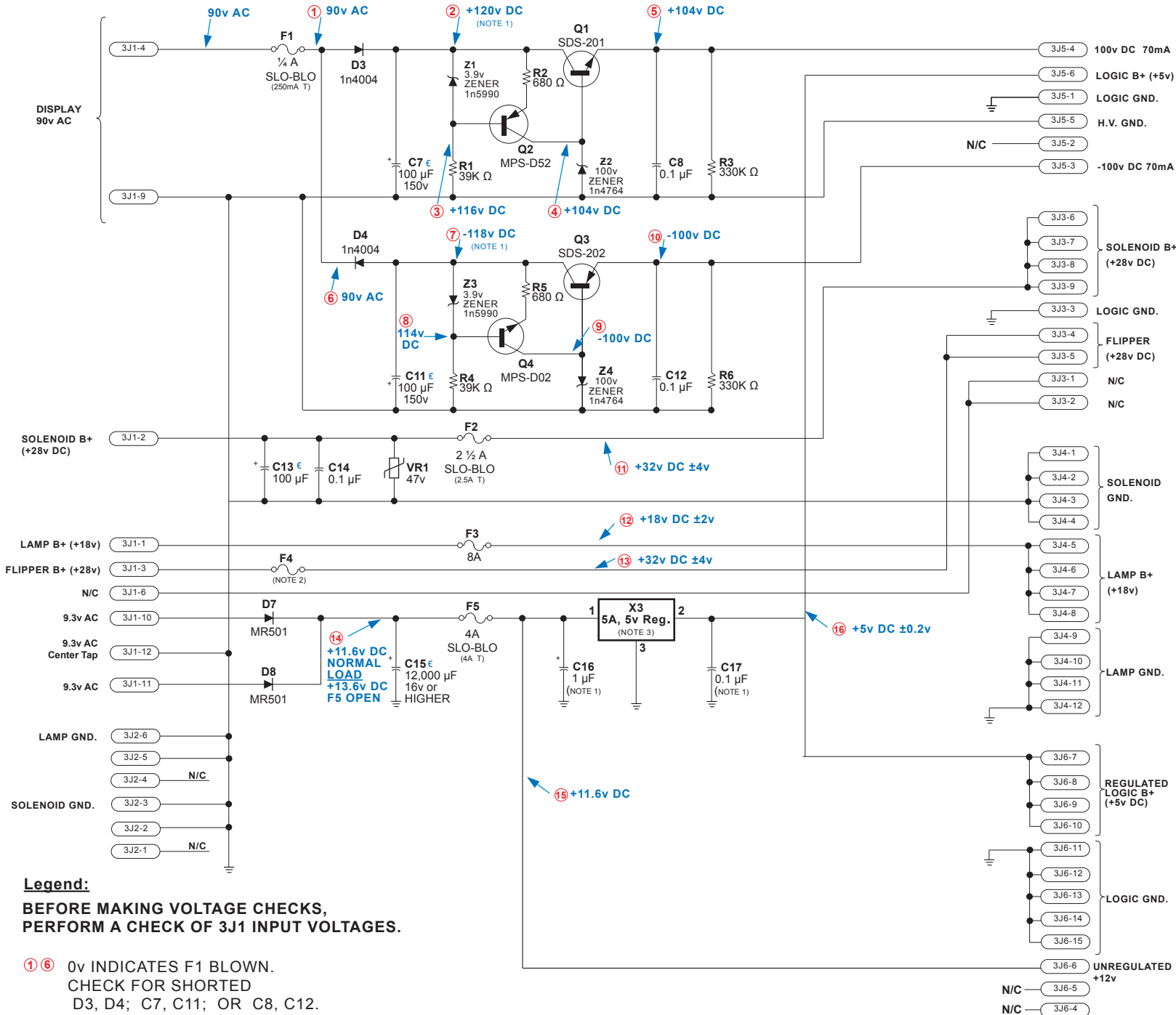




PSU Board Logic Drawing
 (Williams System 3-6) including example test measurements and fault indications.



Notes:

- EXCEPT FOR REGULATED +5v DC, ALL VOLTAGE READINGS ARE TYPICAL AND WILL VARY WITH 117/235v AC LINE VOLTAGE INPUT. FOR EXAMPLE, VOLTAGE READINGS SHOWN IN +100v DC AND -100v DC REGULATORS SHOW TYPICAL ACCEPTABLE VARIATIONS.
- FUSE F4 IS NOT USED ON SHUFFLE ALLEYS. ON FLIPPER GAMES, EITHER 10A OR 15A S.B. RATING IS REQUIRED. REFER TO MANUAL FOR THE VALUE USED IN GAME. USUALLY 10A FOR 2 FLIPPERS, AND 15A FOR 4 FLIPPERS.
- ACCEPTABLE REPLACEMENTS FOR X3, THE 5v REGULATOR ARE AS FOLLOWS: 78H05(KC), LAS1405, LM323K

Equivalent and Upgraded Parts:

- Q1 = SDS201 (NTE171) - No longer available.
 - Use MJE15030, note: part has different pinouts.†
- Q2 = MPSD52 (NTE288, 2N5400, or 2N5401).
 Q3 = SDS202 (NTE296) - No longer av available.
 - Use MJE15031, note: part has different pinouts.†
- Q4 = MPSD02 (NTE287) MPS-A06, or MPS-A42.
- Z1,Z3 = 1N4730 (3.9 volt 1 watt) resistors
 - replaces original 1N5990 (3.9 volt 1/2 watt).
- Z2,Z4 = 1N4763 (91 volt) zener diodes
 - used to replace original 1N4764 (100 volt) diodes, can help extend the display life.
- R1,R4 = 39k ohm 2 watt
 - replaces original 1/2 watt version.
- R2,R5 = 1.2k ohm 1/2 watt resistors
 - replaces original 680 ohm 1/2 watt resistor.
- C7,C11 (C1,C3 on Sys7) = 100 mfd 150 volt elect. (ε) caps
 C8,C12 (C2,C4 on Sys7) = 0.1uF 500 volt ceramic disc caps
- D7, D8 = 6A2 (6 amp, 200 volts), or 6A50 (6 amp, 50 volts)
 - replaces original MR501 diodes.

Legend:

BEFORE MAKING VOLTAGE CHECKS, PERFORM A CHECK OF 3J1 INPUT VOLTAGES.

- | | | | |
|---|---|--------------------------|--|
| ① ⑥ 0v INDICATES F1 BLOWN. CHECK FOR SHORTED D3, D4; C7, C11; OR C8, C12. | ④ ⑨ IF 0v Q2, Q4 OR R2, R5 FAULTY. IF OTHERWISE ABNORMAL Z2, Z4 FAULTY. | ⑪ 0v INDICATES F2 BLOWN. | ⑭ LOW VOLTAGE INDICATES OPEN D7 OR D8; C15, C16, OR C17, OR X3 FAULTY. |
| ② ⑦ 0v INDICATES OPEN D3, D4. LOW VOLTAGE INDICATES FAULTY C7,C11. | ⑤ ⑩ 0v OR SAME READING AS ② OR ⑦ INDICATES FAULTY Q1 OR Q3. | ⑫ 0v INDICATES F3 BLOWN. | ⑮ 0v INDICATES F5 BLOWN |
| ③ ⑧ IF VOLTAGE IS HIGH WITH RESPECT TO ② OR ⑦, Z1, Z3, OR R1, R4 FAULTY. | | ⑬ 0v INDICATES F4 BLOWN. | ⑯ ABNORMAL INDICATES X3 FAULTY. |

† See end of section 2.c.
<http://www.pinrepair.com/sys37/index1.htm#fuses>