This configuration for 115V.

For lower line voltages or 220 volt operation see samples below.

Jumper for voltage variation:

- 230/218/206 volts
  - 1F1 = 4A SLO BLO
  - 1V1 = 275V VARISTOR
- 100/105 volts
  - 1F1 = 8A SLO BLO
  - 1V1 = 130V

Remove pin 9.
Cabinet Wiring Diagram
Cabinet Wiring Diagram
Playfield Coil / Flashlamp Wiring Diagram
72  Playfield Switch Wiring Diagram
<table>
<thead>
<tr>
<th>No. &amp; Description</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target Middle</td>
<td>180-5092-01</td>
</tr>
<tr>
<td>Target Middle</td>
<td>180-5092-01</td>
</tr>
<tr>
<td>Target Bottom</td>
<td>180-5092-01</td>
</tr>
<tr>
<td>Pit</td>
<td>180-5027-01</td>
</tr>
<tr>
<td>Pit</td>
<td>180-5057-00</td>
</tr>
<tr>
<td>Pit</td>
<td>180-5116-00</td>
</tr>
<tr>
<td>Pit</td>
<td>515-6073-00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Net No. &amp; Description</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 &quot;R&quot; Ramp Exit</td>
<td>180-5090-00</td>
</tr>
<tr>
<td>51 &quot;G&quot; Ramp Enter</td>
<td>180-5090-00</td>
</tr>
<tr>
<td>52 &quot;G&quot; Ramp Exit</td>
<td>180-5090-00</td>
</tr>
<tr>
<td>53 Left Return Lane</td>
<td>500-5707-00</td>
</tr>
<tr>
<td>54 Left Outlane</td>
<td>500-5707-00</td>
</tr>
<tr>
<td>55 Right Outlane</td>
<td>500-5707-00</td>
</tr>
<tr>
<td>56 Right Return Lane</td>
<td>500-5706-00</td>
</tr>
<tr>
<td>57 Right Drop Target Top</td>
<td>180-5092-01</td>
</tr>
<tr>
<td>58 Right Orbit Top</td>
<td>500-5707-00</td>
</tr>
<tr>
<td>59 Left Drop Target Top</td>
<td>180-5092-01</td>
</tr>
<tr>
<td>60 Left Orbit Top</td>
<td>500-5706-00</td>
</tr>
<tr>
<td>61 Not Used</td>
<td>--- --- ---</td>
</tr>
<tr>
<td>62 Gun Trigger</td>
<td>180-5093-00</td>
</tr>
<tr>
<td>63* Left Flipper Cabinet via Q7 (Transistor) on SSFB</td>
<td>180-5124-00</td>
</tr>
<tr>
<td>64* Right Flipper Cabinet via Q5 (Transistor) on SSFB</td>
<td>180-5124-00</td>
</tr>
</tbody>
</table>

---

**CPU BOARD**

**CN8**

- GRN - RED
- GRN - ORG
- GRN - YEL
- GRN - BLK
- GRN - BLU
- GRN - VIO
- GRN - GRY

- 2 SWITCH DRIVE 2
- 3 SWITCH DRIVE 3
- 4 SWITCH DRIVE 4
- 5 SWITCH DRIVE 5
- 6 SWITCH DRIVE 6
- 7 SWITCH DRIVE 7
- 8 SWITCH DRIVE 8

**CN10**

- WHT - BRN
- WHT - RED
- WHT - ORN
- WHT - YEL
- WHT - GRN
- WHT - BLU
- WHT - VIO
- WHT - GRY

- 9 SWITCH RETURN 1
- 8 SWITCH RETURN 2
- 7 SWITCH RETURN 3
- 6 SWITCH RETURN 4
- 5 SWITCH RETURN 5
- 3 SWITCH RETURN 6
- 2 SWITCH RETURN 7
- 1 SWITCH RETURN 8

---

72 Playfield Switch Wiring Diagram
CPU Board Logic Diagram
(Sheet 4 of 4)
VALUES ARE IN OHMS, 5%, 1/4W, SE SPECIFIED.
VALUES ARE IN MICROFARADS, SE SPECIFIED.

DATA EAST PINBALL
POWER SUPPLY BOARD SCHEMATIC

PREPARED BY
CES INC.

DWA PART NO. REV
C 520-5047-02 A

Sheet 1 of 1

Power Supply Board Schematic 79
DOT MATRIX BOARD
520-5052-00
Display Driver, Dwg. 1 (Cherry)
2. RESISTOR VALUES ARE IN OHMS, 1/8 WATT, 5%.
1. CAPACITOR VOLTAGES ARE 50V, 20%.

NOTES: UNLESS OTHERWISE SPECIFIED.
Display Driver, Dwg. 3 (Dale)
DALE PLASMA DISPLAY
PD-128G032

ANODE CONNECTIONS

OUT PUTS

HV9308PJ

ALL RESISTORS ARE 27K OHM X 128 RESISTORS

HV9308PJ

HV9308PJ

HV9308PJ

281103

CLASS 2

DALE ELECTRONICS, INC.
A COMPANY OF VISHAY
COLUMBUS, NEBRASKA

TITLE
ELECTRICAL SCHEMATIC
APD-128G032

SIGNATURES

DATE

92/02/21

D 91637 281103

SCALE NONE

86 Display Driver, Dwg. 3 (Dale)
Solid State Flipper Circuit
Troubleshooting Flowchart

START

Check for a good Ground Connection to Flipper Cabinet Switch (Black Wires).

Check Flipper Switch mounted on side of cabinet.
(Normally Open (NO) Switch)

Check wiring & connections from CN1 to EOS to cabinet switches.

Does Flipper energize?

NO

Does LED flicker on Solid State Flipper Board?

NO

YES

Check Fuses F2 & F4 on Solid State Flipper Board (SSFB).

Check Fuses on Solid State Flipper Board (SSFB) F1, F3 & F5

NPF

Check connector CN2 on SSFB Pins 9&10 for 8V AC.

Check 2-Pin connector (GRY & GRY/GRN Wire) beneath head in Cabinet for continuity. Check output voltage from transformer.

NPF

Replace Solid State Flipper Board (SSFB).

Replace PPB.

Check connector J7, Pins 1, 2, 3 for 50V DC on PPB.

Check F5 (5Amp Slo-Blo) on PPB.

Note: NPF = No Problem Found
New Solid State Flipper Board

We have redesigned our Solid State Flipper Board (S.S.F.B.) so that a misadjustment or failure of the End-of-Stroke (E.O.S.) Switch will not affect the operation of the flippers. The flippers will still work! The E.O.S. switch is strictly an added feature, not a functional part of the circuit (see E.O.S. Theory of Operation).

**Theory of Operation for the Solid State Flippers**

The Solid State Flipper Board is a Multiple Flipper Solenoid Driver Circuit. Each solenoid driver circuit contains a One Shot Timer, a 50V Driver, and an 8V Driver.

Looking at one circuit, Schmidt NAND gates U1A, U1b, and U1D make up the One Shot Timer. The timer length is controlled by R10, R33 and C2. The output of the timer is gated at U1C with the buffered switch input from Q6. The output of U1C controls the 50V driver circuit consisting of Q4, Q1, Q2, Q3, and D1. As long as the flipper button is activated, Q6 will keep the 8V driver circuit, SR1, on.

The 50 volts provides the actuation power to the flipper solenoid while the 8 volts provides the holding power.

**E.O.S. Switch Theory of Operation**

The End of Stroke (E.O.S.) Switch used in our flipper circuit is a Gold Peened Contact, Blade Switch Assembly, mounted on the flipper assembly.

Electrically, it is connected in series with the Cabinet Flipper Switch and the Flipper E.O.S. input on the Solid State Flipper Board (S.S.F.B.) connector CN1 which enables the 50 Volt DC Drive Circuit.

Refering to the Flipper Wiring Diagram, one side of the Flipper Cabinet Switch is connected to ground (BLK-Wire), the other side (BLU-VIO Wire) is connected to the flipper switch input on the S.S.F.B. connector CN1 which enables your 9 Volt DC holding voltage and is connected in series to the E.O.S. switch which is a normally closed switch.

The function of the E.O.S. switch is to prevent the flipper bat from being knocked back by a high velocity shot on the playfield. If while holding the flipper in the up position, the bat is moved back 1/16" or more, the E.O.S. switch will close giving the coil another 50 Volt pulse.

**E.O.S. Switch Adjustment**

The switch contacts should be adjusted so that when the solenoid is energized, the contacts stay closed for almost the full travel of the plunger. The contacts should open 1/16" before the plunger bottoms out or reaches maximum travel.

**Troubleshooting Tips**

The only indication of a problem you will have is the player complaining that when the flipper bat is being held in the up position, a high velocity shot from one of the playfield solenoids causes the ball to hit the flipper bat and physically knock it back. This will not occur if the E.O.S. is working. Check switch for alignment and continuity, replace if necessary.
NOTE:
-ALL RESISTOR VALUES ARE IN OHMS, V/4K, 5K UNLESS OTHERWISE SPECIFIED.
-ALL CAPACITOR VALUES ARE IN MICROFARADS, UNLESS OTHERWISE SPECIFIED.
-C107 AND C9 ARE 0.33uFD BYPASS CAPACITORS.