

Bally

AUGUST 1994
16-50036-101

CORVETTE®



Operations Manual Includes:

Operations & Adjustments • Testing & Problem Diagnosis • Parts Information •
Reference Diagrams & Schematics



FLIPPERSPILL.COM

Midway Manufacturing Company, 3401 North California Avenue, Chicago, Illinois 60618

DIP SWITCH SETTINGS AND JUMPERS

EPROM Jumper Settings for U6

1MEG, 2MEG, 4 MEG EPROM

W1	W2
In	Out

Dip Switch Chart

Country	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
America	Off	Off	On	On	On	On	On	On
European	Off	Off	On	On	On	Off	On	On
French	Off	Off	On	On	On	On	Off	Off
German	Off	Off	On	On	On	On	On	Off
Spain	Off	Off	On	On	Off	On	On	On

SOLENOID/FLASHER TABLE

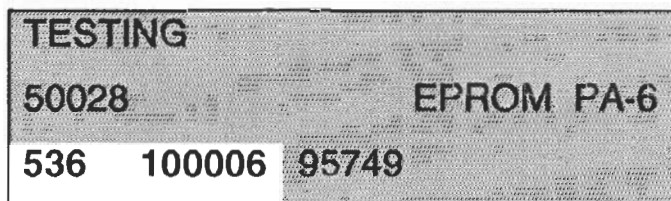
Sol. No.	Function	Solenoid Type	Voltage Connections			Drive Xister	Drive Connections			Drive Wire Color	Solenoid Part number Flashlamp Type		
			Playfield	Backbox	Cabinet		Playfield	Backbox	Cabinet		Playfield	Backbox	
01	Trough Eject	High Power	J107-2			Q82	J130-1			Vio-Brn	AE-26-1500		
02	ZR-1 Low Rev Gate	High Power	J107-2			Q80	J130-2			Vio-Red	SM1-28-900-DC		
03	Kickback	High Power	J107-2			Q78	J130-4			Vio-Org	AE-23-800		
04	Pit Stop Popper	High Power	J107-2			Q76	J130-5			Vio-Yel	AE-23-800		
05	ZR-1 Up Rev Gate	High Power	J107-2			Q64	J130-6			Vio-Grn	SM1-35-4000-DC		
06	Not Used	High Power	J107-2			Q66	J130-7			Vio-Blu			
07	Knocker	High Power		J107-2		Q68		J130-8		Vio-Blk		AE-23-800	
08	Route 66 Kickout	High Power	J107-2			Q70	J130-9			Vio-Gry	AE-23-800		
09	Left Slingshot	Low Power	J107-3			Q58	J127-1			Brn-Blk	AE-26-1200		
10	Right Slingshot	Low Power	J107-3			Q56	J127-3			Brn-Red	AE-26-1200		
11	Left Jet	Low Power	J107-3			Q54	J127-4			Brn-Org	AE-26-1200		
12	Bottom Jet	Low Power	J107-3			Q52	J127-5			Brn-Yel	AE-26-1200		
13	Right Jet	Low Power	J107-3			Q50	J127-6			Brn-Grn	AE-26-1200		
14	Not Used	Low Power	J107-3			Q48	J127-7			Brn-Blu			
15	ZR-1 Lockup	Low Power	J107-3			Q46	J127-8			Brn-Vio	AE-30-2000		
16	Loop Gate	Low Power	J107-3			Q44	J127-9			Brn-Gry	A-14406		
17	Race Direction	Flasher	J107-6			Q42	J126-1			Blk-Brn	A-19159		
18	Left Race Enable	Flasher	J107-6			Q40	J126-2			Blk-Red	14-8015		
19	Right Race Enable	Flasher	J107-6			Q38	J126-3			Blk-Org	14-8015		
20	Tenth Corvette	Flasher		J106-5		Q36		J125-5		Blk-Yel		24-8802	
21	Jets	Flasher	J107-6			Q28	J126-5			Blu-Grn	24-8704		
22	Right Ramps	Flasher	J107-6	J106-5		Q30	J126-6	J125-7		Blu-Blk	24-8704	24-8802	
23	Upper Left Flipper	Flasher	J107-6	J106-5		Q34	J126-7	J125-8		Blu-Vio	24-8704	24-8802	
24	Catch Me	Flasher	J107-6	J106-5		Q32	J126-8	J125-9		Blu-Gry	24-8704	24-8802	
25	ZR-1 Ramp	Gen. Purpose	J107-6	J106-5		Q26	J122-1	J124-1		Blu-Brn	24-8802	24-8802	
26	ZR-1 Underside	Gen. Purpose	J107-6	J106-5		Q24	J122-2	J124-2		Blu-Red	24-8704	24-8802	
27	Right Rear Panel	Gen. Purpose	J107-6	J106-5		Q22	J122-3	J124-3		Blu-Org	24-8802	24-8802	
28	Right Standup	Gen. Purpose	J107-6	J106-5		Q20	J122-4	J124-5		Blu-Yel	24-8802	24-8802	
33	Diverter Power	High Power	J907-6,7			Q2	J902-6			Yel-Vio	A-15943-1		
34	Diverter Hold	Low Power	J907-6,7			Q7	J902-4			Org-Vio	A-15943-1		
General Illumination													
01	Upper Left	G.I.	J121-1			Q18	J121-7			Wht-Brn	#44		
02	Upper Right	G.I.	J121-2			Q10	J121-8			Wht-Org	#44		
03	Lower Left	G.I.	J121-3	J120-3		Q14	J121-9	J120-9		Wht-Yel	#44	#555	
04	Lower Right	G.I.	J121-5	J120-5		Q16	J121-10	J120-10		Wht-Grn	#44	#555	
05	Backbox Title	G.I.		J120-6		Q12		J120-11		Wht-Vio		#555	
Flipper Circuits													
			Voltage Connections			Drive Transistors		Drive Connectors		Drive Wire Colors		Coil Part No.	Coil Color
			Playfield			Power	Hold	Playfield		Power	Hold		
	Lower Left Flipper	Lwr. Lt. Power	J907-4 (Red-Blu)			Q3		J902-9		Yel-Blu		FL-11629	BLUE
		Lwr. Lt. Hold	J907-4 (Red-Blu)				Q9	J902-7		Org-Blu			
	Lower Right Flipper	Lwr. Rt. Power	J907-1 (Red-Grn)			Q4		J902-13		Yel-Grn		FL-11629	BLUE
		Lwr. Rt. Hold	J907-1 (Red-Grn)				Q11	J902-11		Org-Grn			
	Upper Left Flipper	Upr. Lt. Power	J907-8 (Red-Gry)			Q1		J902-3		Yel-Gry		FL-11630	RED
		Upr. Lt. Hold	J907-8 (Red-Gry)				Q5	J902-1		Org-Gry			
	Upper Right Flipper	Upr. Rt. Power	J907-6 (Red-Vio)			Q2		J902-6		Yel-Vio		NOT	USED
		Upr. Rt. Hold	J907-6 (Red-Vio)				Q7	J902-4		Org-Vio			

J1xx=Power Driver Board; J9xx=Flitronic II Board; 24-6549=#44 bulb; 24-8704=#89 bulb; 24-8768=#555 bulb; 24-8802=#906 bulb

ATTENTION

This game uses a new Security CPU Board that is not downward compatible to the CPU boards used in previous games. The new board has an added security chip that can be interchanged between other Corvette games and software revision levels. The CPU board itself is interchangeable with later model games, but must be equipped with the correct security chip and software for that specific game.

The games' electronic ID number is shown in the display during power-up. The number displayed is the same nine digit number printed on the security chip label. The first three digits are the project number without a country specific code. An example of the power-up display is shown below, the electronic ID number is bolded.



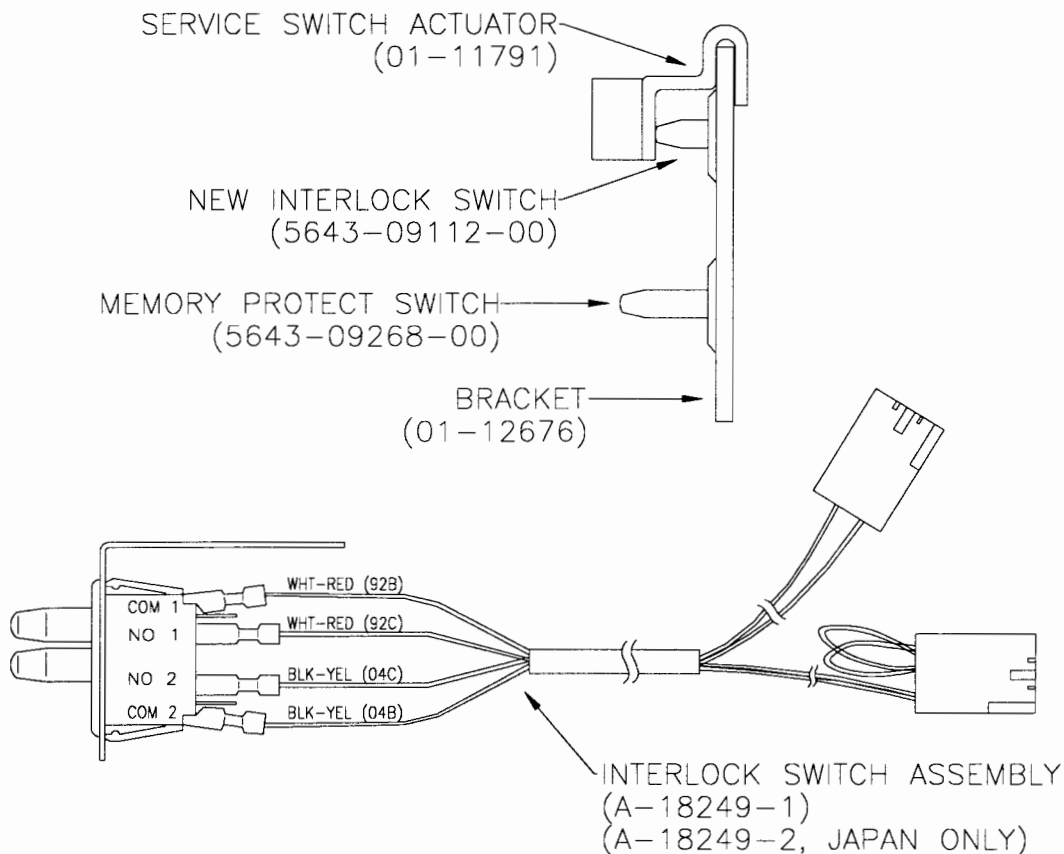
IMPORTANT NOTICE

PLEASE READ

This pinball game is equipped with a SAFETY FEATURE to prevent shocks from the solenoid circuit when the coin door is open. A new interlock switch assembly (part no. A-18249-1), located at the left of the coin door opening, has been added to the game. This assembly is a bracket containing the existing memory protect switch on the bottom and a new interlock switch on the top. When the coin door is open, the new interlock switch opens, breaking the connection to the +50V and +20V winding of the transformer secondary.

A special tool called the Service Switch Actuator is provided for the serviceman/technician that repairs the game. This tool is painted yellow and located in a bag stapled inside the cabinet. The Service Switch Actuator slips over the interlock switch and holds it closed while the coin door is open, allowing the serviceman to test and repair the solenoid circuit.

Hold the top interlock switch in, then slide the short end of the Service Switch Actuator over the top of the interlock switch bracket and the long end over the center of the switch plunger to hold it in.



CORVETTE®

Midway Manufacturing Company reserves the rights to make modifications and improvements to its products.

The specifications and parts identified in this manual are subject to change without notice.

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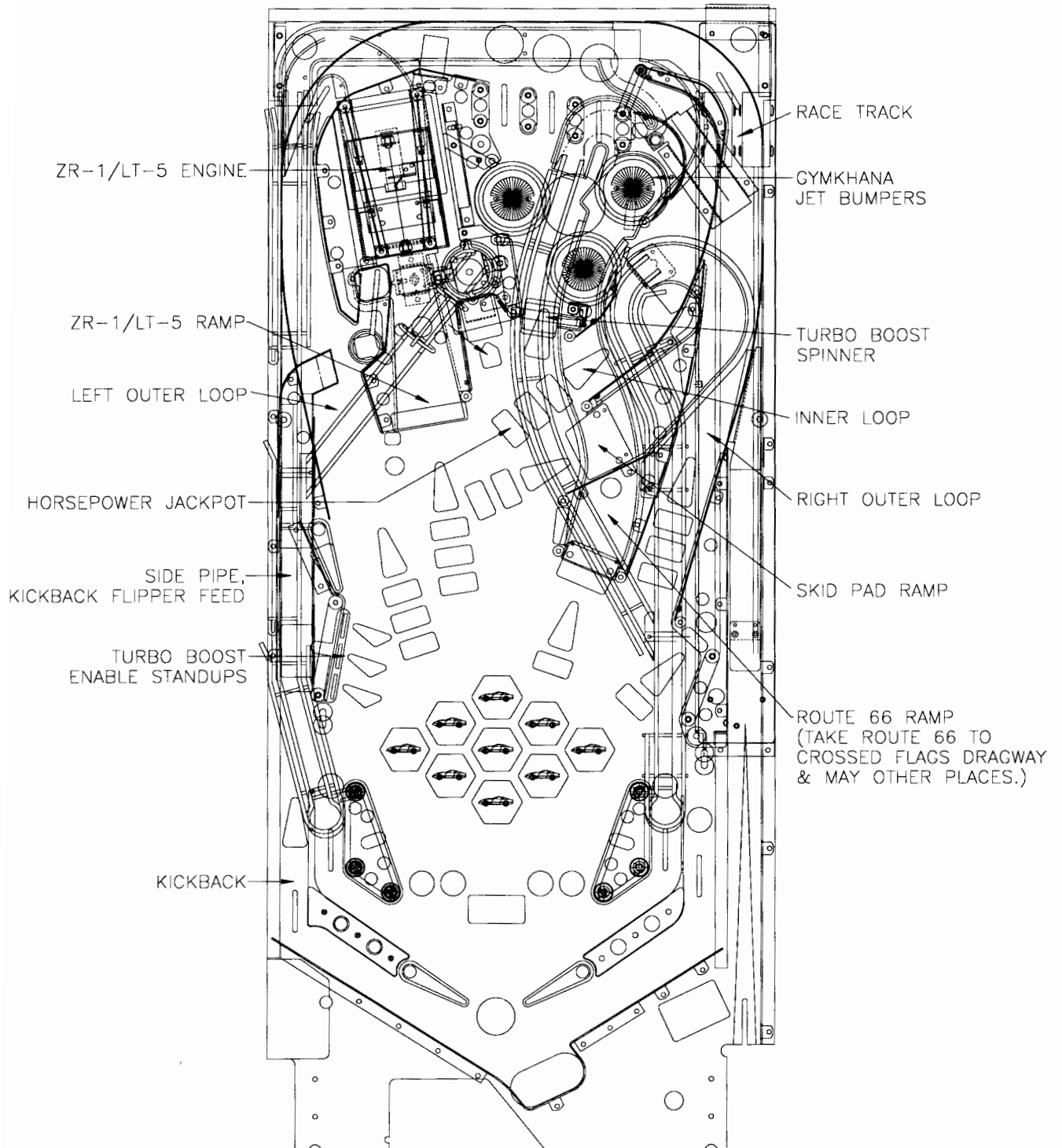
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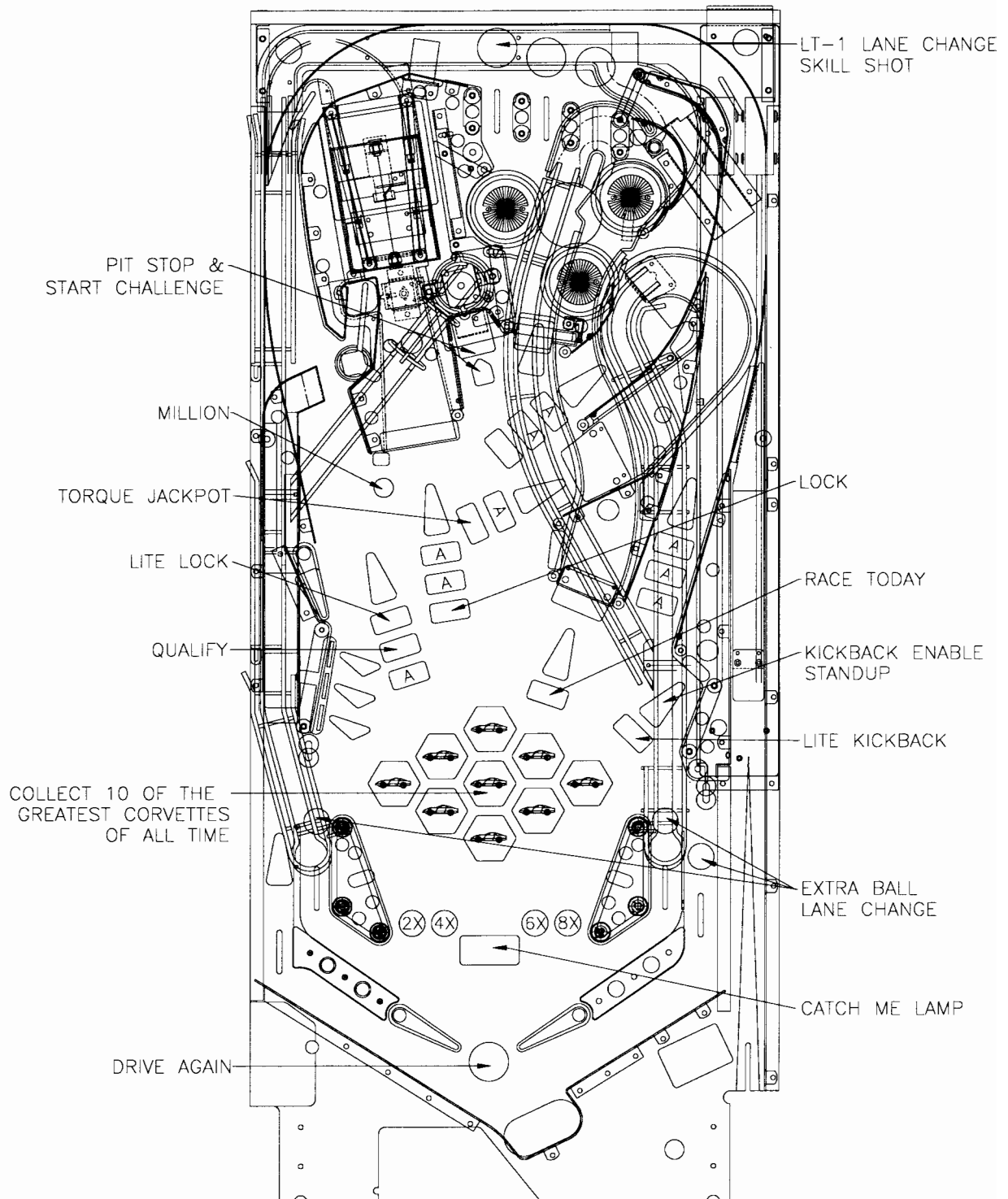
Bally's CORVETTE Pinball

Playfield Shot Maps and Game Rules

PLAYFIELD SHOTS



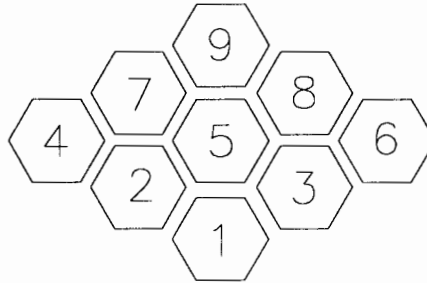
PLAYFIELD SHOTS



COLLECT CARS:

The CORVETTE player collects cars by winning the CORVETTE CHALLENGE, visiting stops along ROUTE 66, and LOCKING BALLS and playing MULTIBALL. By collecting all nine cars, the player faces PUZZLE MODE, during which the player attempts to complete the puzzle for the tenth car, the future car. When the future car is discovered, it is revealed in the backglass artwork and PUZZLE MULTIBALL is started.

The cars are earned in the following order:



1. 1953 Blue Flame Six
2. 1963 Grand Sport
3. 1963 Fuelie Split Window Coupe
4. 1967 Stingray L-88
5. 1971 LT-1 Stingray
6. 1978 Indy Pace Car L-82
7. 1982 Collector Edition L-83
8. 1989 Corvette Challenge L-98
9. 1993 ZR-1 40th Anniversary LT-5

SPEED PARTS:

During main play, certain shots will be lit in order to collect a SPEED PARTS. The number of SPEED PARTS available are based on the player's position in the CORVETTE CHALLENGE ladder. When an SPEED PART is collected, the associated shot's point value and CHALLENGE advance value are doubled. This allows the player to win CORVETTE CHALLENGE races as they become more difficult. Collecting all available SPEED PARTS lights START CHALLENGE. The SPEED PARTS lamp inserts are blue in color.

The SPEED PARTS are:

Speed Part	Associated Shot	Car Availability Level
-----	-----	-----
BIG BLOCK	L. Outer Loop	2 - 1963 Grand Sport
HI LIFT CAMS	ZR-1/LT-5 Ramp	1 - 1953 Blue Flame Six
6-SPEED TRANS	ZR-1/LT-5 Ramp	8 - 1989 Corvette Challenge L-98
FUELIE	Inner Loop	4 - 1967 Stingray L-88
NITROUS	Inner Loop	7 - 1982 Collector's Edition
STICKY TIRES	Skid Pad Ramp	5 - 1971 LT-1 Stingray
Z07 SUSPENSION	R. Outer Loop	9 - 1993 ZR-1 40th Anniversary LT-5
BIG BRAKES	R. Outer Loop	3 - 1963 Fuelie Split Window Coupe
SUPER CHARGER	R. Outer Loop	6 - 1978 Indy Pace Car L-82

CORVETTE CHALLENGE:

When START CHALLENGE is lit, the pitstop shot starts a CORVETTE CHALLENGE. During CORVETTE CHALLENGE, the cars on the race track display the race progress. The car in lane #1 (left/blue) represents the player and the car in lane #2 (right/red) represents the machine. The machine's car moves towards the finish at a steady pace and the player's car moves as targets, shots, ramps, and flippers are made. Harder shots move the car farther than easy shots. If the player's car reaches the finish before the machine's car, the player wins the CORVETTE CHALLENGE and the next car in the ladder. As the player moves up the CORVETTE CHALLENGE ladder, the races become more difficult.

PUZZLE MODE:

During PUZZLE MODE, a number of shots are lit and the dot matrix display shows an incomplete puzzle. Each of the lit shots completes one of the missing puzzle pieces. Completing the puzzle awards the 10th Corvette Future car, illuminating it in the back glass artwork. This starts a four ball multiball during which the ZR-1/LT-5 ramp is a JACKPOT shot worth a score times the number of balls in play. Other shots are valued based on the number of CORVETTE CHALLENGE races won throughout the game.

LITE LT-5 LOCK:

During main play, the left outer loop shot lights the LT-5 LOCK lamp on the ZR-1/LT-5 ramp.

LT-5 LOCK:

During main play, when the LT-5 LOCK lamp is lit and the ZR-1/LT-5 ramp shot is made, the ball is captured and locked by the ZR-1/LT-5 engine mechanism. Locking three balls starts the Mid-Ohio Endurance multiball (3) during which all shots award a fixed point value. Two JACKPOT shots are available for increased scoring, TORQUE JACKPOT and HORSE POWER JACKPOT. When a JACKPOT shot is made, it is disabled until the other JACKPOT is also made, at which point they are both again available.

LT-5 REMATCH:

At the end of the Mid-Ohio Endurance multiball, if no JACKPOTs were made, the multiball can be restarted by shooting the ZR-1/LT-5 ramp before the timer expires.

ROUTE 66:

The Route 66 (right ramp) shot gives a progression of awards for every other completion of the shot. The qualifying shot tells the player what to expect for the next shot. The next shot gives an award as follows:

Award Level	Award
-----	-----
0	Start Catch Me
1	Award Challenge Car
2	Start Pitstop Hurrayup
3	Award Challenge Car
4	Enable QuadraJets
5	Award Challenge Car
6	Start Catch Me
7	Bonus X Increase
8	Award Challenge Car
9	Award Points
10	Award Special

RACE TRACK COMBOS:

Each set of recognized COMBO shots award a visit to a different FAMOUS RACE TRACK and a millions plus point award, which builds over the life of the ball. The following list comprises the recognized COMBOs.

COMBO Description

Right Outer, Skid Pad Ramp, Inner Loop
ZR-1 Ramp, Skid Pad Ramp, Inner Loop
Right Outer, Inner Loop
ZR-1 Ramp, Inner Loop
Right Outer Loop, Inner Loop, Skid Pad
ZR-1 Ramp, Inner Loop, Skid Pad Ramp
Right Outer Loop, Skid Pad Ramp
Inner Loop, Skid Pad Ramp
ZR-1 Ramp, Skid Pad Ramp
Right Outer Loop, Route 66 Ramp
Left Outer Loop, ZR-1 Ramp
Right Outer Loop, Inner Loop, RAUCOUS
ZR-1 Ramp, Inner Loop, RAUCOUS
Right Outer Loop, RAUCOUS
ZR-1 Ramp, RAUCOUS

SPARK PLUGS:

A SPARK PLUG is collected for shooting lit arrows. An award is given at every eight SPARK PLUGS collected. The SPARK PLUG awards toggle between light RACE TODAY and points. EXTRA BALL is also awarded at a percentaged number of SPARK PLUGS.

CATCH ME:

When CATCH ME is lit, the ROUTE 66 (right ramp) starts the mode. CATCH ME mode is a timed sequence in which a shot is flashing and the player must make the shot before the time expires. If the shot is made, the timer is reset and another shot begins flashing. After the last shot is completed, a two ball multiball is started during which all shots are worth a point value.

PITSTOP HURRY UP:

This is a timed sequence in which a point value is reduced until the player shoots the PIT-IN shot. If the shot is made before the time expires, a two ball multiball is started during which the PIT-IN shot becomes a JACKPOT worth the stopped point value. After a preset number of JACKPOTS have been awarded, the QUALIFY (left outer loop) shot must be made to re-lite the JACKPOT.

RACE TODAY:

When RACE TODAY is lit, the ROUTE 66 (right ramp) starts the mode. Drag Race mode pits the player against the machine in a simulated drag race. The ball is held and attention turns to the Cross Flags drag strip. The race tree lamps count down and the player races the car in lane #1 (left/blue) against the car in lane #2 (right/red). Using the left flipper button to accelerate, the player shifts with the right flipper button against the tachometer shown in the dot matrix display. If the player wins the race, a two ball multiball is started during which all ramp shots are worth a fixed point value.

QUADRAJETS:

When QUADRAJETS are enabled, the value of each JET BUMPER hit is multiplied by four for the duration of the ball.

TURBO BOOST:

When one or more of the left three bank standup targets are hit, a hurry up is started to complete the remaining target(s). Each time the set is completed in time, the TURBO BOOST is enabled for an additional period of time. When TURBO BOOST is enabled, the point value of the SPINNER and all shots as well as the advance value during CORVETTE CHALLENGE is increased based on the TURBO BOOST value. The TURBO BOOST value is increased each time the SPINNER shot is made and decays with time. When TURBO BOOST is enabled, an ICON appears in the lower right corner of the dot matrix display.

WORLD SPEED RECORD:

When the left or right outer loop shot is completed two or more times in succession, the player is eligible to win the WORLD SPEED RECORD. The winner of the WORLD SPEED RECORD is allowed to place their initials, which are displayed along with the High Score To Date (HSTD) information. SPECIAL is also awarded to the WORLD SPEED RECORD champion.

CORNERING RECORD:

When the inner loop shot is completed two or more times in succession, the player is eligible to win the CORNERING RECORD. The winner of the CORNERING RECORD is allowed to place their initials, which are displayed along with the High Score To Date (HSTD) information. SPECIAL is also awarded to the WORLD SPEED RECORD champion.

SKILL SHOT:

Each time a ball is served (excluding ball saves), a basic SKILL SHOT is available in the top BUMPER JET entry lanes. A SKILL SHOT point value is awarded by using the flipper buttons to LANE CHANGE such that the ball rolls over the blinking light.

SUPER SKILL SHOT:

If during SKILL SHOT the code (Left, Right, Left, Left) is entered using the flipper buttons, the SUPER SKILL SHOT is activated. When active, the outer loop control gate is open and a SUPER SKILL SHOT point value is awarded for making either of the INNER LOOP or SKID PAD RAMP shots. Entering the code (Right, Left, Right, Right) deactivates the SUPER SKILL SHOT.

BONUS COUNT:

At the end of a ball, a tally is made of the following items and multiplied by the BONUS MULTIPLIER:

1. FAMOUS RACE TRACKs visited
2. CORVETTE CHALLENGE cars collected
3. CATCH ME mode shots completed
4. RAUCOUS completed
5. TURBO BOOST remaining
6. BIG POINTS

BONUS MULTIPLIER:

The bonus multiplier is increased by completing the set of three LT-1 top rollover lamps. The flipper buttons cause Lane Change to occur, assisting the player in collecting all three lamps. The bonus multiplier sequence is 2X, 4X, 6X, and 8X.

EXTRA BALL:

There are two possible extra balls that can be awarded. The first is lit when the bonus multiplier reaches 8X. The second is at an adjustable level based on the number of SPARK PLUGS collected.

SECTION ONE

GAME OPERATION AND TEST INFORMATION

(System WPC) ROM Summary

IC	TYPE	BOARD	LOCATION	PART NUMBER
Game 1	27c040	CPU	U6	A-5343-50036-1A (Domestic)
Game 1	27c040	CPU	U6	A-5343-50036-1X (Foreign)
Music/Speech	27c040	Audio	SU2	A-5343-50036-S2
Music/Speech	27c040	Audio	SU3	A-5343-50036-S3
Music/Speech	27c040	Audio	SU4	A-5343-50036-S4
Music/Speech	27c040	Audio	SU5	A-5343-50036-S5
Music/Speech	27c040	Audio	SU6	A-5343-50036-S6
Music/Speech	27c040	Audio	SU7	A-5343-50036-S7

NOTICE

Order replacement ROMs from your authorized MIDWAY MANUFACTURING CO. Distributor. Specify:
(1) Part Number (if available); (2) ROM Level (number on the label); (3) Game in which ROM is used.

PINBALL GAME ASSEMBLY INSTRUCTIONS

CORVETTE IS A 4 BALL GAME.

Power: Domestic 120V @ 60 Hz
Foreign 230V @ 50 Hz
Japan 100V @ 50 Hz

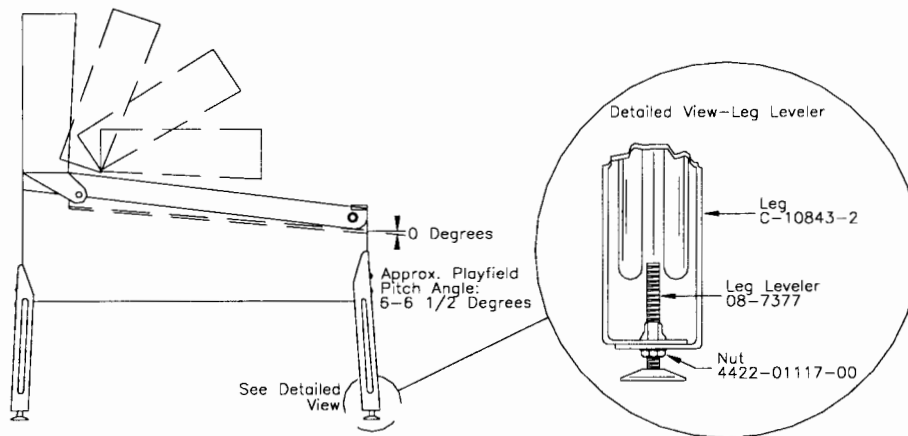
Temp: 32° F to 100° F
(0° C to 38° C)

Humidity: Not to exceed 95% relative.

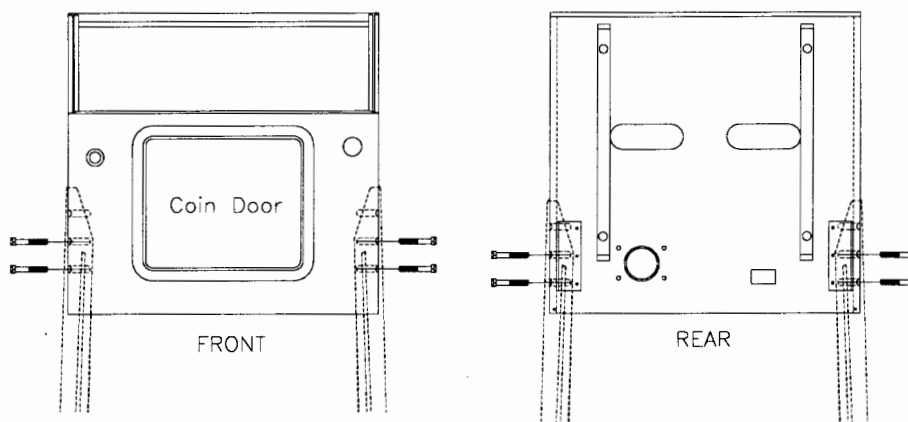
Dimensions: Width: 22" Approx.
Depth: 52" Approx.
Height: 75" Approx.

Weight: Approx. 325 Lbs. (crated)

1. Remove all cartons, parts, and miscellaneous items from the shipping container and set them aside.
2. Leg levelers and leg bolts are provided among the parts in the cash box. Install leg levelers on front and back legs (View 1). Place the cabinet on a support and attach rear legs using leg bolts (View 2).
3. Attach the front legs using leg bolts (View 2).



VIEW 1



VIEW 2

4. Reach into the cabinet and backbox and ensure that the interconnecting cables are not kinked or pinched. Be careful to avoid damaging wires at any stage of the assembly process.
5. Raise the hinged backbox upright and latch it into position. Unlock the backbox, and remove the backglass, storing it carefully to avoid damage. Remove the shipping screws holding the Insert Panel. Unlatch and open the Insert Panel. Carefully lift the Speaker Panel and lay it down on the playfield glass. Be careful not to damage the Dot Matrix Display/Driver Board. This allows access to the bolt holes used for securing the backbox upright. Install the washer-head mounting bolts through the bottom holes of the backbox into the threaded fasteners in the cabinet to secure the backbox. Close the Insert Panel and latch into position. Replace the Speaker Panel. Reinstall the backglass, and lock the backbox.



CAUTION

FAILURE TO INSTALL the backbox mounting hardware properly can cause personal injury.

NEVER TRANSPORT a pinball game with the hinged backbox erect. Always lower the backbox forward onto the playfield cabinet on a layer of protective material to prevent marring or damage and possible personal injury.

6. Extend each leg leveler slightly below the leg bottom, so that all four foot pads protrude approximately the same distance. Remove the cabinet from its support and place it on the floor.
7. Unlock and open the coin door. Move the molding latch lever toward the left side of the game, to release the front molding. Lift the front molding off the playfield cover glass, return the latch lever to the right, and close the coin door. Carefully slide the glass downward, until it clears the grooves of the left and right side moldings. Lift the glass up and away from the game, storing it carefully to avoid breakage.
8. Place a level or an inclinometer on the playfield surface. Adjust the leg levelers for proper playfield level (side-to-side). NOTE: These measurements must be made ON the playfield, not the cabinet nor the playfield cover glass. Tighten the nut on each leg leveler shaft to maintain this setting.
9. Adjust leg levelers to the desired playfield pitch (front to back). The recommended pitch level is 6 1/2 degrees.

CAUTION

Playfield pitch angle adjustments can affect the operation of the plumb bob tilt, inside the cabinet. The plumb bob weight is among the parts in the cash box; the operator should install the weight and adjust this tilt mechanism for proper operation, after completion of the desired playfield pitch angle setting. The unit is factory installed for a 6 1/2 degree angle. If an adjustment is necessary, loosen screw at the bottom of the unit. Move the pointer, one groove at a time to the left or right, depending on the degree desired. Hold pointer in place and tighten screw.

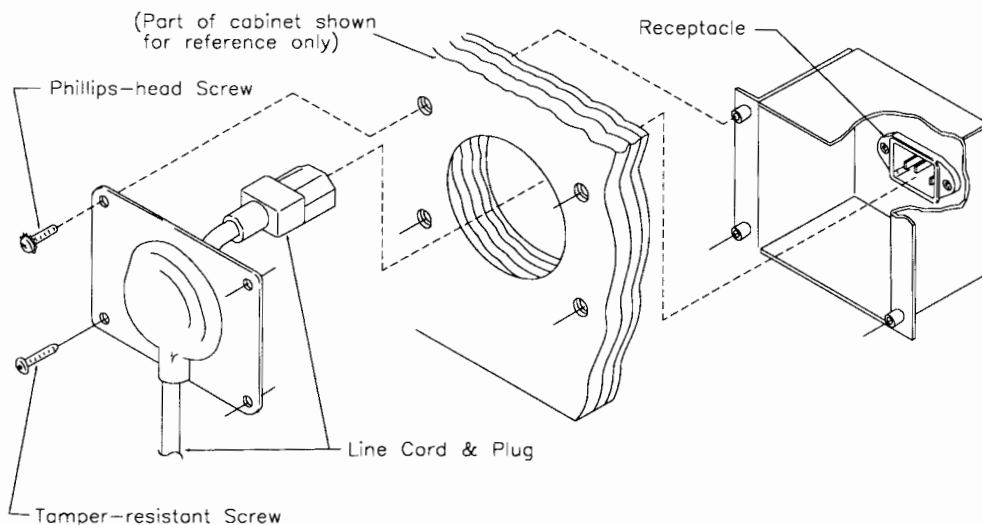
10. Move the game into the desired location; recheck the level and pitch angle of the playfield.
11. Verify that the **required number** of balls are installed in the game. **CORVETTE** uses 4 balls.

12. Install playfield mylars if desired.

NOTE: The **CORVETTE** playfield has a special hardcoat surface and does not require a full protective mylar. However, mylars can be purchased through your local Bally Distributor. Specify part number 03-9295-1 for full playfield mylar.

13. Clean and reinstall the playfield cover glass, reversing the procedure of step 7.

14. To attach line cord, remove envelope stapled to the inside cabinet (near cashbox). Remove the four Phillips-head screws that mount the line cord cover plate to the rear cabinet. Match the prongs on the plug with the holes in the receptacle and push line cord securely into place. Make sure cord aligns with the indentation of plate (indentation should point toward bottom of cabinet). Remount line cord cover plate. If desired, tamper resistant screws are provided in an envelope marked "Security Screws" (located in cashbox) to remount cover plate.





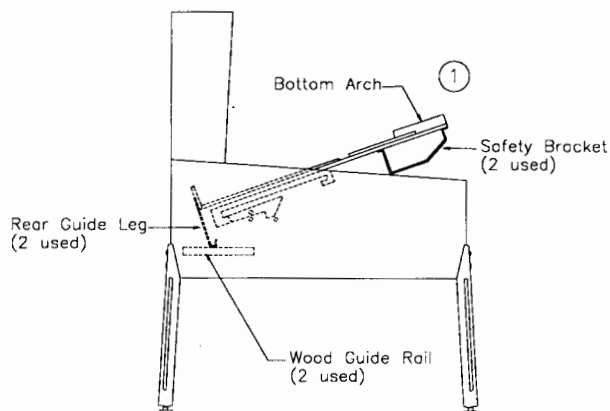
! CAUTION

Do not raise the playfield straight up! This game uses a slide assembly to raise and lower the playfield.

RAISING THE PLAYFIELD

To Raise Playfield:

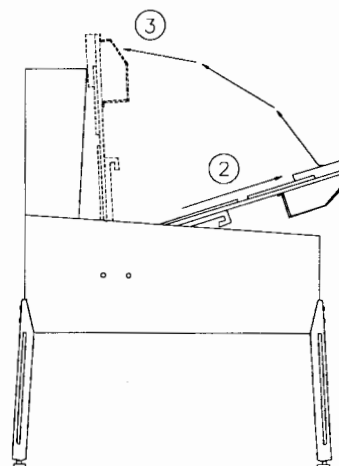
1. Grasp bottom arch and carefully lift up playfield only high enough to clear safety brackets. Rear guide legs should not hit wood guide rails or be used to slide out playfield.



2. Pull the playfield out toward you until it stops (rest position) and raise it approximately 3".

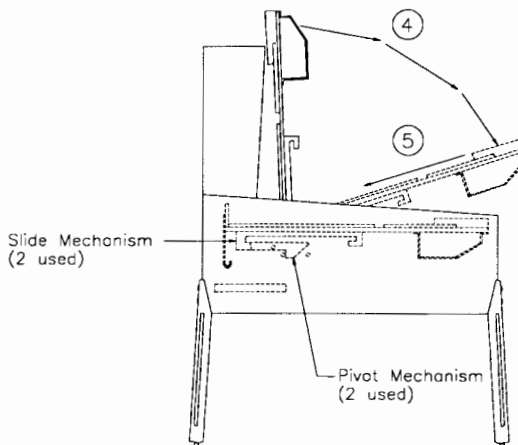
Be sure playfield is in locked position and does not slide back into the cabinet. If it does, repeat Step 2 before proceeding to Step 3.

3. Rotate playfield to upright service position (lean on backbox) by pulling toward you and up. Listen for the sound of a click; this insures locking and pivoting sequence.



To Lower Playfield:

4. Rotate the playfield to the rest position. This unlocks the pivoting sequence.
5. Push back playfield into cabinet and into playing position.



GAME CONTROL LOCATIONS

Cabinet Switches

The On-Off switch is located on the bottom of the cabinet near the right front leg.

The Start Button is the push-button to the left of the coin door on the cabinet exterior. Press the Start button to begin a game, or during the diagnostic mode, to ask for HELP.

Coin Door Switches

The operator controls all game adjustments, obtains bookkeeping information, and diagnoses problems, using only four push-button switches mounted on the inside of the coin door. The Coin Door Switches have two modes of operation Normal Function and Test Function.

Normal Function

The Service Credits button puts credits on the game that are not included in any of the game audits.

The Volume Up (+) button raises the sound level of the game. Press and hold the button until the desired level is reached.

The Volume Down (-) button lowers the sound level of the game. Press and hold the button until the desired level is reached. See Adjustment A.1 28 to shut sound OFF completely.

The *Begin Test button starts the Menu System Operation and changes the Coin Door Switches from Normal Function to Test Function.

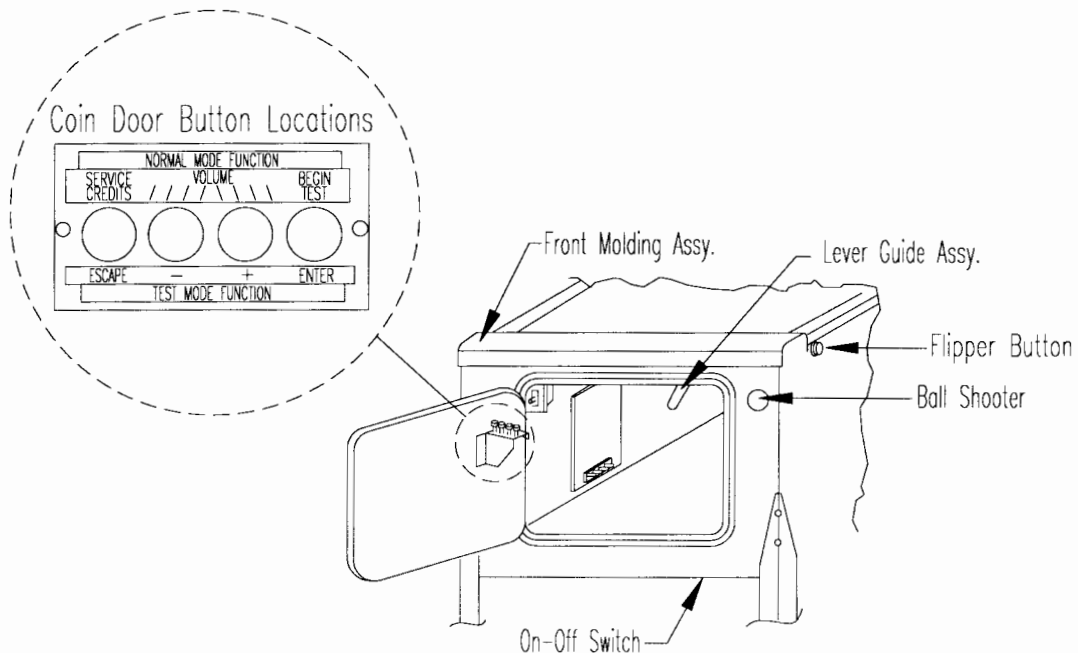
Test Function

The Escape button allows you to get out of a menu selection or return to the Attract Mode.

The Up (+) button allows you to cycle forward through the menu selections or adjustment choices.

The Down (-) button allows you to cycle backward through the menu selections or adjustment choices.

The *Enter button allows you to get into a menu selection or lock in an adjustment choice.



****To reset High Score, hold down the Begin Test/Enter switch for 5 seconds while in the Attract Mode.***

GAME OPERATION



CAUTION

After assembly and installation at the site location, this game must be plugged into a properly grounded outlet to prevent shock hazard, and to assure proper game operation. DO NOT use a 'cheater' plug to defeat the ground pin on the line cord. DO NOT cut off the ground pin.

POWERING UP. With the coin door closed, plug the game in and switch it On. In normal operation, testing will show in the display as the game performs Start-Up Tests. Once the Start-Up Tests have been successfully completed the last score is displayed. After which, the game goes into the Attract Mode.

Note: After the game has been on location for a period of time, the Start-Up Tests may contain messages concerning game problems. See 'Error Messages' for more detailed information regarding messages.

Open the coin door and press the Begin Test Switch. The display shows the game name, number, and software revision. The message changes. The display shows the sound software revision, revision level of the system software and date the game software was revised.

Example:

CORVETTE
50036 Rev. PA-O

Sound Rev. P-O
Sy. 3.23 7/13/94

Press the Enter button to enter the WPC Menu System (refer to the section entitled 'Menu System Operation' for more information). Slide the Service Switch Actuator over the top interlock switch located in the bottom left corner of the coin door opening. Perform the entire Test Menu routine to verify the game is operating satisfactorily.

ATTRACT MODE*. After completing the Test Menu routine, press the Escape button three times to enter the Attract Mode. During the Attract Mode the display shows a series of messages informing the player of the recent highest scores*, "custom messages*", and the score to achieve to obtain a replay award*

CREDIT POSTING. Insert coin(s). A sound is heard for each coin and the display shows the number of credits purchased. So long as the number of maximum allowable credits* are NOT exceeded by coin purchase or high score, credits are posted correctly.

STARTING A GAME. Press the Start button once. A startup sound plays and the credit amount shown in the display decreases by one. The display flashes 00 (until the first playfield switch is actuated), and shows ball 1. If credits are posted, additional players may enter the game by pressing the Start button once for each player, before the end of play on the first ball.

TILTS. Actuating the cabinet tilt switch inside the cabinet ends the current game and proceeds to the Game Over Mode. With the third closure* of the plumb bob tilt switch, the player loses the remaining play of that ball, but can complete the game.

END OF GAME. All earned scores and bonuses are awarded. If a player's final score exceeds the specified value, the player receives a designated award for achieving the current highest score. A random digit set* appears in the display. Credit* may be awarded when the last two digits of any player's score match the random digits. Match, high score, and game over sounds are made, as appropriate.

GAME OVER MODE. Game Over will show in the display. Afterward, the high scores flash on the display. The game proceeds to the Attract Mode.

*Operator-adjustable feature.

MENU SYSTEM OPERATION

The Main Menu allows you to choose from several categories, which in turn lead to other menus. To access the Main Menu, open the coin door and press the Begin Test button, then press the Enter button. Press the Up or Down buttons to cycle through the Main Menu. Press the Enter button to access a menu. Press the Escape button to return to the Main Menu. Press the Start button for HELP at any time.

Main Menu

B. Bookkeeping Menu

B.1 Main Audits
B.2 Earnings Audits
B.3 Standard Audits
B.4 Feature Audits
B.5 Histograms
B.6 Time-Stamps

P. Printouts Menu

P.1 Earnings Data
P.2 Main Audits
P.3 Standard Audits
P.4 Feature Audits
P.5 Score Histograms
P.6 Game Time Histograms
P.7 Time-Stamps
P.8 All Data

T. Test Menu

T.1 Switch Edges
T.2 Switch Levels
T.3 Single Switches
T.4 Solenoid Test
T.5 Flasher Test
T.6 General Illumination
T.7 Sound & Music Test
T.8 Single Lamps
T.9 All Lamps
T.10 Lamp & Flasher Test
T.11 Display Test
T.12 Flipper Test
T.13 Ordered Lamp Test
T.14 Lamp Row-Col Test
T.15 Dip Switch Test
T.16 ZR-1/LT-5 Test
T.17 Race Test
T.18 Empty Balls Test

U. Utilities Menu

U.1 Clear Audits
U.2 Clear Coins
U.3 Reset H.S.T.D.
U.4 Set Time & Date
U.5 Custom Message
U.6 Set Game I.D.
U.7 Factory Adjustments
U.8 Factory Resets
U.9 Presets
U.10 Clear Credits
U.11 Auto Burn-In

A. Adjustments Menu

A.1 Standard Adjustments
A.2 Feature Adjustments
A.3 Pricing Adjustments
A.4 H.S.T.D. Adjustments
A.5 Printer Adjustments

Press Escape

To move out of a menu selection.

Press Enter

To get into a menu selection.

Press Up

Increases sequence; Example A.1, A.2, A.3, A.4.

Press Down

Decreases Sequence; Example A.4, A.3, A.2, A.1.

Use Up and Down to cycle through the selections in a menu.

Use Escape and Enter to move into and out of the selected menu

Press the Up or Down buttons to cycle through the menu. Press the Enter button to access an audit menu. Press the Escape button to return to the Bookkeeping Menu.

B. BOOKKEEPING MENU

B.1 Main Audits

B.2 Earning Audits

B.3 Standard Audits

B.4 Feature Audits

B.5 Histograms

B.6 Time-Stamps

One Button Audit System. The Bookkeeping Menu is obtainable directly from the Attract Mode. Repeatedly pressing the Enter button, while in the Attract Mode, will cycle through all of the game audits.

B.1 Main Audits

B.1	01	Total Earnings	00	B.1	06	Total Plays	00
B.1	02	Recent Earnings	00	B.1	07	Replay Awards	00
B.1	03	Free Play Percent	00	B.1	08	Percent Replays	00
B.1	04	Average Ball Time	00	B.1	09	Extra Balls	00
B.1	05	Time Per Credit	00	B.1	10	Percent Extra Ball	00

B.2 Earning Audits*

B.2	01	Recent Earnings	00	B.2	08	Total Earnings*	00
B.2	02	Recent Left Slot	00	B.2	09	Total Left Slot*	00
B.2	03	Recent Center Slot	00	B.2	10	Total Center Slot*	00
B.2	04	Recent Right Slot	00	B.2	11	Total Right Slot*	00
B.2	05	Recent 4th Slot	00	B.2	12	Total 4th Slot*	00
B.2	06	Recent Paid Credits		B.2	13	Total Paid Credits*	
B.2	07	Recent Service Credits		B.2	14	Total Service Credits*	

*These audits are NOT resettable. They are a record of the earnings of the game since the "CLOCK 1ST SET" Time-Stamp.

B.3 Standard Audits

B.3	01	Games Started	00	B.3	20	Time Per Credit	00
B.3	02	Total Plays**	00	B.3	21	Play Time	00:00:00
B.3	03	Total Free Play	00	B.3	22	Minutes On	00
B.3	04	Free Play Percent	00	B.3	23	Balls Played	00
B.3	05	Replay Awards	00	B.3	24	Tilts	00
B.3	06	Percent Replays	00	B.3	25	Replay 1 Awards	00
B.3	07	Special Awards	00	B.3	26	Replay 2 Awards	00
B.3	08	Percent Special	00	B.3	27	Replay 3 Awards	00
B.3	09	Match Awards	00	B.3	28	Replay 4 Awards	00
B.3	10	Percent Match	00	B.3	29	1 Player Games	00
B.3	11	H.S.T.D. Credits	00	B.3	30	2 Player Games	00
B.3	12	Percent H.S.T.D	00	B.3	31	3 Player Games	00
B.3	13	Extra Ball	00	B.3	32	4 Player Games	00
B.3	14	Percent Extra Ball	00	B.3	33	H.S.T.D. Reset Count	00
B.3	15	Tickets Awarded	00	B.3	34	Burn-in Time †	00:00:00
B.3	16	Percent Tickets	00	B.3	35	1st Replay Level	00
B.3	17	Left Drains	00	B.3	36	Left Flipper	00
B.3	18	Right Drains	00	B.3	37	Right Flipper	00
B.3	19	Average Ball Time	00				

** "Total Plays" only counts completed games. A game is considered complete when the final ball begins. Audit information from incomplete games is ignored, therefore test and servicing operations do not affect the Audits.

† This Audit is not resettable.

B.4 Feature Audits

B.4	01	BUY-IN EX. BALLS	00
B.4	02	MULTIBALLS	00
B.4	03	CHALLENGE STARTS	00
B.4	04	ROUTE 66 VISITS	00
B.4	05	CARS WON	00
B.4	06	CHAMP CREDITS	00
B.4	07	STD. BALL SAVES	00
B.4	08	DEF. BALL SAVES	00
B.4	09	SKILL SHOTS	00
B.4	10	SUPER SKILL SHOTS	00
B.4	11	LEFT KICKBACKS	00
B.4	12	SPARK PLUGS	00
B.4	13	S. PLUG EX. BALL	00
B.4	14	BONUS X	00
B.4	15	BONUS X EX. BALL	00
B.4	16	ZR-1 MULTIBALLS	00
B.4	17	ZR-1 REMATCH	00
B.4	18	CATCH MULTIBALLS	00
B.4	19	RACE MULTIBALLS	00
B.4	20	PIT-IN MULTIBALL	00
B.4	21	PUZZLE MULTIBALL	00
B.4	22	HP JACKPOTS	00
B.4	23	TORQUE JACKPOTS	00
B.4	24	PUZZLE JACKPOTS	00
B.4	25	PUZZLE STARTS	00
B.4	26	CHALLENGE WINS	00
B.4	27	CARS WASHED	00
B.4	28	CATCH ME ENABLES	00
B.4	29	CATCH ME STARTS	00
B.4	30	CATCH ME WINS	00
B.4	31	CATCH ME SHOTS	00
B.4	32	DRAG RACE ENABLE	00
B.4	33	DRAG RACES	00
B.4	34	DRAG RACE WINS	00
B.4	35	HURRYUP STARTS	00
B.4	36	PIT-IN JACKPOTS	00
B.4	37	QUADRAJETS	00
B.4	38	TURBO ENABLES	00
B.4	39	TWIN ENABLES	00
B.4	40	SUPER REV PLAYS	00

B.5 Histograms

B.5	01	0.0-0.4 Million Scores	00%	00
B.5	02	0.5-0.9 Million Scores	00%	00
B.5	03	1.0-1.4 Million Scores	00%	00
B.5	04	1.5-1.9 Million Scores	00%	00
B.5	05	2.0-2.9 Million Scores	00%	00
B.5	06	3.0-3.9 Million Scores	00%	00
B.5	07	4.0-4.9 Million Scores	00%	00
B.5	08	5.0-5.9 Million Scores	00%	00
B.5	09	6.0-7.9 Million Scores	00%	00
B.5	10	8.0-9.9 Million Scores	00%	00
B.5	11	10-15 Million Scores	00%	00
B.5	12	15-20 Million Scores	00%	00
B.5	13	Over 20 Million	00%	00
B.5	14	Game Time 0.0-1.0 Mins	00%	00
B.5	15	Game Time 1.0-1.5 Mins	00%	00
B.5	16	Game Time 1.5-2.0 Mins	00%	00
B.5	17	Game Time 2.0-2.5 Mins	00%	00
B.5	18	Game Time 2.5-3.0 Mins	00%	00
B.5	19	Game Time 3.0-3.5 Mins	00%	00
B.5	20	Game Time 3.5-4.0 Mins	00%	00
B.5	21	Game Time 4-5 Mins	00%	00
B.5	22	Game Time 5-6 Mins	00%	00
B.5	23	Game Time 6-8 Mins	00%	00
B.5	24	Game Time 8-10 Mins	00%	00
B.5	25	Game Time 10-15 Mins	00%	00
B.5	26	Game Time Over 15 Mins	00%	00

B.6 Time-Stamps

The Time-Stamps Menu allows you to view dates and times that are important to game software.

B.6	01	Current Time
B.6	02	Clock 1st Set
B.6	03	Clock Last Set
B.6	04	Audits Cleared
B.6	05	Coins Cleared
B.6	06	Factory Setting
B.6	07	Last Game Start
B.6	08	Last Replay
B.6	09	Last H.S.T.D. Reset
B.6	10	Champion Reset
B.6	11	Last Printout
B.6	12	Last Service Credit

Press the Up or Down buttons to cycle through the menu. Press the Enter button to access a menu. Press the Escape button to return to the Printouts Menu.

P. PRINTOUTS MENU

(optional board required)

P.1	Earnings Data
P.2	Main Audits
P.3	Standard Audits
P.4	Feature Audits
P.5	Score Histograms
P.6	Time Histograms
P.7	Time-Stamps
P.8	All Data

The Printouts Menu is a combination of the other menus. This menu allows you to access and print information in the available menu selections.

If no printer is attached the message "Waiting for Printer" appears in the displays.

Note: Set print specification from the Adjustment Menu, A.5 Printer Adjustments.

Use the Service Switch Actuator to hold in the top interlock switch located in the bottom left corner of the coin door opening. The actuator must be in place in order to activate the solenoids and flashlamps.

Press the Up or Down buttons to cycle through the menu. Press the Enter button to access a test. Press the Escape button to return to the Test Menu.

Note: During any test, press the Start button to obtain the wire color, driver number, connector number and fuse location.

T. TEST MENU

T.1	Switch Edges
T.2	Switch Levels
T.3	Single Switch
T.4	Solenoid Test
T.5	Flasher Test
T.6	General Illumination
T.7	Sound & Music Test
T.8	Single Lamps
T.9	All Lamps
T.10	Lamp & Flasher Tests
T.11	Display Test
T.12	Flipper Test
T.13	Ordered Lamps Test
T.14	Lamp Row-ColTest
T.15	Dip Switch Test
T.16	ZR-1/LT-5 Test
T.17	Race Test
T.18	Empty Balls Test

The switch matrix, on the left side of the display, shows the state of all switches. A dot indicates the switch is open, and a square indicates the switch is closed. The numbers assigned to each switch indicate where the switch is located in the matrix. The number on the left indicates the column, and the number on the right indicates the row. Example: Switch 23 is 2nd column, 3rd row.

A short to ground, on either the row or column wire, appears as a shorted row(s). However, a column wire shorted to ground disappears when all the indicated row switches are open. A row wire shorted to ground does not disappear.

A shorted diode in the switch matrix can cause other switches to appear closed. These "phantom" switches (though not actually closed) complete a rectangle in the switch matrix. Therefore, if two switches in the same column are closed (example; #22 and #24), and a third switch is pressed in another column but in the same row as one of the first two (example; #32), the "phantom" switch #34 is falsely indicated as closed. The switch with the shorted diode is diagonally opposite the "phantom" switch (in this case #22).

T.1 Switch Edges Press each switch one at a time. The name and number of the switch is shown in the display. If a switch other than the one pressed, or no switch at all is indicated, the system has detected a problem with the switch circuit.

T.2 Switch Levels This test automatically cycles through all switches that are detected closed. The name and number of each switch that is detected is shown in the display. A filled square indicates the switch's position in the matrix.

T.3 Single Switches The Single Switch Test isolates a particular switch by blocking signals from all other switches. Use the Up or Down buttons to select the switch to be tested.

T.4 Solenoid Test

The Solenoid Test has three modes: Repeat, Stop, and Run. Only one solenoid should pulse at a time. The system has detected a problem if; more then one solenoid pulses, a solenoid comes On and stays On, or no solenoids pulse during the Repeat or Run modes.

- Repeat - The Repeat Mode pulses a single solenoid. After entering this test, Solenoid 1 shows in the display. and the corresponding solenoid activates. Press the Up or Down button to cycle through the solenoids, one at a time. The same solenoid pulses until the Up or Down button is pressed. Either press the Escape button to return to the Test Menu, or press the Enter button to advance to the next mode.
- Stop - The Stop Mode halts the Solenoid Test. Press Enter during the Repeat mode and the Solenoid Test Stops. No solenoids should be activated while the test is stopped. Either press the Escape button to return to the Test Menu, or the Enter button to advance to the next mode.
- Run - The Run Mode cycles through the solenoids automatically. The display shows the name and number of the solenoid currently being pulsed. Either press the Escape button to return to the Test Menu, or the Enter button to advance to the next mode.

T.5 Flasher Test

This tests the flashlamp part of the solenoid circuit exclusively. This, like the Solenoid Test has three test modes: Repeat, Stop, and Run. During this test, only one flashlamp circuit should pulse at a time. The system has detected a problem if more than one circuit pulses, a circuit stays On, or no circuits pulse during the Repeat or Run modes.

- Repeat - The Repeat mode pulses a single flashlamp. After entering this test, the name and number of the first flashlamp circuit will show in the display and the corresponding bulb(s) flash. Press the Up or Down button to cycle through all of the flashlamp circuits one at a time. The same circuit pulses until the Up or Down button is pressed. Either press the Escape button to return to the Test Menu, or press the Enter button to advance to the next mode.
- Stop - The Stop Mode halts the Flasher Test. No flashlamp circuit should be active during this mode. Either press the Escape button to return to the Test Menu, or the Enter button to advance to the next mode.
- Run - The Run Mode cycles through the flashlamps automatically. The display shows the name and number of the flashlamp circuit currently being pulsed and the corresponding bulb(s) flash. Either press the Escape button to return to the Test Menu, or the Enter button to advance to the next mode.

T.6 General Illumination

This test checks all of the General Illumination circuits. There are two modes of operation: Stop and Run.

- Stop - Press the Up or Down buttons to cycle through the General Illumination Test manually. All illumination is tested first, followed by an individual circuit test. The circuit name and number will show in the display while the corresponding lamps light. If any other results occur the system has detected an error.
- Run - Press the Enter button any time during Stop mode and the General Illumination Test cycles through automatically. For each circuit shown in the displays the corresponding bulbs should light. If any other results occurs the system has detected a problem.

T.7 Sound and Music Test The Sound and Music Test allows you to check the audio circuits. This test has three modes for testing the sound and music circuits: Run, Repeat, and Stop.

- Run - The Run Mode steps through a sequence of sounds and music. Pressing the Up or Down button during this portion of the Sound and Music test advances to a particular sound/tune without having to wait for the program to play all the sounds available in the test. A sound/tune should be heard for each name and number that appears in the display. Any other results indicate the system has detected a problem.
- Repeat - Press the Enter button at any time during the Run Mode to cause the program to stop and repeat a particular sound/tune. The same sound should repeat continuously until the Up or Down button is pressed. Any other results indicates the system has detected a problem.
- Stop - Press the Enter button at any time during the Repeat Mode to stop this test altogether. No sound/tune should be heard. Any other results indicates the system has detected a problem.

T.8 Single Lamp Test The number assigned to each lamp indicates the lamp's position in the matrix. The number on the left indicates the column. The number on the right indicates the row. Example: Lamp 23 means 2nd column, 3rd row.

This test checks each lamp circuit individually. Press the Up or Down button to cycle through this test. For each name and number that is shown in the display the corresponding lamp should light. Any other results indicate the system has detected a problem.

T.9 All Lamps Test This test causes all the controlled lamps to flash at the same time. Every controlled lamp should flash. Any other results indicate the system has detected a problem.

T.10 Lamp and Flasher Test This test causes all the flashlamps and the controlled lamps to flash at the same time. The controlled lamps blink, while the flashlamps cycle from highest to lowest. Any other results indicates the system has detected a problem.

T.11 Display Test This test automatically lights every dot in the Dot Matrix Display. A series of patterns appear in sequence. Each pattern turns On and Off a section of dots. Every dot on the display should be turned On and Off during this test.

T.12 Flipper Coil Test

The Flipper Coil Test has three modes: Repeat, Stop, and Run. Only one flipper should pulse at a time. The system has detected a problem if more than one flipper pulses, a flipper comes On and stays On, or no flippers pulse during the Repeat or Run modes.

- Repeat - The Repeat Mode pulses a single flipper. After entering this test, coil 01 shows in the display and the corresponding flipper activates. Press the Up or Down button to cycle through the flipper coils, one at a time. The same flipper coil pulses until the Up or Down button is pressed. Either press the Escape button to return to the Test Menu, or press the Enter button to advance to the next mode.
- Stop - The Stop Mode halts the Flipper Coil Test. Press Enter during the Repeat mode and the Flipper Coil Test stops. No flipper coil should be activated while the test is stopped. Either press the Escape button to return to the Test Menu, or the Enter button to advance to the next mode.
- Run - The Run Mode cycles through the flippers automatically. The display shows the name and number of the flipper coil currently being pulsed. Either press the Escape button to return to the Test Menu, or the Enter button to advance to the next mode.

T.13 Ordered Lamp Test

The number assigned to each lamp indicates the lamp's position in the matrix. The number on the left indicates the column. The number on the right indicates the row. Example - Lamp 23 means 2nd column, 3rd row.

This test checks each lamp circuit individually. Press the Up or Down button to cycle through the lamps. Lamps light in a clock-wise or counter clock-wise direction starting from the bottom of the playfield. Direction depends on which button, Up or Down, is pressed. For each name and number that is shown in the display the corresponding lamp should light. Any other results indicates the system has detected a problem.

T.14 Lamp Row-Col Test

This test allows individual rows and columns in the lamp matrix to be operated. This is useful for trouble-shooting wiring and driver problems.

Press the UP or DOWN buttons to cycle through the different rows and columns.

T.15 Dip Switch Test

This test is used to show the positions of the dip switches on the CPU board (U27).

T.16 ZR-1/LT-5 Test

Select T.16 from the Test Menu and press "ENTER" to begin the ZR-1/LT-5 (engine) test. Once the "SELF TEST" completes successfully, the "UP" and "DOWN" buttons can be used to select the following tests. Use the "ENTER" button to start the selected test, and the "ESCAPE" button to abort the selected test.

The status of the "FULL LEFT" and "FULL RIGHT" optical switches and the angular position are displayed on the dot matrix display during all tests.

SELF TEST - This test verifies that the engine is fully operational. This test is run automatically upon entry to the ZR-1/LT-5 TEST. It can also be started manually by pressing the "ENTER" button when selected.

AUTO RUN - This test runs the engine in an oscillatory fashion until the "ESCAPE" button is pressed. The test pauses the engine periodically.

ENGINE LEFT - This test moves the angular position of the engine to the left (counter-clockwise) until the "FULL LEFT" optical switch closes.

ENGINE RIGHT - This test moves the angular position of the engine to the right (clockwise) until the "FULL RIGHT" optical switch closes.

ENGINE CENTER - This test moves the angular position of the engine to the center. At this point, neither the "FULL LEFT" nor the "FULL RIGHT" optical switches should be closed.

T.17 Race Test Select T.17 from the Test Menu and press "ENTER" to begin the RACE TRACK test. Once the "SELF TEST" completes successfully, the "UP" and "DOWN" buttons can be used to select the following tests. Use the "ENTER" button to start the selected test, and the "ESCAPE" button to abort the selected test.

The status of the "LEFT START", "RIGHT START", "LEFT ENCODER", and "RIGHT ENCODER" optical switches and car positions are displayed on the dot matrix display during all tests.

SELF TEST - This test verifies that the race track is operational. This test is run automatically upon entry to the RACE TEST. It can also be started manually by pressing the "ENTER" button when selected.

LEFT HOME - This test drives the left car in reverse until the "LEFT START" optical switch is closes.

LEFT FORWARD - This test drives the left car forward while the "+" button is pressed.

LEFT REVERSE - This test drives the left car in reverse while the "-" button is pressed.

RIGHT HOME - This test drives the right car in reverse until the "RIGHT START" optical switch is closes.

RIGHT FORWARD - This test drives the right car forward while the "+" button is pressed.

RIGHT REVERSE - This test drives the right car in reverse while the "-" button is pressed.

T.18 Empty Balls Test Select T.18 from the Test Menu and press "ENTER" to begin the EMPTY BALLS test.

This test kicks out all balls loaded in troughs, lockups, poppers, and kickouts until no balls remain in those locations.

Note: As the trough kicks out balls, they will stack up in the shooter groove, which may require manual clearing in order to allow further balls to be kicked out.

Press the Up or Down buttons to cycle through the menu. Press the Enter button to access a utility. Press the Up or Down buttons to see the setting choices. Press the Enter button to lock in a choice. If a mistake is made, press Escape while "Saving Adjustment Value" is in the display. The original settings is retained and the new settings is ignored. Press the Escape button to return to the Utility Menu.

U. UTILITIES MENU

- U.1 Clear Audits**
- U.2 Clear Coins**
- U.3 Reset H.S.T.D.**
- U.4 Set Time & Date**
- U.5 Custom Message**
- U.6 Set Game I.D.**
- U.7 Factory Adjustments**
- U.8 Factory Resets**
- U.9 Presets**
- U.10 Clear Credits**
- U.11 Auto Burn-in**

U.1 Clear Audits Press the Enter button to clear the Standard Audits (except Burn-In Time), Feature Audits, and Histograms.

U.2 Clear Coins Press the Enter button to clear the Earnings Audits.

U.3 Reset H.S.T.D. Press the Enter button to clear the High Score to Date Table and the Grand Champion.

U.4 Set Time and Date Press the Enter button to activate the time and date. Use the Up or Down button to change the value, then press the Enter button to lock in that value. If a mistake is made, press the Escape button while "Saving Adjustment Value" is displayed. The new value is ignored and the original value is retained.

U.5 Custom Message Set A.1 20 to ON before writing a Custom Message. Press the Enter button to begin entry of the custom message. Use the Up or Down button to cycle through letters. Use the Start button to cycle through punctuation marks. Press the Enter button to lock in the desired letter and punctuation. If you make a mistake, use Up and Down to select the "back-arrow" character. The "back-arrow" character is located before the space character and after the number nine. Press Enter while the back-arrow shows to erase the previously entered character. Once your message is complete, press and hold the Enter button until "Message Stored" is displayed.

Press the Escape button to cancel the new message. The message "Press Enter to Reset" appears. If you press Enter, the custom message is cleared and no message is displayed. If Escape is pressed, the original message remains intact.

U.6 Set Game I.D. This utility allows the operator to install a message, such as game location, that only appears on printouts. Press the Enter button to activate Set Game I.D.. Use the Up or Down button to cycle through letters. Use the Start button to cycle through punctuation marks. Press the Enter button to lock in the desired letter and punctuation.

U.7 Factory Adjustment Press the Enter button to restore the adjustments to factory settings.

U.8 Factory Reset Press the Enter button to restore the adjustments to their factory setting, clear the Audits, H.S.T.D Table, and Custom Message/Game I.D.

U.9 Presets Use the Up or Down buttons to cycle through the available Presets. When the desired Preset is displayed, press the Enter button to lock in that Preset. If a mistake is made, press the Escape button while "Saving Adjustment Value" is displayed. The new value is ignored and the original value is retained.

Game Difficulty Levels The game play difficulty adjustments can be changed to a combination that is MUCH LESS to MUCH MORE difficult than Factory Settings. The Game Difficulty Setting Table lists the adjustments and settings that comprise the individual groups.

U.9 01 Install Extra Easy MUCH LESS difficult than factory setting.

U.9 02 Install Easy Somewhat LESS difficult than factory setting.

U.9 03 Install Medium About the SAME as factory setting.

U.9 04 Install Hard Somewhat MORE difficult than factory setting.

U.9 05 Install Extra Hard MUCH MORE difficult than factory setting.

Game Difficulty Setting Table for U.S./Canadian/French Games

Adj. No.	Adjustment Description	Extra Easy U.9 01	Easy U.9 02	Medium U.9 03	Hard U.0 04	Extra Hard U.9 05
A.2 05	Ball Saves	2	2	1	1	0
A.2 06	Ball Save Time	11	9	7	5	2
A.2 07	Lock Difficulty	Extra Easy	Easy	Medium	Hard	Extra Hard
A.2 08	Race Difficulty	Extra Easy	Easy	Medium	Hard	Extra Hard
A.2 09	Catch Difficulty	Extra Easy	Easy	Medium	Hard	Extra Hard
A.2 10	Challenge Difficulty	Extra Easy	Easy	Medium	Hard	Extra Hard

Game Difficulty Setting Table for German/European Games

Adj. No.	Adjustment Description	Extra Easy U.9 01	Easy U.9 02	Medium U.9 03	Hard U.0 04	Extra Hard U.9 05
A.2 05	Ball Saves	2	2	1	1	0
A.2 06	Ball Save Time	11	9	7	5	2
A.2 07	Lock Difficulty	Extra Easy	Easy	Medium	Hard	Extra Hard
A.2 08	Race Difficulty	Extra Easy	Easy	Medium	Hard	Extra Hard
A.2 09	Catch Difficulty	Extra Easy	Easy	Medium	Hard	Extra Hard
A.2 10	Challenge Difficulty	Extra Easy	Easy	Medium	Hard	Extra Hard

U.9 06 Install 5 Ball**U.9 07 Install 3 Ball**

Adjustments U.9 06 and U.9 07 can be used to change a game to 3 or 5 ball play, including the changing of certain features to the recommended 3- and 5-ball level. The Preset Game Adjustments Table for U.S./Canadian Games lists the adjustments and settings that comprise the individual groups.

Preset Game Adjustments Table for U.S./Canadian Games

Adjustment Number	Adjustment Description	Install 3-Ball U.9 07 (factory)	Install 5 Ball U.9 06
A.1 01	Balls Per Game	3	5
A.1 07	Replay Start	650,000,000	750,000,000
A.2 04	Extra Ball Level	10	18
A.2 05	Ball Saves	1	1
A.2 06	Ball Save Time	7	5
A.2 07	Lock Difficulty	Medium	Hard
A.2 10	Challenge Difficulty	Medium	Hard

U.9 08 Install Add-A-Ball This option deletes all Free Play awards and replaces them with Extra Ball awards. Individual adjustments are affected, as follows:

<u>Adjustment</u>	<u>Name</u>	<u>New Setting</u>
A.1 13	Replay Boost	Off
A.1 14	Replay Award	Extra Ball
A.1 15	Special Award	Extra Ball
A.1 17	Extra Ball Ticket	No
A.1 19	Match Feature	Off
A.4 04	Champion Credits	00
A.4 05	High Score 1 Credits	00
A.4 06	High Score 2 Credits	00
A.4 08	High Score 3 Credits	00
A.4 07	High Score 4 Credits	00

U.9 09 Install Ticket This option deletes Credit awards and replaces them with Ticket awards. Individual adjustments are affected, as follows:

<u>Adjustment</u>	<u>Name</u>	<u>New Setting</u>
A.1 14	Replay Award	Ticket
A.1 15	Special Award	Ticket
A.1 16	Match Award	Ticket
A.1 17	Extra Ball Ticket	Yes
A.1 31	Ticket Expansion Board	Yes
A.4 02	H.S.T.D. Award	Ticket

U.9 10 Install Novelty This option removes all Free Play and Extra Ball awards. Individual adjustments are affected, as follows:

<u>Adjustment</u>	<u>Name</u>	<u>New Setting</u>
A.1 04	Max. Extra Ball	Off
A.1 05	Replay System	Fixed
A.1 09	Replay Level 1	Off
A.1 10	Replay Level 2	Off
A.1 11	Replay Level 3	Off
A.1 12	Replay Level 4	Off
A.1 15	Special Award	Points
A.1 19	Match Feature	Off
A.4 01	Highest Score	On
A.4 04	Champion Credits	00
A.4 05	High Score 1 Credits	00
A.4 06	High Score 2 Credits	00
A.4 07	High Score 3 Credits	00
A.4 08	High Score 4 Credits	00

U.9 12 Serial Capture This sets up the printer adjustments for serial transmission to a laptop computer (9600 baud, 40 column, no page breaks, serial printer). This option requires the installation of the optional printer kit, part number 63110.

- U.9 17 Install German 1•**
- U.9 18 Install German 2•**
- U.9 19 Install German 3•**
- U.9 20 Install German 4•**
- U.9 21 Install German 5•**
- U.9 22 Install German 6•**

Adjustments U.9 17 through U9 22 are used to modify game pricing and type of game play. The Preset Game Adjustments Table for German/European Games lists the adjustments and settings that comprise the individual groups. **NOTE:** German Replay starts at 50,000,000.

Preset Game Adjustments Table for German/European Games

Adj. #	Adj. Description	German 1 U.9 17	German 2 U.9 18	German 3 U.9 19	German 4 U.9 20	German 5 U.9 21	German 6 U.9 22
A.1 14	Replay Award	Credit	Ticket	Audit	Credit	Ticket	Audit
A.1 15	Special Award	Credit	Extra Ball	Points	Credit	Extra Ball	Points
A.1 15	Match Award	Credit	Ticket	Credit	Credit	Ticket	Credit
A.1 19	Match Feature	7%	7%	Off	7%	7%	Off
A.3 01	Game Pricing	6 spiele/5 DM	6 spiele/5 DM	6 spiele/5 DM	7 spiele/5 DM	7 spiele/5 DM	7 spiele/5 DM
A.4 02	H.S.T.D. Award	Credit	Ticket	Credit	Credit	Ticket	Credit
A.4 04	Champion Credits	03	03	00	03	03	00
A.4 05	High Score 1 Credits	01	01	00	01	01	00
A.4 06	High Score 2 Credits	00	00	00	00	00	00
A.4 07	High Score 3 Credits	00	00	00	00	00	00
A.4 08	High Score 4 Credits	00	00	00	00	00	00

• The German DIP Switch Settings are:

SW4	SW5	SW6	SW7	SW8
On	On	On	On	Off

- U.9 23 Install French 1***
- U.9 24 Install French 2***
- U.9 25 Install French 3***
- U.9 26 Install French 4***
- U.9 27 Install French 5***
- U.9 28 Install French 6***

Adjustments U.9 23 through U.9 26 are used to modify game pricing and type of play. The Preset Game Adjustments Table for French Games lists the adjustments and settings that comprise the individual groups.

Preset Game Adjustments Table for French Games

Adj. #	Adjustment Description	French 1 U.9 23	French 2 U.9 24	French 3 U.9 25	French 4 U.9 26	French 5 U.9 27	French 6 U.9 28
A.2 01	Extra Ball Percent	20%	15%	25%	25%	20%	20%

* The French DIP Switch Settings are:

SW4	SW5	SW6	SW7	SW8
On	On	On	Off	Off

U.10 Clear Credits Press the Enter button to clear the game Credits.

U.11 Auto Burn-in Press the Enter button to activate Auto Burn-in. This utility automatically cycles through several tests. This will help in find intermittent problems. The tests that Auto Burn-in cycle through are: the Display Test, Sound and Music Test, All Lamps Test, Solenoid Test, Flashers Test, General Illumination Test, and the Flipper Coil Test. All of the tests are run concurrently. The time spent on the current burn-in cycle, and the total time the game has spent in burn-in are displayed.

Press the Up or Down buttons to cycle through the menu. Press the Enter button to access an adjustment. Press the Up or Down buttons to see the setting choices. Press the Enter button to lock in a choice. If a mistake is made, press Escape while "Saving Adjustment Value" is in the display. The original settings is retained and the new value is ignored. Press the Escape button to return to the Adjustment Menu.

A. ADJUSTMENTS MENU

- A.1 Standard Adjustments**
- A.2 Feature Adjustments**
- A.3 Pricing Adjustments**
- A.4 H.S.T.D Adjustments**
- A.5 Printer Adjustments (optional board required)**

A.1 Standard Adjustments

A.1 01 Balls Per Game

A "game" is defined by specifying the number of balls to be played.
Range: 1-10

A.1 02 Tilt Warnings

The number of total actuation's of the plumb bob mechanism that can occur before the game is "tilted".
Range: 1-10

A.1 03 Maximum Extra Balls

The number of extra balls that a player may accumulate.
Range: 1-10

A.1 04 Maximum Extra Balls/Ball in Play

The number of extra balls to be awarded per ball in play.

OFF	-	No maximum number of Extra Balls per ball in play.
1-10	-	1 through 10 Extra Balls per ball in play.

A.1 05 Replay System

The type of replay system to be used.

Fixed	-	Replay value is set and does not change during game play.
Auto %	-	Replay starting value is set and changes every 50 games to comply with the percentage of replays desired.

A.1 06 Replay Percent*

The percentage of replays the players are able to earn when Auto Replay is used.
Range: 5-50%

A.1 07 Replay Start*

The replay start value when Auto % Replay is used. The range of this setting is 100,000,000 to 700,000,000.

A.1 08 Replay Levels*

The number of replay levels used by the Auto % Replay mode. The range of this setting is 1 to 4. When two replay levels are chosen, the second replay level is automatically adjusted to twice the starting replay level value. When three of four replay levels are chosen, their values are automatically adjusted to three or four times the starting replay level.

*For Auto % Replay.

A.1 09 Replay Level 1

A.1 10 Replay Level 2

A.1 11 Replay Level 3

A.1 12 Replay Level 4

The values used for the 1st through 4th levels of Fixed Replay. Range: 00 - 25,000,000.

A.1 13 Replay Boost

The replay score can be temporarily boosted by the selected amount EACH time the player reaches or exceeds the replay score. This temporary boost is canceled when credits equal 0, the player inserts another coin, or Begin Test is pressed.

- | | | |
|-----|---|---|
| ON | - | Score is boosted between 1,000,000 and 75,000,000 points. |
| OFF | - | Replay score is not boosted. |

A.1 14 Replay Award

For the form of award automatically provided when the player exceeds any replay level for either Auto % Replay, or Fixed Replay.

- | | | |
|--------|---|---|
| Credit | - | Reaching each Replay level awards credit. |
| Ticket | - | Reaching each Replay level awards a ticket. |
| Ball | - | Reaching each Replay level awards an Extra Ball. |
| Audit | - | Reaching each Replay level awards nothing to the player; it does increase the entry value of the Audit Item(s) maintaining a tally of these awards. |

A.1 15 Special Award

The award automatically provided when the player scores a special.

- | | | |
|--------|---|---|
| Credit | - | Scoring a Special awards a Credit. |
| Ticket | - | Scoring a Special awards a Ticket. |
| Ball | - | Scoring a Special awards an Extra Ball. |
| Points | - | Scoring a Special awards 30 Million points. |

A.1 16 Match Award

The award automatically provided when the players wins a match.

- | | | |
|--------|---|----------------------------------|
| Credit | - | Winning a Match awards a Credit. |
| Ticket | - | Winning a Match awards a Ticket. |

A.1 17 Extra Ball Ticket

A Ticket is awarded when the player earns an Extra Ball.

- | | | |
|-----|---|--|
| YES | - | The player is awarded a Ticket in addition to an Extra Ball. |
| NO | - | The player is not awarded a Ticket. |

A.1 18 Maximum Ticket/Player

The amount of Tickets each player can earn.
Range 00 - 100

A.1 19 Match Feature

The desired percentage for the Match Feature occurring at the end of the game.

OFF - Match Feature is not available.

1 -50% - 1% is 'hard'; 50% is 'extremely easy'. The Match Feature selects a random two-digit number at the end of the game and compares each players score for an identical two digits in the rightmost two positions. A matching of these two digits results in an award of a Credit or a Ticket.

A.1 20 Custom Message

The message displayed during the Attract Mode.

YES - A message is displayed

NO - A message is not displayed.

A.1 21 Language

The language the game uses: English, French, or German.

A.1 22 Clock Style

The style of clock the game uses: A.M./P.M., or 24 Hours.

A.1 23 Date Style

The style of date the game uses: Month/Date/Year, or Date/Month/Year.

A.1 24 Show Date and Time

The date and time show in the Attract Mode.

YES - Show date and time in status report, or Attract Mode.

NO - Do Not show date and time in status report or Attract Mode.

A.1 25 Allow Dim Illumination

The game program dims the General Illumination for special effects and during the Attract Mode.

YES - Dim General Illumination for spiral effects and Attract Mode.

NO - Do Not dim General Illumination.

A.1 26 Tournament Play

Equalize Multi-ball and Jackpots during multi-player games, (do not carry over to next player).

YES - Keep Multi-ball and Jackpots equal.

NO - Do Not Keep Multi-ball and Jackpots equal.

A.1 27 Euro. Scr. Format

Use either commas or dots between digits when numbers are displayed.

- YES - Dots instead of commas, (example 1.000.000).
- NO - Commas instead of dots, (example 1,000,000).

A.1 28 Minimum Volume Control

The volume can be turned Off.

- YES - Volume can be turned Off.
- NO - Volume can be turned Down but not Off.

A.1 29 General Illumination Power Saver

This allows the general illumination and controlled lamps to be dimmed following a time interval after a game is played. Power Saver Level (A.1 30) determines dimness of the lamps. Using this feature will substantially increase the life of the lamps.

Setting: - Off, 2-60 Minutes

A.1 30 Power Saver Level

When General Illumination Power Saver (A.1 29) is set to On, this controls the intensity of the G.I. and controlled lamps once the game has been idle for a specified period of time.

Range: 4-7 (4 = dimmest, 7 = brightest)

A.1 31 Ticket Expansion Board

When a Ticket Expansion Board is connected, full control of the ticket dispenser is available. This includes a ticket low/error lamp, resume on ticket jam switch, and manual ticket dispense switch.

- Yes - Ticket Expansion Board is connected.
- No - Ticket Expansion Board is NOT installed in the game.

A.1 32 No Bonus Flips

The activation of flippers during the end of ball "bonus" sequence. Setting this to "YES" may extend the life of the flipper mechanisms.

A.1 33 Game Restart

When the start button is pressed during or after the 2nd ball, the game in progress will end and a new game will begin. This adjustment has 3 settings to determine how this is handled.

- Never: - Do not allow a new game to start until the current game is over.
- Slow: - Restart if the start button is pressed continuously for over 1/2 second. This helps to prevent the unintended restart of game in progress.
- Instantly: - Restart as soon as the start button is pressed.

When the start button is pressed during game over, or during the 1st ball (to add a player), it is always handled instantly.

A.2 Feature Adjustments

A.2 01 BUY EXTRA BALL

This determines whether each player may buy one extra ball for one credit at the end of a game.

Settings: 1 Credit
 OFF

Factory Default: 1 Credit

A.2 02 EX. BALL MEMORY

This determines whether the lit Extra Ball stays in memory from ball to ball.

Setting: YES
 NO

Factory Default: YES

A.2 03 EX. BALL PERCENT

This determines the total percentage of extra balls desired (for all extra balls awarded from all features except replay score levels). The game will adjust the number of SPARK PLUG levels required for an extra ball to achieve the requested percentage. Set to FIXED to disable the automatic percentaging of the SPARK PLUG Extra Ball.

Setting: FIXED
 15-40%

Factory Default: 20%

A.2 04 EX. BALL LEVEL

This is the number of SPARK PLUGS necessary to light the EXTRA BALL lamp. The machine will start with this value and modify it as necessary to achieve the percentage specified in A.2 03. To use a fixed level for the extra ball, set A.2 03 to FIXED, then set this level.

Setting: 2-10

Factory Default: 4

A.2 05 BALL SAVES

This determines how many times a ball will be saved when it drains. The ball will be saved only once per ball-in-play. The ball saver is available each ball until the adjusted number of ball saves is used by the player.

Settings: OFF
1-5

Factory Default: 1

Example of ball save usage:

With BALL SAVES = 1 (factory default)

BALL 1: Ball save available
Ball drains after ball saver time-out

BALL 2: Ball save available
Ball drains during ball saver timer, and ball is delivered back onto the playfield

BALL 3: Ball save NOT available

Note: Unless the BALL SAVES setting is OFF, a very short ball save is provided even after the player has used up all of their ball saves.

A.2 06 BALL SAVE TIME

This sets the number of seconds that the ball saver is activated.

Setting: 4-15

Factory Default: 7

A.2 07 LOCK DIFFICULTY

This determines the difficulty of enabling the LT-5-LOCK lamp. Both the LITE LOCK and LT-5 LOCK lamps are affected by this setting.

Settings: EXTRA EASY
EASY
MEDIUM
HARD
EXTRA HARD

Factory Default: MEDIUM

	Game Start		Ball Start		Memory	
	LITE LOCK	LT-5 LOCK	LITE LOCK	LT-5 LOCK	LITE LOCK	LT-5 LOCK
Extra Easy	--	--	yes	--	yes	yes
Easy	yes	--	--	yes	yes	yes
Medium	--	--	--	yes	yes	yes
Hard	--	--	--	yes	no	yes
Extra Hard	--	yes	--	--	no	yes

A.2 08 RACE DIFFICULTY

This determines the difficulty of the RACE TODAY feature. This affects the RACE TODAY lamp.

Settings: EXTRA EASY
EASY
MEDIUM
HARD
EXTRA HARD

Factory Default: MEDIUM

	Game Start	Ball Start	Memory
	RACE TODAY	RACE TODAY	RACE TODAY
Extra Easy	yes	--	yes
Easy	--	--	yes
Medium	--	--	yes
Hard	--	--	no
Extra Hard	--	--	no

A.2 09 CATCH DIFFICULTY

This determines the difficulty of the CATCH ME feature. This affects the CATCH ME lamp.

Settings: EXTRA EASY
EASY
MEDIUM
HARD
EXTRA HARD

Factory Default: MEDIUM

	Game Start	Ball Start	Memory
	CATCH ME	CATCH ME	CATCH ME
Extra Easy	yes	--	yes
Easy	--	--	yes
Medium	--	--	yes
Hard	--	--	no
Extra Hard	--	--	no

A.2 10 CHALLENGE DIFFICULTY

This determines the difficulty of the CORVETTE CHALLENGE feature. This affects the START CHALLENGE lamp.

Settings: EXTRA EASY
EASY
MEDIUM
HARD
EXTRA HARD

Factory Default: MEDIUM

	Game Start	Ball Start	Memory
	START CHALLENGE	START CHALLENGE	START CHALLENGE
Extra Easy	--	yes	yes
Easy	yes	--	yes
Medium	--	--	yes
Hard	--	--	no
Extra Hard	--	--	no

A.2 11 SUPER SKILL SHOT

This determines whether the Super Skill Shot is enabled. When the Super Skill Shot is enabled, entering a code with the flippers toggles back and forth between the basic Skill Shot and Super Skill Shot. The code is Left, Right, Left, Left to activate Super Skill Shot and Right, Left, Right, Right to deactivate Super Skill Shot.

Setting: YES
NO

Factory Default: YES

A.2 12 CHALLENGE FLIPS

This determines whether flipper button hits contribute to CORVETTE CHALLENGE race progress.

Setting: YES
NO

Factory Default: YES

A.3 Pricing Adjustments

A.3 01 Game Pricing (if set to custom, then 02 to 09 are available)

The cost of a game is selected from the Standard Pricing Table or by installing Custom pricing.

A.3 02 Left Coin Units

A.3 03 Center Coin Units

A.3 04 Right Coin Units

A.3 05 4th Slot Units

The number of coin units purchased by a coin passing through the left, right, center, and fourth coin chutes.

A.3 06 Units/Credits

Defines the number of coin units required to obtain 1 credit. A coin unit counter in the game program totals the number of coin units purchased through all coin chutes prior to each game. If the total number of these coin units exceeds or matches the Unit per Credit value by a multiple (or more, coin units) of the specified Units per Credit value the Credits display shows the proper number of credits. The coin unit counter retains any remaining coin units, until the start of Ball 2; then the coin unit counter is cleared (its contents are zeroed).

A.3 07 Units/Bonus

Additional credits are to be indicated in the credits display, when a certain number of coin units are accumulated.

A.3 08 Bonus Credits

The number of credits that are awarded when the Units/Bonus level is achieved.

A.3 09 Minimum Units

No credits are to be posted (indicated in the credit display), until the credits unit counter reaches a particular value, by setting this value to 02 (or more).

A.3 10 Coin Door Type (if set to custom, then 11 to 15 are available)

This adjustment is used to preset adjustments 11 through 15, based on standard coin doors (U.S.A., German, Etc.).

A.3 11 Collection Text

The coin system used to display the Earning Audits.

A.3 12 Left Slot Value

A.3 13 Center Slot Value

A.3 14 Right Slot Value

A.3 15 4th Slot Value

The monetary value of the left, center, right, and 4th coin chutes.

A.3 16 Maximum Credits

The maximum number of credits the game can accumulate, either through game play awards or coin purchases. The range of this setting is 5 through 99. Reaching the specified setting prevents the award of any credits. The factory default is 10.

A.3 17 Free Play

The player can operate the game without a coin (free play) or with a coin.

NO	-	A coin is necessary for game play.
YES	-	Game play is free; no coin required.

A.3 18 Hide Coin Audits

The coin audits may, or may not be displayed.

YES	-	The coin audits are not displayed.
NO	-	The coin audits are displayed.
HIDE NAMES	-	The coin audit value is shown but not the audit name.

A.3 20 Base Coin Size

The number of ticket per coin calculations.

A.3 21 Coin Meter Units

It is possible to connect a coin meter to the knocker coil driver which will log all coins through all slots. This adjustment activates the use of the knocker driver for this purpose, and determines the value of each unit on the meter. For example, to show the total amount of money collected as "total quarters", set this adjustment to "0.25". To show the amount of money collected as "total dollars", set this adjustment to "1.00".

Setting this adjustment to anything other than Off establishes the coin unit for a meter attached to the knocker driver, and overrides use of the knocker during awards.

A.3 22 Dollar Bill Slot

The system normally requires 150 microseconds between coin pulses. This is too long a delay for a fast-pulsing dollar bill validator. This adjustment may be used to tell the game that there is a fast pulsing dollar bill validator connected to one of the coin switches. The options are:

NONE	=	No validator connected.
LEFT	=	Validator connected to left slot.
CENTER	=	Validator connected to center slot.
RIGHT	=	Validator connected to right slot.
FOURTH	=	Validator connected to fourth slot.

A.3 23 Minimum Coin Microseconds

This is the minimum width required for coin pulses to be accepted as valid coins. This may be changed to prevent certain kinds of cheating.

Pricing Table

Country	Coin Chutes				Games/Coins	Display	Pricing Adjustments A3
	Left	Center	Right	4th Chute			02 03 04 05 06 07 08 09
USA	25¢	\$1.00*	25¢	\$1.00	1/50¢, 2/75¢, 3/\$1 ²	50¢, 75¢, \$1.00	
	25¢	\$1.00*	25¢	\$1.00	1/75¢, 2/\$1.50, 3/\$2.00 ²	1/75, 3/2.00	
	25	\$1.00	25¢	\$1.00	1/3X25¢ ²	USA1 1/\$0.75	
	25	\$1.00	25¢	\$1.00	1/50¢, 2/\$1 ²	USA 2/\$1.00	
	25	\$1.00	25¢	\$1.00	1/50¢, 3/\$1.00 ²	USA 3/\$1.00	
	25	\$1.00	25¢	\$1.00	1/2x25¢, 2/\$1.00, 3/\$1.50, 6/\$2.00 ²	USA 6/\$2.00	
	25	\$1.00	25¢	\$1.00	1/2x25¢, 2/\$1.00, 3/\$1.50, 5/\$2.00 ^{1,2}	USA 5/\$2.00	
	25	\$1.00	25¢	\$1.00	1/3X25¢, 2/\$1.50, 4/\$2.00 ²	1/75, 4/\$2.00	
	25	\$1.00	25¢	\$1.00	1/2x25¢, 2/\$1.00, 4/\$1.50, 6/\$2.00 ²	6/\$2.00 4/\$1.50	
	25¢	25¢	25¢	-	1/4x25¢, 6/\$5.00 ²	1/1, 6/5	
Canada	25¢	\$1.00*	25¢	\$1.00	1/50¢, 2/75¢, 3/\$1 ²	CAN. 50-75-1	
	25	\$1.00	25¢	\$1.00	1/50¢, 2/\$1 ²	CAN. 2/\$1.00	
	25	\$1.00	25¢	\$1.00	1/50¢, 3/\$1.00 ²	CAN. 3/\$1.00	
	25	\$1.00	25¢	\$1.00	1/2x25¢, 2/4x25¢, 3/\$1.00 ²	3/\$1.00 Coin	
	25	\$1.00	25¢	\$1.00	1/2x25¢, 2/\$1.00, 3/\$1.50, 6/\$2.00 ²	CAN. 6/\$2.00	
	25	\$1.00	25¢	\$1.00	1/2x25¢, 2/\$1.00, 3/\$1.50, 5/\$2.00 ^{1,2}	CAN. 5/\$2.00	
	25	\$1.00	25¢	\$1.00	1/2x25¢, 2/\$1.00, 4/\$1.50, 6/\$2.00 ²	6/\$2 4/1.50	
	25	\$1.00	25¢	\$1.00	1/3X25¢, 2/\$1.50, 4/\$2.00 ²	1/75, 4/2.00	
	25¢	\$1.00*	25¢	\$1.00	1/75¢, 2/\$1.50, 3/\$2.00 ²	1/75, 3/2.00	
	25	\$1.00	25¢	\$1.00	1/3X25¢ ²	CAN. 1/\$0.75	
Austria	5sch	10sch	10sch	-	1/2x5sch, 3/2x10sch ²	AUSTRIA	
	5sch	-	10sch	-	2/5sch, 5/10sch	CUSTOM	02 00 05 00 01 00 01 00
Australia	20¢	\$1	\$1	\$2	1/\$1, 3/\$2 ²	AUSTRALIA 1	
	20¢	\$1	\$1	\$2	1/\$1, 2/\$2	AUSTRALIA 2	
U.K.	£1.00	50P	20P	10P	1/3x10P, 2/50P, 4/£1 ²	U. KINGDOM	
Switzerland	1Fr	2Fr	5Fr	-	1/1Fr, 3/2Fr, 7/5Fr ²	SWISS 1	
	1Fr	2Fr	5Fr	-	1/2Fr, 2/3Fr, 3/4Fr, 5/5F	SWISS 2	
Belgium	5Fr	20Fr	50Fr	-	1/4x5Fr, 1/20Fr, 3/50Fr ²	BELGIUM	
Germany	1DM	2DM	5DM	-	1/2DM, 2/3DM, 3/4DM, 5/5DM ^{1,2}	GER. 1/2DM	
				-	1/1DM, 2/2DM, 5/5DM ²	GER. 1/1DM	
				-	1/1DM, 2/2DM, 6/5DM ²	GER. 6/5DM	
Holland	1G	-	1G	-	1/1G ²	HOLLAND	
Sweden	1Kr	5Kr	10Kr	1Kr	1/10Kr, 2/15Kr, 3/20Kr ^{1,2}	SWEDEN 1	
	1Kr	5Kr	10Kr	1Kr	1/5Kr ²	SWEDEN 2	
France	1Fr	5Fr	10Fr	20Fr	1/3x1Fr, 2/5Fr, 5/10Fr, 10/20Fr ^{2,3}	TARIF 1	
	1Fr	5Fr	10Fr	20Fr	1/2x1Fr, 3/5Fr, 7/10Fr, 14/20Fr ^{2,3}	TARIF 2	
	1Fr	5Fr	10Fr	20Fr	1/5Fr, 3/10Fr, 7/2x10Fr, 7/20Fr ^{1,2,3}	TARIF 3	
	1Fr	5Fr	10Fr	20Fr	2/5Fr, 4/10Fr, 9/2x10Fr, 9/20Fr ^{2,3}	TARIF 4	
	1Fr	5Fr	10Fr	20Fr	2/5Fr, 5/10Fr, 11/2x10Fr, 11/20Fr ^{2,3}	TARIF 5	
	1Fr	5Fr	10Fr	20Fr	1/5Fr, 3/10Fr, 6/20Fr ^{2,3}	TARIF 6	
Italy	500L	500L	500L	-	1/500L ²	ITALY 1	
	500L	500L	500L	-	1/2x500L, 3/4x500L ^{1,2}	ITALY 2	
	500L	500L	500L	-	1/2x500L, 2/4x500L ²	ITALY 3	
Spain	100P	-	500P	-	1/100P, 6/500P ²	SPAIN	
	25P	-	100P	-	1/25P, 5/100P	CUSTOM	01 00 04 00 01 04 01 00
	25P	-	100P	-	1/25P, 4/100P	CUSTOM	01 00 04 00 01 00 01 00
	25P	-	100P	-	1/2x25P, 2/100P	CUSTOM	01 00 04 00 02 00 01 00
Japan	100¥	-	100¥	-	1/2x25P, 3/100P	CUSTOM	03 00 12 00 04 00 01 06
	100¥	-	100¥	-	1/100¥ ²	JAPAN	
Chile	Token	-	Token	-	1/1Token ²	CHILE	
Denmark	1Kr	5Kr	10Kr	20Kr	1/2x1kr, 3/5kr, 7/10kr ²	DENMARK 1	
	1Kr	5Kr	10Kr	20Kr	1/5kr, 3/10kr, 6/20kr ^{1,2}	DENMARK 2	
Finland	1Mka	-	5Mka	-	1/2x1Mka, 3/5Mka ²	FINLAND 1	
	1Mka	-	5Mka	-	1/3x1Mka, 2/5Mka ²	FINLAND 2	
New Zealand	\$1.00	-	\$2.00	-	1/\$1, 3/\$2	NEW ZEALAND 1	
	\$2.00	-	\$1.00	-	1/\$1, 3/\$2, (\$2-\$1 door)	NEW ZEALAND 2	
Norway	5Kr	-	10Kr	-	1/5Kr, 2/10Kr, 5/20Kr ²	NORWAY	
Argentina	10¢	10¢	10¢	-	1/1Token ²	ARGENTINA	
Greece	10D	20D	50D	-	1/2x10D, 1/20D, 3/50D	GREECE	
Antilles	25¢	25¢	1G	-	1/25¢, 4/1G	ANTILLES	
Netherlands	1Hfl	2.5Hfl	2.5Hfl	-	1/1Hfl, 3/2.5Hfl	NETHERLANDS	
Hungary	10F	10F	20F	-	1/1x20F, 1/2x10F, 3/2x20F ²	HUNGARY	

Note: 1. Factory Default. 2. Standard Setting - Change by pressing Enter button. 3. Other functions are also affected.
 * Only if Bill Acceptor and Center Coin Chute are available.

A.4 H.S.T.D. Adjustments

A.4 01 Highest Scores

The game maintains a record of the four highest scores achieved to date.

- OFF - No high scores are recorded, or displayed.
- ON - The four highest scores are stored in memory and displayed in the Attract Mode.

A.4 02 H.S.T.D. Award

The award given for achieving the High Score To Date, or the Champion H.S.T.D: Credit or Ticket.

A.4 03 Champion H.S.T.D.

The "Highest" High Score is displayed in the Attract Mode. This score is not cleared when "High Score Reset Every" occurs.

- ON - The "Highest" High Score is retained in memory and is displayed.
- OFF - The "Highest" High Score is not retained.

A.4 04 Champion Credits

The operator chooses the number of credits or tickets awarded for a Grand Champion Score. Range: 00 - 10.

A.4 05 H.S.T.D. 1 Credits

A.4 06 H.S.T.D. 2 Credits

A.4 07 H.S.T.D. 3 Credits

A.4 08 H.S.T.D. 4 Credits

The number of credits or tickets to be awarded whenever a player exceeds the 1st, 2nd, 3rd, and 4th highest scores. Range: 00 - 10.

A.4 09 High Score Reset Every

The number of games to be played before an automatic reset of the displayed "Highest Score" occurs. The values provided upon reset are those selected by the operator in the Back-up High Scores. Range: OFF (disabled); 250 to 20, 000.

A.4 10 Backup Champion

The Back-up Grand Champion Score. Range: 00 - 99,900,000.

A.4 11 Backup H.S.T.D. 1

A.4 12 Backup H.S.T.D. 2

A.4 13 Backup H.S.T.D. 3

A.4 14 Backup H.S.T.D. 4

The first through the fourth Back-up High Score values. The game automatically restores this value when the High Score Reset Every value is reached. Range: 00 - 99,900,000.

A.4 15 DEFAULT SPEED CHAMPION

This determines the default World Speed Record loop champion level.

Setting: 1-50

Factory Default: 3

A.4 16 DEFAULT CORNERING CHAMPION

This determines the default Cornering Record loop champion level.

Setting: 1-50

Factory Default: 3

A.4 17 CREDIT LOOP CHAMPS

This determines the number of credits awarded for the World Speed Record and Cornering Record loop champions.

Setting: 0-3

Factory Default: 1

A.5 Printer Adjustments (optional board required)

A.5 01 Column Width

The column width to be printed. Range: 22 - 80.

A.5 02 Lines Per Page

The amount of lines per page. Range: 20 - 80.

A.5 03 Pause Every Page

Choose whether the printer pauses at the end of a page.

YES	-	The printer does pause.
NO	-	The printer does not pause.

A.5 04 Printer Type

Select the type of printer . Choices: Parallel, Serial, ADP., Mini-Drucker, or NSM.

A.5 05 Serial Baud Rate

The baud rate used for Serial or ADP communications (bit rate). Choices: 300, 600, 1200, 2400, 4800, or 9600.

A.5 06 Serial D.T.R. (Data Terminal Ready)

When a Serial Printer is used, this line may be connected to a printer output line signaling that the printer is busy.

Normal	-	Normal D.T.R. signal goes low to indicate the printer is not ready.
Inverted	-	Inverted D.T.R. (busy) signal goes high to indicate printer is not ready.
Ignore	-	D.T.R. signal is ignored.

A.5 07 Auto Printout

With the optional printer board installed, this adjustment allows the initiation of printouts whenever the game detects a printer connected to the game. Parallel printers are detected automatically by plugging them in and putting them on-line. Serial printers (or computers) are detected by sending a carriage return (ASCII 0x0D) or XON (ASCII 0x11).

This adjustment has the following settings:

OFF	Disable automatic printouts
MAIN AUDS	Main Audit table (B.1)
EARNINGS	Earning Audits (B.2)
STD. AUDITS	Standard Audits (B.3)
FEATURES	Feature Audits (B.4)
HISTOGRAMS	Histograms (B.5)
TIMESTAMPS	Time Stamps (B.6)
ALL DATA	All of the above data

The table specified above will automatically be printed when a printer (or computer) is detected.

If the printer is detected during game over or test mode, the printout will take place right away.

If the printer is connected while a game is being played, it will take up to 10 seconds to be detected, after which the printout will occur. The game will resume after the printout is complete.

Automatic printout will only take place if the coin door is open.

After an automatic printout has been generated, a second automatic printout will not be possible until a new game has started, or test mode begins.

ERROR MESSAGES

The WPC game program has the capability to aid the operator and service personnel. At Game Turn-on, or after pressing the Begin Test switch, (once the game has been operating for an extended period), the display may signal with the message, "Press ENTER for Test Report". This indicates the game program has detected a possible problem with the game.

To obtain details of the problem, open the coin door and press the Begin Test switch. Press the Enter button to begin displaying the message(s). The following messages apply to your game.

Check Ramp Diverter

This message is displayed if the game has detected that the diverter is not functioning correctly. After any problem is corrected, the message will be cleared when the game detects 3 correctly diverted balls (during game play) in each direction.

Check Switch ##.

This message indicates that at least one switch was stuck 'On' at game turn-on or has NOT been actuated during ball play (for 90 balls or 30 games). The game program compensates the game play requirements affected by each disabled switch to allow 'nearly normal' play. This helps keep the game earning, until the service technician can repair the problem.

To verify the problem, refer to the Test Menu text describing Switch Testing, and check each reported switch using applicable switch tests. Always check switch operation using a ball, to simulate game conditions. Switch problems may often be resolved by adjusting the wire switch actuators, fixing switch circuitry problems, securing loose connectors, etc. Mechanisms using 'opto switches' (drop targets, etc.) need to be checked for proper power connections (+12V dc and ground).

Check Fuses F115 and F116 and Opto 12V Supply.

This message will be displayed if the game senses that all optical switches are not functioning. This usually occurs when there is no 12V supply to the playfield optics.

The problem is likely to be a blown fuse (F115 or F116) or at connectors J112, J116, J117 or J118 on the power driver board.

Opto Trough Bad Check Connectors, Wires and 12V Supply

This message will be displayed if all of the optics in the playfield ball trough are not functioning. This is usually caused by a problem with a ball trough connector supplying 12V and Ground for the optical circuits.

Pinball Missing.

This game normally uses 4 balls; however, it will operate with as few as one ball. This message announces that a ball is missing or stuck. When the ball is located, return it to the game via the Outhole. Other possibilities for this problem could be malfunctions of the Ball Trough optos or the Ball Shooter switch.

xxxxx Sw. is Stuck On.

This message indicates that a switch, which is not usually On, remains in the On position after the game is switched On. The stuck switch is essential for game play (for example, a coin chute switch, the slam tilt switch, the plumb bob tilt switch), and should be cleared to permit proper game operation.

Ground Short Row-N, Wht-xxx.

This message indicates that the switch wires being called out are touching a grounded part on the playfield or coin door. The following should be checked:

1. Slam Tilt (or other coin door) switch touching the grounded coin door.
2. A leaf-type, playfield switch touching a grounded part.
3. Players poking metallic objects (wires, coat hanger, etc.) into the game
4. Switch cable insulation pierced or damaged allowing bare wire contact with a grounded part
5. All switches in a row closing at the same time. Note: This instance is NOT a switch problem; however, for most games this is a very rare possibility.

U6 Checksum Error.

The game ROM checksum is invalid. If this occurs replace the game ROM.

Time and Date Not Set.

The real time clock is not set. If this occurs go to U.4 of the Utilities Menu and set the time and date.

Factory Settings Restored.

This message indicates that the CMOS RAM no longer retains any custom Pricing or Game Adjustment settings and has reverted to factory default settings. Generally, the following CPU checks will isolate the cause of the CMOS RAM memory failure. The voltage at pin 28 and pin 26 of U8 should be +5V (game turned On) and at least +4V (game turned Off). When the voltage drops below +4 V, memory reset occurs. Check the batteries and battery holder. Be sure that the batteries are good and that there is no contamination on the battery holder terminals. Turn the game OFF, and use an ohmmeter to check diodes D1 and D2 on the CPU Board. D1 should read 0 ohms when forward-biased and infinite ohms when reverse-biased. D2 should read 15 ohms when forward-biased and infinite ohms when reverse-biased. Note: Readings taken from Analog Meter. This message can also indicate that there is an open diode on a 50V coil circuit and noise is entering the circuit.

CPU L.E.D.'s

The CPU has three L.E.D.'s located on the upper left side of the board: D19, D20, and D21. On game power-up D19 and D21 turn on for a moment then, D19 turns off and D20 starts to blink rapidly. D21 remains on. The system has detected a problem if the following happens:

CPU Board L.E.D. Error Codes

Center L.E.D. blinks one time	-	ROM Error U6
Center L.E.D. blinks two times	-	RAM Error U8
Center L.E.D. blinks three times	-	Custom Chip Failure U9

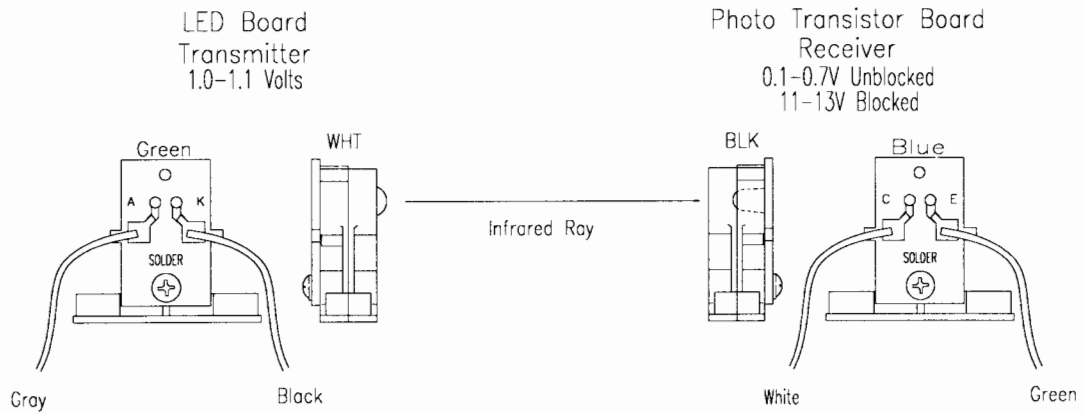
Sound Board Beep Error Codes

Upon Game Turn-On:

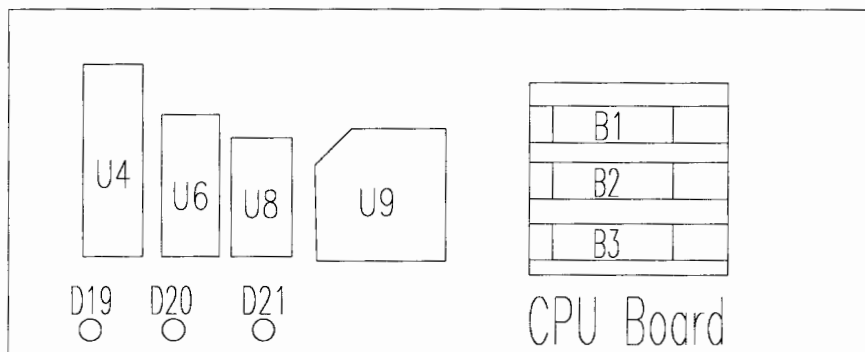
1 Beep	=	Sound Board O.K.
2 Beeps	=	U2 Failure
3 Beeps	=	U3 Failure
4 Beeps	=	U4 Failure
5 Beeps	=	U5 Failure
6 Beeps	=	U6 Failure
7 Beeps	=	U7 Failure
8 Beeps	=	U8 Failure
9 Beeps	=	U9 Failure

OPTO THEORY

The opto receiver (Photo Transistor) should be approximately 0.1-0.7 volts when the opto beam is unblocked and approximately 11-13 volts when the opto beam is blocked. The opto transmitter (L.E.D.) should always be approximately 1.4 volts. Note, the transmitter (L.E.D.) is larger than the receiver (Photo Transistor); it protrudes further from its case.



LED List



CPU Board

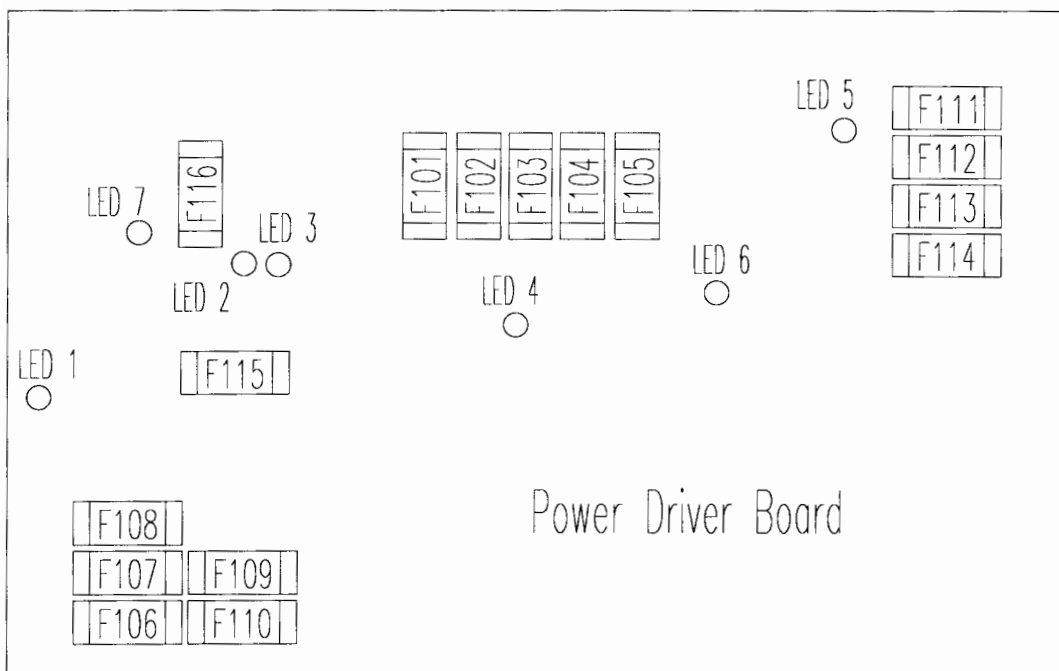
D19, Blanking

D20, Diagnostic

D21, +5vdc

At Game Turn-On = D19 & D21 On, D20 Off

During Normal Operation = D19 Off, D20 flashing, D21 On



Power Driver Board

LED 1, +12vdc, Switch Circuit, Normally On

LED 2, High/Low Line Voltage Sensor, Normally On

LED 3, High/Low Line Voltage Sensor, Normally Off

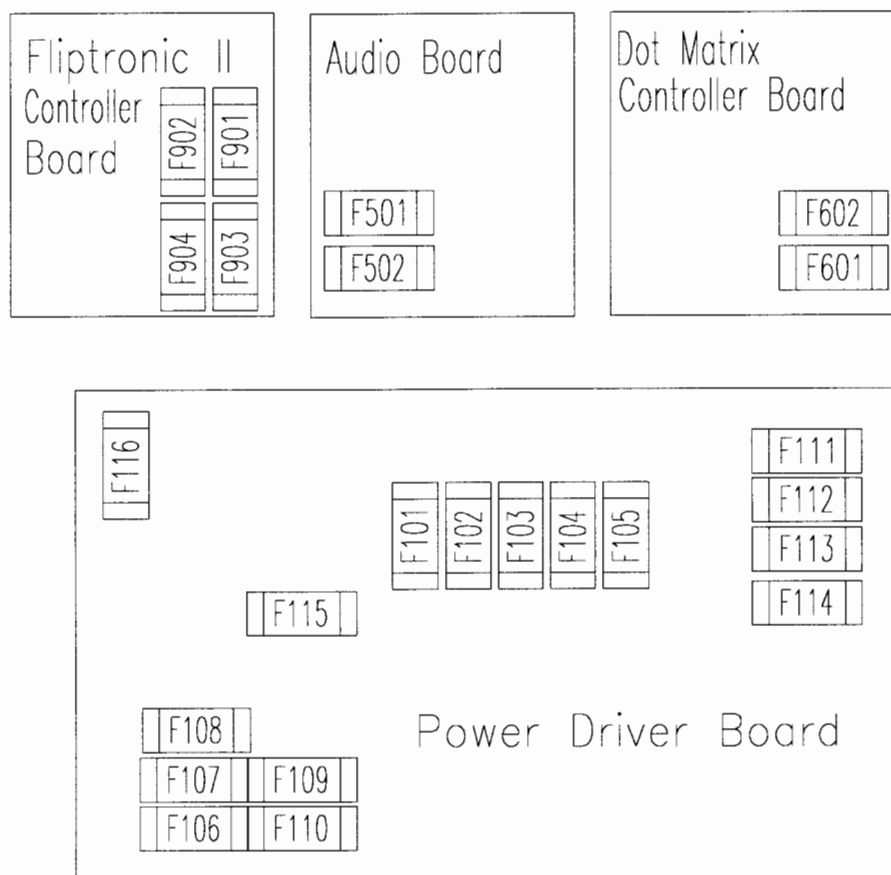
LED 4, +5vdc, Digital Circuit, Normally On

LED 5, +20vdc, Flashlamp Circuit, Normally On

LED 6, +18vdc, Lamps Circuit, Normally On

LED 7, +12vdc, Power Circuit (Motors, Relays, Etc.), Normally On

Fuse List



Audio Board

F501 -25V Circuit	3A, 250V, S.B.
F502 +25V Circuit	3A, 250V, S.B.

Dot Matrix Controller Board

F601 +62V Circuit	3/8A, 250V, F.B.
F602 -113V and -125V Circuits	3/8A, 250V, F.B.

Fliptronic II Controller Board

F901 Upper Right Flipper	3A, 250V, S.B.
F902 Upper Left Flipper	3A, 250V, S.B.
F903 Lower Right Flipper	3A, 250V, S.B.
F904 Lower Left Flipper	3A, 250V, S.B.

Power Driver Board

F101 +50VDC General (Left Flipper)	3A, 250V, S.B.
F102 +50VDC General (Right Flipper)	3A, 250V, S.B.
F103 Solenoid #25-#28	3A, 250V, S.B.
F104 Solenoid #9-#16	3A, 250V, S.B.
F105 Solenoid #1-#8	3A, 250V, S.B.
F106 G.I. #5 Wht-Vio	5A, 250V, S.B.
F107 G.I. #4 Wht-Grn	5A, 250V, S.B.
F108 G.I. #3 Wht-Yel	5A, 250V, S.B.
F109 G.I. #2 Wht-Org	5A, 250V, S.B.
F110 G.I. #1 Wht-Brn	5A, 250V, S.B.
F111 Flasher Secondary	5A, 250V, S.B.
F112 Solenoid Secondary	7A, 250V, S.B.
F113 +5V Logic	5A, 250V, S.B.
F114 +18V Lamp Matrix	8A, 32V, N.B.
F115 +12V Switch Matrix	3/4A, 250V, F.B.
F116 +12V Secondary	3A, 250V, S.B.

Line Filter

Domestic Game	8A
Foreign Game	5A, S.B.

MAINTENANCE INFORMATION

LUBRICATION

The two main lubrication points of the Ball Eject mechanism* are the pivots for the arm. The mechanism of other playfield devices are somewhat similar and have the same lubrication requirements. A medium viscosity oil (switch target grease) is satisfactory for these devices.

Because of the functional design (arm-actuated via solenoid plunger operation), the pivot points of the Left and Right Kickers ("Slingshots") all require lubrication as a regular servicing procedure.

Lubrication to ensure proper operation also applies to the target blades of Drop Targets. MBI Instrument Grease, also known as Drop Target Switch Lubricant, (Bally part number of EI 165), is a recommended lubricant.

SWITCH CONTACTS

Playfield Switches

For proper game operation, switch contacts should be free of dust, dirt, contamination, and corrosion. Blade switch contacts are plated to resist corrosion. Cleaning blade switch contacts requires gentle closing of the contacts on a clean business card or piece of paper, and then pulling the paper about 2 inches, which should restore the clean contact surface. Adjust the switch contacts to a 1/16-inch gap.

Flipper Switches

This game uses the new Fliptronic II Electronic Flipper System. The end-of-stroke switches are NORMALLY OPEN and should close when the flipper is energized. All end-of-stroke switches are gold flashed computer grade leaf switches. Only low computer current is carried through these switches. DO NOT FILE or abrasively clean these switches! DO NOT REPLACE these switches with the old style tungsten high current type switches, as intermittent operation could occur. Please note that unlike the old style of flipper, an end-of-stroke switch failure will not harm the flipper. The game will notify the operator of a switch being misadjusted in the test report, but will continue to play. The end-of-stroke switches are a means by which the new electronic flippers feel and play with all of the subtleties of the old flippers.

CLEANING

Good game action and extended playfield life are the results of regular playfield cleaning. During each collection stop, the playfield glass should be removed and thoroughly cleaned and the playfield should be wiped off with a clean, lint-free cloth. The game balls should be cleaned and inspected for any chips, nicks, or pits. Replace any damaged balls to prevent playfield damage.

Regular, more extensive, playfield cleaning is recommended. However, avoid excessive use of water and caustic or abrasive cleaners because they tend to damage the playfield surface. Playfield wax (or any carnauba based wax), or polish may be used sparingly, to prevent a buildup on the playfield surface. Do not use cleaners containing petroleum distillates on any playfield plastics because they may dissolve the plastic material or damage the artwork.

*May not be used on all games.

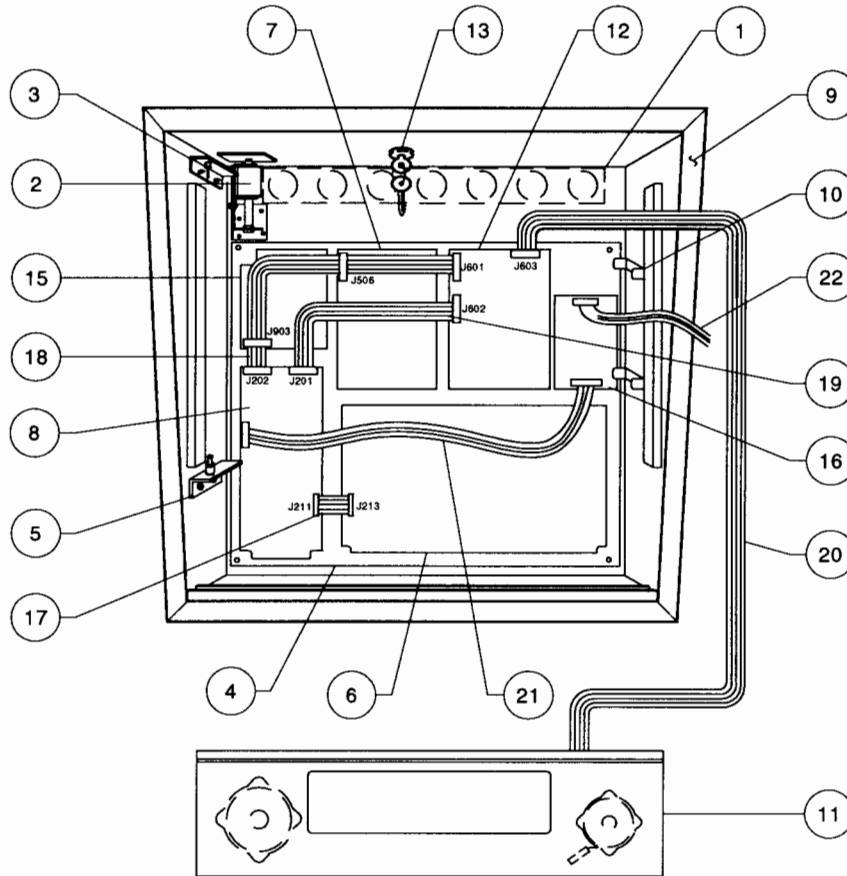
Notes

Notes

SECTION TWO

GAME PARTS INFORMATION

50036-BB Backbox Assembly



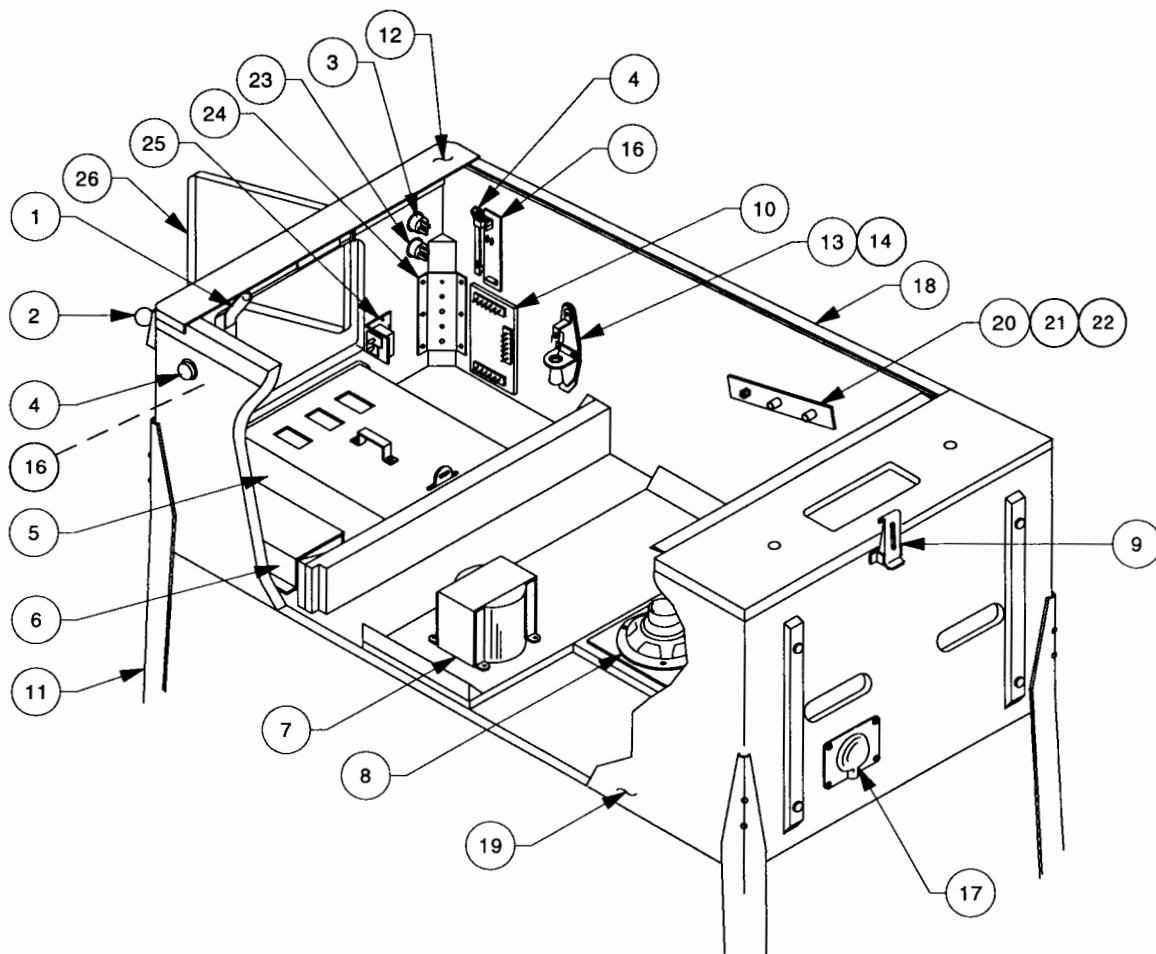
◆ Ribbon Cables

Item	Part No.	Description	Item	Part No.	Description
1.	01-6645	Venting Screen	17.	5795-12653-03	Ribbon Cable, 3"
2.	B-10686-1	Knocker Assembly	18.	5795-13018-01	Ribbon Cable, 23.5"
3.	A-12497	Insert Bd.Hinge Assy., Upr.	19.	5795-10938-15	Ribbon Cable, 15"
4.	A-14092-5	WPC Mounting Plate Assy.	20.	5795-12838-30	Ribbon Cable, 30"
5.	A-12498	Insert Bd. Hinge Assy., Lwr.	21.	5795-10938-32	Ribbon Cable, 32"
6.	A-12697-3	Power Driver Assembly	22.	5795-14325-00	Ribbon Cable,V-8 Mtr.

◆ Miscellaneous Parts

7.	A-16917-50036	Sound Board Assembly	A-8552-50036	Tempered Backglass Assy.
8.	A-17651-50036	WPC Security CPU Board	03-8228-2	Glass Channel Top (1)
9.	A-17814-50036A	Backbox, Screened	03-8228-3	Glass Channel Edge (2)
10.	01-9047	Insert Stop Bracket	03-8229-1	Glass Lift Channel (1)
11.	A-18614	Speaker/Display Assembly	08-7456	Backbox Glass:27x18-7/8"
12.	A-14039.1	Dot Matrix Controller Board	31-1357-50036	Screened Translight
13.	A-13379	Lock & Plate Assembly		
14.	50036-IN	Insert Board		
15.	A-15472-1	Fliptronic II Board		
16.	A-18532	Motor Driver Master PCB Assy.		

50036-CAB Cabinet Assembly



Item	Part No.	Description
1.	A-16773	Lever Guide Assembly
2.	A-17730-2	Ball Shooter w/Knob Assy.
3.	20-9663-2	Push Button w/Sw., Start
4.	A-16883-4	Flipper Button, Red (2)
5.	A-17900-1	5-Ball Cashbox Assembly
6.	A-17540	Univ. Power Interface Assy.
7.	5610-13953-00	WPC Transformer
8.	5555-12929-00	Speaker, 4Ω, 6", 25w
9.	20-9347	Toggle Latch
10.	A-17051-1	Coin Door Interface Board
11.	C-10843-2	Leg Assembly
12.	A-19123	Front Molding Assy., Black
13.	20-6502-A	Plum Bob
14.	A-15361	Tilt Mechanism Assembly
15.	*	Cordset
16.	A-17316	Opto Flipper Assembly (2)
17.	01-10714	Line Cord Cover
18.	A-12359-4-B	Side Molding Assembly (2)
19.	11-1213	Wood Cabinet

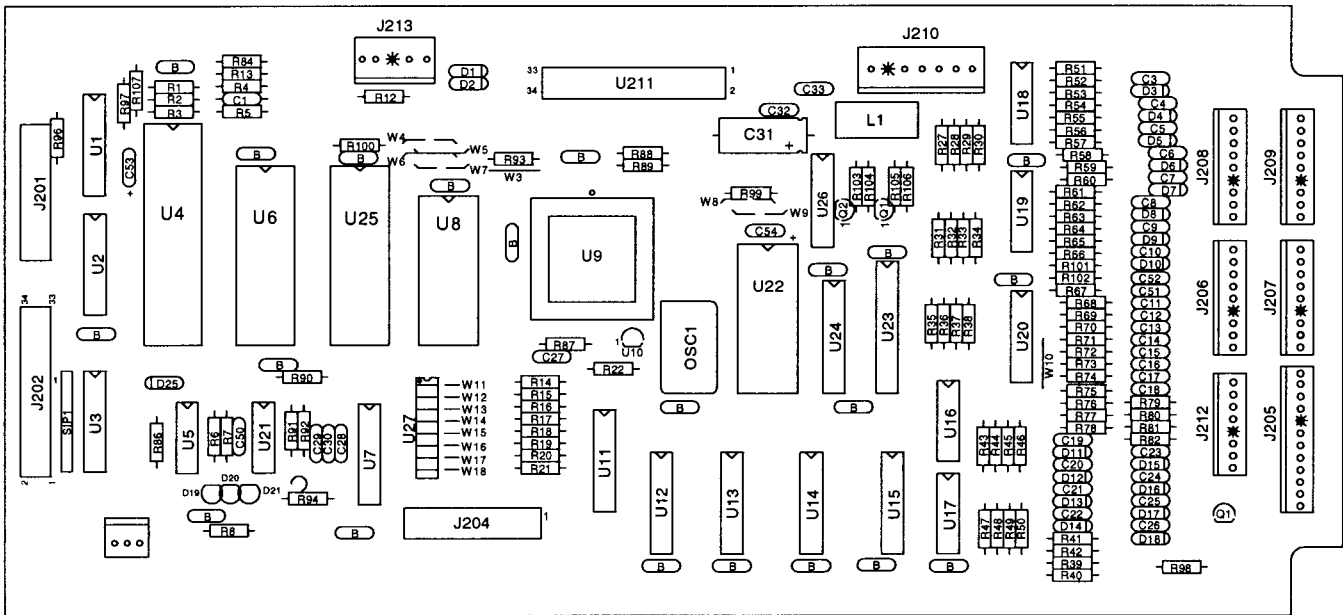
Item	Part No.	Description
20.	01-11408	Plate Spacer (2)
21.	02-4329-1	Pivot Nut, 7/8" (4)
22.	02-4352	Pivot Bushing (2)
23.	20-9663-18	Push Button w/Sw., Green
24.	01-11400	Leg Plate (4)
25.	A-18249-1	Cable & Interlock Switch Assy.
26.	09-61000-1	Coin Door-USA

♦ Miscellaneous

A-17195	Tilt Switch Assy. w/Cable
01-10797	Playfield Support Bar, 18"
01-12352	Clip Bracket
01-9011-L	Backbox Mtg. Bracket, Left
01-9011-R	Backbox Mtg. Bracket, Right
08-7028-T	Tempered Plfd. Glass: 21"x43"
08-7377	Leg Leveler Adjuster, 3"
20-6500	Steel Ball, 1-1/16" (4)

* See Application Chart p.2-39.

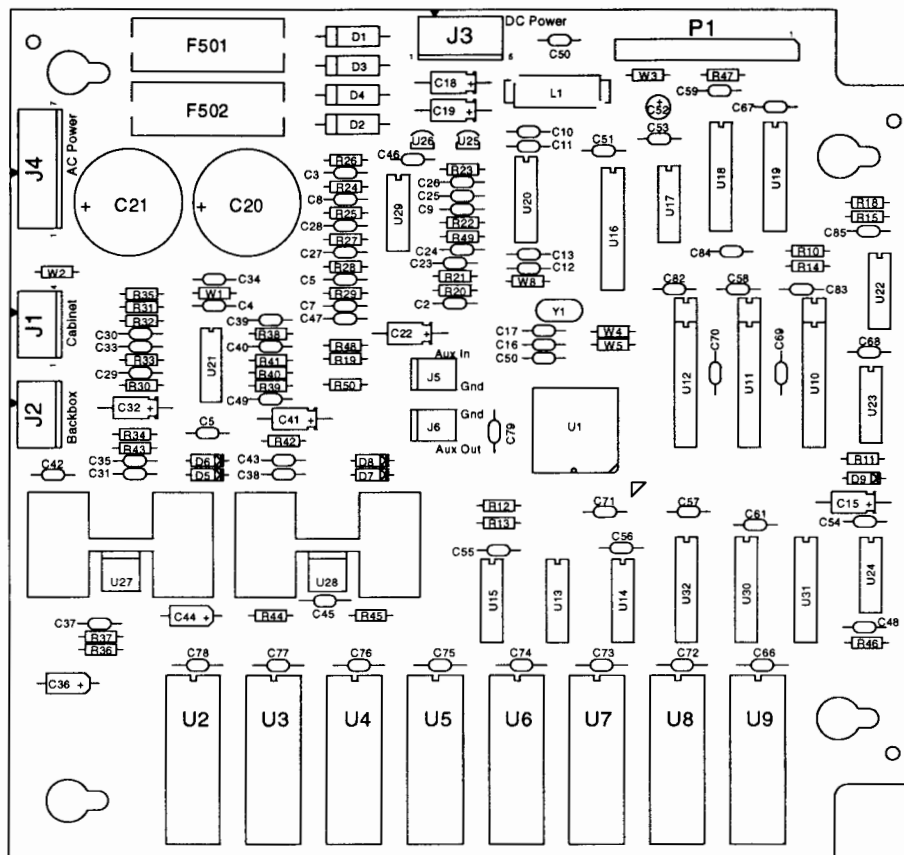
WPC CPU Security Board Assembly



Part Number	Designator	Description	Part Number	Designator	Description
5010-09034-00	R14-R22, R27-R42, R86, R94, R90, R98	Res., 10K Ω , ¼w, 5%	5281-10182-00	U11-U13, U15	IC, 74LS240 / DRVr
5010-09314-00	R52, R54, R56, R58, R60, R62, R64, R66, R75-R82	Res., 1.2K Ω , ¼w, 5%	5284-12651-00	U21	IC, 4548
5010-09358-00	R3, R43-R51, R53, R55, R57, R59, R61, R63, R65, R67-R74, R84, R101, R102, R105, R106	Res., 1K Ω , ¼w, 5%	5315-13924-00	U23	IC, 74HC4514 LTCH 1to16 Dec.
5010-09416-00	R5-R8, R12, R13, R87-R89, R99, R100	Res., 470 Ω , ¼w, 5%	5281-09246-00	U26	IC, 74LS139 2 T 4 Decoder
5010-09085-00	R1, R2, R4, R96, R97, R107	Res., 1.5K Ω , ¼w, 5%	5340-13062-00	U8	IC/RAM 32kX8 Static
5010-09534-00	W3, W4, W7, W9	Res., 0 Ω	5370-12272-00	U16-U19	IC, LM339 Quad Comp
5010-10989-00	R92	Res., 470K Ω , ¼w, 5%	5370-12687-00	U10	MC 34064
5010-12104-00	R91	Res., 22M Ω , ¼w, 5%	5521-10931-00	OSC1	8.00MHZ OSC 14PIN DIP
5010-08991-00	R103, R104	Res., 4.7K Ω , ¼w, 5%	5520-12084-00	X1	Crystal 32.768 KHz
5019-09362-00	SI P1	SIP 4.7K, 9R, 10P, 5%	5551-09822-00	L1	Inductor, 4.7 μ H, 3.0A.
5040-08986-00	C31	Cap., 100M, 10v ($\pm$ 20%)	5671-13732-00	D19-D21	Display LED Red
5043-08980-00	B	Cap., .01M, 50v (+80, -20%)	5700-08985-00	U4	Socket IC 40P .6"
5043-09030-00	C27	Cap., .047M, 50v, ($\pm$ 20%)	5700-12088-00	U6	Socket IC 32P .6"
5043-09065-00	C3-C26, C51, C52	Cap., 470P, 50v, ($\pm$ 20%)	5700-12424-00	U9	Socket 84 Pin PLCC
5043-09491-00	C29, C30	Cap., 22P, 1KV ($\pm$ 10%)	5700-10176-00	U22	Socket IC 28 P .6"
5043-09492-00	C28	Cap., 100P, 50v ($\pm$ 10%)	5791-10850-00	J201, J204	Connector, 26-pin Header Str
5041-09163-00	C53, C54	Cap., 2.2 μ F, 15v (20%) Ax.	5791-14090-05	J213	Connector, 5-pin Header Str
5070-08919-00	D2-D18	Diode, 1N4148 150MA	5791-10862-07	J210	Connector, 7-pin Header Str
5070-09266-00	D1, D25	Diode, 1N5817, 1.0A.	5791-13830-08	J212	Connector, 8-pin Header Str
5160-10269-00	Q1-Q3	Trans., 2N3904 NPN	5791-13830-09	J208, J209	Connector, 9-pin Header Str
5700-10389-00	U20	IC Socket 18-pin	5791-13830-11	J206, J207	Connector, 11-pin Header Str
5281-09308-00	U3	IC, 74LS245 TRNCV	5791-12516-00	J202, J211	34 Hen 2x17 Str
5281-09486-00	U14, U24	IC, 74LS374 8 D F/F	5048-11033-00	C50	Cap., .022 μ F
5281-09851-00	U5	IC, 74LS14 SMT TRG	5791-13830-12	J205	Cap., 12-pin Header Str
5281-09867-00	U1, U2, U7	IC, 74LS244 OCT BUF	5043-09845-00	C32, C33	Cap., 1KP, 50v ($\pm$ 10%)
			5645-09025-00	U27	Switch DIP 8 POS
			5162-12422-00	U20	IC, ULN 2803A
			A-5400-50036-1	U22	WPC PIC 16C57 Micro-C
			A-5343-50036-1	U6	Game ROM Assembly
			A-17643	-	Battery Holder PCB Assy.
			5400-10320-00	U4	MC68B09E 2Mhz μ P
			5410-12426-00	U9	WPC ASIC-89
			20-9665-1	-	PCB Standoffs
			H-18258	-	WPC CPU Security Cable

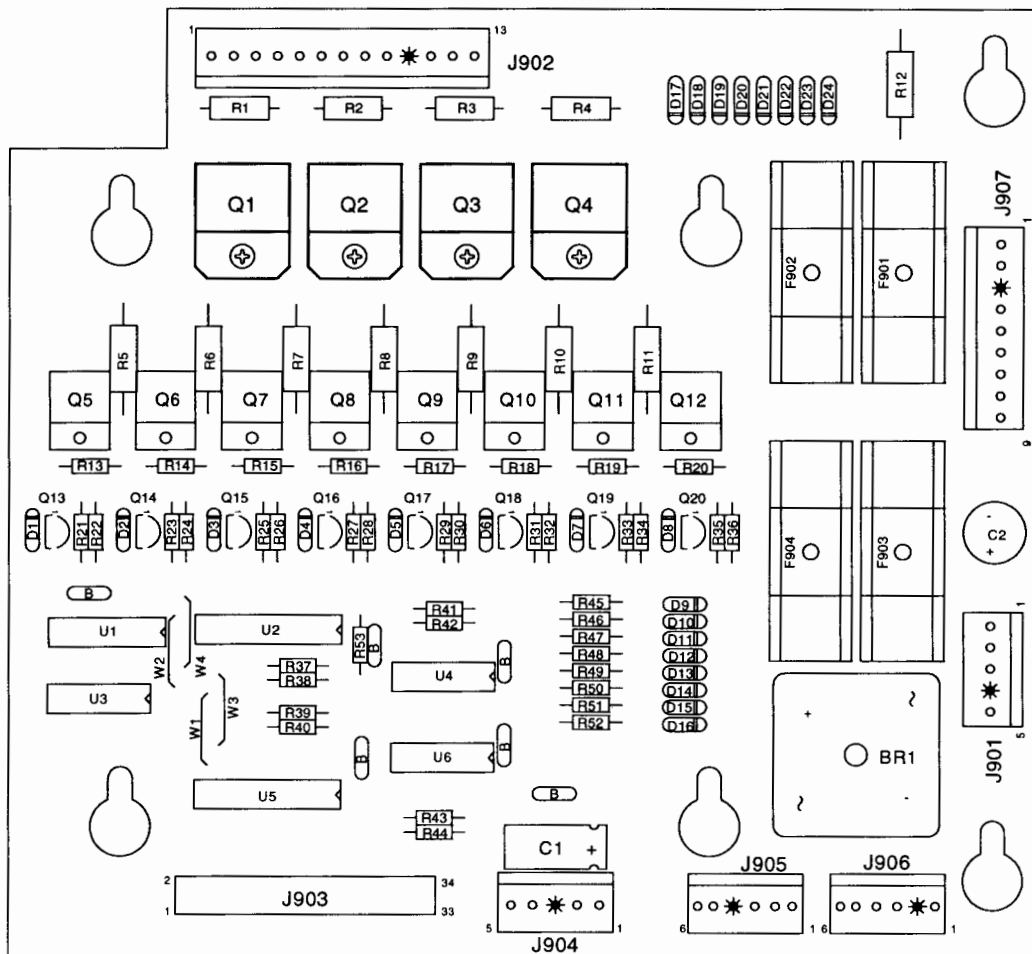
A-16917-50036

Sound Board Assembly



Part Number	Designator	Description	Part Number	Designator	Description
4004-01005-06	U27, U28	MS, 4-40 x 3/8"	5070-09054-00	D5-D9	Diode Signal 1N4004
4404-01119-00	U27, U28	Nut 4-40	5250-13302-00	U25	78L05 Pos 5V reg TO-92
5010-08772-00	R39, R41	Resistor, 15K Ω , 1/4w, 5%	5250-13303-00	U26	79L05 Neg 5V Reg TO-92
5010-08774-00	R30, R34, R37, R42, R45	Resistor, 22K Ω , 1/4w, 5%	5283-10551-00	U17	IC74F00 Fast Quad NAND
5010-08991-00	R10, R12-R16	Resistor, 4.7K Ω , 1/4 w, 5%	5311-10946-00	U22	IC74HC74 Dual D Flip Flop
5010-09034-00	R47	Resistor, 10K Ω , 1/4w, 5%	5311-10947-00	U23	IC74HC125 Quad Tri-State Buffer
5010-09035-00	R11, R19, R33, R40	Resistor, 47K Ω , 1/4w, 5%	5311-10948-00	U15	IC74HC138 1 of 8 Decoder
5010-09036-00	R46	Resistor, 100 Ω , 1/4w, 5%	5315-12009-00	U18, U19	IC74HCT374 Octal D Flip Flop
5010-09219-00	R31, R32, R38	Resistor, 8.2K Ω , 1/4w, 5%	5311-12043-00	U13, U14	IC74HC174 Hex D Flip Flop
5010-09358-00	R50	Resistor, 1K Ω , 1/4 w, 5%	5311-12538-00	U24	IC74HC14 Hex Schmitt Inverter
5010-09534-00	W4, W6	Resistor, 0 Ω (Jumper)	5311-12287-00	U30-U32	IC74HC541 Octal Bus Driver
5010-13420-00	R36, R44	Resistor, 680 Ω , 1/4w, 5%	5340-13304-00	U10-U12	ICSRAM 2Kx8 35ns .300 DIP
5010-13607-00	R20-R29, R48, R49	Resistor, 6.2K Ω , 1/8w, 1%	5370-12730-00	U21, U29	IC74HC174 Hex D Flip Flop
5010-13517-00	R35, R43	Resistor, 15 Ω , 1/4w, 5%	5370-13419-00	U27, U28	IC74HC174 Hex D Flip Flop
5040-09365-00	C15, C18, C19, C32, C41	Cap., 1 μ F, 63v, Alum Ax.	5371-13299-00	U20	IC DAC AD-1851 16Bit
5040-09421-00	C52	Cap., 100 μ F, 25v, Alum Ax.	5520-13301-00	Y1	Crystal 10MHz Parallel resonant
5040-13417-00	C20, C21	Cap., 10,000 μ F, 35v, Alum.	5551-09822-00	L1	Inductor, 4.7 μ H, 3Amp.
5041-09009-00	C36, C44	Cap., 22 μ F, 10v, Tant Alum	5700-12047-00	U16	IC, Socket 24-Pin .300 DIP
5041-13187-00	C22	Cap., 4.7 μ F, Tant Axial.	5700-12088-00	U2-U9	IC, Socket 32-Pin .600 DIP
5043-08996-00	C4, C5, C10-C13	Cap., .10 μ F, 50v, Cer Ax.	5705-12638-00	U27, U28	Heatsink 5298-B
	C31, C35, C38, C43, C46, C4		5733-12060-01	F501, F502	MT3AG PCMounted Fuse Holder
	C50-C79		5791-10862-04	J1, J2	Connector, 4-pin Header STR .156
5043-10267-00	C37, C45	Cap., 150 μ F, 50v, Cer Ax.	5791-10862-05	J3	Connector, 5-pin Header STR .156
5048-11028-00	C16, C17	Cap., 22 μ F, 50v, Cer Ax.	5791-10862-07	J4	Connector, 7-pin Header STR .156
5048-11029-00	C48	Cap., 100 μ F, 50v, Cer Ax.	5791-12516-00	P1	Connector, 34 Hen 2x17 STR .100
5048-11030-00	C49	Cap., 470 μ F, 50v, Cer Ax.	A-17002	U16	PAL Sub-Assembly
5048-11033-00	C33	Cap., .022 μ F, 50v, CerAx.	A-5343-50036-S2	U2	ROM Sub-Assembly
5048-12036-00	C34, C4	Cap., .22 μ F, 50v, Cer Ax.	A-5343-50036-S3	U3	ROM Sub-Assembly
5048-13418-00	C30, C39, C40	Cap., .047 μ F, 50v, Cer Ax.	A-5343-50036-S4	U4	ROM Sub-Assembly
5048-13608-00	C8	Cap., 6800 μ F, 50v, Cer Ax.	A-5343-50036-S5	U5	ROM Sub-Assembly
5048-13609-00	C7, C24, C26	Cap., 3900 μ F, 50v, Cer Ax.	A-5343-50036-S6	U6	ROM Sub-Assembly
5048-13610-00	C2, C3, C9, C27, C29	Cap., 1000 μ F, 50v, Cer Ax.	A-5343-50036-S7	U7	ROM Sub-Assembly
5048-13611-00	C6, C23, C25, C28	Cap., 680 μ F, 50v, Cer Ax.	A-5343-50036-S8	U8	ROM Sub-Assembly
5070-09045-00	D1-D4	MR-501 Rectifier Diode	A-5343-50036-S9	U9	ROM Sub-Assembly
			5731-10356-00	F501, F502	Fuse, 3Amp, 250v, Slow Blow

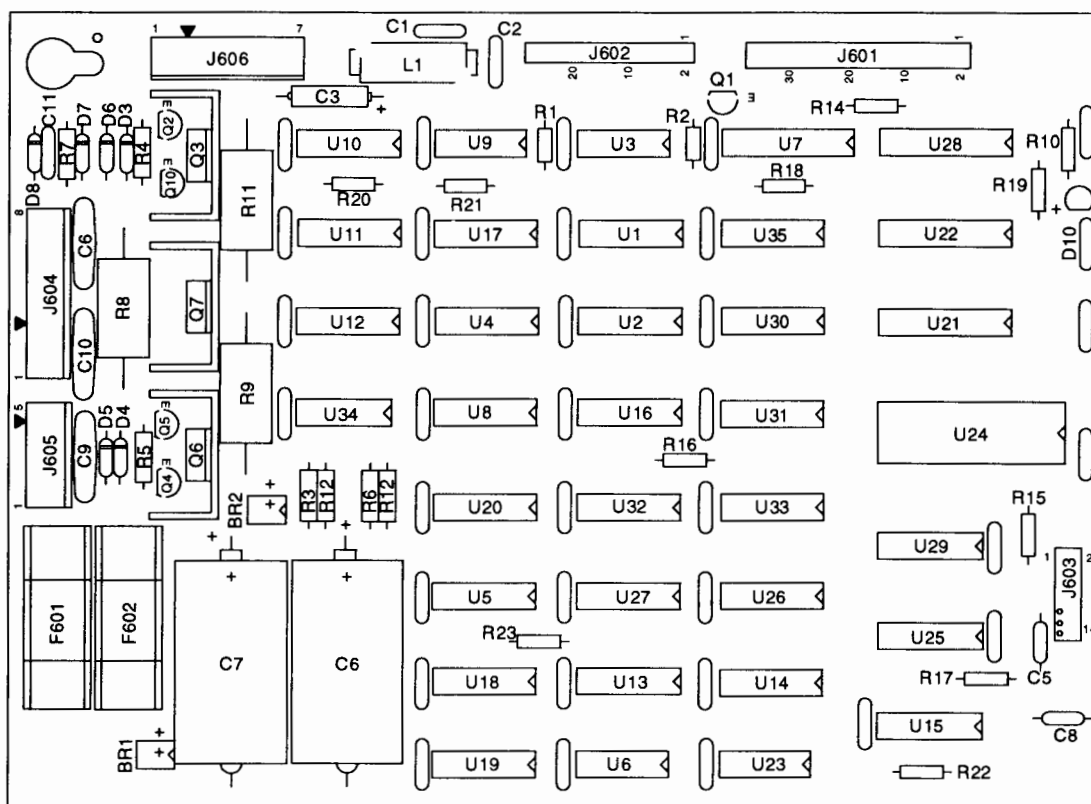
A-15472-1 Fliptronic II Board Assembly



Part Number	Designator	Description	Part Number	Designator	Description
01-10572	Q1-Q4	Heatsink	5070-09054-00	D1-D24	Diode, 1N4004
20-9684	Q5-Q12	Fastener Snap In	5100-09690-00	BR1	Bridge Rectifier
4006-10003-08	Q1-Q4	Mach. screw, 6-32	5162-12635-00	Q5-Q12	Trans., TIP102 NPN
4406-01128-00	Q1-Q4	Nut 6-32 KEPS	5190-09016-00	Q13, Q20	Trans., 2N4403 PNP
5010-09034-00	R37-R44, R53	Res., 10KΩ, ¼w, 5%	5191-12179-00	Q1-Q4	Trans., TIP36C PNP
5010-09358-00	R22, R24, R26, R28, R30, R32, R34, R36, R45-R52	Res., 1KΩ, ¼w, 5%	5315-12009-00	U2	IC, 74HCT374
5010-09361-00	R1-R4	Res., 220Ω, ¼w, 5%	5315-12031-00	U5	IC, 74HCT244
5010-09416-00	R21, R23, R25, R27, R29, R31, R33, R35	Res., 470Ω, ¼w, 5%	5315-12812-00	U1	IC, 74HCT138
5010-09534-00	W3, W4	Res., 0Ω	5315-12951-00	U3	IC, 74HCT00
5010-10171-00	R13, R20	Res., 56Ω, ¼w, 5%	5370-12272-00	U4, U6	IC, LM339 Quad Comp
5011-12956-00	R5, R12	Res., 2.7KΩ, 1w, 5%	5731-10356-00	F901-F904	Fuse S-B, 3A., 250v
5040-08986-00	C1	Cap., 100M, 10v	5733-12060-01		Fuse Holder (F901-F904)
5040-09537-00	C2	Cap., 100μF, 100v	5791-10862-05	J901, J904	Connector, 5-pin Header
5043-08980-00	B	Cap., .01μF, 50v	5791-10862-09	J907	Connector, 9-pin Header
			5791-10862-13	J902	Connector, 13-pin Header
			5791-13830-06	J905, J906	Connector, Str Sq. Pin Hdr.
			5791-12516-00	J903	34 Hen 2 x 17 STR

A-14039.1

Dot Matrix Assembly



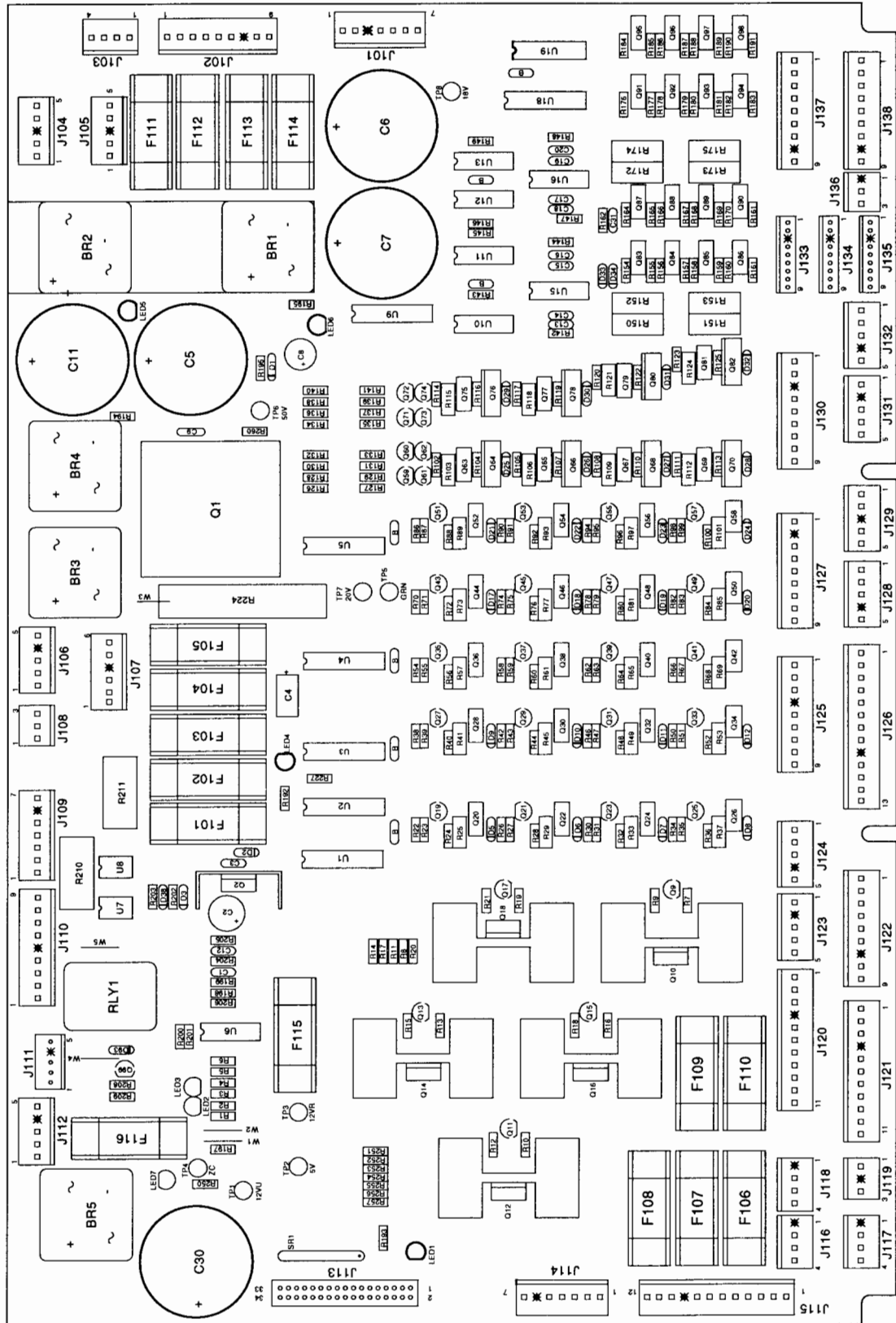
Part Number	Designator	Description	Part Number	Designator	Description
5010-08991-00	R1	Res., 4.7K Ω , 1/4w, 5%	5311-10946-00	U4, U5, U17, U18, U20	IC, 74HC74
5010-09036-00	R14-R23	Res., 100 Ω , 1/4w, 5%	5311-10947-00	U9	IC, 74HC125
5010-09224-00	R10	Res., 270 Ω , 1/4w, 5%	5311-10951-00	U10, U11	IC, 74HC161
5010-12832-00	R3, R6, R12, R13	Res., 4.7K Ω , 1/2w, 5%	5311-10977-00	U6	IC, 74HC04
5010-12841-00	R4, R5	Res., 120 Ω , 1/2w, 5%	5311-12817-00	U29	IC, 74HC165
5012-12830-00	R9	Res., 1.8K Ω , 5w, 5%	5311-12819-00	U21	IC, 74HC688
5012-12842-00	R11	Res., 120 Ω , 5w, 5%	5311-12820-00	U23	IC, 74HC27
5012-12843-00	R8	Res., 4.7K Ω , 5w, 5%	5311-12822-00	U13-U15	IC, 74HC193
5010-10171-00	R7	Res., 56 Ω , 1/4w, 5%	5315-12009-00	U22	IC, 74HCT374
5043-09492-00	C5, C8	Cap., 100P, 50v, ($\pm$ 10%)	5315-12812-00	U1, U2, U30, U12	IC, 74HCT138
5040-08986-00	C3	Cap., 100M, 10v ($\pm$ 20%)	5281-09308-00	U28	IC, 74HCT245
5040-12324-00	C4, C7	Cap., 150M, 160v ($\pm$ 50%)	5315-12815-00	U8, U34	IC, 74HCT08
5043-08980-00	BYPASS	Cap., .01M, 50v (+80,-20%)	5315-12816-00	U19	IC, 74HCT32
5043-09072-00	C6, C9, C10	Cap., .1M, 500v (+80,-20%)	5315-12821-00	U7	IC 74HCT240
5043-09845-00	C1, C2, C11	Cap., 1KP, 50v ($\pm$ 20%)	5340-12278-00	U24	S/RAM 2064 150NS
5070-09054-00	D7	Diode, 1N4004, 1.0A.	5551-09822-00	L1	Ind. 4.7 μ H, 3A.
5075-12824-00	D6, D8	Zener, 1N4742A, 12v	5671-13732-00	D10	Display LED Red
5075-12823-00	D4, D5	Zener, 1N4758, 56v	5705-09199-00	Q3, Q6, Q7	Heatsink, 6030B
5075-12826-00	D3	Zener, 1N4759A, 62v	5731-12328-00	F601, F602	Fuse, 3/8A., SB, 250v
5100-12833-00	BR1, BR2	Bridge, 400v, 1A	5733-12060-01		Fuse Holder (F601, F602)
5150-10269-00	Q1	Trans., 2N3904 NPN	5791-10850-00	J602	Connector, 26-pin Header
5164-09056-00	Q2, Q10	Trans., MPSD02 NPN	5791-10862-05	J605	Connector, 5-pin Header
5164-12154-00	Q3, Q7	Trans., MJE15030 NPN	5791-10862-07	J606	Connector, 7-pin Header
5194-09055-00	Q4, Q5	Trans., MPSD52 PNP	5791-10862-08	J604	Connector, 8-pin Header
5194-12155-00	Q6	Trans., MJE15031 PNP	5791-12516-00	J601	34 Hen 17x2 STR
5281-09738-00	U16, U25-U27	IC, 74LS157	5791-12827-00	J603	14 Hen 7x2 STR
5281-10033-00	U3	IC, 74LS30			
5281-10043-00	U31-U33, U35	IC, 74LS175			

A-12697-3

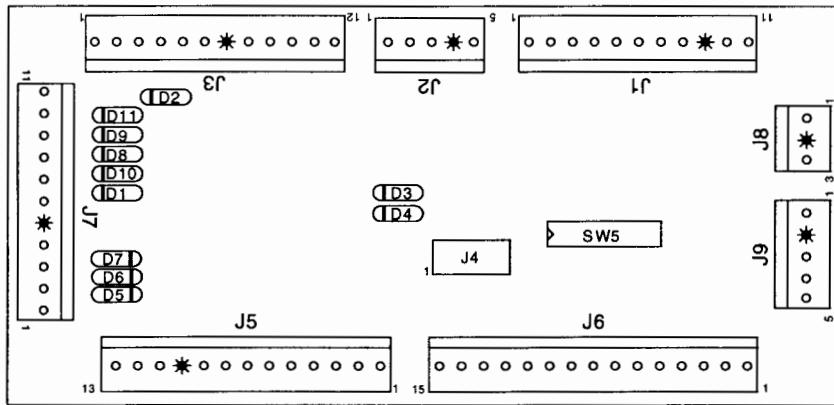
WPC Power Driver Assembly

Part No.	Designator	Description	Part No.	Designator	Description
5010-08981-00	R260	Res., 10K Ω , 1/2w, 5%	5040-12313-00	C5-C7, C11, C30	Cap., 15KM, 25v ($\pm 20\%$)
5010-08991-00	R9, R12, R15, R18, R21, R23, R27, R31, R35, R39, R43, R47, R51, R55, R59, R63, R67, R71, R75, R79, R83, R87, R91, R95, R99, R126, R128, R130, R132, R134, R136, R138, R140, R227	Res., 4.7K Ω , 1/4w, 5%	5043-08980-00	B-BYPASS	Cap., .01M, 50v (+80, -20%)
5010-08992-00	R8, R11, R14, R17, R20, R177, R179, R181, R183, R185, R187, R189, R191	Res., 560 Ω , 1/4w, 5%	5043-08996-00	C13-C20, C31	Cap., .1M, 50v ($\pm 20\%$)
5010-08993-00	R25, R29, R33, R37, R41, R45, R49, R53, R57, R61, R65, R69, R73, R77, R81, R85, R89, R93, R97, R101, R103, R106, R109, R112, R115, R118, R121, R124	Res., 68K Ω , 1/2w, 5%	5043-09845-00	C1, C12	Cap., 1KP, 50v ($\pm 20\%$) Axial
5010-08997-00	R24, R28, R32, R36, R40, R44, R48, R52, R56, R60, R64, R68, R72, R76, R80, R84, R88, R92, R96, R100, R102, R105, R108, R111, R114, R117, R120, R123, R155, R157, R159, R161, R165, R167, R169, R171	Res., 2.7K Ω , 1/4w, 5%	5048-10994-00	C3	Cap., .33M, 50v ($\pm 20\%$) Axial
5010-08998-00	R142-R149, R197-R198	Res., 2.2K Ω , 1/4w, 5%	5070-08919-00	D33, D34	Diode 1N4148, 150MA.
5010-09034-00	R194, R196, R251, R253-R257	Res., 1.5K Ω , 1/4w, 5%	5070-09054-00	D1-D3, D5-D12, D17-D32, D38	Diode 1N4004, 1.0A.
5010-09086-00	R252	Res., 6.8K Ω , 1/4w, 5%	5100-09690-00	BR1-BR5	Bridge, 35A., Rect, 200v
5010-09224-00	R192, R202-R205	Res., 270 Ω , 1/4w, 5%	5131-12725-00	Q10, Q12, Q14, Q16, Q18	Triac BT138E
5010-09314-00	R176, R178, R180, R182, R184, R186, R188, R190	Res., 1.2K Ω , 1/4w, 5%	5162-12422-00	U19	IC ULN 2803 OC-DRL
5010-09324-00	R206	Res., 27K Ω , 1/4w, 5%	5162-12635-00	Q20, Q22, Q24, Q26, Q28, Q30, Q32, Q34, Q36, Q38, Q40, Q42, Q44, Q46, Q48, Q50, Q52, Q54, Q56, Q58, Q63, Q65, Q67, Q69, Q75, Q77, Q79, Q81, Q83-Q90	Transistor, TIP 102
5010-09358-00	R154, R156, R158, R160, R162, R164, R166, R168, R170, R193, R199, R250	Res., 1K Ω , 1/4w, 5%	5194-09055-00	Q9, Q11, Q13, Q15, Q17, Q19, Q21, Q23, Q25, Q27, Q29, Q31, Q33, Q35, Q37, Q39, Q41, Q43, Q45, Q47, Q49, Q51, Q53, Q55, Q57, Q59-Q62, Q71-Q74	Transistor, 2N5401 PNP
5010-09361-00	R104, R107, R110, R113, R116, R119, R122, R125	Res., 220 Ω , 1/2w, 5%	5191-12179-00	Q64, Q66, Q68, Q70, Q76, Q78, Q80, Q82	Transistor, TIP36C PNP
5010-09416-00	R22, R26, R30, R34, R38, R42, R46, R50, R54, R58, R62, R66, R70, R74, R78, R82, R86, R90, R94, R98, R127, R129, R131, R133, R135, R137, R139, R141	Res., 470 Ω , 1/4w, 5%	5192-12428-00	Q91-Q98	Transistor, TIP 107
5010-11079-00	R7, R10, R13, R16, R19	Res., 51 Ω , 1/4w, 5%	5250-12634-00	Q1	Reg LM 323 5v
5010-12427-00	R150-R153, R172-R175	Res., .22 Ω , 1w, 5%	5281-09486-00	U1-U5, U18	IC, 74LS374 8D F/F
5012-12632-00	R224	Res., .12 Ω , 10w, 5%	5281-09487-00	U10-U13	IC, 74LS74 Dual D F/F
5019-10143-00	SR1	SIP 470 Ω , 9R, 10-pin, 5%	5281-10182-00	U9	IC, 74LS240 L/Drv.
5040-08986-00	C4	Cap., 100M, 10v ($\pm 20\%$)	5370-12272-00	U6, U15, U16	IC, LM339 Quad Comp.
5040-09421-00	C2	Cap., 100M, 25v (+50, -10%)	5460-12423-00	Q2	IC, LM7812
5040-09537-00	C8	Cap., 100M, 100v ($\pm 20\%$)	5671-13732-00	LED1, LED4-LED7	Display LED Red
			5701-09652-00	Q1	Thermal Pad
			5705-09199-00	Q2	Heatsink 6030B
			5705-12637-00	Q1	Heatsink 5054
			5705-12638-00	Q10, Q12, Q14, Q16, Q18	Heatsink 5298B
			5733-10450-00	F101-F116	Fuse Holder PC MT3AG
			5791-10862-03	J108, J119, J136	Connector, 3-pin Header .156
			5791-10862-04	J103, J116-J118	Connector, 4-pin Header .156
			5791-10862-05	J104-J106, J112, J123, J124, J128, J129, J131, J132	Connector, 5-pin Header .156
			5791-10862-06	J107	Connector, 6-pin Header .156
			5791-10862-07	J101, J109, J114	Connector, 7-pin Header .156
			5791-10862-09	J102, J122, J125, J127, J130, J137, J138	Connector, 9-pin Header .156
			5791-10862-11	J120, J121	Connector, 11-pin Header .156
			5791-10862-12	J115	Connector, 12-pin Header .156
			5791-10862-13	J126	Connector, 13-pin Header .156
			5791-13830-05	J111	Connector, 5-pin Header
			5791-13830-09	J133-J135	Connector, 9-pin Header
			5791-12516-00	J113	34 Hen 2x17 STR
			5824-09248-00	TP1-TP8	Test Point #1502-1
			5041-09163-00	C9	Cap., 2.2MF Tant
			5730-09071-00	F114	Fuse, 8A, 32v
			5731-09432-00	F112	Fuse, S-B, 7A., 250v
			5731-09651-00	F106-F111, F113	Fuse, S-B, 5A., 250v
			5731-10356-00	F101-F105, F116	Fuse, S-B, 3A., 250v
			5730-09797-00	F115	Fuse, S-B, 3/4A., 250v
			5705-12698-00		Heatsink #62365

A-12697-3 WPC Power Driver Assembly

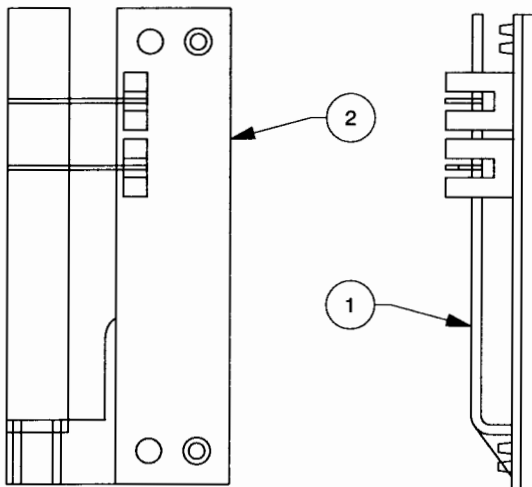


A-17051-1 Coin Door Interface PCB Assembly



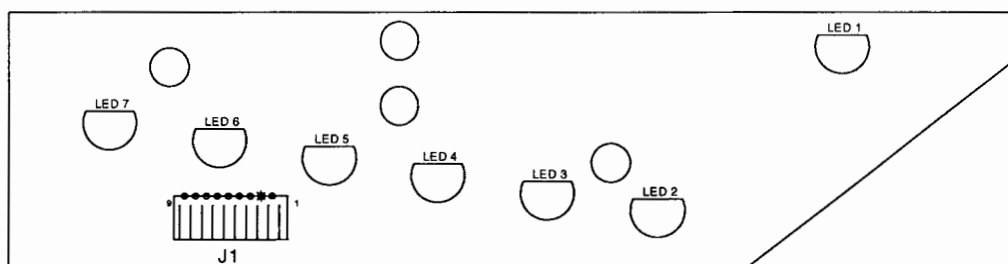
Part Number	Designator	Description
5791-10862-03	J8	Connector, 3-pin Header Str Sq.
5791-10862-05	J2, J9	Connector, 5-pin Header Str Sq.
5791-10862-11	J1, J7	Connector, 11-pin Header Str Sq.
5791-10862-12	J3	Connector, 12-pin Header Str Sq.
5791-10862-13	J5	Connector, 13-pin Header Str Sq.
5791-10862-15	J6	Connector, 15-pin Header Str Sq.
5645-09025-00	SW5	Switch DIP 8 Pos.
5070-09054-00	D1 - D11	Diode, 1N4004, 1.0A.
5791-11000-10	J4	Connector, 10-pin Header Str Sq.

A-17316 Flipper Opto PCB Assembly



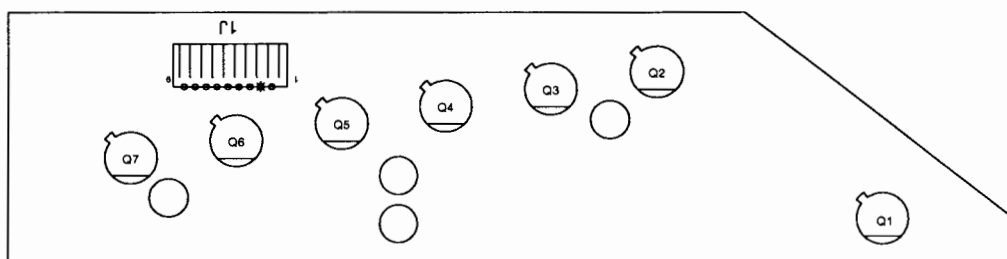
Item	Part Number	Description
1.	03-9001	Interrupter Flip-Opto
2.	A-16384	Flipper Opto Sw. Assy.
	5010-08930-00	Res., 470Ω, ½w, 5%
	5490-12451-00	Opto Inter Lg. 10mA.
	5791-12462-07	Connector, 7-pin Header

A-18617 Trough 7 IRED PCB Assembly



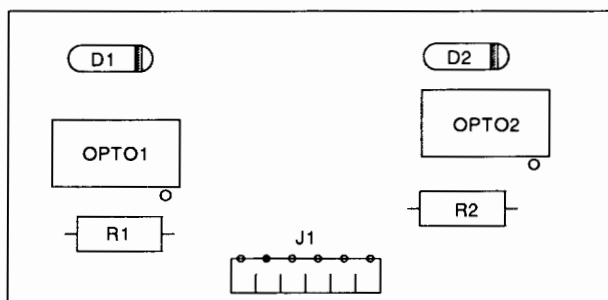
Part No.	Designator	Description
5671-12731-00	LED1 - LED7	Infra Red Diode
5791-12622-09	J1	Connector, 9-pin Header Sq.

A-18618 Trough 7 IR TSTR PCB Assembly



Part No.	Designator	Description
5163-14114-00	Q1 - Q7	Infra Red Photo Transistor
5791-12622-09	J1	Connector, 9-pin Header Sq.

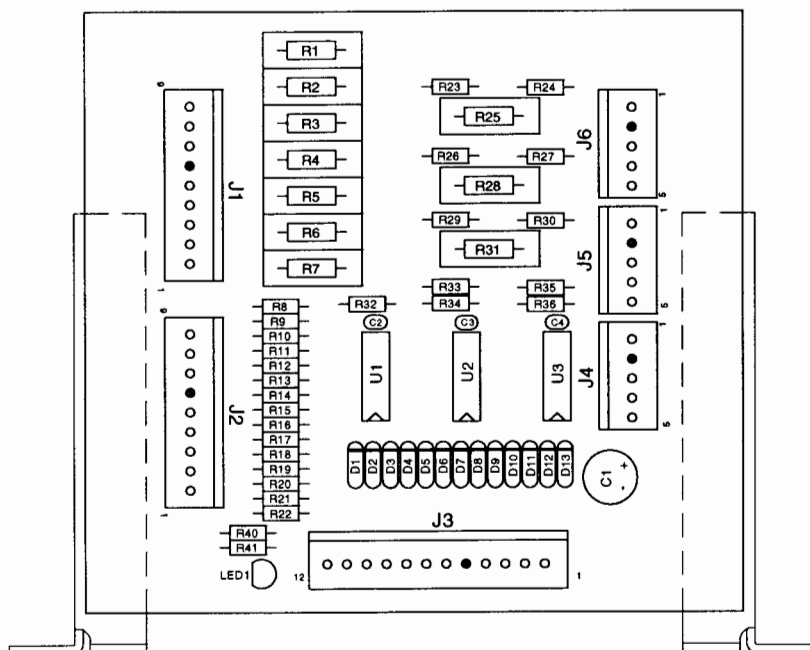
A-18821 Opto Track Limit PCB Assembly



Part Number	Designator	Description
5791-12622-06	J1	Connector, 6-pin Header
5010-08930-00	R1, R2	Res., 470Ω, 1/2w, 5%
5070-09054-00	D1, D2	Diode, 1N4004, 1.0A.
5490-12451-00	OPTO1, OPTO2	Opto Integrated, 10mA.

A-18159-1

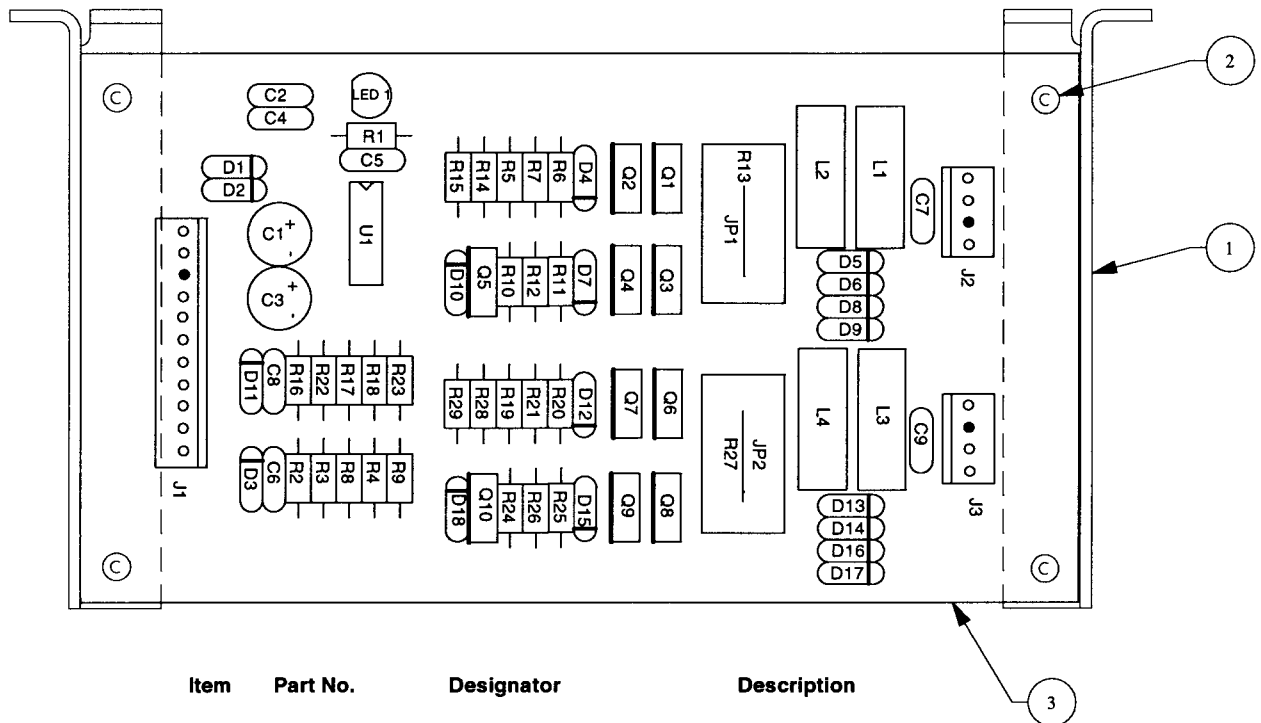
10-Opto Switch PCB & Bracket Assembly



Item	Part No.	Designator	Description
1.	A-18159	-	10-Opto PCB Assembly
	5040-10974-00	C1	Cap., 100 μ Fd, 35v
	5043-08980-00	C2-C4	Cap., 0.01 μ Fd, 50v
	5671-13732-00	LED1	Display Red LED1
	5370-12272-00	U1-U3	I.C. LM339, Quad Compar
	5070-09054-00	D1-D13	Diode, 1N4004, 1.0A.
	5010-12928-00	R1-R7, R25, R28, R31	Res., 270 Ω , 2w, 5%
	5010-09999-00	R8-R21, R23, R24, R26, R27, R29, R30	Res., 2K Ω , 1/4w, 5%
	5010-09314-00	R22	Res., 1.2K Ω , 1/4, 5%
	5010-09162-00	R32, R35, R39-R41	Res., 100K Ω , 1/4w, 5%
	5010-08774-00	R33, R34, R36	Res., 22K Ω , 1/4w, 5%
	5010-09034-00	R37, R38	Res., 10K Ω , 1/4w, 5%
	5791-10862-12	J3	Connector, 12-pin Header
	5791-10862-09	J1, J2	Connector, 9-pin Header
	5791-10862-05	J4-J6	Connector, 5-pin Header
2.	01-10756	-	Bracket
3.	07-6688-18N	-	Rivet, 3/16 X 1/8"

A-19242

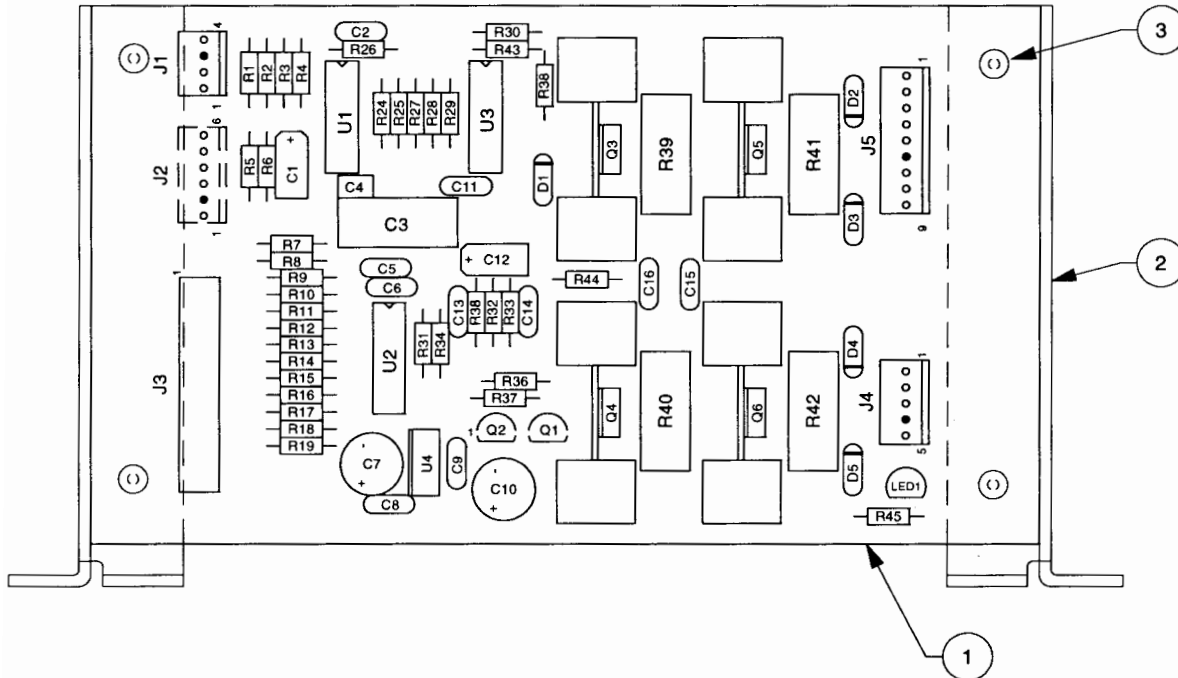
Dual H-Drive Motor Controller & Bracket Assy.



Item	Part No.	Designator	Description
1.	01-10756	-	Bracket
2.	07-6688-18N	-	Rivet, 3/16 X 1/8"
3.	A-19159	-	Dual H-Driver PCB Assy.
	5040-10974-00	C1, C3	Cap., 100μFd, 35v, Rad.
	5043-08980-00	C2, C4-C9	Cap., 0.01μFd, 50v, Ax.
	5010-09999-00	R1	Res., 2KΩ, 1/4w, 5%
	5010-08991-00	R2, R3, R5, R8, R10, R16, R17, R19, R22, R24	Res., 4.7KΩ, 1/4w, 5%
	5010-09034-00	R4, R6, R7, R9, R11, R12, R18, R20, R21, R23, R25, R26	Res., 10KΩ, 1/4w, 5%
	5070-09054-00	D1-D18	Diode, 1N4004, 1.0A.
	5162-12635-00	Q1, Q3, Q6, Q8	Trans., TIP102, NPN
	5192-12428-00	Q2, Q4, Q7, Q9	Trans., TIP107, PNP
	5370-12272-00	U1	IC, LM339, Quad
	5671-13732-00	LED1	LED Display RED
	5551-09822-00	L1-L4	Inductor, 4.7μH, 3A
	5010-09534-00	JP1, JP2	Jumper, 0Ω
	5791-12273-11	J1	Connector, 11-pin Header
	5791-12273-04	J2, J3	Connector, 4-pin Header

A-19243

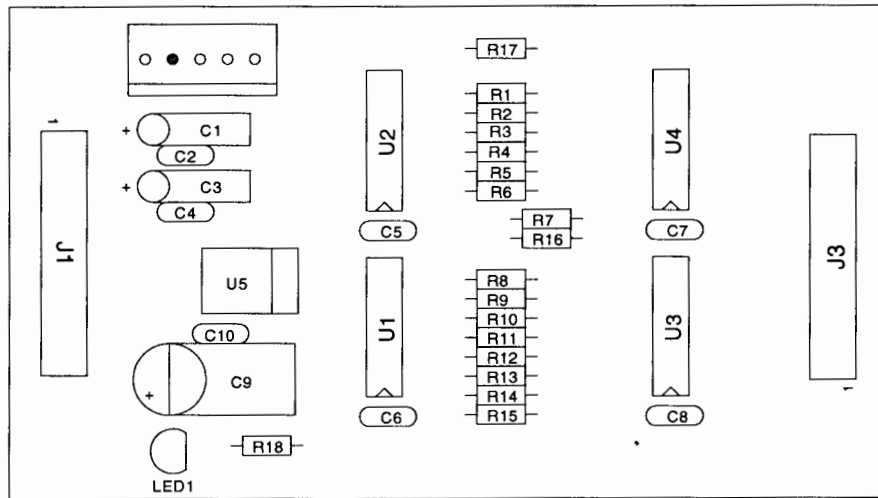
Motor Driver Slave Board & Bracket Assembly



Item	Part No.	Designator	Description
1.	A-18533		Motor Driver Slave Board Assy.
	5040-12808-00	C1, C12	Cap., 10µfd, 35v, El. Ax.
	5040-10974-00	C7, C10	Cap., 100µfd, 50v, El. Rad.
	5048-10994-00	C8, C9, C13-C16	Cap., 0.33µfd, 50v, Cer. Ax.
	5045-14316-00	C3	Cap., 0.47µfd, 63v, 5%, Ax.
	5048-14319-00	C4	Cap., 0.1µfd, 50v, 5%, Ax.
	5043-08996-00	C2, C5, C6, C11	Cap., 0.1µfd, 50v, 20%, Ax.
	5370-12960-00	U1, U3	IC, LM324, Quad Op-Amp
	5371-12727-00	U2	IC, AD7524, DAC
	5250-09157-00	U4	Reg, 7805, 5v, 1.0A.
	5070-09054-00	D2-D5	Diode, 1N4004, 1.0A.
	5160-10269-00	Q1, Q2	Trans., 2N3904, NPN
	5162-12635-00	Q3-Q6	Trans., TIP102, NPN Darl.
	5075-14321-00	D1	Zener, 1N5225B, 3v, 1/2w
	5671-13732-00	LED1	LED Display RED
	5013-14135-00	R3-R6, R9, R25	Res., 10KΩ, ¼w, 1%
	5013-14317-00	R24	Res., 12.1KΩ, ¼w, 1%
	5013-14136-00	R7, R8	Res., 20KΩ, ¼w, 1%
	5013-14137-00	R31	Res., 619Ω, ¼w, 1%
	5010-12065-00	R2	Res., 120KΩ, ¼w, 5%
	5010-08984-00	R36, R37	Res., 1KΩ, ¼w, 5%
	5010-09034-00	R1, R10-R19, R27-R29, R43	Res., 10KΩ, ¼w, 5%
	5010-09224-00	R45	Res., 270Ω, ¼w, 5%
	5010-09162-00	R26, R38	Res., 100KΩ, ¼w, 5%
	5010-09160-00	R30, R32-R35, R44	Res., 220Ω, ¼w, 5%
	5012-14318-00	R39, R42	Res., 0.51Ω, 5w, 5%
	5791-10862-05	J4	Connector, 5-pin Header
	5791-10862-09	J5	Connector, 9-pin Header
	5791-10850-00	J3	Connector, 26-pin Header
	5791-13830-04	J1	Connector, 4-pin Header
	5705-12464-00	Q3-Q6	Heatsink, w/pins
	4004-01005-06	Q3-Q6	Mach. Screw, 4-40x3/8"
	4404-01119-00	Q3-Q6	Nut, 4-40, SNUT
2.	01-10756	-	Bracket
3.	07-6688-18N	-	Rivet, 3/16 x 1/8"

A-18532

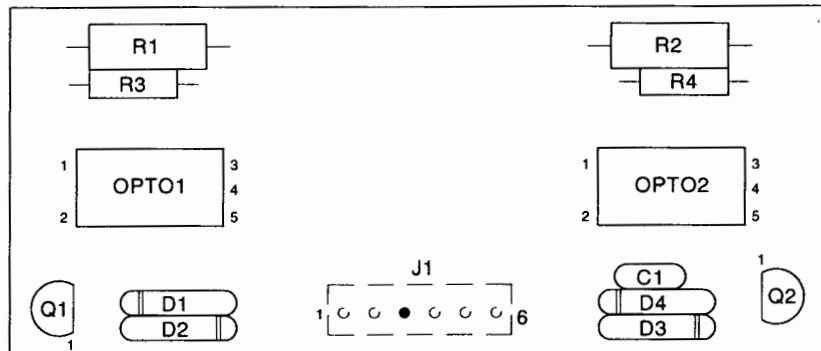
Motor Driver Master Board Assembly



Part No.	Designator	Description	Part No.	Designator	Description
5040-12988-00	C1, C3	Cap., 10 μ Fd, 35v, Rad.	5010-09358-00	R1-R6, R8-R16	Res., 1K, 1/4w, 5%
5048-12036-00	C2, C4, C10	Cap., 0.22 μ Fd, 50v, Ax.	5010-09001-00	R7	Res., 330, 1/4w, 5%
5043-08996-00	C5-C8	Cap., 0.1 μ Fd, 50v, Ax.	5010-09034-00	R17	Res., 10K, 1/4w, 5%
5040-09421-00	C9	Cap., 100 μ Fd, 25v, Rad.	5010-09356-00	R18	Res., 820, 1/4w, 5%
5281-09486-00	U1	IC, 74LS374, Oct. Latch	5791-10850-00	J1, J3	Connector, 26-pin Header
5281-10043-00	U2	IC, 74LS175, Quad FF	5791-10862-05	J2	Connector, 5-pin Header
5162-12422-00	U3, U4	IC, ULN2803, Array Drv	5671-13732-00	LED1	LED Display Red
5460-12423-00	U5	Reg, 7812, +12v			

A-19141

Opto Board Assembly



Item	Part Number	Designator	Description
1.	A-18822	-	Opto Track Encoder PCB
	5791-13830-06	J1	Connector, 6-pin Header
	5010-09061-00	R1, R2	Res., 680 Ω , 1/2w, 5%
	5070-08919-00	D1, D4	Diode, 1N4004, 1.0A.
	5490-14327-00	OPTO1, OPTO2	Opto Integrated, 10mA.
	5160-10269-00	Q1, Q2	Trans., 2N3904, NPN
	5010-08998-00	R3, R4	Res., 2.2K, 1/4w, 5%
	5043-08996-00	C1	Cap., 0.1 μ Fd, 50v, Ax.
2.	01-13160	-	Bracket
3.	07-6688-18	-	Rivet, 3/16 x 1/8"
4.	4700-00003-00	-	Flatwasher, 1/8 x 9/32 x 21ga.



A-15849-L Flipper Assembly

(Parts listed replace same items of A-15849-L-2)

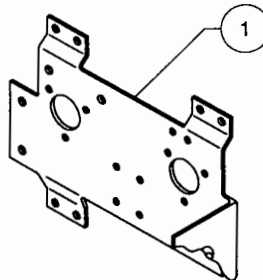
Item	Part No.	Description
12.	FL-11629	Flipper Coil, Red

A-19223-R Flipper Assembly

Item	Part No.	Description	Item	Part No.	Description
1.	A-19262	Flipper Bracket Sub-Assy.	18.	A-15848-R	Crank Link Assembly, Right
2.	SW-1A-194	Switch Assembly	a)	A-17050-R	Flipper Crank Assembly, Right
3.	4701-00002-00	Lockwasher, #6 Split	b)	A-15847	Flipper Link Assembly
4.	4105-01019-10	Sh. Metal Screw, #5 x 5/8"	c)	02-4676	Link Spacer Bushing
5.	4008-01079-05	Mach. Screw, 8-32 x 5/16"	d)	4010-01086-14	Cap Screw, 10-32 x 7/8"
6.	4701-00003-00	Lockwasher #8 Split	e)	4700-00023-00	Flatwasher, 5/8 x 13/64 x 16ga.
7.	01-9375	Switch Mounting Bracket	f)	4701-00004-00	Lockwasher #10 Split
8.	20-6516	Speednut, Tinnerman	g)	4410-01132-00	Nut, 10-32 ESN
9.	4010-01066-06	Cap Screw, 10-32 x 3/8"	19.	23-6577	Bumper Plug, 5/8"
10.	4701-00004-00	Lockwasher #10 Split	20.	03-7568	Flipper Bushing
11.	A-12390	Flipper Stop Assembly			
12.	FL-11629	Flipper Coil, Blue			
a)	03-7066-5	Coil Tubing			
13.	01-7695	Solenoid Bracket			
14.	4006-01017-04	Mach. Screw, 6-32 x 1/4"			
15.	10-364	Spring			
16.	4006-01005-06	Mach. Screw, 6-32 x 3/8"			
17.	4406-01117-00	Nut, 6-32 Hex			

Associated Parts:

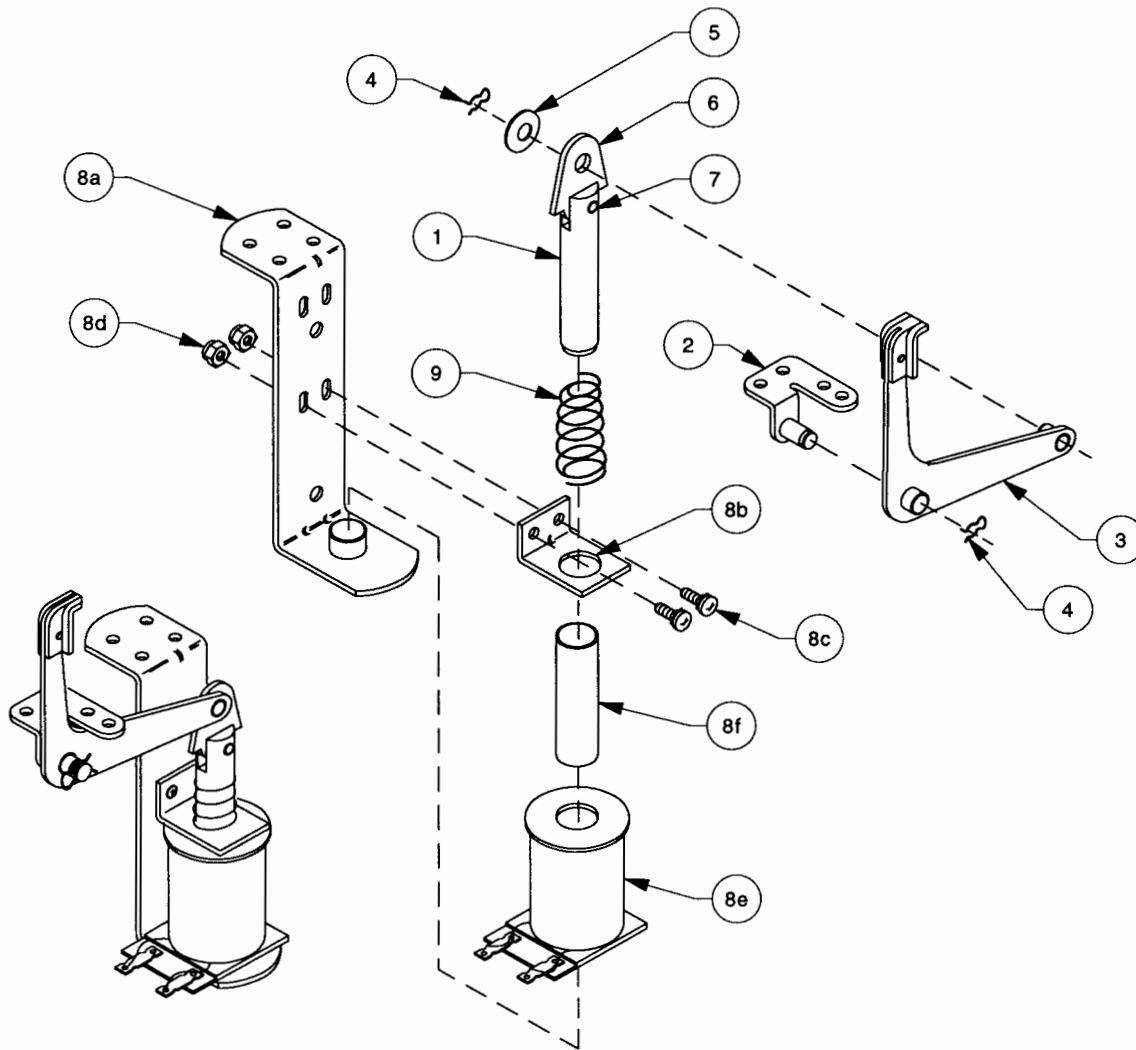
21.	23-6695	Flipper Rubber Ring, Red
22.	20-9250-29	Flipper & Shaft



Flipper Notes...

- Each Flipper Assembly is mounted beneath the playfield, in conjunction with the Plastic Flipper & Shaft, and Flipper Rubber on the upper side of the playfield.
- With the flipper, in the non-activated position, the E.O.S. Switch contacts must have a gap of .062 ($\pm$.015) inch. When flipper is activated switch must close.
- Any adjustment of the E.O.S. switch must be made at a minimum distance of 0.25 inch from the switch body.
- Longer blade of E.O.S. switch must be made straight. Gap adjustment is done by adjusting shorter blade.
- All moving elements of the assembly must operate freely without any evidence of binding.
- Apply Loctite™ 245 when reattaching screws to the Flipper Stop Assembly, the Solenoid Bracket, and the Flipper Bushing.

A-17811 Kicker Arm (Slingshot) Assembly



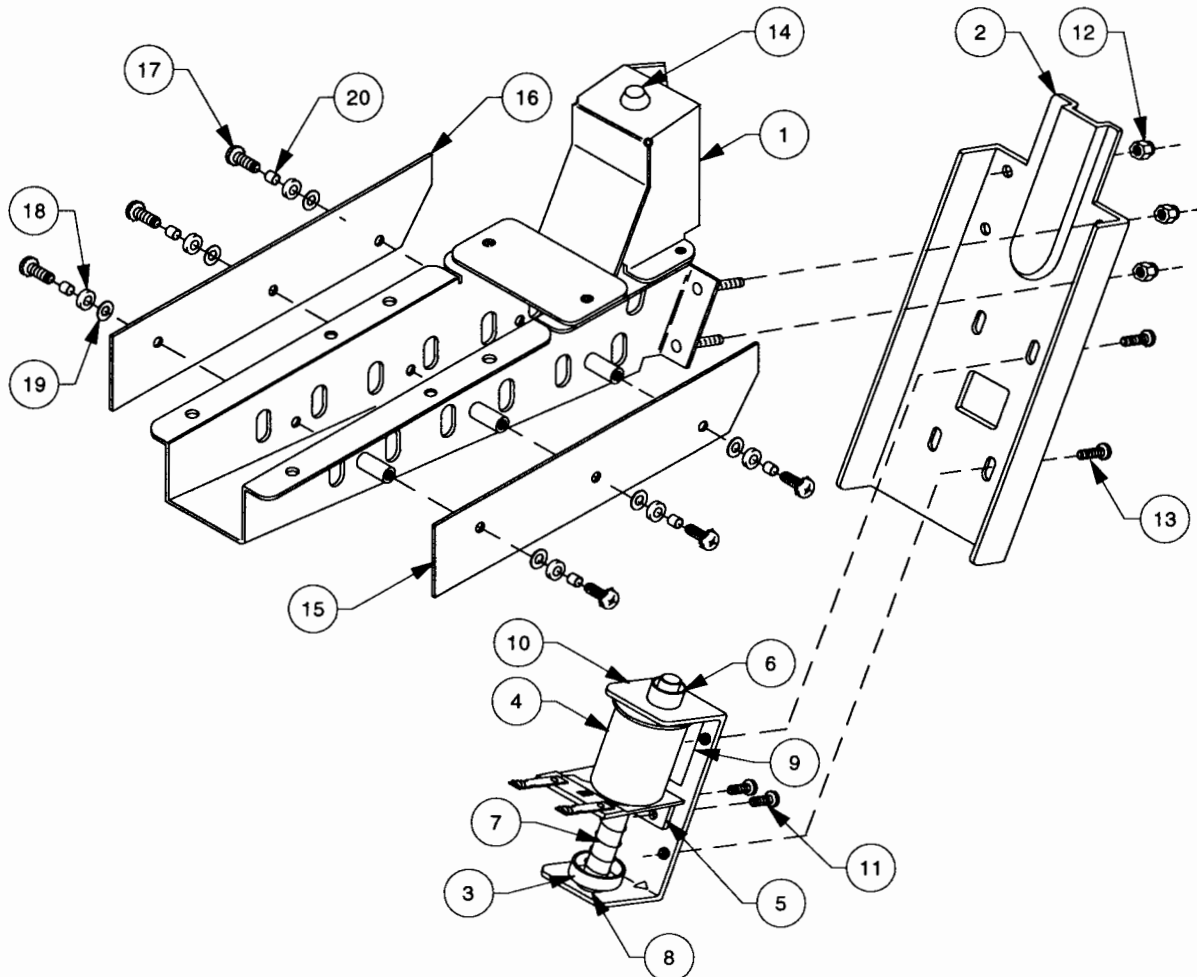
Associated Parts for Right & Left Kickers:

Item	Part No.	Description
1.	02-2364	Coil Plunger
2.	A-17810	Mounting Bracket Assembly
3.	A-12664	Kicker Crank Assembly
4.	12-6227	Hairpin Clip
5.	4700-00030-00	Flatwasher, 17/64 x 1/2 x 15ga.
6.	03-8085	Armature Link
7.	20-8716-5	Roll Pin, 1/8 x 7/16"

Item	Part No.	Description
8.	B-9362-R-3 B-9362-L-2	Coil & Bracket Assy., Left Coil & Bracket Assy., Right
a)	A-17808	Bracket & Stop Assembly
b)	01-8-508-S	Coil Retaining Bracket
c)	4006-01017-06	Mach. Screw, 6-32 x 3/8"
d)	4406-01119-00	Nut, 6-32 ESN
e)	AE-26-1200	Coil Assembly
f)	03-7066	Coil Tubing
9.	10-128	Spring

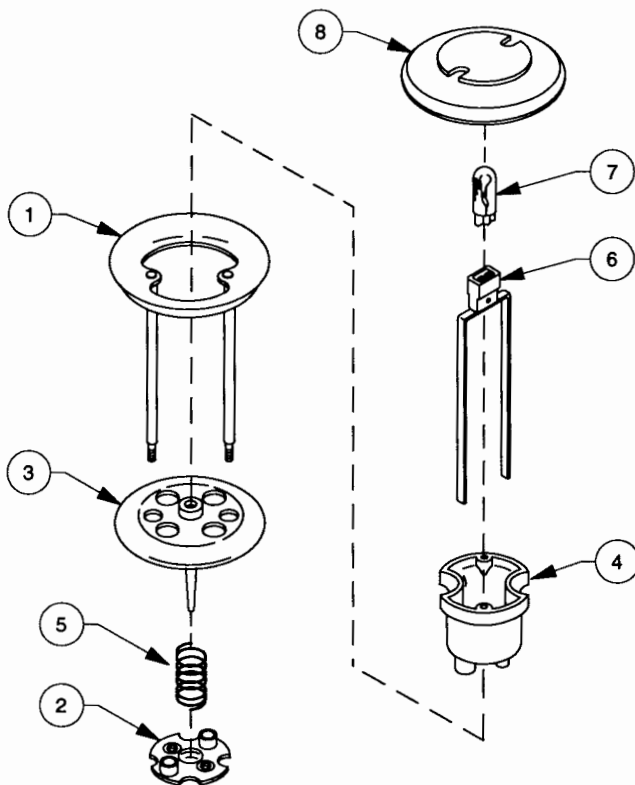
A-18753

Outhole Ball Trough Assembly



Item	Part No.	Description	Item	Part No.	Description
1.	A-16809-2	Ball Trough Welded Assy.	11.	4008-01017-05	Mach. Screw, 8-32 x 5/16"
2.	01-11587	Ball Trough Front	12.	4408-01119-00	Nut 8-32 ESN
3.	A-6306-2	Bell Armature Assembly	13.	4008-01017-06	Mach. Screw, 8-32 x 3/8"
4.	AE-26-1500	Coil Assembly	14.	23-6702	Bumper Plug
5.	01-8-508-T	Solenoid Assembly	15.	A-18617	Trough 7 IRED PCB Assembly
6.	03-7067-5	Coil Tubing	16.	A-18618	Trough 7 IR TSTR PCB Assy.
7.	10-135	Spring	17.	4006-01003-10	Mach. Screw, 6-32 x 5/8" SEMS
8.	23-6420	Rubber Grommet	18.	23-6626	Grommet
9.	03-8523	Insulator	19.	4700-00004-00	Flatwasher, 9/64 x 7/16 x 21ga.
10.	01-11586	Coil Mounting Brkt. (Bell)	20.	02-4975	Bushing

B-9414-3 Jet Bumper Assembly

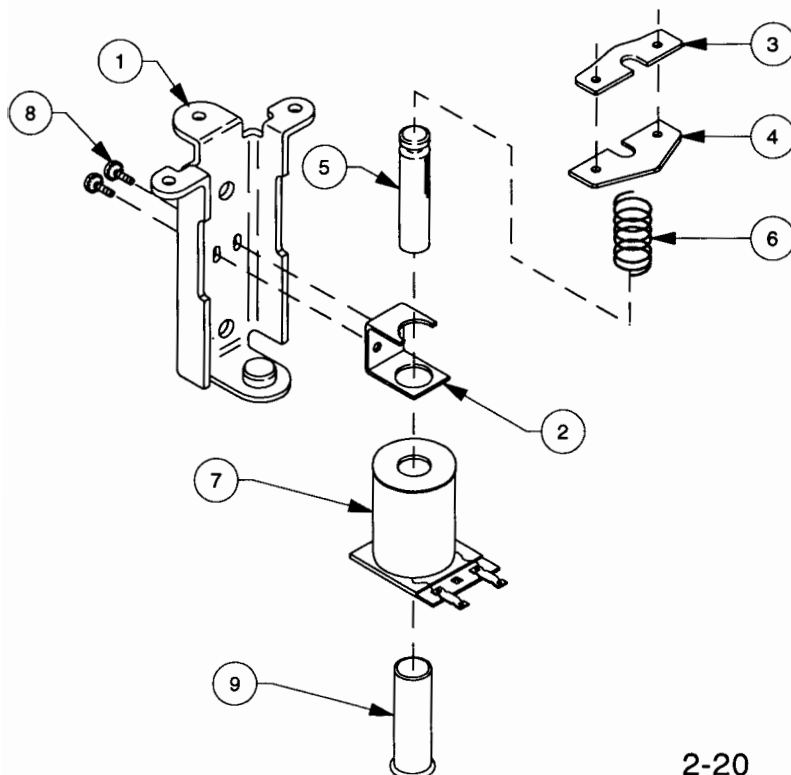


Item	Part No.	Description
1.	A-4754	Bumper Ring Assembly
2.	03-6009-A5	Bumper Base, White
3.	03-6035-4	Bumper Wafer, Red
4.	03-7443-5	Bumper Body, White
5.	10-7	Spring
6.	24-8776	Socket-Wedge Base
7.	24-8768	Bulb #555 (6.3v., 0.25A.)

Associated Part:

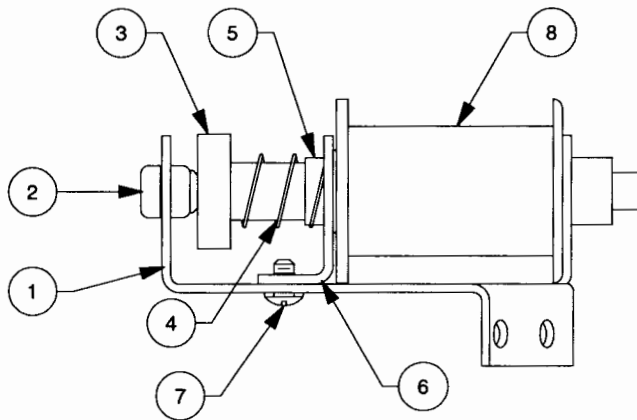
8.	03-8254-9	Jet Bumper Cap
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A-9415-2 Jet Bumper Coil Assembly



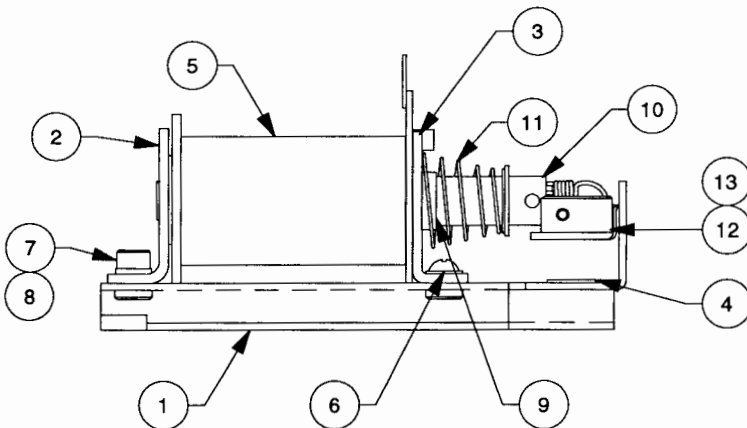
Item	Part No.	Description
1.	B-7417	Bracket & Stop Assembly
2.	01-1747	Coil Retaining Bracket
3.	01-5492	Armature Link, Steel
4.	01-5493	Armature Link, Bakelite
5.	02-3406-1	Coil Plunger
6.	10-326	Armature Spring
7.	AE-26-1200	Coil Assembly
8.	4006-01017-04	Mach. Screw, 6-32 x 1/4"
9.	03-7066	Coil Tubing

A-15368-1 Eject Assembly



Item	Part No.	Description
1.	01-10652	Bracket
2.	23-6240	Rubber Grommet
3.	A-15371	Plunger Assembly
4.	10-135	Spring
5.	03-7067-5	Coil Tubing
6.	01-8-508-T	Solenoid Bracket
7.	4008-01017-04	Mach. Screw, 8-32 x 1/4"
8.	AE-30-2000	Coil Assembly

A-17241 Ramp Diverter Assembly

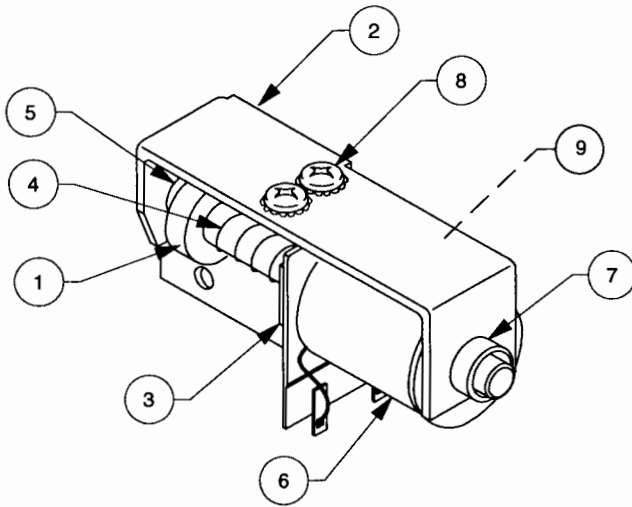


Item	Part No.	Description
1.	01-11957	Mounting Bracket
2.	A-10821	Flipper Stop Bracket
3.	01-7695	Solenoid Bracket
4.	20-8790	Nyliner Bearing
5.	FL-11753-1	Flipper Coil Assy.
6.	4006-01017-04	Mach. Screw, 6-32 x 1/4"
7.	4010-01066-06	Mach. Screw, 10-32 x 3/8"
8.	4701-00004-00	Lockwasher #10 Split
9.	03-7066-5	Coil Tubing
10.	A-16636	Diverter Plunger Assembly
11.	10-303	Spring
12.	A-14185	Drive Arm Assembly
13.	4010-01169-04	Set Screw, 10-32 x 1/4"

Associated Parts: (Not Shown)

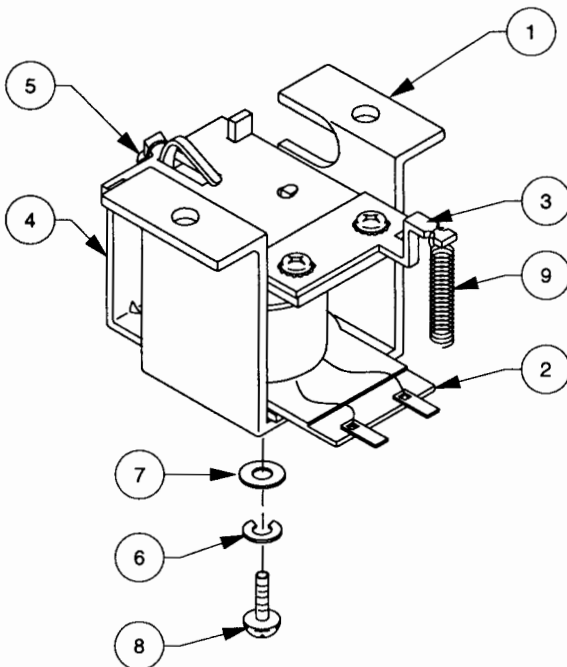
14.	A-18977	Diverter Flag Rivet Assy.
15.	20-8712-25	E-Ring, 1/4" Shaft
16.	4700-00072-00	Flatwasher, 17/64 x 1/2"

B-11873 Kicker Bracket Assembly



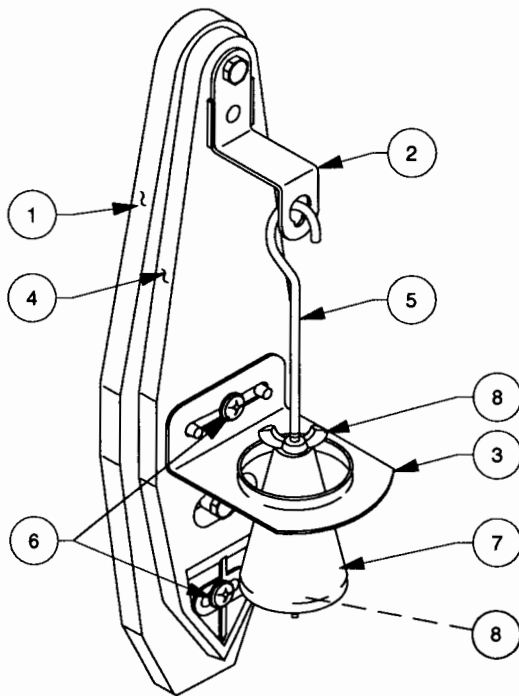
Item	Part No.	Description
1.	A-6306-2	Bell Armature Assembly
2.	01-11273	Mtg. Kicker Bracket Assembly
3.	01-8-508-T	Solenoid Bracket
4.	10-135	Solenoid Spring
5.	23-6420	Rubber Grommet
6.	AE-23-800	Coil Assembly
7.	03-7067-5	Coil Tubing
8.	4008-01017-05	Mach. Screw, #8-32 x 5/16"
9.	03-8523	Insulator

A-17796 Ball Gate Actuator Assembly



Item	Part No.	Description
1.	01-12348	Ball Gate Coil Bracket
2.	A-14406	Coil Assembly
3.	A-11146	Armature Assembly
4.	A-6892	Frame & Eyelet Assembly
5.	10-120	Spring
6.	4701-00003-00	Lockwasher, #8 Split
7.	4700-00089-00	Flatwasher, 11/64 x 7/16 x 16ga.
8.	4008-01021-07	Mach. Screw, 8-32 x 7/16"
9.	10-194	Extension Spring

A-15361 Tilt Mechanism Assembly

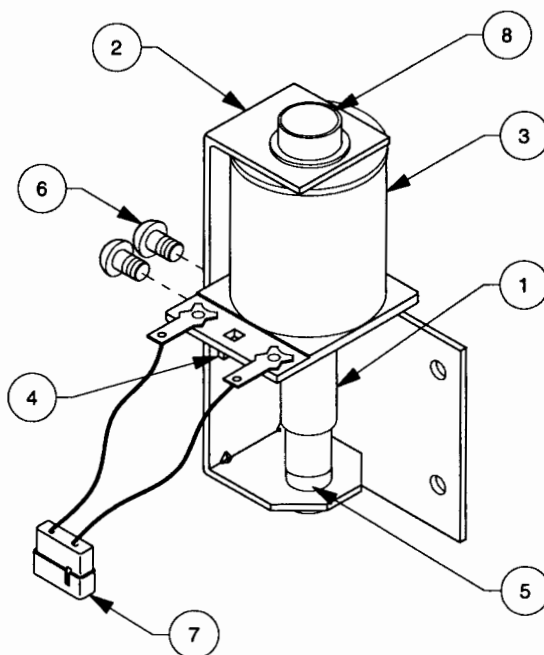


Item	Part No.	Description
1.	A-15360	Mount Plate, Tilt Mech.
2.	01-3444	Bracket, Tilt Upper
3.	01-3445	Bracket, Tilt Lower
4.	03-8668	Pendulum, Tilt Mech.
5.	12-6231	Wire, Plum Bob
6.	4006-01113-06	Mach. Screw, 6-32 x 3/8"

Associated Parts:

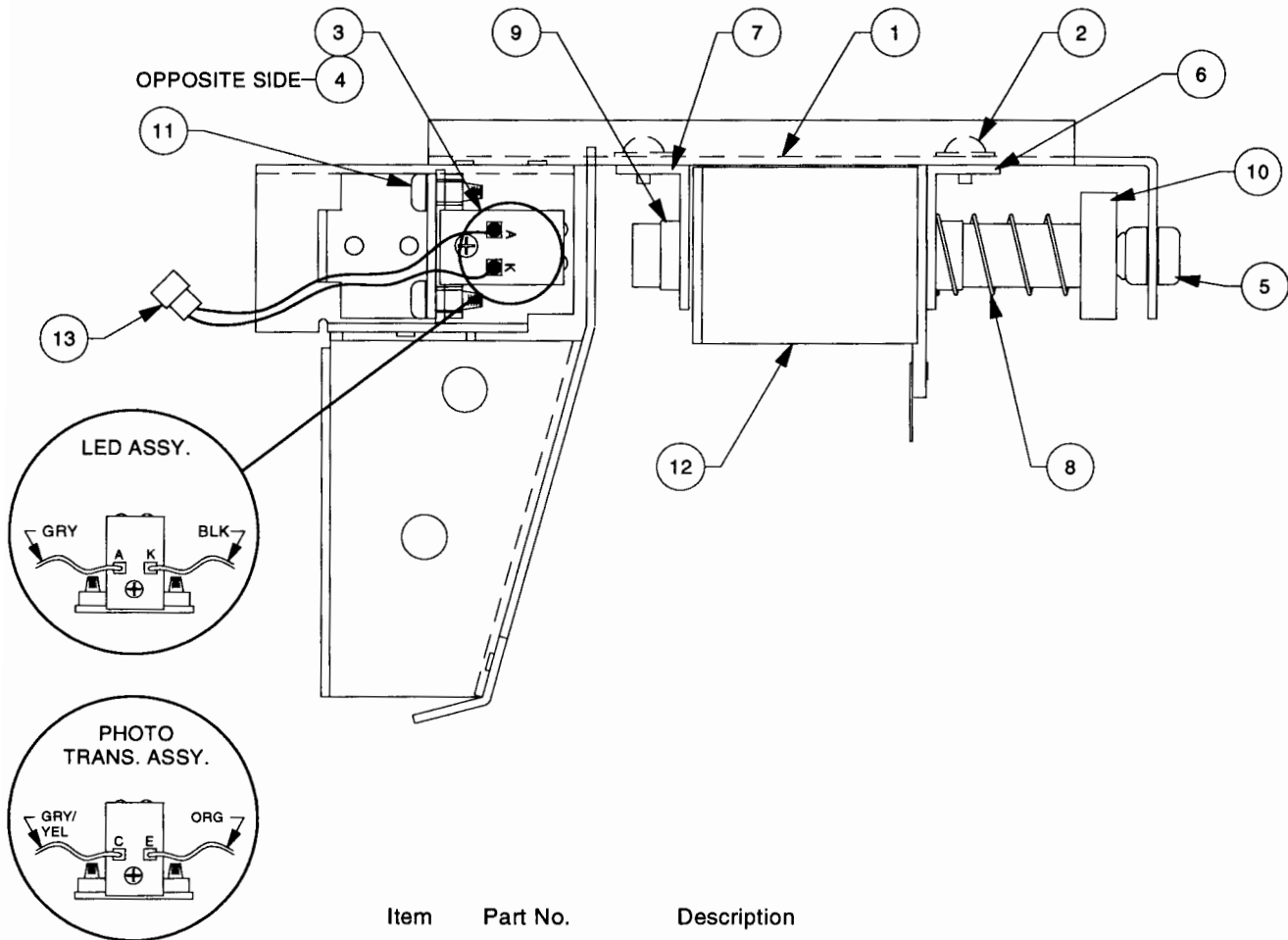
7.	20-6502-A	Plumb Bob
8.	4406-01120-00	Wing Nut (2)

B-10686-1 Knocker Assembly



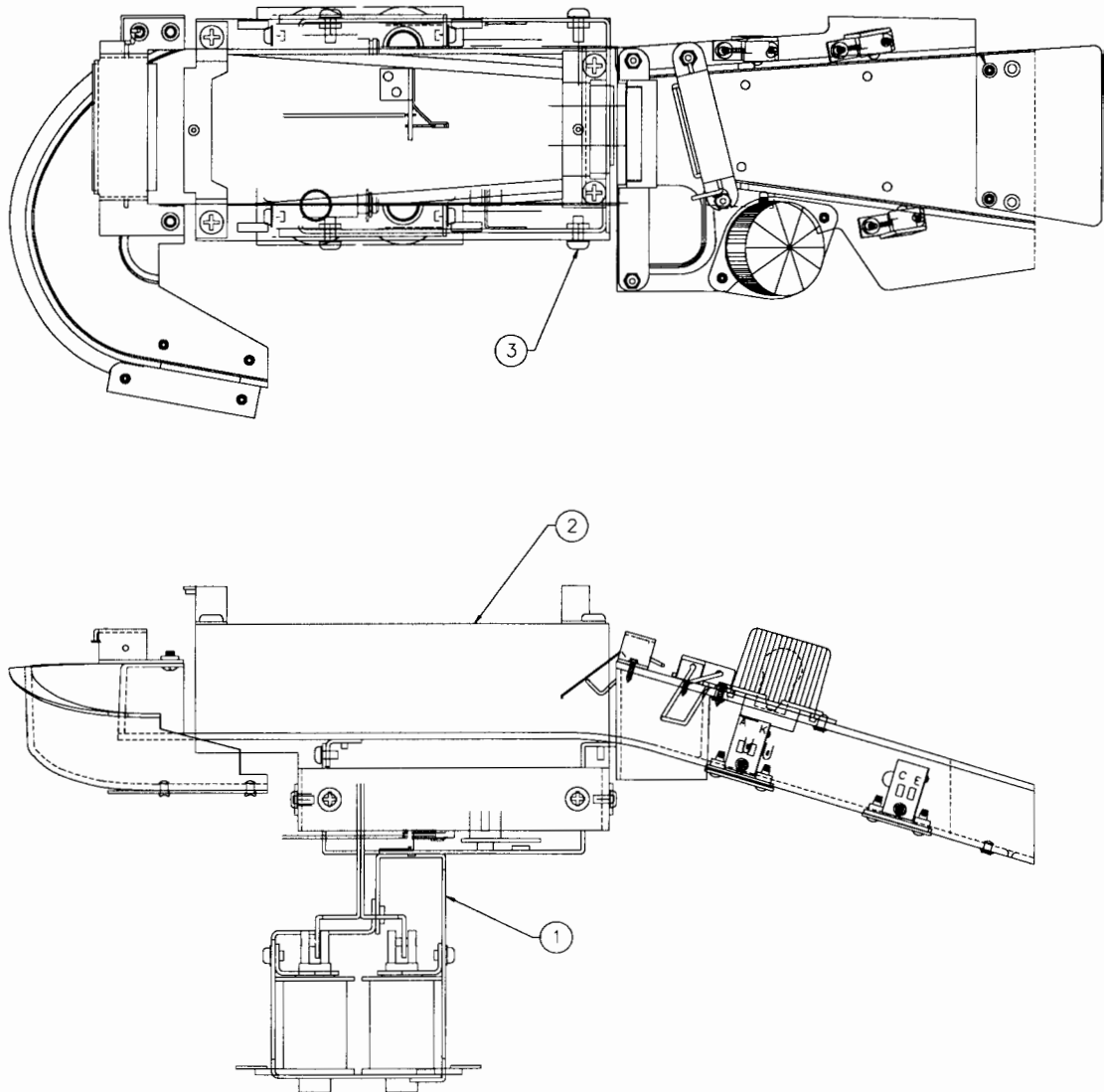
Item	Part No.	Description
1.	A-5387	Coil Plunger Assembly
2.	01-11273	Mounting Bracket Assy.
3.	AE-23-800	Coil Sub-Assembly
4.	01-8-508-T	Coil Retaining Bracket
5.	23-6420	Rubber Grommet
6.	4008-01017-04	Mach. Screw, 8/32 x 1/4"
7.	H-11835	Knocker Cable
8.	03-7067-5	Coil Tubing

A-19005 Popper Assembly



Item	Part No.	Description
1.	A-18991	Popper Assy., Weld
2.	4008-01017-03	Mach. Screw, 8-32 x 3/16"
3.	A-16908	LED Assembly
4.	A-16909	Photo Transistor Assembly
5.	23-6420	Rubber Grommet
6.	01-9794	Mounting Bracket
7.	01-8-508-T	Coil Retainer Bracket
8.	10-135	Spring
9.	03-7067-5	Coil Tubing
10.	A-17767	Bell Armature Assembly
11.	4106-01013-06	Sh. Metal Screw, #6 x 3/8"
12.	AE-23-800	Coil Assembly
13.	A-17609-8	Cable Harness

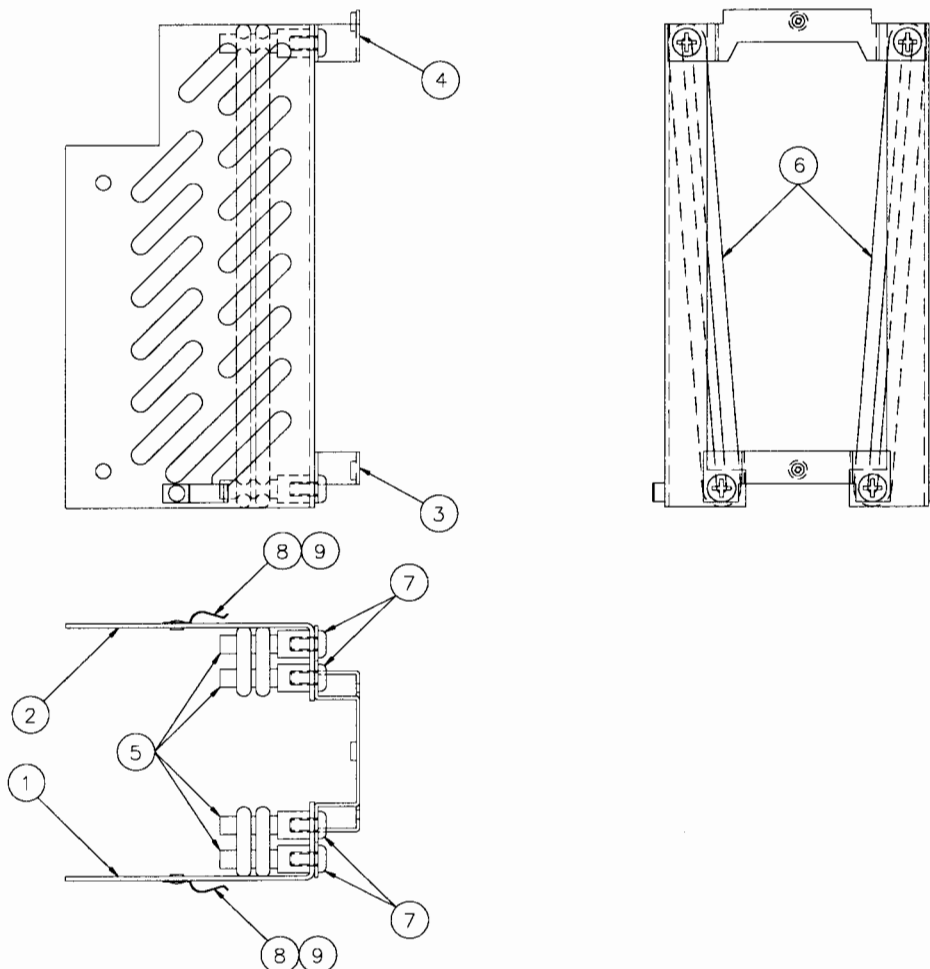
A-19140 Engine & Ramp Assembly



Item	Part No.	Description
1.	A-19139	Ramp Assembly No. 5 (see page 2-27)
2.	A-19138	Engine Assembly No. 4 (see page 2-26)
3.	4010-01006-05	Mach. Screw, #10-32 x 5/16"

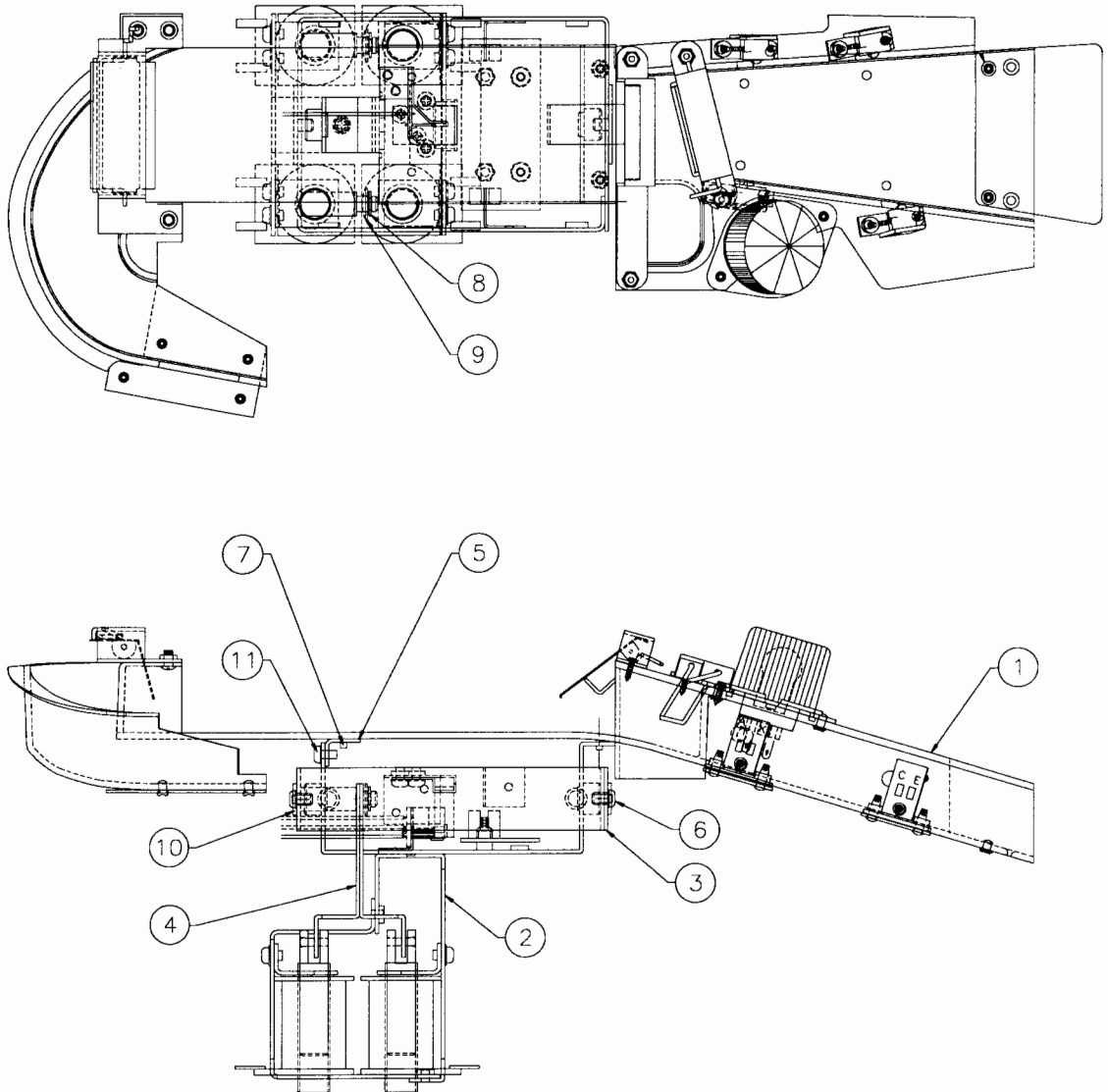
A-19138

Engine Assembly No. 4



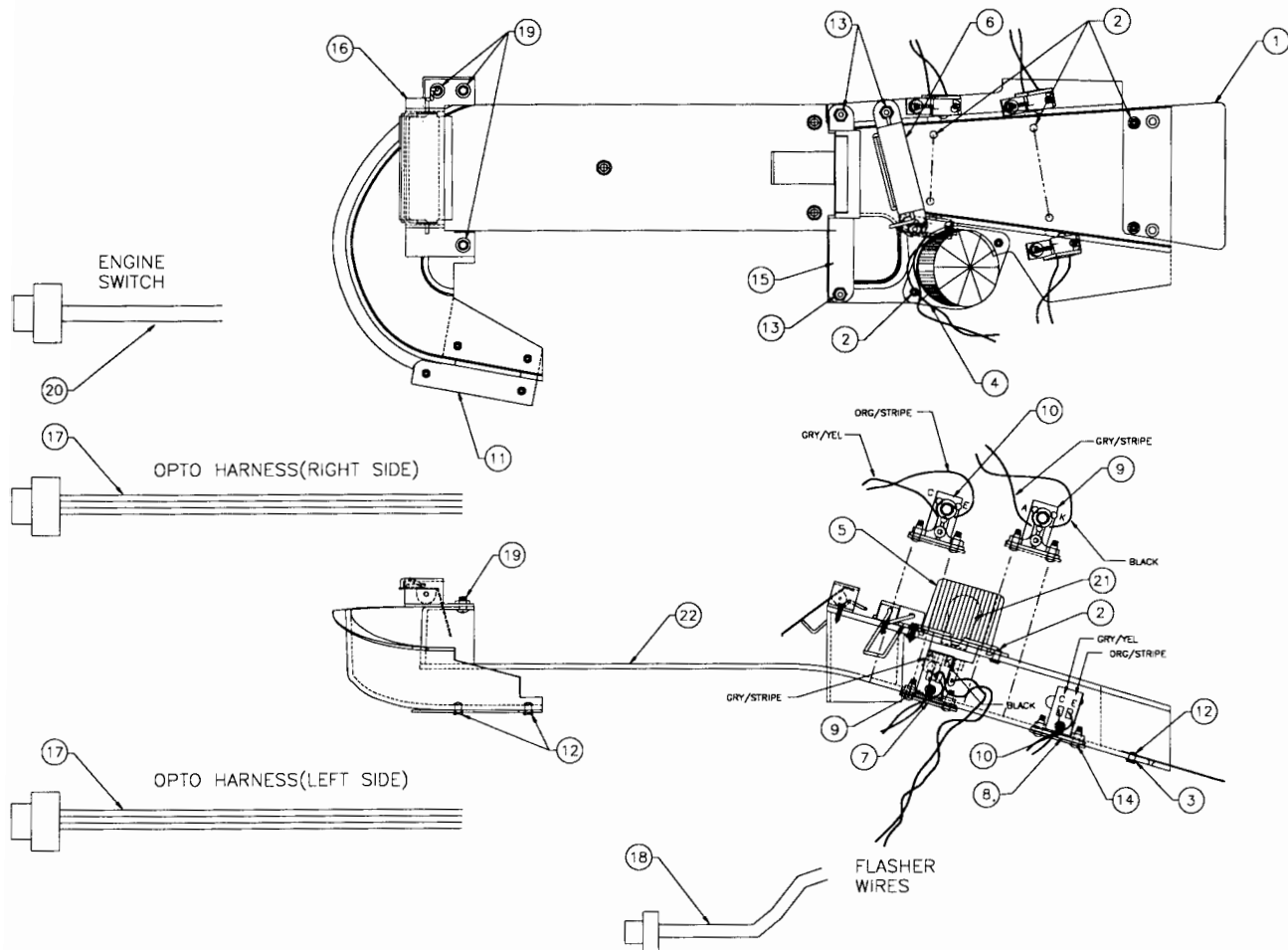
Item	Part No.	Description
1.	01-13176-1	Engine Head, Right
2.	01-13176-2	Engine Head, Left
3.	A-19017	Front Tie Bar, Engine
4.	A-19018	Rear Tie Bar, Engine
5.	02-5136	Post, Engine Mount
6.	23-6306	Ring, White Rubber 2-1/2" I.D.
7.	4010-01006-05	Mach. Screw, #10-32 x 5/16"
8.	01-13287	Retaining Clip
9.	07-6688-17N	Rivet, 5/32 x 1/8"

A-19139 Engine & Ramp Assembly



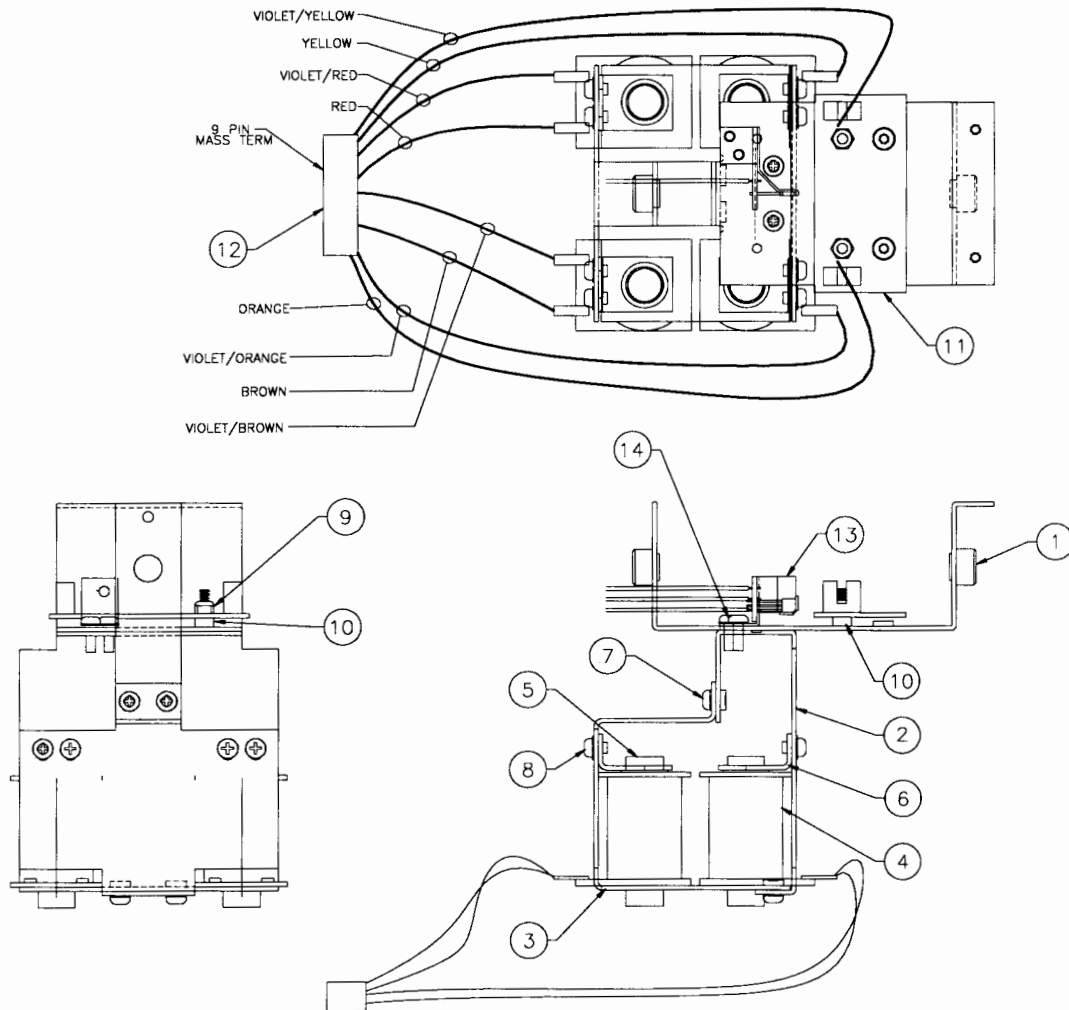
Item	Part No.	Description
1.	A-19008	Ramp Assembly (see page 2-28)
2.	A-19135	Engine Assembly No. 1 (see page 2-29)
3.	A-19137	Engine Assembly No. 3 (see page 2-30)
4.	A-19136	Engine Assembly No. 2 (see page 2-30)
5.	01-13175	Bracket - Ramp
6.	4106-01004-04	Sh. Metal Screw, #6 x 1/4"
7.	4006-01041-04	Mach. Screw, #6 x 1/4"
8.	12-6227	Hairpin Clip
9.	4700-00027-00	Flatwasher, 1/4 x 1/2 x 21ga.
10.	A-18998	Engine Axle
11.	4006-01005-04	Mach. Screw, #6-32 x 1/4"

A-19008 Engine Ramp Assembly



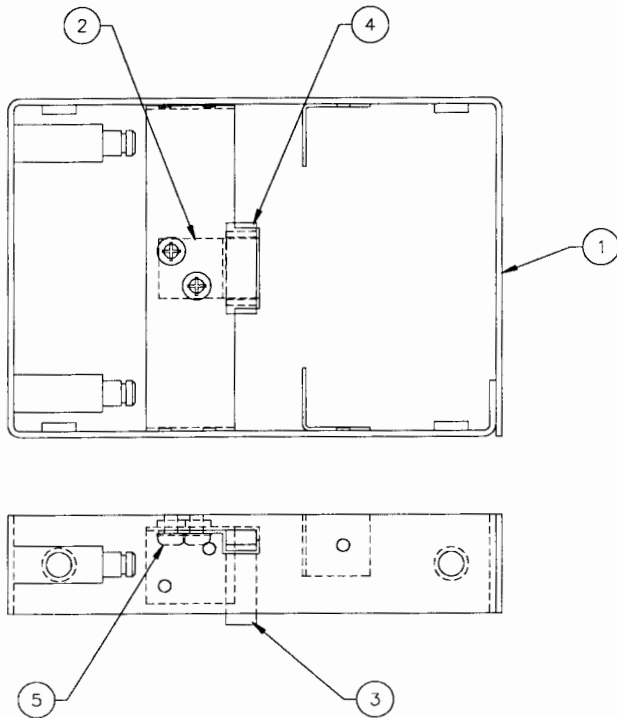
Item	Part No.	Description	Item	Part No.	Description
1.	01-13130	Skirt-Engine	12.	07-6688-8	Rivet, 7/32"
2.	07-6688-19N	Rivet, 9/32"	13.	4608-01081-07	H-F #8 x 7/16"
3.	4700-00003-00	Flatwasher, 1/8x9/32x21ga.	14.	4106-01013-06	Sh. Metal Screw, #6 x 3/8"
4.	A-14265-13	Recpt. - Skt. Assy., Clear	15.	A-19110	Frontgate
5.	03-8171-9	T-L Mini Dome, Trans. Red	16.	A-19099	Backgate
6.	A-19002	Flopgate Assembly	17.	H-19219	Cable-Optos
7.	01-13240	Opto Plate 1-Eng. Ramp	18.	H-18219-1	Cable-Flasher
8.	01-13239	Opto Plate 2-Eng. Ramp	19.	4006-01017-05	Mach. Screw, 6-32x5/16"
9.	A-16908	Opto LED Assembly-RTV	20.	H-18214-3	Cable - Engine Switch
10.	A-16909	Opto Photo Trans. Assy., -RTV	21.	24-8802	Bulb #906
11.	A-19092	Ramp Switch - Engine	22.	03-9213	Ramp

A-19135 Engine Assembly No.1



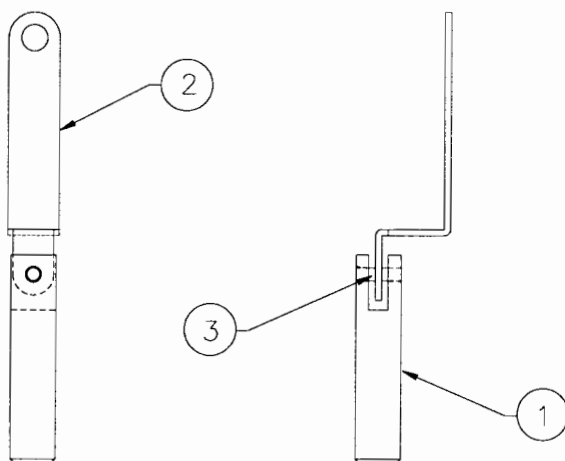
Item	Part No.	Description
1.	20-10119	Bearing
2.	A-19000	Engine Block, Weldment
3.	A-19016	Coil Bracket #1-Engine
4.	AE-25-1000	Coil
5.	03-7067-05	Tubing, Black
6.	01-8-508-T	Solenoid Bracket
7.	4006-01003-04	Mach. Screw, #6-32 x 1/4"
8.	4008-01003-04	Mach. Screw, #8-32 x 1/4"
9.	4406-01119-00	Nut #6 ESNA
10.	03-9129	Spacer, 1/8 x #6
11.	A-18951	Opto Board Assembly
12.	H-19181	V-8 Power Cable
13.	A-19230	Hall Effect Sensor Assembly
14.	4006-01041-06	Mach. Screw, 4-40 x 3/8"

A-19137 Engine Assembly No.3



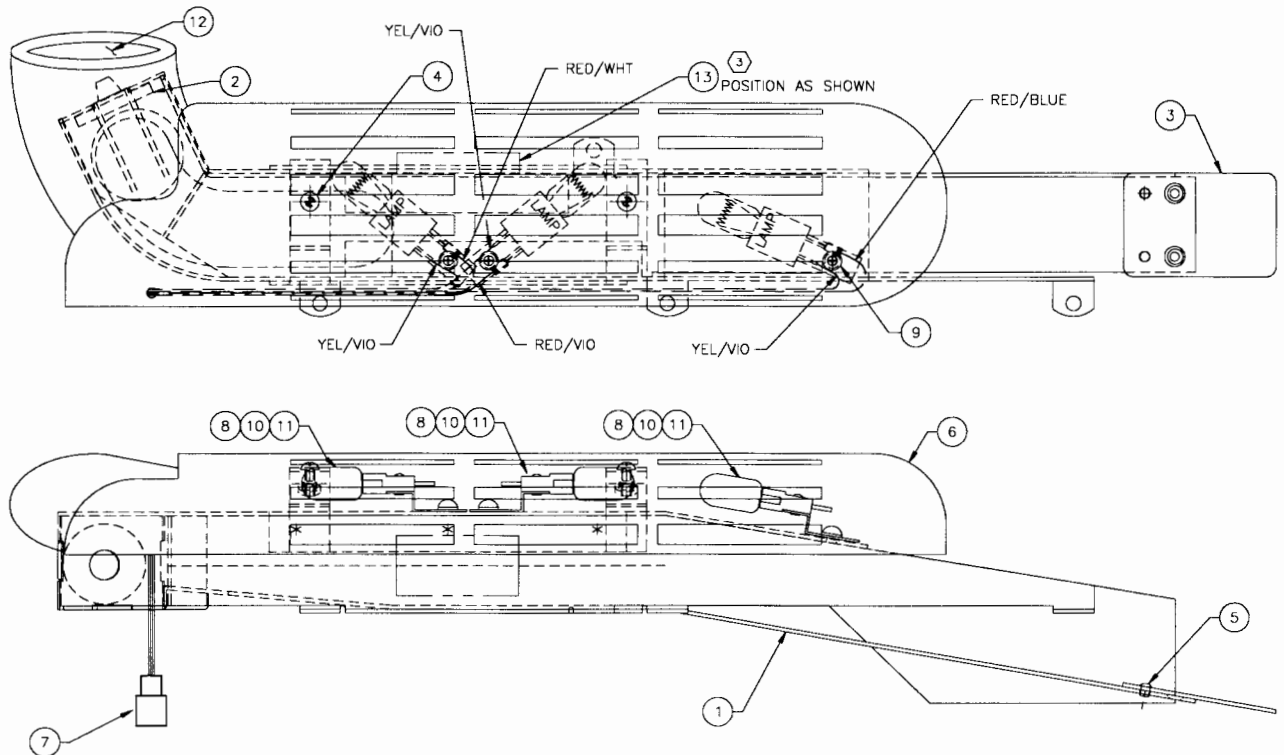
Item	Part No.	Description
1.	A-18999	Engine Shake Weldment
2.	01-13171	Magnet Clamp
3.	01-13169	Q-Conducting Bracket
4.	20-10115	Magnet
5.	4006-01003-03	Mach. Screw, #6-32 x 3/16"

A-19136 Engine Assembly No.2



Item	Part No.	Description
1.	02-2364	Coil Plunger
2.	01-13168	Engine Link
3.	20-8716-5	Roll Pin, 1/8 x 7/16"

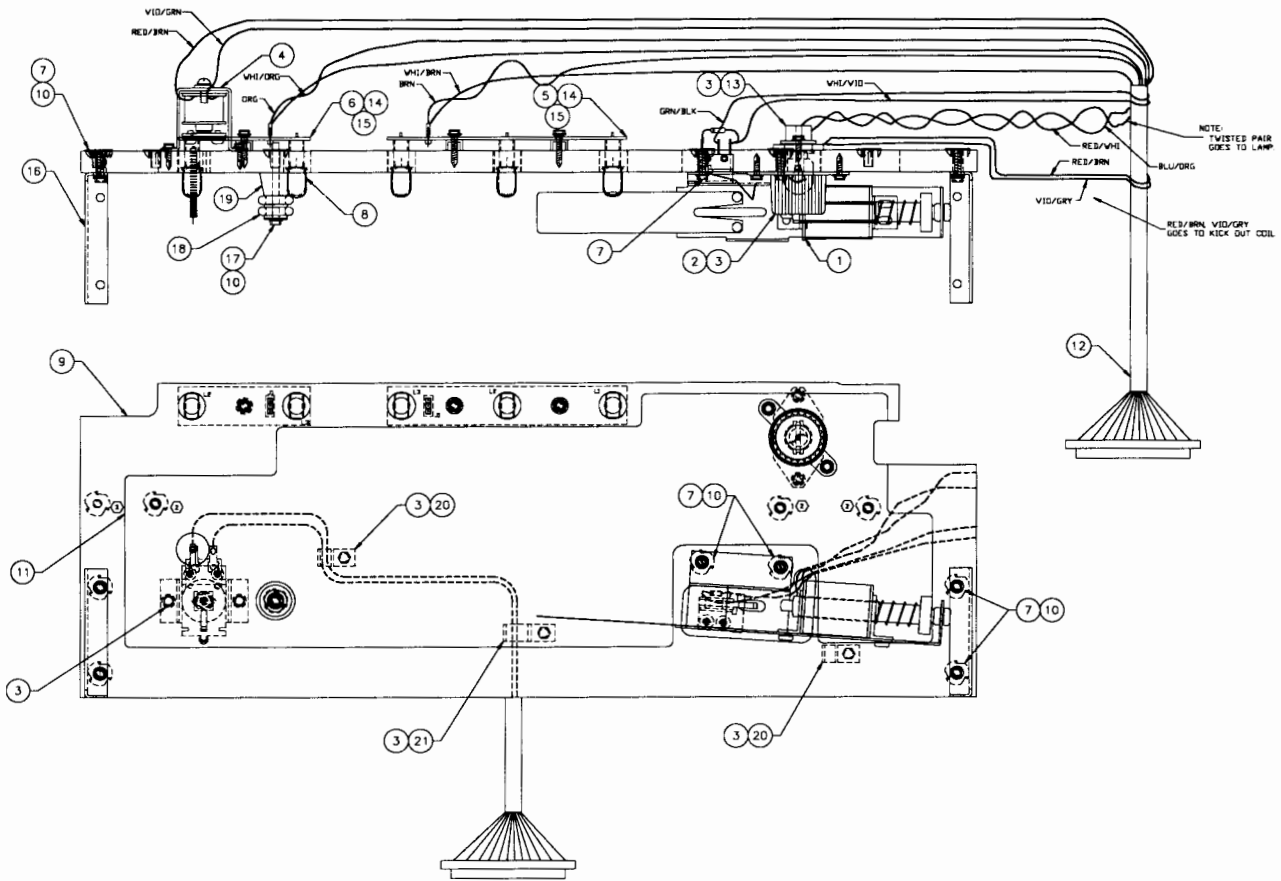
A-19154 Exhaust Pipe Assembly



Item	Part No.	Description
1.	A-18966.1	Welded Exhaust Assembly
2.	23-6686	Rubber Bumper
3.	01-13122	Skirt-Exhaust Pipe
4.	4006-01003-04	Mach. Screw, 6-32 x 1/4"
5.	07-6688-18N	Rivet, 3/16 x 1/8"
6.	A-19162	Plastic Exhaust Assembly
7.	H-19220	Cable
8.	A-12887	Socket & Bulb
9.	4006-01003-03	Mach. Screw, #6-32 x 3/16"
10.	5070-09054-00	Diode
11.	RM-21-03	Sleeve
12.	*31-1996-7	Decal
13.	23-6534-3	Edge Protector, 1-1/2"

* Not available for individual sale. Order Decal Set 31-1996.

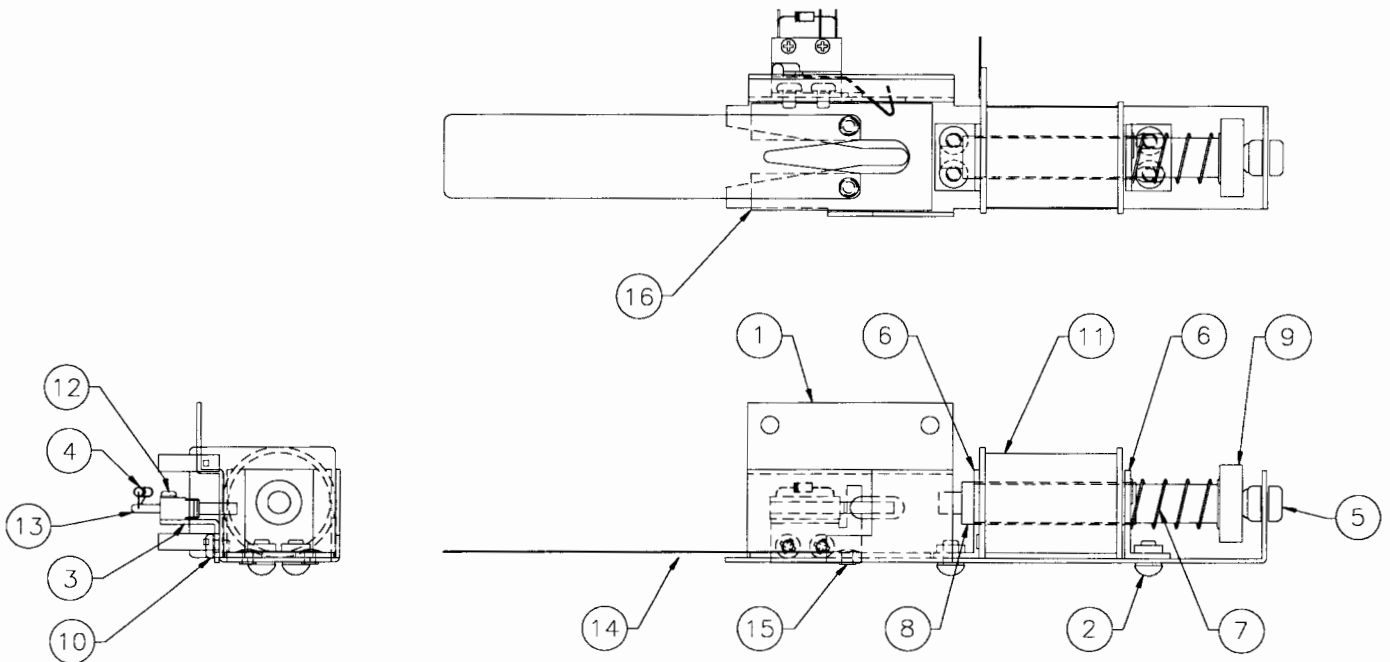
A-19177 Back Panel Assembly



Item	Part No.	Description	Item	Part No.	Description
1.	A19006	Kickout Coil Assembly	12.	H-19171	Cable
2.	03-8149-9	Playfield Insert (Mini-Dome)	13.	B-12156	Lamp Assembly
3.	4808-01175-08	E-P #8 x 1/2" IND-PL-HWH	14.	03-8022-5	Spacer, .343" Long
4.	A-19176	Ball Gate Actuator Assembly	15.	4106-01115-12	Sh. Metal Screw, #6 x 3/4"
5.	A-17713	Three Lamp G.I. Assembly	16.	01-12569	Back Panel Gusset Brkt.
6.	A-17712	Two Lamp G.I. Assembly	17.	4008-01113-28	Mach. Screw, 8-32 x 1-3/4"
7.	4008-01168-10	Mach.Screw, 8-32 x 5/8"	18.	23-6694-3	Rubber Ring, 5/16"
8.	03-8063-6	Bulb Sleeve, Yellow	19.	03-8247-9	Bumper Post
9.	11-1215.3	Wood Panel	20.	03-7655-4	Clamp - Cable 1/4"
10.	4408-01118-00	Nut 8-32 Tee 3/8" L.	21.	03-7655-8	Clamp - Cable 1/2"
11.	*31-1995-9	Back Panel Decal			

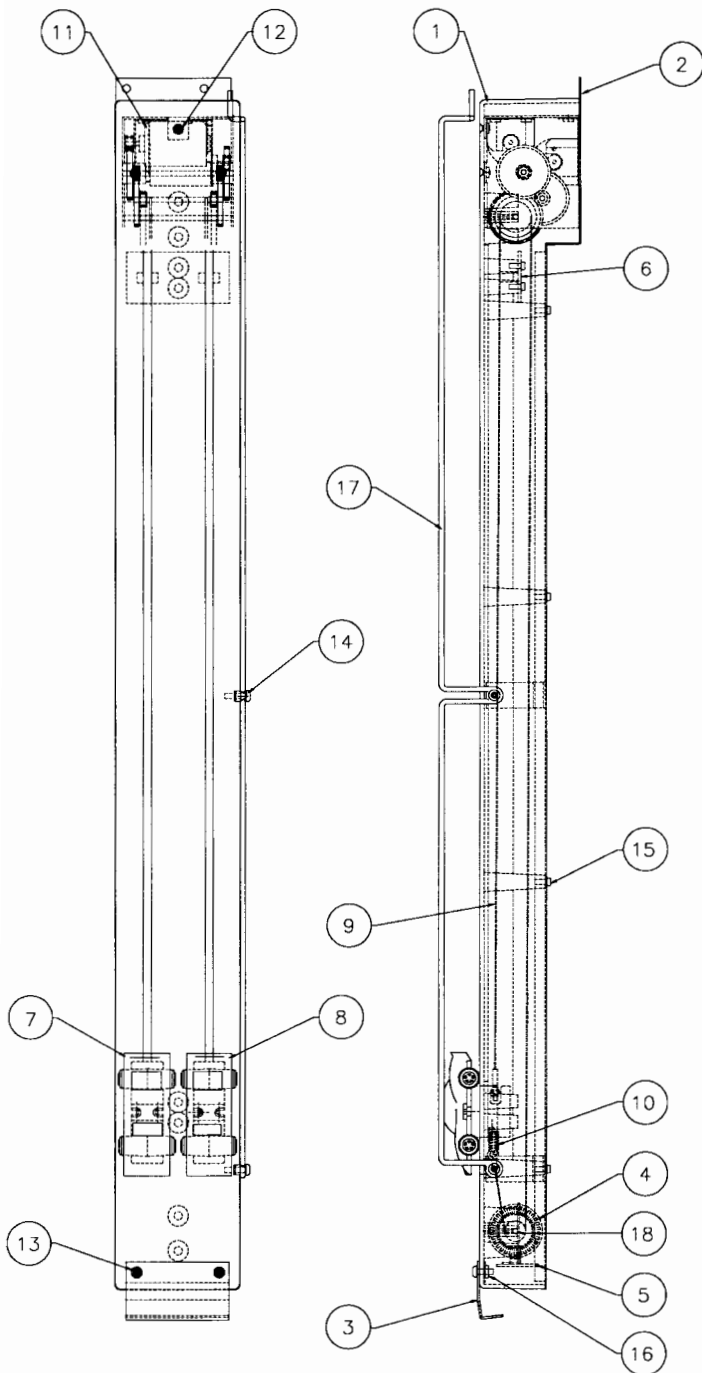
* Not available for individual sale. Order decal set 31-1995.

A-19006 Kick-Out Coil Assembly



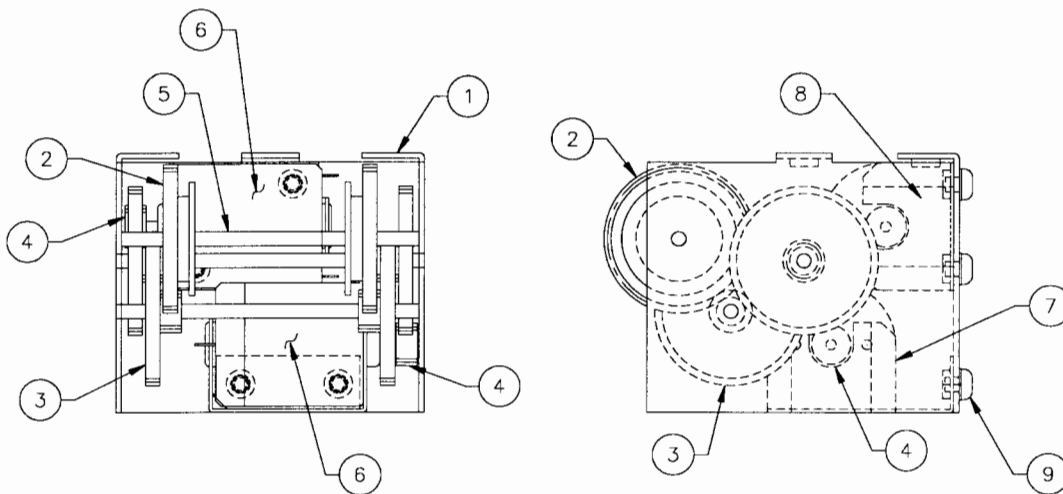
Item	Part No.	Description
1.	01-13163.1	Racetrack Kick-Out Coil Bracket
2.	4008-01017-05	Mach. Screw, #8-32 x 5/16"
3.	01-12356-1	Switch Mounting Bracket
4.	5070-09054-00	Diode, 1N4004
5.	23-6420	Rubber Grommet
6.	A-11721	Solenoid Bracket Assembly
7.	10-135	Spring
8.	03-7067-5	Coil Tubing
9.	A-6306-2	Bell Armature Assembly
10.	4006-01003-03	Mach. Screw, #6-32 x 3/16"
11.	AE-23-800	Coil Sub-Assembly
12.	4002-01105-07	Mach. Screw, #2-56 x 7/16"
13.	5647-12693-21	Sub Miniature Switch
14.	01-13425.1	Drag Flap
15.	07-6688-17N	Rivet, 5/32 x 1/8"
16.	01-13548	Shim

A-19004 Track Assembly



Item	Part No.	Description
1.	03-9217	Racetrack Frame
2.	01-13069	Track Bottom
3.	01-13272	Top Bracket - Racetrack
4.	03-9221	Opto - Pulley
5.	A-19141	Opto Board Assembly
6.	A-18821	Limits Opto Board Assembly
7.	A-19146	Right Car Assembly
8.	A-19145	Left Car Assembly
9.	20-10116	Cord
10.	10-489	Spring-Cord
11.	A-19134	Gear Box Assembly
12.	4004-01041-04	Mach. Screw, #4-40 x 1/4"
13.	4006-01003-06	Mach. Screw, #6-32 x 3/8"
14.	4006-01003-08	Mach. Screw, #6-32 x 1/2"
15.	4106-01115-08	Sh. Metal Screw, #6-32 x 1/2"
16.	A-19013	Bottom Bracket, Racetrack
17.	12-7226	Wireform
18.	02-5087	Shaft- Opto Pulley

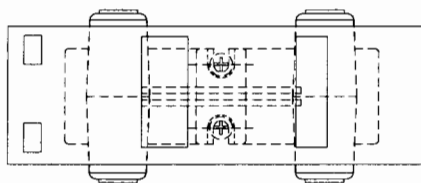
A-19134 Gear Box Assembly



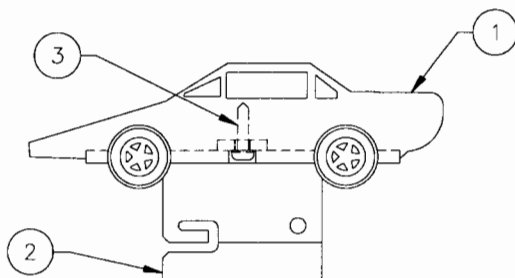
Item	Part No.	Description
1.	A-19148	Frame - Gear Box
2.	03-9220	Cluster Pulley
3.	03-9219	Gear Cluster
4.	03-9222	Pinion Gear
5.	02-5046	Gear Shaft
6.	14-8015	Gear Box Motor
7.	A-19019	Motor Mount #1, Gear Box
8.	A-19020	Motor Mount #2, Gear Box
9.	4006-01003-02	Mach. Screw, #6-32 x 1/4"

A-19145 & A-19146 Car Assembly

A-19145 Left Car Assembly



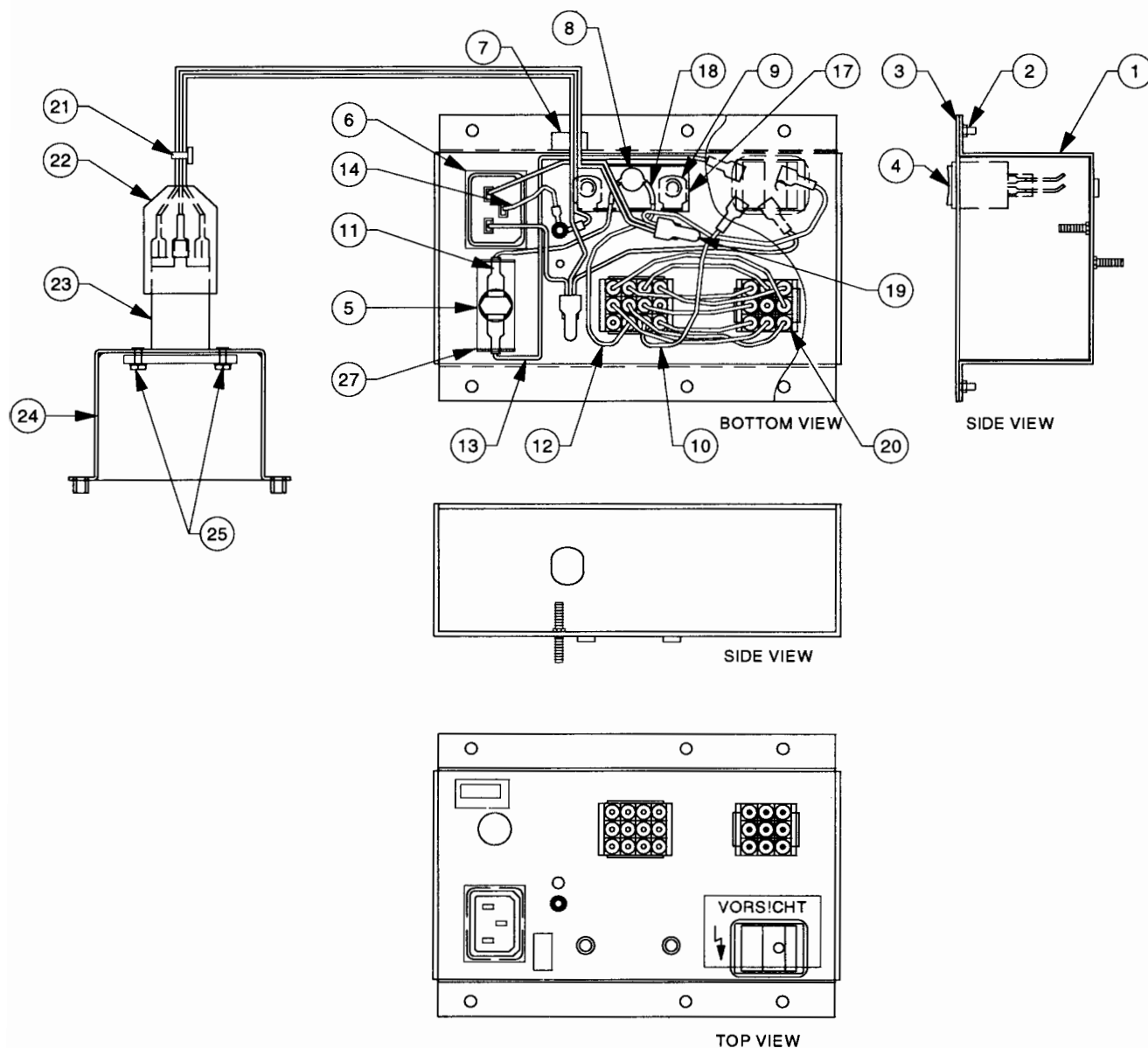
Item	Part No.	Description
1.	03-9263	Top - Car
2.	03-9260	Bottom - Car
3.	4104-01001-06	Sh. Metal Screw, #4-40 x 3/8"



A-19146 Right Car Assembly

Item	Part No.	Description
1.	03-9265	Top - Car
2.	03-9260	Bottom - Car
3.	4104-01001-06	Sh. Metal Screw, #4-40 x 3/8"

A-17540 Universal Power Interface Assembly



Item	Part No.	Description	Item	Part No.	Description
1.	01-12293.1	Power Control Chassis Box	14.	H-17542	Ground Jumper Grn/Yel Cable
2.	4406-01128-00	Nut #6-32 KEPS	15.	5797-13940-01	Jumper Cable
3.	01-12294	Switch Mounting Plate Assembly	16.	01-10623	Insulator, Thermistor
4.	5642-13935-00	Power Switch	17.	01-12299	Insulator, Terminal Strip
5.	5733-12869-00	Fuse Holder Panel	18.	RM-21-06	#18 Vinyl Fgls
6.	5851-13867-00	Outlet-IEC Conn. 237 Socket	19.	5822-13865-00	Terminal Strip 3-CKT 2-Mtg.
7.	03-8712	Strain Relief Bushing	20.	H-18050	Jumper Cable, Transformer Prog.
8.	5016-12978-00	Thermistor 8A., 2.5R25	21.	03-7933	Ty-Wrap Nylon
9.	4006-01003-10	Mach. Screw, #6-32 x 5/8"	22.	20-9682-1	Boot w/9-32 Dia. Hole
10.	H-17992	Jumper Cable Neutral Sw/1FC	23.	5102-13864-00	Line Filter w/IEC Connector
11.	H-17543	Hot Jumper Black Cable	24.	01-12292	Line Filter Chassis Box
12.	H-17546	Jumper Interface Hot Black Cable	25.	4004-01003-05	Mach. Screw, #4-40 x 5/16"
13.	H-17545	Jumper Switch/Fuse Black Cable			

Posts

Part No.	Description	Quantity
02-3905	Post #8 WS	1
02-4020	Post-Spacer, 1/2"	1
02-4424-1	Post Fastner 6-32	3
02-4425-1	Post Fastner 8-32	1
02-4425-3	Post Fastner 8-32	2
02-4434	Post Spacer #8-32	2
02-4658	Double Bumper Post	1
02-4659-1	Post #10	13
02-4678	Double Bumper Post	1
02-4842	Post Bumper Threaded	2
02-5107	Adjusting Post	2
02-5108	Post, Standoff	1
03-8044-9	Mini Post, Tr. Red	3
03-8130-13	Double Star Post	1
03-8247-9	Post #8	1
03-8319-9	Post #8	9
03-8365-9	Post #8	13

Cables

Backbox Cables

Part No.	Description
H-15736	Secondary Cable
H-15476	Logic Power Cable
H-14584	Dot Matrix Display Power Cable
H-19180	V8 Master Power Cable

Playfield Cables

H-19072.1	Playfield Switch Cable
H-19073	Playfield Lamp Cable
H-19074.1	Playfield Solenoid Cable
H-19075	Playfield Opto Cable
H-18219-11	General Flasher 3-pin Cable

Cabinet Cables

H-17005-2	Cabinet Cable
H-17217	Plum Bob/Mem. Protect Cable
H-17837-2	Voltage Program Jumper Cable
H-19130	Dixie-Vend Interconnect Cable
H-19173	Cabinet Switch Lamp Cable

Unique Parts

Part No.	Description
A-12359-4-B	Side Molding Assembly - Black
A-13204-50036	Bottom Arch Assembly
A-13769-50036	Playfield & Insert Assembly
A-15378-1	Eject Assembly
A-16917-50036	Sound Board Assembly
A-17347-1	3-Lamp Board & Spacer Assy.
A-17651-50036	WPC Security CPU Board
A-17730-2	Ball Shooter w/Knob Black
A-17814-50036	Backbox Assembly
A-18587	Ball Guide Assembly #1
A-18589	Ball Guide Assembly #3
A-18590	Ball Guide Assembly #4
A-18591	Ball Guide Assembly #5
A-18592	Ball Guide Assembly #8
A-18593	Ball Guide Assembly #9
A-18594.2	Ball Guide #11
A-18614	Speaker/Display Panel Assy.
A-18967	Ball Guide #13
A-18975	Garage Weld Assembly
A-18977	Diverter Flag Rivet Assembly
A-18982	Spinner Gate Assembly
A-19001	Ball Gate Special Assembly
A-19003	2-Switch & Bracket Assembly
A-19004	Race Track Assembly
A-19005	Popper Assembly
A-19007	Loop Ramp Assembly
A-19009	Race Track Ramp Assembly
A-19035-1	4-Lamp PCB & Spacers
A-19036-1	5-Lamp PCB & Spacers
A-19037-1	9-Lamp PCB & Spacers
A-19038-1	2-Lamp PCB & Spacers
A-19039-1	3-Lamp PCB & Spacers
A-19123	Front Molding Assembly
A-19140	Engine & Ramp Assembly No. 6
A-19151	Upper Loop Switch Assembly
A-19154	Exhaust Pipe Assembly
A-19177	Back Panel Assembly
A-19208-1	Flipper Guide Right Lane Assy.
A-19208-2	Flipper Guide Left Lane Assy.
A-19223-R	Flipper Assembly
A-19242	Dual Driver & Bracket Assy.
A-19243	Motor Driver Slave & Bracket
A-19259	Xmas Tree Lamp & Bracket
A-19260	Right Wire Ramp Assembly
A-19294	3-Bank Standup Target
A-19314-1	Playfield Plastic Assembly
A-19314-2	Playfield plastic Assembly
A-19314-3	Playfield Plastic Assembly
A-19316	Ramp Cover Assembly #1
A-19317	Ramp Cover Assembly #2
A-19332	Lt-5 Engine Wire Assembly
A-19521	Bumper Gate Assembly
A-8552-50036	Backglass Assembly
01-13020	Ball Guide #6
01-13021	Ball Guide #7
01-13022	Ball Guide #10
01-13022.1	Ball Guide #10
01-13023.1	Ball Guide #12
01-13146	Guide - Left Lane
01-13147	Guide - Right Lane
01-13167	Ball Guide #3

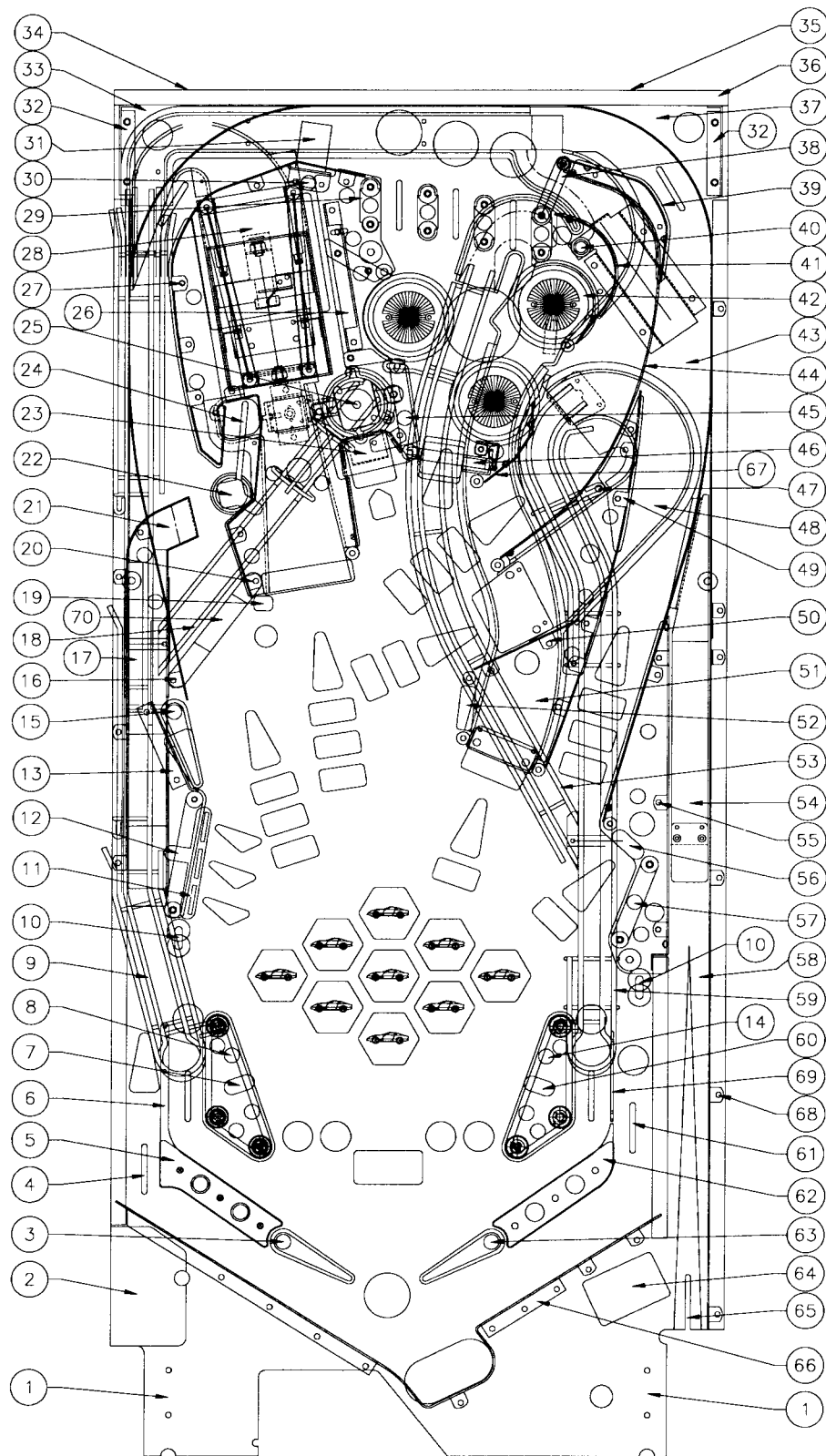
Universal Power Interface/Cordset Application Chart

COUNTRY	UNIVERSAL PWR. INTERFACE ASSEMBLY	VOLTAGE PROGRAMMING JUMP CABLE				5AMP FUSE/ LABEL	8AMP FUSE/ LABEL	LABEL HIGH/ VOLTAGE CAUTION	POWER ADAPTER CORD	CORDSET									
		H-17837-1	H-17837-2	H-17837-3	H-17837-4					5850-14052-00	5850-13271-00	5850-13272-00	5850-13273-00	5850-13274-00	5850-13275-00	5850-13276-00	5850-13277-00	5850-13278-00	A-17175-2
UNITED STATES	X		X				X	X		X	X								
CANADA	X	X					X	X			X								
TAIWAN	X		X				X	X			X								
MEXICO	X		X				X	X			X								
CENTRAL AMERICA	X		X				X	X			X								
SOUTH KOREA	X		X				X	X			X								
PUERTO RICO	X		X				X	X			X								
AUSTRIA	X			X	X	X		X				X							
BELGIUM	X			X	X	X		X				X							
FINLAND	X			X	X	X		X				X							
FRANCE	X			X	X	X		X				X							
GREECE	X			X	X	X		X				X							
HOLLAND	X			X	X	X		X				X							
HUNGARY	X			X	X	X		X				X							
NETHERLANDS	X			X	X	X		X				X							
NETH. ANTILLES	X			X	X	X		X				X							
NORWAY	X			X	X	X		X				X							
POLAND	X			X	X	X		X				X							
PORTUGAL	X			X	X	X		X				X							
SPAIN	X			X	X	X		X				X							
SWEDEN	X			X	X	X		X				X							
TURKEY	X			X	X	X		X				X							
WEST GERMANY	X			X	X	X		X				X							
UNITED KINGDOM	X			X	X	X		X					X						
IRELAND	X			X	X	X		X					X						
HONG KONG	X			X	X	X		X					X						
DENMARK	X			X	X	X		X						X					
ITALY	X			X	X	X		X							X				
CHILE	X			X	X	X		X							X				
PEOPLE'S REP. OF CHINA	X			X	X	X		X							X				
SWITZERLAND	X			X	X	X		X								X			
AUSTRALIA	X			X	X	X		X									X		
NEW ZEALAND	X			X	X	X		X									X		
ARGENTINA	X			X	X	X		X									X		
JAPAN	X				X		X	X										X	X

UPPER PLAYFIELD PARTS

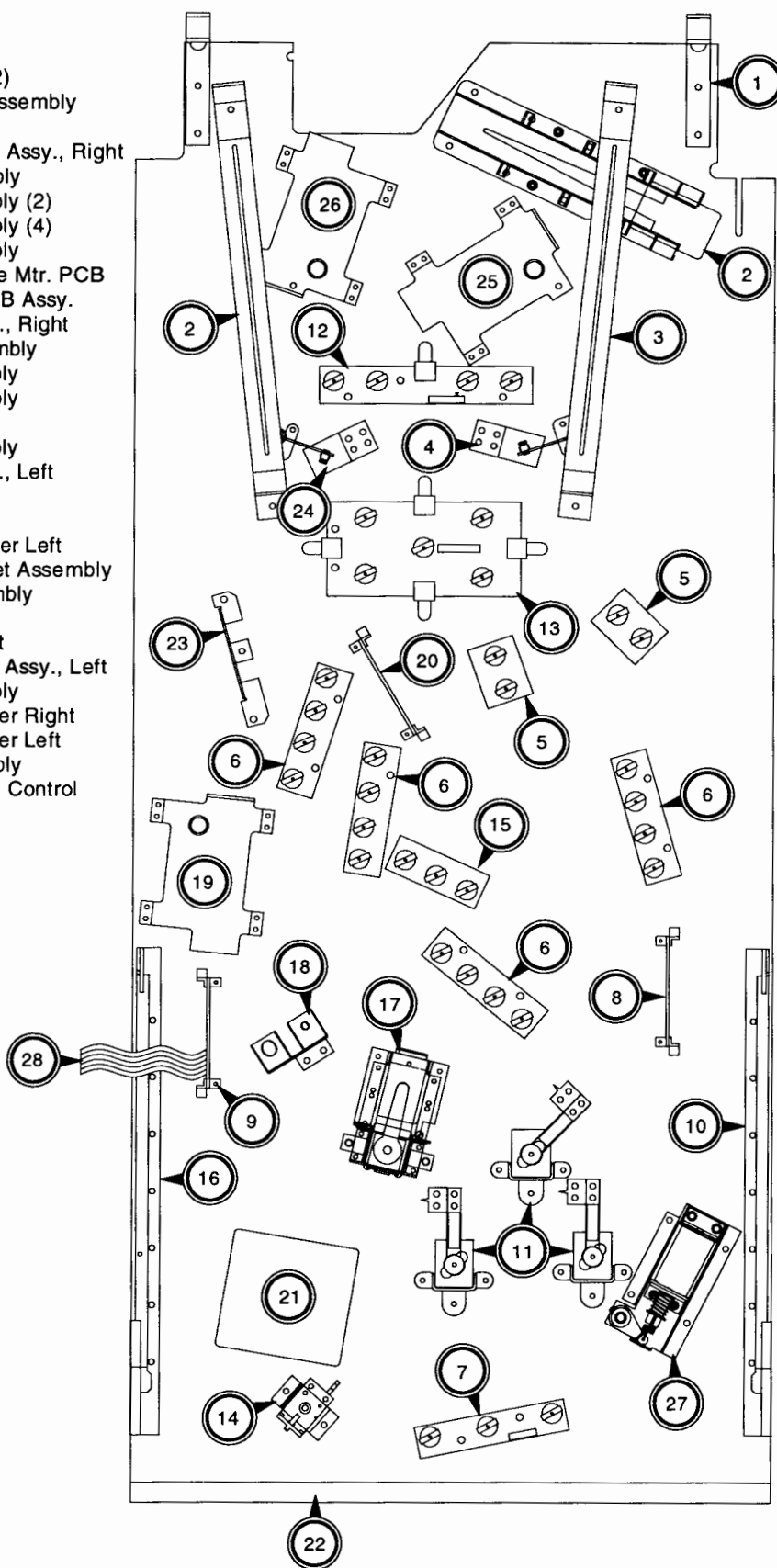
Item No.	Part Number	Description
1	01-9211	Playfield Hanger Bracket (2)
2	B-11873	Bottom Arch Kicker Assy.
3	A-15849-L-2	Lower Left Flipper Assembly
	20-9250-5	Flipper & Shaft, White
4	A-17791	Kickback Micro Switch Assy.
5	A-19208-2	Flipper Ball Guide, Left
6	12-7231	Right Lane Wire
7	A-17811	Slingshot Kicker Assembly
	B-9362-R-3	Coil & Bracket Assembly
	10-128	Spring
8	A-17801	Kicker Count Switch Assy.
9	12-7214	Left Wire Ramp
10	02-5107	Adjustable Post (2)
11	A-19221	3-Bank Drop Target Assembly
12	A-18988	3-Bank Rubber Switch Assy.
13	01-13023	Ball Guide
14	A-17611	Kicker Count Switch Assy.
15	A-15849-L	Upper Left Flipper Assembly
	20-9250-5	Flipper w/Shaft, White
16	A-18588	Ball Guide
17	A-19162	* Plastic Exhaust Pipe
18	12-7215	Garage Wire Ramp
19	A-16816-4	Oblong Target, Red
20	01-13022	Ball Guide
21	A-19154	Exhaust Pipe Assembly
22	A-15368-1	Eject Assembly
	A-17985-R	Eject Switch Assembly
23	A-18975	Garage Guide Weld Assembly
24	A-19003	2-Switch & Bracket Assembly
25	A-19005	Popper Assembly
26	A-19156	Engine Plastic Bracket
27	A-18594	Ball Guide
28	A-19140	Engine & Ramp Assembly
	A-19332	LT-5 Engine Wire Assembly
29	03-8318-9	Light Hood, Red (4)
30	A-17796	Ball Gate Actuator Coil Assy.
31	A-19001	Ball Gate Special Assembly
32	01-12569	Gusset Bracket (2)
33	01-13296	* Left Corner Bracket
34	A-19176	* Ball Gate Actuator Assembly
35	A-19006	Kickout Coil Assembly
36	A-19177	Back Panel Assembly
37	01-13297	* Right Corner Bracket
38	A-19151	Upper Loop Switch Assembly
39	A-18592	Ball Guide
40	A-17241	Ramp Diverter Assembly
	A-18977	Diverter Flag Rivet Assembly
	20-8712-25	E-ring, 1/4" Shaft
	4700-00072-00	Flat Washer
41	A-18967	Ball Guide
42	A-9415-2	Jet Bumper Coil Assembly (3)
	B-12030-2	Jet Bumper Switch Assy. (3)
	B-9414-3	Jet Wafer Assy., Red (3)
	03-8254-9	Jet Bumper Cap, Red (3)
43	A-19004	* Race Track Assembly
44	A-18591	Ball Guide
45	A-17794	Kicker Switch Sub-Assembly
46	A-18982	Spinner Gate Assembly
47	02-5108	5/16" Standoff
48	A-19007	Loop Ramp Assembly
49	01-13020	Ball Guide
50	01-13021	Ball Guide
51	A-19009	Race Track Ramp Assembly
52	A-17226-4	Rectangle Target, Red
53	12-7213	Center Wire Ramp
54	A-18589	Ball Guide
55	A-18590	Ball Guide
56	A-18019-4	Square Target, Red
57	A-17794	Kicker Switch Sub-Assembly
58	A-19259	* Race Tree Lamp & Bracket
	01-13223	Race Track Bracket
59	A-19260	Right Wire Ramp Assembly
60	A-17811	Slingshot Kicker Assembly
	B-9362-L-2	Coil & Bracket Assembly
	10-128	Spring
61	A-17813	Rollover Switch Assembly
62	A-19208-1	Flipper Ball Guide, Right
63	A-19223-R	Right Flipper Assembly
	20-9250-5	Flipper & Shaft, White
64	A-18753	Ball Trough Assembly
65	A-18973	Shooter Lane Switch Assy.
66	01-13273	Bottom Arch Ball Guide
67	A-18593	Ball Guide
68	A-18587	Ball Guide
69	01-13413	Right Lane Divider
70	A-19521	Bump Gate Assembly
	Miscellaneous	
	A-13204-50036	Bottom Arch Assembly
	A-13769-50036	Screened Playfield
	A-19314-1	Playfield Plastic Assembly
	A-19314-2	Playfield Plastic Assembly
	A-19314-3	Playfield Plastic Assembly
	A-19316	Ramp Cover Assembly
	A-19317	Ramp Cover Assembly
	01-13298	Car Light Baffle (loc. on insert)
	03-9295-1	**Full Playfield Mylar
	03-9295-2	Ramp Drop Area Mylar
	03-9295-3	Ramp Drop Area Mylar
	03-9295-4	Exhaust Drop Area Mylar
	03-9295-5	Jet Bumper Area Mylar
	20-6500	Steel Ball 1 1/6" (4)
	*Not Shown	
	**The Corvette hardcoat playfield does not require a full mylar. However, mylars can be purchased through	

UPPER PLAYFIELD PARTS



Lower Playfield Parts

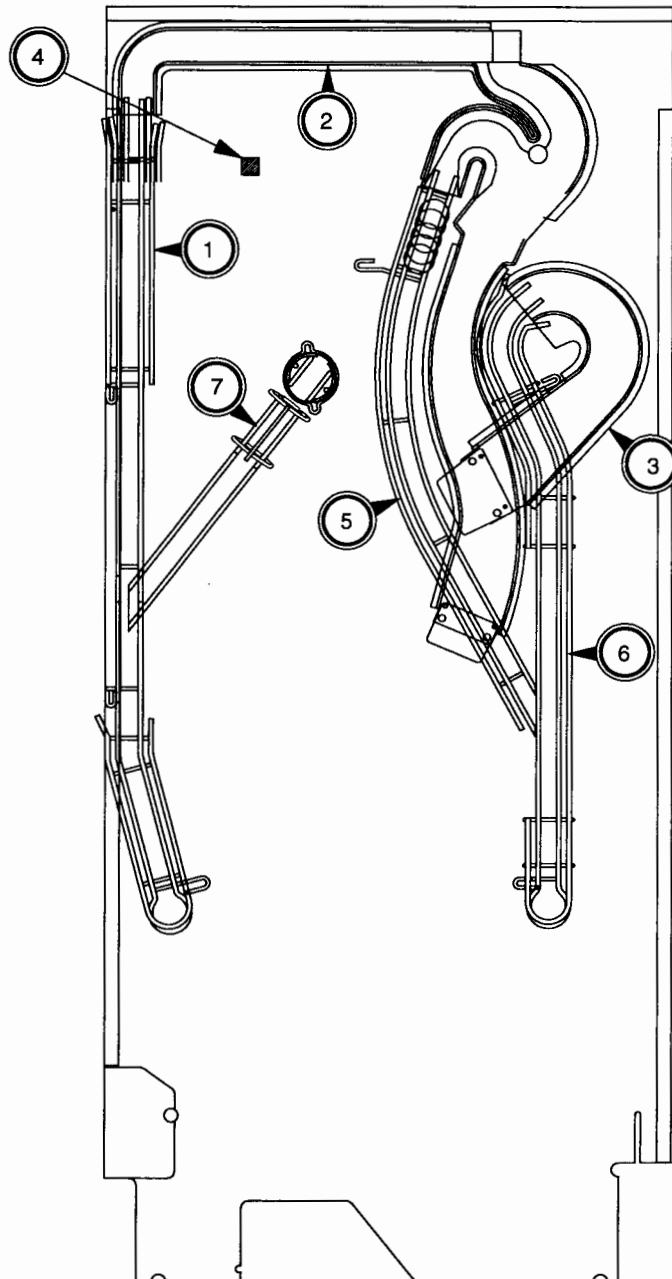
Item	Part No.	Description
1.	01-9211	Plfd. Hanger Bracket(2)
2.	A-18753	Outhole Ball Trough Assembly
3.	01-11781	Leg Support (2)
4.	A-17811	Kicker Arm (Slingshot) Assy., Right
	B-9362-L-2	Coil & Bracket Assembly
5.	A-19038	2-Lamp Board Assembly (2)
6.	A-19035	4-Lamp Board Assembly (4)
7.	A-17624	3-Lamp Board Assembly
8.	A-19242	Bracket & Dual H-Drive Mtr. PCB
9.	A-19243	Motor Driver Slave PCB Assy.
10.	A-17749.1-2	Plfd. Slide Mech. Assy., Right
11.	A-19415-2	Jet Bumper Coil Assembly
12.	A-19036	5-Lamp Board Assembly
13.	A-19037	9-Lamp Board Assembly
14.	A-17796	Ball Gate Actuator
15.	A-19039	3-Lamp Board Assembly
16.	A-17749.1-1	Plfd. Slide Mech. Assy., Left
17.	A-19005	Popper Assembly
18.	A-15368-1	Eject Assembly
19.	A-15849-L	Flipper Assembly, Upper Left
20.	A-18159-1	10-Opto PCB & Bracket Assembly
21.	A-19140	Engine & Ramp Assembly
22.	A-19177	Back Panel Assembly
23.	A-19294	3-Bank Standup Target
24.	A-17811	Kicker Arm (Slingshot) Assy., Left
	B-9362-R-3	Coil & Bracket Assembly
25.	A-19223-R	Flipper Assembly, Lower Right
26.	A-15849-L-2	Flipper Assembly, Lower Left
27.	A-17241	Ramp Diverter Assembly
28.	5795-14325-00	Ribbon Cable, V-8 Mtr. Control



Ramps

Item	Part No.	Description
1.	12-7214.1	Left Wire Ramp
2.	A-19009	Race Track Ramp
3.	A-19007	Loop Ramp Assembly
4.	* A-19008	Engine Ramp Assembly
5.	12-7213	Center Wire Ramp
6.	A-19260	Right Wire Ramp Assembly
7.	12-7215	Garage Wire Ramp

* Assembly not shown; location shown only.



LAMP MATRIX

Yellow (B+) → Red

Column Row	1 Yellow-Brown J137-1 Q98	2 Yellow-Red J137-2 Q97	3 Yellow-Orange J137-3 Q96	4 Yellow-Black J137-4 Q95	5 Yellow-Green J137-5 Q94	6 Yellow-Blue J137-6 Q93	7 Yellow-Violet J138-7 Q92	8 Yellow-Gray J138-9 Q91
1 Red-Brown J133-1 Q90	Left Rollover 11	Inner Loop Arrow 21	Left Outer Loop Arrow 31	Corvette 6 41	Corvette 9 51	Left Outer Tail 61	Kickback Arrow 71	Right Tree Red 81
2 Red-Black J133-2 Q89	Middle Rollover 12	Fuelie 22	Lite Lock 32	Corvette 3 42	Corvette 8 52	Left Inner Tail 2	Left Return Lane 72	Left Tree Red 82
3 Red-Orange J133-4 Q88	Right Rollover 13	Nitrous 23	Qualify 33	Corvette 1 43	Pit Stop 53	Catch Me 63	Right Return lane 73	Tree Bottom Yellow 83
4 Red-Yellow J133-5 Q87	Skid Pad Arrow 14	Inner Loop Jackpot 24	Big Block 34	Corvette 2 44	Corvette 7 54	Right Inner Tail 64	Right Our Lane 74	Tree Top Yellow 84
5 Red-Green J133-6 Q86	Sticky Tires 15	Right Outer Loop Arrow 25	ZR-1 Ramp 35	Corvette 4 45	Corvette 5 55	Right Outer Tail 65	Million Standup 75	Right Tree Green 85
6 Red-Blue J133-7 Q85	Skid Pad Jackpot 16	Z07 Suspension 26	6 Speed Trans 36	Left Standup 3 46	Pit Stop Arrow 56	Right Standup Arrow 66	Side Pipe 1 76	Left Tree Green 86
7 Red-Violet J133-8 Q84	Route 66 Arrow 17	Big Brakes 27	Hi Lift Cams 37	Left Standup 2 47	Spinner Arrow 57	Lite Kickback 67	Side Pipe 2 77	Buy In 87
8 Red-Gray J133-9 Q83	Race Today 18	Super Charger 28	ZR-1 Ramp Arrow 38	Left Standup 1 48	Drive Again 58	Start Challenge 68	Side Pipe 3 78	Start Button 88

J1XX = Power Driver Board

LAMP LOCATIONS

Item No.	Bulb No.	Lamp Assy. No.	Description	Item No.	Bulb No.	Lamp Assy. No.	Description
11	24-8768	A-17624	Left Rollover	31	24-8768	A-19035	L Outer Loop Arrow
12	24-8768	A-17624	Middle Rollover	32	24-8768	A-19035	Lite Lock
13	24-8768	A-17624	Right Rollover	33	24-8768	A-19035	Qualify
14	24-8768	A-19039	Skid Pad Arrow	34	24-8768	A-19035	Big Block
15	24-8768	A-19039	Sticky Tires	35	24-8768	A-19035	ZR-1 Ramp Lock
16	24-8768	A-19039	Skid Pad Jackpot	36	24-8768	A-19035	6 Speed Trans
17	24-8768	A-19038	Route 66 Arrow	37	24-8768	A-19035	Hi Lift Cams
18	24-8768	A-19038	Race Today	38	24-8768	A-19035	ZR-1 Ramp Arrow
21	24-8768	A-19035	Inner Loop Arrow	41	24-8768	A-19037	Corvette 6
22	24-8768	A-19035	Fuelie	42	24-8768	A-19037	Corvette 3
23	24-8768	A-19035	Nitrous	43	24-8768	A-19037	Corvette 1
24	24-8768	A-19035	Inner Loop Jackpot	44	24-8768	A-19037	Corvette 2
25	24-8768	A-19035	R Outer Loop Arrow	45	24-8768	A-19037	Corvette 4
26	24-8768	A-19035	Z07 Suspension	46	24-8768	A-17347	Left Standup 3
27	24-8768	A-19035	Big Brakes	47	24-8768	A-17347	Left Standup 2
28	24-8768	A-19035	Super Charger	48	24-8768	A-17347	Left Standup 1

LAMP LOCATIONS (continued)

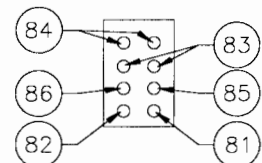
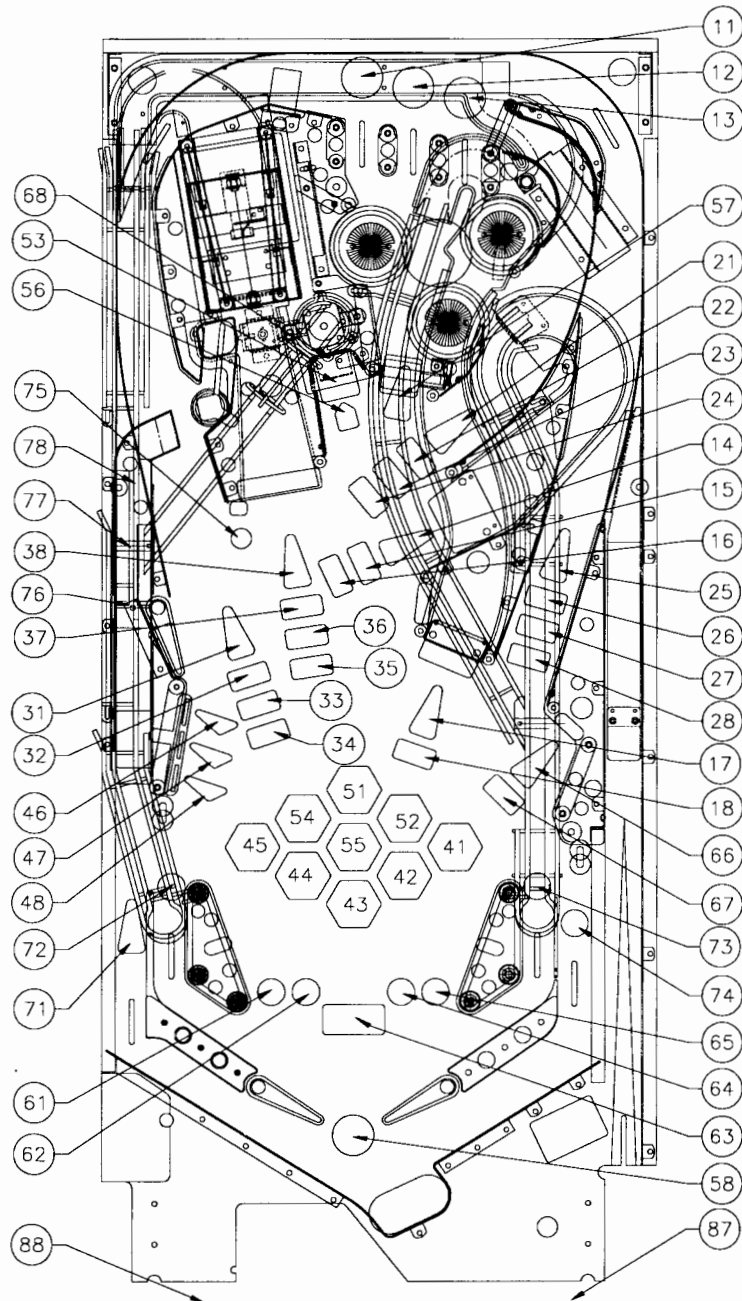
Item No.	Bulb No.	Lamp Assy. No.	Description
51	24-8768	A-19037	Corvette 9
52	24-8768	A-19037	Corvette 8
53	24-8768	A-17272	*Pit Stop
54	24-8768	A-19037	Corvette 7
55	24-8768	A-19037	Corvette 5
56	24-6549	A-17807	Pit Stop Arrow
57	24-6549	A-17835	Spinner Arrow
58	24-6549	A-17807	Drive Again
61	24-8768	A-19036	Left Outer Tail
62	24-8768	A-19036	Left Inner Tail
63	24-8768	A-19036	Catch Me
64	24-8768	A-19036	Right Inner Tail
65	24-8768	A-19036	Right Outer Tail
66	24-8768	A-19038	Right Standup Arrow
67	24-8768	A-19038	Lite Kickback
68	24-8768	A-17272	*Start Challenge
71	24-6549	A-17807	Kickback Arrow
72	24-6549	A-17835	Left Return Lane
73	24-6549	A-17835	Right Return Lane
74	24-6549	A-17835	Right Out Lane
75	24-6549	A-17835	Million Standup
76	24-8768	A-17826	Side Pipe 1
77	24-8768	A-17826	Side Pipe 2
78	24-8768	A-17826	Side Pipe 3
81	24-8768	A-18820	*Right Tree Red
82	24-8768	A-18820	*Left Tree Red
83	24-8768	A-18820	*Tree Bottom Yellow
84	24-8768	A-18820	*Tree Top Yellow
85	24-8768	A-18820	*Right Tree Green
86	24-8768	A-18820	*Left Tree Green
87	20-9663-18	---	**Buy In
88	20-9663-2	---	**Start Button

24-8768 = #555 Bulb
24-6549 = #44 Bulb

*Bulb Sleeves

03-8063-2 = Green
03-8063-4 = Red
03-8063-6 = Yellow

**Located on Cabinet



Race Tree Lamps

SWITCH MATRIX

White ——— | ——— Green

Dedicated Grounded Switches	Column	1 Green-Brown J207-1 U20-18	2 Green-Red J207-2 U20-17	3 Green-Orange J207-3 U20-16	4 Green-Yellow J207-4 U20-15	5 Green-Black J207-5 U20-14	6 Green-Blue J207-6 U20-13	7 Green-Violet J207-7 U20-12	8 Green-Gray J207-9 U20-11	Flipper Grounded Switches
Row										
Orange-Brown (1) J205-1 Left Coin Chute D1	1 White-Brown J209-1 U18-11	Left Out Lane 11	Slam Tilt 21	Trough Ball 1 31	ZR-1 Bottom Entry 41	Left Race Start 51	Left Slingshot 61	ZR-1 Full Left 71	Million Standup 81	Black-Green J906-1 Right Flipper EOS F1
Orange-Red (2) J205-2 Center Coin Chute D2	2 White-Red J209-2 U18-9	Right Out Lane 12	Coin Door Closed 22	Trough Ball 2 32	ZR-1 Top Entry 42	Right Race Start 52	Right Slingshot 62	ZR-1 Full Right 72	Skid Pad Standup 82	Black-Violet J906-1 Right Flipper Opto F2
Orange-Black (3) J205-3 Right Coin Chute D3	3 White-Orange J209-3 U18-5	Start Button 13	Buy In Button 23	Trough Ball 3 33	Skid Pad Entry 43	Not Used 53	Left Jet 63	Not Used 73	Right Standup 83	Black-Blue J906-3 Left Flipper EOS F3
Orange-Yellow (4) J205-4 4th Coin Chute D4	4 White-Yellow J209-4 U18-7	Plumb Bob Tilt 14	Always Closed 24	Trough Ball 4 34	Skid Pad Exit 44	Not Used 54	Bottom Jet 64	Not Used 74	Right Rubber 84	Black-Gray J905-2 Left Flipper Opto F4
Orange-Green (5) J205-6 Normal Function Ser Credits Esc D5	5 White-Green J209-5 U19-11	Plunger 15	First Gear (optional) 25	Route 66 Entry 35	Route 66 Exit 45	Left Race Encoder 55	Right Jet 65	ZR-1 Exit 75	Not Used 85	Black-Violet J906-4 Upper Right Flipper EOS F5
Orange-Blue (6) J205-7 Normal Function Vol Down D6	6 White-Blue J209-7 U19-9	Left Return Lane 16	Second Gear (optional) 26	Pit Stop Popper 36	Left Standup 3 46	Right Race Encoder 56	Left Rollover 66	ZR-1 Lock Ball 1 76	Jet Rubber 86	Black-Yellow J905-3 Upper Right Flipper Opto F6
Orange-Violet (7) J205-8 Normal Function Vol Up D7	7 White-Violet J209-8 U19-5	Right Return Lane 17	Third Gear (optional) 27	Trough Eject 37	Left Standup 2 47	Route 66 Kickout 57	Middle Rollover 67	ZR-1 Lock Ball 2 77	Left Outer Loop 87	Black-Gray J906-5 Upper Left Flipper EOS F7
Orange-Gray (8) J205-9 Normal Function Begin Test Enter D8	8 White-Gray J209-9 U19-7	Spinner 18	Fourth Gear (optional) 28	Inner Loop Entry 38	Left Standup 1 48	Skid Route 66 Exit 58	Right Rollover 68	ZR-1 Lock Ball 3 78	Right Outer Loop 88	Black-Blue J905-5 Upper Left Flipper Opto F8

J2XX = CPU Board; J9XX = Fliptronic II Board;

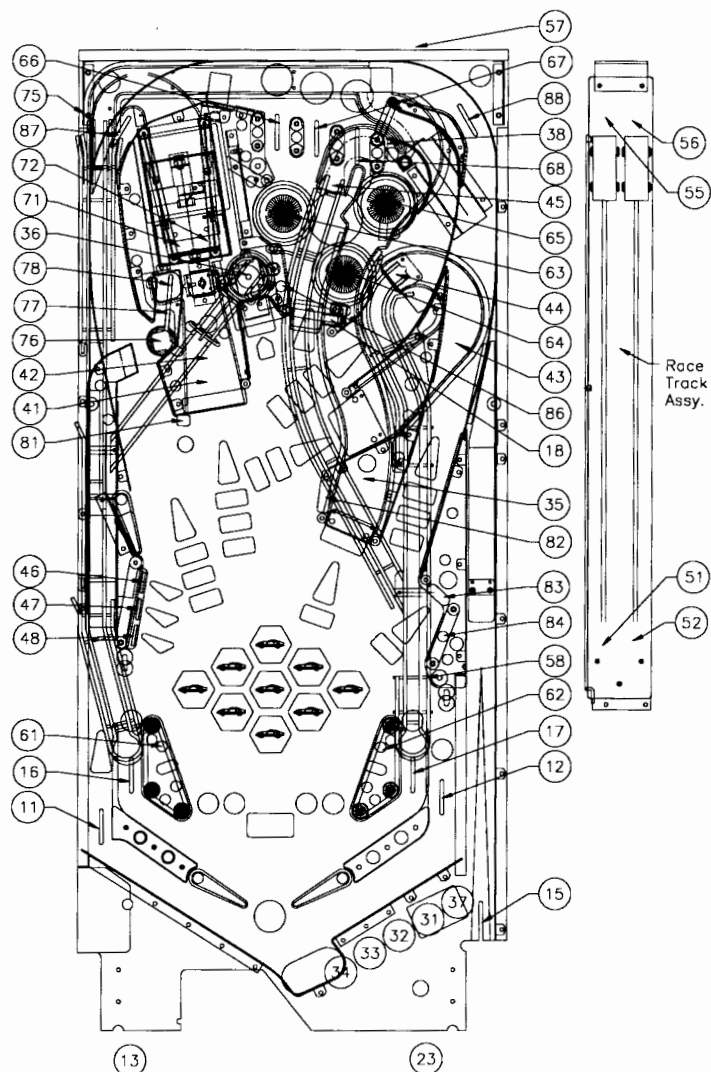
■ = Opto, Typically Closed

SWITCH LOCATIONS

Item No.	Switch Part No.	Description
F1	SW-1A-194	*Lower Right Flipper EOS
F2	A-17316	*Lower Right Flipper Cabinet
F3	SW-1A-194	*Lower Left Flipper EOS
F4	A-17316	*Lower Left Flipper Cabinet
F5	---	Not Used
F6	---	Not Used
F7	SW-1A-194	*Upper Left Flipper EOS
F8	A-17316	*Upper Left Flipper Cabinet
11	5647-12693-32	Left Out Lane
12	5647-12693-19	Right Out Lane
13	20-9663-2	Start Button
14	A-15361	*Plumb Bob Tilt
15	5647-12693-32	Plunger
16	5647-12693-19	Left Return Lane
17	5647-12693-19	Right Return Lane
18	5647-12693-60	Spinner
21	A-17238	*Slam Tilt
22	5643-09288-00	*Coin Door Closed
23	20-9663-18	Buy In Button
24	5643-09112-00	*Always Closed
25	---	1st Gear (optional)

Item No.	Switch Part No.	Description
26	---	2nd Gear (optional)
27	---	3rd Gear (optional)
28	---	4th Gear (optional)
31	A-18617	Trough Ball 1 (LED)
	A-18618	(Transistor)
32	A-18617	Trough Ball 2 (LED)
	A-18618	(Transistor)
33	A-18617	Trough Ball 3 (LED)
	A-18618	(Transistor)
34	A-18617	Trough Ball 4 (LED)
	A-18618	(Transistor)
35	A-16908	Route 66 Entry (LED)
	A-16909	(Transistor)
36	A-16908	Pit Stop Popper (LED)
	A-16909	(Transistor)
37	A-18617	Trough Eject (LED)
	A-18618	Trough Eject ((Transistor)
38	5647-12693-31	Inner Loop Entry
41	A-16908	ZR-1 Bottom Entry (LED)
	A-16909	(Transistor)

SWITCH LOCATIONS (continued)



Item No.	Switch Part No.	Description
42	A-16908	ZR-1 Top Entry (LED)
	A-16909	(Transistor)
43	A-16908	Skid Pad Entry (LED)
	A-16909	(Transistor)
44	5647-12693-21	Skid Pad Exit
45	5647-12693-21	Route 66 Exit
46	A-19294	Left Standup 3
47	A-19294	Left Standup 2
48	A-19294	Left Standup 1
51	A-19141	Left Race Start
52	A-19141	Right Race Start
53	---	Not Used
54	---	Not Used
55	A-18821	Left Race Encoder
56	A-18821	Right Race Encoder
57	5647-12693-21	Route 66 Kickout
58	5647-12693-13	Skid Route 66 Exit
61	SW-1A-114	Left Slingshot
	SW-1A-120	
62	A-17612	Right Slingshot
	A-17613	
63	SW-11A-37	Left Jet
*Not Shown		

Item No.	Switch Part No.	Description
64	SW-11A-37	Bottom Jet
65	SW-11A-37	Right Jet
66	5647-12693-19	Left Rollover
67	5647-12693-19	Middle Rollover
68	5647-12693-19	Right Rollover
71	A-18951	ZR-1 Full Left
72	A-18951	ZR-1 Full Right
73	---	Not Used
74	---	Not Used
75	5647-12693-31	ZR-1 Exit
76	5647-12133-11	ZR-1 Lock Ball 1
77	5647-12693-53	ZR-1 Lock Ball 2
78	5647-12693-54	ZR-1 Lock Ball 3
81	A-16816-4	Standup Million
82	A-17226-4	Skid Pad Standup
83	A-18019-4	Right Standup
84	SW-1A-120	Right Rubber
85	---	Not Used
86	SW-1A-120	Jet Rubber
87	5647-12693-19	Left Outer Loop
88	5647-12693-19	Right Outer Loop

SOLENOID/FLASHER TABLE

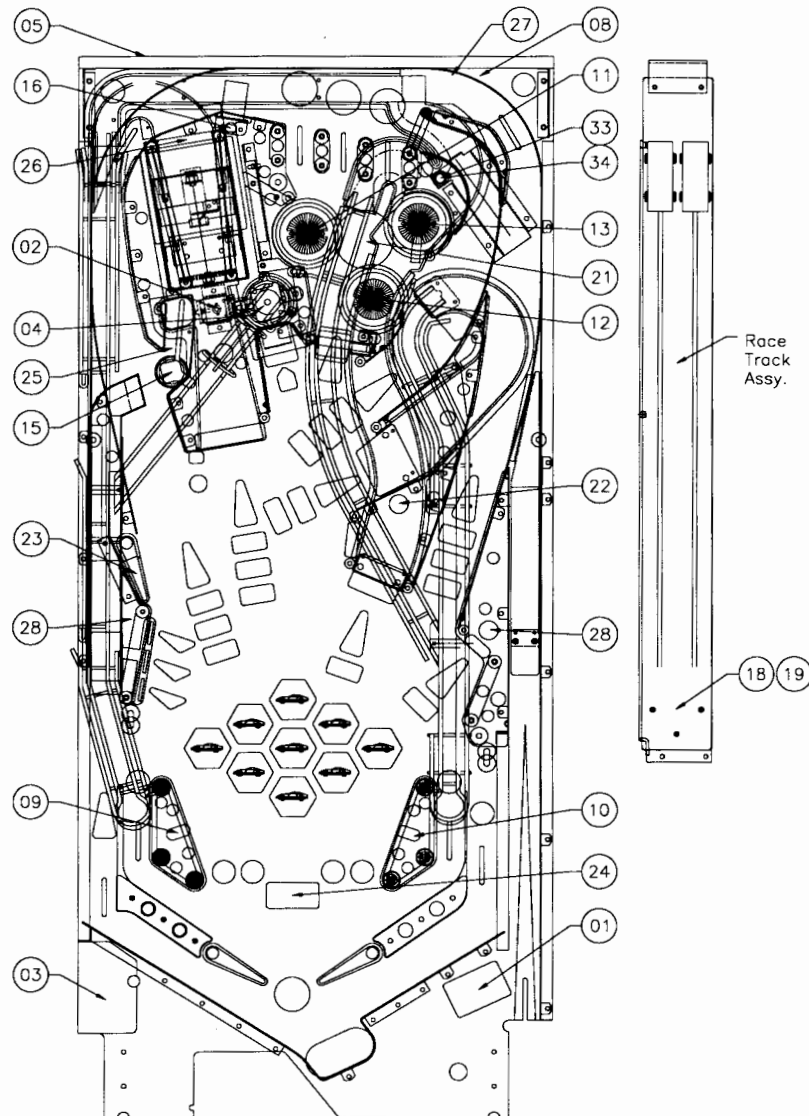
Sol. No.	Function	Solenoid Type	Voltage Connections			Drive Xister	Drive Connections			Drive Wire Color	Solenoid Part number	
			Playfield	Backbox	Cabinet		Playfield	Backbox	Cabinet		Flashlamp Type	
											Playfield	Backbox
01	Trough Eject	High Power	J107-2			Q82	J130-1			Vio-Brn	AE-26-1500	
02	ZR-1 Low Rev Gate	High Power	J107-2			Q80	J130-2			Vio-Red	SM1-28-900-DC	
03	Kickback	High Power	J107-2			Q78	J130-4			Vio-Org	AE-23-800	
04	Pit Stop Popper	High Power	J107-2			Q76	J130-5			Vio-Yel	AE-23-800	
05	ZR-1 Up Rev Gate	High Power	J107-2			Q64	J130-6			Vio-Grn	SM1-35-4000-DC	
06	Not Used	High Power	J107-2			Q66	J130-7			Vio-Blu		
07	Knocker	High Power		J107-2		Q68		J130-8		Vio-Blk		AE-23-800
08	Route 66 Kickout	High Power	J107-2			Q70	J130-9			Vio-Gry	AE-23-800	
09	Left Slingshot	Low Power	J107-3			Q58	J127-1			Brn-Blk	AE-26-1200	
10	Right Slingshot	Low Power	J107-3			Q56	J127-3			Brn-Red	AE-26-1200	
11	Left Jet	Low Power	J107-3			Q54	J127-4			Brn-Org	AE-26-1200	
12	Bottom Jet	Low Power	J107-3			Q52	J127-5			Brn-Yel	AE-26-1200	
13	Right Jet	Low Power	J107-3			Q50	J127-6			Brn-Grn	AE-26-1200	
14	Not Used	Low Power	J107-3			Q48	J127-7			Brn-Blu		
15	ZR-1 Lockup	Low Power	J107-3			Q46	J127-8			Brn-Vio	AE-30-2000	
16	Loop Gate	Low Power	J107-3			Q44	J127-9			Brn-Gry	A-14406	
17	Race Direction	Flasher	J107-6			Q42	J126-1			Blk-Brn	A-19159	
18	Left Race Enable	Flasher	J107-6			Q40	J126-2			Blk-Red	14-8015	
19	Right Race Enable	Flasher	J107-6			Q38	J126-3			Blk-Org	14-8015	
20	Tenth Corvette	Flasher		J106-5		Q36		J125-5		Blk-Yel		24-8802
21	Jets	Flasher	J107-6			Q28	J126-5			Blu-Grn	24-8704	
22	Right Ramps	Flasher	J107-6	J106-5		Q30	J126-6	J125-7		Blu-Blk	24-8704	24-8802
23	Upper Left Flipper	Flasher	J107-6	J106-5		Q34	J126-7	J125-8		Blu-Vio	24-8704	24-8802
24	Catch Me	Flasher	J107-6	J106-5		Q32	J126-8	J125-9		Blu-Gry	24-8704	24-8802
25	ZR-1 Ramp	Gen. Purpose	J107-6	J106-5		Q26	J122-1	J124-1		Blu-Brn	24-8802	24-8802
26	ZR-1 Underside	Gen. Purpose	J107-6	J106-5		Q24	J122-2	J124-2		Blu-Red	24-8704	24-8802
27	Right Rear Panel	Gen. Purpose	J107-6	J106-5		Q22	J122-3	J124-3		Blu-Org	24-8802	24-8802
28	Right Standup	Gen. Purpose	J107-6	J106-5		Q20	J122-4	J124-5		Blu-Yel	24-8802	24-8802
33	Diverter Power	High Power	J907-6,7			Q2	J902-6			Yel-Vio	A-15943-1	
34	Diverter Hold	Low Power	J907-6,7			Q7	J902-4			Org-Vio	A-15943-1	
General Illumination												
01	Upper Left	G.I.	J121-1			Q18	J121-7			Wht-Brn	#44	
02	Upper Right	G.I.	J121-2			Q10	J121-8			Wht-Org	#44	
03	Lower Left	G.I.	J121-3	J120-3		Q14	J121-9	J120-9		Wht-Yel	#44	#555
04	Lower Right	G.I.	J121-5	J120-5		Q16	J121-10	J120-10		Wht-Grn	#44	#555
05	Backbox Title	G.I.		J120-6		Q12		J120-11		Wht-Vio		#555
Flipper Circuits												
		Voltage Connections			Drive Transistors		Drive Connectors		Drive Wire Colors		Coil Part No.	Coil Color
		Playfield	Power	Hold			Playfield	Power	Hold			
	Lower Left Flipper	Lwr. Lt. Power	J907-4 (Red-Blu)	Q3			J902-9	Yel-Blu			FL-11629	BLUE
		Lwr. Lt. Hold	J907-4 (Red-Blu)	Q9			J902-7	Org-Blu				
	Lower Right Flipper	Lwr. Rt. Power	J907-1 (Red-Grn)	Q4			J902-13	Yel-Grn			FL-11629	BLUE
		Lwr. Rt. Hold	J907-1 (Red-Grn)	Q11			J902-11	Org-Grn				
	Upper Left Flipper	Upr. Lt. Power	J907-8 (Red-Gry)	Q1			J902-3	Yel-Gry			FL-11630	RED
		Upr. Lt. Hold	J907-8 (Red-Gry)	Q5			J902-1	Org-Gry				
	Upper Right Flipper	Upr. Rt. Power	J907-6 (Red-Vio)	Q2			J902-6	Yel-Vio			NOT	USED
		Upr. Rt. Hold	J907-6 (Red-Vio)	Q7			J902-4	Org-Vio				

J1xx=Power Driver Board; J9xx=Flitronic II Board; 24-6549=#44 bulb; 24-8704=#89 bulb; 24-8768=#555 bulb; 24-8802=#906 bulb

SOLENOID/FLASHER LOCATIONS

Item No.	Coil/ Flasher No.	Assy. Number.	Description	Item No.	Coil/ Flasher No.	Assy. Number.	Description
01	AE-26-1500	A-18753	Trough Eject	12	AE-26-1200	A-9415-2	Bottom Jet
02	SM1-28-900-DC	A-19140	ZR-1 Low Rev Gate	13	AE-26-1200	A-9415-2	Right Jet
03	AE-23-800	B-11873	Kickback	14	---	---	Not Used
04	AE-23-800	A-19005	Pit Stop Popper	15	AE-30-2000	A-15368-1	ZR-1 Lockup
05	SM1-35-4000-DC	A-19006	ZR-1 Up Rev Gate	16	A-14406	A-17796	Loop Gate
06	---	---	Not Used	17	---	A-19159	*Race Direction
07	AE-23-800	B-16086-1	Knocker	18	14-8015	A-19134	Left Race Enable
08	AE-23-800	A-19006	Route 66 Kickout	19	14-8015	A-19134	Right Race Enable
09	AE-26-1200	B-9362-R-3	Left Slingshot	20	24-8802	---	*Tenth Corvette
10	AE-26-1200	B-9362-L-2	Right Slingshot	21	24-8704	A-17803	Jets
11	AE-26-1200	A-9415-2	Left Jet				

SOLENOID/FLASHER LOCATIONS (continued)



Item No.	Coil/Flasher No.	Assy. Number.	Description
22	24-8704	A-17983	Right Ramps
	24-8802		
23	24-8704	A-17803	Upper Left Playfield
	24-8802		
24	24-8704	A-17803	Catch Me
	24-8802		
25	24-8802	A-19008	ZR-1 Ramp
26	24-8704	A-17983	ZR-1 Underside
	24-8802		
27	24-8802	B-12156	Right Rear Panel
28	24-8802	---	Right Standup
33	A-15943-1	A-17241	Diverter Power
34	A-15943-1	A-17241	Diverter Hold

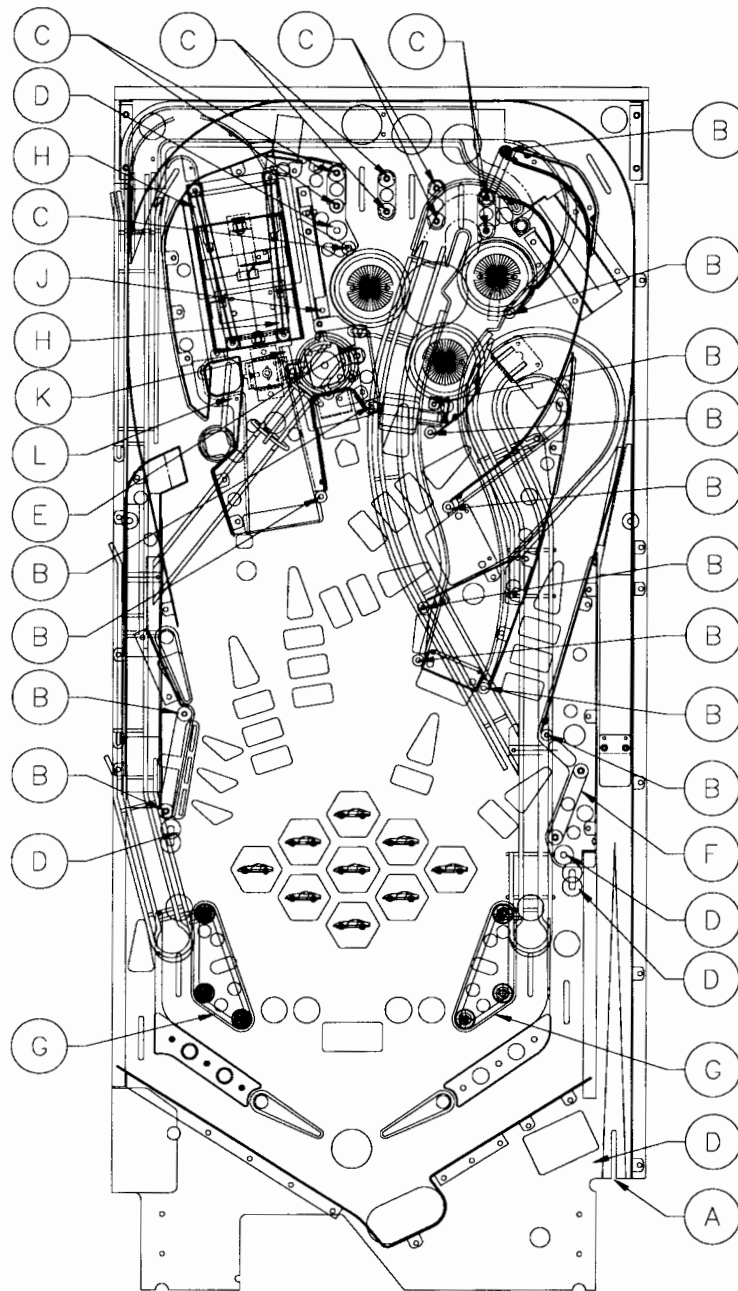
General Illumination Circuits

Item No.	Description	Bulb No.	
01	Upper Left	#44	G.I. String 1
02	Upper Right	#44	G.I. String 2
03	Lower Left	#44, #555	G.I. String 3
04	Lower Right	#44, #555	G.I. String 4
05	Backbox Title	#555	G.I. String 5

Flipper Coils

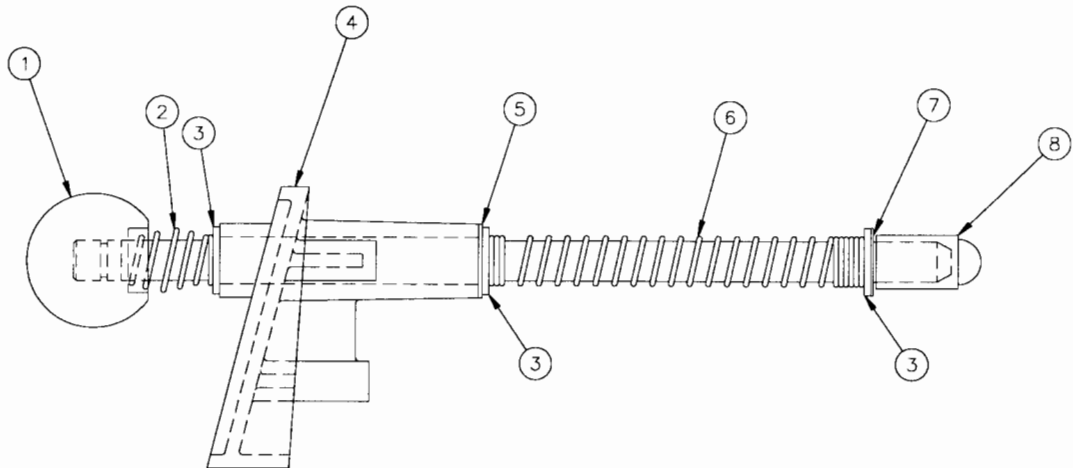
Coil No.	Color	Assy. No.	Description
*FL-11629	(blue)	A-15849-L-2	Lower Left Flipper
*FL-11629	(blue)	A-19223-R	Lower Right Flipper
*FL-11630	(red)	A-15849-L	Upper Left Flipper
* Not Shown			
24-6549 = #44 bulb			
24-8704 = #89 bulb			
24-8768 = #555 bulb			
24-8802 = #906 bulb			

RUBBER RINGS



Item No.	Part Number	Description.	Qty	Item No.	Part Number	Description.	Qty
A	23-6327	Shooter Tip	1	H	23-6694-10	2 1/2" Black Ring	2
B	23-6556	Black Sleeve	13	I	23-6306	2 1/2" White Ring	4
C	23-6641	.64 O.D. Black Ring	9	J	23-6552	Yellow Sleeve	1
D	23-6694-3	5/16" Black Ring	5	K	23-6694-1	3/32" Black Ring	1
E	23-6694-6	1" Black Ring	1	L	23-6694-2	15/64" Black Ring	1
F	23-6694-8	1 1/2" Black Ring	2				

A-17730-2 Ball Shooter Rod Assembly



Item	Part No.	Description
1.	20-9927-2	Ball Shooter Rod w/Shaft
2.	10-149	Outer Spring
3.	4700-00051-00	Flatwasher, 25/64 x 5/8 x 16ga.
4.	21-6645-2	Shooter Housing
5.	03-7357	Shooter Sleeve
6.	10-148-4	Power Spring
7.	20-8714-37	External Retainer Spring
8.	23-6327	Ball Shooter Tip

Notes

SECTION THREE

GAME WIRING AND SCHEMATICS

CONNECTOR & COMPONENT IDENTIFICATION

Each plug or jack (except the Audio Board and Dot Matrix Display/Driver Board) receives a number that identifies the circuit board and position on that board that it connects to. J-designations refer to the male part of a connector. P-designations refer to the female part of a connector. For example, J101 designates jack 1 of board 1 (a Power Driver Board jack); P206 designates plug 6 of board 2 (a CPU Board plug). Identifying the specific pin number of a connector involves a hyphen, which separates the pin number from the plug or jack designation. For example, J101-3 refers to pin 3 of jack 1 on board 1.

Other game components may also have similar numbers to clarify their locations or related circuits. For example, F501 refers to a fuse located on the Sound Board.

Prefix number for the WPC circuit boards are as listed below.

1-Power Driver Board
2-CPU Board
6-Dot Matrix Controller
9-Fliptronic II Controller Board

P.C. BOARD LEGEND J1XX = Power Driver Board J2XX = CPU Board J3XX = Dot Matrix Controller Board J4XX = Fliptronic II Board
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The Audio Board and the Dot Matrix Display/Driver Board do not have an identification number.

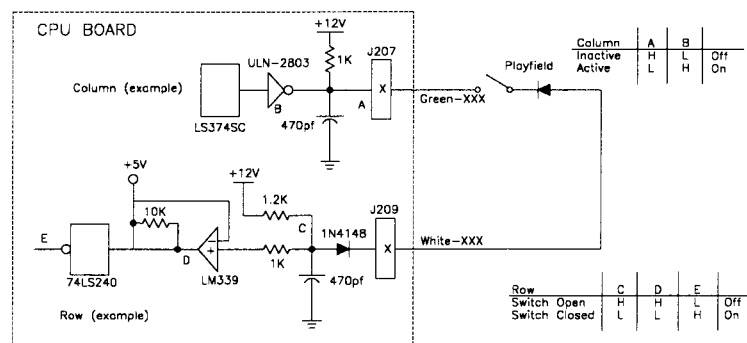
Schematics for standard WPC backbox boards are found in the WPC Schematics Manual. Playfield, cabinet, and all other backbox board schematics are found in this section.

SWITCH MATRIX

Dedicated Grounded Switches	Column Row	White ——— ——— Green								Flipper Grounded Switches
		1 Green-Brown J207-1 U20-18	2 Green-Red J207-2 U20-17	3 Green-Orange J207-3 U20-16	4 Green-Yellow J207-4 U20-15	5 Green-Black J207-5 U20-14	6 Green-Blue J207-6 U20-13	7 Green-Violet J207-7 U20-12	8 Green-Gray J207-9 U20-11	
Orange-Brown (1) J205-1 Left Coin Chute D1	1 White-Brown J209-1 U18-11	Left Out Lane 11	Slam Tilt 21	Trough Ball 1 31	ZR-1 Bottom Entry 41	Left Race Start 51	Left Slingshot 61	ZR-1 Full Left 71	Million Standup 81	Black-Green J906-1 Right Flipper EOS F1
Orange-Red (2) J205-2 Center Coin Chute D2	2 White-Red J209-2 U18-9	Right Out Lane 12	Coin Door Closed 22	Trough Ball 2 32	ZR-1 Top Entry 42	Right Race Start 52	Right Slingshot 62	ZR-1 Full Right 72	Skid Pad Standup 82	Black-Violet J906-1 Right Flipper Opto F2
Orange-Black (3) J205-3 Right Coin Chute D3	3 White-Orange J209-3 U18-5	Start Button 13	Buy In Button 23	Trough Ball 3 33	Skid Pad Entry 43	Not Used 53	Left Jet 63	Not Used 73	Right Standup 83	Black-Blue J906-3 Left Flipper EOS F3
Orange-Yellow (4) J205-4 4th Coin Chute D4	4 White-Yellow J209-4 U18-7	Plumb Bob Tilt 14	Always Closed 24	Trough Ball 4 34	Skid Pad Exit 44	Not Used 54	Bottom Jet 64	Not Used 74	Right Rubber 84	Black-Gray J906-2 Left Flipper Opto F4
Orange-Green (5) J205-6 Normal Function Ser Credits Esc D5	5 White-Green J209-5 U19-11	Plunger 15	First Gear (optional) 25	Route 66 Entry 35	Route 66 Exit 45	Left Race Encoder 55	Right Jet 65	ZR-1 Exit 75	Not Used 85	Black-Violet J906-4 Upper Right Flipper EOS F5
Orange-Blue (6) J205-7 Normal Function Vol Down D6	6 White-Blue J209-7 U19-9	Left Return Lane 16	Second Gear (optional) 26	Pit Stop Popper 36	Left Standup 3 46	Right Race Encoder 56	Left Rollover 66	ZR-1 Lock Ball 1 76	Jet Rubber 86	Black-Yellow J906-3 Upper Right Flipper Opto F6
Orange-Violet (7) J205-8 Normal Function Vol Up D7	7 White-Violet J209-8 U19-5	Right Return Lane 17	Third Gear (optional) 27	Trough Eject 37	Left Standup 2 47	Route 66 Kickout 57	Middle Rollover 67	ZR-1 Lock Ball 2 77	Left Outer Loop 87	Black-Gray J906-5 Upper Left Flipper EOS F7
Orange-Gray (8) J205-9 Normal Function Begin Test Enter D8	8 White-Gray J209-9 U19-7	Spinner 18	Fourth Gear (optional) 28	Inner Loop Entry 38	Left Standup 1 48	Skid Route 66 Exit 58	Right Rollover 68	ZR-1 Lock Ball 3 78	Right Outer Loop 88	Black-Blue J906-5 Upper Left Flipper Opto F8

J2XX = CPU Board; J9XX = Fliptronic II Board;  = Opto, Typically Closed

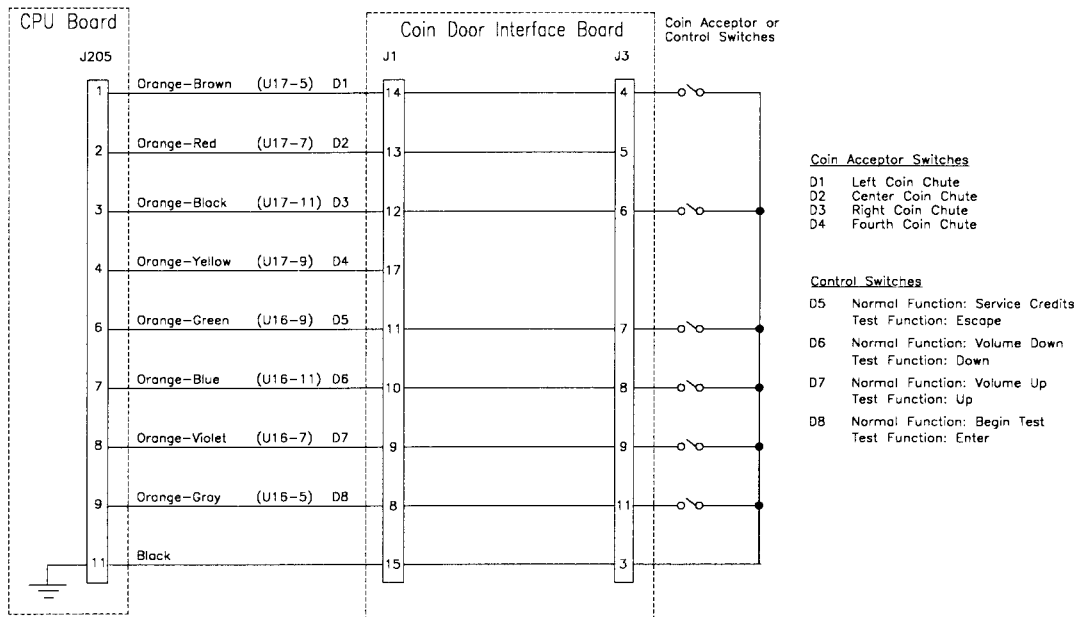
SWITCH MATRIX CIRCUIT



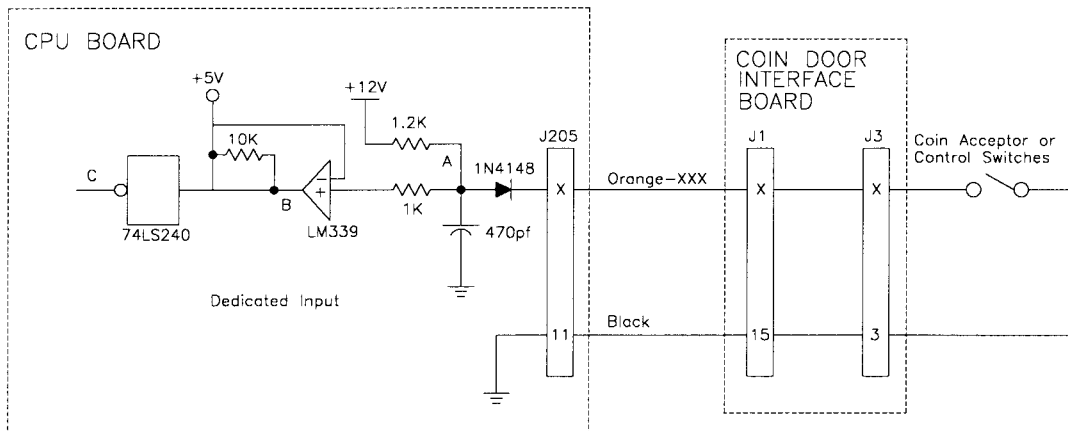
The microprocessor is constantly strobing the column side of the switch. When point "A" on the column circuit toggles low, the column side is active.

When a switch closes, the row side of the circuit activates. The "+" input to the LM339 drops below +5V causing its output to go low. Corresponding row and column switches must be low at the same time for the switch to be considered closed by the microprocessor. When the switch opens, the "+" input to the LM339 is above +5V, its output is high and the row is inactive.

DEDICATED SWITCHES



DEDICATED SWITCH CIRCUIT



Switch	A	B	C	
Open	H	H	L	Off
Closed	L	L	H	On

The dedicated switches operate similar to switches in the matrix except that instead of a column circuit there is a direct tie to ground. Therefore, the column side is constantly active (low).

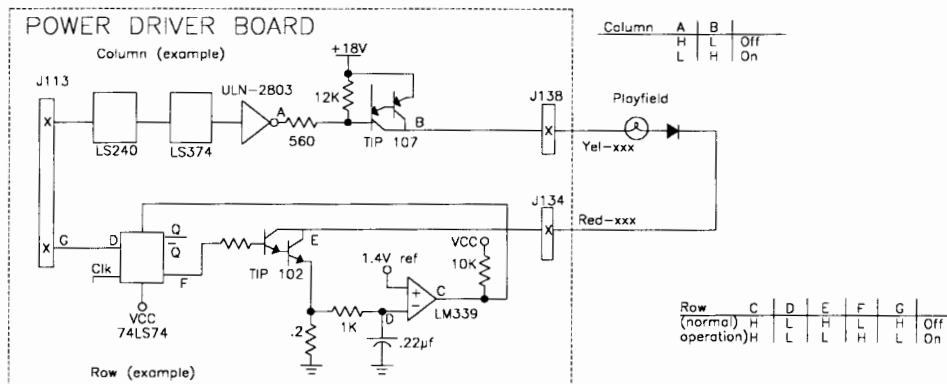
When a switch closes the row side (dedicated input) of the circuit activates. The "+" input to the LM339 drops below +5V causing its output to go low. Since the row circuit (dedicated input) is tied directly to ground through the switch, the switch is considered closed by the microprocessor. When the switch opens, the "+" input to the LM339 is about +5V, its output is high and the row is inactive.

LAMP MATRIX

		Yellow (B+)  Red						
Column	1 Yellow-Brown J137-1 Q98	2 Yellow-Red J137-2 Q97	3 Yellow-Orange J137-3 Q96	4 Yellow-Black J137-4 Q95	5 Yellow-Green J137-5 Q94	6 Yellow-Blue J137-6 Q93	7 Yellow-Violet J138-7 Q92	8 Yellow-Gray J138-9 Q91
Row	1 Red-Brown J133-1 Q90	Left Rollover 11	Inner Loop Arrow 21	Left Outer Loop Arrow 31	Corvette 6 41	Corvette 9 51	Left Outer Tail 61	Right Tree Red 81
2 Red-Black J133-2 Q89	Middle Rollover 12	Fuelie 22	Lite Lock 32	Corvette 3 42	Corvette 8 52	Left Inner Tail 2	Left Return Lane 72	Left Tree Red 82
3 Red-Orange J133-4 Q88	Right Rollover 13	Nitrous 23	Qualify 33	Corvette 1 43	Pit Stop 53	Catch Me 63	Right Return lane 73	Tree Bottom Yellow 83
4 Red-Yellow J133-5 Q87	Skid Pad Arrow 14	Inner Loop Jackpot 24	Big Block 34	Corvette 2 44	Corvette 7 54	Right Inner Tail 64	Right Our Lane 74	Tree Top Yellow 84
5 Red-Green J133-6 Q86	Sticky Tires 15	Right Outer Loop Arrow 25	ZR-1 Ramp 35	Corvette 4 45	Corvette 5 55	Right Outer Tail 65	Million Standup 75	Right Tree Green 85
6 Red-Blue J133-7 Q85	Skid Pad Jackpot 16	Z07 Suspension 26	6 Speed Trans 36	Left Standup 3 46	Pit Stop Arrow 56	Right Standup Arrow 66	Side Pipe 1 76	Left Tree Green 86
7 Red-Violet J133-8 Q84	Route 66 Arrow 17	Big Brakes 27	Hi Lift Cams 37	Left Standup 2 47	Spinner Arrow 57	Lite Kickback 67	Side Pipe 2 77	Buy In 87
8 Red-Gray J133-9 Q83	Race Today 18	Super Charger 28	ZR-1 Ramp Arrow 38	Left Standup 1 48	Drive Again 58	Start Challenge 68	Side Pipe 3 78	Start Button 88

J1XX = Power Driver Board

LAMP MATRIX CIRCUIT



The processor sends a signal to the column circuit, causing the output of the ULN-2803 to toggle. When point "A" drops low, the TIP107 transistor conducts and point "B" changes to a high state. At the same time the processor drives the input of the 74LS74 low, causing a high at output "F". A high state at the base of TIP102 causes the transistor to conduct, bringing the row circuit to ground and turning the lamp On.

The processor changes the input of the 74LS74 to a high state to turn the lamp Off.

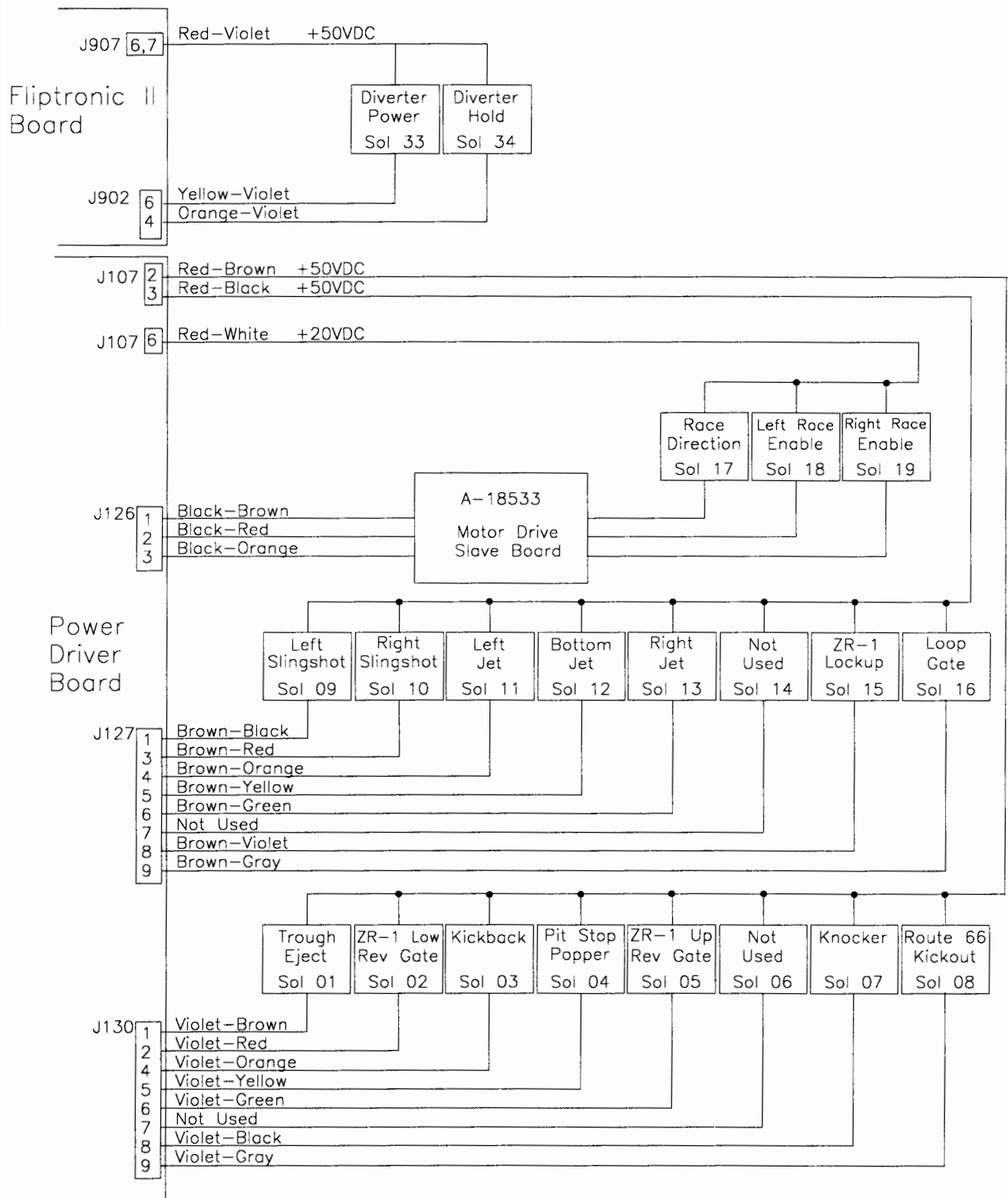
In overcurrent conditions the lamps is shut Off through the comparator. If the voltage at the negative input of the LM330 rises above 1.4V the output changes to a low, which is fed back to the 74LS74 and shuts the row circuit Off.

SOLENOID/FLASHER TABLE

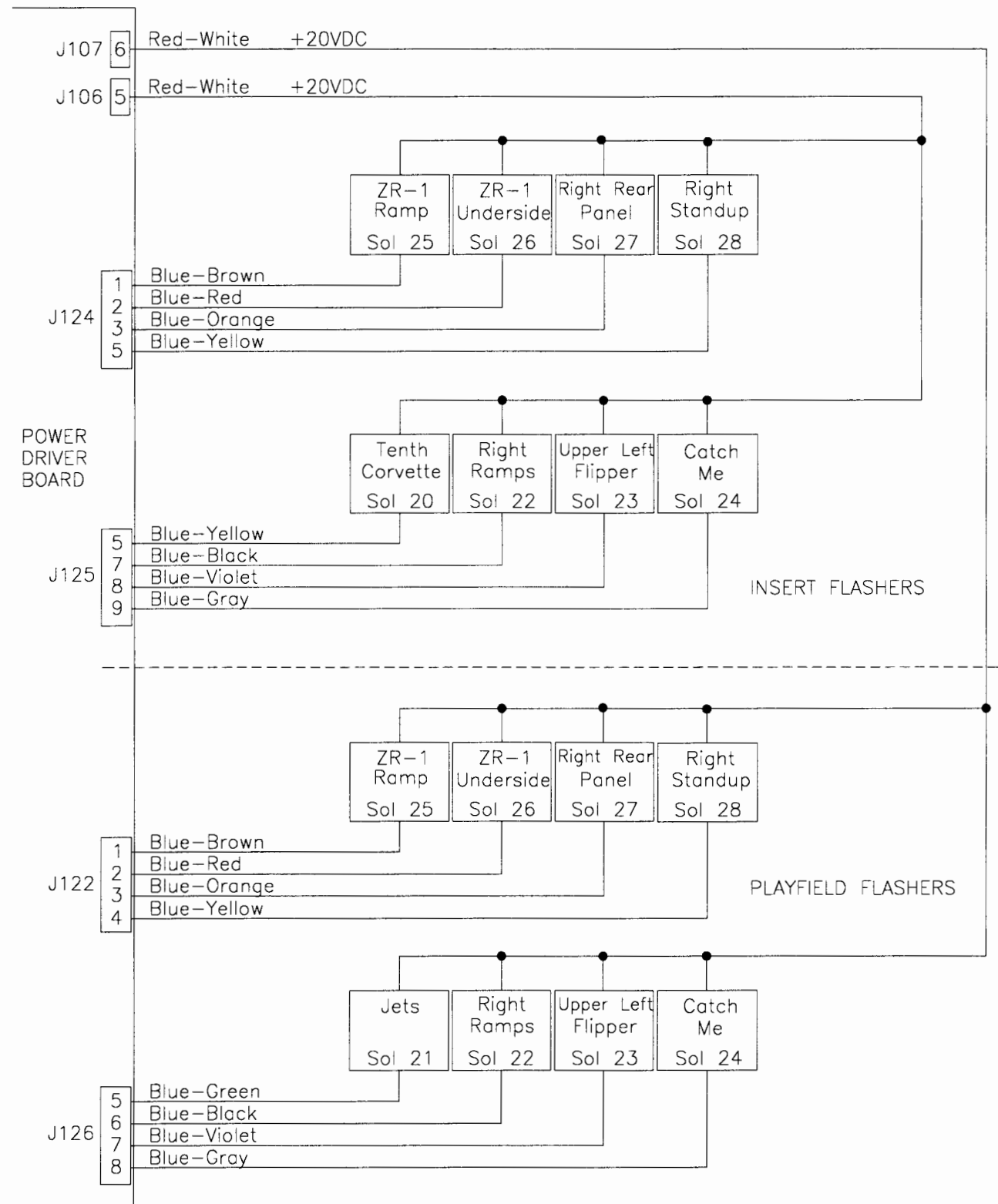
Sol. No.	Function	Solenoid Type	Voltage Connections			Drive Xister	Drive Connections			Drive Wire Color	Solenoid Part number	
			Playfield	Backbox	Cabinet		Playfield	Backbox	Cabinet		Flashlamp Type	Playfield
01	Trough Eject	High Power	J107-2			Q82	J130-1			Vio-Brn	AE-26-1500	
02	ZR-1 Low Rev Gate	High Power	J107-2			Q80	J130-2			Vio-Red	SM1-28-900-DC	
03	Kickback	High Power	J107-2			Q78	J130-4			Vio-Org	AE-23-800	
04	Pit Stop Popper	High Power	J107-2			Q76	J130-5			Vio-Yel	AE-23-800	
05	ZR-1 Up Rev Gate	High Power	J107-2			Q64	J130-6			Vio-Grn	SM1-35-4000-DC	
06	Not Used	High Power	J107-2			Q66	J130-7			Vio-Blu		
07	Knocker	High Power		J107-2		Q68		J130-8		Vio-Blk		AE-23-800
08	Route 66 Kickout	High Power	J107-2			Q70	J130-9			Vio-Gry	AE-23-800	
09	Left Slingshot	Low Power	J107-3			Q58	J127-1			Brn-Blk	AE-26-1200	
10	Right Slingshot	Low Power	J107-3			Q56	J127-3			Brn-Red	AE-26-1200	
11	Left Jet	Low Power	J107-3			Q54	J127-4			Brn-Org	AE-26-1200	
12	Bottom Jet	Low Power	J107-3			Q52	J127-5			Brn-Yel	AE-26-1200	
13	Right Jet	Low Power	J107-3			Q50	J127-6			Brn-Grn	AE-26-1200	
14	Not Used	Low Power	J107-3			Q48	J127-7			Brn-Blu		
15	ZR-1 Lockup	Low Power	J107-3			Q46	J127-8			Brn-Vio	AE-30-2000	
16	Loop Gate	Low Power	J107-3			Q44	J127-9			Brn-Gry	A-14406	
17	Race Direction	Flasher	J107-6			Q42	J126-1			Blk-Brn	A-19159	
18	Left Race Enable	Flasher	J107-6			Q40	J126-2			Blk-Red	14-8015	
19	Right Race Enable	Flasher	J107-6			Q38	J126-3			Blk-Org	14-8015	
20	Tenth Corvette	Flasher		J106-5		Q36		J125-5		Blk-Yel		24-8802
21	Jets	Flasher	J107-6			Q28	J126-5			Blu-Grn	24-8704	
22	Right Ramps	Flasher	J107-6	J106-5		Q30	J126-6	J125-7		Blu-Blk	24-8704	24-8802
23	Upper Left Flipper	Flasher	J107-6	J106-5		Q34	J126-7	J125-8		Blu-Vio	24-8704	24-8802
24	Catch Me	Flasher	J107-6	J106-5		Q32	J126-8	J125-9		Blu-Gry	24-8704	24-8802
25	ZR-1 Ramp	Gen. Purpose	J107-6	J106-5		Q26	J122-1	J124-1		Blu-Brn	24-8802	24-8802
26	ZR-1 Underside	Gen. Purpose	J107-6	J106-5		Q24	J122-2	J124-2		Blu-Red	24-8704	24-8802
27	Right Rear Panel	Gen. Purpose	J107-6	J106-5		Q22	J122-3	J124-3		Blu-Org	24-8802	24-8802
28	Right Standup	Gen. Purpose	J107-6	J106-5		Q20	J122-4	J124-5		Blu-Yel	24-8802	24-8802
33	Diverter Power	High Power	J907-6,7			Q2	J902-6			Yel-Vio	A-15943-1	
34	Diverter Hold	Low Power	J907-6,7			Q7	J902-4			Org-Vio	A-15943-1	
General Illumination												
01	Upper Left	G.I.	J121-1			Q18	J121-7			Wht-Brn	#44	
02	Upper Right	G.I.	J121-2			Q10	J121-8			Wht-Org	#44	
03	Lower Left	G.I.	J121-3	J120-3		Q14	J121-9	J120-9		Wht-Yel	#44	#555
04	Lower Right	G.I.	J121-5	J120-5		Q16	J121-10	J120-10		Wht-Grn	#44	#555
05	Backbox Title	G.I.		J120-6		Q12		J120-11		Wht-Vio		#555
Flipper Circuits												
			Voltage Connections		Drive Transistors	Drive Connectors		Drive Wire Colors		Coil Part No.	Coil Color	
			Playfield	Power	Hold	Playfield	Power	Hold				
	Lower Left Flipper	Lwr. Lt. Power	J907-4 (Red-Blu)		Q3	J902-9	Yel-Blu			FL-11629	BLUE	
		Lwr. Lt. Hold	J907-4 (Red-Blu)		Q9	J902-7	Org-Blu					
	Lower Right Flipper	Lwr. Rt. Power	J907-1 (Red-Grn)		Q4	J902-13	Yel-Grn			FL-11629	BLUE	
		Lwr. Rt. Hold	J907-1 (Red-Grn)		Q11	J902-11	Org-Grn					
	Upper Left Flipper	Upr. Lt. Power	J907-8 (Red-Gry)		Q1	J902-3	Yel-Gry			FL-11630	RED	
		Upr. Lt. Hold	J907-8 (Red-Gry)		Q5	J902-1	Org-Gry					
	Upper Right Flipper	Upr. Rt. Power	J907-6 (Red-Vio)		Q2	J902-6	Yel-Vio			NOT	USED	
		Upr. Rt. Hold	J907-6 (Red-Vio)		Q7	J902-4	Org-Vio					

J1xx=Power Driver Board; J9xx=Fliptronic II Board; 24-6549=#44 bulb; 24-8704=#89 bulb; 24-8768=#555 bulb; 24-8802=#906 bulb

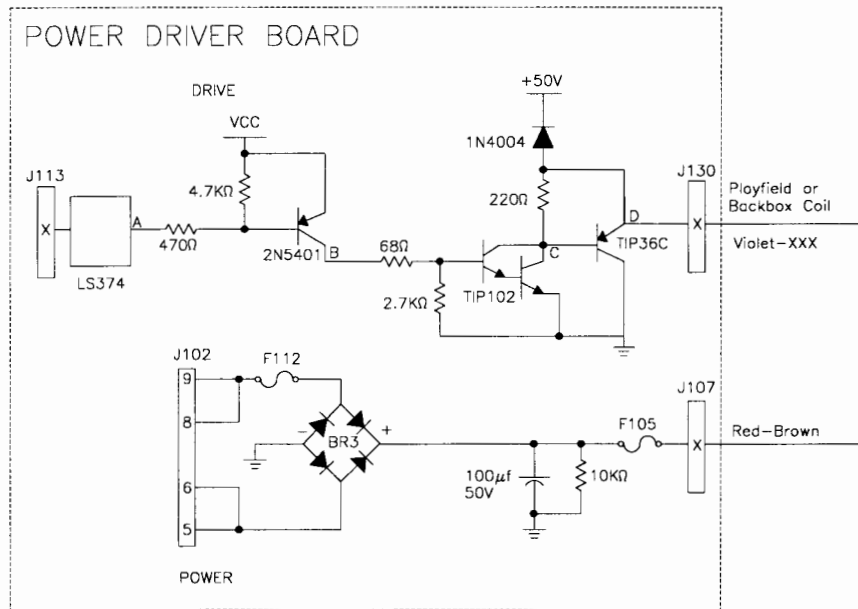
SOLENOID WIRING



FLASHER WIRING

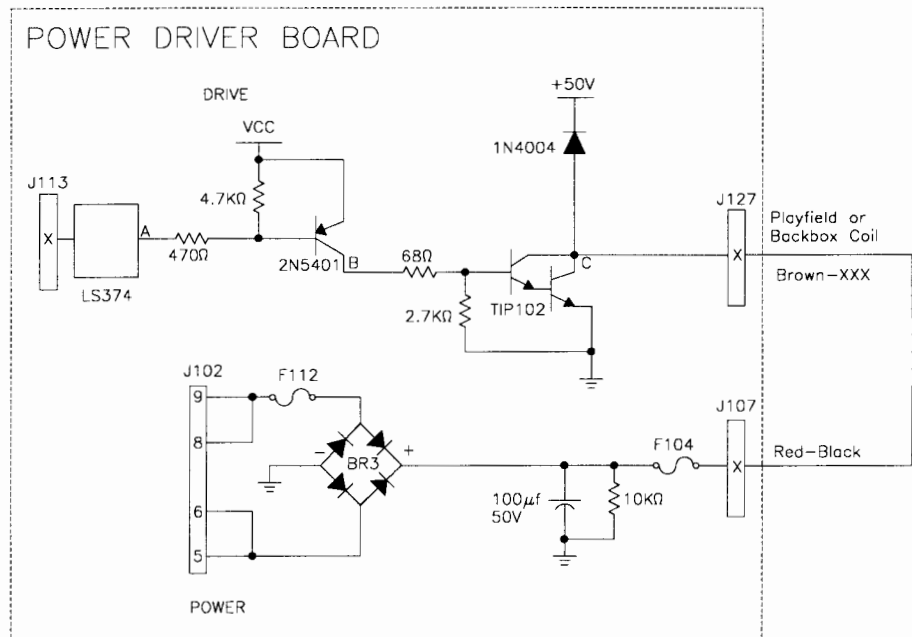


High Power Solenoid Circuit



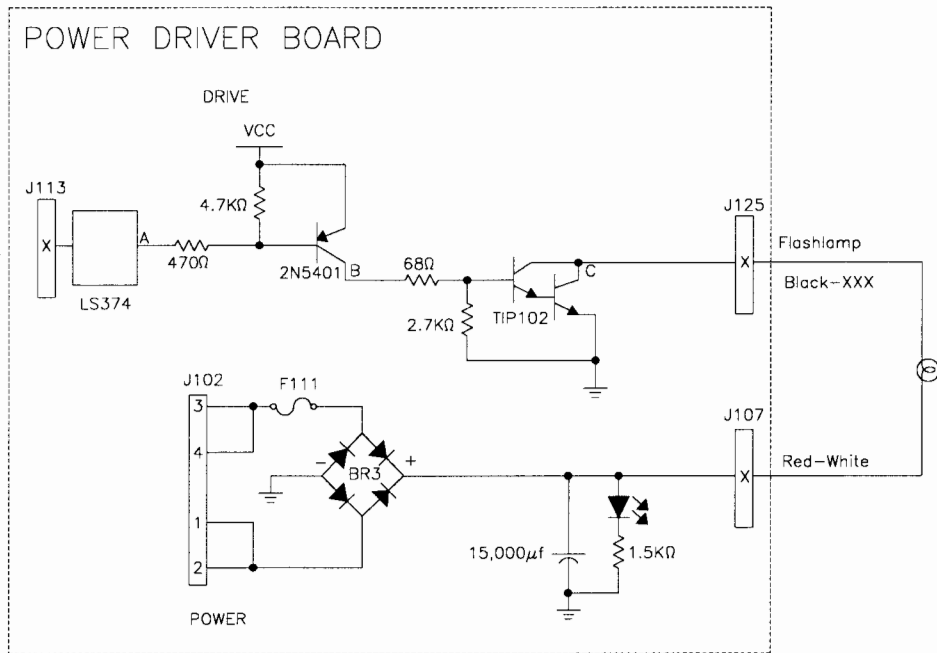
The microprocessor toggles the output of the 74LS374. When point "A" drops low, point "B" the collector of the 2N5401 transistor is high. A high at point "B" causes point "C" the collector of the TIP102 transistor, and point "D" the emitter of the TIP36 transistor to drop low. When point "D" is low the coil is grounded through the transistor and the coil turns On. The coil shuts Off when point "A" toggles high.

Low Power Solenoid Circuit



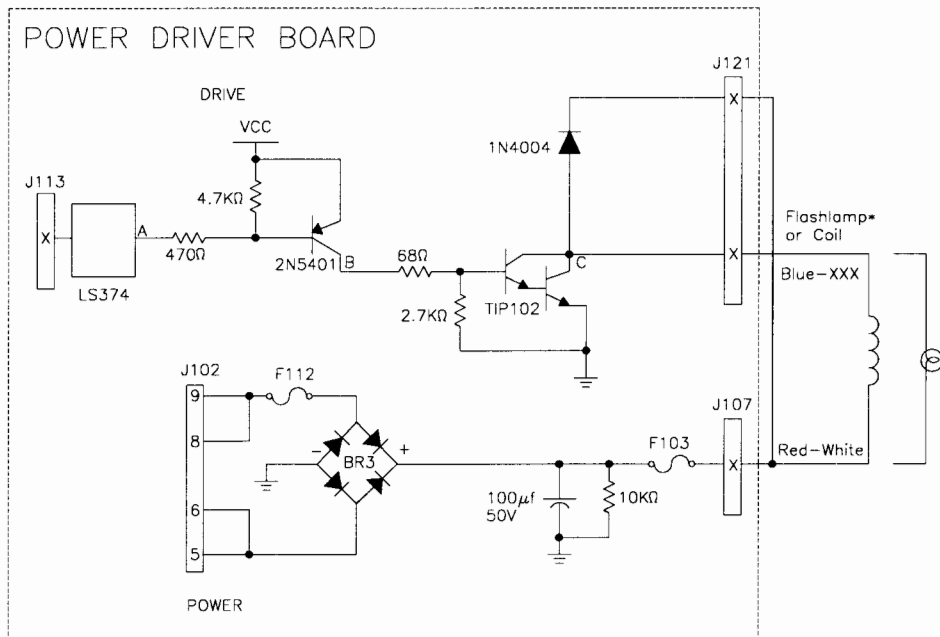
The microprocessor toggles the output of the 74LS374. When point "A" is low, point "B" the collector of the 2N5401 transistor is driven high. A high at point "B" turns On the TIP102 transistor, and causes point "C" to drop low. When point "C" is low the coil is grounded through the transistor and the coil turns On. The coil shuts Off when point "A" toggles high.

Flashlamp Circuit



The microprocessor toggles the output of the 74LS374. When point "A" is low, point "B" the collector of the 2N5401 transistor is high. Once point "B" is high, point "C" the collector of the TIP102 transistor is low. When point "C" is low the flashlamp is grounded through the transistor and the flashlamp turns On. When point "A" toggles high the circuit shuts Off.

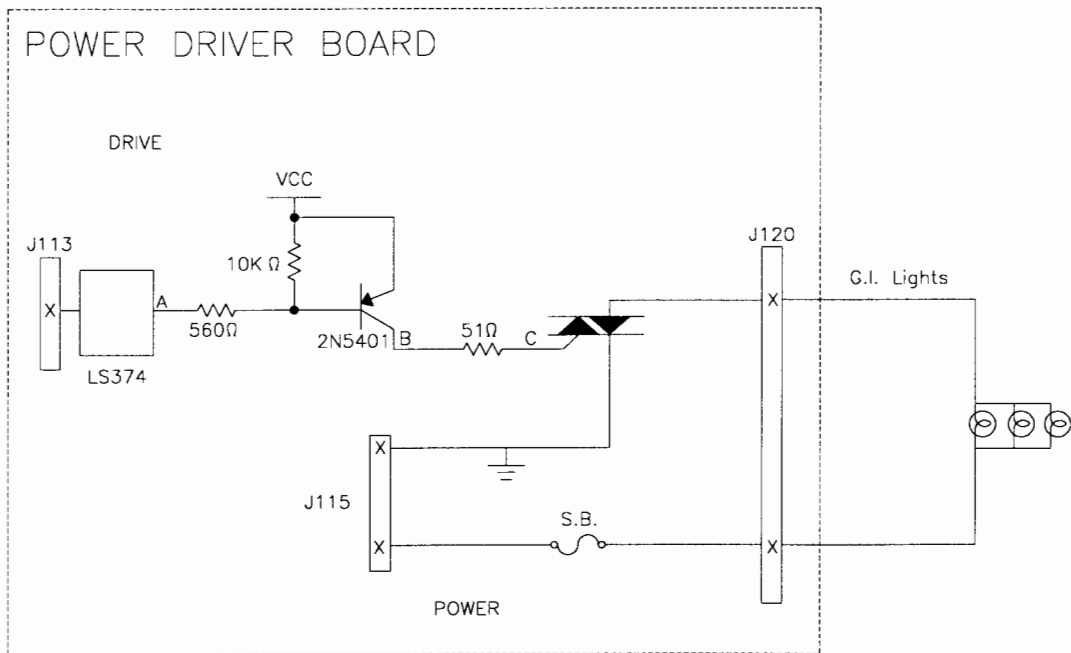
Special (General Purpose) Solenoid Circuit



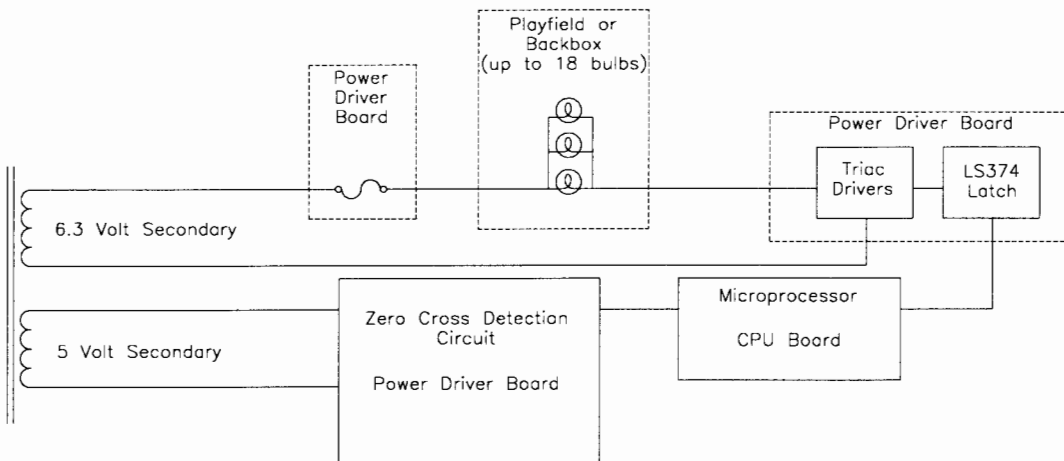
The microprocessor toggles the output of the 74LS374. When point "A" drops low, point "B" is high. A high at point "B" causes a low at point "C". When point "C" is low the coil/flashlamp is grounded through the transistor and the coil/flashlamp turns On. When point "A" toggles high the coil/flashlamp turns Off.

*Tieback Diode is not used for flashlamp circuit.

General Illumination Circuit

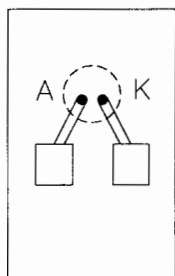
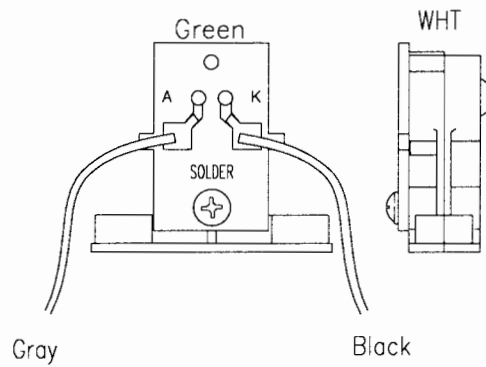


Block Diagram of General Illumination Circuit

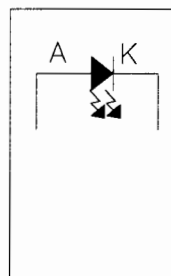


When point "A" toggles low, then points "B" and "C" are high. This turns On the triac and the desired general illumination string lights.

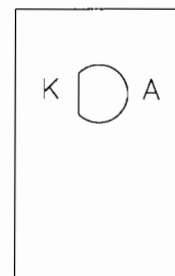
LED P.C.B. Assembly (transmitter) **A-16908**



solder side

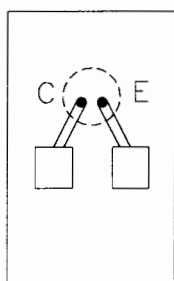
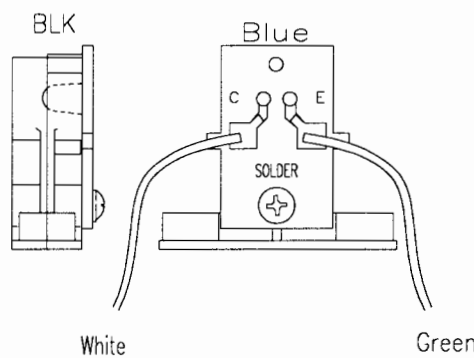


schematic

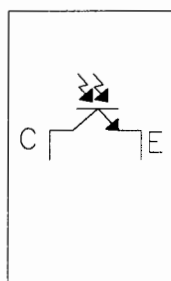


component side

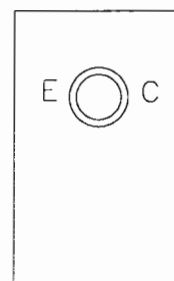
Photo Transistor P.C.B. Assembly (receiver) **A-16909**



solder side

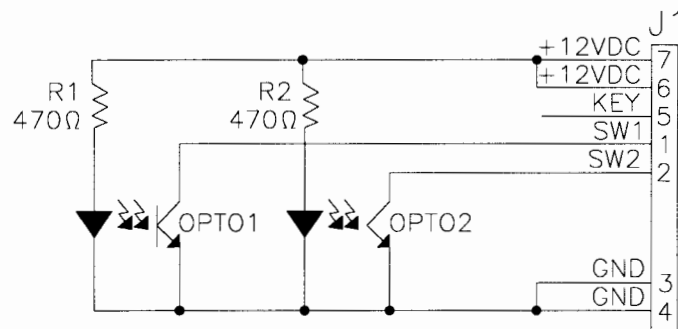
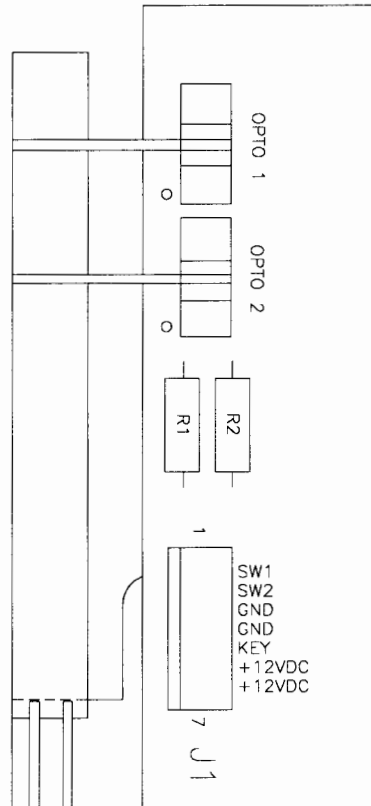


schematic



component side

Flipper Opto P.C.B. Assembly A-17316



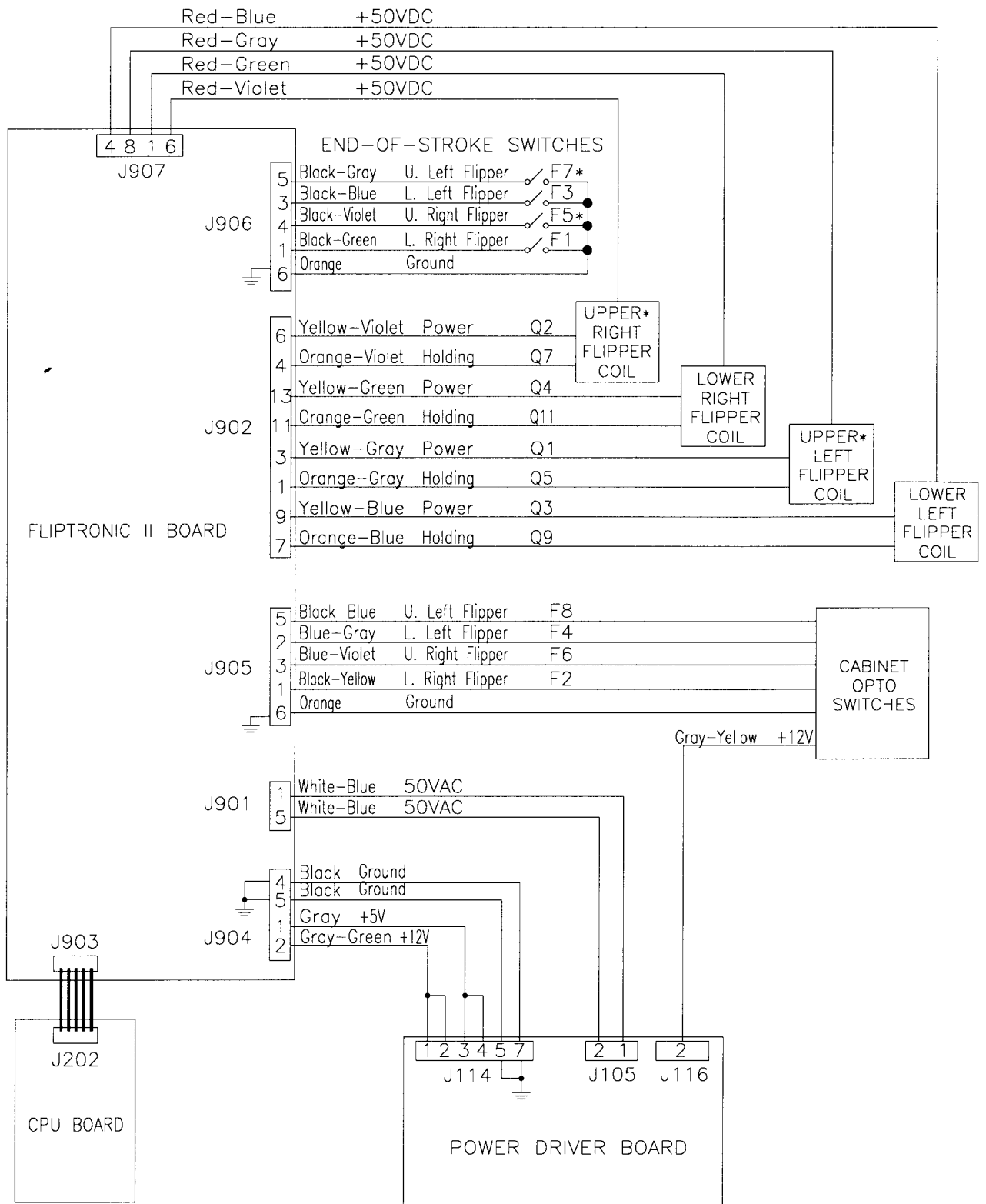
Left Side Flipper Cabinet Opto Switch Board

J1-1 Black-Blue from Fliptronic II Board J905-2
 J1-2 Blue-Gray from Fliptronic II Board J905-2
 J1-3 Not Used
 J1-4 Orange from Fliptronic II Board J905-6
 J1-5 Not Used
 J1-6 Gray-Yellow to Right Flipper Opto Board J1-6
 J1-7 Gray Yellow from Fliptronic II Board J118-2

Right Side Flipper Cabinet Opto Switch Board

J2-1 Black-Yellow from Fliptronic II Board J905-3
 J2-2 Blue-Violet from Fliptronic II Board J905-1
 J2-3 Orange from Fliptronic II Board J905-6
 J2-4 Orange from Left Flipper Opto Board J1-4
 J2-5 Not Used
 J2-6 Gray-Yellow to Left Flipper Opto Board J1-6
 J2-7 Not Used

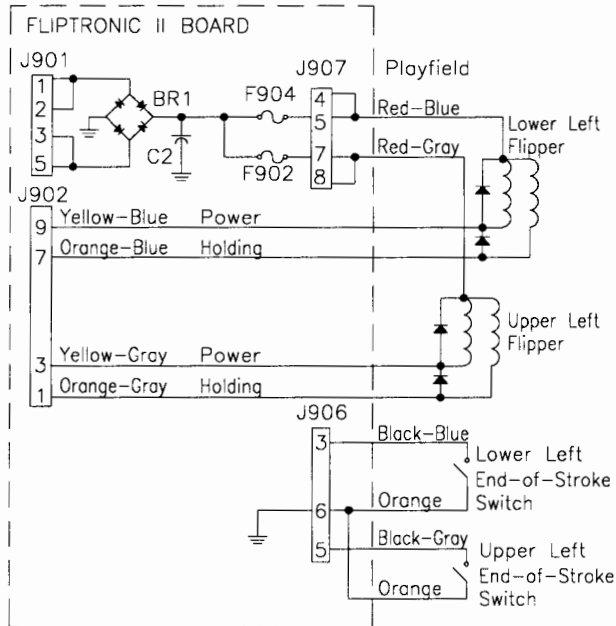
Flipper Circuit Diagram



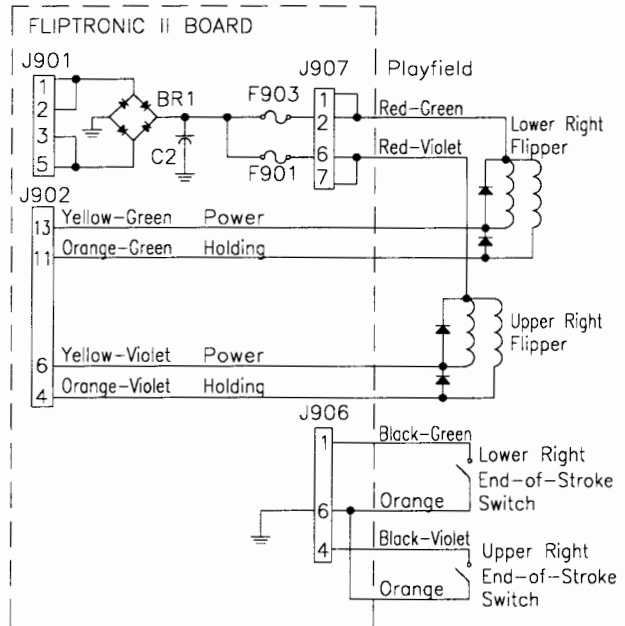
***NOTE: Used as circuits other than flipper circuits in this game.**

Flipper Coil Circuits

Left Flipper Circuit

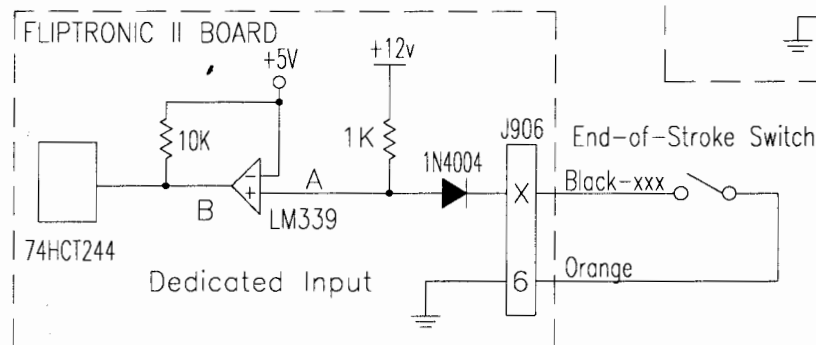
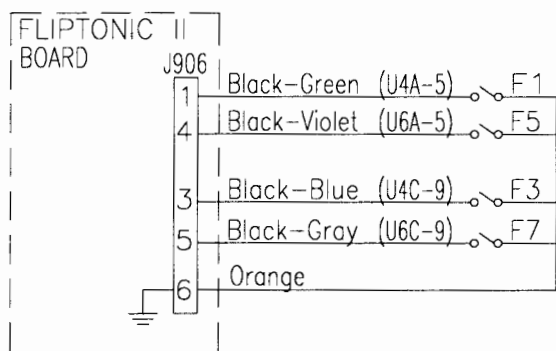


Right Flipper Circuit



Flipper End-of-Stroke Switches

- F1 Lower Right Flipper
- F5 Upper Right Flipper
- F3 Lower Left Flipper
- F7 Upper Left Flipper

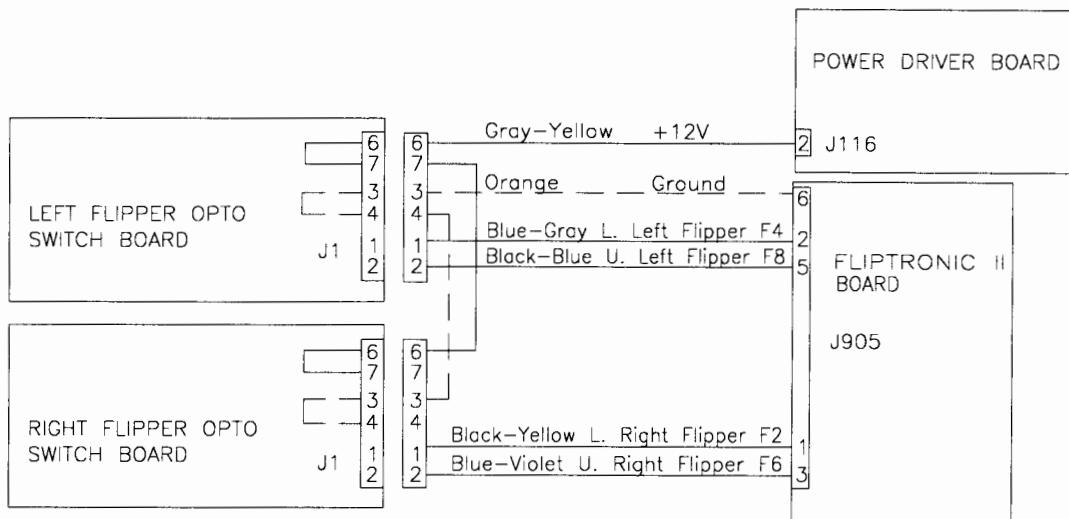


Switch	A	B	
Open	H	H	Off
Closed	L	L	On

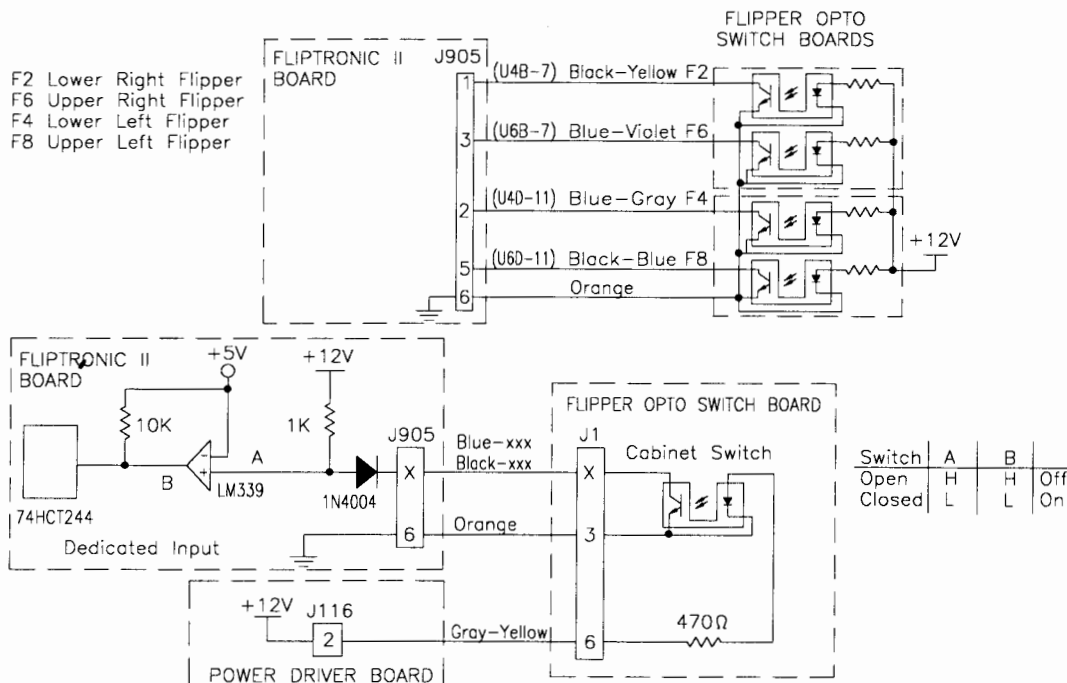
The flipper switch circuits operate similar to the dedicated switch circuit. The circuits are active low and tied to ground through the switch.

When a switch closes the row side (dedicated input) of the circuit activates. The "+" input to the LM339 drops below +5V therefore its output is low. Since the row (dedicated input) circuit is tied directly to ground through the switch, the switch is considered closed by the microprocessor. When the switch opens, the "+" input to the LM339 is about +5V, its output is high and the row (dedicated input) is inactive.

Flipper Cabinet Switch Circuit Diagram



Flipper Cabinet Switches

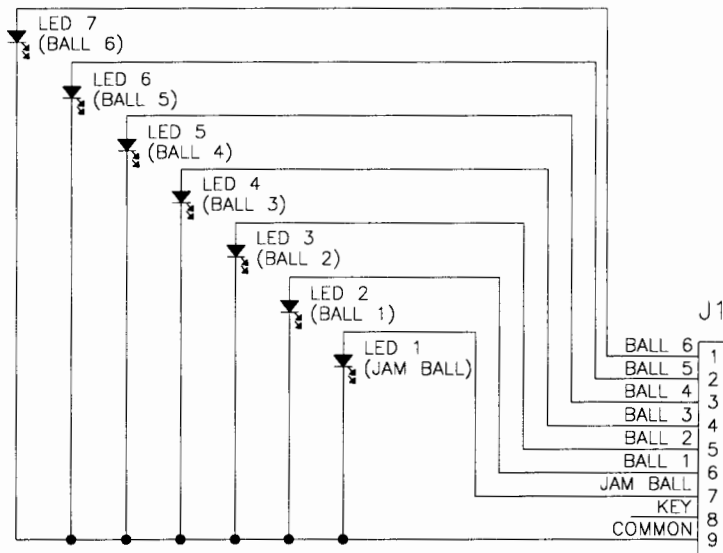
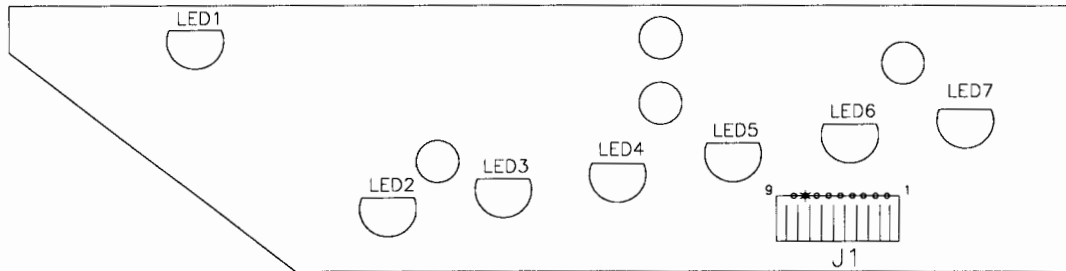


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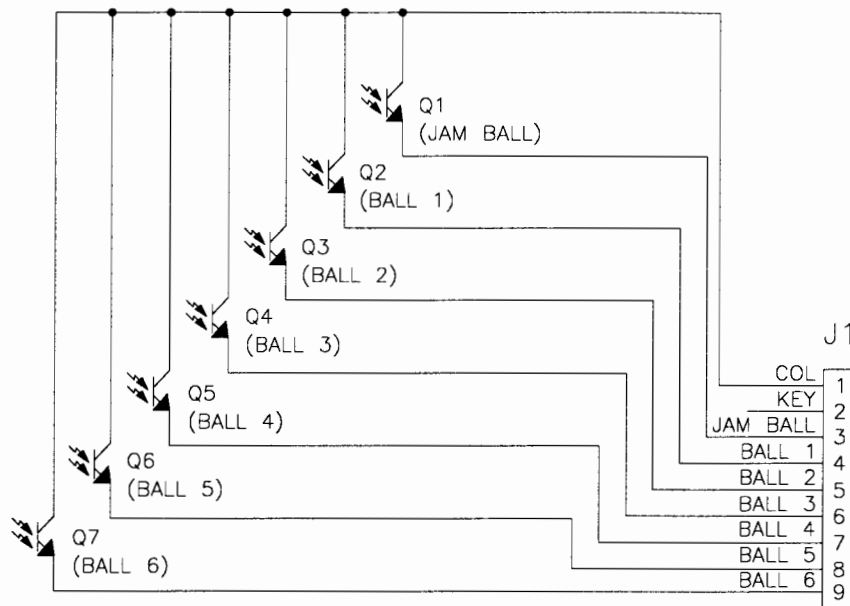
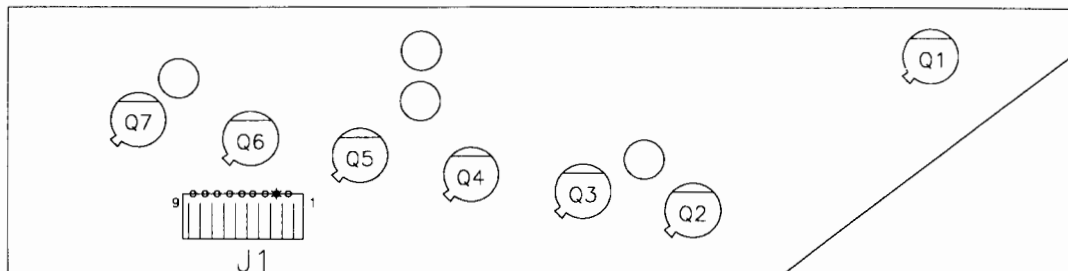
TROUGH 7 IRED PCB ASSEMBLY **A-18617**

J1-1 Not Used
J1-2 Not Used
J1-3 Gray-Black, from Opto SW10 Board J1-4
J1-4 Gray-Orange, from Opto SW10 Board J1-5
J1-5 Gray-Red, from Opto SW10 Board J1-6
J1-6 Gray-Brown, from Opto SW10 Board J1-7
J1-7 Gray-Violet, from Opto SW10 Board J1-1
J1-8 Key
J1-9 Black, from Opto SW10 Board J1-9



TROUGH 7 IR TSTR PCB ASSEMBLY **A-18618**

J1-1 Gray-Yellow, from Opto SW10 Board J2-9
 J1-2 Key
 J1-3 Orange-Violet, from Opto SW10 Board J2-1
 J1-4 Orange-Brown, from Opto SW10 Board J2-8
 J1-5 Orange-Red, from Opto SW10 Board J2-7
 J1-6 Orange-Black, from Opto SW10 Board J2-5
 J1-7 Orange-Yellow, from Opto SW10 Board J2-4
 J1-8 Not Used
 J1-9 Not Used



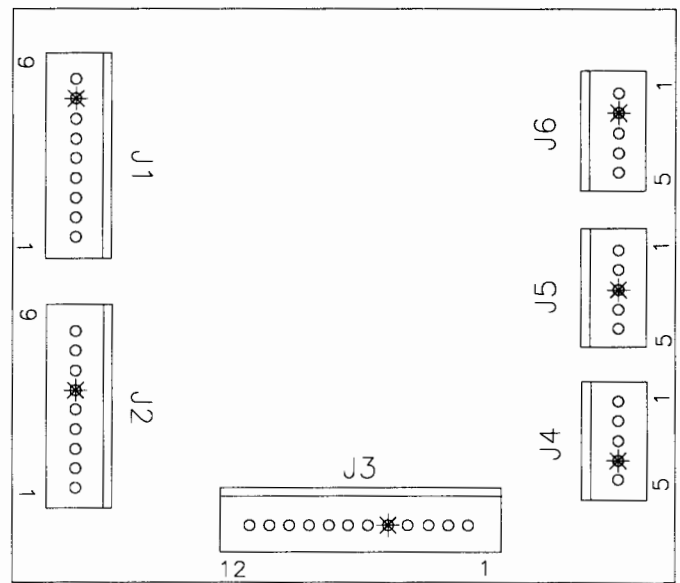
Opto SW10 P.C.B. A-18159

J1-1 Gray-Violet to A-18617 J1-7 Sw #37
J1-2 Gray-Blue to LED Sw #36
J1-3 Gray-Green to LED Sw #35
J1-4 Gray-Black to A-18617 J1-3 Sw #34
J1-5 Gray-Orange to A-18617 J1-4 Sw #33
J1-6 Gray-Red to A-18617 J1-5 Sw #32
J1-7 Gray-Brown to A-18617 J1-6 Sw #31
J1-8 Key
J1-9 Black Ground to A-18617 J1-9

J2-1 Orange-Violet to A-18618 J1-3 Sw #37
J2-2 Orange-Blue to Photo Transistor Sw #36
J2-3 Orange-Green to Photo Transistor Sw #35
J2-4 Orange-Yellow to A-18618 J1-7 Sw #34
J2-5 Orange-Black to A-18618 J1-6 Sw #33
J2-6 Key
J2-7 Orange-Red to A-18618 J1-5 Sw #32
J2-8 Orange-Brown to A-18618 J1-4 Sw #31
J2-9 Gray-Yellow +12VDC to A-18618 J1-1

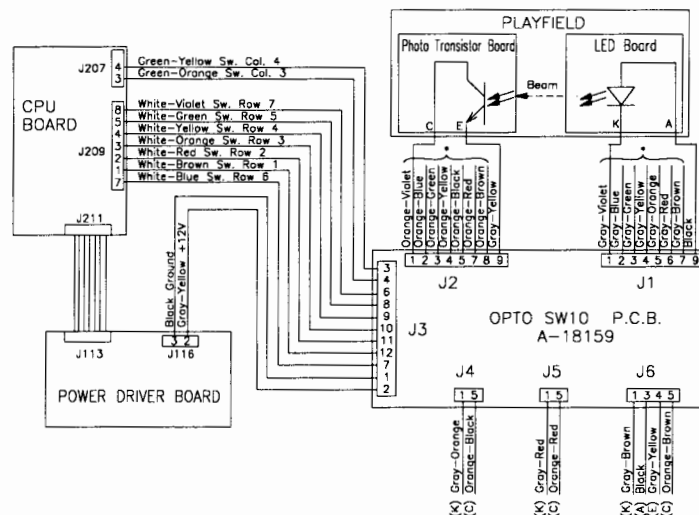
J3-1 Black Ground from J116-3
J3-2 Gray-Yellow +12VDC from J116-2
J3-3 Green-Yellow from J207-4
J3-4 Green-Orange from J207-3
J3-5 Key
J3-6 White-Violet from J209-8
J3-7 White-Blue from J209-7
J3-8 White-Green from J209-5
J3-9 White-Yellow from J209-4
J3-10 White-Orange from J209-3
J3-11 White-Red from J209-2
J3-12 White-Brown from J209-1

J4-1 Gray-Orange to LED Sw #43
J4-2 Not Used
J4-3 Not Used
J4-4 Key
J4-5 Orange-Black to Photo Transistor Sw #43

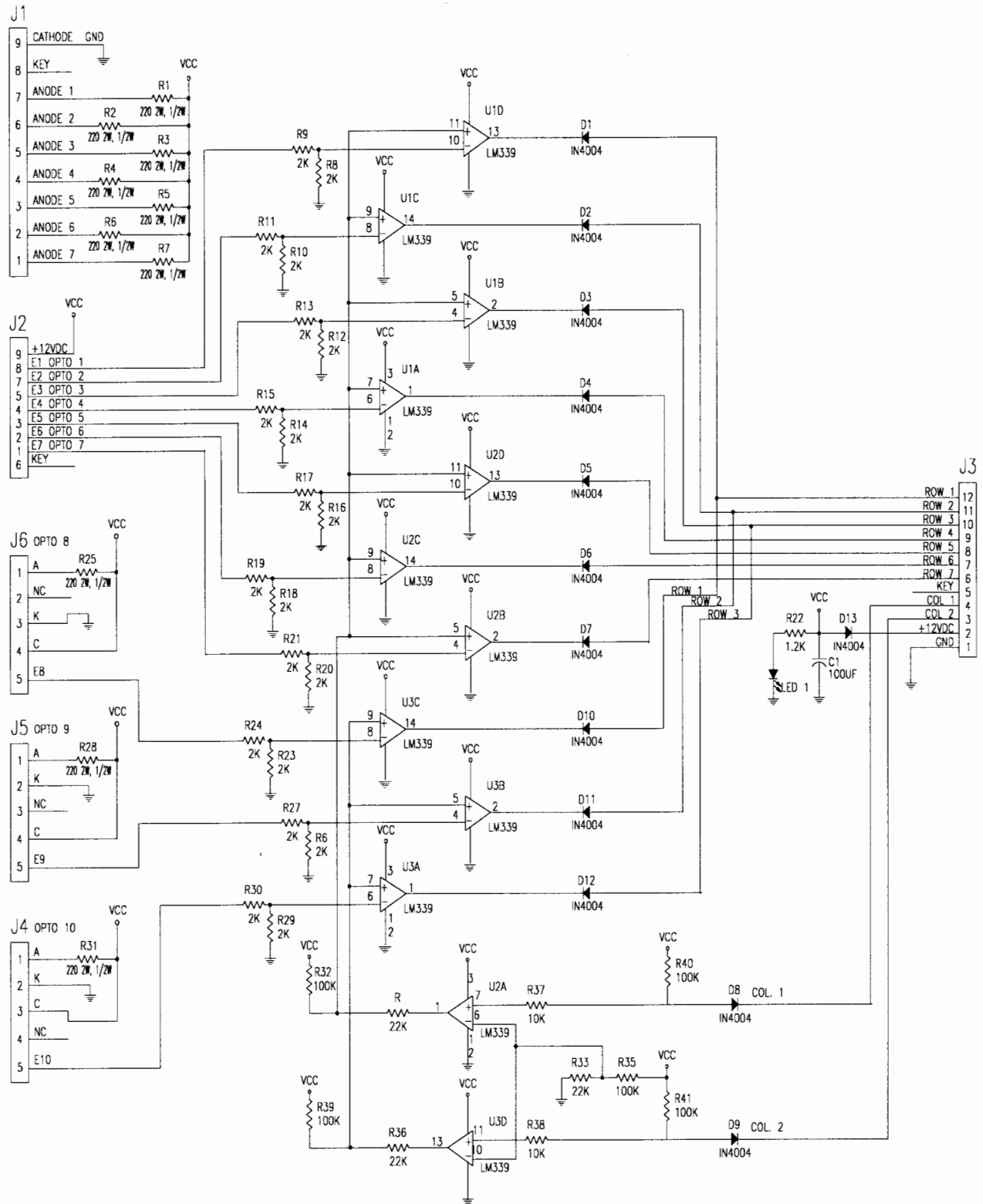


J5-1 Gray-Red to LED Sw #42
J5-2 Not Used
J5-3 Key
J5-4 Not Used
J5-5 Orange-Red to Photo Transistor Sw #42

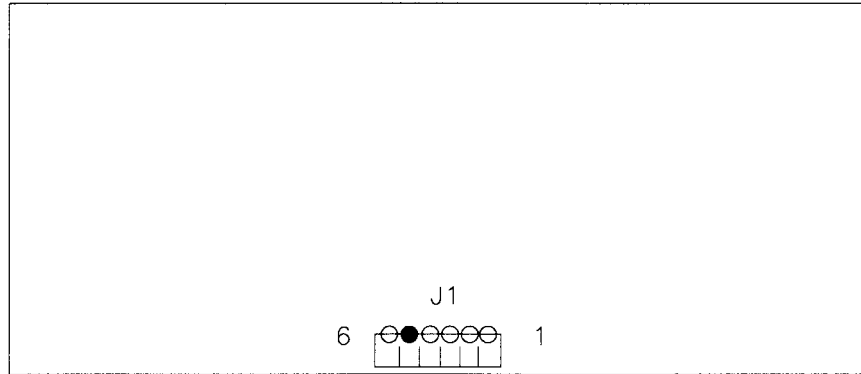
J6-1 Gray-Brown to LED Sw #41
J6-2 Key
J6-3 Black Ground
J6-4 Gray-Yellow +12VDC
J6-5 Orange-Brown to Photo Transistor Sw #41



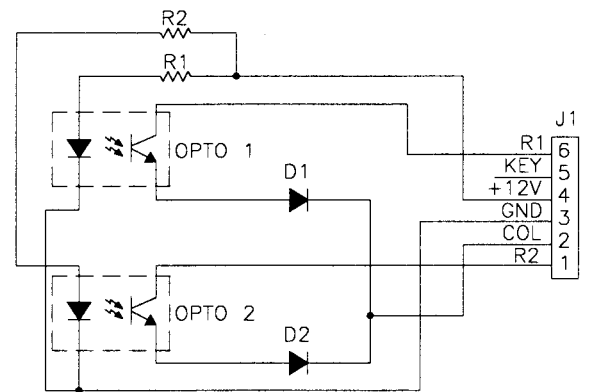
Opto SW10 P.C.B. Schematic



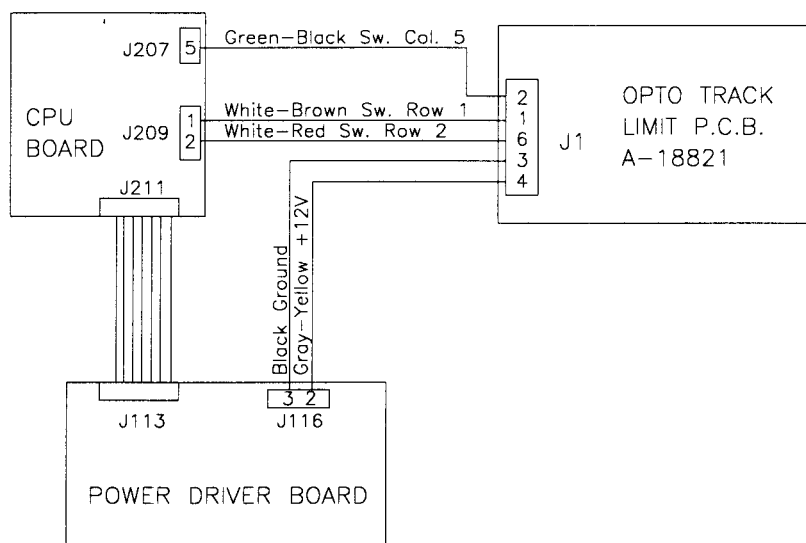
Opto Track Limit P.C.B. Assembly A-18821



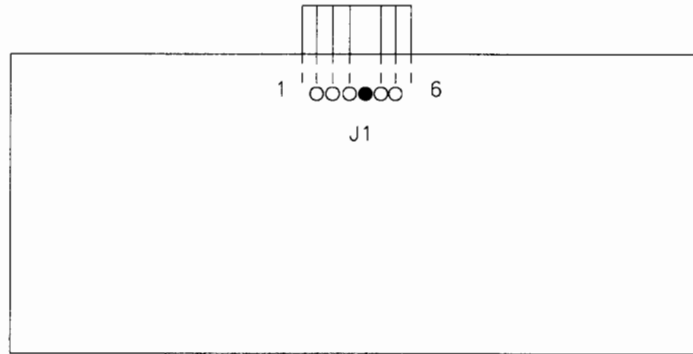
- J1-1 White-Brown from J209-1
- J1-2 Green-Black from J207-5
- J1-3 Black from J116-3
- J1-4 Gray-Yellow +12VDC from J116-2
- J1-5 Key
- J1-6 White-Red from J209-2



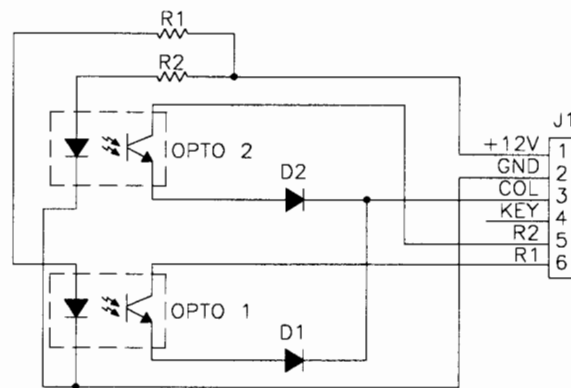
Schematic



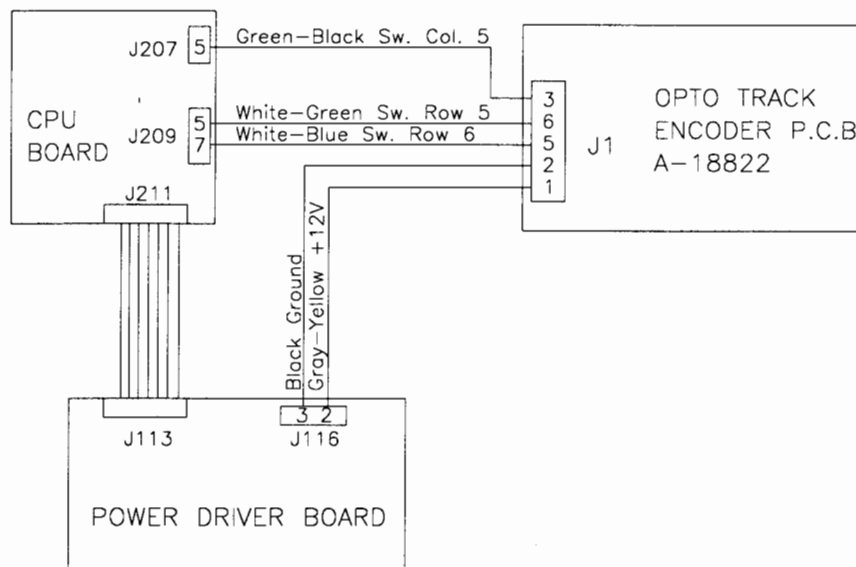
Opto Track Encoder P.C.B. Assembly A-18822



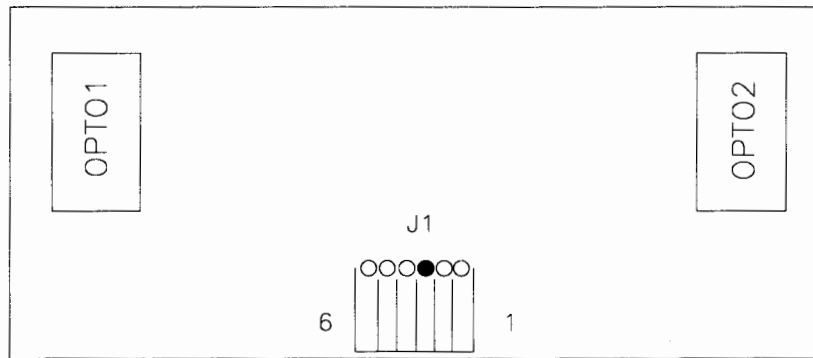
- J1-1 Gray-Yellow +12VDC from J116-2
- J1-2 Black ground from J116-3
- J1-3 Green-Black from J207-5
- J1-4 Key
- J1-5 White-Blue from J209-7
- J1-6 White-Green from J209-5



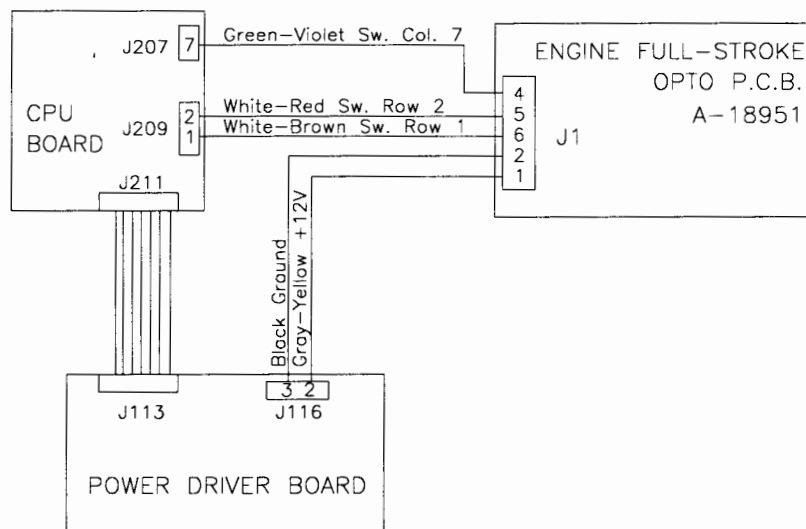
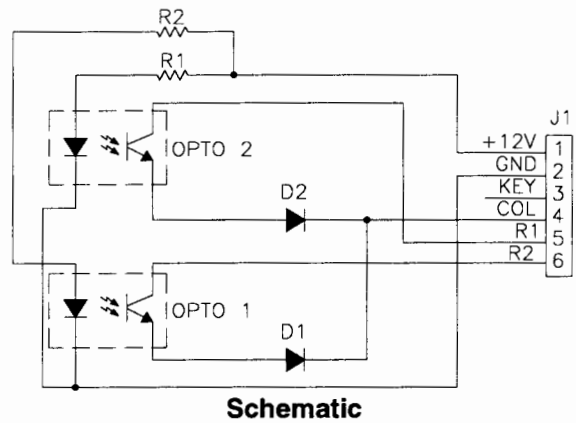
Schematic



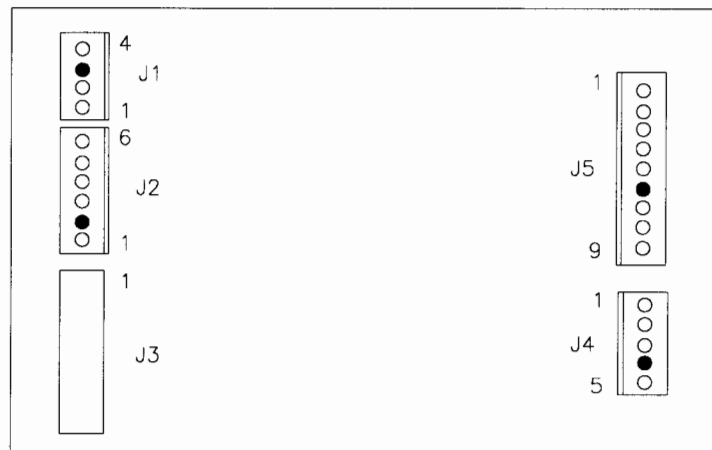
Engine Full-Stroke Opto P.C.B. Assembly A-18951



- J1-1 Gray-Yellow +12VDC from J116-2
- J1-2 Black ground from J116-3
- J1-3 Key
- J1-4 Green-Violet from J207-7
- J1-5 White-Red from J209-2
- J1-6 White-Brown from J209-1



Slave Board A-18533



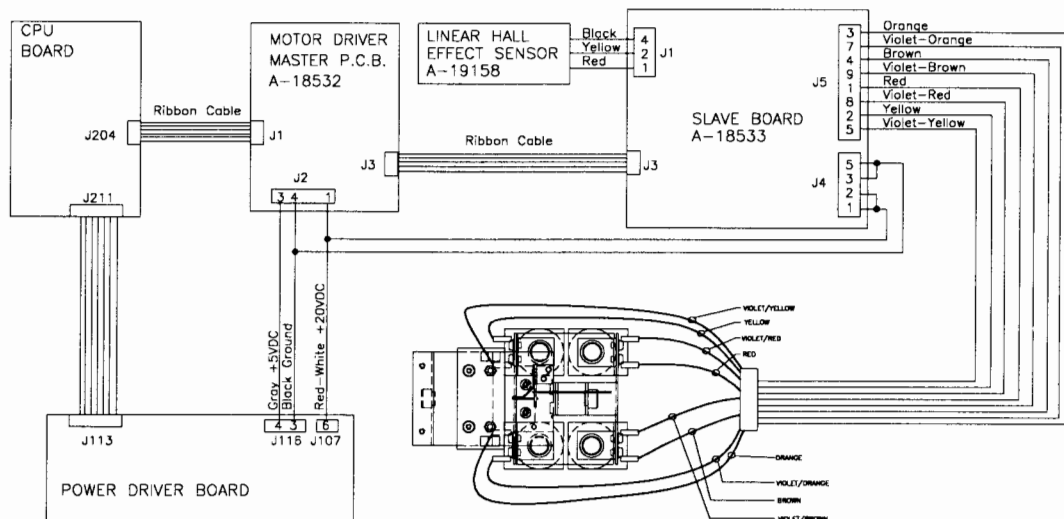
J1-1 Red +20VDC to A-19158
 J1-2 Yellow to A-19158
 J1-3 Key
 J1-4 Black ground to A-19158

J2 Not Used

J3 Ribbon Cable from Master Driver A-18532 J3

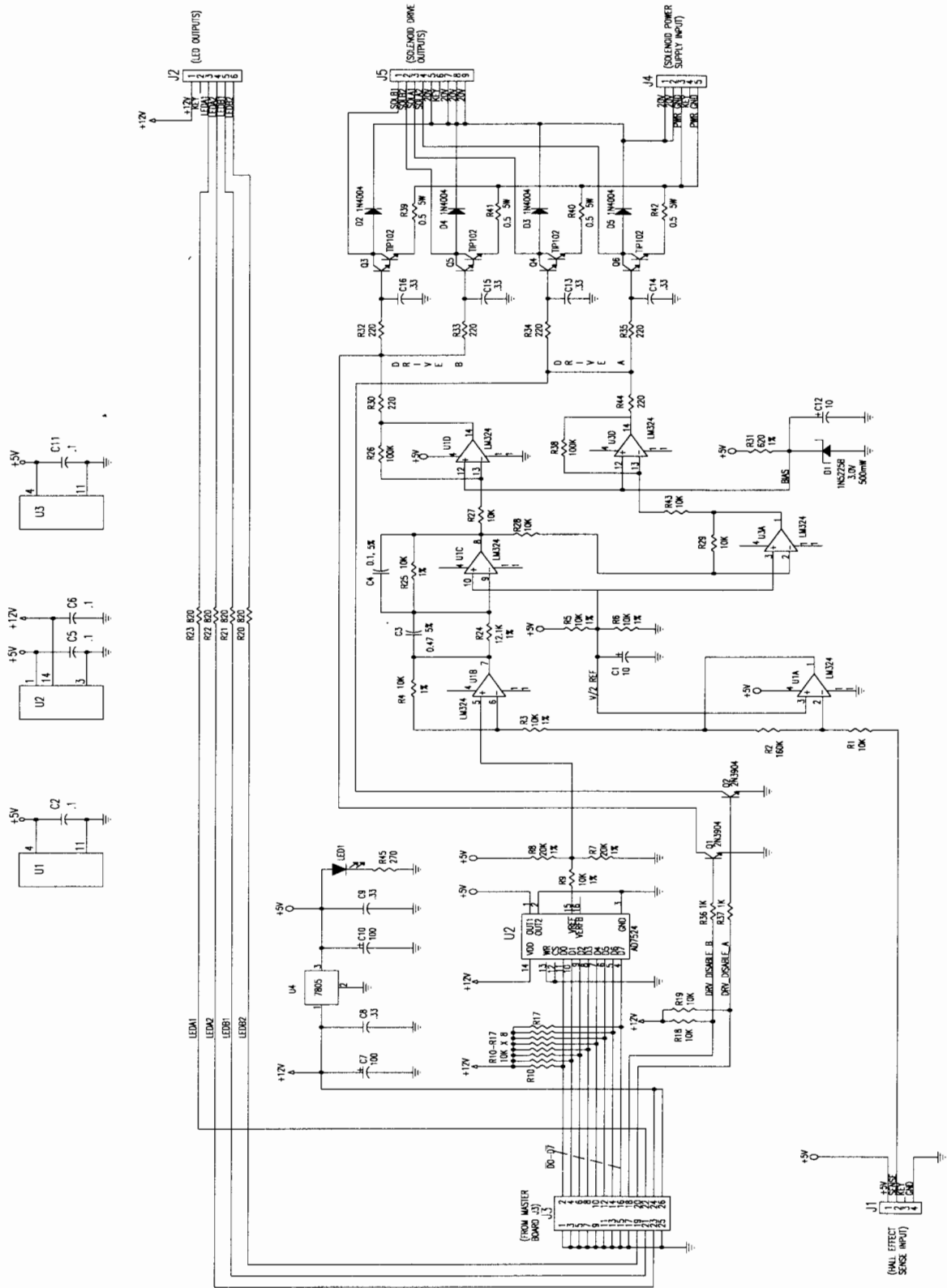
J4-1 Red-White +20VDC from J107-6
 J4-2 Red-White loop from J4-1
 J4-3 Black loop from J4-5
 J4-4 Key
 J4-5 Black ground from J116-3

J5-1 Red to engine coil (see below)
 J5-2 Yellow to engine coil (see below)
 J5-3 Orange to engine coil (see below)
 J5-4 Brown to engine coil (see below)
 J5-5 Violet-Yellow to engine coil (see below)
 J5-6 Key
 J5-7 Violet-Orange to engine coil (see below)
 J5-8 Violet-Red to engine coil (see below)
 J5-9 Violet-Brown to engine coil (see below)

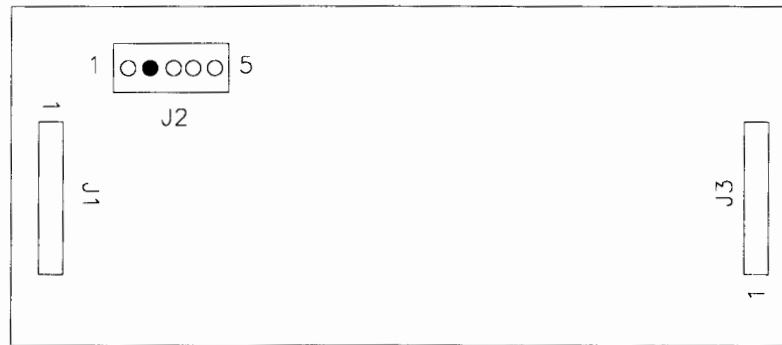


Engine (Bottom View)

Slave Board Schematic A-18533



Motor Driver Master Board A-18532



J1 Ribbon Cable from J204

J2-1 Red-White +20VDC from 107-6

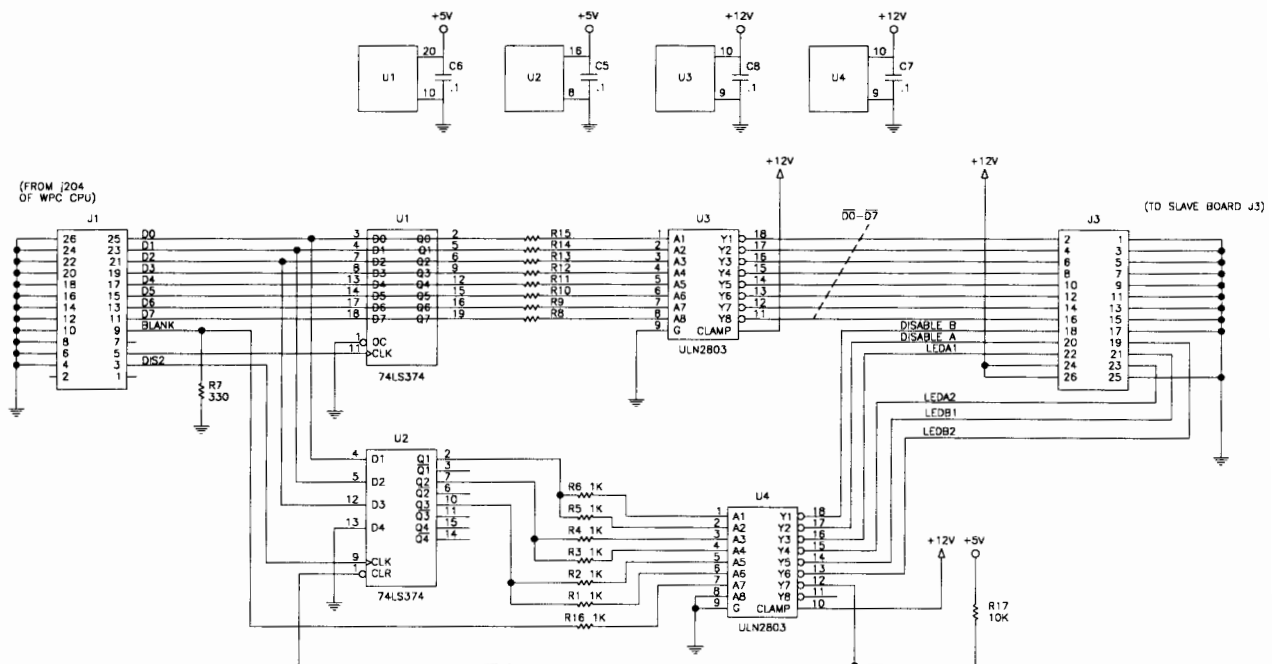
J2-2 Key

J2-3 Gray +5VDC from J116-4

J2-4 Black ground from J116-3

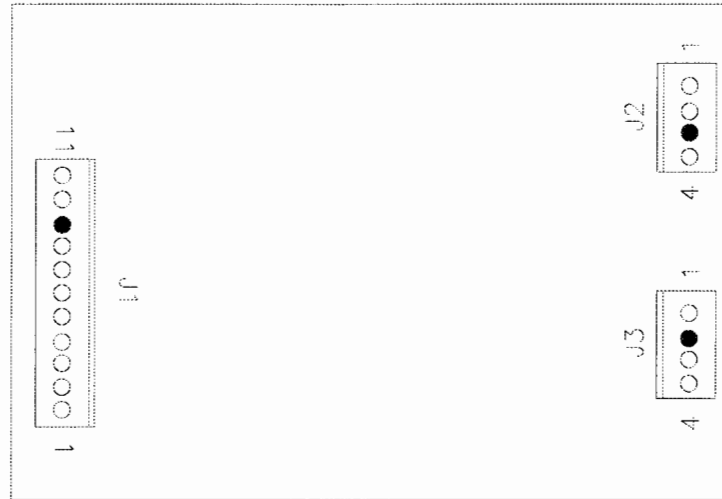
J2-5 Not Used

J3 Ribbon Cable to Slave Board A-18533 J3



Schematic

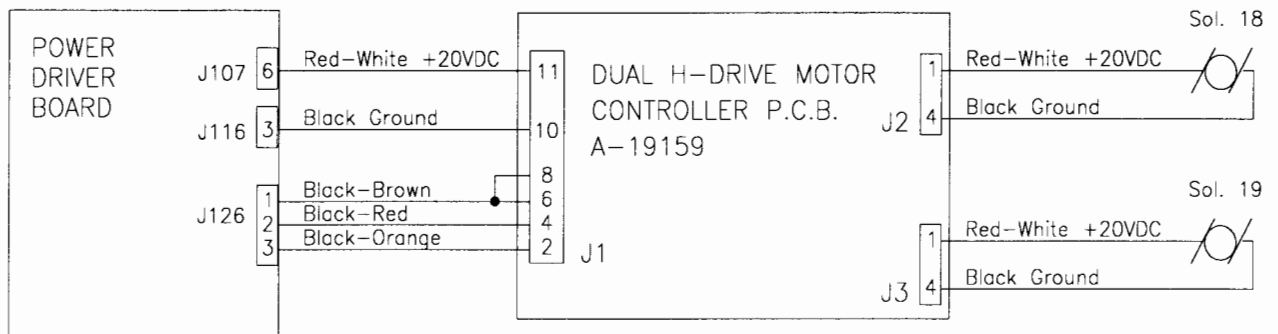
Dual H-Drive Motor Controller P.C.B. Assembly A-19159



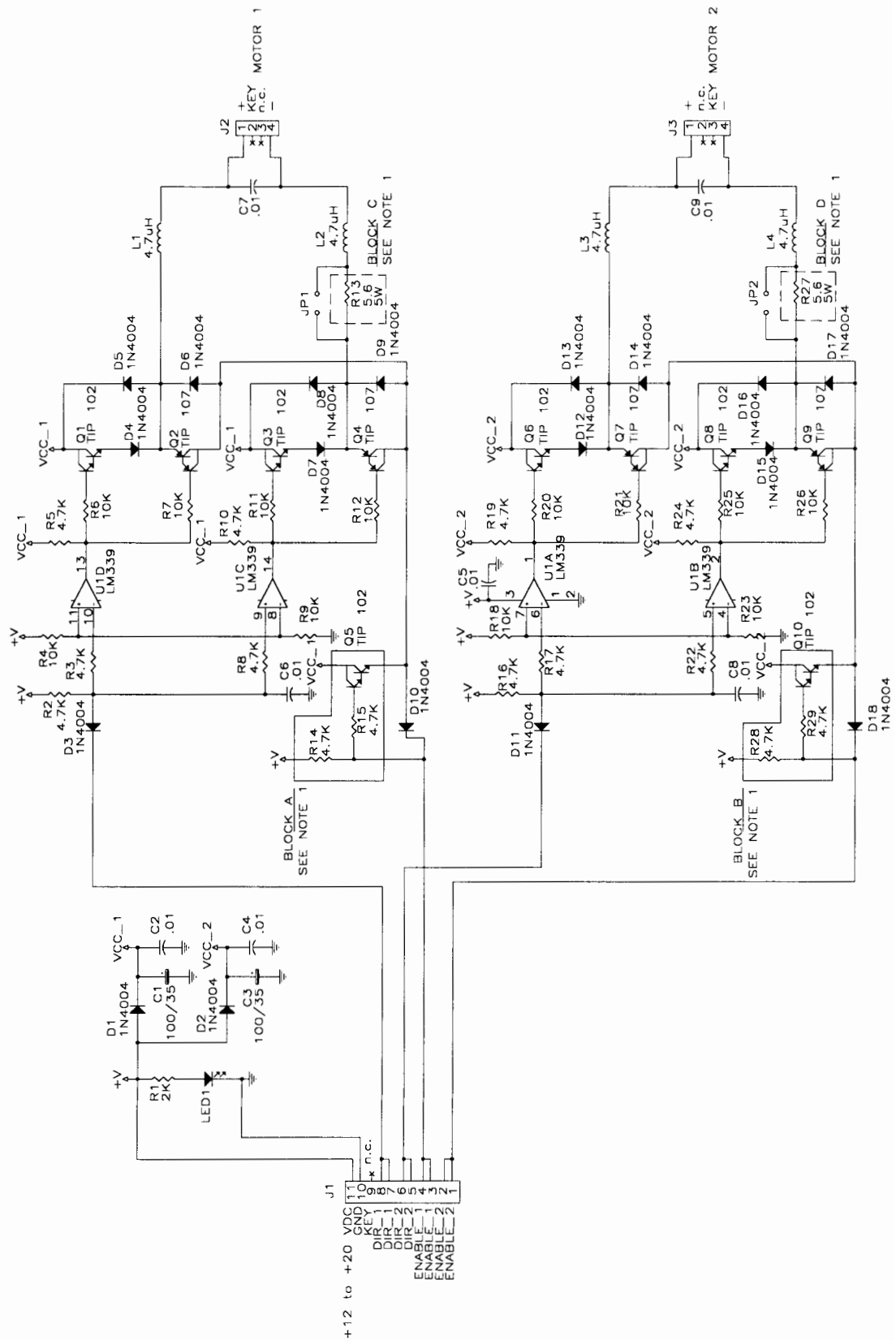
J1-1 Not Used
 J1-2 Black-Orange from J126-3
 J1-3 Not Used
 J1-4 Black-Red from J126-2
 J1-5 Not Used
 J1-6 Black-Brown from J126-1
 J1-7 Not Used
 J1-8 Black-Brown loop from J1-6
 J1-9 Key
 J1-10 Black ground from J116-3
 J1-11 Red-White +20VDC from J107-6

J2-1 Red-White +20VDC to Sol 18
 J2-2 Not Used
 J2-3 Key
 J2-4 Black ground to Sol 18

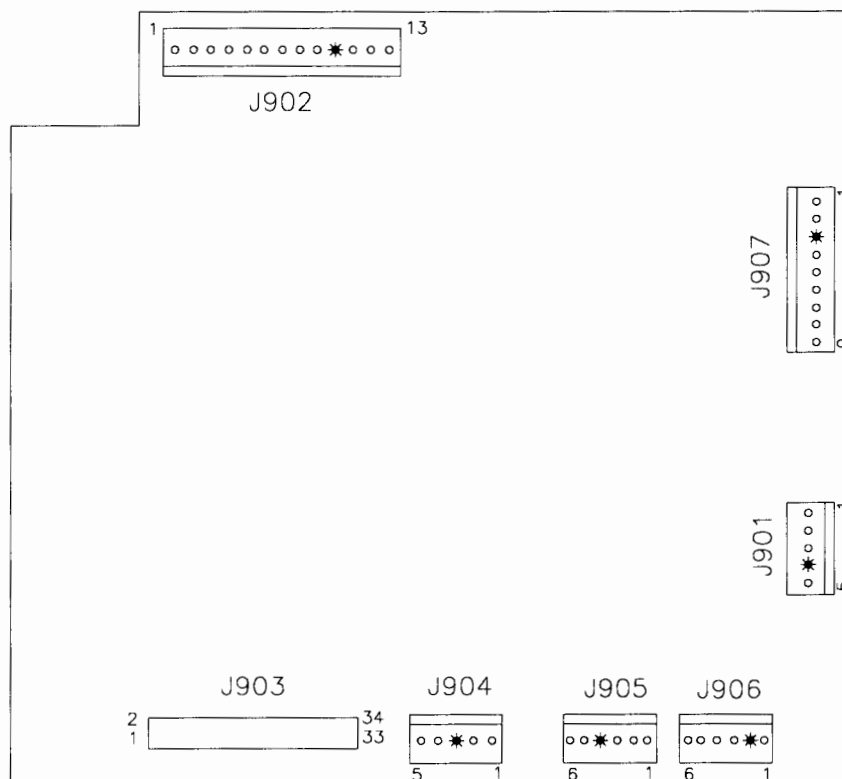
J3-1 Red-White +20VDC to Sol 19
 J3-2 Key
 J3-3 Not Used
 J3-4 Black ground to Sol 19



Dual H-Drive Motor Controller Schematic A-19159



Fliptronic II Board A-15472-1



J901-1 White-Blue, 50VAC from J104-1
 J901-2 White-Blue, loop from J901-1
 J901-3 White-Blue, 50VAC from J104-2
 J901-4 Key
 J901-5 White-Blue, loop from J901-3

J902-1 Orange-Gray, holding upper left flipper
 J902-2 Not Used
 J902-3 Yellow-Gray, power upper left flipper
 J902-4 Orange-Violet, holding upper right flipper
 J902-5 Not Used
 J902-6 Yellow-Violet, power upper right flipper
 J902-7 Orange-Blue, holding lower left flipper
 J902-8 Not Used
 J902-9 Yellow-Blue, power lower left flipper
 J902-10 Key
 J902-11 Orange-Green, holding lower right flipper
 J902-12 Not Used
 J902-13 Yellow-Green, power lower right flipper

J903 Ribbon Cable, data to/from J202; J506; J601

J904-1 Gray, +5V to/from J114-4; J210-4
 J904-2 Gray-Green, +12V to/from J114-2; J210-6
 J904-3 Key
 J904-4 Black, Ground to/from J114-7; J210-1

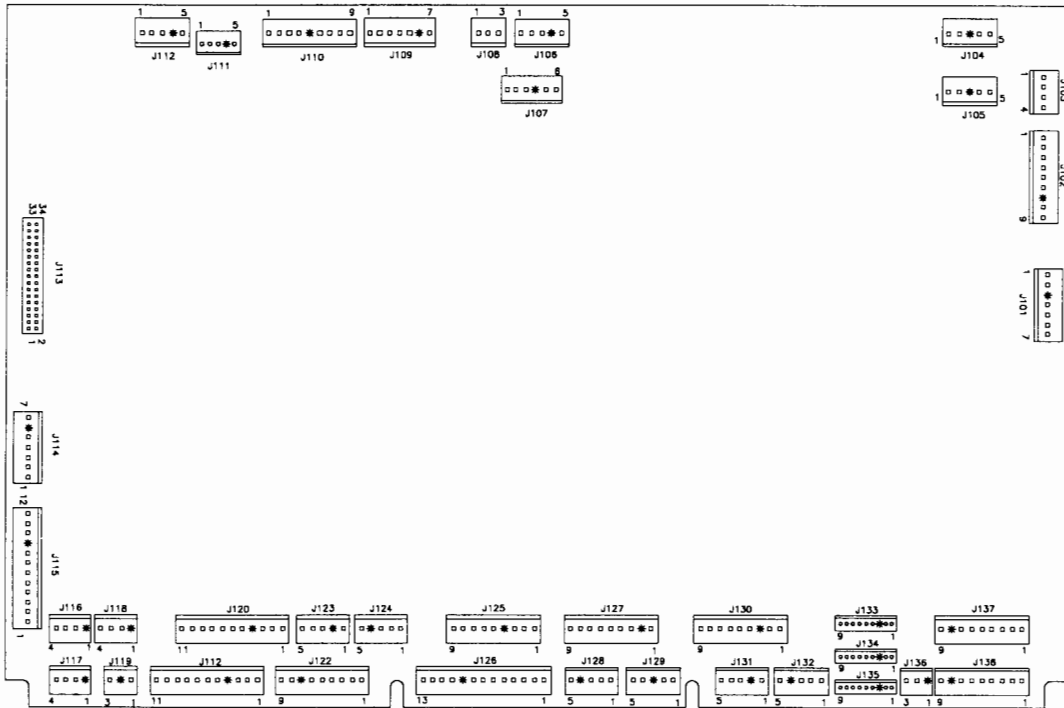
J904-5 Black, Ground to/from J114-5; J210-3

J905-1 Black-Violet, to right flipper opto
 J905-2 Blue-Gray, to left flipper opto
 J905-3 Blue-Yellow, to right flipper opto
 J905-4 Key
 J905-5 Black-Blue, to left flipper opto
 J905-6 Orange, Switch Ground

J906-1 Black-Green, to lower right E.O.S. switch
 J906-2 Key
 J906-3 Black-Blue, to lower left E.O.S. switch
 J906-4 Not Used
 J906-5 Black-Gray, to upper left E.O.S. switch
 J906-6 Orange, Switch Ground

J907-1 Red-Green, +50V to lower right flipper
 J907-2 Red-Green, loop from J907-1
 J907-3 Key
 J907-4 Red-Blue, +50V to lower left flipper
 J907-5 Red-Blue, loop from J907-4
 J907-6 Red-Violet, +50V to upper right flipper
 J907-7 Red-Violet, loop from J907-6
 J907-8 Red-Gray, +50V to upper left flipper
 J907-9 Red-Gray, loop from J907-8

Power Driver Board A-12697-3



J101-1 Red 9VAC from xfrmr secondary
 J101-2 Red 9VAC from xfrmr secondary
 J101-3 Key
 J101-4 Blue-White 13VAC from xfrmr secondary
 J101-5 Blue-White loop from J101-4
 J101-6 Blue-White 13VAC from xfrmr secondary
 J101-7 Blue-White loop from J101-6

J102-1 White-Red loop from J102-2
 J102-2 White-Red 16VAC from xfrmr secondary
 J102-3 White-Red loop from J102-4
 J102-4 White-Red 16VAC from xfrmr secondary
 J102-5 Black-Yellow loop from J102-6
 J102-6 Black-Yellow 16VAC from xfrmr secondary
 J102-7 Key
 J102-8 Black-Yellow loop from J102-9
 J102-9 Black Yellow 16VAC from xfrmr secondary

J103 Not Used

J104-1 White-Blue 50VAC to J901-1,2
 J104-2 White-Blue 50VAC to J901-3,5
 J104-3 Key
 J104-4 Not Used
 J104-5 Not Used

J105 Not Used

J106-1 Not Used
 J106-2 Not Used
 J106-3 Not Used
 J106-4 Key
 J106-5 Red-White +20V to insert flashlamps

J107-1 Not Used
 J107-2 Red-Brown 50V to playfield coils
 J107-3 Red-Black 50V to playfield coils
 J107-4 Key
 J107-5 Not Used
 J107-6 Red-White +20V to playfield flashlamps

J108 Not Used

J109 Not Used

J110 Not Used

J111 Not Used

J112-1 White-Green 9.8VAC from xfrmr secondary
 J112-2 White-Green loop from J112-1
 J112-3 White-Green 9.8VAC from xfrmr secondary
 J112-4 Key
 J112-5 White-Green loop from J112-3

J113 Ribbon Cable data to/from J211

J114-1 Gray-Green +12VDC to J210-7
J114-2 Gray-Green +12VDC to J904-2; J210-6
J114-3 Gray +5VDC to J3-3 Sound Bd; J210-5
J114-4 Gray +5VDC to J3-1 Sound Bd; J904-1; J210-4
J114-5 Black Ground to J3-5 Sound Bd; J904-5; J210-3
J114-6 Key
J114-7 Black Ground to J3-4 Sound Bd; J904-4; J210-1

J115-1 Yellow-White 6.8VAC from xfrmr secondary
J115-2 White-Brown 6.8VAC from xfrmr secondary
J115-3 White-Brown loop from J115-2
J115-4 White-Orange 6.8VAC from xfrmr secondary
J115-5 White-Yellow loop from J115-6
J115-6 White-Yellow 6.8VAC from xfrmr secondary
J115-7 Orange 6.8VAC from xfrmr secondary
J115-8 Orange 6.8VAC loop from J115-7
J115-9 Key
J115-10 Green 6.8VAC from xfrmr secondary
J115-11 Brown 6.8VAC from xfrmr secondary
J115-12 Brown 6.8VAC loop from J115-11

J116-1 Key
J116-2 Gray-Yellow +12VDC to playfield
J116-3 Black Ground
J116-4 Gray +5VDC to playfield

J117-1 Key
J117-2 Gray-Yellow +12VDC to J606-6,7
J117-3 Black Ground to J606-1,3
J117-4 Gray +5VDC to J606-4,5

J118-1 Key
J118-2 Gray-Yellow +12VDC to cabinet
J118-3 Black Ground
J118-4 Not Used

J119-1 White-Violet 6.8VAC G.I. to A-17051-1 J2-3
J119-2 Key
J119-3 Violet Return G.I. to A-17051-1 J2-5

J120-1 Not Used
J120-2 Not Used
J120-3 Yellow Return G.I. to playfield
J120-4 Key
J120-5 Green Return G.I. to playfield
J120-6 Violet Return G.I. to playfield
J120-7 Not Used
J120-8 Not Used
J120-9 White-Yellow 6.8VAC to playfield
J120-10 White-Green 6.8VAC to playfield
J120-11 White-Violet 6.8VAC to playfield

J121-1 Brown Return G.I. to insert
J121-2 Orange Return G.I. to insert
J121-3 Yellow Return G.I. to insert
J121-4 Key
J121-5 Green Return G.I. to insert
J121-6 Not Used
J121-7 White-Brown 6.8VAC to insert
J121-8 White-Orange 6.8VAC to insert
J121-9 White-Yellow 6.8VAC to insert
J121-10 White-Green 6.8VAC to insert
J121-11 Not Used

J122-1 Blue-Brown Sol 25 to playfield flashlamps
J122-2 Blue-Red Sol 26 to playfield flashlamps
J122-3 Blue-Orange Sol 27 to playfield flashlamps
J122-4 Blue-Yellow Sol 28 to playfield flashlamps
J122-5 Not Used
J122-6 Not Used
J122-7 Key
J122-8 Not Used
J122-9 Not Used

J123 Not Used

J124-1 Blue-Brown Sol 25 to insert flashlamps
J124-2 Blue-Red Sol 26 to insert flashlamps
J124-3 Blue-Orange Sol 27 to insert flashlamps
J124-4 Key
J124-5 Blue-Yellow Sol 28 to insert flashlamps

J125-1 Not Used
J125-2 Not Used
J125-3 Not Used
J125-4 Key
J125-5 Black-Yellow Sol 20 to insert flashlamps
J125-6 Not Used
J125-7 Blue-Black Sol 22 to insert flashlamps
J125-8 Blue-Violet Sol 23 to insert flashlamps
J125-9 Blue-Gray Sol 24 to insert flashlamps

J126-1 Black-Brown Sol 17 to playfield flashlamps
J126-2 Black-Red Sol 18 to playfield flashlamps
J126-3 Black-Orange Sol 19 to playfield flashlamps
J126-4 Not Used
J126-5 Blue-Green Sol 21 to playfield flashlamps
J126-6 Blue-Black Sol 22 to playfield flashlamps
J126-7 Blue-Violet Sol 23 to playfield flashlamps
J126-8 Blue-Gray Sol 24 to playfield flashlamps
J126-9 Key
J126-10 Not Used
J126-11 Not Used
J126-12 Not Used
J126-13 Not Used

J127-1 Brown-Black Sol 9 to playfield coil
J127-2 Key
J127-3 Brown-Red Sol 10 to playfield coil
J127-4 Brown-Orange Sol 11 to playfield coil
J127-5 Brown-Yellow Sol 12 to playfield coil
J127-6 Brown-Green Sol 13 to playfield coil
J127-7 Not Used
J127-8 Brown-Violet Sol 15 to playfield coil
J127-9 Brown-Gray Sol 16 to playfield coil

J128 Not Used

J129 Not Used

J130-1 Violet-Brown Sol 1 to playfield coil
J130-2 Violet-Red Sol 2 to playfield coil
J130-3 Key
J130-4 Violet-Orange Sol 3 to playfield coil
J130-5 Violet-Yellow Sol 4 to playfield coil
J130-6 Violet-Green Sol 5 to playfield coil
J130-7 Not Used
J130-8 Violet-Black Sol 7 to playfield coil
J130-9 Violet-Gray Sol 8 to playfield coil

J131 Not Used

J132 Not Used

J133 Not Used

J134-1 Not Used
J134-2 Not Used
J134-3 Key

J134-4 Not Used
J134-5 Not Used
J134-6 Not Used
J134-7 Red-Blue Row 6 to cabinet lamp
J134-8 Red-Violet Row 7 to cabinet lamp
J134-9 Red-Gray Row 8 to cabinet lamp

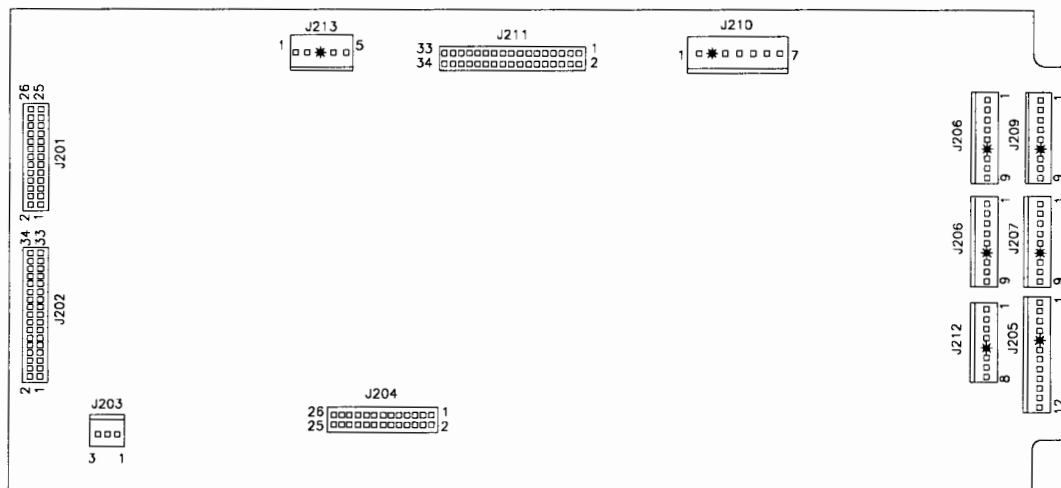
J135-1 Red-Brown Row 1 to playfield lamps
J135-2 Red-Black Row 2 to playfield lamps
J135-3 Key
J135-4 Red-Orange Row 3 to playfield lamps
J135-5 Red-Yellow Row 4 to playfield lamps
J135-6 Red-Green Row 5 to playfield lamps
J135-7 Red-Blue Row 6 to playfield lamps
J135-8 Red-Violet Row 7 to playfield lamps
J135-9 Red-Gray Row 8 to playfield lamps

J136-1 Key
J136-2 Not Used
J136-3 Yellow-Gray Col 8 to insert lamps

J137 Not Used

J138-1 Yellow-Brown Col 1 to playfield lamps
J138-2 Yellow-Red Col 2 to playfield lamps
J138-3 Yellow-Orange Col 3 to playfield lamps
J138-4 Yellow-Black Col 4 to playfield lamps
J138-5 Yellow-Green Col 5 to playfield lamps
J138-6 Yellow-Blue Col 6 to playfield lamps
J138-7 Yellow-Violet Col 7 to playfield lamps
J138-8 Key
J138-9 Yellow-Gray Col 8 to playfield lamps

Security CPU Board A-17651-50036



J201 Ribbon Cable data to J602

J202 Ribbon Cable data to J903; J506; J601

J203 Not Used

J204 Ribbon Cable data to A-16100 J1

J205-1 Orange-Brown Dir Sw 1, Left Coin to J1-14

J205-2 Orange-Red Dir Sw 2, Center Coin to J1-13

J205-3 Orange-Black Dir Sw 3, Right Coin to J1-12

J205-4 Orange-Yellow Dir Sw 4, 4th Coin to J1-17

J205-5 Key

J205-6 Orange-Green Dir Sw 5, Escape/Service to J1-11

J205-7 Orange-Blue Dir Sw 6, Down/Vol Down to J1-10

J205-8 Orange-Violet Dir Sw 7, Up/Vol Up to J1-9

J205-9 Orange-Gray Dir Sw 8, Enter/Test to J1-8

J205-10 Black ground to J1-15

J205-11 Not Used

J205-12 Orange-White Enable to J1-18

J206 Not Used

J207-1 Green-Brown Sw Col 1 to playfield switches

J207-2 Not Used

J207-3 Green-Orange Sw Col 3 to playfield switches

J207-4 Green-Yellow Sw Col 4 to playfield switches

J207-5 Green-Black Sw Col 5 to playfield switches

J207-6 Green-Blue Sw Col 6 to playfield switches

J207-7 Green-Violet Sw Col 7 to playfield switches

J207-8 Key

J207-9 Green-Gray Sw Col 8 to playfield switches

J207-10 Not Used

J207-11 Not Used

J208 Not Used

J209-1 White-Brown Sw Row 1 to playfield switches

J209-2 White-Red Sw Row 2 to playfield switches

J209-3 White-Orange Sw Row 3 to playfield switches

J209-4 White-Yellow Sw Row 4 to playfield switches

J209-5 White-Green Sw Row 5 to playfield switches

J209-6 Key

J209-7 White-Blue Sw Row 6 to playfield switches

J209-8 White-Violet Sw Row 7 to playfield switches

J209-9 White-Gray Sw Row 8 to playfield switches

J210-1 Black ground from J904-4; J3-4 Sound Bd; J114-7

J210-2 Key

J210-3 Black ground from J904-4; J3-5 Sound Bd; J114-5

J210-4 Gray +5VDC from J901-1; J3-1 Sound Bd; J114-4

J210-5 Gray +5VDC from J3-3 Sound Bd; J114-3

J210-6 Gray-Green +12VDC from J904-2; J114-2

J210-7 Gray-Green +12VDC from J114-1

J211 Ribbon Cable data from J113

J212-1 Green-Brown Sw Col 1 to J1-1

J212-2 Green-Red Sw Col 2 to J1-7

J212-3 Not Used

J212-4 White-Brown Sw Row 1 to J1-6

J212-5 Key

J212-6 White-Red Sw Row 2 to J1-5

J212-7 White-Orange Sw Row 3 to J1-4

J212-8 White-Yellow Sw Row 4 to J1-3

J213-1 Black to battery holder J1-1

J213-2 Black to battery holder J1-2

J213-3 Key

J213-4 Gray to battery holder J1-4

J213-5 Gray to batter holder J1-5

Sound Board A-16917-50036

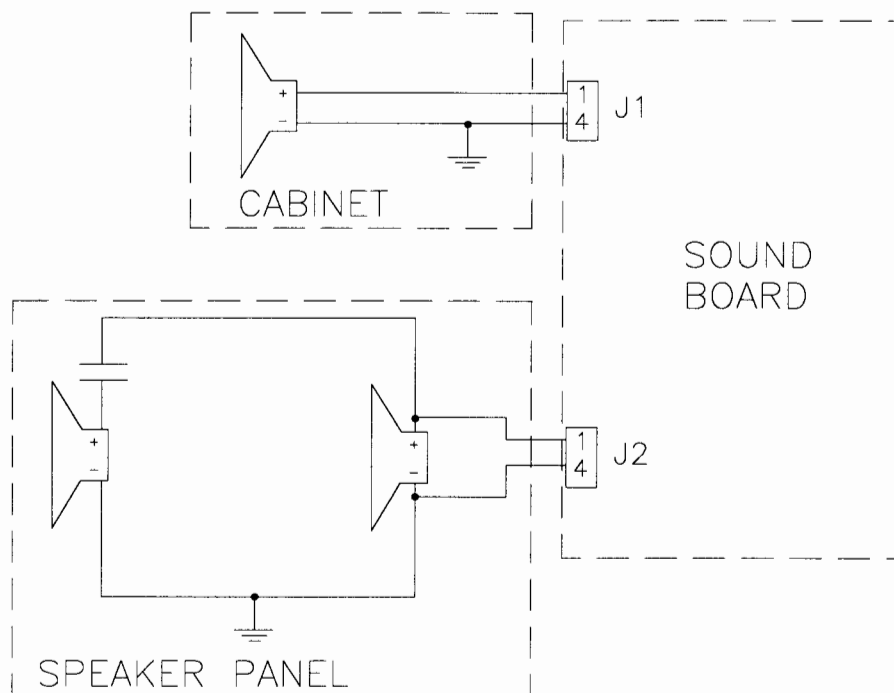
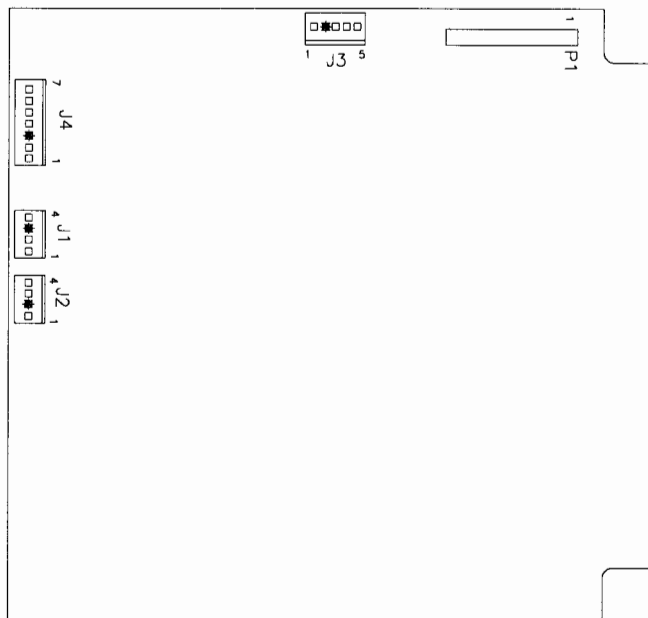
P1 34-pin Ribbon Cable data to/from J601; J903; J202

J1-1 Black-Yellow signal to cabinet speaker
J1-2 Not Used
J1-3 Key
J1-4 Black ground

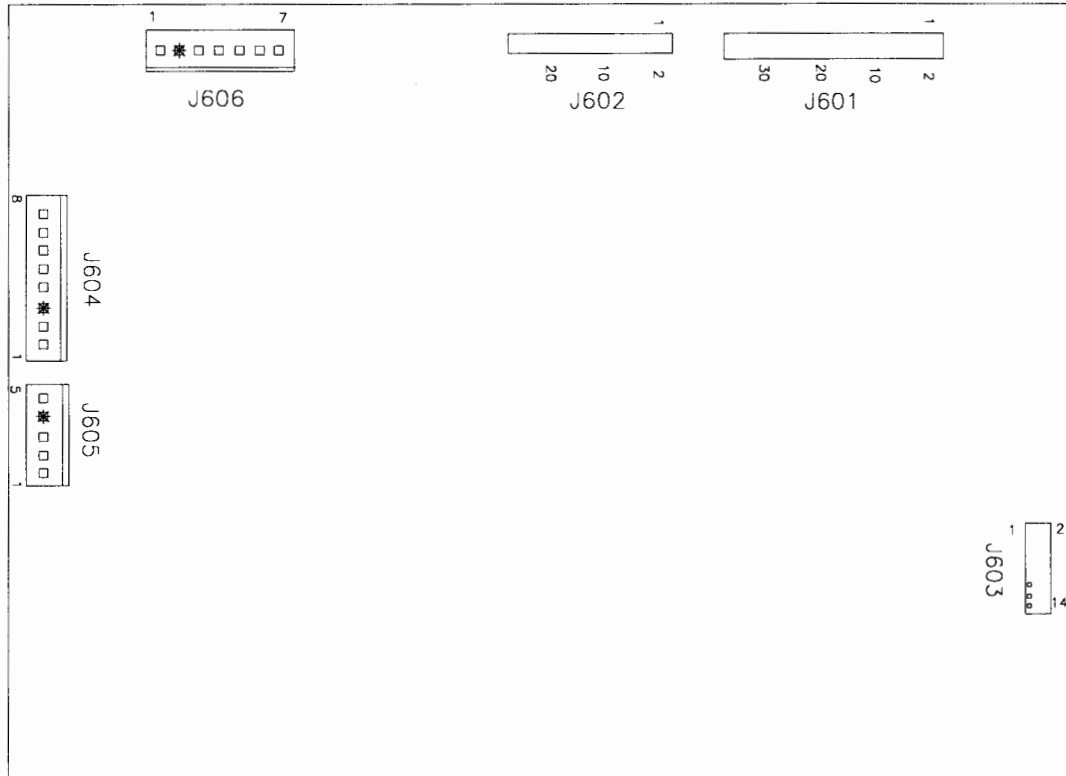
J2-1 Black-Yellow signal to display panel speakers
J2-2 Key
J2-3 Not Used
J2-4 Black ground

J3-1 Gray +5V from J114-4; J904-1; J210-4
J3-2 Key
J3-3 Gray +5V from J114-3; J210-5
J3-4 Black ground from J114-7; J904-4; J210-1
J3-5 Black ground from J114-5; J904-5; J210-3

J4-1 Gray-Green 18VAC from xfrmr secondary
J4-2 Gray-Green 18VAC loop from J4-1
J4-3 Key
J4-4 Gray 18VAC from xfrmr secondary
J4-5 Gray 18VAC loop from J4-4
J4-6 Gray-White 18VAC from xfrmr secondary
J4-7 Gray-White loop from J4-6



Dot Matrix Contoller Board A-14039.1



J601 Ribbon Cable data to/from J202; J903; Dot Matrix Display/Driver P1

J601 Ribbon Cable data from J201

J603 Ribbon Cable data to Dot Matrix Display/Driver

J604-1 Orange -125V to Dot Matrix Display/Driver Pin 1

J604-2 Blue -113V to Dot Matrix Display/Driver Pin 2

J604-3 Key

J604-4 Black ground to Dot Matrix Display/Driver Pin 4

J604-5 Black ground to Dot Matrix Display/Driver Pin 5

J604-6 Gray +5V to Dot Matrix Display/Driver Pin 6

J604-7 Gray-Yellow +12V Dot Matrix Display/Driver Pin 7

J604-8 Brown +62 to Dot Matrix Display/Driver Pin 8

J605-1 White 80VAC from xfrmr secondary

J605-2 White 80VAC from xfrmr secondary

J605-3 Violet 100VAC from xfrmr secondary

J605-4 Key

J605-5 Violet 100VAC from xfrmr secondary

J606-1 Black ground loop from J606-3

J606-2 Key

J606-3 Black ground from J117-3

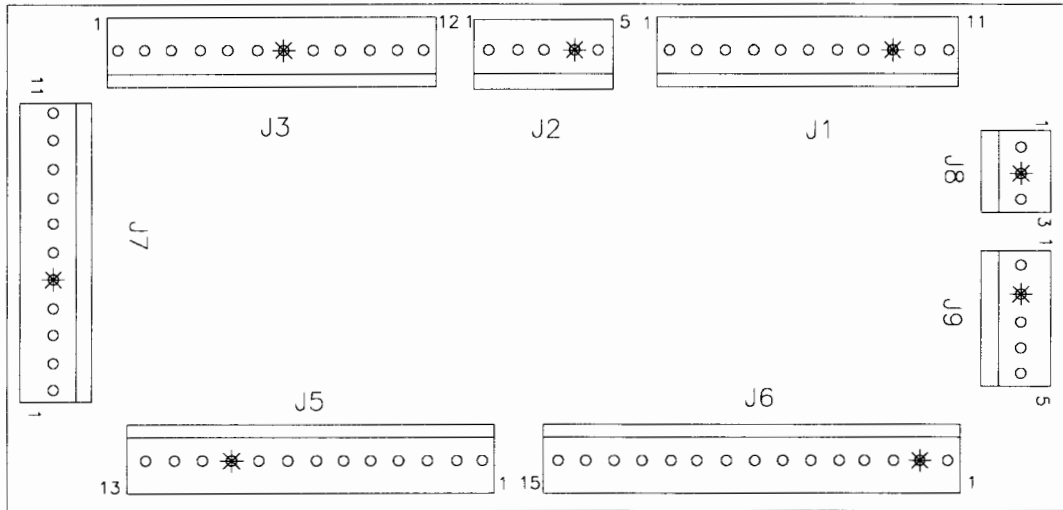
J606-4 Gray +5V loop from J606-5

J606-5 +5V from J117-4

J606-6 Gray-Yellow +12V loop from J606-7

J606-7 Gray-Yellow +12V from J117-2

Coin Door Interface P.C.B. Assembly A-17051-1



J1-1 Orange-Gray dedicated row 8 from J205-9
 J1-2 Orange-Violet dedicated row 7 from J205-8
 J1-3 Orange-Blue dedicated row 6 from J205-7
 J1-4 Orange-Green dedicated row 5 from J205-6
 J1-5 Orange-Yellow dedicated row 4 from J205-4
 J1-6 Orange-Black dedicated row 3 from J205-3
 J1-7 Orange-Red dedicated row 2 from J205-2
 J1-8 Orange-Brown dedicated row 1 from J205-1
 J1-9 Key
 J1-10 Black ground from J205-10
 J1-11 Orange-White switch enable from J205-12

J2-1 Black ground from J116-3
 J2-2 Gray-Yellow +12VAC from J116-2
 J2-3 White-Violet G.I. 6.8VAC from J119-1
 J2-4 Key
 J2-5 Violet G.I. from J119-3

J3-1 Green-Brown switch column 1 from J212-1
 J3-2 Green-Red switch column 2 from J212-2
 J3-3 White-Brown switch row 1 from J212-4
 J3-4 White-Red switch row 2 from J212-6
 J3-5 White-Orange switch row 3 from J212-7
 J3-6 White-Yellow switch row 4 from J212-8
 J3-7 Key
 J3-8 Yellow-Gray lamp column 8 from J136-3
 J3-9 Red-Blue lamp row 6 from J134-7
 J3-10 Red-Violet lamp row 7 from J134-8
 J3-11 Red-Gray lamp row 8 from J134-9
 J3-12 Not Used

J4 Not Used

J5-1 Violet G.I. return to coin door
 J5-2 White-Violet G.I. 6.8VAC to coin door
 J5-3 Black ground to coin door
 J5-4 Orange-Brown dedicated switch row 1 to coin door
 J5-5 Orange-Red dedicated switch row 2 to coin door
 J5-6 Orange-Black dedicated switch row 3 to coin door
 J5-7 Orange-Green dedicated switch row 5 to coin door
 J5-8 Orange-Blue dedicated switch row 6 to coin door
 J5-9 Orange-Violet dedicated switch row 7 to coin door
 J5-10 Key
 J5-11 Orange-Gray dedicated switch row 8 to coin door
 J5-12 Green-Red switch column 2 to coin door Slam Tilt
 J5-13 White-Brown switch row 1 to coin door Slam Tilt

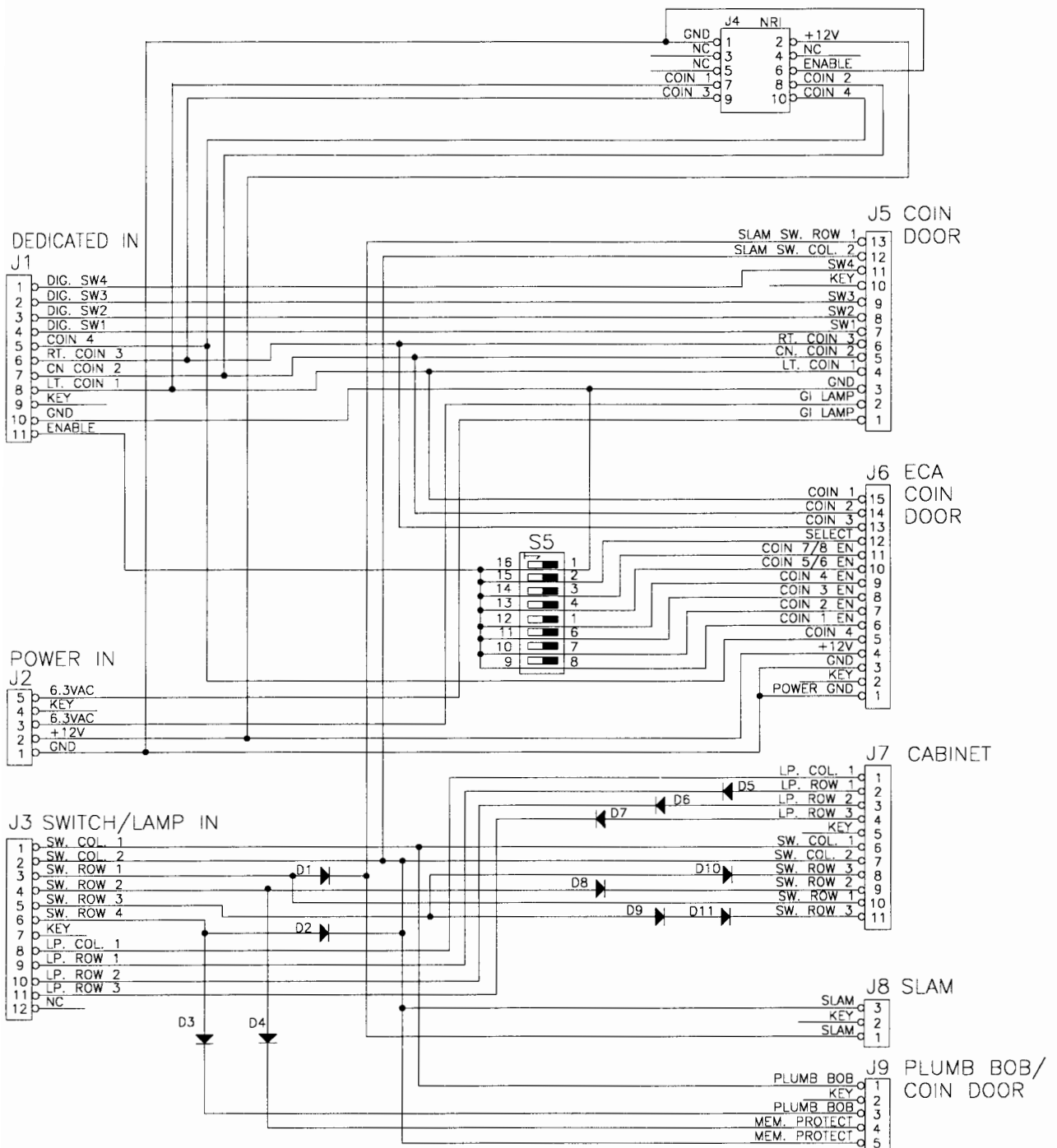
J6 Not Used

J7-1 Yellow-Gray lamp column 8 to cabinet
 J7-2 Not Used
 J7-3 Red-Violet lamp row 7 to cabinet
 J7-4 Red-Gray lamp row 8 to cabinet
 J7-5 Key
 J7-6 Green-Brown switch column 1 to cabinet
 J7-7 Green-Red switch column 2 to cabinet
 J7-8 White-Orange switch row 3 to cabinet
 J7-9 Not Used
 J7-10 Not Used
 J7-11 White-Orange switch row 3 to cabinet

J8-1 White switch row to cabinet Slam Tilt
 J8-2 Key
 J8-3 Green switch column to cabinet Slam Tilt

J9-1 White-Yellow switch row 4 to Plumb Bob Tilt
 J9-2 Key
 J9-3 Green-Brown switch column 1 to Plumb Bob Tilt
 J9-4 White-Red switch row 2 to Interlock Switch
 J9-5 Green-Red switch column 2 to Interlock Switch

Coin Door Interface P.C.B. Schematic



Notes

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2.25
2.25

LAMP MATRIX

Column		1 Yellow-Brown J137-1 Q98	2 Yellow-Red J137-2 Q97	3 Yellow-Orange J137-3 Q96	4 Yellow-Black J137-4 Q95	5 Yellow-Green J137-5 Q94	6 Yellow-Blue J137-6 Q93	7 Yellow-Violet J138-7 Q92	8 Yellow-Gray J138-9 Q91
Row									
1	Red-Brown J133-1 Q90	Left Rollover 11	Inner Loop Arrow 21	Left Outer Loop Arrow 31	Corvette 6 41	Corvette 9 51	Left Outer Tail 61	Kickback Arrow 71	Right Tree Red 81
2	Red-Black J133-2 Q89	Middle Rollover 12	Fuelie 22	Lite Lock 32	Corvette 3 42	Corvette 8 52	Left Inner Tail 62	Left Return Lane 72	Left Tree Red 82
3	Red-Orange J133-4 Q88	Right Rollover 13	Nitrous 23	Qualify 33	Corvette 1 43	Pit Stop 53	Catch Me 63	Right Return lane 73	Tree Bottom Yellow 83
4	Red-Yellow J133-5 Q87	Skid Pad Arrow 14	Inner Loop Jackpot 24	Big Block 34	Corvette 2 44	Corvette 7 54	Right Inner Tail 64	Right Our Lane 74	Tree Top Yellow 84
5	Red-Green J133-6 Q86	Sticky Tires 15	Right Outer Loop Arrow 25	ZR-1 Ramp 35	Corvette 4 45	Corvette 5 55	Right Outer Tail 65	Million Standup 75	Right Tree Green 85
6	Red-Blue J133-7 Q85	Skid Pad Jackpot 16	Z07 Suspension 26	6 Speed Trans 36	Left Standup 3 46	Pit Stop Arrow 56	Right Standup Arrow 66	Side Pipe 1 76	Left Tree Green 86
7	Red-Violet J133-8 Q84	Route 66 Arrow 17	Big Brakes 27	Hi Lift Cams 37	Left Standup 2 47	Spinner Arrow 57	Lite Kickback 67	Side Pipe 2 77	Buy In 87
8	Red-Gray J133-9 Q83	Race Today 18	Super Charger 28	ZR-1 Ramp Arrow 38	Left Standup 1 48	Drive Again 58	Start Challenge 68	Side Pipe 3 78	Start Button 88

J1XX = Power Driver Board

SWITCH MATRIX

Dedicated Grounded Switches		Column Row	1 Green-Brown J207-1 U20-18	2 Green-Red J207-2 U20-17	3 Green-Orange J207-3 U20-16	4 Green-Yellow J207-4 U20-15	5 Green-Black J207-5 U20-14	6 Green-Blue J207-6 U20-13	7 Green-Violet J207-7 U20-12	8 Green-Gray J207-9 U20-11	Flipper Grounded Switches
Orange-Brown (1) J205-1 Left Coin Chute D1		1 White-Brown J209-1 U18-11	Left Out Lane 11	Slam Tilt 21	Trough Ball 1 31	ZR-1 Bottom Entry 41	Left Race Start 51	Left Slingshot 61	ZR-1 Full Left 71	Million Standup 81	Black-Green J906-1 Right Flipper EOS F1
Orange-Red (2) J205-2 Center Coin Chute D2		2 White-Red J209-2 U18-9	Right Out Lane 12	Coin Door Closed 22	Trough Ball 2 32	ZR-1 Top Entry 42	Right Race Start 52	Right Slingshot 62	ZR-1 Full Right 72	Skid Pad Standup 82	Black-Violet J905-1 Right Flipper Opto F2
Orange-Black (3) J205-3 Right Coin Chute D3		3 White-Orange J209-3 U18-5	Start Button 13	Buy In Button 23	Trough Ball 3 33	Skid Pad Entry 43	Not Used 53	Left Jet 63	Not Used 73	Right Standup 83	Black-Blue J906-3 Left Flipper EOS F3
Orange-Yellow (4) J205-4 4th Coin Chute D4		4 White-Yellow J209-4 U18-7	Plumb Bob Tilt 14	Always Closed 24	Trough Ball 4 34	Skid Pad Exit 44	Not Used 54	Bottom Jet 64	Not Used 74	Right Rubber 84	Black-Gray J905-2 Left Flipper Opto F4
Orange-Green (5) J205-6 Normal Function Ser Credits Esc D5	Test Function Esc	5 White-Green J209-5 U19-11	Plunger 15	First Gear (optional) 25	Route 66 Entry 35	Route 66 Exit 45	Left Race Encoder 55	Right Jet 65	ZR-1 Exit 75	Not Used 85	Black-Violet J906-4 Upper Right Flipper EOS F5
Orange-Blue (6) J205-7 Normal Function Vol Down D6	Test Function Down	6 White-Blue J209-7 U19-9	Left Return Lane 16	Second Gear (optional) 26	Pit Stop Popper 36	Left Standup 3 46	Right Race Encoder 56	Left Rollover 66	ZR-1 Lock Ball 1 76	Jet Rubber 86	Black-Yellow J905-3 Upper Right Flipper Opto F6
Orange-Violet (7) J205-8 Normal Function Vol Up D7	Test Function Up	7 White-Violet J209-8 U19-5	Right Return Lane 17	Third Gear (optional) 27	Trough Eject 37	Left Standup 2 47	Route 66 Kickout 57	Middle Rollover 67	ZR-1 Lock Ball 2 77	Left Outer Loop 87	Black-Gray J906-5 Upper Left Flipper EOS F7
Orange-Gray (8) J205-9 Normal Function Begin Test D8	Test Function Enter	8 White-Gray J209-9 U19-7	Spinner 18	Fourth Gear (optional) 28	Inner Loop Entry 38	Left Standup 1 48	Skid Route 66 Exit 58	Right Rollover 68	ZR-1 Lock Ball 3 78	Right Outer Loop 88	Black-Blue J905-5 Upper Left Flipper Opto F8

J2XX = CPU Board; J9XX = Fliptronic II Board;

 = Opto, Typically Closed

WARNINGS & NOTICES

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TO MAINTAIN THESE LEVELS, reposition harnesses and reconnect ground straps to their original placements, if they become disconnected during maintenance.

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