

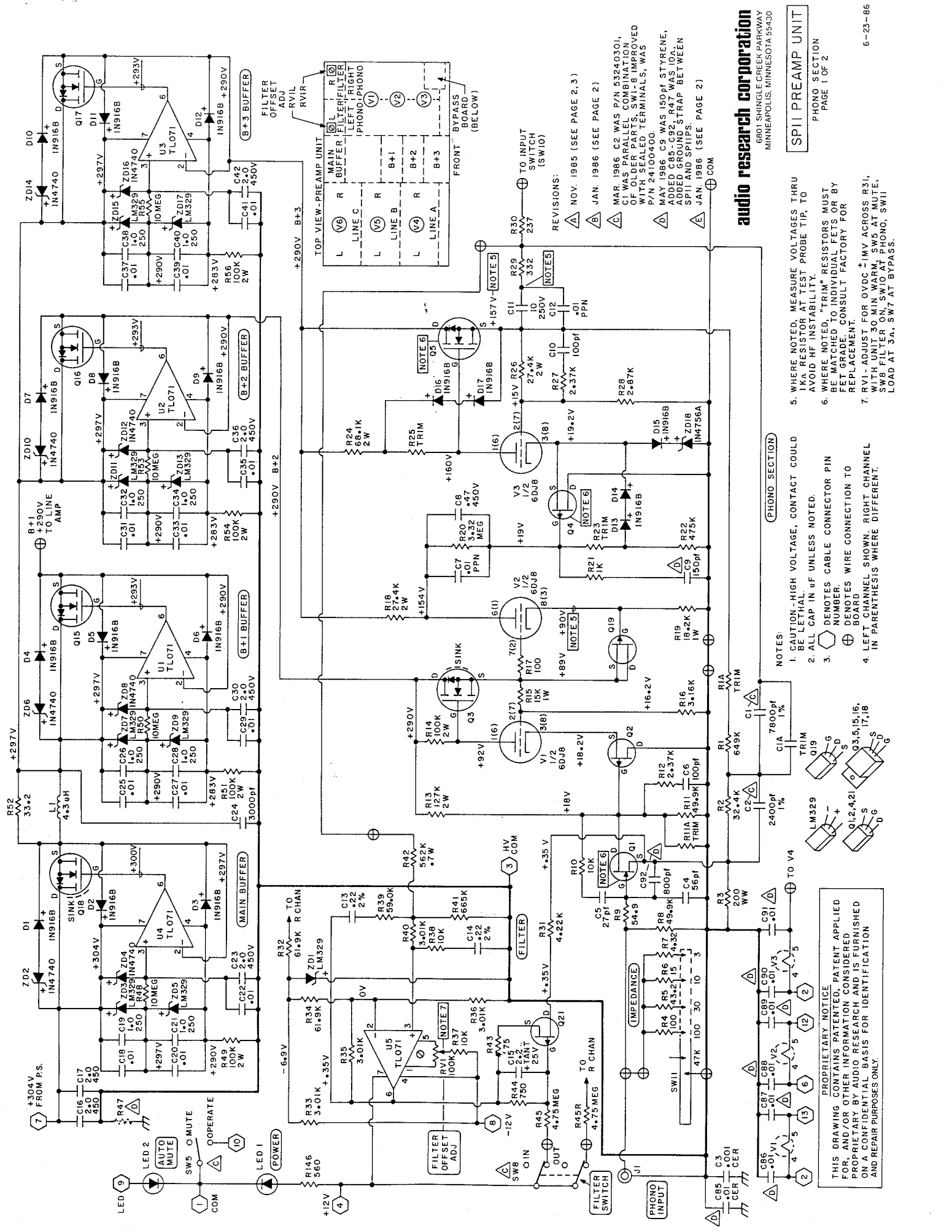
SP11 PREAMPLIFIER  
SP11PS POWER SUPPLY

SCHEMATIC

6/23/86

**audio research corporation**

6801 SHINGLE CREEK PARKWAY  
MINNEAPOLIS, MINNESOTA 55430

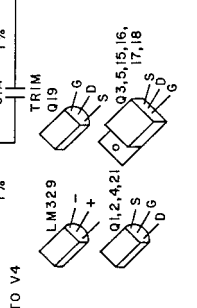


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**SPIII PREAMP UNIT**  
 PHONO SECTION  
 PAGE 1 OF 2

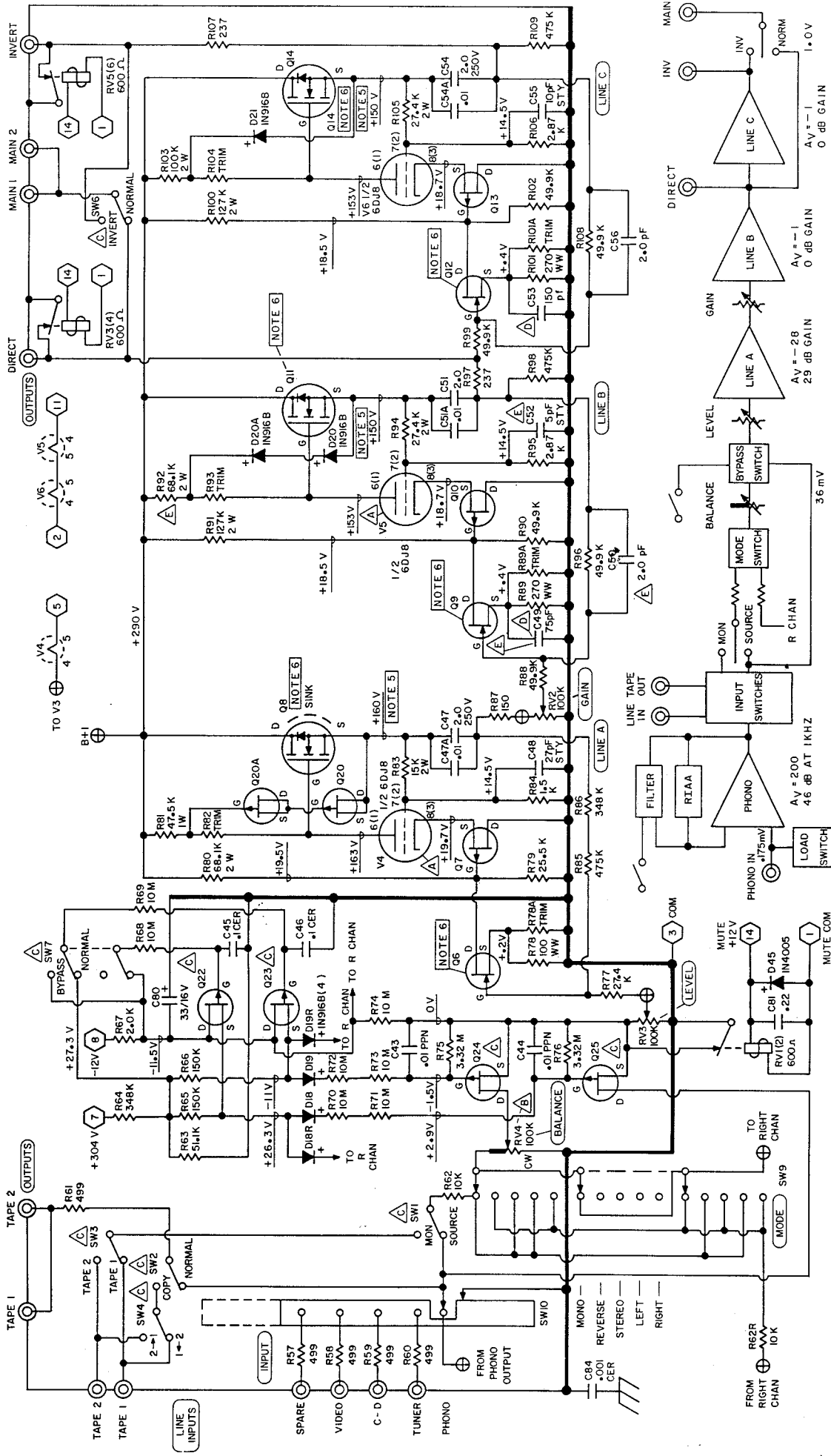
- NOTES:
1. CAUTION-HIGH VOLTAGE, CONTACT COULD BE LETHAL.
  2. ALL CAP IN  $\mu$ F UNLESS NOTED.
  3. DENOTES CABLE CONNECTOR PIN NUMBER.
  4. DENOTES WIRE CONNECTION TO BOARD.
  5. WHERE NOTED, MEASURE VOLTAGES THRU 1KA KVAR INSTABILITY.
  6. WHERE NOTED, "TRIM" RESISTORS MUST BE MATCHED TO INDIVIDUAL FETS OR BY FET GRADE. CONSULT FACTORY FOR REPLACEMENT.
  7. RV1-ADJUST FOR OVDC  $\pm$  1MV ACROSS R31, WITH UNIT 30 MIN WARM, SW5 AT MUTE, SW8 FILTER ON, SW10 AT BYPASS, LOAD AT 3A, SW7 AT BYPASS.

- REVISIONS:
- NOV. 1985 (SEE PAGE 2, 3)
  - JAN. 1986 (SEE PAGE 2)
  - MAR. 1986 C2 WAS P/N 53240301, C1 WAS PARALLEL COMBINATION OF C1 AND C2. C1 WAS REPLACED WITH SEaled TERMINALS, WAS P/N 24100400.
  - MAY 1986 C9 WAS 150P1 STYRENE, ADDED C85-C92 R47 WAS IO, ADDED GROUND STRAP BETWEEN SW1 AND SW1PS.
  - JAN. 1986 (SEE PAGE 2)

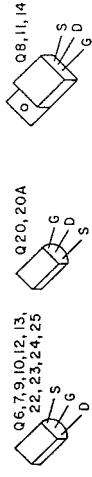


PHONO SECTION

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SP11 PREAMP UNIT  
 LINE SECTION  
 PAGE 2 OF 3

- REVISIONS:
- ▲ NOV 1965 V4,5 SELECTED FOR TRANSCONDUCTANCE.
  - ▲ JAN 1966 RV4 OLDER TYPES REPLACED BY P/N 45100529.
  - ▲ MAR 1986 SW1-8 IMPROVED WITH SEALED TERMINALS, WAS P/N 24100400. R22,23,24,25 CHANGED, WAS P/N 30006410. (SEE PARTS LIST)
  - ▲ MAY 1986 C49, 53 WERE 150PF STYRENE.
  - ▲ JUN 1986 C49 WAS 150 PF PPN, C50 WAS (2) 5pF STYRENE IN SERIES OR (2) 4 pF PPN IN SERIES, C52 WAS 10PF STYRENE. R92 WAS 100K 2W.

- NOTES:
- 1. CAUTION - HIGH VOLTAGE - CONTACT COULD BE LETHAL.
  - 2. CAP. IN uF UNLESS NOTED.
  - 3. ○ DENOTES CABLE CONNECTOR PIN NUMBERS.
  - 4. LEFT CHANNEL SHOWN, RIGHT CHANNEL IN PARENTHESIS WHERE DIFFERENT.
  - 5. WHERE NOTED, MEASURE VOLTAGE THRU IKA RESISTOR AT TEST PROBE TIP, TO AVOID HF INSTABILITY.
  - 6. WHERE NOTED, "TRIM" RESISTORS MUST BE MATCHED TO INDIVIDUAL FETS OR BY FET GRADE. CONSULT FACTORY FOR REPLACEMENT.

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 MINNEAPOLIS, MINNESOTA 55430



## BILL OF MATERIALS

PRODUCT SP11PS

As of NOV 29 90

Part Num	Description	Quantity
34300102	L.E.O. COLLAR & RETAINING RING	2
34501000	FUSE, 6-1/4 MDX	1
34501700	FUSE, MDX 1.5 A	1
41100304	RES. 1K 1W 5%	2
41620204	RES. 620 OHM 1W 5%	1
42100203	RES. 100 OHM 1% MK-3 50PPM	4
42100403	RES. 10K+/-1% MK-3 50PPM	2
42100505	RES. 100K 1% MK-3 50PPM	2
42150503	RES. 150K 1% MK-3 50PPM	1
42150514	RES. 150K 1% MK-5 1W 50PPM	2
42150613	RES. 1.5 MEG 1% MK-4 50PPM	1
42200303	RES. 2K MK-3 1% 50PPM	1
42255403	RES. 25.5K 1% MK-3 50PPM	1
42274403	RES. 27.4K 1% MK-3 50PPM	2
42280513	RES. 280K 1% MK-4 50PPM	1
42287303	RES. 2.87K 1% MK-3 50PPM	1
42301503	RES. 301K 1% MK-3 50PPM	1
42332203	RES. 332 OHM 1% MK-3 50PPM	1
42392403	RES. 39.2K 1% MK-3 50PPM	1
42432503	RES. 432K 1% MK-3 50PPM	1
42464603	RES. 4.64 MEG. 1% MK-3 50PPM	1
42499303	RES. 4.99K 1% MK-3 50PPM	2
43100002	RES. 1 OHM 2W 5% W.W.	1
43100105	RES. 10 OHM 2W 5% W.W.	2
43750001	RES. 7.5 OHM 2W W.W.	5
46100201	RES. POWER OX. 100 OHM 5% 3W	1
50150803	CAP. 150 UF 20% 50V	1
50150903	CAP. 1500 UF 30V	1
50200600	CAP. 2 UF 150V "LYTIC"	1
50200802	CAP. 180 UF 400V	2
50600900	CAP. 6000 UF 25V	1
51100700	CAP. 10 UF 20V	1
51330702	CAP. 33 UF+/-10% 16V	1
52100300	CAP. 1000 PF 20% 1000V	4
52100500	CAP. 0.1 UF 100V	2
52470300	CAP. 4700 PF 10% 100V	1
53100403	CAP. .01 UF+/-10% 150V	1
53100406	CAP. .01 UF+/-10% 630V	2
53200602	CAP. 2 UF +/-10% 450V	1
53200603	CAP. 2 UF +/-10% 250V	2
53220507	CAP. .22 UF 10% 160V	5
60007021	XFR. SP11 TOROID REV.A	1
64100600	RELAY, 24V	1
91007510	WARNING LABEL	1
92002401	SP6 OUTER BOX OYSTER WHITE	1
92002402	SP6 INNER CARTON OYSTER WHT	1
92002403	SP6 BOTTOM FILLER	1
92002404	SP6 TOP FILLER	1
92002405	SP6 SIDE PAD CARD BOARD FOLD	2
92002406	SP6 FRONT PANEL PAD	2
92002407	FOAM, SP6 TOP/BTM (1*) EPS	2
92002408	FOAM, SP6 SIDE WHITE (1*) ESP	2
92002409	FOAM, PRE-AMP F/B WHITE (1*)EPS	2
92200600	DESSICANT (SILICA EAGLE GEL)	1
92400700	POLY BAG, D100 AMPLIFIER	1

## BILL OF MATERIALS

As of NOV 29 90

PRODUCT SP11PS

Part Num	Description	Quantity
03000800	STRIP GROMMET 3/4X1 1/2 3/4X4	1
10014930	SP9/15/14 ANGLE BRKT REV.B	1
100152100	PRE-AMP TOP COVER	3
10025020	SP11PS FRONT PANEL	1
10025120	SP11 PS/S15PS SUB FT COMP.	1
10031710	SP11PS CHASSIS	1
13100300	1/2" RUBBER FOOT	4
14003010	INSULATOR HEAT SINK	2
16023910	SP 9/11/15/LS1 SWITCH BD	1
16025810	SP11 PS BOARD REV.A	1
20002610	4" HANDLE	2
20002900	STRAIN RELIEF	1
20004000	HEAT SINK	5
20005100	HEAT SINK	1
21104005	4-40X1/4 MCH.PH.FL.SCR.SP8/10	4
21106006	6-32X1/2 PHILLIPS PAN NICKEL	2
21106007	6-32X3/8 PHIL.PAN HD. M.S.	6
21106020	6-32X3/8"PHIL PAN BLK NCK PLAT	10
21106030	6-32X1/4 PHIL COVER SCREW	20
21108000	8-32X3/8 SLOTTED PAN NKL PLATE	4
21108008	8-32X5/8 PHIL PAN SCREW NICKEL	2
21110014	10-24X5/8 HEX SOCKET	4
21110019	10-24X2 1/2 PHIL. PAN MCH. SCR	1
21206000	6-32X1/4 HEX NUT	12
21208000	8-32X11/32 HEX NUT	2
21306000	#6 LOCKWASHER	12
21308000	#8 LOCKWASHER	2
21310000	#10 INTERNAL TOOTH LOCKWASHER	4
21408001	8/32X3/4 HEX SPACER	2
21500100	CABLE TIE (WHITE)	15
23001400	TRANSISTOR PAD	1
23001700	STRAIGHT FUSE HOLDER	2
23104001	AMP 206043-1 CONNECTOR FEMALE	1
23104002	AMP 206044-1 CONNECTOR MALE	1
23104004	AMP 206322-1	1
23104005	AMP 202507-1 MALE PIN	14
23104006	AMP 202508-1 SOCKET	14
23201200	GRAY GROUNDING PLUG	1
23201300	AC OUTLETS, SP8, 10, 11, 15	4
24100710	TOGGLE SW., PREM.SILVER,PRE AM	2
25000700	POWER CORD #16X3,8',D115,SP11	1
30005301	D4 1K-2	1
30006300	NTM 2N45	1
30500300	1N4740A	1
30500400	1N4005 GENERAL INSTRUMENT	11
30500910	FAIRCHILD 1N916B	4
30501500	MOTOROLA 1N5400	4
30502200	1N4006	4
30503500	1N5359 B	1
30504200	1N5359A	1
31000801	TIMER MC1455P1	2
31001300	MC7812CK	2
31001700	MC7815CK	3
31001800	MOTOROLA LM311N	1
31002100	MOT MC79L12CP	1
31002200	MC3407 1P MOTOROLA	1

## BILL OF MATERIALS

As of NOV 29 90

PRODUCT SP11MEMK2

Part Num	Description	Quantity
92002406	SP6 FRONT PANEL PAD	2
92002407	FOAM, SP6 TOP/BTM ( 1#) EPS	2
92002408	FOAM, SP6 SIDE WHITE (1#) ESP	2
92002409	FOAM, PRE-AMP F/B WHITE (1#)EPS	2
92200600	DESSICANT (SILICA EAGLE GEL)	1
92400700	POLY BAG, D100 AMPLIFIER	1

## BILL OF MATERIALS

As of NOV 29 90

PRODUCT SP11MBMK2

Part Num	Description	Quantity
42392403	RES. 39.2K 1% MK-3 50PPM	2
42422303	RES. 4.22K 1% MK-3 50PPM	2
42432003	RES. 4.32 OHM 1% MK-3 50PPM	2
42432103	RES. 43.2 OHM 1% MK-3 50PPM	4
42464603	RES. 4.64 MEG. 1% MK-3 50PPM	2
42475503	RES. 475K 1% MK-3 50PPM	8
42475603	RES. 4.75 MEG 1% MK-3 50PPM	2
42499203	RES. 499 OHM 1% MK-3 50PPM	2
42499403	RES. 49.9K 1% MK-3 50PPM	6
42511203	RES. 511 OHM 1% MK-3 50PPM	2
42511403	RES. 51.1K 1% MK-3 50PPM	1
42549103	RES. 54.9 OHM 1% MK-3 50PPM	10
42562513	RES. 562K 1% MK-4 50PPM	2
42590403	RES. 59K 1% MK-3 50PPM	2
42619403	RES. 61.9K 1% MK-3 50 PPM	2
42665503	RES. 665K 1% MK-3 50 PPM	4
42681405	RES. 68.1K 1% MK-3 50PPM	6
42750103	RES. 75 OHM 1% MK-3 50PPM	2
42750203	RES. 750 OHM 1% MK-3 50PPM	4
42750503	RES. 750K 1% MK-3 50PPM	2
43100201	RES. 100 OHM 2W 5%	2
43200200	RES. 200 OHM +/-1% 2W W.W.	6
43270200	RES. 270 OHM 2-3W +/-1%	4
45100527	POT. 100 K 10%	2
45100528	100K DUAL GAIN POT	2
45100529	100K DUAL BALANCE POT	1
51220601	CAP. 2.2 UF +/-10% 25V	2
51330702	CAP. 33 UF +/-10% 16V	1
52100402	CAP. .01 UF 500V DISC.	2
52100500	CAP. 0.1 UF 100V	2
52200400	CAP. .02 UF 20% 300VAC/2000VD	2
53100101	CAP. 10 PF +/-1 PF 630V PPM	4
53100202	CAP. 100 PF +/-2 1/2% 630 V PPM	2
53100406	CAP. .01 UF +/-10% 630V	32
53100606	CAP. 1.0 UF +/-10% 250V	8
53100700	CAP. 10 UF +/-10% 250V	2
53150202	CAP. 150 PF 2 1/2% 630V PPM	12
53200003	CAP. 2 PF STY.	2
53200005	CAP. 2 PF STY.	2
53200602	CAP. 2 UF +/-10% 450V	6
53200603	CAP. 2 UF +/-10% 250V	6
53200604	CAP. 2.0 UF +/-20% 425V	2
53220506	CAP. .22 UF 100V	5
53240300	CAP. .0024 UF 630V	2
53270101	CAP. 27 PF +/-1PF 630V PNP	8
53300303	CAP. 3000 PF +/-2.5% 630V DPN	1
53470509	CAP. .47 UF +/-10% 450V	2
53500001	CAP. 5 PF +/-1PF 630V DPN	2
53560103	CAP. 56 PF +/-2% 630V DPN	8
53780300	CAP. 7800 PF 630V	2
64101000	RELAY, 12V REED 51P 1200 OHM	6
91007510	WARNING LABEL	1
92002401	SP6 OUTER BOX OYSTER WHITE	1
92002402	SP6 INNER CARTON OYSTER WHT	1
92002403	SP6 BOTTOM FILLER	1
92002404	SP6 TOP FILLER	1
92002405	SP6 SIDE PAD CARD BOARD FOLD	2



## BILL OF MATERIALS

As of NOV 29 90

PRODUCT SP11MBNK2

Part Num	Description	Quantity
30006424	FET, GRAY YELLOW	4
30006506	FET, WHITE BLUE	2
30006526	FET, WHITE RED BLUE	2
30006627	FET, VIOLET RED VIOLET	4
30006705	FET, ORANGE GREEN	8
30006706	FET, ORANGE BLUE	2
30006805	FET, YELLOW GREEN	1
30006836	FET, GREEN BLUE	1
30007106	FET, YELLOW BLUE	2
30007107	FET, YELLOW VIOLET	1
30007501	FET, ORANGE WHITE BROWN	4
30500300	IN4740A	4
30500400	IN4005 GENERAL INSTRUMENT	1
30500910	FAIRCHILD IN916B	36
30502700	IN4742-A	4
30503700	DIODE, 220 10%	4
31000703	LM329DZ ORANGE	4
31000705	LM329DZ GREEN	5
31001900	TLD71CP	6
32001110	VAC.TUBE, 6DJ8 RUSSIAN	6
34300102	L.E.D.COLLAR & RETAINING RING	2
41560203	RES. 560 OHM +/- 5% 1/2W	1
42100103	RES. 10 OHM 1% MK-3 50PPM	2
42100203	RES. 100 OHM 1% MK-3 50PPM	4
42100303	RES. 1K 1% MK-3 50PPM	4
42100403	RES. 10K +/- 1% MK-3 50PPM	8
42100505	RES. 100K 1% MK-8 50PPM	16
42100702	RES. 10 NEG 1% MK-2 50PPM	12
42100703	RES. 10 NEG 1% MK-3 50PPM	4
42127403	RES. 12.7K 1% MK-3 50PPM	4
42127505	RES. 127K 1% MK-8 50PPM	4
42150103	RES. 15 OHM 1% MK-3 50PPM	4
42150203	RES. 150 OHM 1% MK-3 50PPM	2
42150403	RES. 15K 1% MK-3 50PPM	4
42150405	RES. 15K 1% MK-8 50PPM	2
42150414	RES. 15K 1% MK-5 50PPM	2
42150503	RES. 150K 1% MK-3 50PPM	4
42182303	RES. 1.82K 1% MK-3 50PPM	16
42182413	RES. 18.2K 1% MK-4 50PPM	2
42200205	RES. 200 OHM +/- 1% MK8 50PPM	2
42200303	RES. 2K MK-3 1% 50PPM	1
42237203	RES. 237 OHM 1% MK-3 50PPM	4
42237303	RES. 2.37K 1% MK-3 50PPM	4
42267203	RES. 267 OHM 1% MK-3 50PPM	2
42274403	RES. 27.4K 1% MK-3 50PPM	2
42274405	RES. 27.4K 1% MK-8 50PPM	8
42287303	RES. 2.87K 1% MK-3 50PPM	12
42301303	RES. 3.01K 1% MK-3 50PPM	5
42301503	RES. 301K 1% MK-3 50PPM	2
42316303	RES. 3.16K 1% MK-3 50PPM	2
42332103	RES. 33.2 OHM 1% MK-3 50PPM	1
42332203	RES. 332 OHM 1% MK-3 50PPM	2
42332602	RES. 3.32 NEG 1% MK-2 50PPM	4
42332603	RES. 3.32 NEG 1% MK-3 50PPM	2
42348503	RES. 348K 1% MK-3 50PPM	2
42348513	RES. 348K 1% MK-4 50PPM	3
42357403	RES. 35.7K 1% MK-3 50PPM	16

## BILL OF MATERIALS

As of NOV 29 90

PRODUCT SP11MBMK2

Part Num	Description	Quantity
		1
06XXX011	MISC. WIRE SP11	1
10014930	SP9/15/14 ANGLE BRKT REV.B	2
100152100	PRE-AMP TOP COVER	1
10031410	SP11 FRONT PANEL	1
10031520	SP11/SP15 SUB FRONT PANEL	1
10031610	SP11 CHASSIS COMPLETE	1
13001410	KNOB, 5MM	3
13001510	KNOB, 1/4"	3
13100300	1/2" RUBBER FOOT	4
14001510	MODULE SPACER	4
14003100	BOBBINS (POLYCARBONATE)	1
14003400	VIGOR BOTTLE BU234(0-1 COVER)	2
15025010	SP11 CONTROL BD. REV.A	1
15025710	SP11 M. BD. REV.A	1
15025910	SP11 SWITCH BD. REV.A	1
15026010	SP11 BY PASS BOARD	1
20002610	4" HANDLE	2
20002800	SCREW INSULATOR	2
20003800	RUBBER GROMMET	4
20004400	HEAT SINK	2
20004600	VACUUM TUBE DAMPERS	4
20005200	HEAT SINK, CLIP ON	3
21104005	4-40X1/4 MCH. PH. FL. SCR. SP9/10	4
21106005	6-32X1/2 PHIL PAN SCREW	4
21106014	6-32X5/16 PHIL PAN	1
21106020	6-32X3/8"PHIL PAN BLK NCK PLAT	8
21106030	6-32X1/4 PHIL COVER SCREW	20
21108000	8-32X3/8 SLOTTED PAN NKL PLATE	4
21110014	10-24X5/8 HEX SOCKET	4
21206000	6-32X1/4 HEX NUT	12
21306006	#6 FLATWASHER ZINC PLATED .440	8
21308000	#8 LOCKWASHER	1
21310000	#10 INTERNAL TOOTH LOCKWASHER	4
21338006	SP11/15/14/M300 TIF. WSHR SW-2	52
21406011	1/4X3/8 SPACER #6 HOLE	4
21500100	CABLE TIE (WHITE)	35
23000401	9 PIN SM.VAC.TUBE SOCKET	6
23100700	GROUND POST, PRE-AMP	1
23102100	#10 SOLDER LUG	1
23103100	#6 TWO HOLE BENT LUG	3
23104000	AMP 206036-1 CONNECTOR MALE	1
23104003	AMP 206037-1 CONNECTOR FEMALE	1
23104004	AMP 206322-1	1
23104005	AMP 202507-1 MALE PIN	14
23104006	AMP 202508-1 SOCKET	14
23201501	GOLD PHONO JK., W/RD. BND. SP11	13
23201502	GOLD PHONO JK., W/WH. BD. SP11	13
24000700	5 POS MODE SWITCH, SP11	1
24001000	5 POS SOURCE SWITCH, SP11	1
24001500	5 POS IMPED. SWITCH, GOLD, SP11	1
24100420	TOGGLE SW. GOLD PRE. SATIN	8
30005901	FET, RED BROWN	18
30006403	FET, BLUE ORANGE	2
30006405	FET, BLUE GREEN	4
30006406	FET, BLUE BLUE	6
30006407	FET, BLUE VIOLET	2