PERFORM A CHECK OF 3J1 INPUT VOLTAGES.

0v INDICATES F1 BLOWN.
CHECK FOR SHORTED
D3, D4, C7, C11; OR C8, C12.

0v INDICATES OPEN D3, D4.
LOW VOLTAGE INDICATES FAULTY C7, C11.

IF VOLTAGE IS HIGH WITH RESPECT TO 2 OR 7,
Z1, Z3, OR R1, R4 FAULTY.

IF 0v Q2, Q4 OR R2, R5
FAULTY. IF OTHERWISE
ABNORMAL Z2, Z4 FAULTY.
0v OR SAME READING AS
2 OR 9 INDICATES FAULTY
Q1 OR Q3.

0v INDICATES F2 BLOWN.

LOW VOLTAGE INDICATES OPEN D7 OR D8; C15, C16,
OR C17, OR X3 FAULTY.
0v INDICATES F5 BLOWN
ABNORMAL INDICATES X3 FAULTY.

Notes:

1. 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.

2. 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.

3. ACCEPTABLE REPLACEMENTS FOR X3,
THE 5v REGULATOR ARE AS FOLLOWS:
78H05(KC), LAS1405, LM323K

Equivalent and Upgraded Parts:

Q1 = S60201 (NTE171) - No longer available.
Use MJE15030, note: part has different sockets.

Q2 = MPSD52 (NTE288, 2N5400, or 2N5401).
Use MJE15031, note: part has different sockets.

Q3 = S60202 (NTE290) - No longer available.
Use MPSD52 (NTE287) MPS-A06, or MPS-A42.

Z1, Z3 = 1N4004 (3.9 volt 1/2 watt) diodes
- replaces original 1N4764 (100 volt) diodes,
can help extend the display life.

Z2, Z4 = 1N4764 (5 volt) zener diodes
- used to replace original 1N4764 (100 volt) diodes,
can help extend the display life.

R1, R4 = 33k ohm 1 watt
- replaces original 1/2 watt version.
R2, R5 = 1k ohm 1/2 watt resistors
- replaces original 680 ohm 1/2 watt resistor.

C7, C11 (C13 on Sys7) = 100 mh 5 volt elect.
(C) caps
C8, C12 (C24 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.

Notes:

Capacitor values are given in microfarads.
Indicates Electrolytic Capacitors: C7, C11, C13 and C15
Resistor values are given in ohms and are ½ watt 10%.

Unless otherwise specified:
Resistor values are given in ohms and are ½ watt 10%.
Indicates Electronic Capacitors; C7, C11, C13 and C15
Capacitor values are given in microfarads.

†See end of section 2.c.
http://www.pinepair.com/sys7/index1.html#fuses