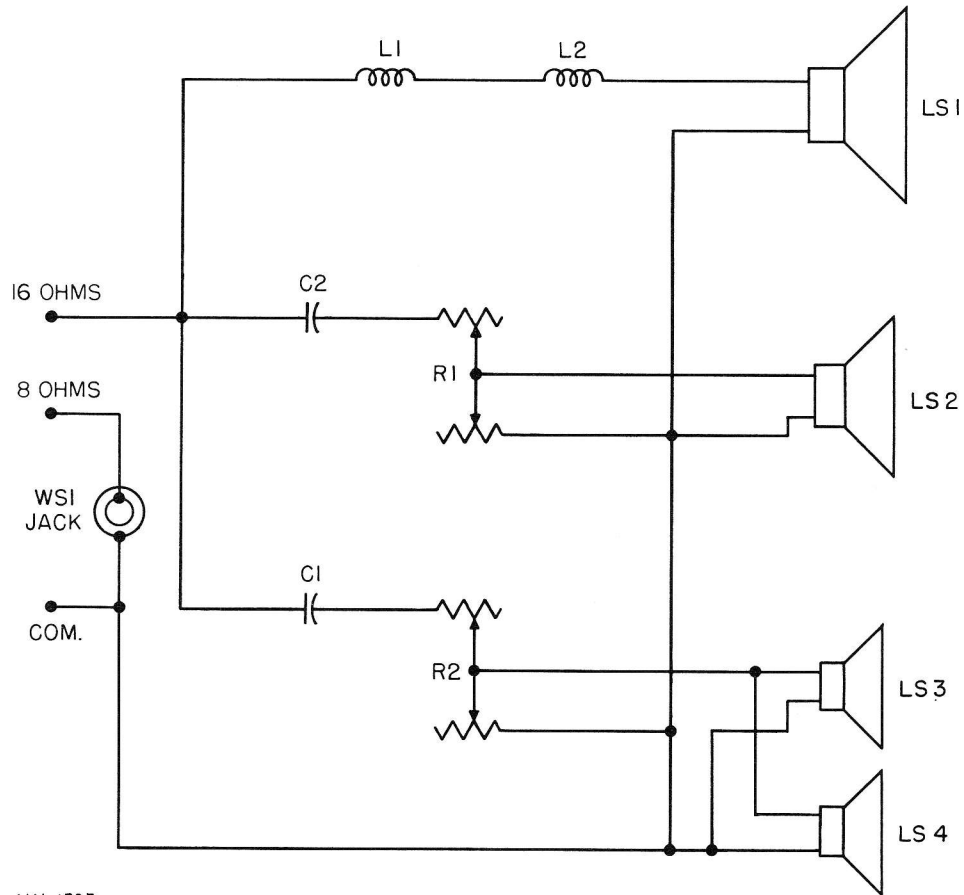
Symbol	Description	Part No.
T1	Transformer, output	T-557-145
T2	Transformer, power	T-649-114

MISCELLANEOUS

Symbol	Description	Part No.
F1	Fuse, 3 ampere	F-3000
J1	Jack, input	J-3143
J2	Receptacle, auxiliary AC	J-546-129



SCHEMATIC DIAGRAM • SPEAKER SYSTEMS



AW 1727

PARTS DESCRIPTION LIST • SPEAKER SYSTEMS

Symbol	Description	Part No.
C1, C2	Capacitor, 2uf, 50V	C547-118
L1, L2	Coil, Crossover, 3MH	L547-120
LS1	Speaker, Woofer, 15-Inch	LS776-105
LS2	Speaker, Mid-Range, 8-Inch	LS547-123
LS3, LS4	Speakers, Tweeter	LS769-104



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