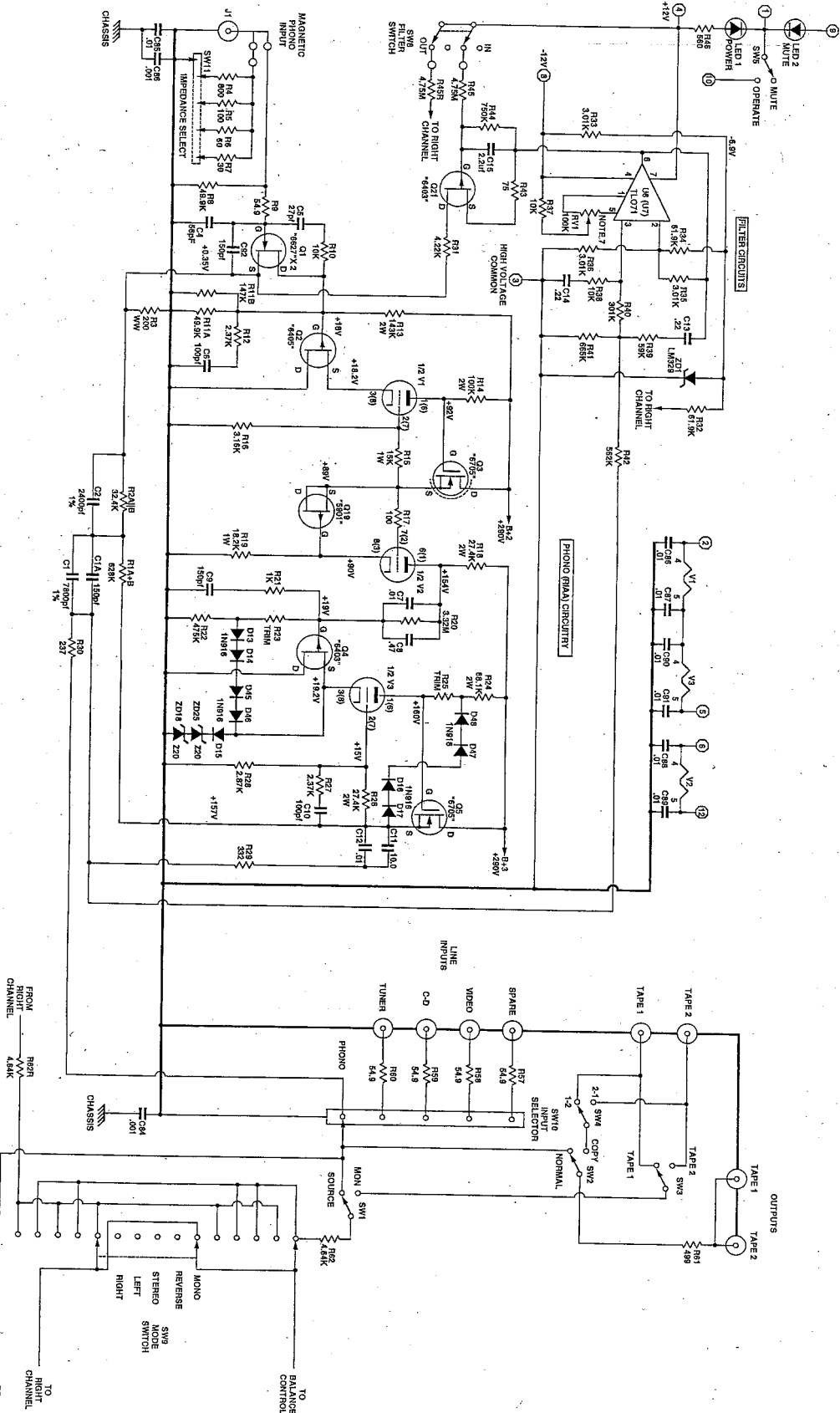


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NOTES:

1. CAUTION - HIGH VOLTAGE, CONTACT COULD BE LETHAL.
2. ALL CAPS IN μ UNLESS NOTED.
3. DENOTES CABLE CONNECTION PIN NUMBERS.
4. LEFT CHANNEL SHOWN, RIGHT CHANNEL IN PARENTHESES WHERE DIFFERENT.
5. WHERE NOTED, MEASURE VOLTAGES THRU 1K RESISTOR AT TEST PHONO TIP, TO AVOID HF INSTABILITY.
6. WHERE NOTED, TRIMMER RESISTORS MUST BE MATCHED TO INDIVIDUAL FETs OR BY FET GRADE, CONSULT FACTORY FOR REPLACEMENT.
7. RV1 - ADJUST FOR 0VDC $\pm$ 1mV ACROSS R1, WITH UNIT 20 PHONO, SW11 CLOSED AT 50, SW17 AT BYPASS.



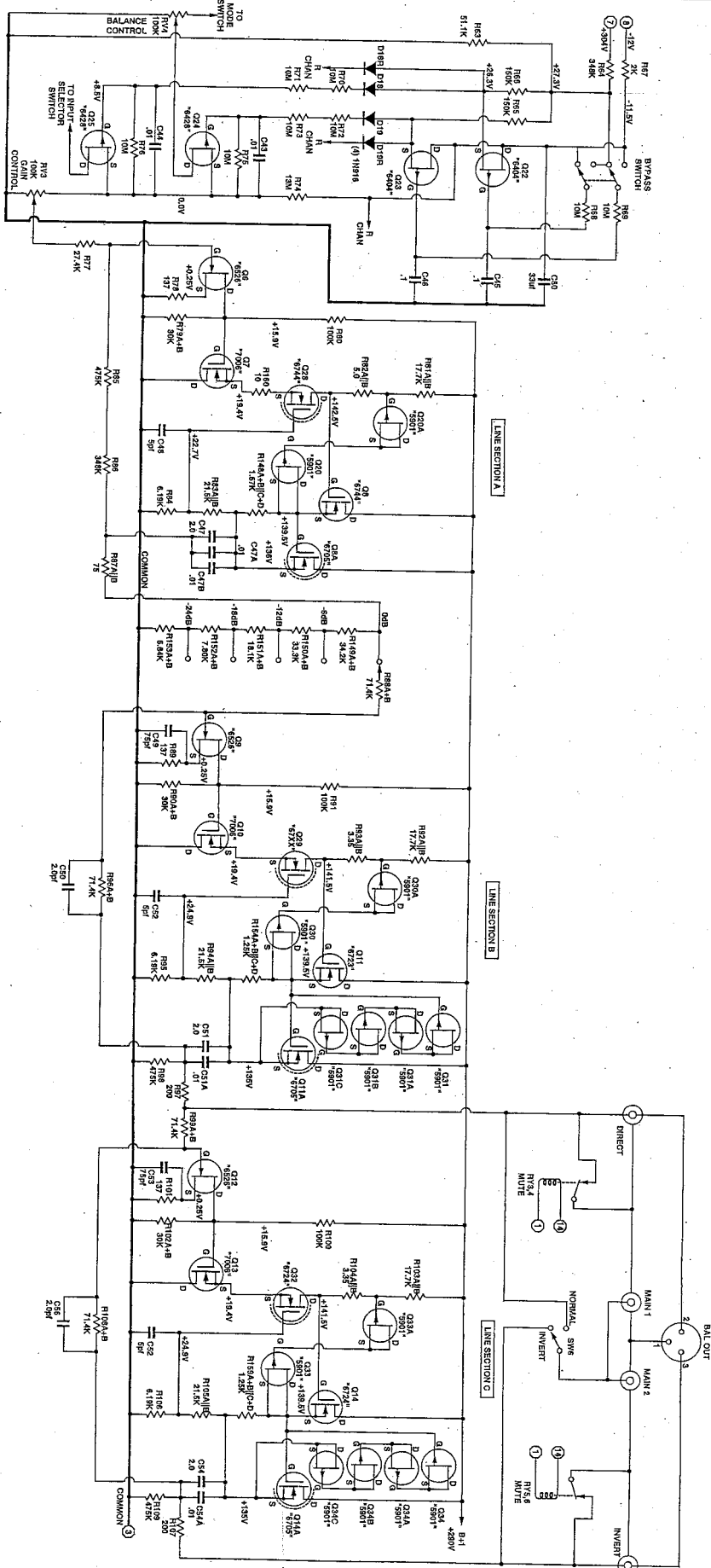
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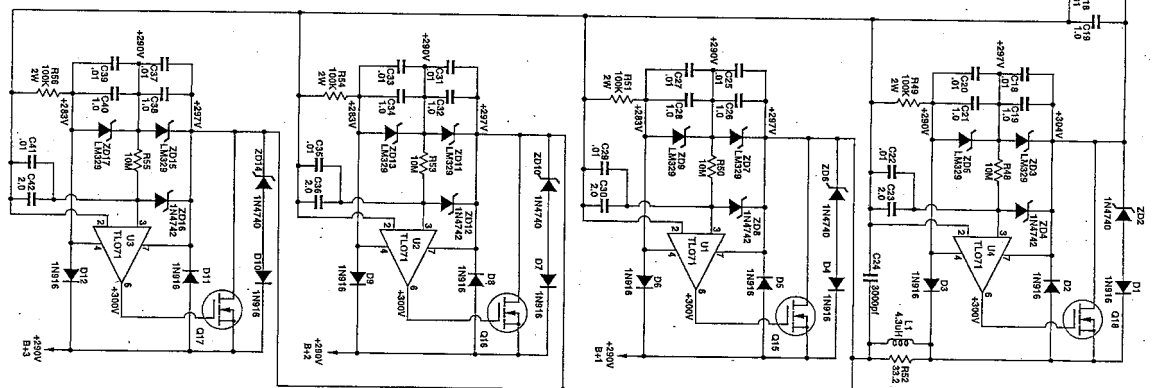
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NOTES:

1. CAUTION - HIGH VOLTAGE, CONTACT COULD BE LETHAL.
2. ALL CAPS IN PARENTHESES.
3. DENOTES CABLE CONNECTOR PIN NUMBERS.
4. LEFT CHANNEL, SHOWN, RIGHT CHANNEL, IN PARENTHESS
WHERE DIFFERENT.

5. WHEN NOTED, MEASURE VOLTAGES THRU 1K RESISTOR
AT TEST POINTS IN 10 MINUTE PERIOD.
6. WHEN NOTED, 10K RESISTORS MUST BE MATCHED TO
MINIMUM 1% TOLERANCE BY RES ORANGE CONSULT FACTORY
FOR REPLACEMENT.





TO MATCH ZD21,22 USED.

3900 MARINE BOULEVARD NORTH
FLEMING, MINN 55447-5447

PAGE 3 OF 3
11/30/01

FORWARDED ON A CONFIDENTIAL BASIS FOR IDENTIFICATION PURPOSES ONLY.

PARTS LIST

As of OCT 5 89

PRODUCT: SP15MB

NOTES:

Schematic Symbol	Quantity	ARC Part #	Description
CAPACITORS			
53,53A,92	14	53150202	CAP. 150 PF 2 1/2% 630V PPN
C 1B,6	4	53270101	CAP. 27 PF +/-1PF 630V PNP
C 1	2	53780300	CAP. 7800 PF 630V
C 1A,9,49,49A,	14	53150202	CAP. 150 PF 2 1/2% 630V PPN
C 2	2	53240300	CAP. .0024 UF 630V
C 4,69	8	53560103	CAP. 56 PF +/-2% 630V DPN
C 7,12,18,20,22,25,27,29,31,33,35,37	24	53100406	CAP. .01 UF +/-10% 630V
C 39,41,43,44,47A,47B			
C 8	2	53470509	CAP. .47 UF +/-10% 450V
C 10	2	53100202	CAP. 100 PF +/-2 1/2% 630 V PPN
C 11	2	53100700	CAP. 10 UF +/-10% 250V
C 13,14	4	53220507	CAP. .22 UF 10% 160V
C 15	2	51220601	CAP. 2.2 UF +/-10% 25V
C 16,17,23,30,38,40	6	53200602	CAP. 2 UF +/-10% 450V
C 19,21,26,28,32,34,38,40	8	53100606	CAP. 1.0 UF +/-10% 250V
C 45,46	2	52100500	CAP. 0.1 UF 100V
C 47	2	53200604	CAP. 2.0 UF +/-20% 425V
C 48,52,55	6	53500001	CAP. 5 PF +/-1PF 630V DPN
C 50,56	4	53200005	CAP. 2 PF STY.
87,88,89,90,91	8	53100406	CAP. .01 UF +/-10% 630V
C 51,54	4	53200603	CAP. 2 UF +/-10% 250V
C 51A,54A,86,	8	53100406	CAP. .01 UF +/-10% 630V
C 80	1	51330702	CAP. 33 UF +/-10% 16V
C 81	1	53220506	CAP. .22 UF 100V
C 84,86	4	52100300	CAP. 1000 PF 20% 1000V
C 85	2	52100402	CAP. .01 UF 500V DISC.
DIODES			
D 1-18,18R,19,19R,45,46,47,48	34	30500910	FAIRCHILD IN916B
D 18,25	4	30503700	DIODE, Z20 10%
D 45	1	30500400	IN4005 GENERAL INSTRUMENT
CONNECTORS			
J 1R-13R	13	23201501	GOLD PHONO JK.,W/RD.BND.SP11
J 1L-13L	13	23201502	GOLD PHONO JK.,W/WH.BD.SP11
J 14L,14R	2	23201910	SP15 MIC CONN. CH. MNT.
PANEL INDICATOR			
LE 1,2	2	34300102	L.E.D.COLLAR & RETAINING RING
TRANSISTORS			
Q 1,1A	4	30006627	FET, VIOLET RED VIOLET
Q 2,4,21,22,23	4	30006451	FET, BLUE,YEL,BROWN
Q 3,5,8A,11A,14A	10	30006705	FET, ORANGE GREEN
Q 6,9,12	6	30006526	FET, WHITE RED BLUE
Q 7,10,13	6	30007006	FET, GRAY BLUE
Q 8,11,14,28,29,32	8	30006724	FET, ORANGE RED YELLOW

PARTS LIST

As of OCT 5 89

PRODUCT: SP15MB

NOTES:

Schematic Symbol	Quantity	ARC Part #	Description

TRANSISTORS			
Q 15,16	1	30007106	FET, YELLOW BLUE
Q 17	1	30007107	FET, YELLOW VIOLET
Q 18	1	30006836	FET, GREEN BLUE
Q 19,20,20A,30,30A,31,31A,31B,31C,33	30	30005901	FET, RED BROWN
Q 33A,34,34A,34B,34C			
Q 24,25	4	30006424	FET, GRAY YELLOW
RESISTORS			
4A-D159A-D	24	42182303	RES. 1.82K 1% MK-3 50PPM
R 148A-D,15	24	42182303	RES. 1.82K 1% MK-3 50PPM
R 1A	2	42280513	RES. 280K1% MK-4 50PPM
R 1	2	42348503	RES. 348K 1% MK-3 50PPM
R 2,40	2	42301503	RES. 301K 1% MK-3 50PPM
96,96A,108,108A	16	42357403	RES. 35.7K 1% MK-3 50PPM
R 2A,88,88A,	16	42357403	RES. 35.7K 1% MK-3 50PPM
R 3,78,78A,78B,89,89A,89B,101,101A	20	43200200	RES. 200 OHM +/-1% 2W W.W.
R 101B			
R 4,21	4	42100303	RES. 1K 1% MK-3 50PPM
R 5,6,7A	6	42150203	RES. 150 OHM 1% MK-3 50PPM
R 5A,61	1	42499203	RES. 499 OHM 1% MK-3 50PPM
R 7,17	4	42100203	RES. 100 OHM 1% MK-3 50PPM
R 8,11	4	42499403	RES. 49.9K 1% MK-3 50PPM
R 9,57,58,59,60	10	42549103	RES. 54.9 OHM 1% MK-3 50PPM
R 10,37,38	6	42100403	RES. 10K +/-1% MK-3 50PPM
R 11A	2	42147503	RES. 147K 1% MK-3 50PPM
R 12,27	4	42237403	RES. 23.7K 1% MK-3 50PPM
R 13	2	42143505	RES. 143K 1% MK-8 50PPM
R 14,49,51,54,56,80,81A&B,83A,92A&B	30	42100505	RES. 100K 1% MK-8 50PPM
R 94A,100,103A&B,105A			
R 15	2	42150414	RES. 15K 1% MK-5 50PPM
R 16,152A	4	42316303	RES. 3.16K 1% MK-3 50PPM
R 18,26,81,83,92,94,103,105	16	42274405	RES. 27.4K 1% MK-8 50PPM
R 19	2	42182413	RES. 18.2K 1% MK-4 50PPM
R 20	2	42332602	RES. 3.32 MEG 1% MK-2 50PPM
R 22,85,98,109	8	42475503	RES. 475K 1% MK-3 50PPM
R 24	2	42681405	RES. 68.1K 1% MK-8 50PPM
R 28	2	42287303	RES. 2.87K 1% MK-3 50PPM
R 29	2	42332203	RES. 332 OHM 1% MK-3 50PPM
R 30	2	42237203	RES. 237 OHM 1% MK-3 50PPM
R 31	2	42422303	RES. 4.22K 1% MK-3 50PPM
R 32	1	42332103	RES. 33.2 OHM 1% MK-3 50PPM
R 32,34	2	42619403	RES. 61.9K 1% MK-3 50 PPM
R 33,35,36	5	42301303	RES. 3.01K 1% MK-3 50PPM
R 39	2	42590403	RES. 59K 1% MK-3 50PPM
R 41	2	42665503	RES. 665K 1% MK-3 50 PPM
R 42	2	42562513	RES. 562K 1% MK-4 50PPM
R 43	2	42750103	RES. 75 OHM 1% MK-3 50PPM
R 44	2	42750503	RES. 750K 1% MK-3 50PPM
R 45,45R	2	42475602	RES. 4.75 MEG 1% MK-2 50PPM
R 46	1	41560203	RES. 560 OHM +/- 5% 1/2W

PARTS LIST

As of OCT 5 89

PRODUCT: SP15MB

NOTES:

Schematic Symbol	Quantity	ARC Part #	Description

RESISTORS			
R 48,50,53,55,75,76	8	42100703	RES. 10 MEG 1% MK-3 50PPM
R 49	1	42432303	RES. 4.32K 1% MK-3 50PPM
R 62,62A,152,153	6	42464303	RES. 4.64K 1% MK-3 50PPM
R 63	1	42511403	RES. 51.1K 1% MK-3 50PPM
R 64,86	3	42348513	RES. 348K 1% MK-4 50PPM
R 65,66	2	42150503	RES. 150K 1% MK-3 50PPM
R 67,148,154,154E,159,159E	11	42200303	RES. 2K MK-3 1% 50PPM
R 68,69,70,71,72,73,74A	12	42100702	RES. 10 MEG 1% MK-2 50PPM
R 74A	2	42301602	RES. 3.01 MEG 1% MK-2 50PPM
R 78,79A,90,90A,102,102A	12	42150403	RES. 15K 1% MK-3 50PPM
R 78D,89D,101D	6	42432103	RES. 43.2 OHM 1% MK-3 50PPM
R 78C,89C,101C	6	42511203	RES. 511 OHM 1% MK-3 50PPM
R 82,82A,160	6	42100103	RES. 10 OHM 1% MK-3 50PPM
R 84,95,106	6	42619314	RES. 6.19K 1% MK-5 50PPM
R 93A,104A	4	42150103	RES. 15 OHM 1% MK-3 50PPM
R 93,104	6	42432003	RES. 4.32 OHM 1% MK-3 50PPM
R 97,107	4	42200205	RES. 200 OHM+/-1% MK8 50PPM
R 149A,151A	4	42127403	RES. 12.7K 1% MK-3 50PPM
R 149A,150A	4	42215403	RES. 21.5K 1% MK-3 50PPM
R 150	2	42118403	RES. 11.8K 1% MK-3 50PPM
R 151	2	42536303	RES. 5.36K 1% MK-3 50PPM
R 153A	2	42221303	RES. 2.21K 1% MK-3 50PPM
CONTROLS			
RV 1	2	45100527	POT. 100 K 10%
RV 3	1	45100528	100K DUAL GAIN POT
RV 4	1	45100529	100K DUAL BALANCE POT
RELAYS			
RY 1-6	6	64101000	RELAY, 12V REED 51P 1200 OHM
SWITCHES			
SW 1-8	8	24100420	TOGGLE SW.GOLD PRE. SATIN
SW 9	1	24002100	SWITCH, 5 POS. MODE
SW 10	1	24002200	SWITCH, 5 POS. SOURCE
SW 11	1	24001500	5 POS IMPED.SWITCH,GOLD,SP11
SW 14	1	24002000	SWITCH, 5 POS. ROTARY
INTEGRATED CIRCUITS			
U 1,2,3,4,5	6	31001900	TL071CP
VACUUM TUBES			
V 1,2,3	3	32001110	VAC.TUBE, 6DJ8 RUSSIAN
ZENER DIODES			
ZD 1,3,5,7,9,11,13,15,17	9	31000705	LM329DZ GREEN

PARTS LIST

As of OCT 5 89

PRODUCT: SP15MB

NOTES:

Schematic Symbol

Quantity

ARC Part #

Description

ZENER DIODES

ZD 2,6,10,14
ZD 4,8,12,164
430500300
30502700IN4740A
IN4742-A

PARTS LIST

As of OCT 5 89

PRODUCT: SP15PS

NOTES:

Schematic Symbol	Quantity	ARC Part #	Description

CAPACITORS			
C 47	1	53200602	CAP. 2 UF +/-10% 450V
C 57	1	53100403	CAP. .01 UF+/-10% 160V
C 58,59	2	50200802	CAP. 180 UF 400V
C 60,61	2	53500606	CAP. 5 UF+/-20% 250V
C 62,66	3	53100406	CAP. .01 UF+/-10% 630V
C 63,64,65,74,78	5	53220507	CAP. .22 UF 10% 160V
C 68	1	50200600	CAP. 2 UF 150V "LYTIC"
C 69	1	50150803	CAP. 150 UF 20% 50V
C 70,75	2	52100500	CAP. 0.1 UF 100V
C 71	1	51100700	CAP. 10 UF 20V
C 72	1	51330702	CAP. 33 UF+/-10% 16V
C 73	1	52470300	CAP. 4700 PF 10% 100V
C 76	1	50150903	CAP. 1500 UF 30V
C 77	1	50600900	CAP. 6000 UF 25V
C 82,83	2	52200400	CAP. .02 UF 20% 300VAC/2000VD
DIODES			
D 22,27,28,29,30,31,32,33,34,43,44	11	30500400	IN4005 GENERAL INSTRUMENT
D 23,24,25,26	4	30502200	IN4006
D 35,36,37,38	4	30501500	MOTOROLA IN5400
D 39,40,41,42	4	30500910	FAIRCHILD IN916B
FUSES			
F 1,2	2	23001700	STRAIGHT FUSE HOLDER
F 1	1	34501700	FUSE, MDX 1.5 A
F 2	1	34500102	FUSE, BUSSMAN AGC 1/4 250V
PANEL INDICATOR			
LE 3,4	2	34300102	L.E.D.COLLAR & RETAINING RING
OUTLETS			
OT 1,2,3,4	4	23201300	AC OUTLETS,SP8,10,11,15
TRANSISTORS			
Q 26	1	30006300	MTM 2N45
Q 27	1	30005301	D41K-2
RESISTORS			
R 110,111	2	42150514	RES. 150K 1% MK-5 1W 50PPM
R 112	2	42300514	RES. 300K 1% MK-5 50PPM
R 113	1	42301503	RES. 301K 1% MK-3 50PPM
R 114,135A	2	42392403	RES. 39.2K 1% MK-3 50PPM
R 115,116	2	42100505	RES. 100K 1% MK-8 50PPM
R 117,124	2	42499303	RES. 4.99K 1% MK-3 50PPM
R 118,118A	2	42274403	RES. 27.4K 1% MK-3 50PPM

PARTS LIST

As of OCT 5 89

PRODUCT: SP15PS

NOTES:

Schematic Symbol	Quantity	ARC Part #	Description

RESISTORS			
R 119	1	42280513	RES. 280K1% MK-4 50PPM
R 120	1	42332203	RES. 332 OHM 1% MK-3 50PPM
R 121	1	43100002	RES. 1 OHM 2W 5% W.W.
R 122	1	42432503	RES. 432K 1% MK-3 50PPM
R 123	1	42150503	RES. 150K 1% MK-3 50PPM
R 125	1	42150613	RES. 1.5 MEG 1% MK-4 50PPM
R 127	1	42464603	RES. 4.64 MEG. 1% MK-3 50PPM
R 128,134,138,139	4	42100203	RES. 100 OHM 1% MK-3 50PPM
R 129	1	41620204	RES. 620 OHM 1W 5%
R 131,136,142	5	43750001	RES. 7.5 OHM 2W W.W.
R 132	1	42255403	RES. 25.5K 1% MK-3 50PPM
R 133	1	42200303	RES. 2K MK-3 1% 50PPM
R 135	1	42392303	RES. 3.92K 1% MK-3 50PPM
R 137	1	43100103	RES. 10 OHM 3W 5%
R 137A	1	42127203	RES. 127 1% OHM MK-3 50PPM
R 144,145	2	41100304	RES. 1K 1W 5%
RELAYS			
RY 7	1	64100600	RELAY, 24V
SWITCHES			
SW 12,13	2	24100720	TOGGLE SW. SILVER PRE. SATIN
TRANSFORMERS			
T 1	1	60007021	XFR. SP11 TOROID REV.A
INTEGRATED CIRCUITS			
U 6	1	31002200	MC34071P MOTOROLA
U 7	1	31001800	MOTOROLA LM311N
U 8,9	2	31000801	TIMER MC1455P1
VOLTAGE REGULATOR			
VR 1	1	31002100	MOT MC79L12CP
VR 2,3	2	31001300	MC7812CK
VR 4,6	2	31001700	MC7815CK
ZENER DIODES			
ZD 19	1	30504200	IN5535A
ZD 20	1	30500300	IN4740A
ZD 21,22,24	3	31000703	LM329DZ ORANGE
ZD 23	1	30503500	IN5359 B