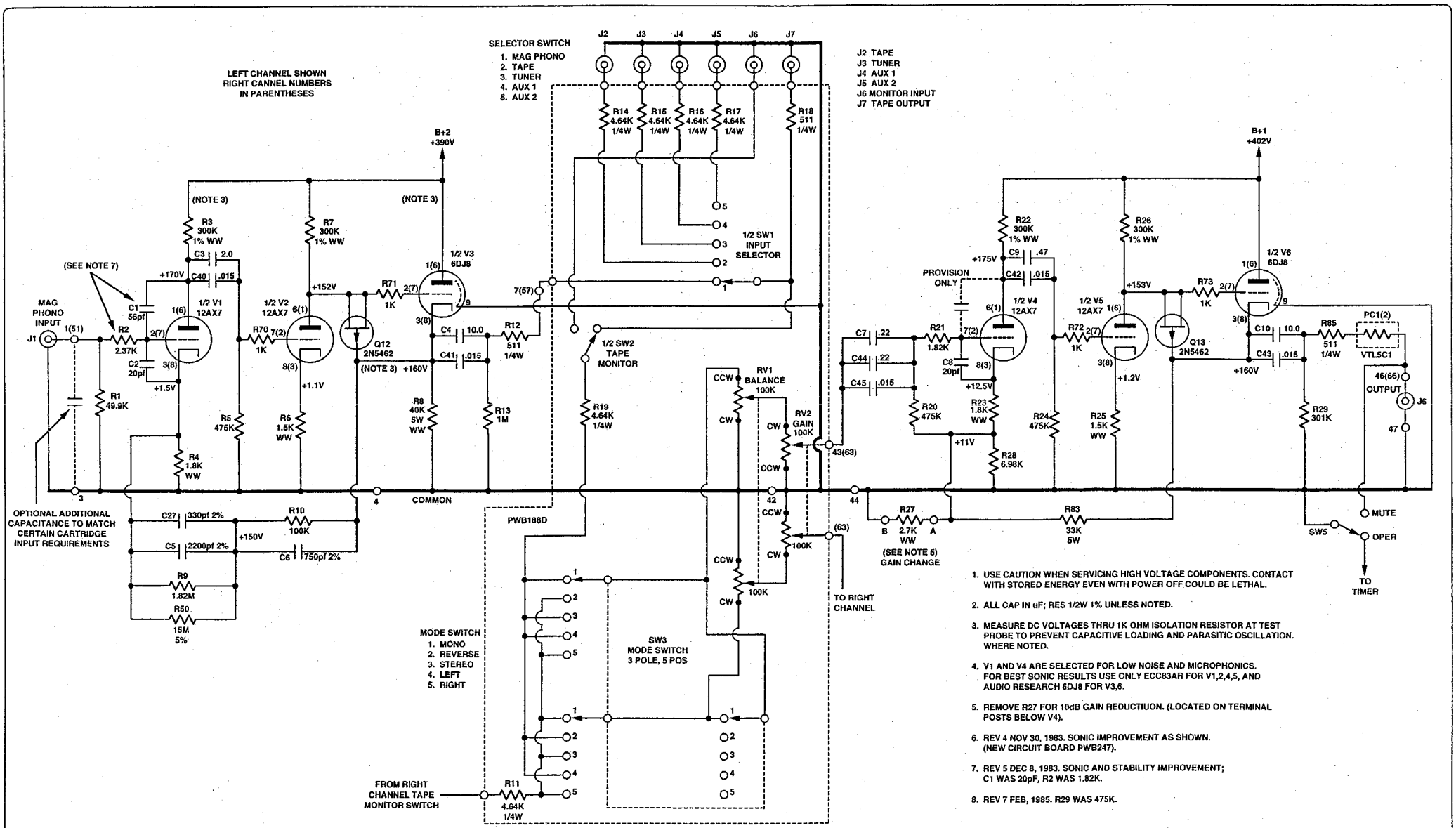
audio research
HIGH DEFINITION®

3900 ANNAPOLIS LANE NORTH / PLYMOUTH, MINNESOTA 55447-5447 / PHONE: 763-577-9700 FAX 763-577-0323

SP8 PREAMPLIFIER

SCHEMATIC

Rev. 7
12-27-01

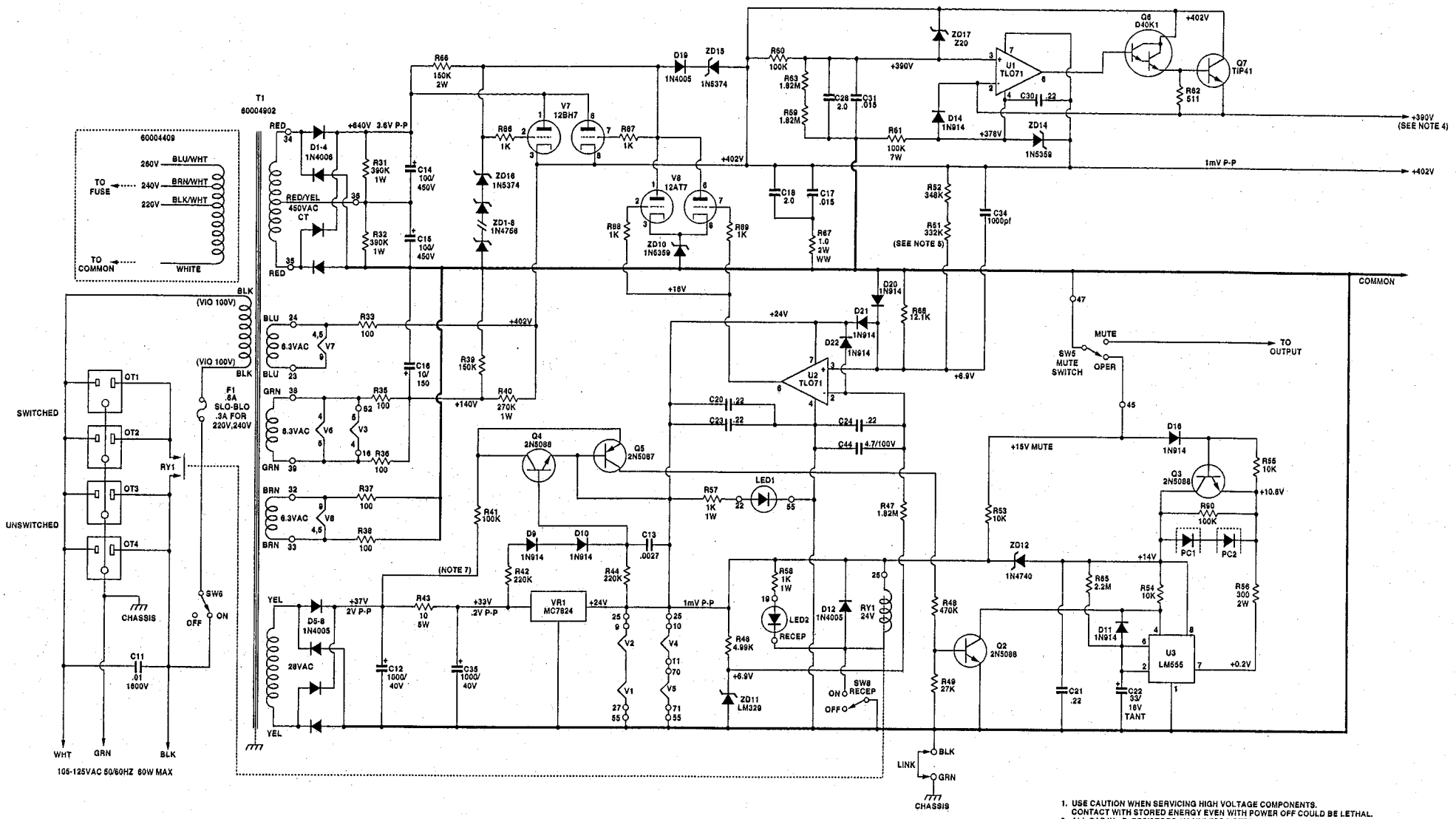


1. USE CAUTION WHEN SERVICING HIGH VOLTAGE COMPONENTS. CONTACT WITH STORED ENERGY EVEN WITH POWER OFF COULD BE LETHAL.
2. ALL CAP IN uF; RES 1/2W 1% UNLESS NOTED.
3. MEASURE DC VOLTAGES THRU 1K OHM ISOLATION RESISTOR AT TEST PROBE TO PREVENT CAPACITIVE LOADING AND PARASITIC OSCILLATION. WHERE NOTED.
4. V1 AND V4 ARE SELECTED FOR LOW NOISE AND MICROPHONICS. FOR BEST SONIC RESULTS USE ONLY ECC83AR FOR V1,2,4,5, AND AUDIO RESEARCH 6DJ8 FOR V3,6.
5. REMOVE R27 FOR 10dB GAIN REDUCTIUON. (LOCATED ON TERMINAL POSTS BELOW V4).
6. REV 4 NOV 30, 1983. SONIC IMPROVEMENT AS SHOWN. (NEW CIRCUIT BOARD PWB247).
7. REV 5 DEC 8, 1983. SONIC AND STABILITY IMPROVEMENT; C1 WAS 20pF, R2 WAS 1.82K.
8. REV 7 FEB, 1985. R29 WAS 475K.

SP8
AUDIO REV 7
PAGE 1 OF 2
12/27/01

AUDIO RESEARCH CORPORATION
3900 ANNAPOLIS LANE NORTH
PLYMOUTH, MN 55447-5447

PROPRIETARY NOTICE: THIS DRAWING CONTAINS PATENTED, PATENT APPLIED FOR, AND/OR OTHER CIRCUITRY CONSIDERED PROPRIETARY BY AUDIO RESEARCH CORPORATION AND IS FURNISHED ON A CONFIDENTAL BASIS FOR IDENTIFICATION PURPOSES ONLY.



1. USE CAUTION WHEN SERVICING HIGH VOLTAGE COMPONENTS. CONTACT WITH STORED ENERGY EVEN WITH POWER OFF COULD BE LETHAL.
2. ALL CAP IN uF; RESISTORS 1% UNLESS NOTED.
3. ALL VOLTAGES AT 120VAC 60HZ LINE.
4. MEASURE DC VOLTAGES THRU 1K OHM ISOLATION RESISTOR WHERE NOTED, TO MINIMIZE CAPACITIVE LOADING EFFECTS.
5. R51 MAY BE 348K OR 357K TO TRIM +402V WITH SOME ZD11.
6. REV 4 NOV. 30, 1983 SONIC IMPROVEMENT AS SHOWN. (NEW CIRCUIT BOARD PWB247).
7. REV 5 DEC. 8, 1983 CORRECTION TO ACTIVATE LOW LINE VOLTAGE MUTING. (R41 WAS INCORRECTLY CONNECTED TO C35.)
8. REV 7 FEB, 1985 HV SLOW START. R31,32 WERE 270K. ADDED D22,R90,C44.

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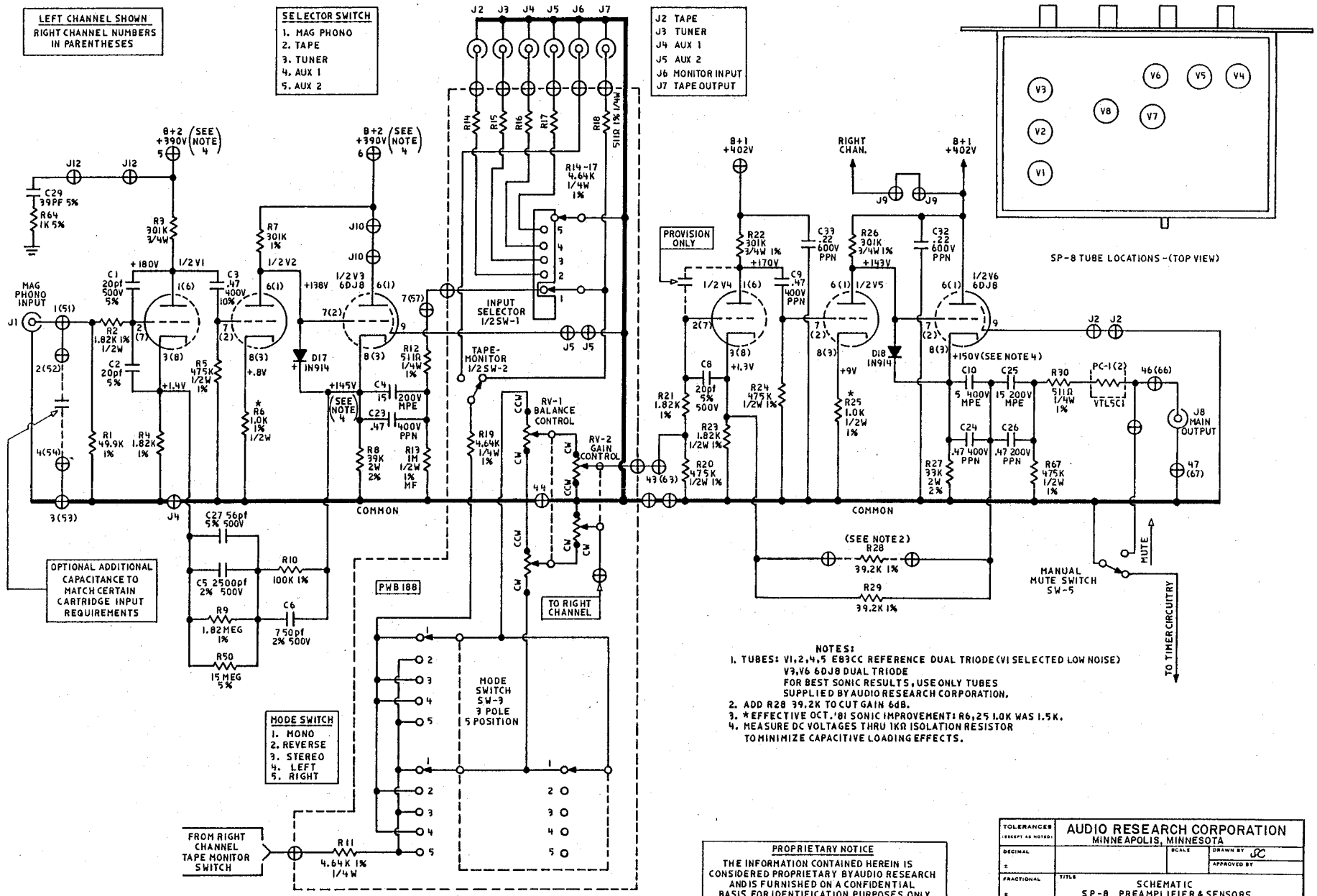
SP-8 PARTS LIST

COMPONENT	QUAN.	DESCRIPTION	VALUE	RATING	TOL.	ARC PART NO.
V1,2,4,5	4	ECC83AR				32001300
V3,6	2	6DJ8				32001100
V7	1	12BH7A				32001200
V8	1	12AT7				32000900
D1-4	4	1N4006	1A	800V		30502200
D5-8,12,19	6	1N4005	1A	600V		30500400
D9,10,11,14,16 20,21	7	1N914		100V		30500900
ZD1-8	8	1N4756A Zener	47V	1W		30503200
ZD10,14	2	1N5359A Zener	24V	5W		30503500
ZD11	1	LM329DZ Zener Ref.	6.9V			31000700
ZD12	1	1N4740A Zener	10V	1W		30500300
ZD15,16	2	1N5374A Zener	75V	5W		30502900
ZD17	1	Z20 Zener	20V	1W		30503700
LED1,2	2	LED Green				34300100
Q2,3,4	3	2N5088 Trans	NPN			30003100
Q5	1	2N5087 Trans	PNP			30003000
Q6	1	D40K1 Trans	Darl NPN			30005200
Q7	1	TIP41 Trans				30005000
Q12, 13	4	2N5462 FET	P-Chan			30005900
RV1	1	Balance Control	100K	LinTaper	10%	45100525
RV2	1	Gain Control	100K	LogTaper	10%	45100528
VR1	1	MC7824CK	24V	1A		31001200
U1,2	2	TL071CP Op Amp				31001900
U3	1	LM555CN Timer				31000800
PC1,2	2	VTL5C1 Photocoupler				34400100
R1	2	Metal Film	49.9K	1/2W	1%	42499403
R2	2	Metal Film	2.37K	1/4W	1%	42237302
		Metal Film	1.82K	1/2W	1%	42182303
R3,7,22,26	8	Wirewound	300K	0.2W	1%	43300501
R4,23	4	Wirewound	1.8K	1W	1%	43182300
R5,20,24,29	8	Metal Film	475K	1/2	1%	42475503
R6,25	4	Wirewound	1.5K	2W	1%	43150302
R8	2	Wirewound	40K	5W	3%	43400400
R9,47,59,63	5	Metal Film	1.82Meg	1/2W	1%	42182603
R10,60	3	Metal Film	100K	1/2W	1%	42100503
R11,14-17,19	10	Metal Film	4.64K	1/4W	1%	42464302
R12,18,62,85	7	Metal Film	511	1/4W	1%	42511202
R13	2	Metal Film	1Meg	1/2W	1%	42100603
R21	2	Metal Film	1.82K	1/2W	1%	42182303
R27	2	Wirewound	2.70K	2W	1%	43270301
R28	2	Metal Film	6.98K	1/2W	1%	42698303
R31,32	2	Carbon	270K	2W	10%	40270505
R33,35-38	5	Carbon	100	1/2W	10%	40100203
R39	1	Carbon	150K	1/2W	5%	41150503
R40	1	Carbon	270K	1W	5%	41270504
R41	1	Carbon	100K	1/4W	5%	41100502
R42,44	2	Carbon	220K	1/4W	5%	41220502
R43	1	Wirewound	10	5W	5%	43100104
R46	1	Metal Film	4.99K	1/2W	1%	42499303
R48	1	Carbon	470K	1/4W	5%	41470502
R49	1	Carbon	27K	1/4W	5%	41270402
R50	2	Carbon	15Meg	1/2W	5%	41150703
R51	1	Metal Film	332K	1/2W	1%	42332503
R52	1	Metal Film	348K	1/2W	1%	42348503
R53-55	3	Carbon	10K	1/4W	5%	41100402

SP-8 PARTS LIST

COMPONENT	QUAN.	DESCRIPTION	VALUE	RATING	TOL.	ARC PART NO.
R56	1	Wirewound (M. Film)	300	2W	5%	43300200
R57,58	2	Carbon	1K	1W	5%	41100304
R61	1	Wirewound	100K	7W	5%	43100500
R65	1	Carbon	2.2Meg	1/4W	5%	41220602
R66	1	Metal Film	150K	2W	2%	46150500
R67	1	Wirewound	1.0	2W	5%	43100002
R68	1	Metal Film	12.1K	1/2W	1%	42121403
R70,71,86,87	6	Metal Film	1K	1/4W	1%	42100302
R72,73,88,89	6	Metal Film	1K	1/2W	1%	42100303
R83	2	Wirewound	33K	5W	1%	43330400
C1	2	Polystyrene	56pF	630V	2.5%	53560102
		Polystyrene	20pF	630V	5%	53200101
C2,8	4	Polystyrene	20pF	630V	5%	53200101
C3,18,28	4	Polypropylene	2uF	450V	10%	53200602
C4,10	4	Polypropylene	10uF	250V	10%	53100700
C5	2	Polystyrene	2200pF	160V	2.5%	53220302
C6	2	Polystyrene	750pF	160V	2.5%	53750200
C7,20,21,23 24,30,44	9	Polypropylene	.22uF	100V	10%	53220506
C9	2	Polypropylene	.47uF	450V	10%	53470509
C11	1	Polyester	.01uF	1600V	10%	53100403
C12,35	2	Electrolytic	1000uF	40V		50100904
C13	1	Polyester	.0027uF	200V	10%	53270301
C14,15	2	Electrolytic	100uF	450V		50100802
C16	1	Electrolytic	10uF	150V		50100703
C17,31,40-43,45	12	Polystyrene	.015uF	630V	5%	53150404
C22	1	Tantalum	33uF	10V	10%	51330700
C27	2	Polystyrene	330pF	160V	2.5%	53330200
C34	1	Polystyrene	1000pF	630V	5%	53100301
F1 120V	1	Fuse, Slo-Blo	0.6A	250V		34500220
240V			0.3A	250V		34500120
T1	1	Transformer		120V		60004402
		Transformer		100V		60004403
		Transformer		240V		60004409
OT1-4	4	AC Receptacle				23201300
SW1	1	Input Selector Sw.	2Pole	5Position		24001000
SW2	1	Tape Monitor Sw.	DPDT	Gold		24100400
SW3	1	Mode Switch	3Pole	5Position		24000700
SW5	1	Mute-Operate Sw.	DPDT	Gold		24100400
SW6	1	On-Off Switch	DPDT	Silver		24100700
SW8	1	Receptacle Sw.	DPDT	Silver		24100700
RY1	1	Relay 24V	SPST	N.O.		64100600
J1-J16	16	Phono Jack				23201000

NOTE: Resistor values are in "ohms" except "K" = x 1,000; "Meg" = x 1,000,000



NOTES:

1. TUBES: V1,2,4,5 E83CC REFERENCE DUAL TRIODE (V1 SELECTED LOW NOISE)
   V3,V6 6DJ8 DUAL TRIODE
   FOR BEST SONIC RESULTS, USE ONLY TUBES SUPPLIED BY AUDIO RESEARCH CORPORATION.
2. ADD R28 39.2K TO CUT GAIN 6dB.
3. *EFFECTIVE OCT. '81 SONIC IMPROVEMENT: R6, 25 1.0K WAS 1.5K.
4. MEASURE DC VOLTAGES THRU 1KΩ ISOLATION RESISTOR TO MINIMIZE CAPACITIVE LOADING EFFECTS.

PROPRIETARY NOTICE

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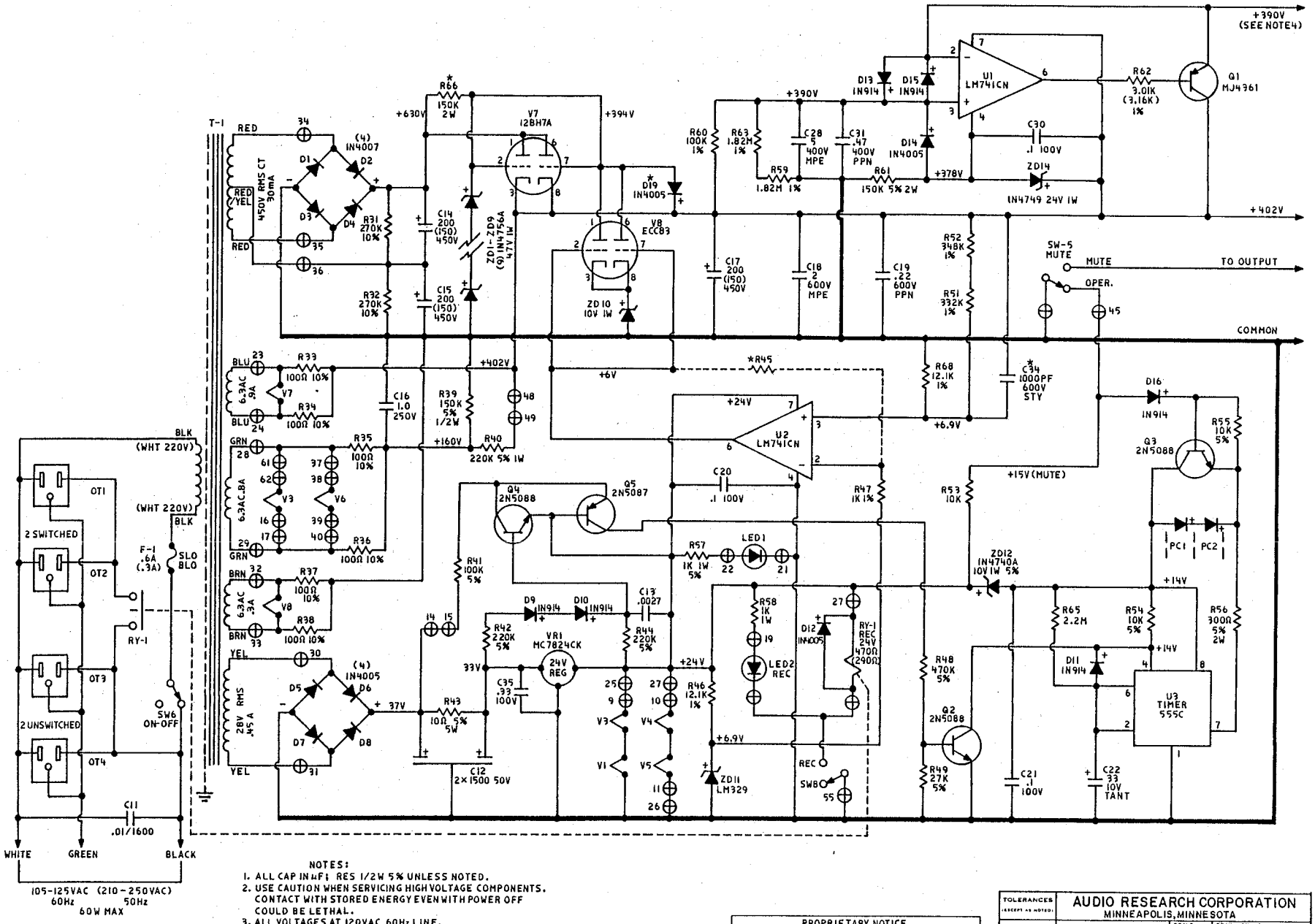
TOLERANCES (EXCEPT AS NOTED)	AUDIO RESEARCH CORPORATION MINNEAPOLIS, MINNESOTA
DECIMAL ±	SCALE
	DRAWN BY JRC
	APPROVED BY
FRACTIONAL ±	TITLE SCHEMATIC SP-8 PREAMPLIFIER & SENSORS
ANGULAR ±	DATE 7-1-81.
	DRAWING NUMBER 910079-10 A



NOTES:

1. ALL CAP IN μF; RES 1/2W 5% UNLESS NOTED.
2. USE CAUTION WHEN SERVICING HIGH VOLTAGE COMPONENTS. CONTACT WITH STORED ENERGY EVEN WITH POWER OFF COULD BE LETHAL.
3. ALL VOLTAGES AT 120VAC 60Hz LINE.
4. MEASURE DC VOLTAGES THRU 1KΩ ISOLATION RESISTOR TO MINIMIZE CAPACITIVE LOADING EFFECTS.
5. * EFFECTIVE OCT.'81 SONIC AND RELIABILITY IMPROVEMENT: ADDED C34 AND D19, R66 2W WAS 1/2W, R45 DELETED WAS 100K. LITZ WIRE ADDED.

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TOLERANCES (EXCEPT AS NOTED)	AUDIO RESEARCH CORPORATION MINNEAPOLIS, MINNESOTA
DECIMAL	SCALE / DRAWN BY / APPROVED BY
FRACTIONAL	TITLE: SCHEMATIC SP-8 POWER SUPPLY
ANGULAR	DATE: 7-1-81 / DRAWING NUMBER: 910078-10 A

SP-8 PARTS LIST

COMPONENT	QUAN.	DESCRIPTION	VALUE	RATING	TOL.	ARC PART NO.
V1,2,4,5	4	E83CC Reference				32001000
V3,6	2	6DJ8				32001100
V7	1	12BH7A				32001200
V8	1	ECC83/12AX7A				32000100
D1-4	4	IN4007(IN4006)	1A	1000V		30501000
D5-8,12,14,19	7	IN4005	1A	600V		30500400
D9-11,13,15-18	10	IN914		100V		30500900
ZD1-9	9	IN4756A Zener		47V	1W	30503200
ZD10,12	2	IN4740A Zener		10V	1W	30500300
ZD11	1	LM329DZ Zener Ref.		6.9V		31000700
ZD14	1	IN4749 Zener		24V	1W	30502500
LED 1,2	2	LED Green				34300100
Q1	1	MJ4361 Transistor				30004400
Q2,3,4	3	2N5088 Transistor				30003100
Q5	1	2N5087 Transistor				30003000
RV1	1	Balance Control	100K	LinTaper	10%	45100525
RV2	1	Gain Control	100K	LogTaper	10%	45100523
VR1	1	MC7824CK	24V	1A		31001200
U1,U2	1	LM741CN				31000400
U3	1	LM555CN Timer				31000800
PC1,2	2	VTL5C1 Photo Coupler		100V		34400100
R1	2	Metal Film	49.9K	1/2W	1%	42499403
R2,4,21,23	8	Metal Film	1.82K	1/2W	1%	42182303
R3,7,22,26	8	Metal Film	301K	3/4W	1%	42301504
R5,20,24,67	8	Metal Film	475K	1/2W	1%	42475503
R6,25	4	Metal Film	1.0K	1/2W	1%	42100303
		Metal Film	1.5K	1/2W	1%	42150303
R8	2	Metal Film	39K	2W	2%	46390401
R9,59,63	4	Metal Film	1.82Meg	1/2W	1%	42182603
R10,60	3	Metal Film	100K	1/2W	1%	42100503
R11,14-17,19	10	Metal Film	4.64K	1/4W	1%	42464302
R12,18,30	6	Metal Film	511Ω	1/4W	1%	42511202
R13	2	Metal Film	1.0Meg	1/2W	1%	42100603
R27	2	Metal Film	33K	2W	2%	46330401
R29(R28)	2	Metal Film	39.2K	1/2W	1%	42392403
R31,32	2	Carbon	270K	2W	10%	40270505
R33-38	6	Carbon	100Ω	1/2W	10%	40270505
R39	1	Carbon	150K	1/2W	5%	41150503
R40	1	Carbon	220K	1W	5%	41220504
R41	1	Carbon	100K	1/4W	5%	41100502
R42,44	2	Carbon	220K	1/4W	5%	41220502
R43	1	Wirewound	10Ω	5W	5%	43100104
R45		Metal Film	100K	1/4W	1%	42100502
R46,68	2	Metal Film	12.1K	1/2W	1%	42121403
R47	1	Metal Film	1K	1/4W	1%	42100302
R48	1	Carbon	470K	1/4W	5%	41470502

SP-8 PARTS LIST

COMPONENT	QUAN.	DESCRIPTION	VALUE	RATING	TOL.	ARC PART NO.
R49	1	Carbon	27K	1/4W	5%	41270402
R50	2	Carbon	15Meg	1/2W	5%	41150703
R51	1	Metal Film	332K	1/2W	1%	42332503
R52	1	Metal Film	348K	1/2W	1%	42348503
R53,54,55	3	Carbon	10K	1/4W	5%	41100402
R56	1	Wirewound (M. Film)	300Ω	2W	5%	43300200
R57,58	2	Carbon	1K	1W	5%	41100304
R61,66	2	Carbon	150K	2W	5%	41150505
		Metal Film	150K	1/2W	1%	42150503
R62	1	Metal Film	3.01K	1/2W	1%	42301303
R64	1	Carbon	1K	1/4W	5%	41100302
R65	1	Carbon	2.2Meg	1/4W	5%	41220602
C1,2,8	6	Dipped Mica	20pF	500V	5%	57200100
C3,9	4	Polypropylene	.47µF	400V	20%	53470506
C4,25	4	Polyester	15µF	200V	20%	53150700
C5	2	Dipped Mica	2500pF	500V	2%	57250301
C6	2	Dipped Mica	750pF	500V	2%	57750201
C10,28	3	Polyester	5µF	400V	10%	53500602
C11	1	Polyester	.01µF	1600V	10%	53100403
C12	1	Electrolytic	2x1500µF	50V		50150900
C13	1	Polyester	.0027µF	200V	10%	53270301
C14,15,17	3	Electrolytic	(150)200µF	450V		50200801
C16	1	Polypropylene	1.0µF	250V	20%	53100606
C18	1	Polyester	2µF	600V	10%	53200600
C19,32,33	3	Polypropylene	.22µF	600V	10%	53220505
C20,21,30	3	Ceramic Monolythic	.1µF	100V	10%	52100500
C22	1	Dipped Tantalum	33µF	10V	10%	51330700
C23,24,31	5	Polypropylene	.47µF	400V	20%	53470505
C26	2	Polypropylene	.47µF	200V	20%	53470507
C27	2	Dipped Mica	56pF	500V	5%	57560100
C29	1	Dipped Mica	39pF	500V	5%	57390100
C34	1	Polystyrene	1000pF	600V	5%	53100301
C35	1	Ceramic Monolythic	.33µF	100V	20%	52330500
F1	1	Slo-Blo 120V	0.6A	250V		34500220
		220V	0.3A	250V		34500120
T1	1	Transformer		120V		60004402
		Transformer		220V		60004406
OT1-4	4	AC Receptacle				23201300
SW1	1	Input Selector Switch	2Pole	5Pos		24001000
SW2	1	Tape Monitor Switch	DPDT	Gold		24100400
SW3	1	Mode Switch	3Pole	5Pos		24000700
SW5	1	Mute-Operate Switch	DPDT	Gold		24100400
SW6,8	1	On-Off Switch	DPDT	Silver		24100700
RY-1	1	Relay, 24V	SPST	N.O.		64100300
V1-J16	16	Phono Jack				23201000