

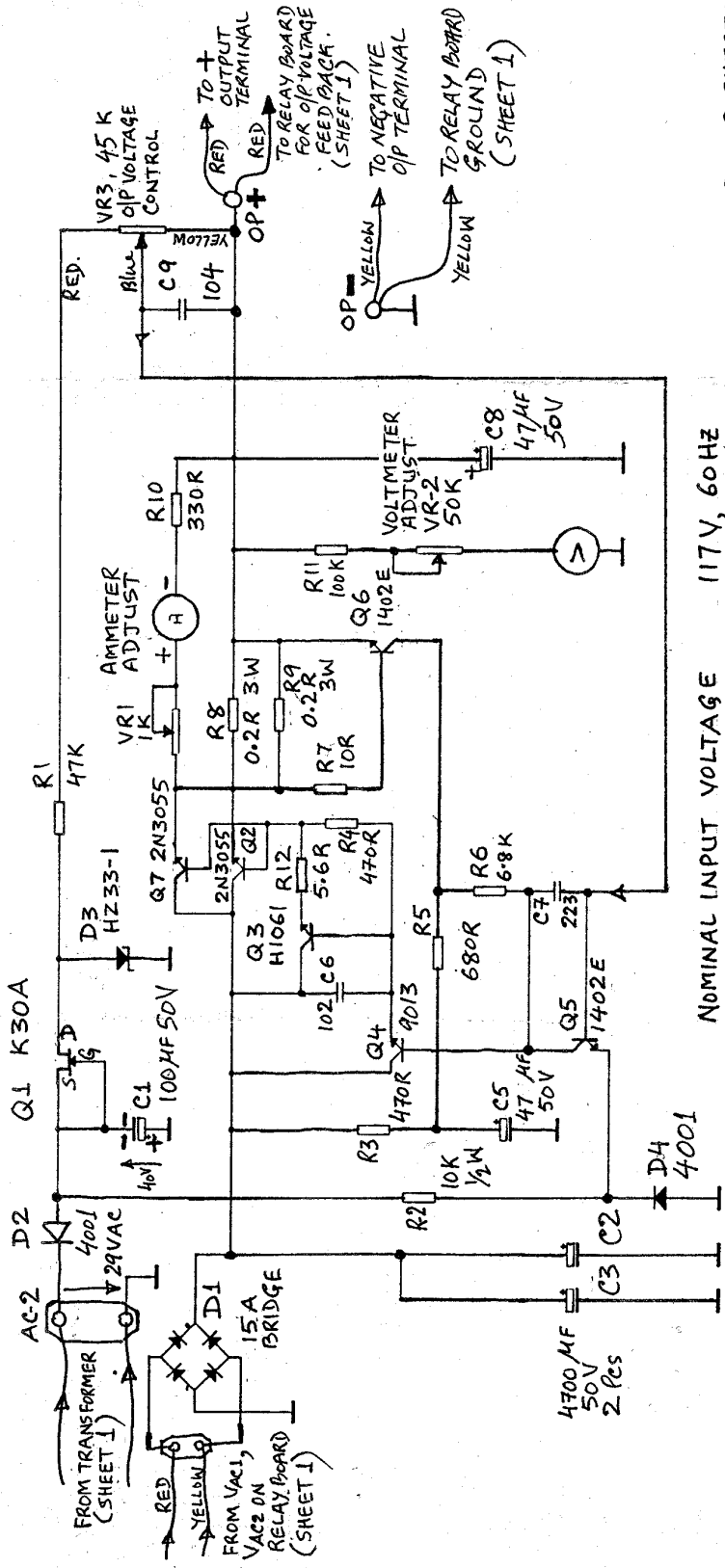
SAMLEX PSA-305 Power Supply

Schematics

Likely Causes of Failure

Component Specifications

Last revision: January 8, 2008



NOMINAL INPUT VOLTAGE 117V, 60HZ
 OUTPUT VOLTAGE - 0-30V DC, REGULATED
 OUTPUT CURRENT - 5A CONTINUOUS
 LOAD REGULATION - LESS THAN 3%
 LINE REGULATION - LESS THAN 1%
 OUTPUT RIPPLE - LESS THAN 12MV PEAK TO PEAK

FOR UNITS WITHOUT OVER-LOAD SHUT DOWN

TEL. (604) 525-3836
 FAX (604) 525-5221

MAIN CONTROL BOARD	
TYPE SAMLEX AMERICA	
SIZE	PSA-305 SHEET 2

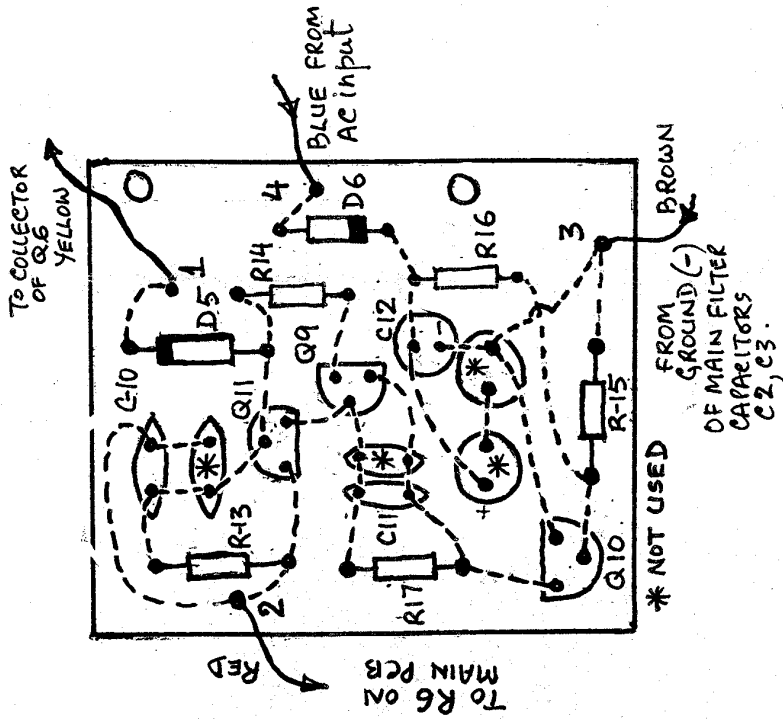
LAYOUT OF SMALL PCB
FOR PSA-305 / 310 FOR
OVERLOAD SHUT DOWN

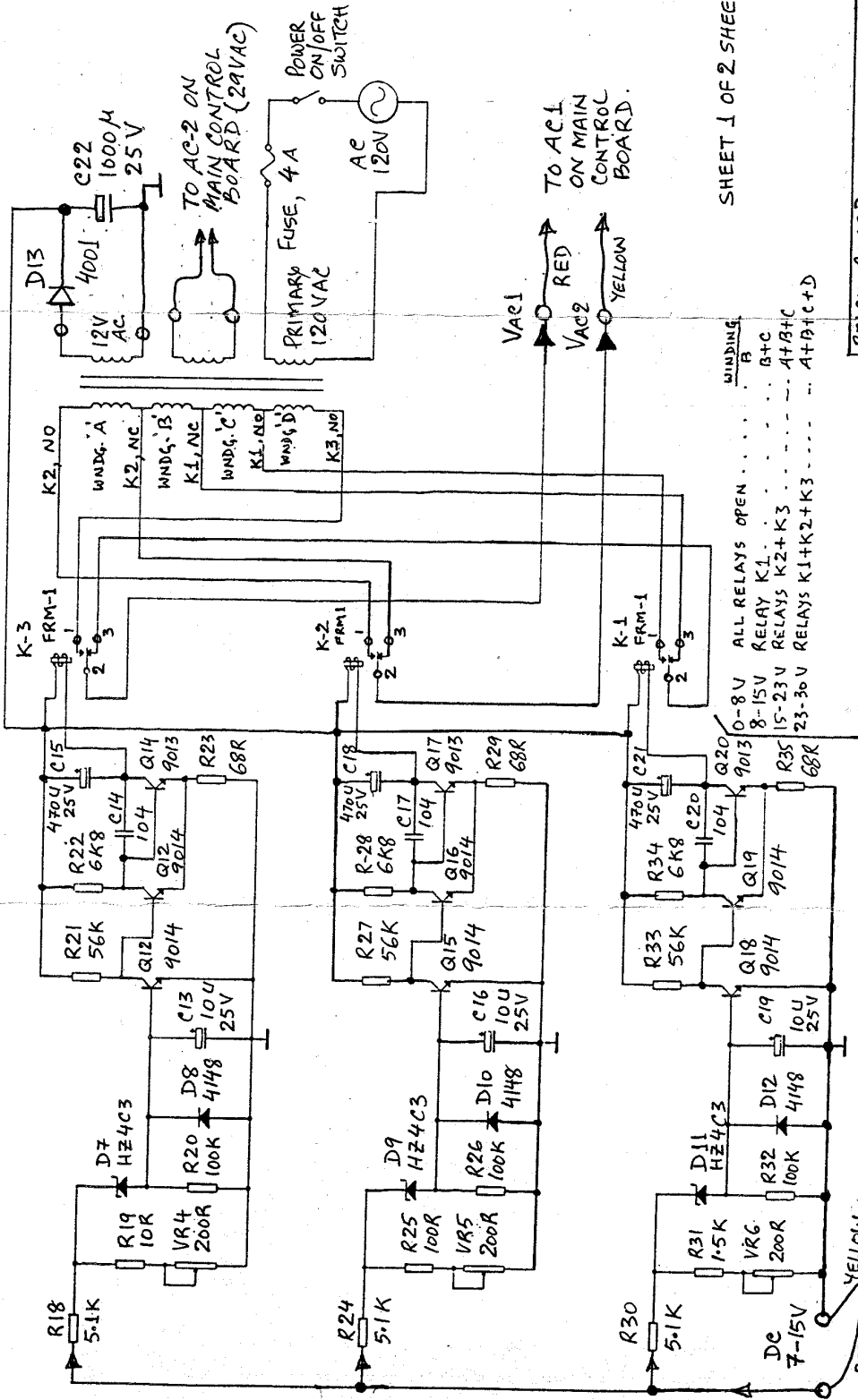
IN THE EXISTING VERSIONS OF THIS UNIT,
 C-10 AND C-11 CAN BE EITHER
 OF THE FOLLOWING :

224 (0.22 MF) CERAMIC DISC
 OR
 1 MF ELECTROLYTIC

PSA-305 / PSA-310
BOARD FOR OVERLOAD
SHUT-DOWN

SAMLEX AMERICA, INC.
 PHONE 604 525 3836
 FAX 604 525 5221





SHEET 1 OF 2 SHEETS

RELAY BOARD	
FILE	PSA-305 SHEET 1
REV	SAMLEX AMERICA

604-525-5221 FAX
604-525-3836 TEL.

- NOMINAL INPUT VOLTAGE - 117V, 60HZ.
- OUTPUT VOLTAGE - 0-30V D.C., REGULATED.
- OUTPUT CURRENT - 5A CONTINUOUS
- LOAD REGULATION - LESS THAN 3%
- LINE REGULATION - LESS THAN 1%
- OUTPUT RIPPLE - LESS THAN 10mV PEAK TO PEAK.
- FUSE - 4A, 125/250V - BUSSMANN TYPE "GMA"

WINDING
A
B+C
A+B+C
A+B+C+D

ALL RELAYS OPEN
RELAY K1
RELAYS K2+K3
RELAYS K1+K2+K3

OUTPUT VOLTAGE
FEED BACK
FROM MAIN
CONTROL BOARD.

DC 7-15V
RED
YELLOW

TO AC1
ON MAIN
CONTROL
BOARD.
VAR1
VAC2
YELLOW

TO AC-2 ON
MAIN CONTROL
BOARD (24VAC)

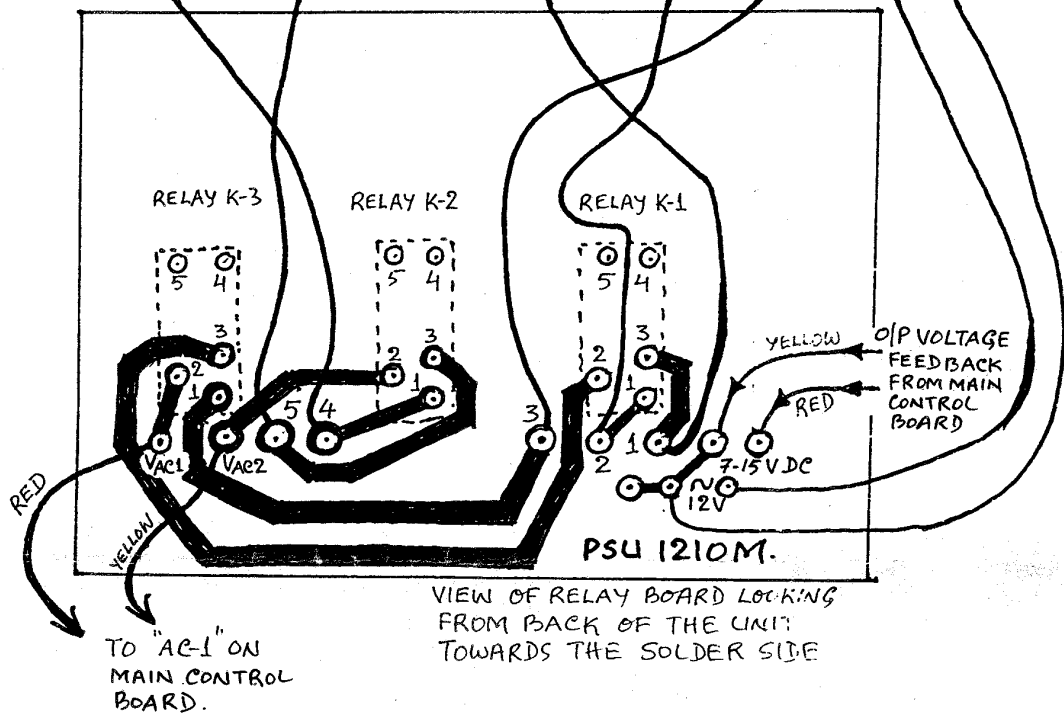
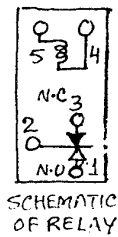
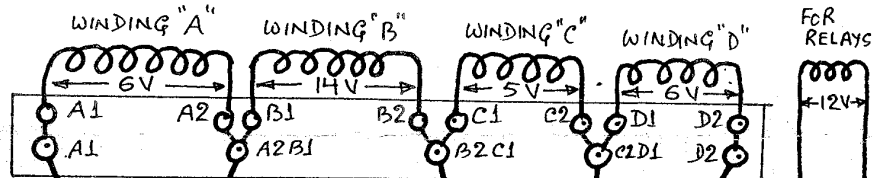
PRIMARY FUSE, 4A
AC 120V
POWER ON/OFF SWITCH

D13
4001
12V AC
C22
1000µ
25V

RELAY BOARD - PSA 305/310

SECONDARY OF POWER TRANSFORMER

FOR PSA-310
 A1 To A2B1 ... 6.2V
 A2B1 To B2C1 ... 15.1V
 B2C1 To C2D1 ... 6.2V
 C2D1 To D2 ... 6.7V



DC OUTPUT	STATE OF RELAYS	WINDINGS IN CIRCUIT	WINDING CONNECTION POINTS ON THE PCB.	VOLTAGE FED TO CONTROL BOARD
0 to 8V	ALL DE-ENERGISED	B	5-1	VAc1 13.8 V - SITUATION 1
8 to 15V	K1 ENERGISED	B+C	5-2	19.5 V - SITUATION 2
15 to 23V	K1+K2 ENER.	A+B+C	4-2	25.9 V - SITUATION 3
23 to 30V	K1+K2+K3	A+B+C+D	4-3	31.5 V - SITUATION 4

- SITUATION 1. VAc1 → K3(2-3) → K1(2-3) → 1 → WINDG. B (B2C1) → WINDG. B (B1A2) → 5 → K2(2-3) → VAc2
- SITUATION 2. VAc1 → K3(2-3) → K1(2-1) → 2 → WINDG. C (C2D1) → WINDG. B (A2B1) → 5 → K2(3-2) → VAc2
- SITUATION 3. VAc1 → K3(2-3) → K1(2-1) → 2 → WINDG. C (C2D1) → WINDG. A (A1) → 4 → K2(1-2) → VAc2
- SITUATION 4. VAc1 → K3(2-1) → 3 → WINDG. D (D2) → WINDG. A (A1) → 4 → K2(1-2) → VAc2

PSA-305

LIKELY CAUSES OF FAILURE:

- 1) OUTPUT VOLTAGE READS $> 30V$ ALL THE TIME: (REFER TO SCHEMATIC FOR CONTROL & POWER CIRCUIT)
- CHECK Q-2 AND Q-7
 - CHECK Q-3.
 - CHECK Q-5

- 2) NO OUTPUT AT ALL: (REF: SCHEMATIC FOR RELAY BOARD)
- CHECK OUTPUT AT POINTS V_{AC1} & V_{AC2} SHOULD READ $13.8 V_{AC}$
IF NO VOLTAGE IS PRESENT, CHECK RELAYS K1, K2 & K-3 FOR BAD CONTACTS AND THEIR SWITCHING CONTROL CIRCUIT.
 - ALSO CHECK PADS ON THE PCB WHERE WIRES COMING FROM THE TRANSFORMER ARE SOLDERED. THE PAD(S) MAY HAVE BEEN STRIPPED OR BROKEN.
 - CHECK PROPER CONNECTIONS AT POINTS A1, A2, B1, B2, C1, C2 & D1, D2 AND ALSO AC VOLTAGES.
 - CHECK AC VOLTAGES AT POINTS 1, 2, 3, 4, & 5 WHERE WIRES FROM THE TRANSFORMER JOIN THE PCB

REF: (CONTROL & POWER CIRCUIT.)

- CHECK Q-2, Q7 & Q-3.

SAMLEX AMERICA, INC.

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SPECIFICATIONS OF COMPONENTS

TRANSISTOR ED1402E (PHILLIPS)

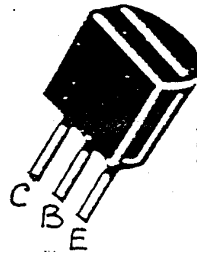
SILICON, NPN, GENERAL PURPOSE

I_c ----- 200mA

V_{CE} ----- 20V

P_{TOT} --- 500mW

h_{fe} --- 410 To 810



CROSS
2N3904
2N4401
MPS2222
MPS2222A

TRANSISTOR H1061C (HITACHI)

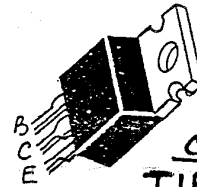
SILICON, NPN, LOW FREQUENCY

V_{CB} ----- 100V

V_{CE} ----- 80V

P_{TOT} ----- 40W

h_{fe} ----- 100 To 200

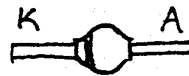


CROSS.
TIP-41C
MJE-3055T

ZENER DIODE BZW03C15 (PHILIPS)

WORKING VOLTAGE --- 15V

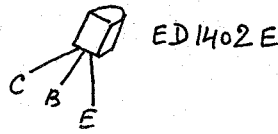
P_{TOT} ----- 6 WATTS.



CROSS
1N5352B
1N5353B.

ED1402E - Silicon NPN GENERAL PURPOSE. (PHILLIPS)

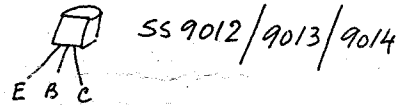
V_{CB} - 28V.
 V_{CE} - 20V.
 P_{tot} - 500mW.
 f_{β} - 410 to 810.



SS 9012 (Same as SS 9012 but PNP)

SS 9013 - SAMSUNG ELECTRONICS. (PSA-305) NPN.

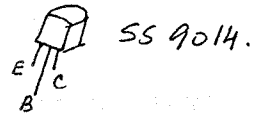
V_{CB} - 40V.
 V_{CE} - 20V.
 P_{tot} - 625mW.
 f_{β} - J: 64-81; E: 78-112; F: 98-135; G: 112-158; H: 144-202.



SS 9014 - Samsung Electronics

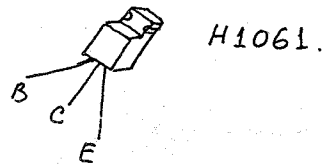
NPN.

V_{CB} - 50V.
 V_{CE} - 45V.
 P_{tot} - 450mW.
 f_{β} - A: 60-160; B: 100-300; C: 200-600; D: 400-1000.



H1061 - Silicon, NPN low frequency Power Amp.

V_{CB} - 100V.
 V_{CE} - 80V.
 P_{tot} - 40W.
 f_{β} - B: 6-120; C: 100-200.



2SK30ATM - Silicon N-channel Junction Type FET.

V_{GS} - -50V. P_D - 100mW.
 I_G - 10mA

