FIVE STAR REDEEMPTION

Raptor's Revenge

OPERATIONS MANUAL

June 26, 2008

Features

- Bright Attention Grabbing Graphics & Cabinet
- Hot looking Lights
- Exciting Super Fast Skill Stop
- Oversized Highly Reliability Buttons
- Operator Programmable

Specifications

Parameter	Value	Units
Voltage	115	VAC
Frequency	60	HZ
Weight	200	Pounds

Overview

Raptors Revenge consists of a lighted Dinosaur panel with a gun. The player console has a gun for shooting, two numeric displays for game play, speakers for sound effects, a spinner mechanism, two coin acceptors, and a ticket dispenser for winners. The objective is to skillfully shoot the ball into the colored dinosaur hoops or cups to obtain the highest point values.

TABLE OF CONTENTS

Game Play

Raptors Revenge offers very fast and interesting play with many different strategies for maximizing points.

The objective is to skillfully shoot the ball into a cup, a stationary or swinging hoop to obtain points, and possibly spin the spinner to obtain a maximum amount of points. The player can obtain jackpot points when they have landed or gone through a specific combination of dinosaur colors.

Tickets are dispensed during game play, and Jackpots are only awarded after games end.

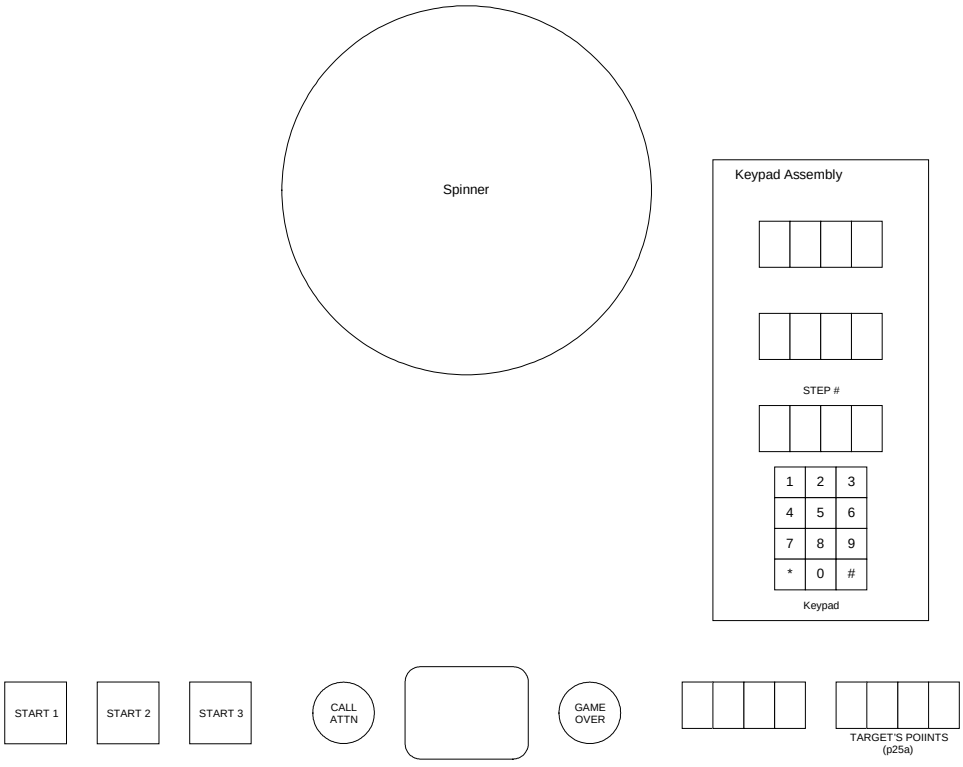
Program Mode Options

How to Enter Into Prograogram Mode

Program Mode allows the Game Operator the option of programming the Game by entering data through the Control Panel, which is located on the front panel of the cabinet. This mode includes viewing the game's statistical data, running diagnostics, and changing game play values.

To go into *Program Mode*, Hold Down both the '*****' and "**#**" symbols for approximately 5 seconds the Keypad Display should go Blank, next enter the number "11" which will allow the game operator to go into *Program Mode* (Keypad should display all zero's).

Pressing the **START 1 BUTTON** will decrement the Value, Pressing the **START 2 BUTTON** will increment the value. To increase the **STEP NUMBER** use the Numeric Keypad and press the '*', to decrease the STEP **NUMBER** press the '#' symbol. To Go to **STEPS** directly Hold down the "*****" key while entering the **STEP NUMBER** in the keypad. Pressing the *Program Mode* or Holding Down both the '*****' and "**#**" symbols will allow the operator to exit. The program button is located near the main board inside of the cabinet.



VIEWING THE STATISTICAL INFORMATION

Pressing the *START 1 Button* will decrement the *Step Number*, and pressing the *START 2 Button* will increase the Step Number.

STEP #	DESCRIPTION
0	Number of Coins Taken In (Lifetime)
1	Number of Coins Taken In (Since Last Reset)

CHANGING OR VIEWING MISCELLANEOUS SETTINGS

Press Call *Attendant* button to increase the value, or Press the *Game Over* button to decrease the value.

STEP #	DESCRIPTION
10	Number of Coins Required to Play Game 1
11	Number of Coins Required to play Game 2
12	Number of Coins Required to Play Game 3
13	Number of Balls for Game 1
14	Number of Balls for Game 2
15	Number of Balls for Game 3
16	Maximum Number of Balls Allowed Per Game
17	Number of Seconds Attraction Audio is On Per cycle
18	Number of Seconds Attraction Audio is Off per Cycle
19	Maximum Number of tickets that will dispense before calling Attendant
20	Ticket Dispensed After Last Ball or Dispense Tickets after Shooting Ball
21	Number of Seconds Before Returning to Attraction After Game Over
22	Number of Seconds Between Loading Balls During Attraction
23	Clock Face Speed (Speed of Clock Face Lights 0 – 10)
24	The Spinner Percentage (Percentage of Time at 3,6,9, or 12:00 Position
25	Spinner Ramp Up Minimum Speed
26	Maximum Spinner RPM
27	Spinner control Button Mode 0= Auto, 1=One Push, 2=Two Push
28	Spinner Self Diagnostic Sensitivity Level 0 – 3 (Most Sensitive)

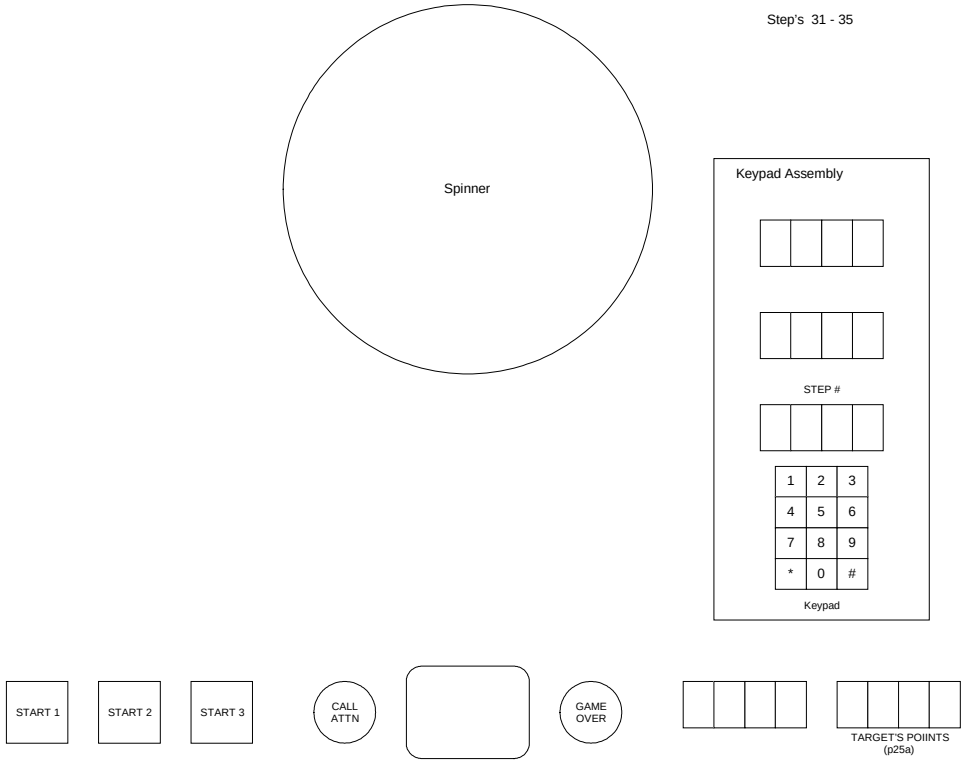
RESETTING THE STATISTICS

Pressing the *Call Attendant* button will execute the reset.

STEP #	DESCRIPTION
30	Reset Statistics

RUNNING PROGRAM DIAGNOSTICS

Pressing the '**#**' Symbol on the Keypad or Start 2 Button on the Game will increment the *Step Number*, and pressing '*****' Symbol or Start 1 Button will decrement the Step Number.



STEP #	DESCRIPTION
31	Display the Value and Light Associated for the sensor that is blocked

Press the flashing **Call Attendant Button** to **Execute** each diagnostic **Steps 32 - 35**.

32	Status of Ramp full, Gun loaded, Tickets lows, and Tickets out sensors

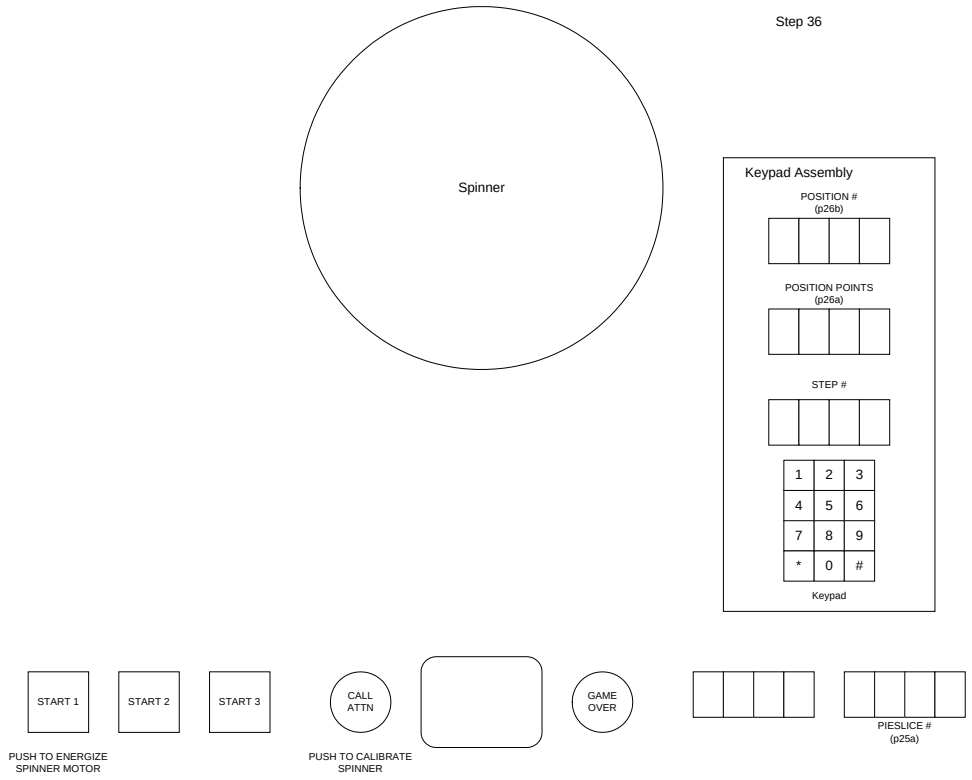
Senor		Displayed
Gun Trough Sensor	Sensor Not Sensing Light	---o
Gun Trough Sensor	Sensor Sensing Light	---o
Tickets Low Sensor	Not Sensing Light	--o-
Tickets Low Sensor	Sensing Light	--o-
Tickets Out Sensor	Sensing Light	-o--
Tickets Out Sensor	Not Sensing Light	-o--
Ramp Full Sensor	Sensing Light	o---
Ramp Full Sensor	Not Sensing Light	o---

Press the flashing **Call Attendant Button** to Execute **Diagnostic Steps 33- 35**

STEP #	DESCRIPTION
33	Dispense Tickets – dispenses a Single Ticket
34	Load a ball by rotating the turntable – Rotates as Long as button pushed
35	Turn on Gun Trough Gate Motor - On while button pressed.

Step 36 Calibrate Spinner and Display Spinner Parameters

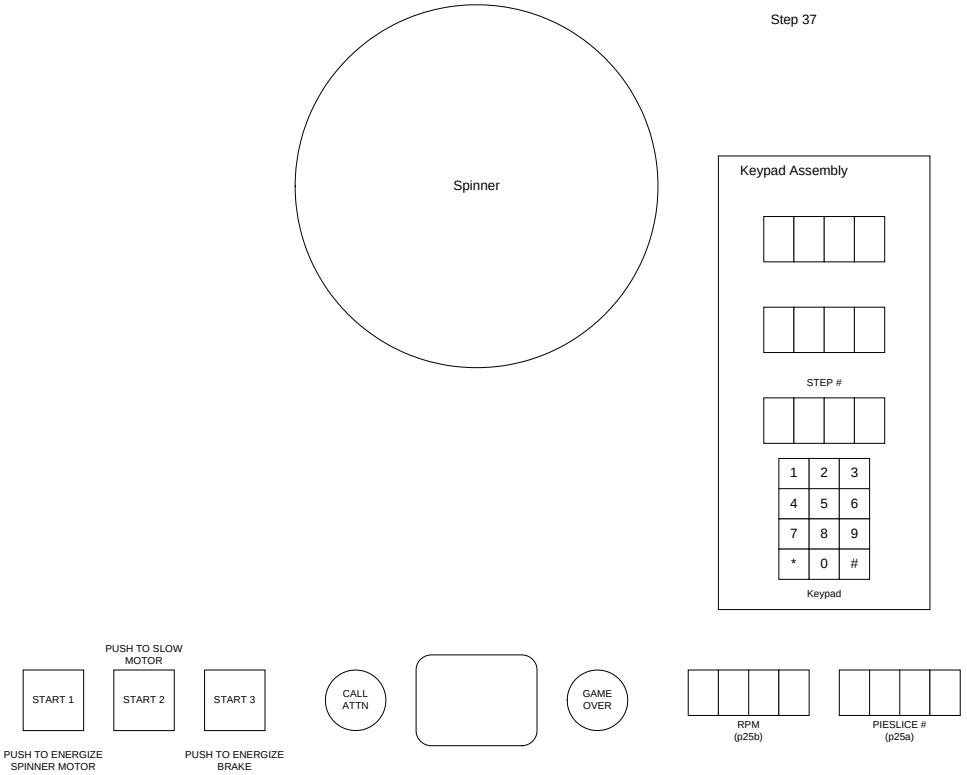
Display Spinner pieslice 0-255, points, and position number. Recalibrate to TDC (top dead center) by manually positioning pointer straight up and pushing Fast Stop button. Perform the troubleshooting steps in the sequence specified in the table below.



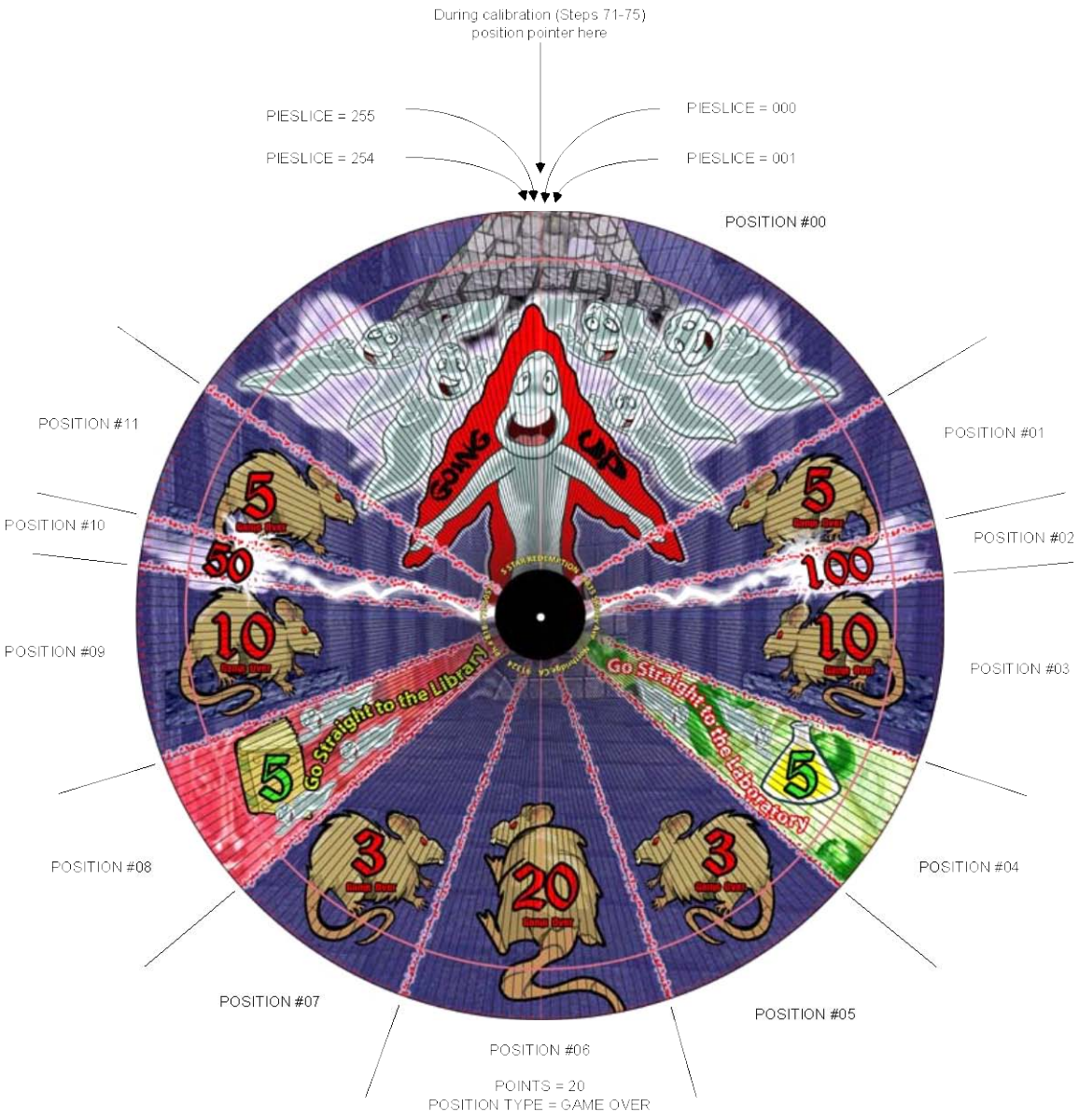
Problem	Solution
Pieslice is not zero when spinner is pointing straight up to TDC (top dead center)	• Recalibrate to TDC by manually positioning pointer straight up and pushing Start button (spinner may be energized by momentarily pushing Fast Stop pushbutton)
Wrong pieslice 0-255, pieslice number should increase smoothly from 0 to 255 as spinner is rotated clockwise	• Verify spinner board switches are set correctly • Examine/reseat wiring harness connections to spinner board
Wrong position number, position number should increase smoothly from 0 as spinner is rotated clockwise through each spinner position	• Verify spinner board switches are set correctly • Examine/reseat wiring harness connections to spinner board • Recalibrate to TDC (top dead center) by manually positioning pointer straight up and pushing Fast Stop button

Step 37 Spinner Factory Diagnostics

Push the Start 3 pushbutton to energize the spinner brake and the Start 1 pushbutton to energize the spinner motor. Hold down the Start 2 pushbutton while pushing the Start 1 pushbutton to cause the spinner to spin more slowly.



Problem	Solution
Spinner does not spin	• Examine/reseat wiring harness connections to spinner motor • Look for low-voltage changes at VTMux board output when spinner should be spinning and if voltage does not change, replace VTMux board and retest
Brake does not activate	• Examine/reseat wiring harness connections to spinner solenoid • Look for low-voltage changes at VTMux board output when brake should be activated and if voltage does not change, replace VTMux board and retest



Example Spinner Showing Pie Slice, Spinner Points, Position Types, and Position Numbers

Step 38 Test Keypad Inputs

Press any key on the keypad and the value will be displayed on the Keypad Display

CHANGING OR VIEWING THE PLAYING FIELD POINTS

Press Call *Attendant* button to increase the value, or Press the *Game Over* button to decrease the value.

STEP #	DESCRIPTION
40	Points for Green Paw (Y1)
41	Points for Pink Paw (P1)
42	Points for Orange Paw (O1)
43	Points for Yellow Paw (Y1)
44	Points for Red Paw (R1)
45	Points for Cave #1
46	Points for Hole #1
47	Points for Hole #2
48	Points for Cave #2
49	Points for Volcano
50	Pink Hoop Sensor
51	Green Hoop Sensor
52	Orange Hoop Sensor
53	Yellow Hoop Sensor

CHANGING OR VIEWING JACKPOT POINTS

Press Call *Attendant* button to increase the value, or Press the *Game Over* button to decrease the value.

STEP #	DESCRIPTION
60	Jackpot #1 Points
61	Jackpot #2 Points
62	Jackpot #3 Points
63	Jackpot #4 Points

CHANGING OR VIEWING HOOP POINTS

Press Call *Attendant* button to increase the value, or Press the *Game Over* button to decrease the value.

STEP #	DESCRIPTION
64	Points for Hoop #1
65	Points for Hoop #2
66	Points for Hoop #3
67	Points for Hoop #4
68	Points for Hoop #5

CHANGING OR VIEWING CLOCK FACE POINTS

Press Call *Attendant* button to increase the value, or Press the *Game Over* button to decrease the value.

STEP #	DESCRIPTION
70	Points for 01:00 O'clock Position
71	Points for 02:00 O'clock Position
72	Points for 03:00 O'clock Position
73	Points for 04:00 O'clock Position
74	Points for 05:00 O'clock Position
75	Points for 06:00 O'clock Position
76	Points for 07:00 O'clock Position
77	Points for 08:00 O'clock Position
78	Points for 09:00 O'clock Position
79	Points for10:00 O'clock Position
80	Points for11:00 O'clock Position
81	Points for12:00 O'clock Position

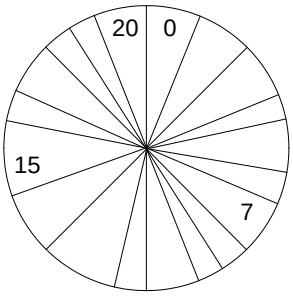
VIEWING SOFTWARE VERSION STEP 99

Press Call *Attendant* button to increase the value, or Press the *Game Over* button to decrease the value.

View and Changing Spinner Target Values

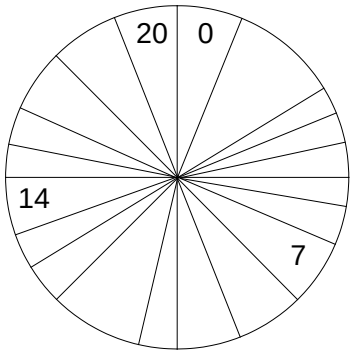
VIEWING AND CHANGING SPINNER TARGET VALUES STEPS 100 – 120

Pressing the **FAST STOP BUTTON** will decrement the Value, Pressing the **START BUTTON** will increment the value. To increase the **STEP NUMBER** use the Numeric Keypad and press the '*', to decrease the **STEP NUMBER** press the '#' symbol. To Go to **STEPS** directly Hold down the "*****" key while entering the **STEP NUMBER** in the keypad. Pressing the *Program Mode* or Holding Down both the '*****' and "**#**" symbols will allow the operator to exit. The program button is located near the main board inside of the cabinet. ***Step Numbers can very depending on the Number of Spinner Positions for that graphic.***



STEPS 100 – 120
VIEWING SPINNER #1 TARGET POINTS

STEP NUMBER	SPINNER POSITION	TARGET POINTS
100	***0***	***INCREMENTS OF 1***
101	***1***	***"***
102	***2***	***"***
103	***3***	***"***
104	***4***	***"***
105	***5***	***"***
106	***6***	***"***
107	***7***	***"***
108	***8***	***"***
109	***9***	***"***
110	***10***	***"***
111	***11***	***"***
112	***12***	***"***
113	***13***	***"***
114	***14***	***"***
115	***15***	***"***
116	***16***	***"***
117	***17***	***"***
118	***18***	***"***
119	***19***	***"***
120	***20***	***"***



STEPS 150 - 170
CHANGING SPINNER #1 TARGET TYPES

STEP NUMBER **SPINNER #1**	**SPINNER POSITION**	**TARGET TYPES**
150	***0***	***0=NONE 1-5 JUMP TO SPINNER# 6=UP 7 = DOWN 8= DEATH***
151	***1***	*“*
152	***2***	*“*
153	***3***	*“*
154	***4***	*“*
155	***5***	*“*
156	***6***	*“*
157	***7***	*“*
158	***8***	*“*
159	***9***	*“*
160	***10***	*“*
161	***11***	*“*
162	***12***	*“*
163	***13***	*“*
164	***14***	*“*
165	***15***	*“*
166	***16***	*“*
167	***17***	*“*
168	***18***	*“*
169	***19***	*“*
170	***20***	*“*

Appendix A Input/Output Signals

CPU AUXILIARY INPUTS

W4 – VTMUX BOARD P2 TO PUSHBUTTONS & MISC SWITCHES

Control Panel Output	Wire #	Auxiliary Inputs	To VTMUX Board Location
NOT USED	*1*	*V+*	*JP2 PIN 1*
GROUND	*2*	*GROUND*	*JP2 PIN 2*
CONNECTOR KEY	*3*	*KEY*	*JP2 PIN 3*
CONNECTOR KEY	*4*	*KEY*	*JP2 PIN 4*
MAINTENANCE MODE BUTTON	*5*	*IN 1*	*JP2 PIN 5*
TILT SWITCH	*6*	*IN 2*	*JP2 PIN 6*
COIN ACCEPTOR	*7*	*IN 3*	*JP2 PIN 7*
NOT USED	*8*	*IN 4*	*JP2 PIN 8*
OPEN DOOR SWITCH	*9*	*IN 5*	*JP2 PIN 9*
NOT USED	*10*	*IN 6*	*JP2 PIN 10*
NOT USED	*11*	*IN 7*	*JP2 PIN 11*
NOT USED	*12*	*IN 8*	*JP2 PIN 12*

W7 – VTMUX BOARD P3 TO PUSHBUTTON SWITCHES

Control Panel Outputs	Wire #	Auxiliary Inputs	To VTMUX Board Location
NOT USED	*1*	*V+*	*JP3 PIN 1*
GROUND	*2*	*GROUND*	*JP3 PIN 2*
CONNECTOR KEY	*3*	*KEY*	*JP3 PIN 3*
START BUTTON #1	*4*	*IN 9*	*JP3 PIN 4*
CONNECTOR KEY	*5*	*KEY*	*JP3 PIN 5*
START BUTTON # 2	*6*	*IN 10*	*JP3 PIN 6*
START BUTTON # 3	*7*	*IN 11*	*JP3 PIN 7*
NOT USED	*8*	*IN 12*	*JP3 PIN 8*
NOT USED	*9*	*IN 13*	*JP3 PIN 9*
NOT USED	*10*	*IN 14*	*JP3 PIN 10*
GAME OVER BUTTON	*11*	*IN 15*	*JP3 PIN 11*
CALL ATTENDANT BUTTON	*12*	*IN 16*	*JP3 PIN 12*

W90 – VTMUX BOARD P4 TO OPTO BOARD #1 P9

Control Panel Outputs	Wire #	Auxiliary Inputs	To VTMUX Board Location
12V	*1*	*V+*	*JP4 PIN 1*
GROUND	*2*	*GROUND*	*JP4 PIN 2*
CONNECTOR KEY	*3*	*KEY*	*JP4 PIN 3*
SENSOR CUP # 1	*4*	*IN 17*	*JP4 PIN 4*
SENSOR CUP #2	*5*	*IN 18*	*JP4 PIN 5*
CONNECTOR KEY	*6*	*KEY*	*JP4 PIN 6*
SENSOR CUP #3	*7*	*IN 19*	*JP4 PIN 7*
SENSOR CUP #4	*8*	*IN 20*	*JP4 PIN 8*
SENSOR CUP #5	*9*	*IN 21*	*JP4 PIN 9*
SENSOR CUP #6	*10*	*IN 22*	*JP4 PIN 10*
SENSOR CUP #7	*11*	*IN 23*	*JP4 PIN 11*
SENSOR CUP #8	*12*	*IN 24*	*JP4 PIN 12*

W91 – VTMUX BOARD P5 TO OPTO BOARD #2 P9

Inputs	Wire #	Auxiliary Inputs	To VTMUX Board Location
12V	*1*	*V+*	*JP5 PIN 1*
GROUND	*2*	*GROUND*	*JP5 PIN 2*
CONNECTOR KEY	*3*	*KEY*	*JP5 PIN 3*
SENSOR CUP #9	*4*	*IN 25*	*JP5 PIN 4*
SENSOR CUP #10	*5*	*IN 26*	*JP5 PIN 5*
SENSOR CUP #11	*6*	*IN 27*	*JP5 PIN 6*
CONNECTOR KEY	*7*	*KEY*	*JP5 PIN 7*
SENSOR CUP #12	*8*	*IN 28*	*JP5 PIN 8*
SENSOR CUP #12	*9*	*IN 29*	*JP5 PIN 9*
SENSOR CUP #14	*10*	*IN 30*	*JP5 PIN 10*
SENSOR CUP #15	*11*	*IN 31*	*JP5 PIN 11*
SENSOR CUP #16	*12*	*IN 32*	*JP5 PIN 12*

W95 – VTMUX BOARD P11 TO OPTO BOARD #3 P9

Inputs	Wire #	Auxiliary Inputs	To VTMUX Board Location
12V	*1*	*V+*	*JP11 PIN 1*
GROUND	*2*	*GROUND*	*JP11 PIN 2*
CONNECTOR KEY	*3*	*KEY*	*JP11 PIN 3*
SENSOR HOOP #17	*4*	*IN 57*	*JP11 PIN 4*
SENSOR HOOP #18	*5*	*IN 58*	*JP11 PIN 5*
SENSOR HOOP #19	*6*	*IN 59*	*JP11 PIN 6*
SENSOR HOOP #20	*7*	*IN 60*	*JP11 PIN 7*
SENSOR HOOP #21	*8*	*IN 61*	*JP11 PIN 8*
SENSOR HOOP #22	*9*	*IN 62*	*JP11 PIN 9*
SENSOR HOOP #23	*10*	*IN 63*	*JP11 PIN 10*
CONNECTOR KEY	*11*	*KEY*	*JP11 PIN 11*
SENSOR HOOP #24	*12*	*IN 64*	*JP11 PIN 12*

W96 – VTMUX BOARD P12 TO OPTO BOARD #4 P9

Inputs	Wire #	Auxiliary Inputs	To VTMUX Board Location
12V	*1*	*V+*	*JP12 PIN 1*
GROUND	*2*	*GROUND*	*JP12 PIN 2*
CONNECTOR KEY	*3*	*KEY*	*JP12 PIN 3*
BALL PRELOADED SENSOR	*4*	*IN 65*	*JP12 PIN 4*
GUN & TROUGH SENSOR	*5*	*IN 66*	*JP12 PIN 5*
TICKETS LOW SENSOR	*6*	*IN 67*	*JP12 PIN 6*
TICKETS OUT SENSOR	*7*	*IN 68*	*JP12 PIN 7*
RAMP FULL SENSOR	*8*	*IN 69*	*JP12 PIN 8*
NOT USED	*6*	*IN 70*	*JP12 PIN 9*
NOT USED	*10*	*IN 71*	*JP12 PIN 10*
NOT USED	*11*	*IN 72*	*JP12 PIN 11*
CONNECTOR KEY	*12*	*KEY*	*JP12 PIN 12*

CPU AUXILIARY OUTPUTS

W6 – VTMUX BOARD P16 TO MISC PANEL LIGHTS

Outputs	Wire #	Auxiliary Outputs	To VTMUX Board Location
CONNECTOR KEY	*1*	*KEY*	*JP16 PIN 1*
GROUND	*2*	*GROUND*	*JP16 PIN 2*
GROUND	*3*	*GROUND*	*JP16 PIN 3*
CONNECTOR KEY	*4*	*KEY*	*JP16 PIN 4*
START #1 BUTTON LIGHT	*5*	*OUT 1*	*JP16 PIN 5*
START #2 BUTTON LIGHT	*6*	*OUT 2*	*JP16 PIN 6*
START # 3 BUTTON LIGHT	*7*	*OUT 3*	*JP16 PIN 7*
NOT USED	*8*	*OUT 4*	*JP16 PIN 8*
NOT USED	*6*	*OUT 5*	*JP16 PIN 9*
NOT USED	*10*	*OUT 6*	*JP16 PIN 10*
GAME OVER LIGHT	*11*	*OUT 7*	*JP16 PIN 11*
CALL ATTENDANT LIGHT	*12*	*OUT 8*	*JP16 PIN 12*

W15 – VTMUX BOARD P17 CLOCKFACE LIGHTS 1 - 8

Outputs	Wire #	Auxiliary Outputs	To VTMUX Board Location
CONNECTOR KEY	*1*	*KEY*	*JP17 PIN 1*
GROUND	*2*	*GROUND*	*JP17 PIN 2*
GROUND	*3*	*GROUND*	*JP17 PIN 3*
CLOCKFACE #1	*4*	*OUT 9*	*JP17 PIN 4*
CONNECTOR KEY	*5*	*KEY*	*JP17 PIN 5*
CLOCKFACE #2	*6*	*OUT 10*	*JP17 PIN 6*
CLOCKFACE #3	*7*	*OUT 11*	*JP17 PIN 7*
CLOCKFACE #4	*8*	*OUT 12*	*JP17 PIN 8*
CLOCKFACE #5	*6*	*OUT 13*	*JP17 PIN 9*
CLOCKFACE #6	*10*	*OUT 14*	*JP17PIN 10*
CLOCKFACE #7	*11*	*OUT 15*	*JP17 PIN 11*
CLOCKFACE #8	*12*	*OUT 16*	*JP17 PIN 12*

W16 – VTMUX BOARD P18 CLOCKFACE LIGHTS 9 -12

Outputs	Wire #	Auxiliary Outputs	To VTMUX Board Location
CONNECTOR KEY	*1*	*KEY*	*JP18 PIN 1*
GROUND	*2*	*GROUND*	*JP18 PIN 2*
GROUND	*3*	*GROUND*	*JP18 PIN 3*
CLOCKFACE #9	*4*	*OUT 17*	*JP18 PIN 4*
CLOCKFACE #10	*5*	*OUT 18*	*JP18 PIN 5*
CONNECTOR KEY	*6*	*KEY*	*JP18 PIN 6*
CLOCKFACE #11	*7*	*OUT 19*	*JP18 PIN 7*
CLOCKFACE #12	*8*	*OUT 20*	*JP18 PIN 8*
NOT USED	*6*	*OUT 21*	*JP18 PIN 9*
NOT USED	*10*	*OUT 22*	*JP18 PIN 10*
NOT USED	*11*	*OUT 23*	*JP18 PIN 11*
NOT USED	*12*	*OUT 24*	*JP18 PIN 12*

W17 – VTMUX BOARD P22 HOOP LIGHTS

Outputs	Wire #	Auxiliary Outputs	To VTMUX Board Location
CONNECTOR KEY	*1*	*KEY*	*JP22 PIN 1*
GROUND	*2*	*GROUND*	*JP22 PIN 2*
GROUND	*3*	*GROUND*	*JP22 PIN 3*
HOOP #1	*4*	*OUT 25*	*JP22 PIN 4*
HOOP #2	*5*	*OUT 26*	*JP22 PIN 5*
HOOP #3	*6*	*OUT 27*	*JP22 PIN 6*
CONNECTOR KEY	*7*	*KEY*	*JP22 PIN 7*
HOOP #4	*8*	*OUT 28*	*JP22 PIN 8*
HOOP #5	*6*	*OUT 29*	*JP22 PIN 9*
HOOP #6	*10*	*OUT 30*	*JP22 PIN 10*
NOT USED	*11*	*OUT 31*	*JP22 PIN 11*
NOT USED	*12*	*OUT 32*	*JP22 PIN 12*

W18 – VTMUX BOARD P23 DINOSAUR LIGHTS WITH JACKPOT LIGHT

Outputs	Wire #	Auxiliary Outputs	To VTMUX Board Location
CONNECTOR KEY	*1*	*KEY*	*JP23 PIN 1*
GROUND	*2*	*GROUND*	*JP23 PIN 2*
GROUND	*3*	*GROUND*	*JP23 PIN 3*
DINO YELLOW	*4*	*OUT 33*	*JP23 PIN 4*
DINO ORANGE	*5*	*OUT 34*	*JP23 PIN 5*
DINO PINK	*6*	*OUT 35*	*JP23 PIN 6*
DINO GREEN	*7*	*OUT 36*	*JP23 PIN 7*
CONNECTOR KEY	*8*	*KEY*	*JP23 PIN 8*
DINO RED	*6*	*OUT 37*	*JP23 PIN 9*
NOT USED	*10*	*OUT 38*	*JP23 PIN 10*
NOT USED	*11*	*OUT 39*	*JP23 PIN 11*
SUPER JACKPOT	*12*	*OUT 40*	*JP23 PIN 12*

W19 – VTMUX BOARD P24 PLAYFIELD LIGHTS 1-8

Inputs	Wire #	Auxiliary Inputs	To VTMUX Board Location
CONNECTOR KEY	*1*	*KEY*	*JP24 PIN 1*
GROUND	*2*	*GROUND*	*JP24 PIN 2*
GROUND	*3*	*GROUND*	*JP24 PIN 3*
PLAYFIELD #1	*4*	*OUT 41*	*JP24PIN 4*
PLAYFIELD #2	*5*	*OUT 42*	*JP24 PIN 5*
PLAYFIELD #3	*6*	*OUT 43*	*JP24 PIN 6*
PLAYFIELD #4	*7*	*OUT 44*	*JP24 PIN 7*
PLAYFIELD #5	*8*	*OUT 45*	*JP24 PIN 8*
CONNECTOR KEY	*9*	*KEY*	*JP24 PIN 9*
PLAYFIELD #6	*10*	*OUT 46*	*JP24 PIN 10*
PLAYFIELD #7	*11*	*OUT 47*	*JP24 PIN 11*
PLAYFIELD #8	*12*	*OUT 48*	*JP24 PIN 12*

W20 – VTMUX BOARD P29 PLAYFIELD LIGHTS 9-10

Inputs	Wire #	Auxiliary Inputs	To VTMUX Board Location
CONNECTOR KEY	*1*	*KEY*	*JP29 PIN 1*
GROUND	*2*	*GROUND*	*JP29 PIN 2*
GROUND	*3*	*GROUND*	*JP29 PIN 3*
PLAYFIELD #9	*4*	*OUT 49*	*JP29PIN 4*
PLAYFIELD #10	*5*	*OUT 50*	*JP29 PIN 5*
NOT USED	*6*	*OUT 51*	*JP29 PIN 6*
NOT USED	*7*	*OUT 52*	*JP29 PIN 7*
NOT USED	*8*	*OUT 53*	*JP29 PIN 8*
NOT USED	*9*	*OUT 54*	*JP29 PIN 9*
CONNECTOR KEY	*10*	*KEY*	*JP29 PIN 10*
NOT USED	*11*	*OUT 55*	*JP29 PIN 11*
NOT USED	*12*	*OUT 56*	*JP29 PIN 12*

W26 – VTMUX BOARD P29 PLAYFIELD LIGHTS 9-10

Inputs	Wire #	Auxiliary Inputs	To VTMUX Board Location
CONNECTOR KEY	*1*	*KEY*	*JP29 PIN 1*
GROUND	*2*	*GROUND*	*JP29 PIN 2*
GROUND	*3*	*GROUND*	*JP29 PIN 3*
PLAYFIELD #9	*4*	*OUT 49*	*JP29PIN 4*
PLAYFIELD #10	*5*	*OUT 50*	*JP29 PIN 5*
NOT USED	*6*	*OUT 51*	*JP29 PIN 6*
NOT USED	*7*	*OUT 52*	*JP29 PIN 7*
NOT USED	*8*	*OUT 53*	*JP29 PIN 8*
NOT USED	*9*	*OUT 54*	*JP29 PIN 9*
CONNECTOR KEY	*10*	*KEY*	*JP29 PIN 10*
NOT USED	*11*	*OUT 55*	*JP29 PIN 11*
NOT USED	*12*	*OUT 56*	*JP29 PIN 12*

W24 - VTMUX BOARD P25 TO SMALL DISPLAY

Outputs	Display Outputs	From CPU Board Location
NOT CONNECTED	*GROUND*	*JP25-1*
*SMALL DISPLAY **ENABLE***	*DISP 0E1*	*JP25-2*
*SMALL DISPLAY **CLK***	*DISP CLK*	*JP25-3*
SMALL DISPLAY NOT CONNECTED	*V+*	*JP25-4*
*SMALL DISPLAY **VPP & VLED***	*VCC*	*JP25-5*
SMALL DISPLAY NOT CONNECTED	*DISP STB1*	*JP25-6*
*SMALL DISPLAY **DATA***	*DISP DATA1*	*JP25-7*
GROUND	*GROUND*	*JP25-8*

W25 - VTMUX BOARD P26 TO SMALL DISPLAY

NOT CONNECTED	*GROUND*	*JP26-1*
*SMALL DISPLAY **ENABLE***	*DISP 0E2*	*JP26-2*
*SMALL DISPLAY **CLK***	*DISP CLK*	*JP26-3*
SMALL DISPLAY NOT CONNECTED	*V+*	*JP26-4*
*SMALL DISPLAY **VPP & VLED***	*VCC*	*JP26-5*
SMALL DISPLAY NOT CONNECTED	*DISP STB2*	*JP26-6*
*SMALL DISPLAY **DATA***	*DISP DATA2*	*JP26-7*
GROUND	*GROUND*	*JP26-8*

Appendix B Wiring Diagrams

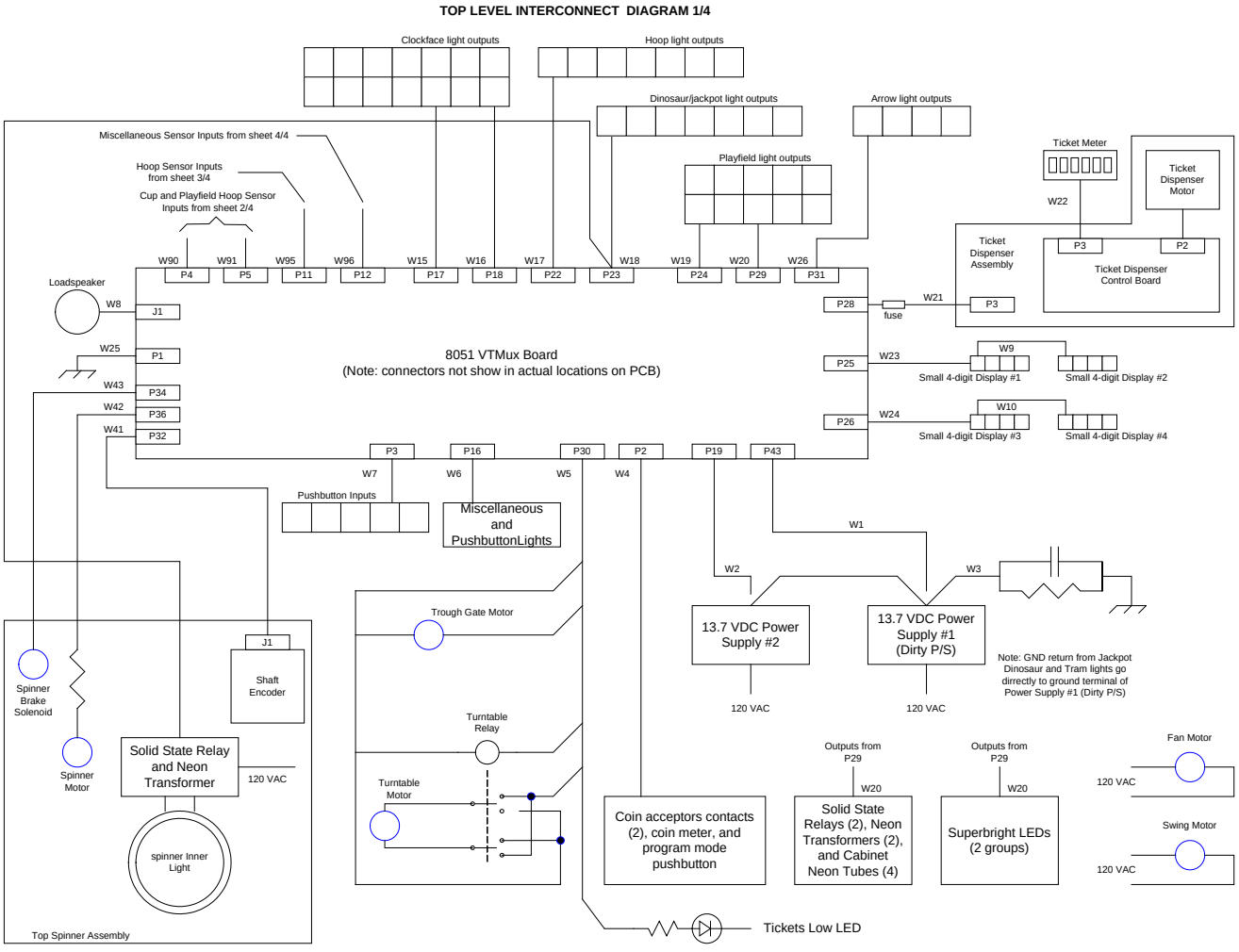


DIAGRAM 1 – TOP LEVEL INTERCONNECT DIAGRAM

APPENDIX B WIRING DIAGRAMS

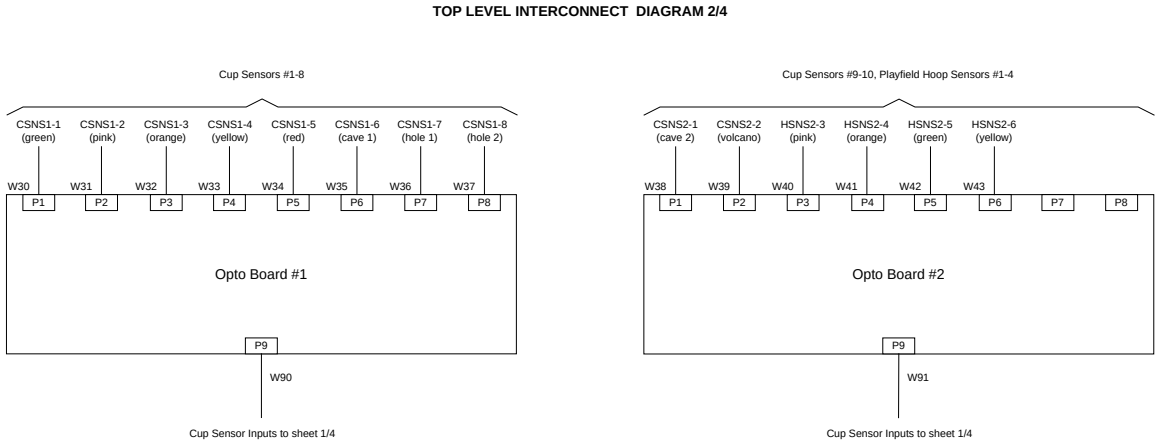


DIAGRAM 2 – TOP LEVEL INTERCONNECT DIAGRAM 2/4

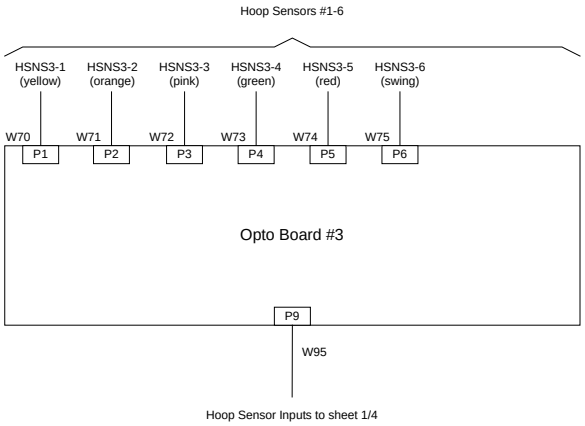


DIAGRAM 3 – TOP LEVEL INTERCONNECT DIAGRAM 3/4

APPENDIX B WIRING DIAGRAMS

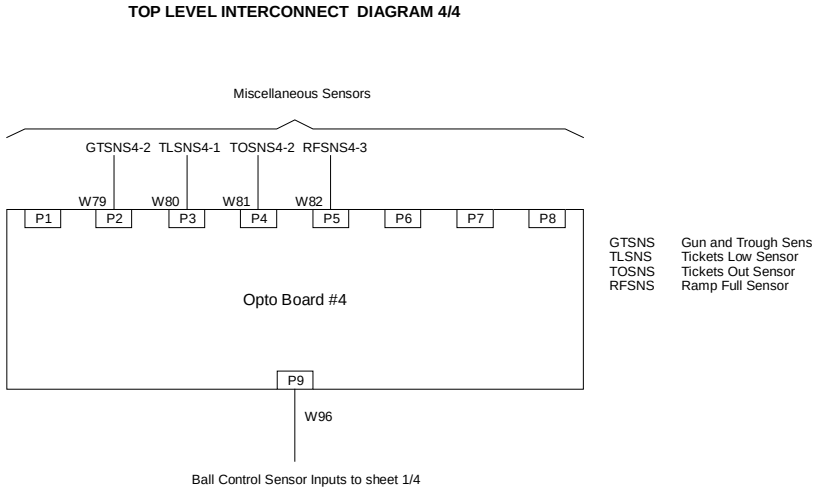


DIAGRAM 4 – TOP LEVEL INTERCONNECT DIAGRAM 4/4

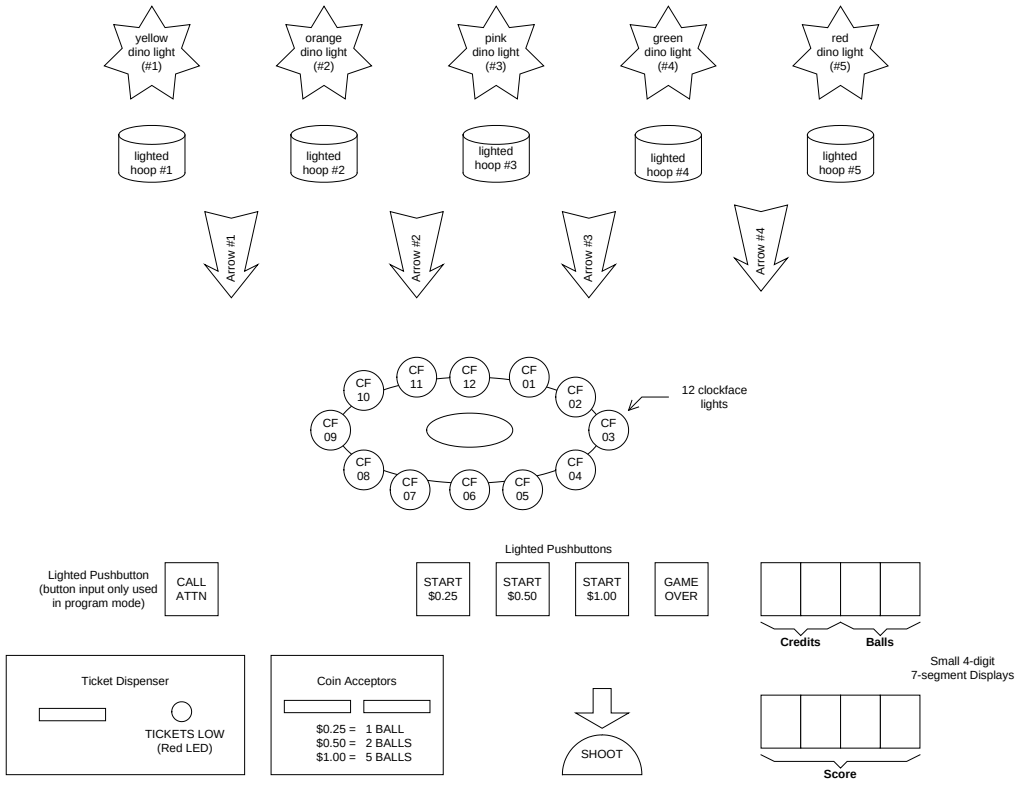
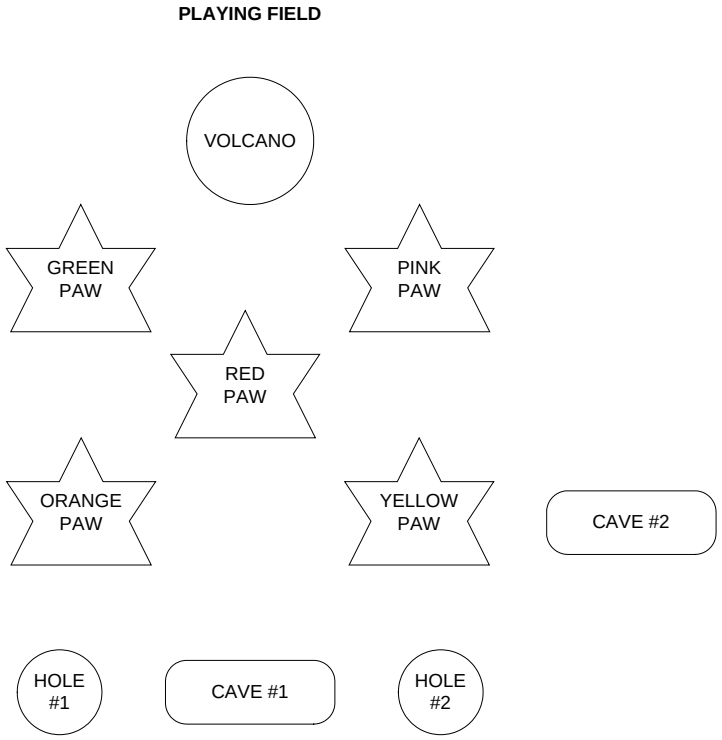


DIAGRAM 5 – FUNCTIONAL COMPONENTS

APPENDIX B WIRING DIAGRAMS



Legend:

GREEN PAW	opto board #1 P1
PINK PAW	opto board #1 P2
ORANGE PAW	opto board #1 P3
YELLOW PAW	opto board #1 P4
RED PAW	opto board #1 P5
CAVE #1	opto board #1 P6
HOLE #1	opto board #1 P7
HOLE #2	opto board #1 P8
CAVE #2	opto board #2 P1
VOLCANO	opto board #2 P2

DIAGRAM 6 - PLAYFIELD LAYOUT

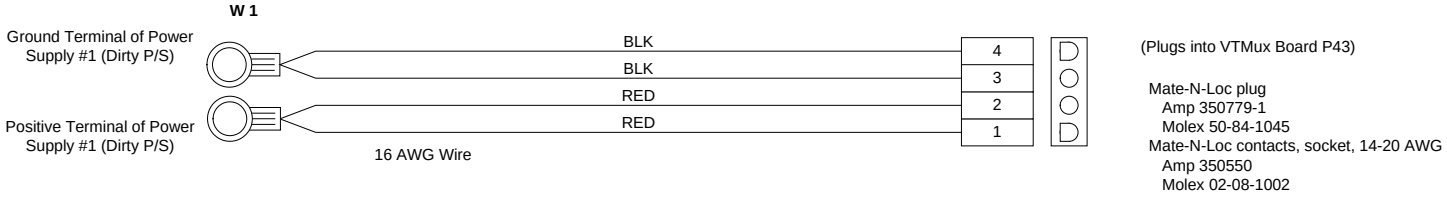


FIGURE 1 – W1 (13.7 VDC POWER SUPPLY TO 8051 VTMUX BOARD P43)

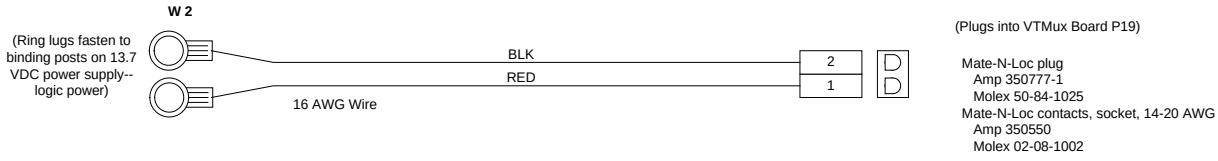


FIGURE 2 – W2 (13.7 VDC POWER SUPPLY TO 8051 VTMUX BOARD P19)

APPENDIX B WIRING DIAGRAMS

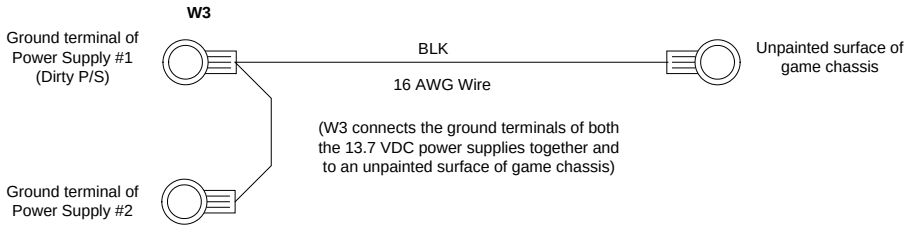


FIGURE 3 -W3 (13.7 VDC POWER SUPPLY AND CHASSIS GROUND)

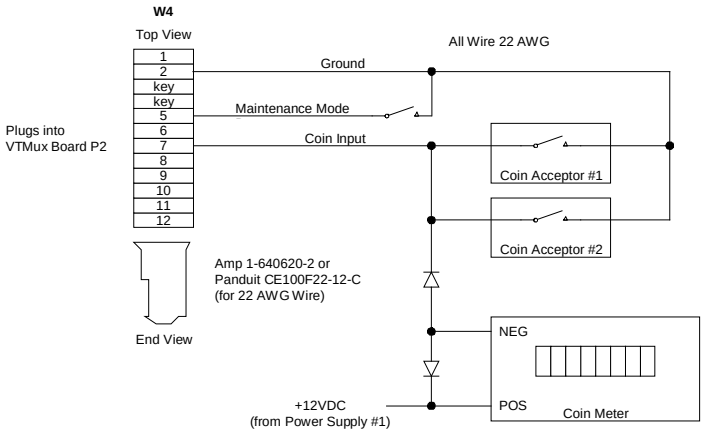


FIGURE 4 - W4 (TO MAINTENANCE MODE AND COIN ACCEPTOR SWITCHES)

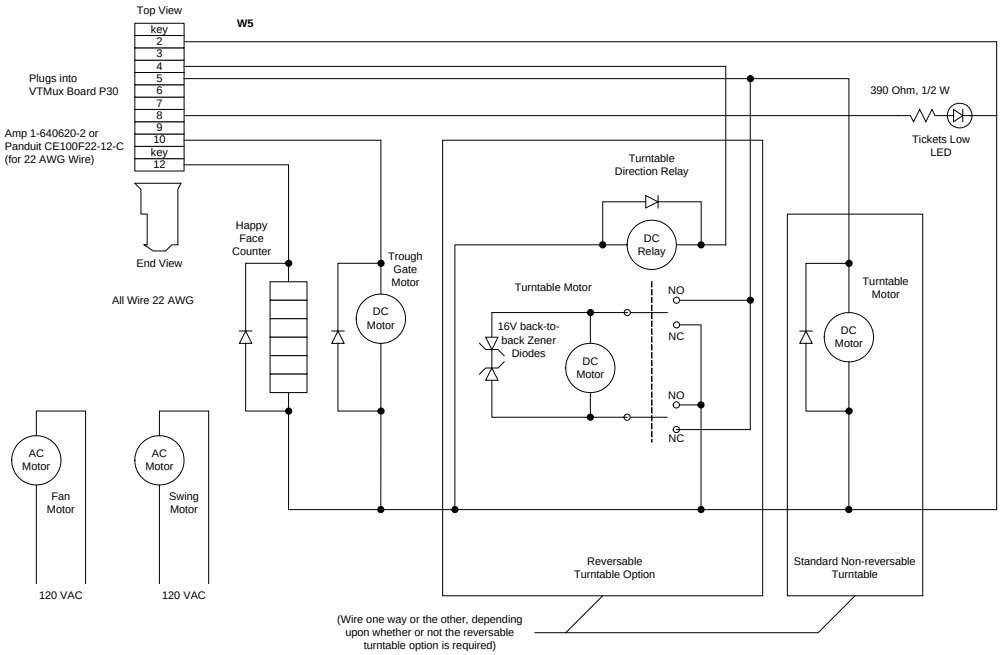


FIGURE 5 - W5 (VTMUX BOARD P30 TO AC RELAYS AND TICKETS LOW LED)

APPENDIX B WIRING DIAGRAMS

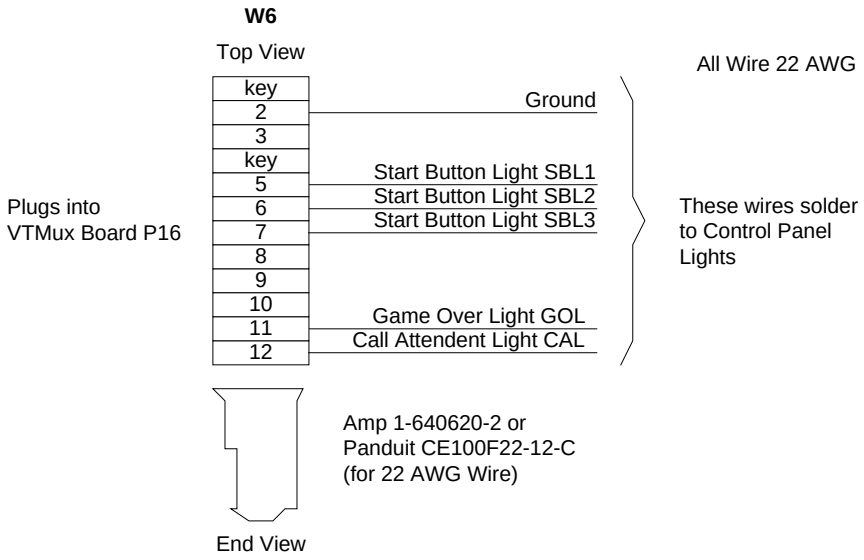


FIGURE 6 - W6 - (VTMUX BOARD P16 TO MISCELLANEOUS PANEL LIGHTS)

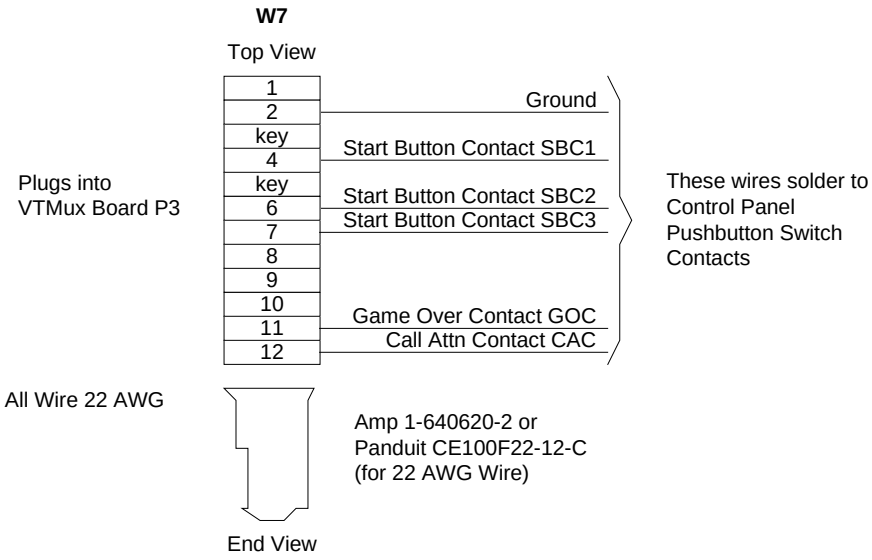


FIGURE 7 – W7 (MISCELLANEOUS PANEL INPUTS TO VTMUX P3)

APPENDIX B WIRING DIAGRAMS

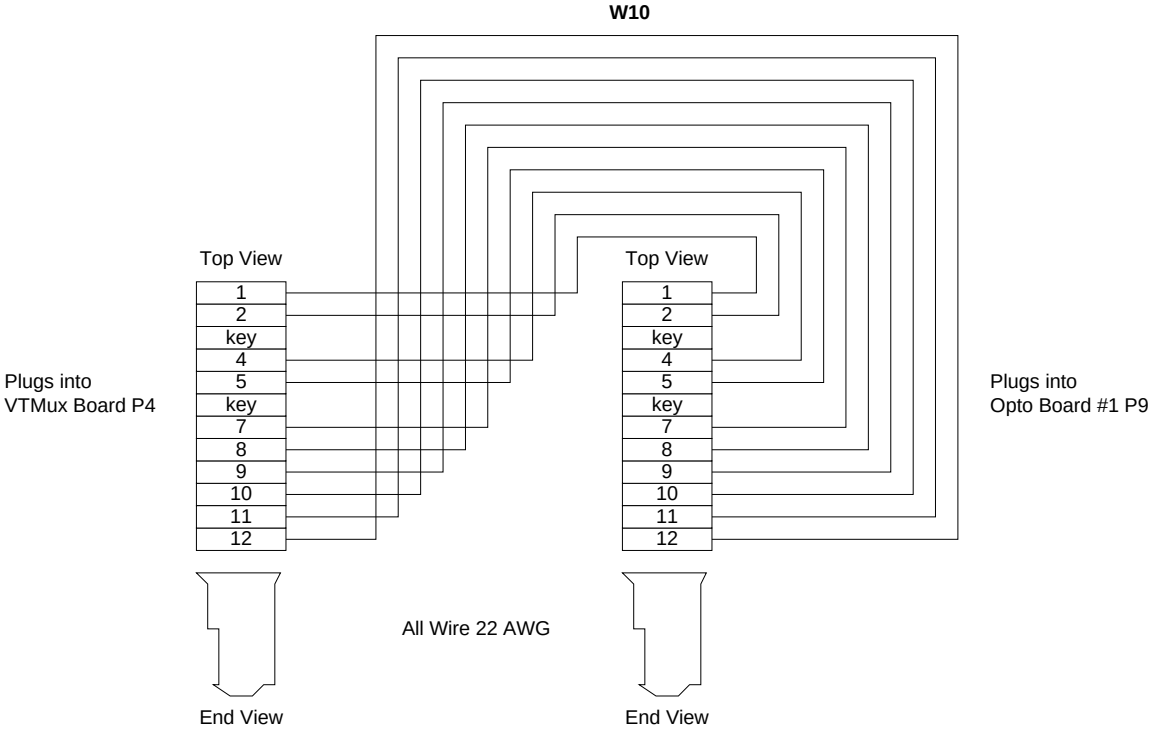


FIGURE 8 - W10 (VTMUX BOARD P4 TO OPTO BOARD #1 P9)

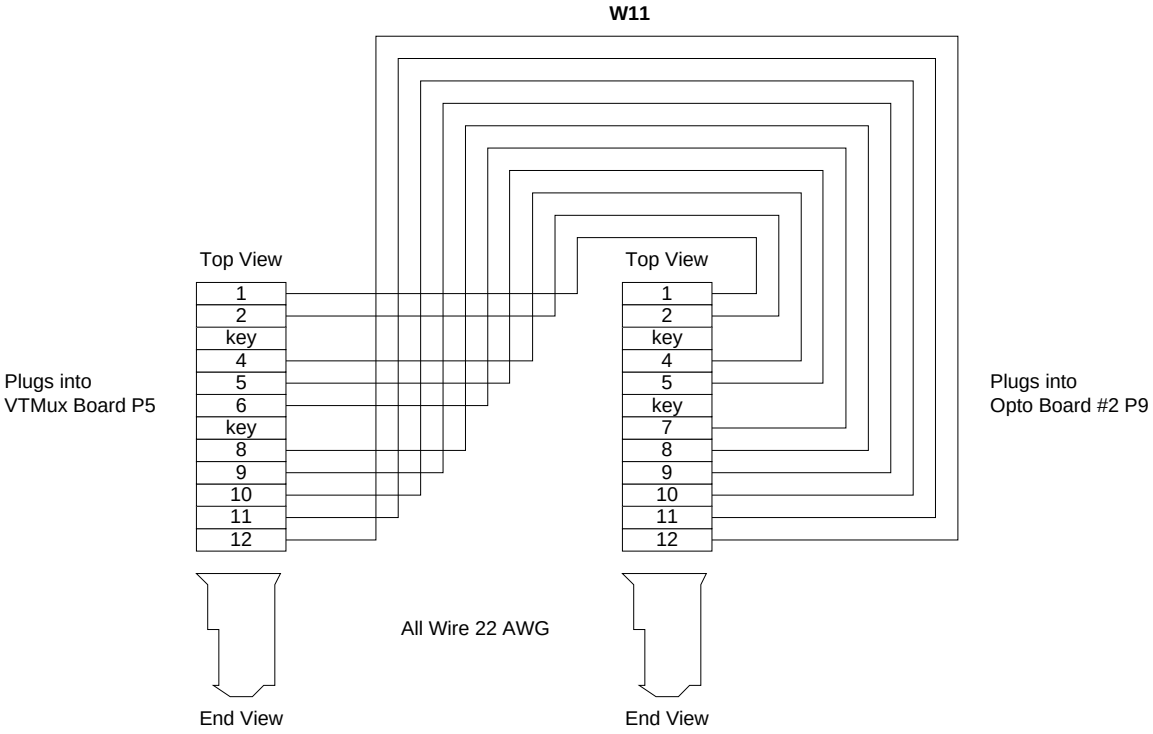


FIGURE 9 - W11 (VTMUX BOARD P4 TO OPTO BOARD #2 P9)

APPENDIX B WIRING DIAGRAMS

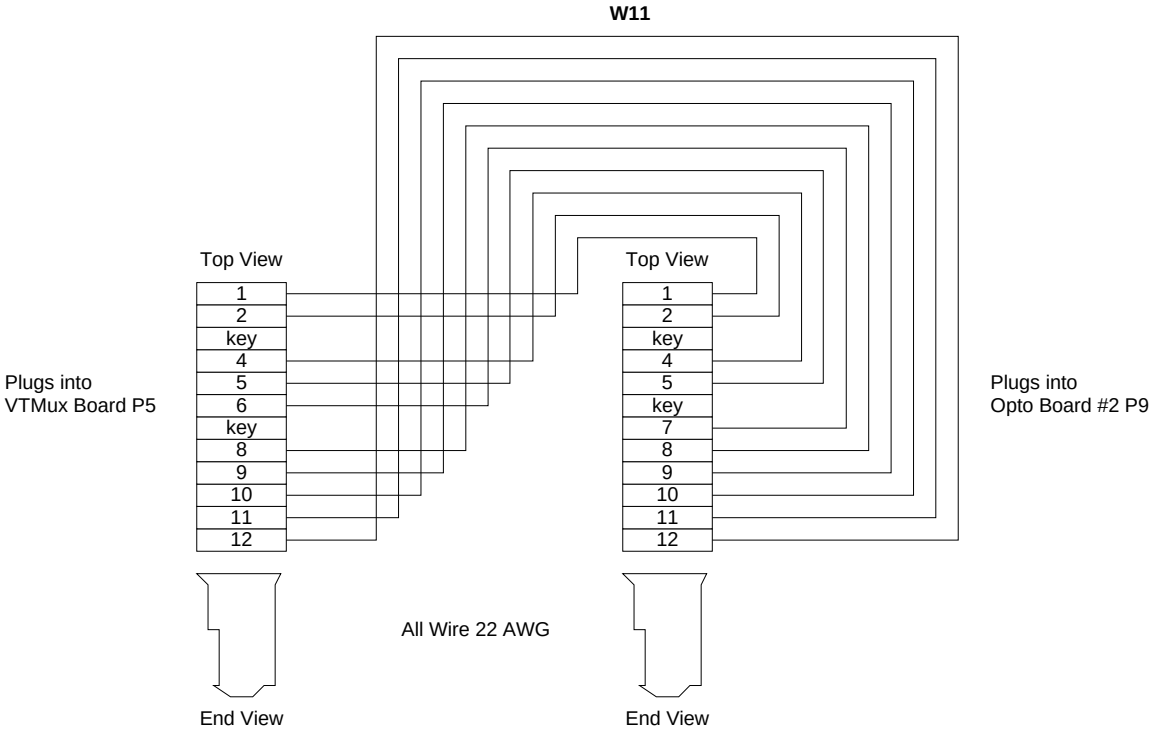


FIGURE 10 - W12 (VTMUX BOARD P5 TO OPTO BOARD #2 P9)

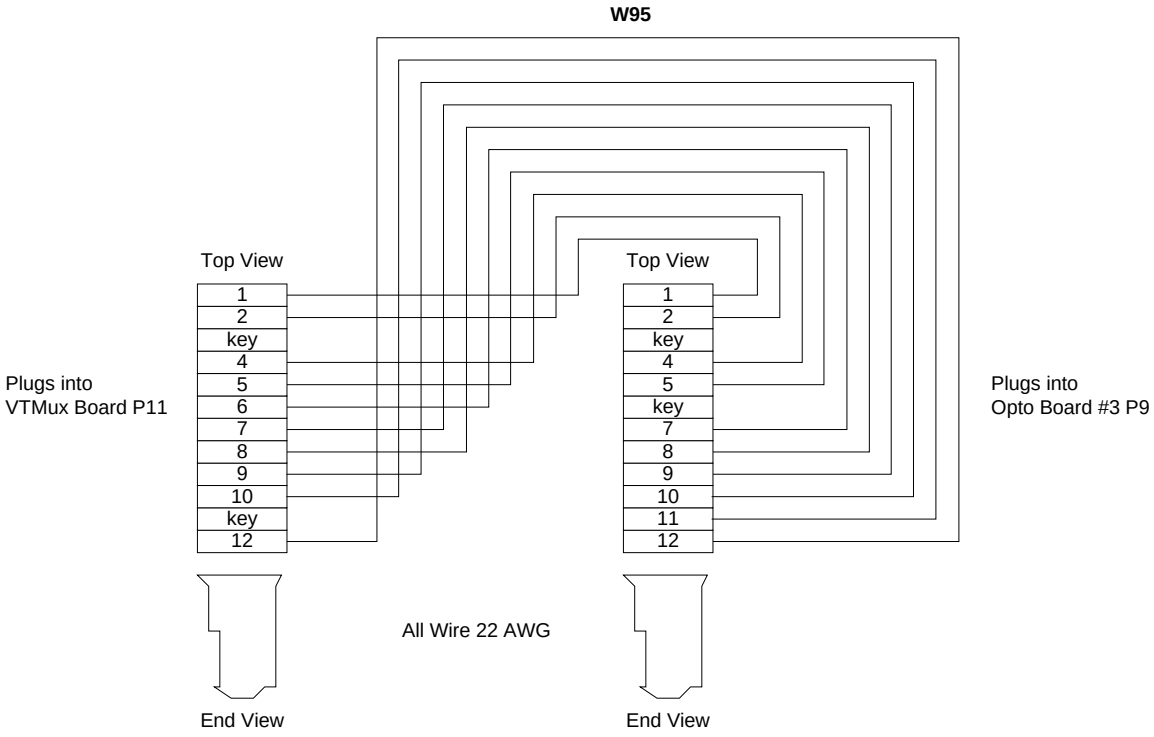


FIGURE 11 - W11 (VTMUX BOARD P11 TO OPTO BOARD #3 P9)

APPENDIX B WIRING DIAGRAMS

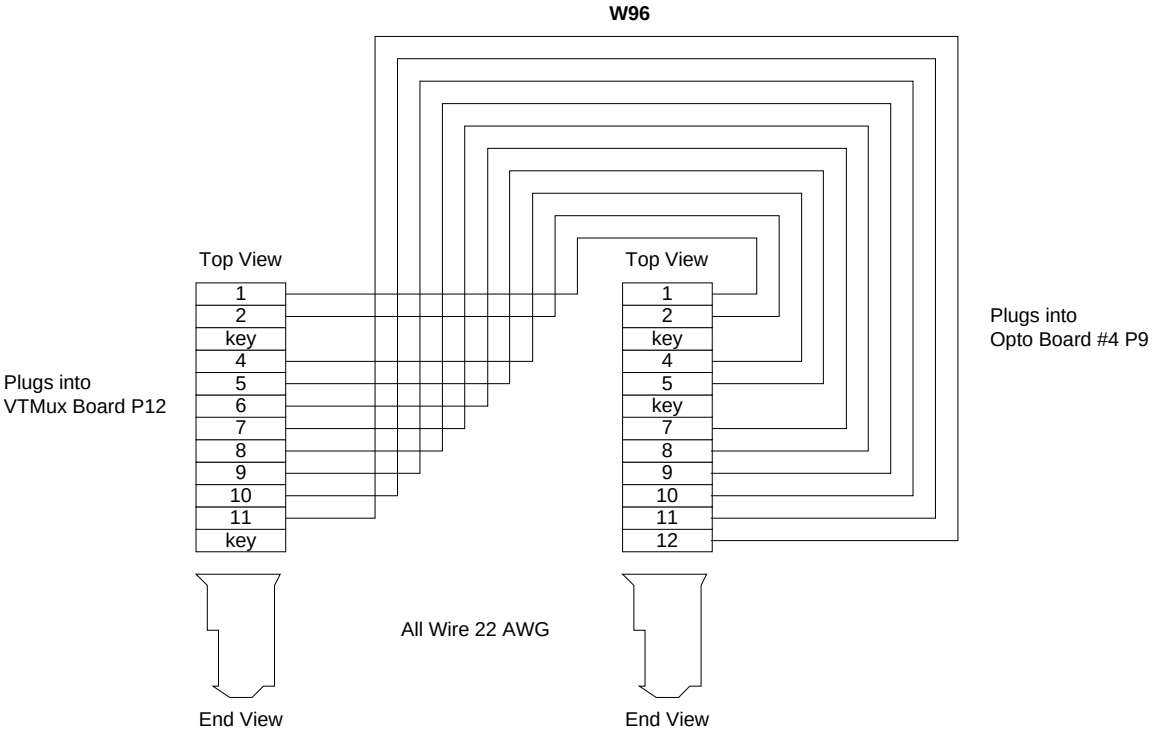


FIGURE 12 - W13 (VTMUX BOARD P6 TO OPTO BOARD #4 P9)

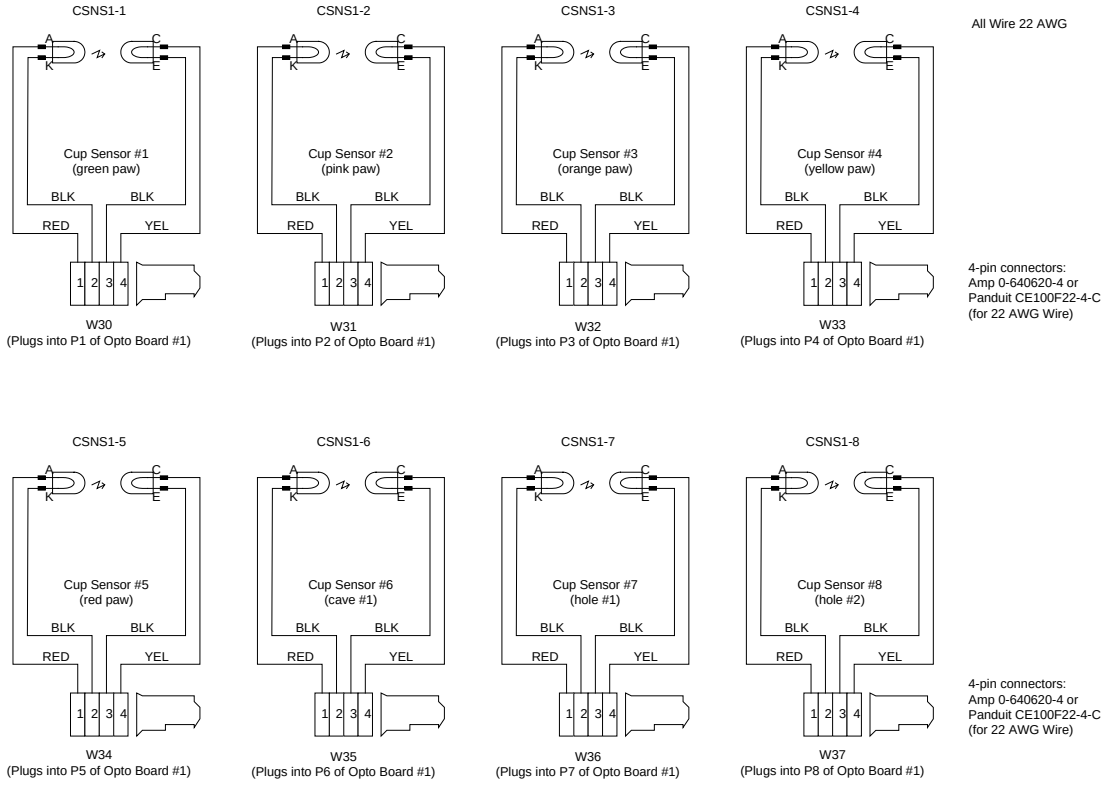
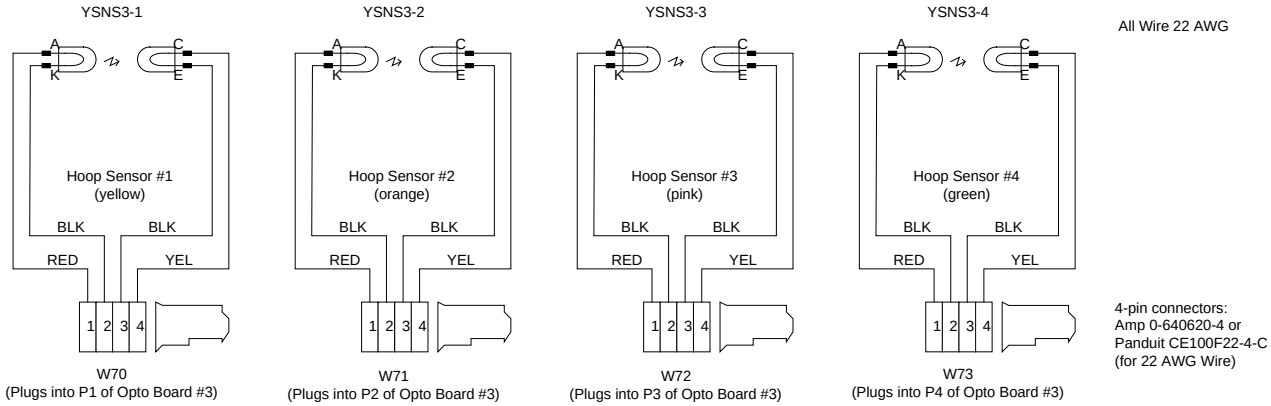


FIGURE 13 - TARGET SENSORS 1-8

APPENDIX B WIRING DIAGRAMS



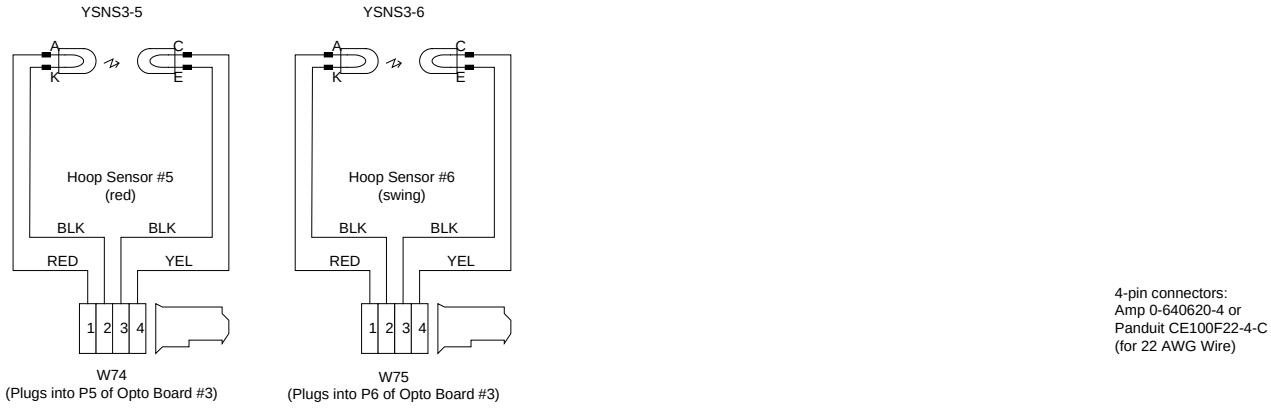


FIGURE 14 – TARGET SENSOR 9 –10

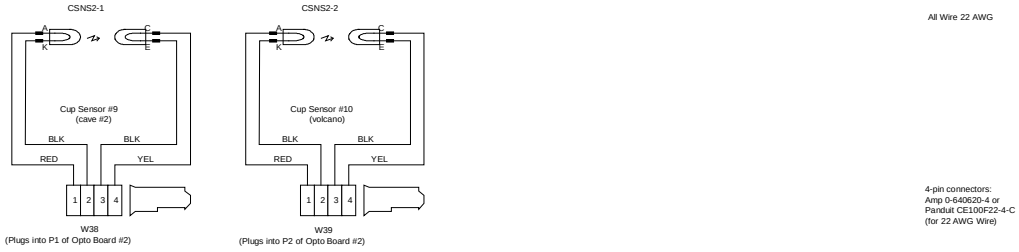


FIGURE 15 – TARGET SENSOR 17 - 24

APPENDIX B WIRING DIAGRAMS

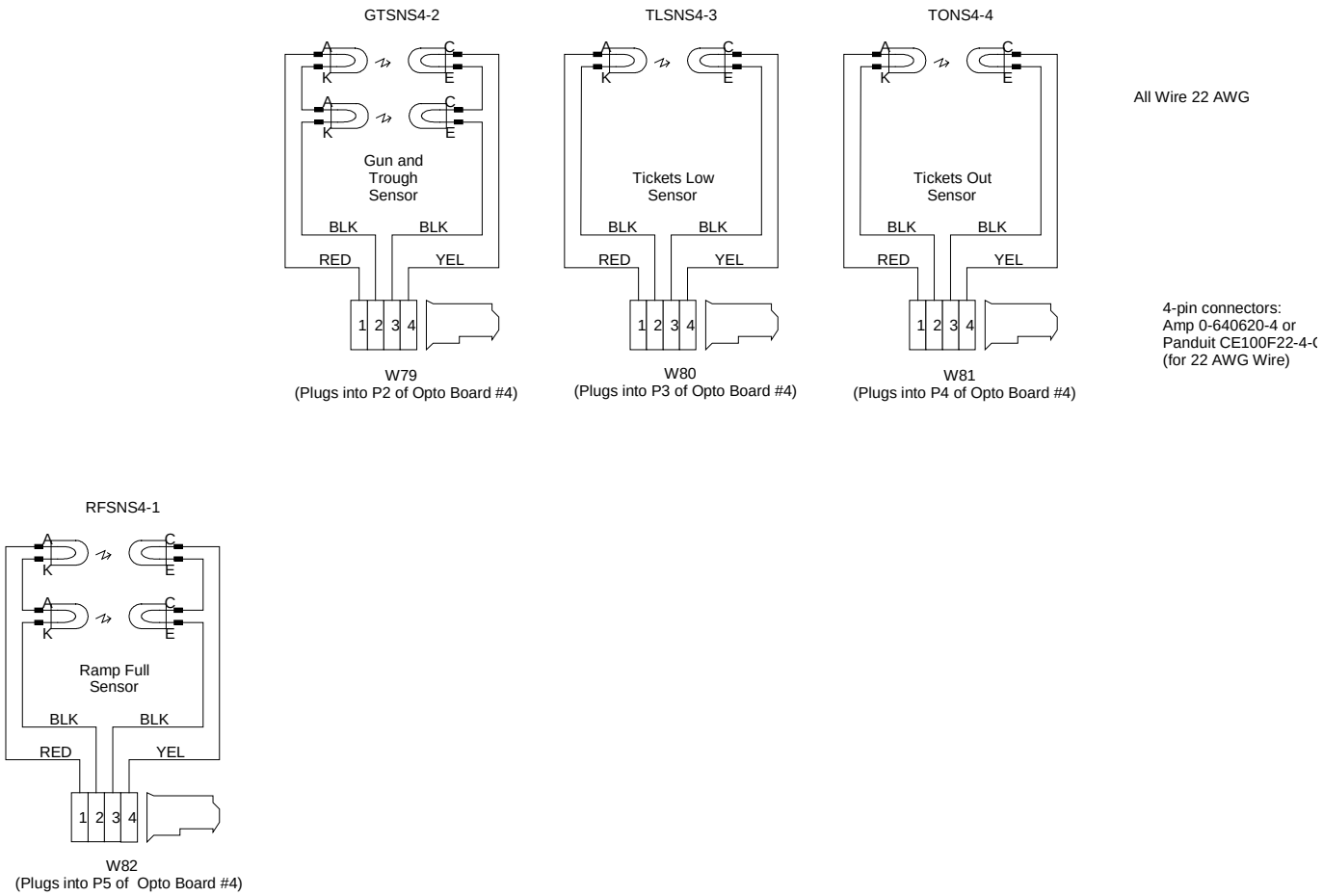


FIGURE 16 – MISCELLANEOUS SENSOR INPUTS

APPENDIX B WIRING DIAGRAMS

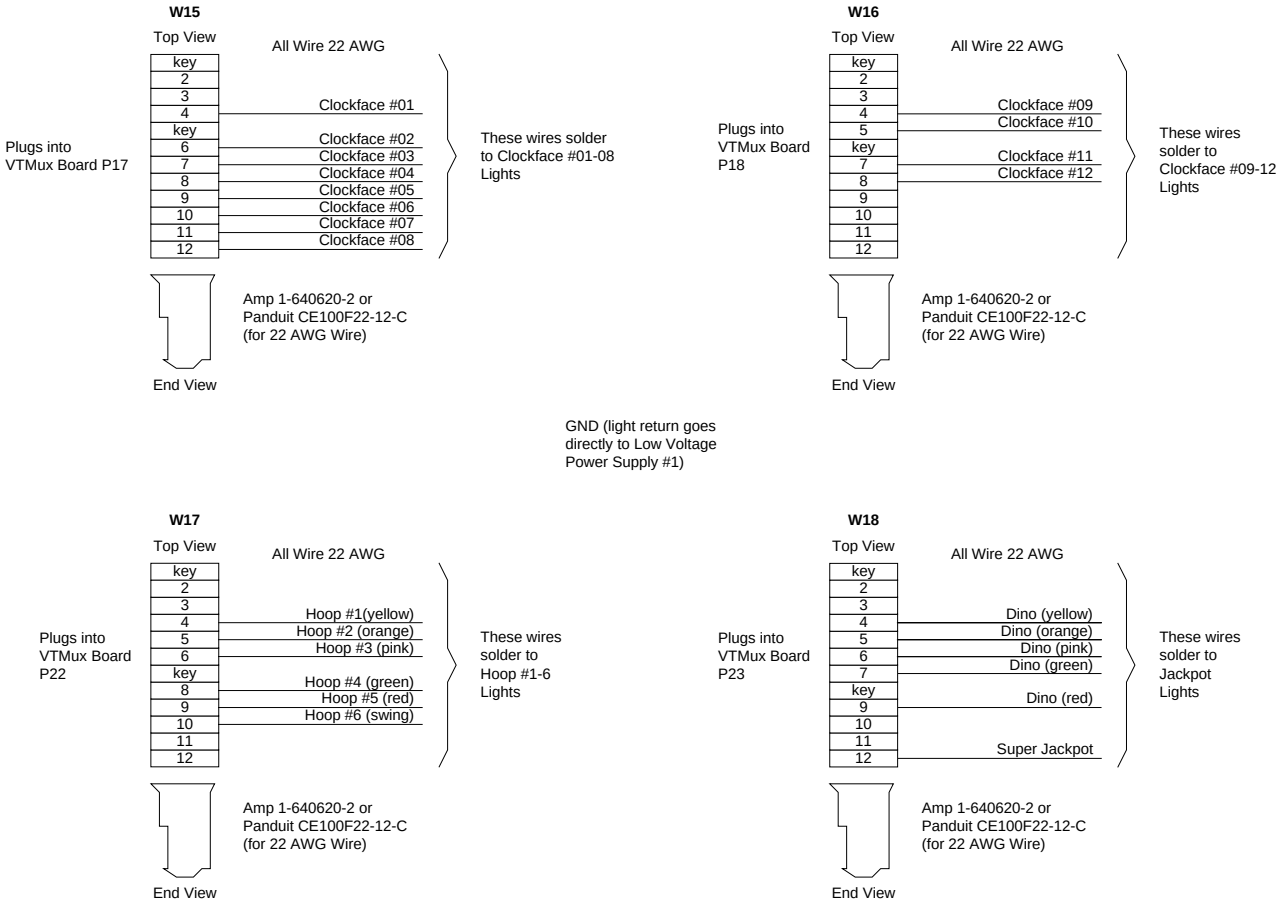


FIGURE 17 - W15, W16, W17, W18 (VTMUX BOARD P17, P18, P22, P23 TO CLOCKFACE AND DINOSAUR JACKPOT LIGHTS)

APPENDIX B WIRING DIAGRAMS

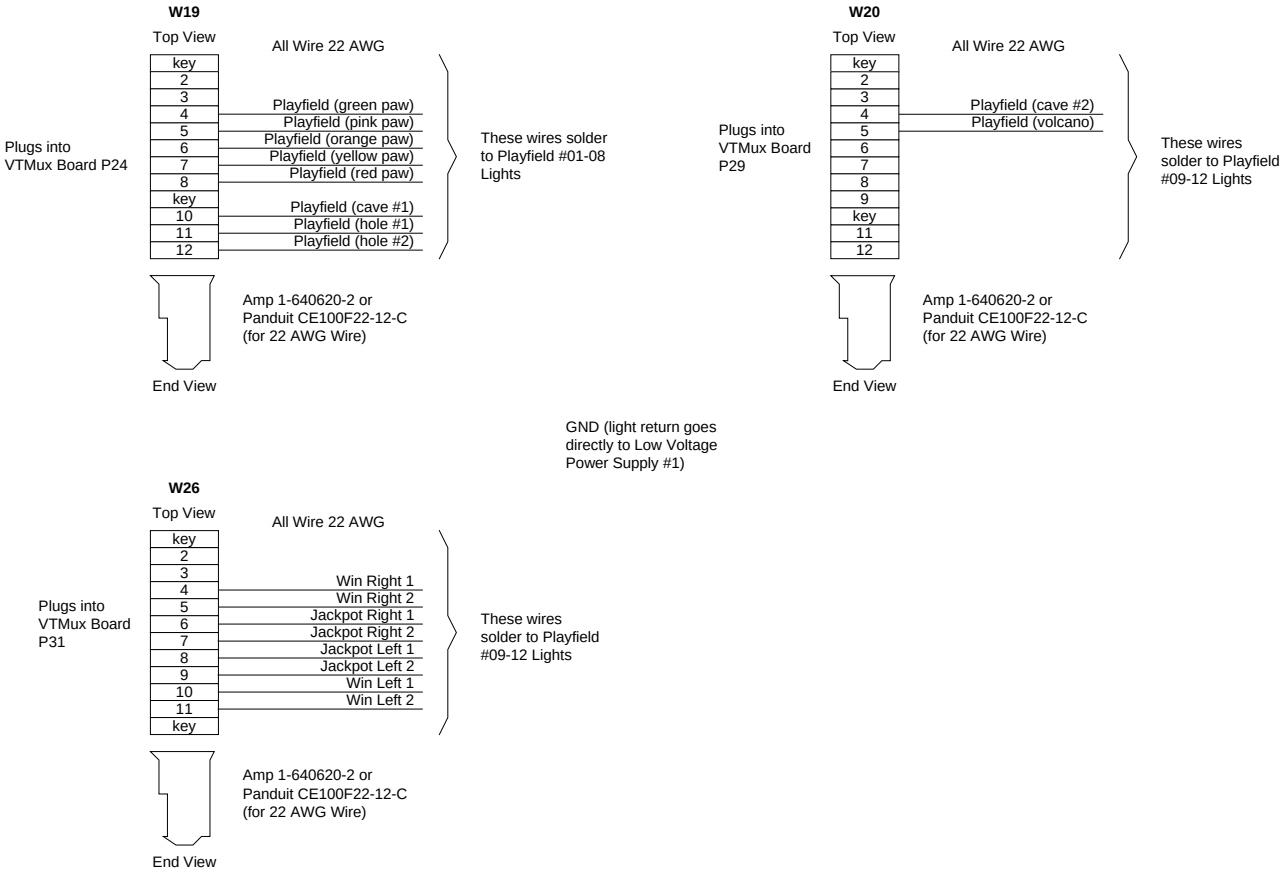


FIGURE 18 - W19, W20, 26 (VTMUX BOARD P24, P29, P31 TO PLAYFIELD AND ARROW LIGHTS)

APPENDIX B WIRING DIAGRAMS

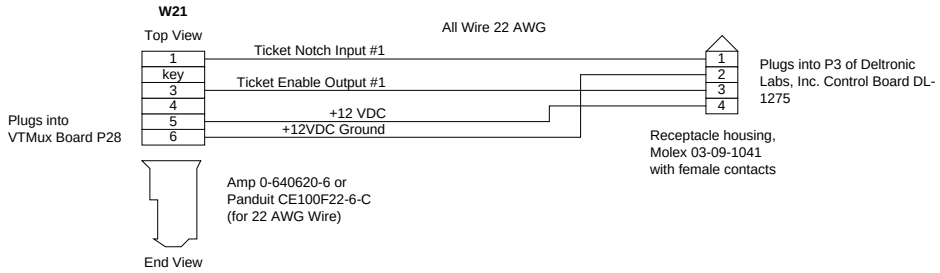


FIGURE 19 - W21 (VTMUX BOARD P28 TO TICKET DISPENSER)

Pin	Signal
1	Brightness
2	Vpp
3	Clock
4	DATA
5	ENABLE
6	Ground
7	VLED
8	N/A

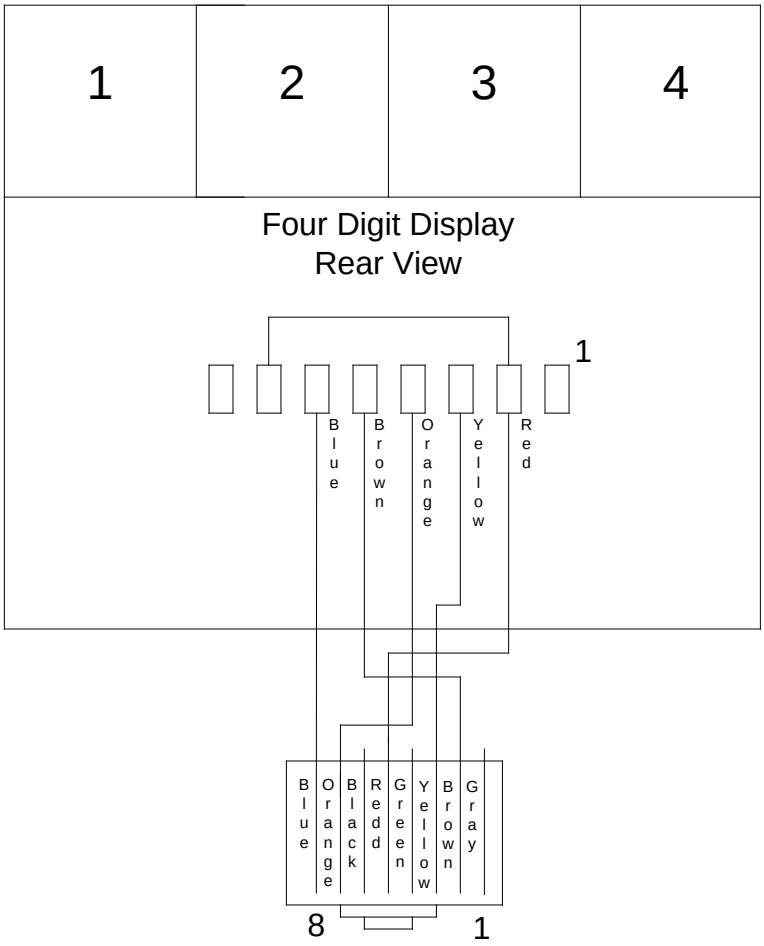


FIGURE 20 - W23 (VTMUX BOARD P25 TO SMALL 4-DIGIT DISPLAY #1)
W24 (VTMUX BOARD P26 TO SMALL 4-DIGIT DISPLAY #2)

APPENDIX B WIRING DIAGRAMS

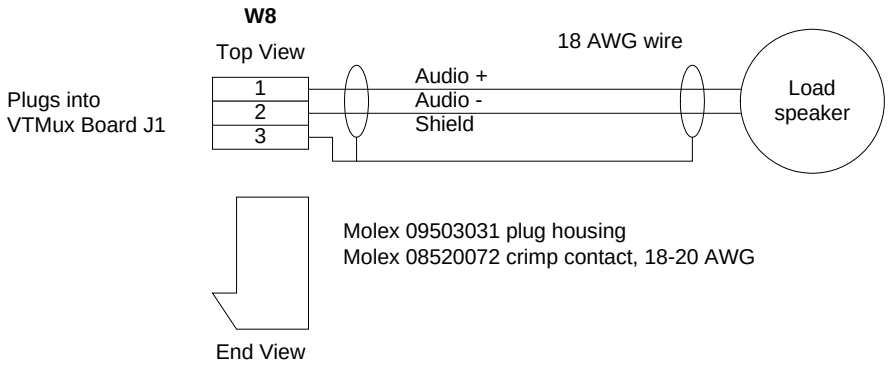


FIGURE 21 - W8 (VTMUX BOARD J1 TO LOUDSPEAKER)

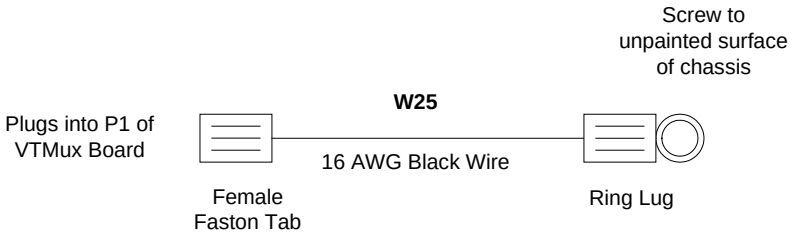
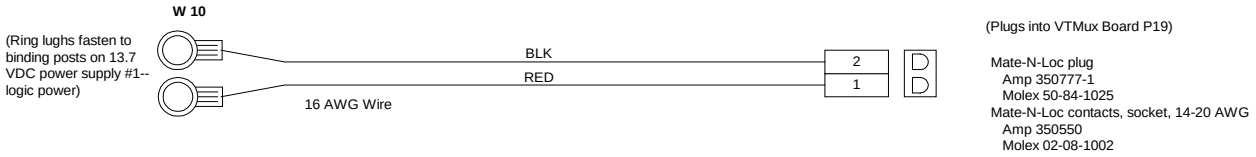


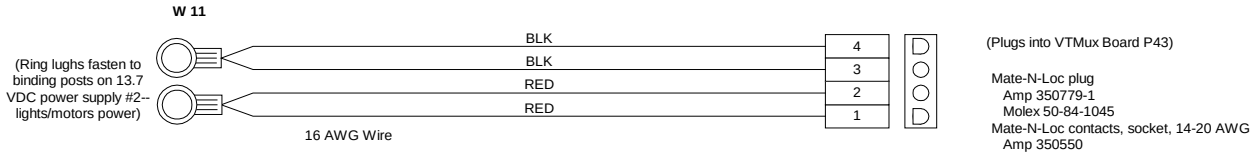
FIGURE 22 - W25 (VTMUX BOARD P1 TO CHASSIS GROUND)

Appendix C Power Supplies Connection



W10 (13.7 VDC POWER SUPPLY #1 TO 8051 VTMUX BOARD P19)

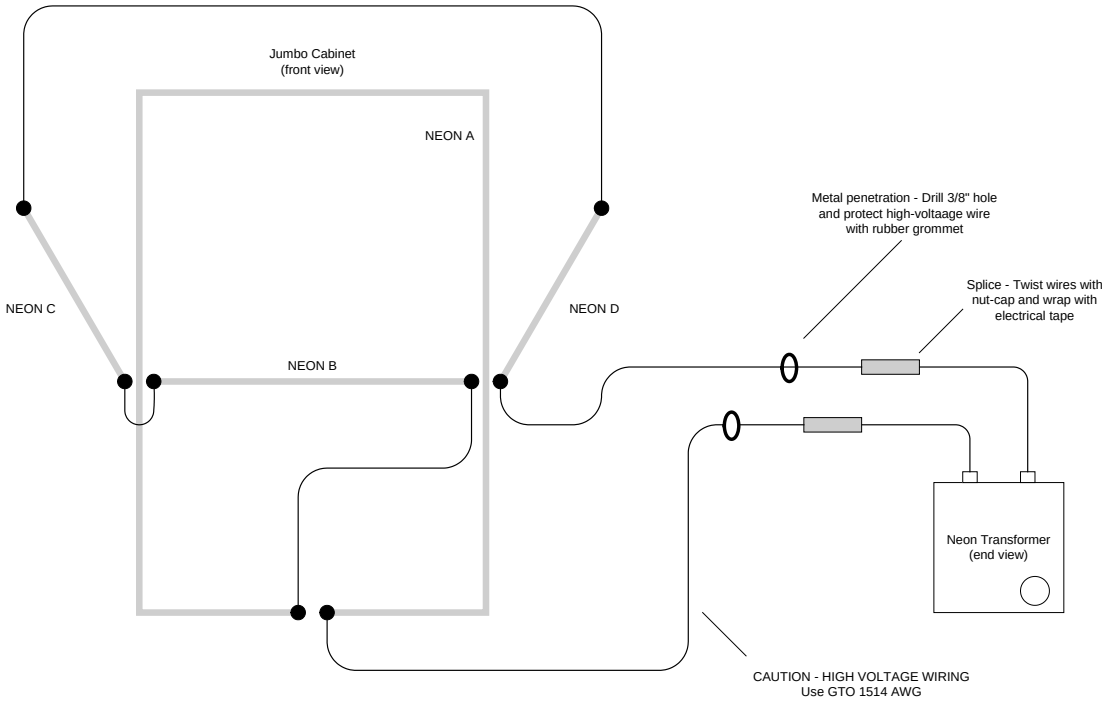
W11 (13.7 VDC POWER SUPPLY #2 TO 8051 VTMUX BOARD P43)

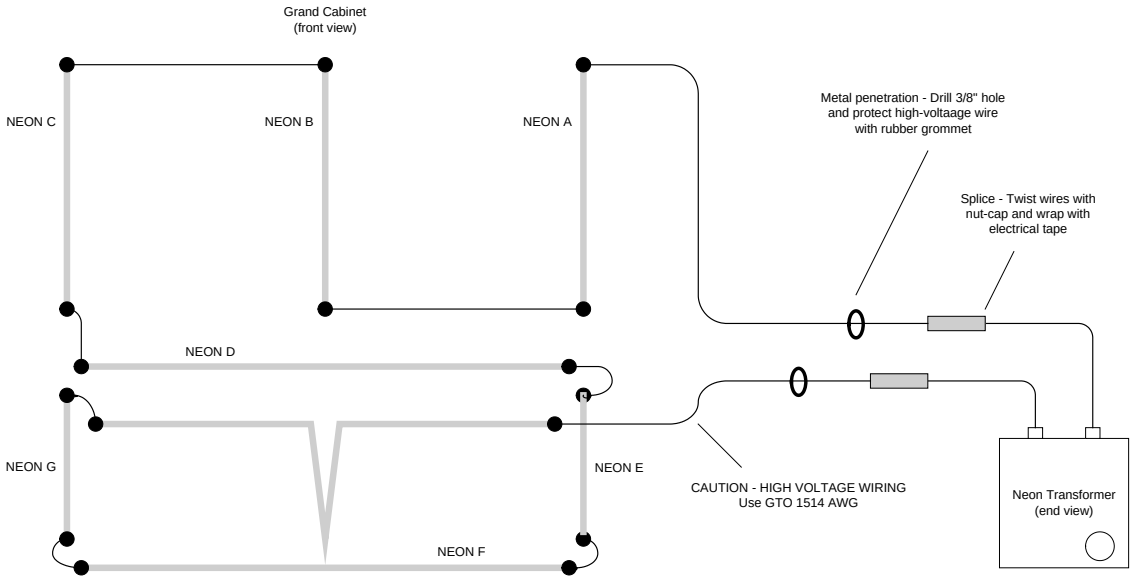


W13 (13.7 VDC POWER SUPPLIES GROUND INTERCONNECT)

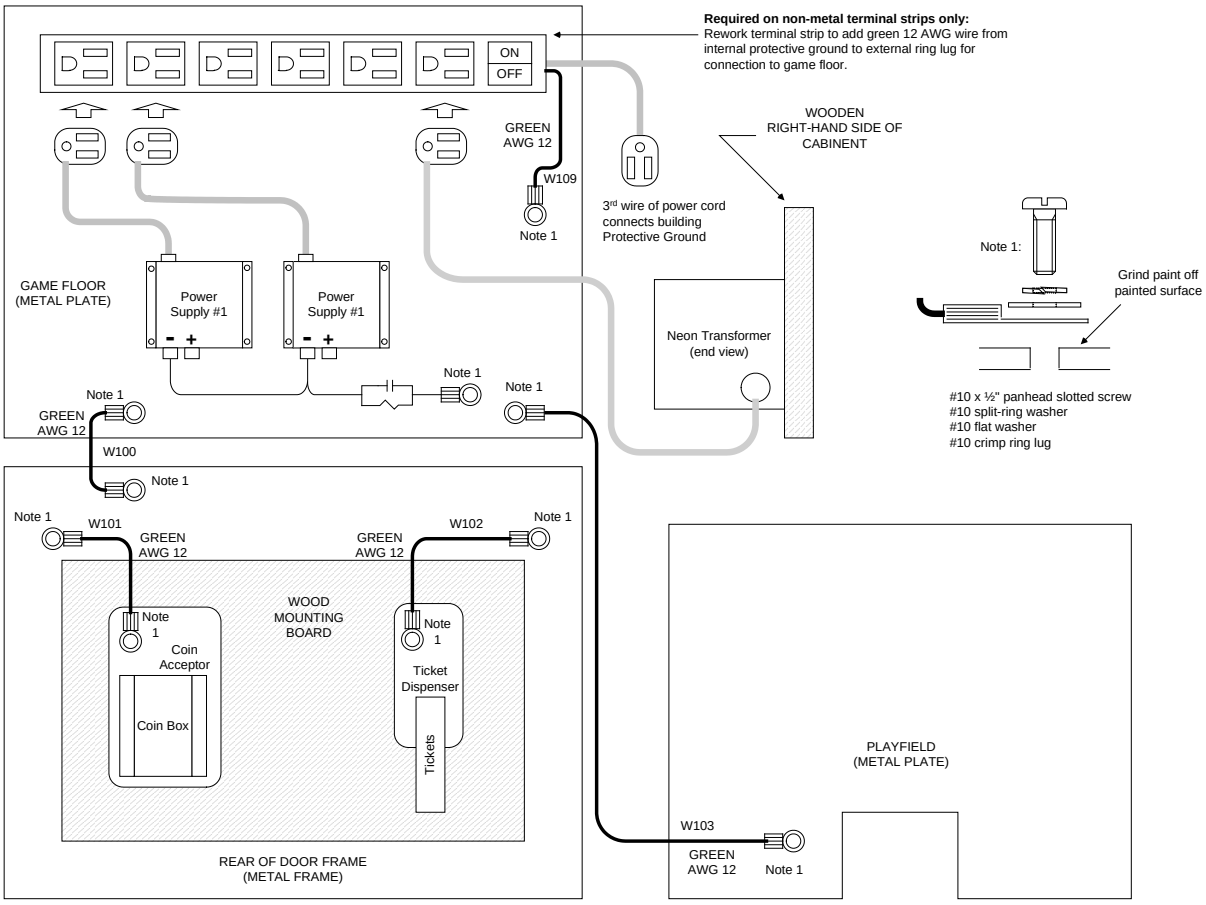
(W39 connects the two ground terminals of the two 13.7 VDC power supplies together)

APPENDIX D TROUBLESHOOTING GUIDE





APPENDIX D TROUBLESHOOTING GUIDE



Appendix E Programmable Options with Defaults

GAME PLAY PROGRAMMING TABLE

STEP#	PROGRAM OPTION	TYPE	PROGRAMMABLE	VALUE
0	*NUMBER OF COINS TAKEN IN (LIFETIME)*	*COINS*	*NO*	*N/A*
1	*NUMBER OF COINS TAKEN IN (SINCE RESET)*	*COINS*	*NO*	*N/A*
10	*COINS REQUIRED TO PLAY GAME 1*	*COINS*	*YES*	*1*
11	*COINS REQUIRED TO PLAY GAME 2*	*COINS*	*YES*	*2*
12	*COINS REQUIRED TO PLAY GAME 3*	*COINS*	*YES*	*4*
13	*NUMBER OF BALLS FOR GAME 1*	*BALLS*	*YES*	*1*
14	*NUMBER OF BALLS FOR GAME 2*	*BALLS*	*YES*	*2*
15	*NUMBER OF BALLS FOR GAME 3*	*BALLS*	*YES*	*5*
16	*MAXIMUM NUMBER OF BALLS PER GAME*	*BALLS*	*YES*	*5*
17	*AUDIO ATTRACTION ON TIME*	*SECONDS*	*YES*	*30*
18	*AUDIO ATTRACTION OFF TIME*	*SECONDS*	*YES*	*10*
19	*MAXIMUM TICKETS WITHOUT ATTENDANT*	*TICKETS*	*YES*	*500*
20	*DISPENSE TICKET AFTER OR DURING GAME*	*BOOL*	*YES*	*1*
21	*NUMBER OF SECONDS BEFORE LEAVING GAME*	*SECONDS*	*YES*	*20*
22	*NUMBER OF SECONDS BETWEEN BALL LOADING*	*SECONDS*	*YES*	*15*
23	*SPINNER SPEED*	*RPM'S*	*YES*	*60*
24	*SPINNER PERCENTAGE*	*PERCENT*	*YES*	*5*
30	*RESET ALL RESETABLE STATISTICS*	*N/A*	*NO*	*N/A*
31	*DISPLAY NUMBER OF SENSOR THAT IS BLOCKED*	*N/A*	*N/A*	*N/A*
32	*DISPLAY MISC OPTO SENSOR STATUS*	*N/A*	*N/A*	*N/A*
33	*DISPENSE TICKETS*	*N/A*	*N/A*	*N/A*
34	*TEST TURNTABLE MOTOR*	*N/A*	*N/A*	*N/A*
35	*TEST GUN TROUGH MOTOR*	*N/A*	*N/A*	*N/A*
40	*POINTS FOR GREEN PAW (G1)*	*POINTS*	*YES*	*10*
41	*POINTS FOR PINK PAW (P1)*	*POINTS*	*YES*	*10*
42	*POINTS FOR ORANGE PAW (O1)*	*POINTS*	*YES*	*5*
43	*POINTS FOR YELLOW PAW (Y1)*	*POINTS*	*YES*	*5*
44	*POINTS FOR RED PAW (R1)*	*POINTS*	*YES*	*15*
45	*POINTS FOR CAVE #1*	*POINTS*	*YES*	*10*
46	*POINTS FOR HOLE #1*	*POINTS*	*YES*	*1*
47	*POINTS FOR HOLE #2*	*POINTS*	*YES*	*1*
48	*POINTS FOR CAVE #2*	*POINTS*	*YES*	*15*
49	*POINTS FOR VOLCANO*	*POINTS*	*YES*	*100*

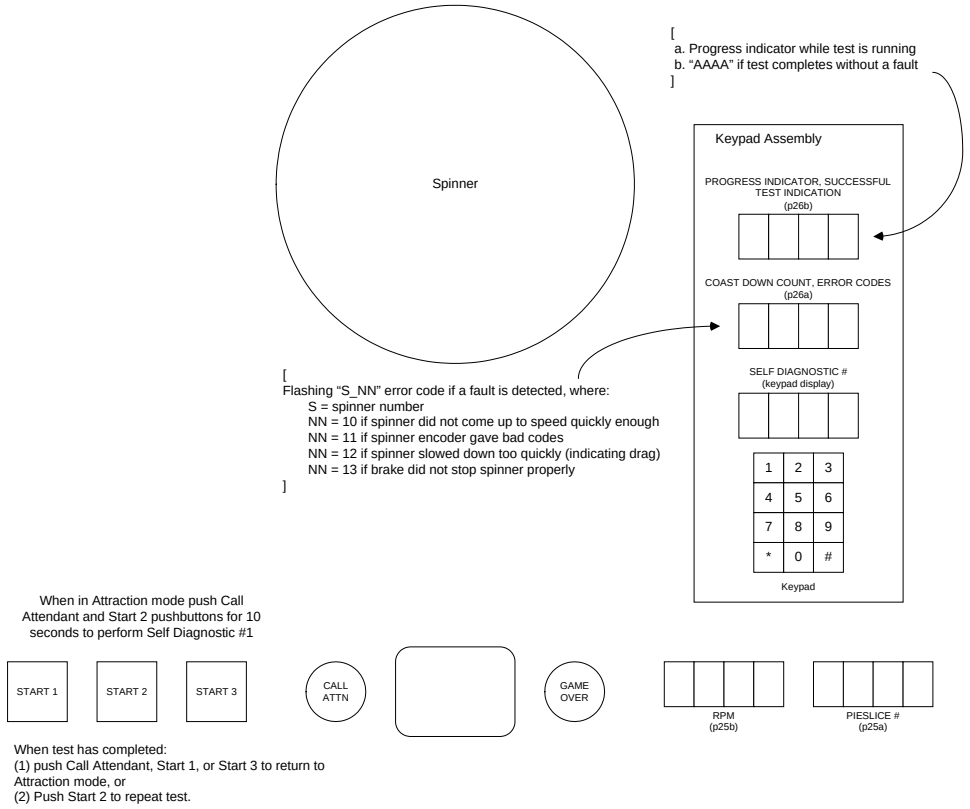
GAME PLAY PROGRAMMING TABLE (CONTINUED)

50	*JACKPOT #1 POINTS*	*POINTS*	*YES*	*20*
51	*JACKPOT #2 POINTS*	*POINTS*	*YES*	*50*
52	*JACKPOT #3 POINTS*	*POINTS*	*YES*	*100*
53	*JACKPOT #4 POINTS*	*POINTS*	*YES*	*1000*
54	*POINTS FOR HOOP #1*	*POINTS*	*YES*	*100*
55	*POINTS FOR HOOP #2*	*POINTS*	*YES*	*15*
56	*POINTS FOR HOOP #3*	*POINTS*	*YES*	*500*
57	*POINTS FOR HOOP #4*	*POINTS*	*YES*	*25*
58	*POINTS FOR HOOP #5*	*POINTS*	*YES*	*250*
60	*CLOCKFACE POINTS FOR 1:00 POSITION*	*POINTS*	*YES*	*10*
61	*CLOCKFACE POINTS FOR 2:00 POSITION*	*POINTS*	*YES*	*25*
62	*CLOCKFACE POINTS FOR 3:00 POSITION*	*POINTS*	*YES*	*10*
63	*CLOCKFACE POINTS FOR 4:00 POSITION*	*POINTS*	*YES*	*5*
64	*CLOCKFACE POINTS FOR 5:00 POSITION*	*POINTS*	*YES*	*10*
65	*CLOCKFACE POINTS FOR 6:00 POSITION*	*POINTS*	*YES*	*50*
66	*CLOCKFACE POINTS FOR 7:00 POSITION*	*POINTS*	*YES*	*10*
67	*CLOCKFACE POINTS FOR 8:00 POSITION*	*POINTS*	*YES*	*5*
68	*CLOCKFACE POINTS FOR 9:00 POSITION*	*POINTS*	*YES*	*10*
69	*CLOCKFACE POINTS FOR 10:00 POSITION*	*POINTS*	*YES*	*25*
70	*CLOCKFACE POINTS FOR 11:00 POSITION*	*POINTS*	*YES*	*5*
71	*CLOCKFACE POINTS FOR 12:00 POSITION*	*POINTS*	*YES*	*250*

Appendix F Troubleshooting Guide

SELF DIAGNOSTIC#1 - SPINNER TEST

From the front of game, hold down Call Attendant and Start 1 pushbuttons for 10 seconds to begin Diagnostic. The game will automatically test spinner's motor, shaft encoder, and brake. If spinner tests okay, "AAAA" will be displayed. If spinner is found to have a problem, an error code will be displayed indicating the type of problem.



Problem	Solution
Error code 10 (spinner did not come up to speed quickly enough)	• Possible causes (most likely first): o Excessive friction or drag on the spinner mechanism caused by brake drag or other misalignment o Bad spinner encoder board o Bad wiring harness o Bad spinner motor o Bad VTMux board
Error code 11 (spinner encoder board	• Possible causes (most likely first): o Excessive friction or drag on the spinner mechanism caused by brake drag or other misalignment o Bad spinner encoder disk o Misaligned spinner encoder board o Bad wiring harness o Bad VTMux board

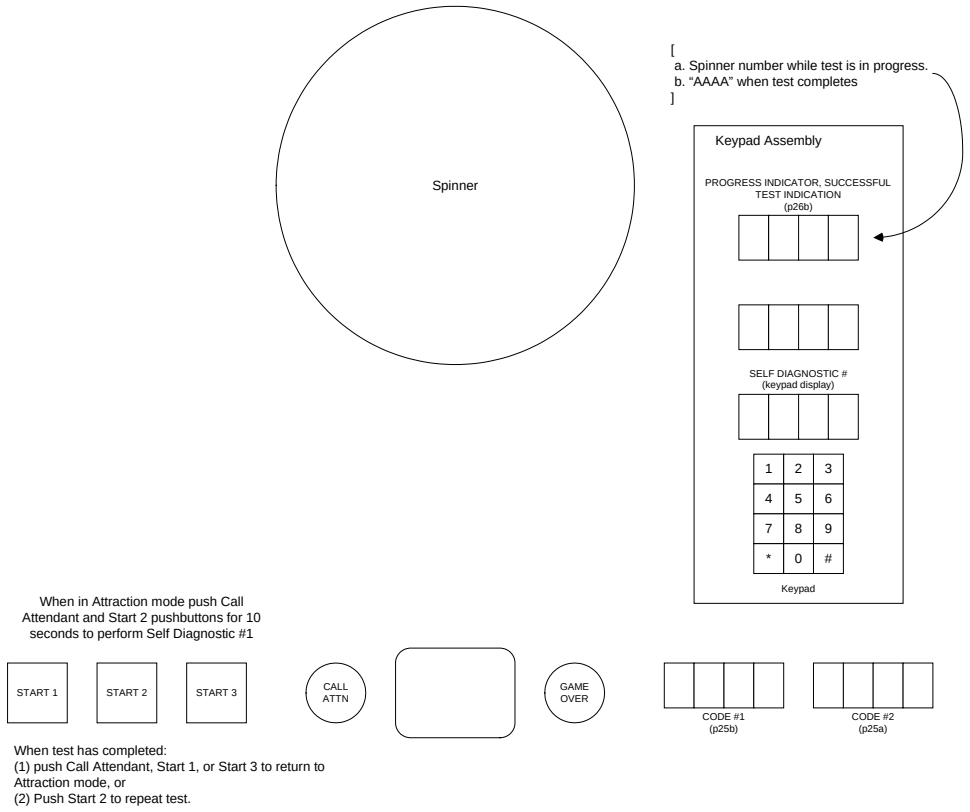
APPENDIX F TROUBLESHOOTING GUIDE

Problem	Solution
Error code 12	• Possible causes (most likely first): o Bad spinner encoder board o Bad VTMux goard
Error code 13	• Possible causes (most likely first): o Brake friction pad and spring not adjusted/aligned properly o Bad brake solenoid o Bad wiring harness o Bad VTMux board

APPENDIX F TROUBLESHOOTING GUIDE

SELF DIAGNOSTIC#2 - SPINNER ENCODER PIESLICE TEST

From front of game, hold down Call Attendant and Start 2 pushbuttons for 10 seconds to begin Self Diagnostic #2. The game will automatically slowly rotate the spinner through one revolutions and verify the encoder is reading properly. When the test completes, "AAAA" and two codes will be displayed.



Problem	Solution
If code #1 and code #2 are both less than or equal 10, the spinner encoder is operating properly. If either code #1 or code #2 is greater than 10, the spinner encoder is not operating properly.	• Possible causes (most likely first): o Bad spinner encoder board o Bad alignment between encoder board and encoder disk o Bad wiring harness o Bad VTMux board

APPENDIX F TROUBLESHOOTING GUIDE

Self Diagnostic#3 - Opto Sensor Test

From front of game, hold down Call Attendant and Start 3 pushbutton for 10 seconds to begin the Two Step Diagnostic Test.

Step I automatically verifies that all the target sensors are able to sense light properly when a ball is not present. If all target sensors are sensing light properly "AAAA" will be displayed. If any target sensor is not sensing light, a flashing error code will be displayed as described below. When a bad sensor is detected, pushing the Start3 button will continue testing the remaining sensors.

Error Codes	Description	Resolution
8010	Playfield Sensor Error	Replace Green Paw Sensor
8020	"	Replace Pink Paw Sensor
8030	"	Replace Orange Paw Sensor
8040	"	Replace Yellow Paw Sensor
8050	"	Replace Red Paw Sensor
8060	"	Replace Volcano Paw Sensor
8070	"	Replace Hole #1 Sensor
8080	"	Replace Hole #2 Sensor
7010	"	Replace Cave #2 Sensor
7020	"	Replace Volcano Sensor
6010	Hoop Sensor Opto Board	Replace Yellow Hoop Sensor
6020	"	Replace Orange Hoop Sensor
6030	"	Replace Pink Hoop Sensor
6040	"	Replace Green Hoop Sensor
6050	"	Replace Red Hoop Sensor
6060	"	Replace Clock Hoop Sensor
5020	Miscellaneous Sensor Error	Replace Gun Trough Sensor
5030	"	Replace Tickets Low Sensor
5040	"	Replace Tickets Out Sensor
5050	"	Replace Ramp Full Sensor

Step II begins after Step I has completed. Step II displays the state of miscellaneous opto-sensors as described below. For each of four miscellaneous opto-sensors, an "$_{o}$" or an "^{o}" will be displayed. If one of these opto-sensors does not appear to be giving the expected indication, it may be required to gain access to the interior of the game to troubleshoot further.

Gun Trough Sensor	Sensor Not Sensing Light	---$_{o}$
Gun Trough Sensor	Sensor Sensing Light	---^{o}
Tickets Low Sensor	Not Sensing Light	--$_{o}$-
Tickets Low Sensor	Sensing Light	--^{o}-
Tickets Out Sensor	Sensing Light	-$_{o}$--
Tickets Out Sensor	Not Sensing Light	-^{o}--
Ramp Full Sensor	Sensing Light	$_{o}$---
Ramp Full Sensor	Not Sensing Light	^{o}---

APPENDIX F TROUBLESHOOTING GUIDE

Upon completing both steps of the test Push the Start3 button to restart the test.Push the Call Attendant, Start1, or Start2 button to return the game to attraction mode. If one of these buttons is not pushed, the game will return to attraction mode after ten minutes.

Program Mode Diagnostics:

Step 32—Display miscellaneous sensors' status

Blocking a target's opto-sensor one at a time displays the target's points and illuminates the target's light.

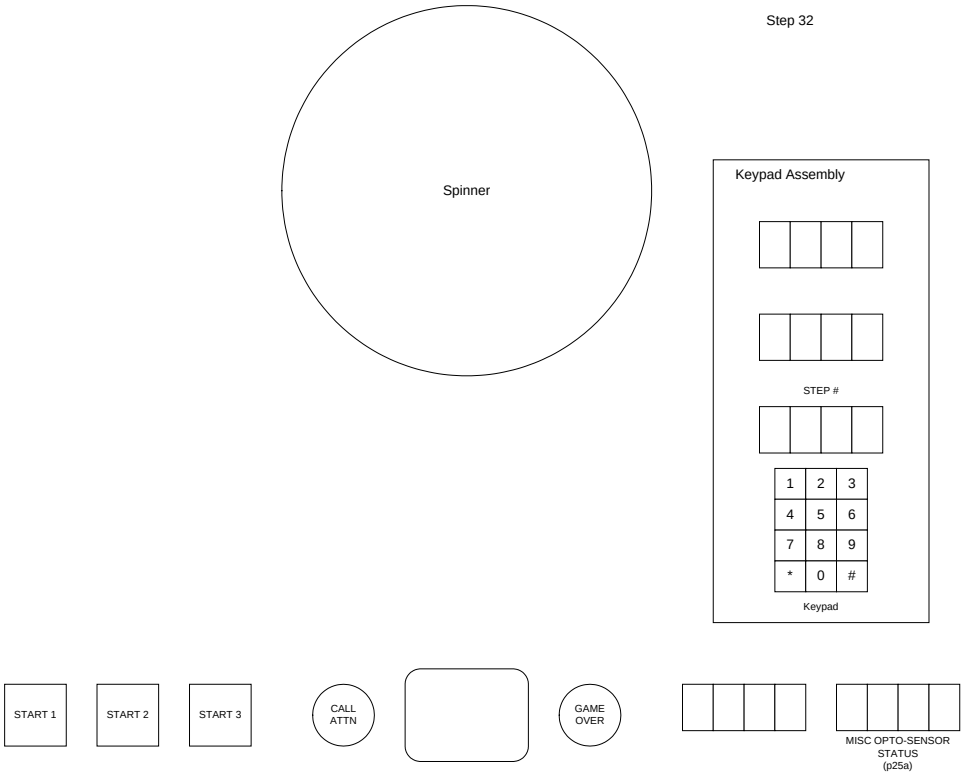
For each of four miscellaneous opto-sensors, an "$_{o}$" or an "^{o}" is displayed as described below:

---$_{o}$ => gun trough sensor not sensing light
---^{o} => gun trough sensor sensing light

--$_{o}$- => tickets low sensor not sensing light
--^{o}- => tickets low sensor sensing light

-$_{o}$-- => tickets out sensor not sensing light
-^{o}-- => ramp full sensor sensing light

$_{o}$--- => ramp full sensor not sensing light
^{o}--- => ramp full sensor sensing light

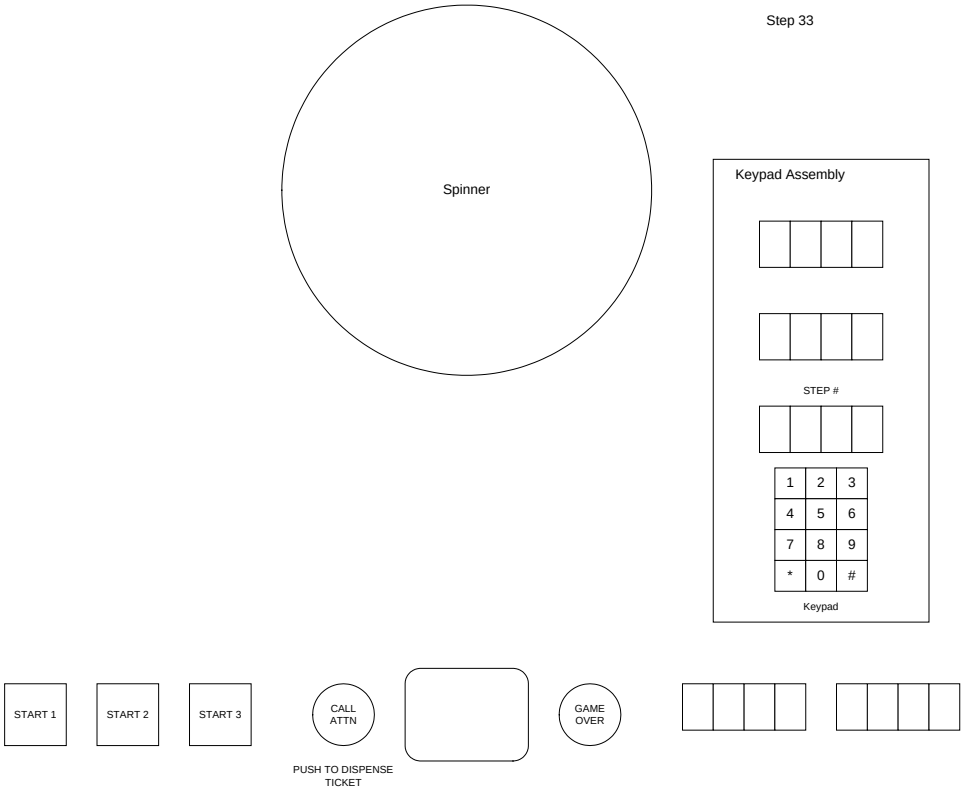


APPENDIX F TROUBLESHOOTING GUIDE

Program Mode Diagnostics (continued):

Step 33—Dispense a ticket

Push Call Attendant button to dispense one ticket.



APPENDIX F TROUBLESHOOTING GUIDE

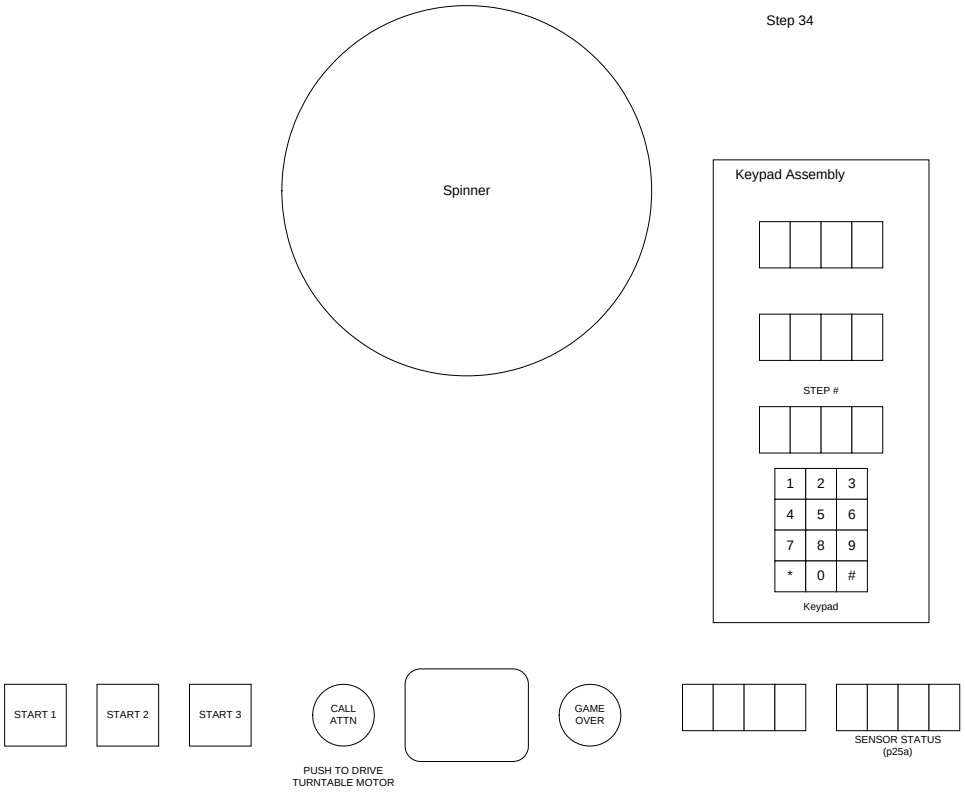
Program Mode Diagnostics (continued):

Diagnostic Step 34—Test turntable motor

Push Call Attendant button to energize turntable motor. Ramp full and gun trough sensors may be monitored as described below:

---$_{o}$ => ramp full sensor not sensing light
---^{o} => ramp full sensor sensing light

--$_{o}$- => gun trough sensor not sensing light
--^{o}- => gun trough sensor sensing light



APPENDIX F TROUBLESHOOTING GUIDE

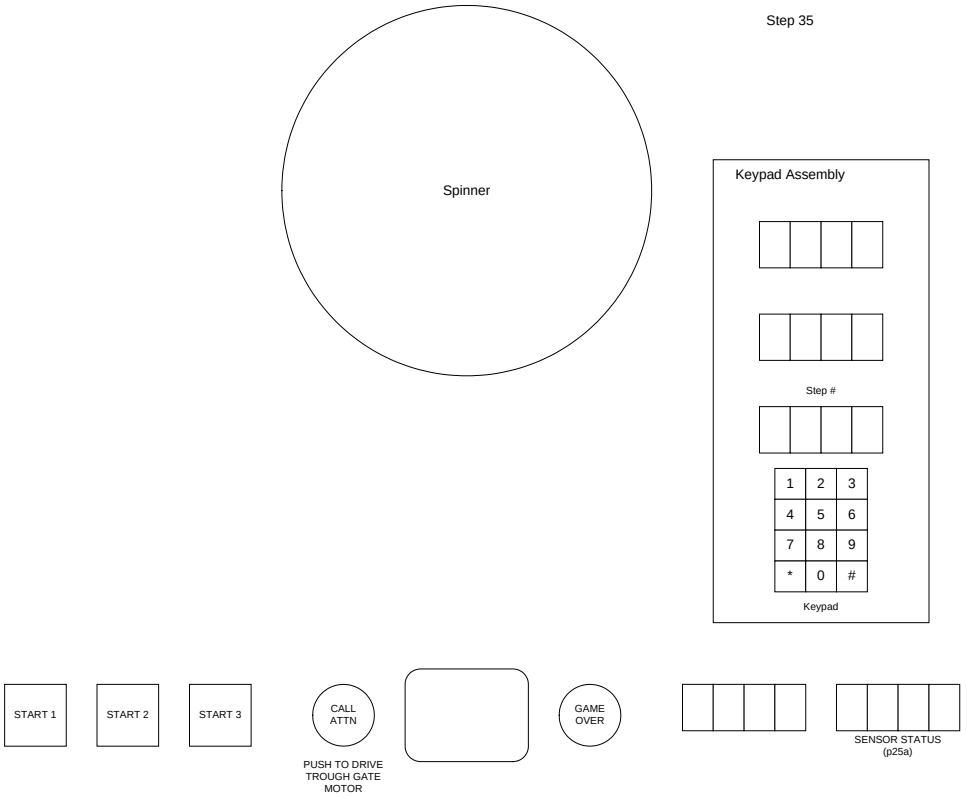
Program Mode Diagnostics (continued):

Diagnostic Step 35—Test trough gate motor

Push Call Attendant button to energize gun trough gate motor Ramp full and gun loaded sensors may be monitored as described below:

---$_{o}$ => ramp full sensor not sensing light
---^{o} => ramp full sensor sensing light

--$_{o}$- => gun loaded sensor not sensing light
--^{o}- => gun loaded sensor sensing light

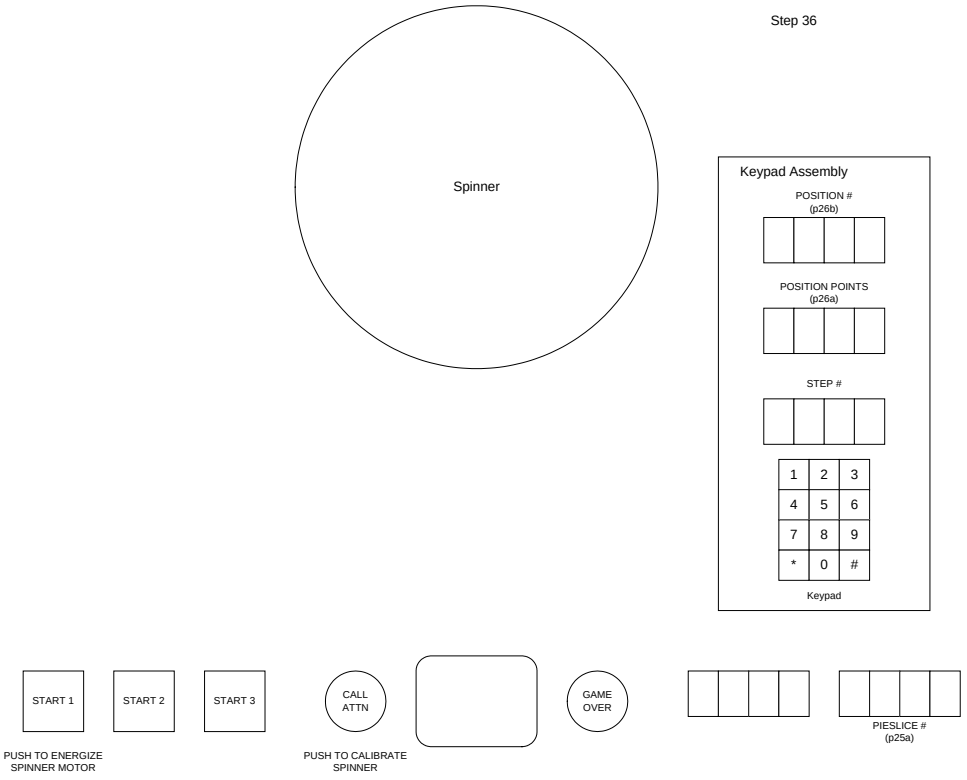


APPENDIX F TROUBLESHOOTING GUIDE

Program Mode Diagnostics (continued):

Diagnostic Step 36—Calibrate spinner and display spinner parameters

Display spinner pieslice 0-255, points, and position number. Recalibrate to TDC (top dead center) by manually positioning pointer straight up and pushing Fast Stop button. Perform the troubleshooting steps in the sequence specified in the table below.



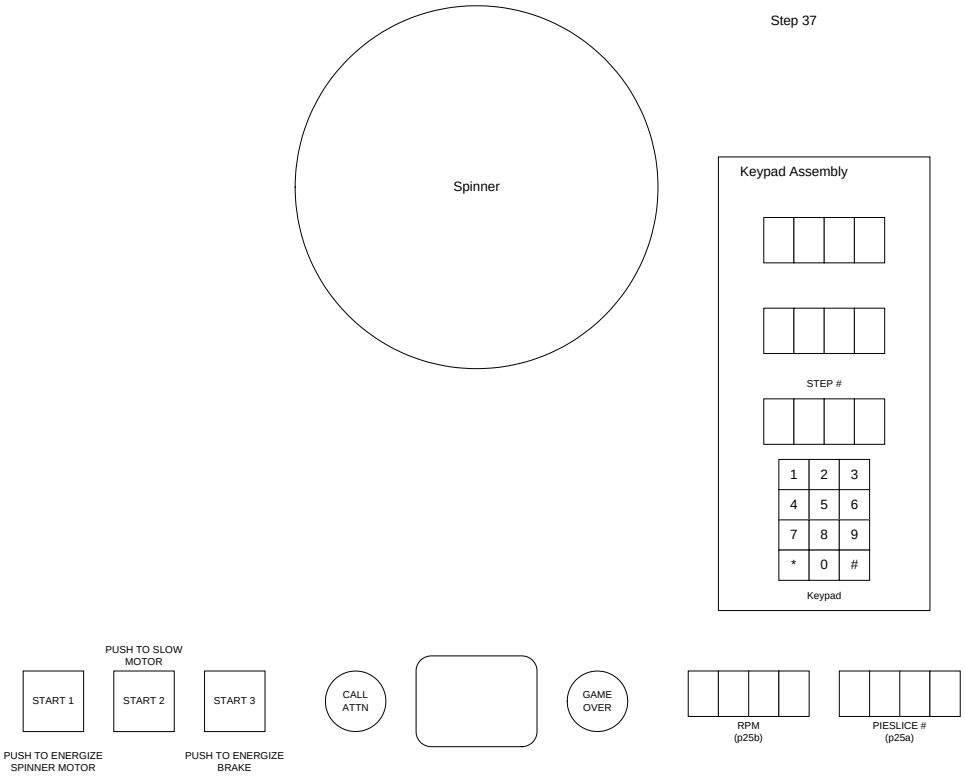
Problem	Solution
Pieslice is not zero when spinner is pointing straight up to TDC (top dead center)	• Recalibrate to TDC by manually positioning pointer straight up and pushing Start button (spinner may be energized by momentarily pushing Fast Stop pushbutton)
Wrong pieslice 0-255, pieslice number should increase smoothly from 0 to 255 as spinner is rotated clockwise	• Verify spinner board switches are set correctly • Examine/reseat wiring harness connections to spinner board
Wrong position number, position number should increase smoothly from 0 as spinner is rotated clockwise through each spinner position	• Verify spinner board switches are set correctly • Examine/reseat wiring harness connections to spinner board • Recalibrate to TDC (top dead center) by manually positioning pointer straight up and pushing Fast Stop button

APPENDIX F TROUBLESHOOTING GUIDE

Program Mode Diagnostics (continued):

Diagnostic Step 37—Spinner factory diagnostic

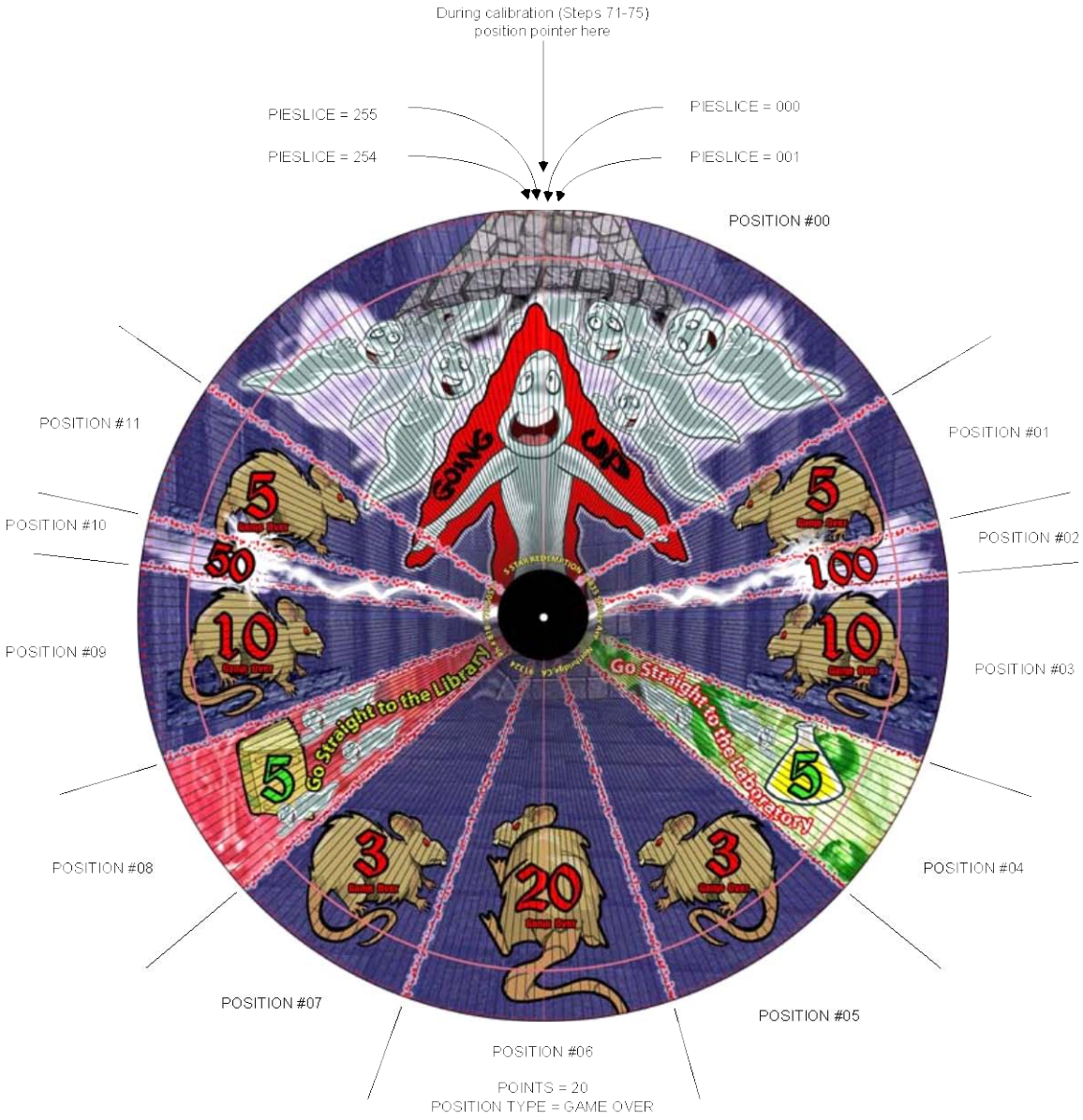
Push the Start 3 pushbutton to energize the spinner brake and the Start 1 pushbutton to energize the spinner motor. Hold down the Start 2 pushbutton while pushing the Start 1 pushbutton to cause the spinner to spin more slowly.



Problem	Solution
Spinner does not spin	• Examine/reseat wiring harness connections to spinner motor • Look for low-voltage changes at VTMux board output when spinner should be spinning and if voltage does not change, replace VTMux board and retest
Brake does not activate	• Examine/reseat wiring harness connections to spinner solenoid • Look for low-voltage changes at VTMux board output when brake should be activated and if voltage does not change, replace VTMux board and retest

APPENDIX F TROUBLESHOOTING GUIDE

Example spinner showing pieslice, spinner points, position types, and position numbers



APPENDIX F TROUBLESHOOTING GUIDE

OPTO-SENSOR PROBLEMS

Problem	Solution	Diagnostic # (if applicable)
Ball going through claw, hoop, or clockface does not give points	• Troubleshoot claw, hoop, and clockface opto-sensors	Self Diagnostic #3 Step 31
Tickets low or out not lights not working properly	• Troubleshoot tickets low and out opto-sensors	Self Diagnostic #3 Step 32
Balls not loading onto ball trough properly	• Troubleshoot ball trough opto-sensor, turntable motor, and trough gate motor	Self Diagnostic #3 Step 32 Step 34 Step 35
Ball is not sensed properly when loaded or shot from gun	• Troubleshoot gun opto-sensor	Self Diagnostic #3 Step32

Spinner Problems

Problem	Solution	Diagnostic # (if applicable)
Spinner light-ring does not illuminate	• Look for low-voltage changes at VTMux board output when light-ring should be illuminated and if voltage does not change, replace VTMux board and retest	na
	• Look for low-voltage changes at input to solid state relay when light-ring should be illuminated and if voltage does not change, check wiring harness	na
	• Look for 120 VAC voltage changes at output from solid state relay when light-ring should be illuminated:	na
	o If voltage does not change, replace solid state relay and retest	na
	o If voltage does change, replace light-ring and/or neon high-voltage transformer and retest (CAUTION— EXTREMELY DANGEROUS HIGH VOLTAGE)	na
Spinner does not spin properly	• Troubleshoot spinner mechanism	Self Diagnostic #1 Self Diagnostic #2
Spinner brake does not operate properly	• Troubleshoot spinner brake	Self Diagnostic #1
Spinner gives wrong points	• Troubleshoot spinner encoder	Self Diagnostic #1 Self Diagnostic #2

APPENDIX F TROUBLESHOOTING GUIDE

TARGET POINT PROBLEMS

Problem	Solution	Diagnostic # (if applicable)
Targets give wrong points	• Verify correct point programming:	
	o Playing field points	Steps 40-49
	o Jackpot points	Steps 50-53
	o Hoop points	Steps 54-58
	o Clockface points	Steps 60-71

PUSHBUTTON AND POWER PROBLEMS

Problem	Solution	Diagnostic # (if applicable)
Game will not power up	• Verify 120 VAC power is present on cabinet power strips	na
	• Replace 13.7 VDC power supply	na
Pushbutton light does not illuminate	• Examine and replace any burned-out lamp	na
	• Measure low-voltage across terminals of lamp socket and if voltage not present when light should be on, check wiring harness	na
	• Measure low-voltage at output from VTMux board and if voltage not present when light should be on, replace VTMux board and retest	na
Game does not respond to pushing a flashing pushbutton	• Check number of coins required to play settings	Steps 10,11,12
	• Examine and replace any defective pushbutton	na
	• Look for low-voltage changes at VTMux board input when pushbutton pushed and if voltage does not change, check wiring harness	na
	• Replace VTMux board and retest	na

TICKET DISPENSER PROBLEMS

Problem	Solution	Diagnostic # (if applicable)
Does not dispense tickets	• Clear ticket dispenser of any jammed tickets	na
	• Load tickets if empty	na
	• Try dispensing a ticket using diagnostic mode, if ticket does not dispense:	Step 33
	o Check wiring harness	na
	o Replace ticket dispenser and retest	na
	o Replace VTMux board and retest	na

APPENDIX F TROUBLESHOOTING GUIDE

COIN ACCEPTOR PROBLEMS

Problem	Solution	Diagnostic # (if applicable)
Does not respond when coin/token inserted	• Examine and replace any defective coin acceptor mechanism	na
	• Look for low-voltage changes at VTMux board input when coin/token inserted and if voltage does not change, check wiring harness	na
	• Replace VTMux board and retest	na

4-DIGIT DISPLAY PROBLEMS

Problem	Solution	Diagnostic # (if applicable)
4-digit display always blank or shows gibberish	• Replace 4-digit display and retest	na
	• Check cables	na
	• Replace VTMux board and retest	na

TURNTABLE MOTOR PROBLEMS

Problem	Solution	Diagnostic # (if applicable)
Balls are not being brought up	• Manually energize turntable motor	Step 34
	• Measure voltage at turntable motor and replace motor if voltage is present	na
	• Check wiring harness	na
	• Replace VTMux board and retest	na

TROUGH GATE MOTOR PROBLEMS

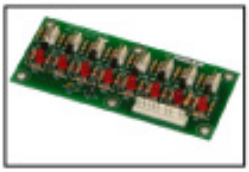
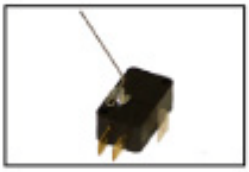
Problem	Solution	Diagnostic # (if applicable)
Balls are not being advanced into gun	• Manually energize trough gate motor	step 35
	• Measure voltage at trough gate motor and replace motor if voltage is present	na
	• Check wiring harness	na
	• Replace VTMux board and retest	na

APPENDIX F TROUBLESHOOTING GUIDE

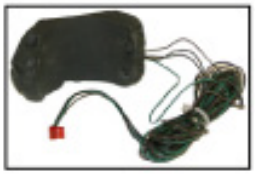
SOUND PROBLEMS

Problem	Solution	Diagnostic # (if applicable)
No sound	• Check VOLUME potentiometer on VTMux board and turn clockwise to increase volume	na
	• Examine and replace any defective speaker	na
	• Check wiring harness	na
	• Replace VTMux board and retest	na

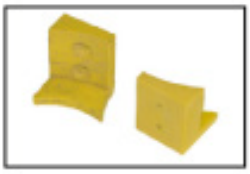
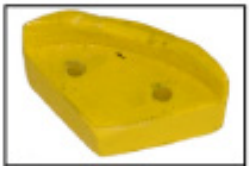
Appendix G Replacement Parts

	Power Supply	CA1-0046-RC
	Bladder Ring	MA2-0111-R
	Display Board	PC1-1007-RC
	Opto Board	PC1-1025-RC
	Coin Switch	TB4-2004
	Shooter Flapper and Pin	HH9-0042
	Play Field PAW Sensor Large	HH6-0018-Y
	Play Field PAW Sensor Small (Red)	HH6-0018-R

APPENDIX G REPLACEMENT PARTS

	Ticket Board	TT1-0008-RC
	Ramp Sensor	PC1-1025-R
	Spindle (Plastic)	MA2-0023-RC
	Ball	MA2-0111-B
	Front Of Shooter Assembly	GU3-0000
	Shooter Handle	GU2-0012-R
	Shooter Handle Full Assembly	GU3-0012-RC
	Bladder	MA2-0111

APPENDIX G REPLACEMENT PARTS

	Turntable Assembly	TB6-X044-RC
	Turntable Motor	MA2-0041-RC
	Door Extension Block	GU3-0066
	Blower	BE1-0002
	Sensor Cave 1	PC1-1055-1
	Sensor Cave 2	PC1-1055-2
	Trough Sensor	BU2-0006
	Shooter Pivot Stop	GU3-0066

APPENDIX G REPLACEMENT PARTS

	Claw Sensor	CA4-0094-S
	Control Panel	TB4-1001-R/C
	Control Panel	TB4-1001-RC
	Claw (Bck & Frnt)	TB1-0005-RC
	Cup Assembly #1	CA4-0080-Y
	Cup Assembly #2	CA4-0080-G
	Cup Assembly #3	CA4-0080-P
	Cup Assembly #4	CA4-0080-O
	Cup Assembly #5	CA4-0080-R

Appendix H

Technical Assistance

Call Attendant Error Codes

Error Codes	Description	Resolution
9001	Error while dispensing tickets	Ran Out of Tickets , Clean Ticket Dispenser, or Replace Ticket Dispenser
9002	Tickets Are Out	Add More Tickets to Ticket Dispenser
8010	Playfield Sensor Error	Replace Green Paw Sensor
8020	“	Replace Pink Paw Sensor
8030	“	Replace Orange Paw Sensor
8040	“	Replace Yellow Paw Sensor
8050	“	Replace Red Paw Sensor
8060	“	Replace Volcano Paw Sensor
8070	“	Replace Hole #1 Sensor
8080	“	Replace Hole #2 Sensor
7010	“	Replace Cave #2 Sensor
7020	“	Replace Volcano Sensor
6010	Hoop Sensor Opto Board	Replace Yellow Hoop Sensor
6020	“	Replace Orange Hoop Sensor
6030	“	Replace Pink Hoop Sensor
6040	“	Replace Green Hoop Sensor
6050	“	Replace Red Hoop Sensor
6060	“	Replace Clock Hoop Sensor
5020	Miscellaneous Sensor Error	Replace Gun Trough Sensor
5030	“	Replace Tickets Low Sensor
5040	“	Replace Tickets Out Sensor
5050	“	Replace Ramp Full Sensor

Problems and Possible Resolutions

Symptom	Resolution
Game is not running properly. 1 display is blank, and the other has zeros.	Check the power supply connected to P41 or P43, insure that the red LED is illuminated in the back of Power Supply # 1. If not illuminated replace the power supply.
Both displays are blank or have erroneous characters constantly being displayed.	1.Check the VTMUX Board and see if the green LED is blinking on & off. If Not blinking: a) Check Power Supply #1 insure that the red LED is illuminating or verify that it is outputting 12volts.
NO Sound	Turn the POT R50 on the VTMUX board Clockwise until sound comes on.
	Make sure that the speaker cable assembly P1 is properly connected to J1.
The Ticket Dispenser Red LED is always ON	Check Ticket Dispenser for Tickets Being Low or Out.

Contacting Customer Service

Most distributors provide technical assistance for the products they sell. If your distributor cannot solve your problem, assistance can be obtained through Five Star Redemption. Call (818) 773-6056 extension 232 between the hours of 8:00 AM and 4:00 PM Pacific time, Monday through Friday, and ask for the service department.

Please have the following information available:

1. Type of Game
2. Serial Number
3. Distributor's Name
4. Date of Purchase
5. Description of Problem

The service technician may ask you to perform some tests on your machine, so it is preferable to call from the game's location if possible.

Five Star Redemption

ADDRESS AND TELEPHONE NUMBERS

8835 Shirley Avenue
Northridge, CA 91324
(818) 773-6057 Fax (818) 773-6064
Sales extension 1
Technical Support extension 2