

SEGA
PINBALL, INC.

BAYWATCH



BAYWATCH™ ©1994, The Baywatch Production Company. All Rights Reserved.

JOE BLACKWELL
TECHNICAL SUPPORT
MANAGER

ERIC WINSTON
TECHNICAL SUPPORT
ENGINEER

TED KILPIN
TECHNICAL SUPPORT
ENGINEER

JAY ALFER
TECH. DOCUMENTATION
ADMINISTRATOR

Sega Pinball, Inc.™
Copyright © 1995, All Rights Reserved.

780-5033-00

Appendixes (Green Section)

Starting with this manual, a new Appendix section has been added to incorporate information relating to all games produced by this company. Following the appendixes is a Glossary of Terms.

Appendix A -	CPU Jumper Table	Appendix E -	Motor Specifications Table
Appendix B -	Pinball Game Firmware	Appendix F -	Semi-Conductor / Integrated Circuits / Relays Cross-Reference Guide
Appendix C -	Board Type Table	Appendix G -	Part Number Prefix Classification Codes Explanation
Appendix D -	Generic Coil Cross-Reference Guide & Flipper Coil Table	Appendix H -	Playfield Inserts (Plastic Light Covers)

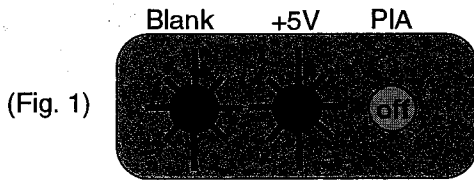
Board Compatibility (Reflexive & Non-Reflexive) of CPU Boards

Version 1 and 2—**Reflexive**—Solenoid Drive Transistor is enabled directly by a *switch closure* on the solenoid assembly. Version 3—**Non-Reflexive**—Solenoid Drive Transistor is enabled by the CPU after reading a *switch closure* in the Switch Matrix. All CPU Boards are *backwards compatible* (e.g. Jurassic Park / Ver. 3 to Time Machine / Ver. 2). Swapping a Version 2 Board to a Version 3 is not possible due to the special solenoids section (i.e. Slingshots, Turbo Bumpers, etc.) changing from **Reflexive** to **Non-Reflexive** on Version 3 Boards.

Power-Up CPU Self Tests

Upon power-up, the CPU Board performs a series of self tests of major components. Turn the game on while observing the LEDs on the CPU Board. Tests of the PIAs, RAM, and EPROMs are performed automatically and results of the tests are indicated by the PIA LED.

With all tests passed, the LEDs illuminate in the following sequence at power turn-on. The PIA and +5v LEDs illuminate immediately. Approximately 1/2-second later, the PIA LED goes out and the Blanking LED illuminates; the +5v and Blanking LEDs remain illuminated until the game is turned off. Test failures are indicated with the PIA LED:



(Fig. 1)

Normal Operation

PIA LED	SUSPECT COMPONENT
Stays On	One of the 6821 PIAs
Flashes 1 Time	6264 RAM at location D5
Flashes 2 Times	EPROM at location C5

DISPLAY READS "OPEN THE DOOR" -- This indicates a faulty memory condition in RAM. Opening the Coin Door will initiate a Factory Restore, by opening the Memory Protect Switch. Check battery voltage at CMOS RAM with power off.

QUICK REFERENCE FUSE CHART

PPB BOARD		POWER SUPPLY BOARD	
F1	5A Slo-Blo G.I. 6.3vAC	F1	7A Slo-Blo +5vDC Regulator Input (9vAC)
F2	5A Slo-Blo G.I. 6.3vAC	F2	7A Slo-Blo +5vDC Regulator Input (9vAC)
F3	5A Slo-Blo G.I. 6.3vAC	F3	Not Used
F4	5A Slo-Blo G.I. 6.3vAC	F4	8A Slo-Blo Switched Illumination Buss (18vDC)
F5	5A Slo-Blo Flipper Power & 50v coils	F5	4A Slo-Blo Solenoid (32vDC)...
F6	5A Slo-Blo Flash Lamps (32vDC) Right		Bumpers, Slingshots, etc.
F7	3A Slo-Blo Flipper Power & 32v coils Left	F6	5A Slo-Blo Solenoid Buss (32vDC)
F8	4A Slo-Blo 50v coils		
F9	5A Slo-Blo 50v coils		

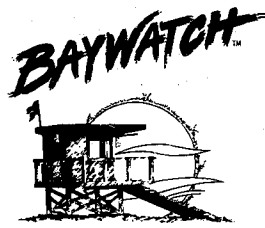


Table of Contents

GAME SPECIFICATIONS	1
Power Requirements	1
EPROM Summary	1
Transportation	1
Overall Dimensions (Shipping Crate Dimensions)	1
Game Assembly Procedures	2
» LEG LEVELER ADJUSTMENT	3
» EASY ACCESS SERVICE SYSTEM	3
» BACKBOX LAYOUT, FUSE & RELAY LOCATIONS	4
GAME OPERATION & FEATURES	5
Standard Features	5
Extra Ball (EB) Buyin Feature	5
Manual Percentaging	5
Playfield Overview and Game Rules	5-15
GAME AUDIT FUNCTIONS	17
» Game Audit Table	16
General	17
» EARNINGS AUDITS (1-12)	17
» SEGA AUDITS (13-46)	18, 19
» BAYWATCH AUDITS (47-85) (GAME SPECIFIC)	19, 20
GAME ADJUSTMENTS	23
» Game Adjustment Table	22
General	23
Replay & Generic Features.....	23
» SEGA ADJUSTMENTS (1-43)	23
Adj. 7 Game Difficulty Explained.....	24
Play Rules: Novelty & 5-Ball, plus Add-A-Ball Settings.....	24
Adj. 43 Tournament Mode Settings Explained.....	24
Adj. 8 Game Pricing Explained	25
» Custom Pricing Table	25
» Standard Pricing Table	26
» SEGA ADJUSTMENTS (1-43) CONTINUED	27-29
» BAYWATCH ADJUSTMENTS (44-52) (GAME SPECIFIC)	29
» PRINTER ADJUSTMENTS ('QUIK', FULL & RESET, 53-55)	30
GAME DIAGNOSTICS	31
Entering Diagnostics	31
Service Credits.....	31
Tech Alert.....	31
Easy Trough Clear.....	31
Burn-In Minutes.....	32
» Sound Tests (with Chart)	32
Speaker Phase Testing.....	32
Dot Matrix Display Explained	33
» Dot Matrix Display Test	33
» Laser Kick Test	33
» Shark Fin Flipper Flip: Test & Adjustment	33
» SWITCH TESTS	34
Switch Test	34
Active Switches.....	34
» Switch Matrix Chart	34
Switch Matrix Locations, Descriptions & Switch Part Numbers	35
» LAMP TESTS	36
All Lamps	36
Lamp Returns (Row).....	36
Lamp Drives (Column).....	36
» Lamp Matrix Chart	36
Lamp Matrix Location and Descriptions.....	37
Single Lamp.....	38
» FLASH LAMP / COIL TESTS	38
Flash Lamp	38
Automatic Test.....	38
Select Coil.....	38
Return to Game Over.....	38
» PLAYFIELD COILS / BACKBOX & PLAYFIELD FLASH LAMP LOCATIONS	38, 39
Switched, CPU Controlled Auxillary & Constant Power Solenoids Chart & Schematic	40, 41

PARTS IDENTIFICATION (PINK SECTION)	43
Backbox - Parts	44
Cabinet - Parts	45
Playfield - Major Assemblies	46
Playfield - Ramps and Rails	47
Playfield - Butyrate and Decals	48
Playfield - Parts	49
Playfield - Metal Posts & Spacers (Actual Size)	50
Playfield - Plastic Posts & Spacers (Actual Size)	51
Playfield - Rubber Parts (Rings Actual Size)	52
Playfield - Wedge Base Type Bulbs & Sockets (Actual Size).....	53
Playfield - Bayonet Type Bulbs & Sockets (Actual Size)	54, 55
Playfield - Lamp Boards	56
UNIQUE PARTS IDENTIFICATION (BLUE SECTION)	57
5-Ball Trough (OPTO) Assy. (500-5965-00-33), Lock Ball Assy. (500-5684-01-33), Ball Trough Exit Scoop (535-7329-00)	59
Flipper Assemblies, Lower Right (500-5832-01-33) and Lower Left (500-5832-02-33)	60
Flipper Assembly, Upper Right (500-5693-01-33), Upper Left (500-5983-02-33)	61, 62
Slingshot Assemblies (500-5849-00-33)	63
Knocker Assembly (In Cabinet)(500-5081-00-33)	63
Turbo Bumper Assemblies, Upper Left & Right (500-5227-02-33).....	64
Turbo Bumper Assembly, Bottom (500-5227-03-33)	65
Auto Ball Launch Assembly (500-5969-00-33).....	66
Upper Ball Launch (Kick Big) Assembly (500-5862-06-33)	66
Laser Kick Assembly (Under Arch) (500-5838-01-33).....	67
Vertical Up-Kicker (VUK) Assembly (500-5839-01-33)	67
Super Scoop (VUK) Assembly (500-5953-00-33)	68
Super VUK Assembly (Under Arch) (500-5880-00-33)	68
Mini-Coil Assembly (for Upper Control Gate) (500-5968-00-33)	69
Mini-Coil Assembly (for Lower Control Gate) (500-5957-00-33)	69
3-Bank Drop Target Assembly (500-5970-00-33)	70, 71
Left Metal Ramp (Tower) Assembly (500-5943-00-33)	72
Baywatch Lock Tower Assembly (500-5006-00-33).....	73
Dual Plastic Ramp (Right & Side) (500-5954-00-33).....	74
Center Plastic Ramp Assembly (500-5941-00-33).....	75
Under Playfield Plastic Ramp (Trough) Assembly (515-6247-00).....	76
Shooter Entry Wire Ramp Assembly (500-5975-00-33).....	76
Center Exit Wire Ramp Assembly (500-5976-00-33)	77
Tower Wire Ramp (Left Exit) Assembly (500-5979-00-33).....	77
Stand-Up Targets Assemblies (used in this game: 500-5857-XX & 500-5835-XX)	78
SCHEMATICS / TROUBLESHOOTING (YELLOW SECTION)	79
Power Wiring Diagram	81
Cabinet Wiring Diagram	82
Backbox Wiring Diagram	83
Playfield Coil / Flashlamp Wiring Diagram	84
Playfield Special Coil Diagram	85
Playfield Switch Wiring Diagram	86
Playfield Lamp Wiring Diagram	87
CPU Board Assembly Diagram	88
CPU Board Logic Diagram (Sheet 1 of 4)	89
CPU Board Logic Diagram (Sheet 2 of 4)	90
CPU Board Logic Diagram (Sheet 3 of 4)	91
CPU Board Logic Diagram (Sheet 4 of 4)	92
Power Supply Board Schematic & Component Layout	93
Sound Board Schematic (520-5126-XX)	94
Sound Board Component Layout (520-5126-XX)	95
Display Controller Board Schematic (Page 1 of 2).....	96
Display Controller Board Schematic (Page 2 of 2).....	97
Display Controller Board Component Layout.....	98
Display Driver, Dwg. 1 (Cherry).....	99
Display Driver, Dwg. 2 (Babcock).....	100
Display Driver, Dwg. 3 (Dale).....	101
Solid State 2-Flipper Board Theory of Operation & Circuit Troubleshooting Flowchart	102
Solid State 2-Flipper Board (520-5080-00) Diagram	103
Solid State 2-Flipper Board (520-5080-00) Wiring Diagram Lower (Page 1 of 2)	104
Solid State 2-Flipper Board (520-5080-00) Wiring Diagram Upper (Page 2 of 2)	105
PPB Diagram.....	106
Trough Up-Kicker OPTO Theory of Operation and Schematic	107
Single Trough OPTO Alignment / Test.....	108
APPENDIX A - H (GREEN SECTION)	109
Appendix A - CPU Jumper Table	111
Appendix B - Pinball Game Firmware	112, 113
Appendix C - Board Type Table	114, 115
Appendix D - Generic Coil Cross-Reference Guide & Flipper Coil Table.....	116, 117
Appendix E - Motor Specifications Table	118, 119
Appendix F - Semi-Conductor / Integrated Circuits / Relays Cross-Reference Guide	120, 121
Appendix G - Part Number Prefix Classification Codes Explanation.....	122
Appendix H - Playfield Inserts (Plastic Light Covers)	123
» Glossary of Terms	125-128

GAME SPECIFICATIONS

Power Requirements

This game is provided with a 3-prong plug and **must be connected to a properly grounded outlet to reduce shock hazard** and insure proper game operation. Refer to AC Power Wiring Diagram for transformer connections required for normal, high, and low line conditions.

Normal Line:	109 to 129 -Volts AC (211 to 225 -Volts AC)
High Line:	(226 to 235 -Volts AC)-- European, International
Low Line:	95 to 108 -Volts AC (200 to 210 -Volts AC)

EPROM Summary

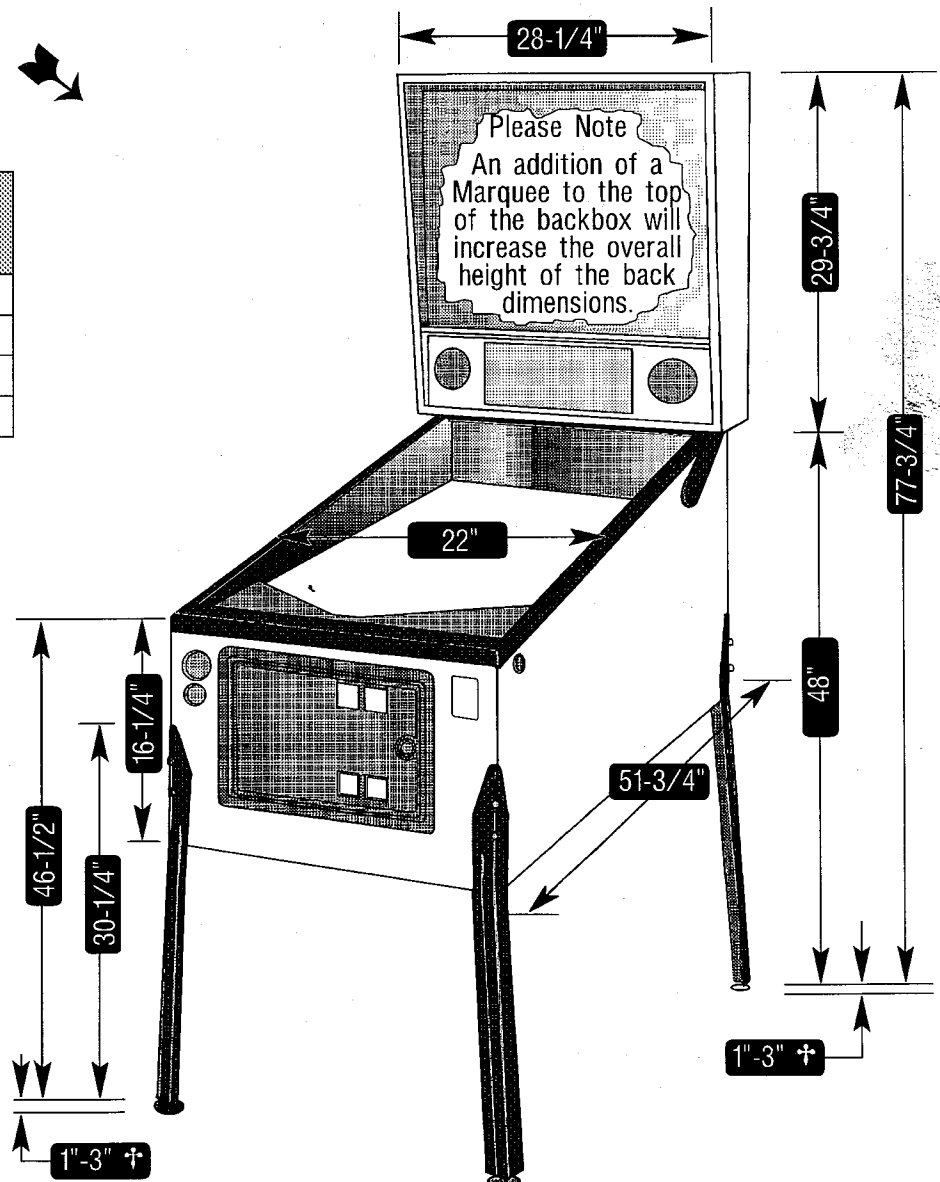
CPU Board:	Location C5
Sound Board:	Locations U17 (Voice ROM 1), U21 (Voice ROM 2), U36 (Voice ROM3) and U7 (Sound ROM)
Display Controller Board:	Location U1 (ROM 0) and U4 (ROM3)

Transportation

To reduce the possibility of damage, observe the following precautions whenever transporting the game. Lower the backbox and secure it to the cabinet. Remove the legs and secure the game within the transporting vehicle.

Overall Dimensions

Shipping Crate Dimensions	
Height	55-1/2"
Width	30-1/2"
Length	31"
Approx. Wt.	250 lbs.



† Note: The Leg Levelers can add up to 2 inches to the overall height of the front and back dimensions. The cabinet is designed to give a 6.5° pitch with the Leg Levelers turned all the way in.

Game Assembly Procedures

(Refer to the Illustrations on pages 3 & 4)

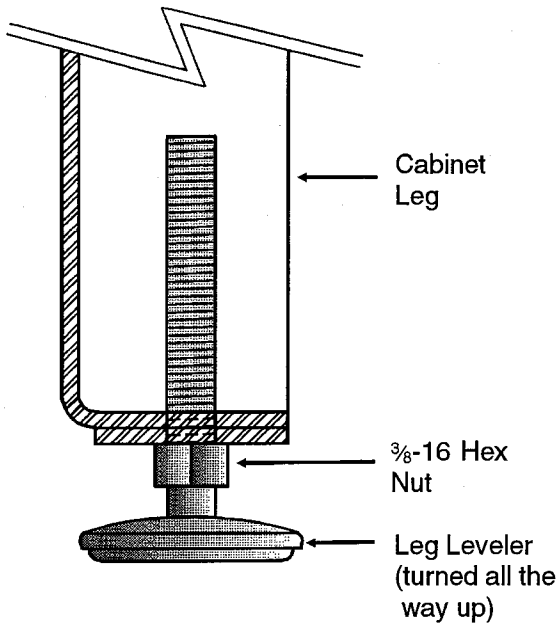
1. Open the top of the carton and lay it on its side with the bottom of the cabinet down. Using the plastic banding strip as a handle, slide the game out of the carton.
2. Remove all packing material. Cabinet legs are located on top of the front moulding above the coin door and the assembly parts package is in the cashbox. There should be four leg levelers, eight leg bolts, six pinballs and a large Allen Wrench, used for securing the backbox, is inserted & taped to the rear of cabinet.
3. Leg Levelers should be attached. If not, attach Leg Levelers from the parts package to each leg, make sure that each leveler is threaded through a hex nut before threading it into the leg. See Illustration "Leg Leveler Adjustment" on the next page.
4. Support rear of cabinet and attach rear legs using two leg bolts for each leg.
5. Support front of cabinet and attach front legs using two leg bolts for each leg.
6. While assuring that no cables are being pinched, carefully raise the backbox and secure it in its upright position with the Allen Wrench in the hole in the back of the cabinet and rotating the wrench 270° ($\frac{3}{4}$ turn).
7. Remove the backbox keys from the playfield glass, unlock and carefully remove the backglass. Set the backglass aside.
8. Check all connectors in the backbox for loose wire terminations. Reseat any loose wire by pushing in on the terminal. Push on all connectors plugged into the CPU Board, Sound Board, Power Supply Board, and Display Board to check that they are properly seated.
9. Check that the fuses on the Power Supply Board, PPB Board and Back Panel are seated properly.
10. Carefully remove the playfield glass and set it aside.
11. Remove all shipping tie downs.
12. Raise the playfield and support it, by lifting the Stay Arm on the Right Side of the Cabinet and locking it into the slotted bracket on the playfield. (Use the instruction sheet provided in the game to see alternative methods of accessing the playfield bottom.)
13. Check all cabinet cables and playfield Lamp Boards connector terminations.
14. Remove the Plumb Bob tilt from the parts package and install on the pendulum wire on the inside left of the cabinet. (See Cabinet Parts Illustration.)
15. Lower the playfield and ensure game is level side-to-side by adjusting Leg Levelers, if required.
16. The game pitch should be at a 6.5° pitch. Depending on the condition of the floor, adjust as required.

THE PLAYFIELD INCLINE AFFECTS DIFFICULTY OF PLAY. USE THE RECOMMENDED INCLINE; GAME DIFFICULTY IS BEST VARIED USING GAME ADJUSTMENTS.

17. Check the plumb tilt and adjust as required.
18. If desired, perform any self tests at this time. With the insert door closed, carefully reinstall and lock the backglass.
19. Place the six pinballs on the playfield near the outhole and carefully reinstall the playfield glass.
20. If desired, make game pricing and Add-A-Ball, Novelty, or 5-Ball Play adjustments at this time.

LEG LEVELER ADJUSTMENT

This cabinet is designed to automatically have a 6.5° pitch without any Leg Leveler adjustment!



STEP 1

Assemble all (4) legs and levelers as shown in the diagram. Be sure the leveler is turned all the way in.

STEP 2

Attach leg assemblies to cabinet with leg bolts provided.

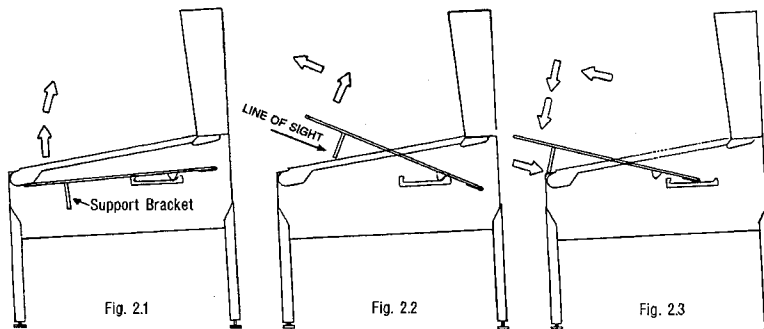
YOUR PLAYFIELD PITCH IS NOW AT 6.5° AS REQUIRED FOR PROPER GAME PLAY! See Step 3.

STEP 3

Verify 6.5° pitch. Minor adjustment(s) may be necessary depending on the location floor being level.

For custom adjustment greater than 6.5° can be achieved by turning out the leg leveler, however, it is not recommended.

EASY ACCESS SERVICE SYSTEM

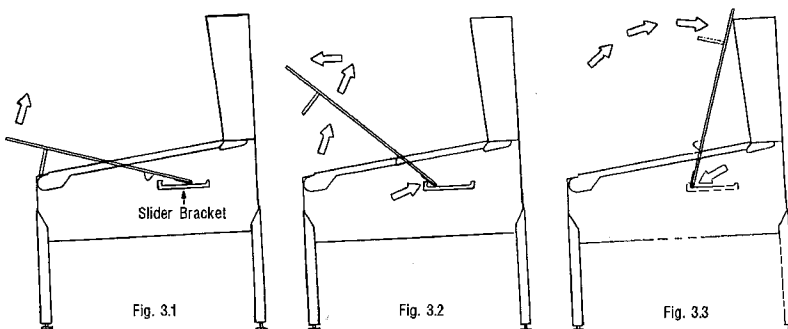


This position is useful to service:

Trough Switches, Connectors at back of cabinet, Cleaning the Playfield, etc.

SERVICE POSTION 1

Lift the playfield **using the left and right ball guides** upward (Fig. 2.1) until the playfield support brackets can be seen to clear cabinet front (Fig. 2.2). At this time, pull playfield toward the front of the cabinet, checking that the mechanical components clears the cabinet front (Fig. 2.3). Then rest the playfield on the support brackets at the front channel of cabinet. **Reverse procedure when service is complete.**



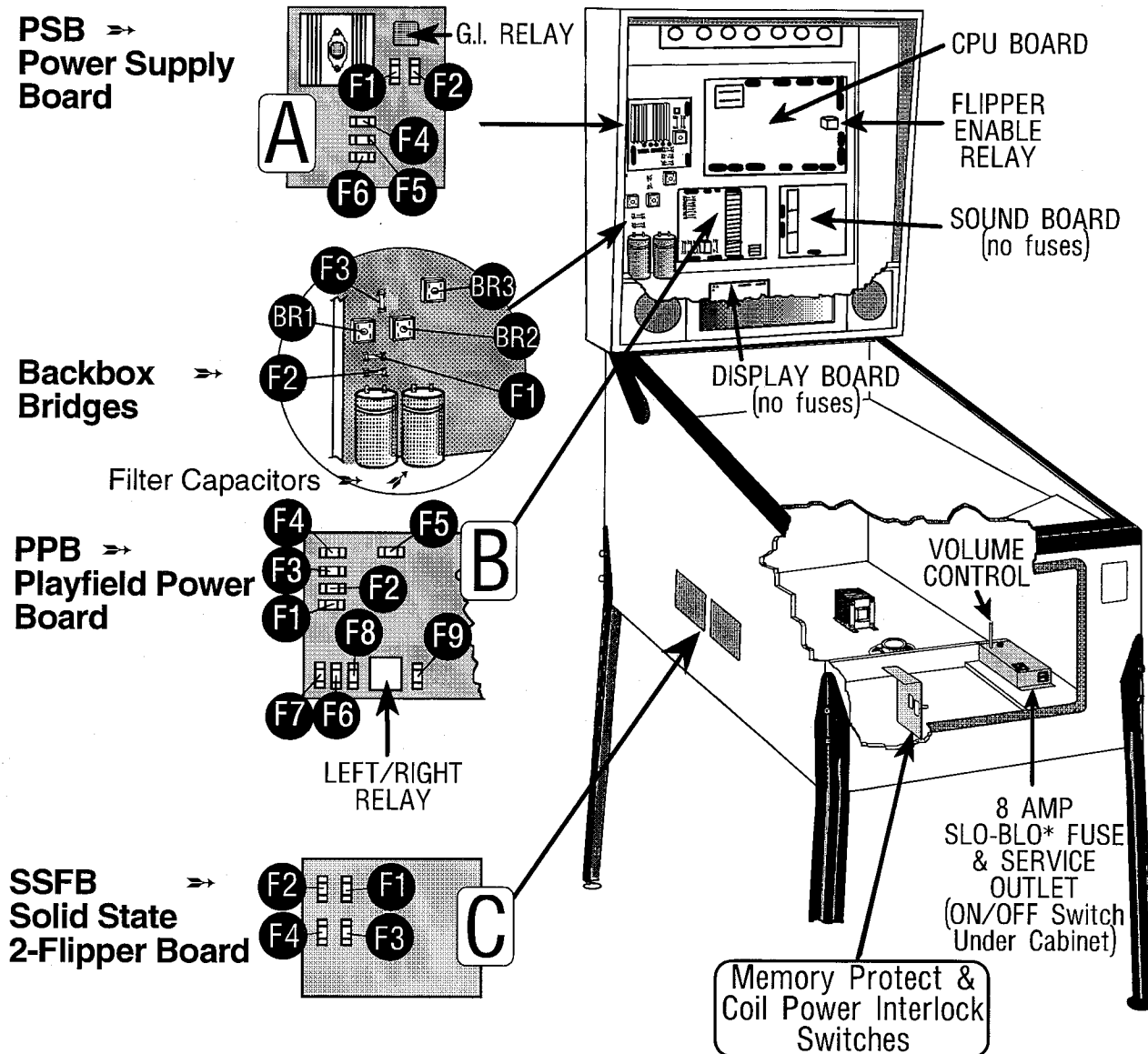
This position is useful to service:

All Playfield Bottom Components, Cabinet Components, etc.

SERVICE POSTION 2

With the playfield at rest (Fig. 3.1), hold sides of playfield and pull toward the front of the cabinet (approximately 6-8"), until resistance is felt from the slider brackets located on either side of the cabinet (Fig. 3.2). At this time, swivel playfield toward the backbox, then rest on top edge of the backbox. **Reverse procedure when service is complete.**

BACKBOX LAYOUT, FUSE & RELAY LOCATIONS



Service Switches are located on the Coin Door.

Note: Backbox Part Numbers on Page 44.

A: In the Backbox		B: In the Backbox		C: In the Cabinet		In the Backbox	
Power Supply Board PSB		Playfield Power Board PPB		Solid State 2-Flipper Bd. SSFB		Backbox Bridges Mounted in Backbox	
F1	7A Slo-Blo +5vDC Regulator Input (9vAC)	F1	G.I. 5A Slo-Blo Playfield	F1	3A 250v Slo-Blo 50v DC Output (All Fuses) Right Flippers	F1	8A Slo-Blo 32v DC BR2 Coils/Flashers
F2	7A Slo-Blo +5vDC Regulator Input (9vAC)	F2	G.I. 5A Slo-Blo Backbox Dr./Spkr. Panel	F2	3A 250v Slo-Blo 9v AC Holding	F2	8A Slo-Blo 18v DC BR1 Lamps
F3	Not Used	F3	G.I. 5A Slo-Blo Playfield & Coin Door	F3	3A 250v Slo-Blo 50v DC Output Left Flippers	F3	8A Slo-Blo 18v DC BR3 Display
F4	8A Slo-Blo Switched Illum'tion Buss (18vDC)	F4	G.I. 5A Slo-Blo Backbox Door	F4	3A 250v Slo-Blo 9v AC Holding	Cabinet Fuses	
F5	4A Slo-Blo Solenoid (32vDC) Bumpers, Sling- shots, etc.	F5	50v 5A Flippers /All 50v Coils			Main Fuse Line: 8A Slo-Blo 250v International	
F6	5A Slo-Blo Solenoid Buss (34vDC) L/R Relay Coils/Flash	F6	32v Flash Lamps 3A Slo-Blo/Right			2X 4A Slo-Blo 250v	
		F7	32v 3A Coils/Flash Right/Left				
		F8	50v 4A / 50v Coils				
		F9	50v 5A Laser Kick				

GAME OPERATION & FEATURES

Standard Features

Insert coin(s), the game generates a sound ("SEGA!") for the first credit & for each subsequent coin(s) and the display indicates the number of credit(s) posted. Depress the Start Button and a start-up sound is produced, the posted credit(s) are reduced by one. The display now indicates the player or # of players selected from the total depressions of the Start Button. The display indicates the ball in play, and a ball is served to the shooter lane. Additional players may be added by pressing the Start Button before the end of ball 1. At game start, an introduction is shown followed by Skill Shot Graphics. Depressing the Start Button after ball 1 of any player will start a new game (if credits are available) only if button is depressed for 2-3 seconds. This delay is to avoid accidental "re-starts" of a game. (Note: Any ½ credit remaining during game play after the end of ball 1, or power down, will be eliminated.)

The second closure (adjustable) or prolonged closure of the Plumb Bob Tilt Switch tilts the ball in play. Closure of the Slam Tilt Switch on the coin door ends the current game(s).

At the end of each ball, earned bonuses are collected. If the player enabled the EB Buy-In Feature*, the player now has the option of purchasing an extra ball to continue game play (See Extra Ball (EB) Buy-In Feature below). Otherwise, the system produces a random 2-digit number (a multiple of 10; 00 to 90) for a Match feature (adjustable). Matching the last two digits of a player score with this number awards a credit. Some geographical areas do not allow the award of a free game, this can be adjusted with Adj. 4, Replay Award. Players exceeding high score levels receive free credits (adjustable) and are able to enter their initials with the new High Score achieved. To enter your initials, use the left & right flipper buttons to choose letter or character as seen on the Visual Display. Hitting the Start Button locks the letter or character in. Proceed with the 2nd & 3rd letter. The game then proceeds into the game-over mode and then to the attract mode. A custom message (adjustable) can be displayed during the attract mode.

*Extra Ball (EB) Buyin Feature

An option to add an extra ball(s) after the game is finished. TO ACTIVATE THE **EXTRA BALL BUY-IN FEATURE**, THE PLAYER MUST PRESS THE EB BUY-IN BUTTON DURING THE COURSE OF THE GAME. At the end of normal game play, the same player may choose to continue the game at the same score and features active by pressing the EXTRA BALL BUTTON prior to the expiration of the "countdown timer." Pressing the START BUTTON or BOTH FLIPPERS SIMULTANEOUSLY cancels this feature. If the player does not have any credits, the player will get "more time" to add credit. The number of extra balls which can be added to a game can be adjusted with Adj. 38, Extra Ball Buyin Count. Default is 1. Set to 1, will allow only 1 extra ball to be purchased per game. Set to **UNLIMITED**, after the end of the game the countdown will appear after the end of each ball for the option of purchasing another extra ball. Set to 0, will make this feature unavailable.

Manual Percentaging

This game is equipped with Manual Percentage Adjustment. As previously with our games, you can either set operator adjustments for a replay percent or you can set a fixed replay score.

If you set operator adjustments for a particular replay percent, the game will compute a recommended score to keep the game at that replay percentage. If a change is recommended and the game coin door is opened, the display will indicate a recommended replay score to beat and make a sound to alert the operator. By pressing the start button, the score to beat will be changed to the recommended level. If you close the coin door or go into Audit or Adjustment Mode, no score change will be made.

You may choose to ignore the recommended change; for example, you may not think last week's players were the usual crowd. Just close the door and the message will disappear without altering the existing level. Or you may choose to make a different score to beat adjustment; this is done by utilizing Adj. 02, Starting Replay Score.

Playfield Overview and Game Rules (See the following pages)

The following pages describe the Game Rules. On the next page is a playfield overview to show the locations of of the featured items. Your game includes an instruction card. The instruction card on the next page may be photo-copied as a temporary replacement if required. Please note, rules and featured items may be subject to change through production.

Playfield Overview & Game Rules

CENTER PLASTIC RAMP

LEFT METAL RAMP

UPPER VUK (Vertical Up-Kicker)

TRAP DOOR ON LEFT PLASTIC RAMP (Enters under Playfield Ramp)

STAND-UP TARGET CENTER RAMP ENTRANCE

SHOOTER LANE WIRE RAMP

STAND-UP TARGETS LEFT RAMP ENTRANCE (Left & Right)

UPPER LEFT FLIPPER

3-BANK DROP TARGET

SUPER SCOOP

5-BANK STAND-UP TARGETS

WIRE RAMP TO LEFT RETURN LANE FROM CENTER PLASTIC RAMP

UNDER PLAYFIELD RAMP

LEFT OUTLANE

LEFT & RIGHT SLINGSHOTS

LEFT RETURN LANE

LOWER FLIPPERS

LASER KICK-BACK (Under Arch)

SUPER VUK UNDER ARCH (Under Playfield Ramp Exit)

SHOOTER LANE WIRE RAMP EXIT TO TOP LANES

TOP 3 ROLLOVER LANES

1-WAY GATE AND MINI-COIL (Under Left Ramp)

RIGHT PLASTIC DOUBLE RAMP

RIGHT TURBO BUMPER (Under Right Ramp)

LEFT TURBO BUMPER

BOTTOM TURBO BUMPER

WIRE RAMP EXIT FROM LEFT METAL RAMP

WIRE RAMP EXIT FROM RIGHT DOUBLERAMP

WIRE RAMP EXIT FROM UPPER VUK

RIGHT RAMP STAND-UP TARGETS LEFT/RIGHT

SPINNER TO MINI-LOOP

1-WAY GATE AND MINI-COIL (Under Butyrate)

UPPER BALL LAUNCH (Under Butyrate)

UPPER RIGHT SHARK FIN FLIPPER

2-BANK STAND-UP TARGETS (Under Shooter Lane Ramp)

INNER RIGHT RETURN LANE

OUTER RIGHT RETURN LANE

RIGHT OUTLANE

SHOOTER LANE RAMP ENTRANCE

5-BALL TROUGH (Under Arch)

AUTO BALL LAUNCH (Under Butyrate)

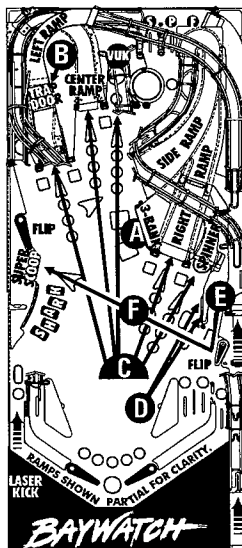
START & EXTRA BALL BUY-IN/LEAGUE BUTTON

LAUNCH BUTTON

BAYWATCH

* Note: Lock Tower Not Shown.

Copy & Cut



SKILL SHOT: Use flippers to select one of 3 skill shots indicated on the *Video Display*. Make 3 in a row or 1 of each for an additional bonus!

MULTIBALL LOCKS: Complete 3-Bank Drop Targets **A** to light lock Trap Door **B** on Left Ramp.

MULTIBALL: Collect all 3 locks to start Multiball.

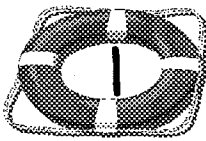
JACKPOTS: Shoot five *Jackpots* to light *Super Jackpots!*

FEATURES: Collect vertical and horizontal sets of lamps to start features. **C**

LASER KICK: Hit 2-Bank Stand-Up Targets **D** to relight Laser Kick.

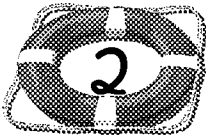
SHARK: From the Upper Right Fin Flipper **E** shoot Shark Super Scoop **F** to collect Sharks to start features. Spell SHARK to light Shark Flips for automatic shot at SHARKS.

SEARCH & RESCUE: During regular play, complete the 5 vehicle Stand-Up Targets (ATV & Rescue Truck @ Left Ramp; Helicopter @ Center Ramp; Wave Runner & Scarab @ Right Ramp) to lite feature at the Spinner.



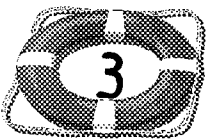
Skill Shot

Use flippers to select one of three skill shots: **A:** Hit flashing **SPF** Lane(s) (steer with flippers) for 10M. **B:** Shoot **SHARK Super Scoop** from *Shark Fin Flipper* for 20M. **C:** Shoot *Side Ramp* from Upper Left Flipper for 50M; each of these values is boosted by 10M for each successful *Skill Shot*. Completing one of each *Skill Shot*, or the same *Skill Shot* on all three balls, awards an additional 50M. All 3 *Skill Shots* are available when ball launched, in case of hardware malfunction.



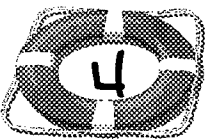
SPF Letters (Top Lanes)

Spell **SPF** to advance the bonus multiplier: 2X, 3X, 4X, ...through 10X. Next completion scores 20M and lights Extra Ball at the upper Vertical Up-Kicker (**VUK**). All subsequent completions score *only* 20M. Bonus multiplier is never held between balls.



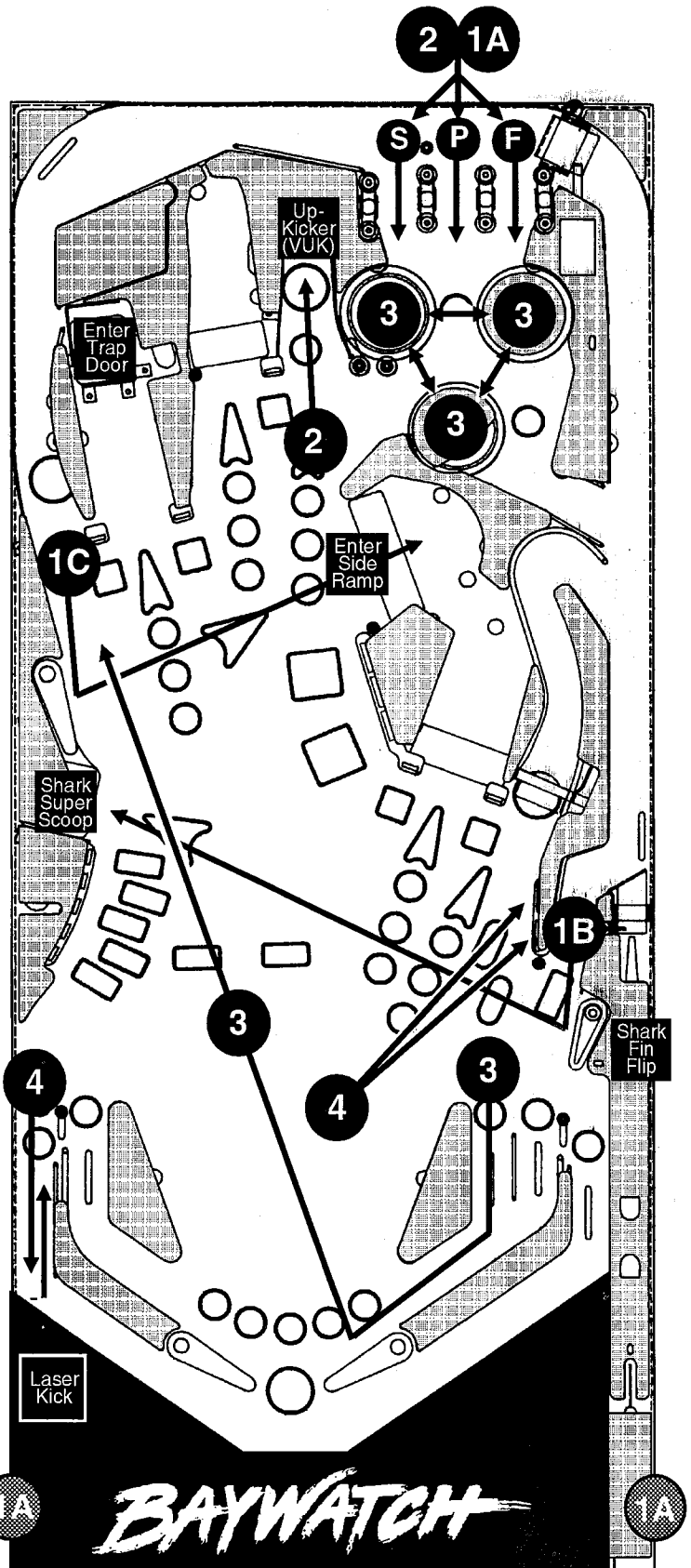
Turbo Bumpers

Turbo Bumpers start at 250K per hit when game begins. Each shot from the *Inner Right Inlane* to the *Left Orbit* boosts this value to 500K and then 1M. This is preserved throughout each player's game. **SQUID POPS** score 2M per bumper for the rest of the current ball.



Laser Kick

The Laser Kick is lit at the beginning of each ball. It is relit by hitting the 2-Bank Stand-Up Targets above the Upper Right Shark Fin Flipper (multiple hits may be necessary).

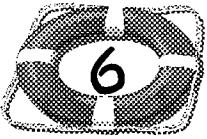


Shown without ramps or Lock Tower for clarity.



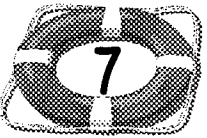
Side Ramp

During regular play, the Side Ramp spots a letter in **IRONMAN**. At beginning of game, several letters of **IRONMAN** are already spotted. When **IRONMAN** is completed, 25M is awarded and a **Video Mode** is lit at the *Spinner Lane*. Each letter is worth 10M.



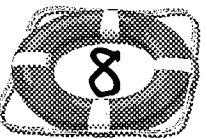
Search & Rescue

During regular play, complete the five vehicle Stand-Up Targets (**ATV (A) & Rescue Truck (R) @ Left Ramp Enter; Helicopter (H) @ Center Ramp Enter; Wave Runner (W) & Scarab (S) @ Right Ramp Enter**) to lite **SEARCH & RESCUE** at the *Spinner Lane*. This is a random award, except in *Tournament Mode*, when awards proceed in a fixed order.



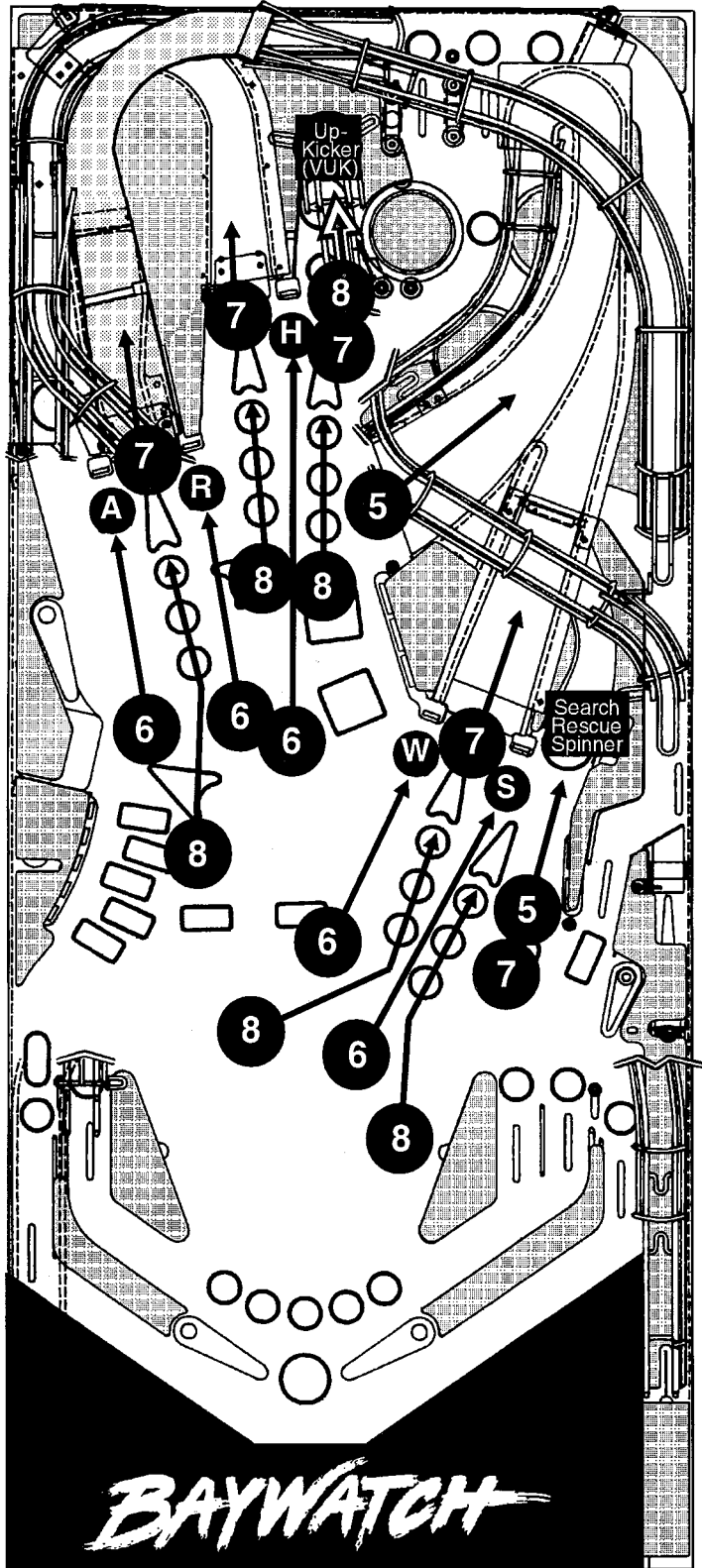
Vertical Modes Definition

The five **Mode Shots** on the playfield are the *Left Ramp*, the *Center Ramp*, the *Upper VUK*, the *Right Ramp*, and the *Spinner Lane*. Shooting any **Mode Shot** four times (cumulative throughout the game) will start a **Vertical Mode**, each of which is described on the next page. When a Vertical Mode has been completed, that shot collects an increasing **Baywatch Millions** value. When all Vertical Modes have been completed, additional shots may be required for the next set.



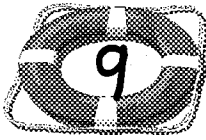
Horizontal Modes Definition

There are 3 lamps on each of the 5 **Mode Shots**. When the 1st lamp of each shot is solidly lit (1 shot to each), the 1st **Horizontal Mode** begins. When the 2nd lamp is solidly lit (3 shots to each), the 2nd **Horizontal Mode** begins. When the 3rd lamp is solidly lit, the final mode **Earth Quake** is lit at the upper **VUK**.



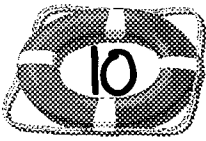
Shown with partial ramps and without Lock Tower for clarity.

Vertical Modes Described:



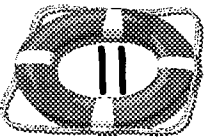
CPR

This **Vertical Mode** starts from the *Left Ramp*. During the 30-second round, the *Left Ramp*, *Center Ramp*, and *Right Ramp* are lit. The first shot is 50M, the second 60M, and the third 70M, plus a 50M **Completion Bonus**. Each shot can only be made once.



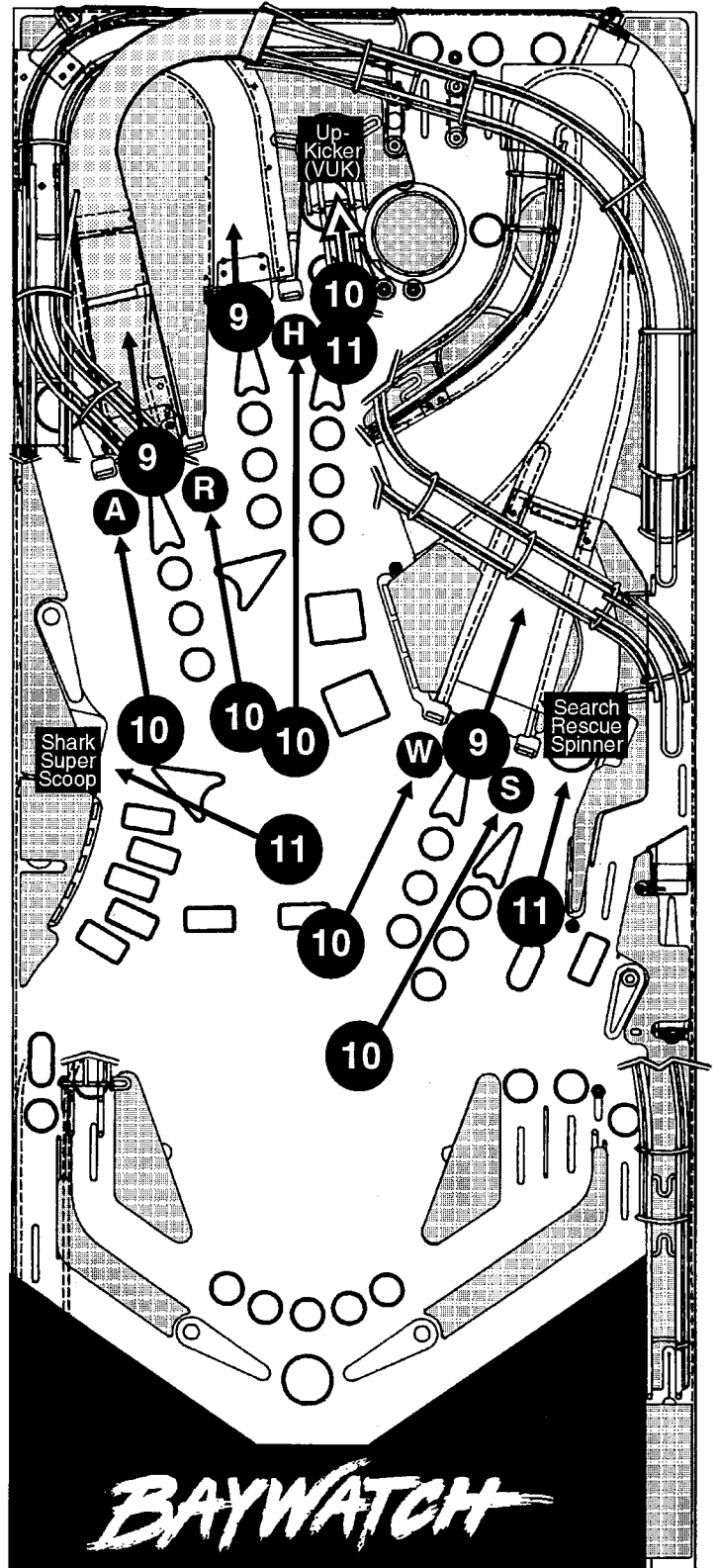
Copter Rescue

This **Vertical Mode** starts from the *Center Ramp*. During the 30-second round, the 5 vehicle *Stand-Up Targets* (**ATV (A)** & **Rescue Truck (R)** @ *Left Ramp Enter*; **Helicopter (H)** @ *Center Ramp Enter*; **Wave Runner (W)** & **Scarab (S)** @ *Right Ramp Enter*) are lit for 20M, each hit rescuing **one** person from the **Sinking Ship**. When 10 people have been rescued, a roving 50M award is lit on the *Left, Center and Right Ramps*.



Diver Trapped

This **Vertical Mode** starts from the **Upper VUK**. During the 30-second round, the **SHARK Super Scoop**, the **Upper VUK**, and the **Spinner Lane** are lit. The first shot is 20M, the second 30M, the third 40M, and the fourth 50M. Shots are repeatable. When all of the shots have been made, the **Upper VUK** is lit for an **Extra Ball** for 15 seconds.



Vertical Modes cont.
on the next page.

Shown with partial ramps and
without Lock Tower for clarity.

Vertical Modes Described:



Shark Attack

This *Vertical Mode* starts from the *Right Ramp*.

During the 30-second round, the **SHARK Targets** and the **SHARK SUPER SCOOP** are lit. Each hit on the bank of **SHARK Targets** kills one shark. There is one shark at first, then a set of two, then a set of three, and finally a set of four. The first time the **SHARK SUPER SCOOP** is shot, all of the sharks currently on-screen are killed. Subsequent shots to the **SCOOP** will only kill one shark. Each shark is worth 10M, plus a 50M **Completion Bonus**.

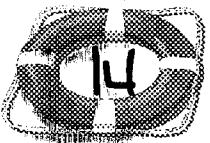


Tidal Wave

This *Vertical Mode* starts from the *Spinner Lane*.

During the 30-second round, the **Left Orbit**, **Upper VUK**, and **Spinner Lane** feed the ball to the **Upper Ball Launch** and award 10M. The ball is then kicked up (*Right Orbit*) to the **Upper Left Flipper**, from which the **Side Ramp** can be shot for a **Rescue Award** of 50M. This sequence can be completed three times, and there is a 50M **Completion Bonus**.

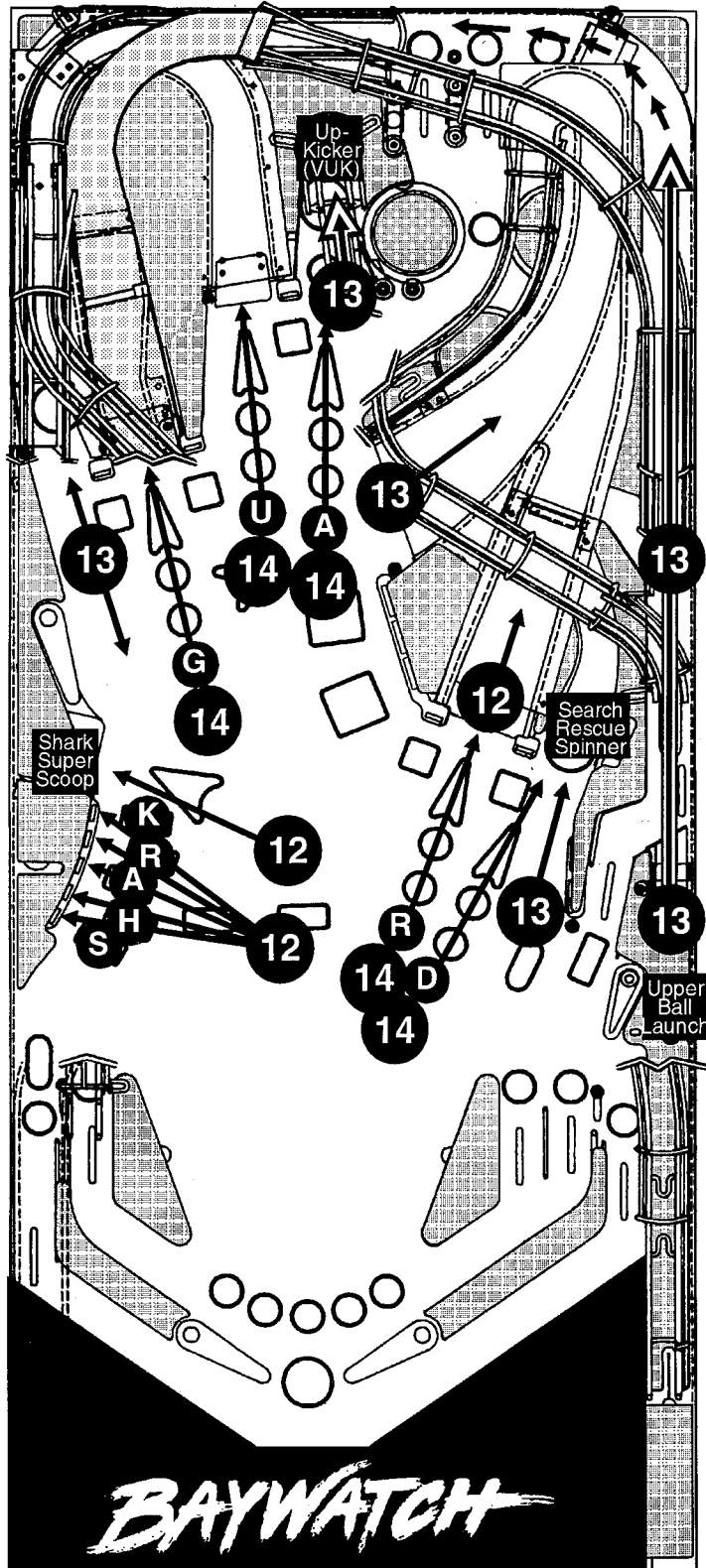
Horizontal Modes Described:



Guard

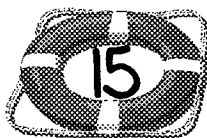
This is the **First Horizontal Mode**. During the 30-second round, each of the five **mode shots** are lit (**GUARD**) for 50M, counting down to 20M. Collecting any shot awards its value and disables that shot.

Horizontal Modes cont.
on the next page.



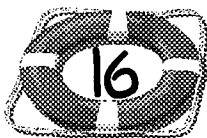
Shown with partial ramps and without Lock Tower for clarity.

Horizontal Modes Described:



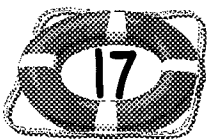
Tourist Season

This is the **2nd Horizontal Mode**. This round is a **2-Ball Multiball** with a **Ball Saver**. The **Right Ramp** is lit to collect countries. The 6 countries are **Germany, Italy, France, Japan, USA & England**. Each country is worth 25M. After all six countries have been collected, larger Jackpots can be collected from the **Side Ramp** for the remainder of the Multiball.



Earth Quake

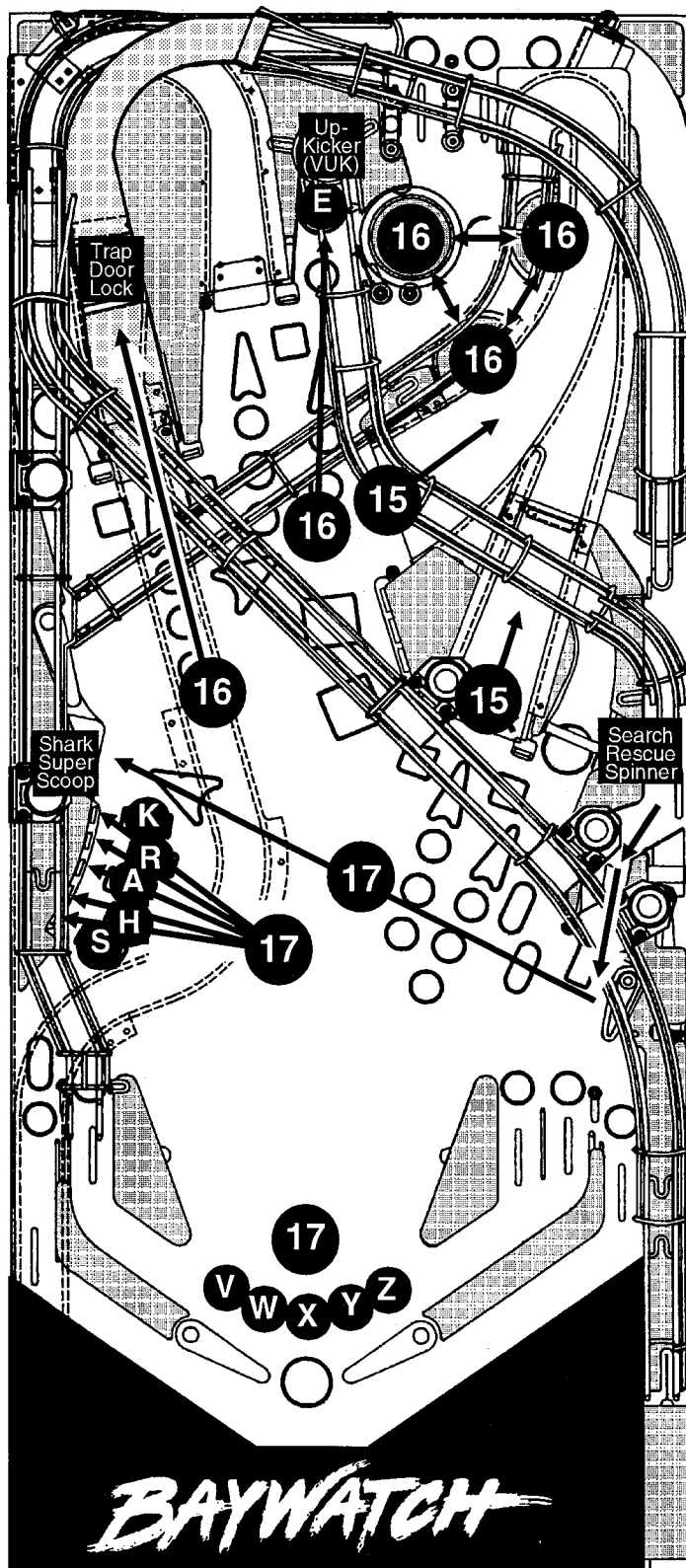
When all 5 **Vertical Modes** and both **Horizontal Modes** have been completed, **EARTH QUAKE (E)** is lit at the **Upr. VUK**. **EARTH QUAKE (E)** can also be lit from the fifth **Shark Feature**. When **EARTH QUAKE (E)** begins, the bonus multiplier is set to maximum (10X), **SQUID POPS** is enabled (2M per hit), and for 30 seconds, **all balls** are **Auto Launched** into play repeatedly. During the round, the **TRAP DOOR** on the **Left Ramp** is lit. Shoot the **TRAP DOOR** as many times as possible before the timer expires. When the timer expires, the **flippers die** and **all balls drain**. Modes are reset to their beginning status if **EARTH QUAKE** was reached via modes rather than the **Shark Features**.



Shark Features

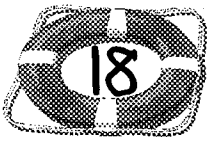
During regular play, shooting the **SHARK SUPER SCOOP** from the **Upr. Right Shark Fin Flipper** (determined by the roll-over switch above that flipper) awards one Shark. After a certain number of Sharks, the following awards are given (denoted by the five Lamp Inserts just above the Lower Flippers):

- **10M + VIDEO MODE (V)** (waterskiing Video Mode begins immediately)
- **20M + (SUPER) LASER KICK (W)** (Laser Kick for remainder of ball)
- **30M + SHARK (FRENZY) (X)** (Shark Flips for remainder of ball)
- **50M + LITE EXTRA BALL (Y)** (by Upper VUK)
- **100M + EARTH QUAKE (Z)** (by Upper VUK).



Shown without Lock Tower for clarity.

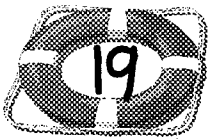
Horizontal Modes Decribed:



Shark Flips

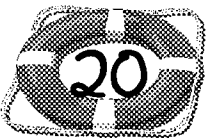
When the **SHARK Stand-Up Targets** are completed to spell **SHARK**, **Shark Flips** is enabled. During regular play, when the ball crosses the **Rollover Switch** above the **Upper Right Shark Fin Flipper**, the game will take control of the upper flippers and automatically shoot for the **SHARK Super Scoop**. If successful, this awards a **Shark** and 25M.

Multiball & Jackpot Features:



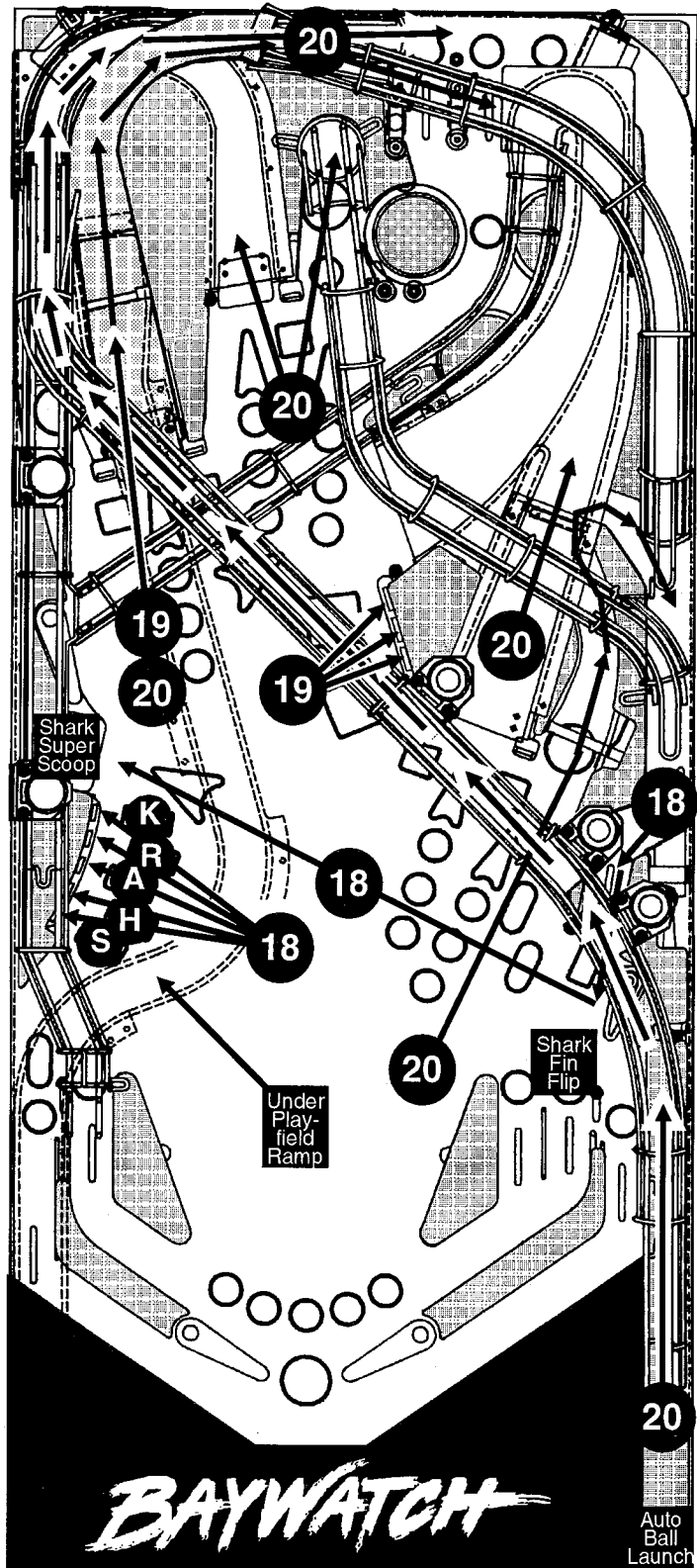
Multiball Locks

Completing the **3-Bank Drop Targets** lights one or more locks on the **Left Ramp**. Locked balls are diverted into the **Under Playfield Ramp** via a **TRAP DOOR** on the **Left Ramp** and another ball is launched into play.



Multiball

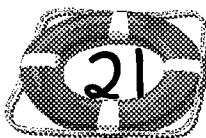
Collecting all three locks starts **Multiball**. Five balls are **Auto-Launched** into play, and a **Ball Saver** is active. All five **Mode Shots** are lit for **SWIMMER JACKPOTS**. The initial value of each **Jackpot** is 30M. This is boosted by 5M each time the **3-Bank Drop Target** is completed. The maximum **Jackpot Value** is 90M, except when it is doubled. Any ball shot into the **Spinner Lane** will be fed into the **Upper Ball Launch**, where it will remain for ten seconds. During this time, all **Jackpot Values** are doubled.



M-Ball & Jackpots cont.
on the next page.

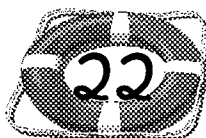
Shown without Lock
Tower for clarity.

Multiball & Jackpot Features:



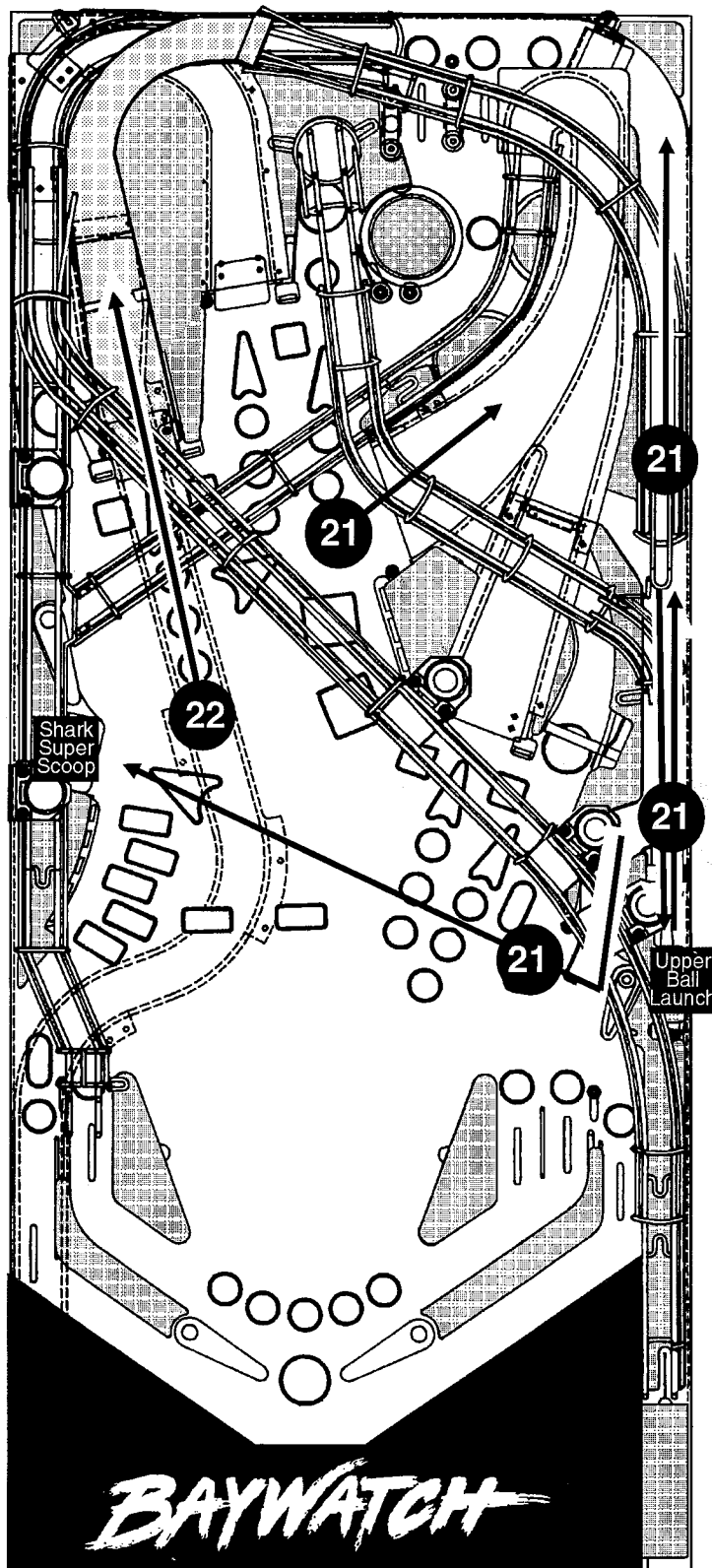
Super Jackpots

After collecting all five *Jackpots*, a **Super Jackpot** is lit at the **SHARK SUPER SCOOP**. The value of the **Super Jackpot** is the sum of the five *Jackpots* previously collected. If it is collected, the **Side Ramp** is lit for the **Double Super Jackpot**, which is, imaginatively enough, double this value. The **Upper Ball Launch** does not double *Jackpot* values at this stage; instead, it launches balls to the **Upper Left Flipper**, via the **Right Orbit**, for a shot at the **Side Ramp**. After both **Super Jackpots** are collected, the *Jackpot* sequence restarts, with the *Jackpot Value* resets to 30M.



Multiball Restart

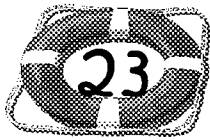
If no *Jackpots* are collected during **Multiball**, a *Restart* is lit at the **Left Ramp**. The restart provides only 3-Balls into play, with a starting **Jackpot Value** of 30M. (Note: This rule is Operator Adjustable.)



Other Bay Features on the next page.

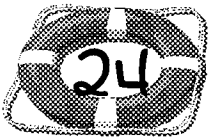
Shown without Lock Tower for clarity.

Other Bay Features:



Video Mode

There are 2 **Video Modes**: One is lit by spelling **IRON-MAN** on the *Side Ramp* and the other is lit by the first **Shark Feature**. The **IRONMAN Video Mode** is collected from the *Spinner Lane*, but only if the ball properly feeds to the *Upper Ball Launch*, while the **Waterskiing Video Mode** starts immediately at the **Shark Super Scoop**.



Inlanes

The *Left Inlane* briefly lights the *Spinner Lane* for an **Automatic Shark Flips**. The *Outer Right Inlane* lights the *Left Orbit* for an **Shark Flips**. The *Inner Right Inlane* lights the *Left Orbit* to boost the *Pops Value* from 250K to 500K to the maximum of 1M.



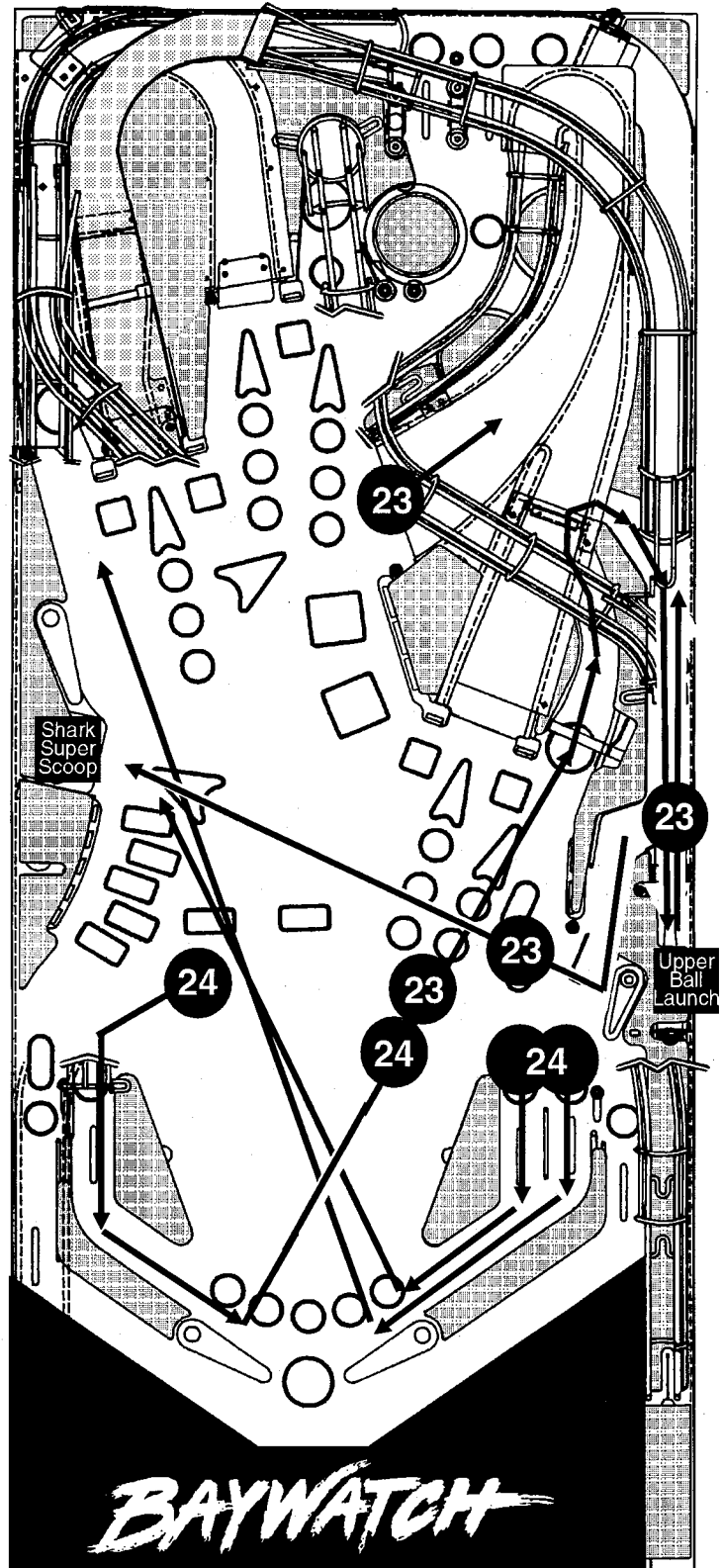
End-Of-Ball Bonus

This is calculated as the sum of: $1M \times \text{Mode Lamps collected}$ (there are three lamps on each of the five shots) + $3M \times \text{Sharks collected}$ + $250K \times \text{Stand-Up Targets hit}$; This total is multiplied by the **SPF Factor** (1 through 10). The first two values are cumulative over the course of the game for each player, while the third applies only to the current ball.



Combination Shots

Baywatch features several **Multi-Way Combos**. These **Combo Shots** involve natural sequences of key shots in the game. Several undocumented difficult combos may also be present.



Shown with partial ramps and without Lock Tower for clarity.

Special Notes on the next page.

Special Notes:

1 to 6 can play! New!
4-Player Doubles! New!

Extra Ball Buy-In/League Button

To buy an Extra Ball:

Pressing the **EXTRA BALL BUY-IN/ LEAGUE BUTTON** at any time during the course of a game activates the *Extra Ball Buy-In Feature* at the end of game play. Once the game ends, Extra Ball(s) may be purchased for one credit before the Buy-In Timer expires. Cancel the Buy-In Feature by pressing the **START BUTTON** or both Flippers simultaneously.

To play the game in *Tournament Play*:

Press the **EXTRA BALL BUY-IN/ LEAGUE BUTTON** to start a League / Tournament game, instead of using the **START BUTTON**.

Four player games are recorded as team matches, with players 1 and 3 competing against players 2 and 4. This does not affect normal 4- or 6-player rules.

Entering Your Initials

The player may enter his/her initials if a High Score was achieved by using the Left or Right Flipper Buttons to choose a letter or character as seen on the Video Display. Hitting the Start Button locks the character in. Proceed with the 2nd and 3rd letter.

Lifeguard Note:

Just like the weather on any beach, rules and point values are subject to change without notice!

Your Notes:

BAYWATCH™

Game Audit Table

EARNINGS AUDITS (1-12)			SEGA AUDITS (13-46) CONTINUED		
Nº	Description	Fill-In	Nº	Description	Fill-In
1	TOTAL PAID CREDITS		43	CENTER DRAINS	
2	FREE GAME PERCENTAGE		44	RIGHT DRAINS	
3	AVERAGE BALL TIME		45	TOTAL SLAM TILTS	
4	AVERAGE GAME TIME		46	TOTAL BALLS SAVED	
5	COINS THRU LEFT SLOT				
6	COINS THRU RIGHT SLOT				
7	COINS THRU CENTER SLOT				
8	COINS THRU 4TH SLOT				
9	TOTAL COINS				
10	TOTAL EARNINGS				
11	METER CLICKS				
12	SOFTWARE METER				
SEGA AUDITS (13-46)			BAYWATCH AUDITS (47-85)		
Nº	Description	Fill-In	Nº	Description	Fill-In
13	TOTAL BALLS PLAYED		47	LEFT RAMP SHOTS	
14	TOTAL EXTRA BALLS		48	MIDDLE RAMP SHOTS	
15	EXTRA BALL PERCENT		49	VUK SHOTS	
16	REPLAY 1 AWARDS		50	SIDE RAMPS SHOTS	
17	REPLAY 2+ AWARDS		51	RIGHT RAMPS SHOTS	
18	TOTAL REPLAYS		52	SPINNER SHOTS	
19	REPLAY PERCENT		53	TOTAL ORBIT SHOTS	
20	TOTAL SPECIALS		54	SHARK SUPER SCOOP SHOTS	
21	SPECIAL PERCENT		55	3-BANK COMPLETED	
22	TOTAL MATCHES		56	SHARK COMPLETED	
23	HIGH SCORE AWARDS		57	VEHICLE TARG. COMPLETED	
24	HIGH SCORE PERCENT		58	LASER KICK USED	
25	TOTAL FREE PLAYS		59	LASER KICK RELIT	
26	TOTAL PLAYS		60	LOCKS LIT	
27	0.0M TO 99.9M		61	LOCK 1 COLLECTED	
28	100.0M TO 199.9M		62	LOCK 2 COLLECTED	
29	200.0M TO 399.9M		63	MULTIBALL READY	
30	400.0M TO 799.9M		64	MULTIBALL START	
31	800.0M TO 1.19B		65	MULTIBALL RESTART LIT	
32	1.2B+ SCORES		66	MULTIBALL RESTART	
33	AVERAGE SCORES		67	TOTAL JACKPOTS	
34	SERVICE CREDITS		68	TOTAL DOUBLE JACKPOTS	
35	PROPRIETARY		69	TOTAL SHARK JACKPOTS	
36	PROPRIETARY		70	TOTAL SUPER JACKPOTS	
37	PROPRIETARY		71	GUARD MILLIONS START	
38	TOTAL BUYIN GAMES		72	TOURIST SEASON START	
39	TOTAL EXTRA BALL BUYINS		73	CPR STARTED	
40	EXTRA BALL BUYIN REPLAYS		74	COPTER RESCUE STARTED	
41	EXTRA BALL BUYIN HSTDS		75	DIVER TRAPPED STARTED	
42	LEFT DRAINS		76	SHARK COVE STARTED	
			77	TIDAL WAVE STARTED	
			78	EARTHQUAKE STARTED	
			79	MYSTERY SCORED	
			80	SHARK FLIP ATTEMPTS	
			81	SHARK AWARDS	
			82	IRONMAN COMPLETED	
			83	VIDEO MODE PLAYED	
			84	SKILL SHOTS MADE	
			85	3 SKILL SHOT BONUS	

GAME AUDIT FUNCTIONS

General

There are 85 audit functions provided for accounting purposes and for evaluation of game difficulty adjustments. Audit functions are split into two groups. There are 12 most-used audits, named Earnings (1-12) in a 'quick look' group, 34 Game Generic (SEGA) Audits (13-46), and 39 Game Specific (BAYWATCH) Audits (47-85). The various auditing functions are summarized in the **GAME AUDIT TABLE** and, when accessed, are shown on the Dot Matrix Display. The *Audit Number* is shown in the top of the display, the *Description* is shown next and the *Audit Total* in the display. Access and control is provided from switches located on the inside of the coin door.

To access audit functions, open the coin door and make sure that the **FORWARD/REVERSE** switch is in the **FORWARD** (up) position. Depress the **STEP** switch and the display indicates **AUDITS & ADJUSTMENTS**. This indicates access to audit functions.

With the **FORWARD/REVERSE** push-button switch still in the **FORWARD** (up) position, depressing the **STEP** push-button switch advances through the audit functions one at a time. To review lower-numbered functions, set the forward/reverse push-button switch to the **REVERSE** (down) position and operate the **STEP** push-button switch.

Audit totals (except for Audits 1, 5-11) may be reset to zero using Game Adjustment, **ADJUSTMENT 9, Reset Game Audits**. Once audits functions have been recorded, and if no adjustments are required, you may return the game to the attract mode. If adjustments are required, continue pressing the **STEP** button until the game adjustments are reached. See Game Adjustments for details.

THE OPERATION OF THIS SECTION WILL CHANGE TO AN ICON MENUING SYSTEM. REFERENCE NEW DIAGNOSTICS MENUING SYSTEM INSTRUCTIONS FOR DETAILS OF NEW ACCESS TO AUDITS AND ADJUSTMENTS (AS WELL AS GAME DIAGNOSTICS, PRINTING OPTIONS, ETC.)

EARNINGS AUDITS (1-12)

Au. #	Audit Name	Audit Definition
Au. 1	Total Paid Credits	The total number of paid credits is displayed.
Au. 2	Free Game Percentage	The Total Free Plays (Audit 25) divided by Total Plays (Audit 26).
Au. 3	Average Ball Time	(In Seconds) The Total Play Time divided by Total Balls Played (Audit 13).
Au. 4	Average Game Time	The Average Game Time expressed in minutes and seconds.
Au. 5	Coins Thru Left Slot	The total amount of coins registered through the left slot.
Au. 6	Coins Thru Right Slot	The total amount of coins registered through the right slot.
Au. 7	Coins Thru Center Slot	The total amount of coins registered through the center slot.
Au. 8	Coins Thru 4th Slot	The total amount of coins registered through the fourth slot.
Au. 9	Total Coins	The total number of coins dropped through all four coin slots.
Au. 10	Total Earnings	The total cash value accumulated since the last Factory Restore occurred.
Au. 11	Meter Clicks	Provides the total number of money clicks accumulated, based on the country's lowest coin denomination used for the game credit.
Au. 12	Software Meter	Provides the Operator with the total number of Meter Clicks. This Audit cannot be reset.

SEGA AUDITS (13-46)

Au.#	Audit Name	Audit Definition
Au. 13	Total Balls Played	The total of regular and extra balls.
Au. 14	Total Extra Balls	The total number of extra balls awarded.
Au. 15	Extra Balls Percent	The Total Extra Balls (Au.14) divided by Total Plays (Au. 26).
Au. 16	Replay 1 Awards	The total awards (credit, extra ball, or audit) for level 1.
Au. 17	Replay 2+ Awards	The total awards (credit, extra ball, or audit) for level(s) 2 or higher.
Au. 18	Total Replays	The total awards (credits, extra balls, or audit only) for exceeding replay score levels.
Au. 19	Replay Percent	The Replay Total awards for exceeding replay score levels, Total Replays (Au. 18) divided by Total Plays (Au. 26).
Au.20	Total Specials	The total awards (credits, extra balls, or scores) for making specials.
Au. 21	Special Percent	The Total Specials (Au. 20) divided by Total Plays (Au. 26).
Au. 22	Total Matches	The total credits awarded for matching the last two digits of the score with the system-generated Match Number at the end of the game. Percentage of match credits will be adjustable from 0% to 10%, by Adj. 13 (Match Percentage), if enabled.
Au. 23	High Score Awards	The total credits awarded for exceeding the High-Score-To-Date scores.
Au. 24	High Score Percent	The High Score Awards (Au. 23) divided by Total Plays (Au. 26).
Au. 25	Total Free Plays	The total free credits for replays, High-Score-To-Date, Specials, and Match.
Au. 26	Total Plays	The sum of Total Paid Credits (Au.1) and Total Free Plays (Au. 25). Note that free credits are not recorded in the Audit until they are actually used.
Au. 27	0.0M to 99.9M	Provides the total number of games the Player's final score was between 0 and 99,999,990 points.
Au. 28	100.0M to 199.9M	Provides the total number of games the Player's final score was between 100,000,000 and 199,999,990 points.
Au. 29	200.0M to 399.9M	Provides the total number of games the Player's final score was between 200,000,000 and 399,999,990 points.
Au. 30	400.0M to 799.9M	Provides the total number of games the Player's final score was between 400,000,000 and 799,999,990 points.
Au. 31	800.0M to 1.19B	Provides the total number of games the Player's final score was between 800,000,000 and 1,199,999,990 points.
Au. 32	1.20B+ Scores	Provides the total number of games the Player's final score was over 1,200,000,000 points.
Au. 33	Average Scores	Provides the Average Score by adding the Final Score of each game to a table and dividing this sum by the Total Plays (Au. 26).
Au. 34	Service Credits	Provides the total number of Service credits added to the game. <i>See Game Diagnostics on page 29 for instructions regarding entry of Service Credits.</i>
Au. 35, 36, 37	Proprietary	Provides information to the game designer to aid in design development (not for consumer use).
Au. 38	Total Buyin Games	Provides the number of times a player utilized the Buyin Feature.

SEGA AUDITS (13-46) CONTINUED

Au.#	Audit Name	Audit Definition
Au. 39	Total Extra Ball Buyins	Provides the total number of times the Extra Ball Buyin Feature was used.
Au. 40	Extra Ball Buyin Replays	Provides the total number of replay awards that resulted from the use of the Total Extra Ball Buyins (Au. 39) Feature.
Au. 41	Extra Ball Buyin HSTD	Provides the total number of times in which use of the Extra Ball Buyin Feature resulted from beating the High-Score-To-Date (HSTD).
Au. 42	Left Drains	Provides the number of times the ball drained out the left drain.
Au. 43	Center Drains	Provides the number of times the ball drained out the center drain.
Au. 44	Right Drains	Provides the number of times the ball drained out the right drain.
Au. 45	Total Slam Tilts	Provides the number of times the Slam Tilt switch was activated.
Au. 46	Total Balls Saved	Provides the total number of times the Total Balls Saved Feature was used. This feature is enabled at the start of each ball and is disabled as soon as the ball makes contact with 5 game switches or allocated time expired.

BAYWATCH AUDITS (47-85)

Au.#	Audit Name	Audit Definition
Au. 47	Total Left Outside Ramp Shots	Provides the total number of times the Left Outside Ramp was scored.
Au. 48	Top Left Inside Ramps	Provides the total number of times the Top Left Inside Ramp was scored.
Au. 49	VUK Shots	Provides the total number of times the VUK was scored.
Au. 50	Side Ramps Completed	Provides the total number of times the Side Ramp was completed.
Au. 51	Right Ramps Completed	Provides the total number of times the Right Ramp was completed.
Au. 52	Total Spinner Shots	Provides the total number of times the Spinner was scored.
Au. 53	Total Orbit Shots	Provides the total number of times the Orbit was completed.
Au. 54	Total Shark Scoops	Provides the total number of times the Shark Scoop was scored.
Au. 55	3-Bank Drops Completed	Provides the total number of times the drops were completed.
Au. 56	SHARK Completed	Provides the total number of times the SHARK Stand-Up targets were completed.
Au. 57	Mystery Lit	Provides the total number of times the Mystery Feature was lit.
Au. 58	Laser Kick Used	Provides the total number of times the Laser Kick was scored.
Au. 59	Laser Kick Relit	Provides the total number of times the Laser Kick Feature was lit.
Au. 60	Locks Lit	Provides the total number of times the the Lock Feature was lit.
Au. 61	Lock 1 Completed	Provides the total number of times Lock 1 was completed.
Au. 62	Lock 2 Completed	Provides the total number of times Lock 2 was completed.
Au. 63	Multiball Ready	Provides the total number of times the Multiball Feature was ready.
Au. 64	Multiball Started	Provides the total number of times the Multiball Feature was started.

BAYWATCH AUDITS (47-85) CONTINUED

Au.#	Audit Name	Audit Definition
Au. 65	Multiball Restart Lit	Provides the total number of times the Multiball Restart Feature was lit.
Au. 66	Multiball Restart Made	Provides the total number of times the Mutiball Restart Feature was collected.
Au. 67	Jackpots Made	Provides the total number of times Jackpots were scored.
Au. 68	Total Double Jackpots	Provides the total number of times Double Jackpots were scored.
Au. 69	Shark Jackpots	Provides the total number of times Shark Jackpots were scored.
Au. 70	Super Jackpots	Provides the total number of times Super Jackpots were scored.
Au. 71	Guard Millions Started	Provides the total number of times the Guard Millions Feature was started.
Au. 72	Tourist Season Started	Provides the total number of times the Tourist Season Feature was started.
Au. 73	CPR Started	Provides the total number of times the CPR Feature was started.
Au. 74	Copter Rescure Started	Provides the total number of times the CPR Feature was started.
Au. 75	Diver Trapped Started	Provides the total number of times the Diver Trapped Feature was started.
Au. 76	Shark Cove Started	Provides the total number of times the Shark Cove Feature was started.
Au. 77	Tidal Wave Started	Provides the total number of times the Tidal Wave Feature was started.
Au. 78	Earthquake Started	Provides the total number of times the Earthquake Feature was started.
Au. 79	Mystery Scored	Provides the total number of times the Mystery Feature was collected.
Au. 80	Shark Flip Attempts	Provides the total number of times the Shark Flip Feature was attempted.
Au. 81	Shark Awards	Provides the total number of times the Shark Feature was collected.
Au. 82	IRONMAN Completed	Provides the total number of times the IRONMAN Feature was collected.
Au. 83	Video Completed	Provides the total number of times the Video Feature was completed.
Au. 84	Skill Shots Made	Provides the total number of times the Skill Shot was collected.
Au. 85	3 Skill Shots Made	Provides the total number of times the 3-Skill Shots were collected.



Game Adjustment Table

SEGA ADJUSTMENTS (1-43)			SEGA ADJUSTMENTS (1-43) CONT.		
Nº	Description	Factory Setting	Nº	Description	Factory Setting
1	REPLAYS: FIXED/MANUAL	10%	33	MINIMUM GAME TIME	0:00
2	REPLAY LEVELS †	1	34	BUYIN TYPE	XBall
3	REPLAY AWARD	Credit	35	EXTRA BALL BUYIN COUNT	1
4	FREE GAME LIMIT	5	36	GAME RESTART	Yes
5	EXTRA BALL LIMIT	3	37	EXTRA BALL PERCENTAGE	25%
6	GAME DIFFICULTY †	Mod.	38	BILL VALIDATOR	No
7	GAME PRICING †	USA 7	39	TOURNAMENT MODE	Off
8	RESET COIN AUDITS	No	40	EXTERNAL REPLAY KNOCKER	Off
9	RESET GAME AUDITS	No	41	SPECIAL MEMORY	Yes
10	RESTORE HIGH SCORES	No	42	LOCATION ID	0
11	MATCH PERCENTAGE	09%	43	GAME ID	0
12	BALLS PER GAME	3	BAYWATCH ADJUSTMENTS (44-52)		
13	TILT WARNINGS	1			
14	REPLAY BOOST	Yes	Nº	Description	Factory Setting
15	CREDIT LIMIT	30	44	LASER KICK CRITERION	Mod.
16	ALLOW HIGH SCORES	Yes	45	MBALL RESTART CRITERION	Mod.
17	AWARD FOR HIGH SCORE #1	3	46	EXTRA BALL MEMORY	Yes
18	AWARD FOR HIGH SCORE #2	1	47	LOCK QUALIFY CRITERION	Mod.
19	AWARD FOR HIGH SCORE #3	0	48	LOCK QUALIFY TIMER	45
20	AWARD FOR HIGH SCORE #4	0	49	MODE START CRITERION	Easy
21	DEFAULT HIGH SCORE #1	2.4M	50	SHARK FLIPPER CONTROL	2
22	DEFAULT HIGH SCORE #2	2.1M	51	RETURNS OPEN TRAPDOOR	No
23	DEFAULT HIGH SCORE #3	1.95M	52	MODESTY FEATURE	No
24	DEFAULT HIGH SCORE #4	1.8M	PRINTER ADJUSTMENTS (53-55)		
25	DEFAULT HIGH SCORE #5	1.65M			
26	DEFAULT HIGH SCORE #6	1.5M	Nº	Description	Factory Setting
27	HSTD RESET COUNT	700	53	QUIK: PRINTER INTERFACE	Press Start To Print
28	FREE PLAY	No	54	FULL: ALISON INTERFACE	Press Start To Print
29	CUSTOM MESSAGE	Enable	55	RESET: RESET PRINTER?	No
30	ATTRACT MODE MUSIC	On	RESET OPTIONS (Formerly Adj. 99)		
31	FLASH LAMP POWER	Normal			
32	COIL PULSE POWER	Normal	Description		
			FACTORY RESET		
			RESET COIN AUDITS		
			RESET ALL AUDITS		

SEGA ADJUSTMENTS CONTINUED NEXT COLUMN.

† Some settings result in Drop-Down Tables. Review the following pages which define all of the above adjustments.

GAME ADJUSTMENTS

General

There are 55 adjustable functions provided to vary difficulty of play and to periodically reset audits and the high score levels. The various game adjustments are summarized in the **Game Adjustments Table** and, when accessed, are shown on the player score display. The *Adjustment Number* is shown in the top of the display, the *Description* is shown next, and the setting, in the bottom of the display. Access and control is provided from switches located on the inside of the coin door.

With the **FORWARD / REVERSE** switch in the **FORWARD** (up) position, depressing the **STEP** switch advances through the game adjustments one at a time. With it in the **REVERSE** (down) position, the **STEP** switch selects lower-numbered adjustments. To rapidly scroll through adjustments, hold the **STEP** switch depressed. Adjustment values are changed by operating the **GAME START** push-button. The **FORWARD / REVERSE** switch setting determines whether the values are increased or decreased. (With the **FORWARD / REVERSE** switch up, the value increases, with it down, the value decreases). When the **STEP** switch is depressed the display indicates **REQUEST INSTALLED**.

Replay & Generic Features

Replays may be adjusted either for fixed levels or for a system-adjusted manual percentage of replay awards. Four levels may be selected. Adjustments allow awarding of a credit or an extra ball as each level is exceeded. With the manual percentage feature, if the actual replay percentage is higher or lower than that desired, the game computes new recommended manual percentage score(s). When the coin door is subsequently opened the player displays indicate the recommended level and a sound is made to alert the operator of a potential change. This new level is entered into adjustments simply by pressing the game start push-button. (If the coin door is closed or you enter audits/adjustments or diagnostics, the replay level is not changed.)

THE OPERATION OF THIS SECTION WILL CHANGE TO AN ICON MENUING SYSTEM. REFERENCE NEW DIAGNOSTICS MENUING SYSTEM INSTRUCTIONS FOR DETAILS OF NEW ACCESS TO AUDITS AND ADJUSTMENTS (AS WELL AS GAME DIAGNOSTICS, PRINTING OPTIONS, ETC.)

SEGA ADJUSTMENTS (1-43)

Adj.#	Adjustment Name	Adjustment Definition
Adj. 1	Replays: Fixed/Manual	Adjust for percentage of awards for Replay Levels (1% through 50%). Lower the automatic value to 0% and the display will indicate Fixed.
Adj. 2	Replay Levels	Adjust the number of replay levels to be active (1 to 4). Any additional starting replay levels are automatically set to values higher than Replay 1. Adjust Replay 1 level to between 100M and 9.99M. (Same as Start Replay). If Adj. 3 is set for 2, 3, or 4, adjust Replay 2, 3, or 4 (respectively) level to between 100M & 9.99M.
Adj. 3	Replay Award	Set for replays to award: CREDIT, EXTRA BALL, NONE or SPECIAL (When score threshold is achieved, a Playfield Special is lit.)
Adj. 4	Free Game Limit	Adjust the max. # of free games that may be accumulated per game; 0 - 9 .
Adj. 5	Extra Ball Limit	Adjust the max. # of extra balls that may be accumulated per game; 1- 9 or OFF .
Adj. 6	Game Difficulty	This adjustment is explained in detail on page 24.
Adj. 7	Game Pricing	This adjustment is explained in detail on pages 25 & 26.

Adj. 6 Game Difficulty Explained

Any one of five INSTALL settings for this adjustment may be activated to automatically select settings for multiple adjustments affecting game difficulty. Use the Start button to choose the difficulty level you require and press the step button to activate the setting. After activation, the individual adjustments may be readjusted if desired. Refer to Install Adjustment Table for details.

Set to **EXTRA EASY, EASY, FACTORY, HARD** or **EXTRA HARD**.

(Note: Additional game features are not adjustable in by the Expanded Adjustments may also change using this setting.)

Install Adjustments	Adj. 6 Extra Easy	Adj. 6 Easy	Adj. 6 Moderate	Adj. 6 Hard	Adj. 6 Extra Hard
(44) Laser Kick Crit.	MODERATE	MODERATE	MODERATE	HARD	EXTRA HARD
(45) Mball Restart Crit.	EXTRA EASY	EASY	EASY	HARD	EXTRA HARD
(46) Extra Ball Memory	YES	YES	YES	YES	NO
(47) Lock Qualify Crit.	EXTRA EASY	EASY	EASY	HARD	EXTRA HARD
(48) Lock Qualify Timer	45	40	35	30	25
(49) Mode Start Crit.	EXTRA EASY	EASY	EASY	HARD	EXTRA HARD

Play Rules: Novelty & 5-Ball, plus Add-A-Ball Settings

The following three combinations are recommended for situations where local laws restrict certain game features regarding the use of replays or the number of balls per game:

Novelty Play Rules - Set to establish recommended settings for no free play or extra balls:

Adj.	Adj. Name	Setting	Adj.	Adj. Name	Setting
1	Replays: Fixed/Manual	Fixed	5	Extra Ball Limit	00
2	Replay Levels	None	11	Match Percentage	Off
3	Replay Award	None	17	Award for High Score #1	3
4	Free Game Limit	00	18	Award for High Score #2	1

5-Ball Play Rules - Set to establish recommended settings for 5-ball play:

Adj.	Adj. Name	Setting	Adj.	Adj. Name	Setting
1	Replays: Fixed/Manual	07%	5	Extra Ball Limit	3
2	Replay Levels	1	11	Match Percentage	4
3	Replay Award	Credit	12	Balls Per Game	5
4	Free Game Limit	5	17	Award for High Score #1	3
			18	Award for High Score #2	1

Add-A-Ball Settings-To disable awarding of credits and provide awards with an extra ball:

Adj.	Adj. Name	Setting	Adj.	Adj. Name	Setting
3	Replay Award	Extra Ball	16	Allow High Scores	No
4	Free Game Limit	00	17-20	Award for High Score #1 - #4	00
11	Match Percentage	Off			

Adj. 39 Tournament Mode Settings Explained

Tournament Mode determines the default conditions to quickly prepare a game for tournament play. When this setting is changed all audits will be reset and all adjustments will be initiated to the particular style selected. The game will then return to game over attract mode, as if a Factory Restore had been performed. **NONE** - Same as a Factory Reset conditions. **IFPA**-Straight 50¢ play, no replay, no Extra Ball, no High Scores, 2 Tilt Warnings and No Match. **PINBALL EXPO-PAPA**- Same as **IFPA** settings except Free Play is enabled. **HOME**-Sets game for Free Play, extra ball play, no replay, 10% Match & Extra Ball percent 30%.

Adj. 7 Game Pricing Explained

There are two methods available for coin switch programming; Standard and Custom. Standard pricing uses a single adjustment (Adj. 7) to select a pricing scheme shown in the **Custom & Standard Pricing Tables**. Custom pricing is used to select additional pricing schemes defined by a Drop Down Menu.

With Adj. 7 set to **CUSTOM** operating the step button again initiates a drop down menu representing coin switch pulses for the left, right, center and fourth coin slots. The prescribed the number of pulses are required for one credit. For example, if *Left Coin Pulses*, was set to 02 and *Coin Switch Pulses Required for 1 Credit*, to 01 a coin in the left slot would produce two credits. Further, if *Left Coin Pulses*, was set to 01 and *Coin Switch Pulses Required for 1 Credit*, to 02, two coins in the left slot would be required for one credit.

Coin Switch Pulses Required for Bonus Credit may be set to post bonus credits when a minimum amount of coins are inserted at one time. For example, if *Left Coin Pulses* was set to 01, *Coin Switch Pulses Required for 1 Credit* to 01 and *Coin Switch Pulses Required for Bonus Credit* to 04, one credit would be posted for each of the first three coins in the left slot and two credits for the fourth coin.

Standard/Custom Pricing - Set for the desired pricing scheme from the Standard Pricing Table as indicated on the dot matrix display. For Custom Pricing, set to **CUSTOM**. When set to CUSTOM, the following adjustments are utilized to tailor each individual coin chute.

Left Coin Switch Pulses - Set the number of pulses registered for closure of the left coin switch; 00 to 99.

Right Coin Switch Pulses - Set the number of pulses registered for closure of the right coin switch; 00 to 99.

Center Coin Switch Pulses - Set the number of pulses registered for closure of the center coin switch; 00 to 99.

4th Coin Switch Pulses - Set the number of pulses registered for closure of the fourth coin switch; 00 to 99.

Coin Switch Pulses Required for 1 Credit - Set the number of coin switch pulses required to post one credit; 00 to 99.

Coin Switch Pulses Required for Bonus Credit - Set the number of coin switch pulses required to award the 1st bonus credit(s); 00 to 99.

Coin Switch Pulses Required for 2nd Bonus Credit - Set the number of coin switch pulses required to award the 2nd bonus credit; 00 to 99.

Credits awarded for 1st Bonus - Set the number of credits awarded for achieving the first Bonus level; 00 to 99.

Custom Pricing Table

Coin Mechs				Plays/Coins	Adjustments								
Left	Right	Center	4th		Left Pulses	Right Pulses	Mid Pulses	4th Pulses	Pulses /Credit	Pulses /Bonus	Pulses /2nd BONUS	Credit /1st BONUS	
25¢	25¢	\$1.00	N/U	1/25¢ 3/50¢	01	01	04	00	01	02	00	01	
				1/25¢ 5/\$1.00	01	01	04	00	01	04	00	01	
				1/25¢ 6/\$1.00	05	05	20	00	04	20	00	01	
5SCH	10SCH	10SCH	N/U	1/10 S	01	02	02	00	02	00	00	00	
				1/10 S 4/30 S	04	08	08	00	06	00	00	00	
10p	£1	50p	20p	1/30p 2/50p 5/£1	01	15	06	02	03	00	00	00	
				1/50p 3/£1	01	15	05	02	05	00	00	00	
				1/30p 4/£1	01	12	05	02	03	00	00	00	
20¢	\$1.00	N/U	N/U	1/60¢ 2/\$1.00	01	05	00	00	03	05	00	01	

Standard Pricing Table

on the next page

Standard Pricing Table

Adj. & Standard Pricing Select	Coin Mechanisms				Pricing Scheme Explained			
	Left	Center	Right	Right	Number of "Plays" for Price Amount Shown			
	1st	2nd	3rd	4th				
USA 1	25¢	\$1	25¢		1/25¢			
USA 2	25¢	\$1	25¢		1/50¢	2/75¢	3/\$1	
USA 3	25¢	\$1	25¢		1/50¢			
USA 4	25¢		25¢		1/50¢			
USA 5	25¢	\$1	25¢		1/50¢	5/\$2		
USA 6	25¢	\$1	25¢		1/50¢	2" 4X25¢"	3/\$1 (bill)	Used to promote Bill Validator
USA 7 ★	25¢	\$1	25¢		1/50¢	4/\$1.50	6/\$2	
Austria	5S	10S	10S		1/10S	2/15S	3/20S	
Australia	20¢	\$A 1	\$A 2		1/\$A 1	3/\$A 2		
Australia 2	20¢	\$1	\$2		1/\$1	2/\$2		
Belgium	5 BF	20 BF	50 BF		1/20 BF	3/50 BF		
Canada	25¢	25¢	Can\$ 1		1/50¢	2/75¢	3/Can\$ 1	
Denmark 1	1DKr	5 DKr	10 DKr	20 DKr	1/3 DKr	2/5 DKr		
Denmark 2	1DKr	5 DKr	10 DKr	20 DKr	1/2 DKr	3/5 DKr	7/10 DKr	
Finland	1Fmk	5Fmk			1/3Fmk	2/5Fmk		
France 1 ★	1 Fr	5 Fr	10 Fr	20 Fr	1/3 Fr	2/5 Fr	5/10 Fr	11/20 Fr
France 2	1 Fr	5 Fr	10 Fr	20 Fr	1/5 Fr	3/10 Fr	7/20 Fr	
France 3	1 Fr	5 Fr	10 Fr	20 Fr	1/3 Fr	2/5 Fr	4/10 Fr	9/20 Fr
Germany 1	1DM	2DM	5DM		1/1 DM	5/5DM		
Germany 2	1DM	2DM	5DM		1/1DM	6/5DM		
Germany 3 ★ †	1DM	2DM	5DM		1/2DM	2/3DM	3/4DM6	6/6DM
Greece	50Dr		100Dr		1/50Dr	3/100Dr		
Holland (See Netherlands 2)								
Hungary	10 Ft	10 Ft	20 Ft		1/20 Ft	3/40 Ft		
Italy 1	500 Lit		500 Lit		1/500 Lit			
Italy 2	500 Lit		500 Lit		1/1000 Lit	3/2000 Lit		
Japan			100¥		1/100¥	3/200¥		
Korea	100Won		100Won		1/100Won			
Netherlands 1	1 Fls.	1 Fls.	2.5 Fls.		1/1Fls.	3/2.5 Fls.		
Netherlands 2 ★	1 Fls.	2.5 Fls.	5 Fls.		1/1Fls.	3/2.5 Fls.	6/5 Fls.	
New Zealand 1	\$NZ 1		\$NZ 2		1/\$NZ 1	2/\$NZ 2		
New Zealand 2	\$NZ 1		\$NZ 2		1/\$NZ 1	3/\$NZ 2		
Norway 1 †	5 NKr	10 NKr	20 NKr		1/5 NKr	2/10 NKr	4/20 NKr	
Norway 2 †	5 NKr	10 NKr	20 NKr		1/10 NKr	3/20 NKr		
Spain	100Pts		500Pts		1/100Pts	6/500Pts		
Sweden	1 SKr	5 SKr	10 SKr		1/10 SKr	2/15 SKr	3/20 SKr	
Switzerland 1 ★	1 SwF	2 SwF	5 SwF		1/1 SwF	6/5 SwF		
Switzerland 2	1 SwF	2 SwF	5 SwF		1/1 SwF	3/2 SwF	9/5 SwF	
UK 1	10p	50p	1£	20p	1/50p	3/1£		
UK 2	10p	50p	1£	20p	1/40p	3/1£		
UK 3 ★	10p	50p	1£	20p	1/50p			
Yugoslavia	5 Din		5 Din		1/5 Din			

★ Default Factory Setting. † New Settings.

SEGA ADJUSTMENTS (1-43) CONTINUED

Adj.#	Adjustment Name	Adjustment Definition
Adj. 8	Reset Coin Audits	When enabled (set to YES) all coin / paid credit totals will be reset to zero when STEP is depressed.
Adj. 9	Reset Game Audit	When enabled (set to YES) all audit totals except for Au. 1, Total Paid Credits, Au. 5-8, Coins thru ... Slot, Au. 9, Total Coins, Au. 10, Total Earnings, & Au. 11, Meter Clicks, will be reset to zero when STEP is depressed.
Adj. 10	Restore High Scores	When enabled (set to YES) the High Score Levels and associated initials will be restored to backup settings when STEP is depressed .
Adj. 11	Match Percentage	Set Match percent from 00% to 10% or OFF . At 00% the match display occurs at the end of the game but never awards a credit.
Adj. 12	Balls Per Game	Adjust the number of balls per game; 2 to 5 .
Adj. 13	Tilt Warnings	Adjust the number of plumb bob tilt switch closures before the ball in play is tilted; 1 , 2 , 3 or OFF .
Adj. 14	Replay Boost	Set to YES or NO . When set to YES , exceeding a replay will set a temporary replay level for each time a replay level is surpassed. This new level will equal the previous replay level (when the replay was awarded) plus 50 Million for each following game, until the replays have all been played. At this time the previous level is resumed.
Adj. 15	Credit Limit	Adjust the maximum number of credits that may be posted; 4 to 50 .
<p>Note: There are 4 of the 6 High Score Levels with associated player initials that are displayed during the attract mode. This provides a High-Score-To-Date feature. When players exceed these levels, the player initials may be entered to replace the previous ones. These levels may be adjusted to award credits and to be reset to backup values after a selected number of games.</p>		
Adj. 16	Allow High Scores	Set to enable or disable the four high score levels; 00 .
Adj. 17	Award for High Score #1	Adjust the number of awards (0 to 4) awarded for exceeding level 1 (the highest of the four levels).
Adj. 18	Award for High Score #2	Adjust the number of awards (0 to 3) awarded for exceeding level 2.
Adj. 19	Award for High Score #3	Adjust the number of awards (0 to 2) awarded for exceeding level 3.
Adj. 20	Award for High Score #4	Adjust the number of awards (0 to 1) awarded for exceeding level 4.
Adj. 21	Default High Score - 26 #1 - #6	Adjust the score level to which the world record, (level 1) (the highest of the four levels) may be altered. This adjustment is not affected by Adj. 28, <i>Reset High Score To Date</i> . Adjust the backup score to which levels 2 - 6 may be reset, respectively.
Adj. 27	HSTD Reset Count	HSTD (High Score To Date) . Adjust the number of games between automatic resets of high score levels to backup settings and ball time averager adjustments; 100 to 900 or OFF (no reset or adjustment).
Adj. 28	Free Play	When set to YES , no coins are required for games.
Adj. 29	Custom Message	When desired, this function is used to establish a custom message periodically displayed during the attract mode. Set the feature to CHANGE using the Credit button and depress STEP . The letter A is indicated in the first position in the display. Vary the letter by operating the left and right flippers. With the desired letter indicated, depress the START Button to lock in the letter and advance to the next character. Repeat this procedure until the desired message is completed in the display. Press the STEP push-button switch to advance to the next adjustment.

SEGA ADJUSTMENTS (1-43) CONTINUED

Adj.#	Adjustment Name	Adjustment Definition
Adj. 30	Attract Mode Music	Set to ON or OFF . When set to ON , Attraction Music is played between games.
Adj. 31	Flash Lamp Power	Set to NORMAL , DIM or OFF . When set to NORMAL the Flash Lamps are active, when DIM the Flash Lamps impulse power is reduced by 25% and when OFF the Flash Lamps do not flash.
Adj. 32	Coil Pulse Power	Set to NORMAL , HARD or SOFT . When HARD the coil pulse power is increased by 12.5% of the normal pulse rate. When set to SOFT the coil pulse power is reduced by 12.5% of the normal pulse rate. These adjustments are provided to compensate for Low Line or High Line voltage conditions where the solenoids appear to kicking too weak or too hard.
Adj. 33	Minimum Game Time	Default is 0:00 . Set between 0:00 - 8:59 for minimum game time. If the last ball in play drains prior to what the game time is set for, another ball will be served into the shooter lane and normal play will continue. Subsequent balls will continue to do be served into the shooter lane if the last ball still drains prior to and up until minimum game time is satisfied.
Adj. 34	Buyin Type	Set to Extra-Ball Buyin . When set to EB Buyin , the game is set to Extra Ball Buyin. When set to Feature Buyin , the game is set to Game Buyin. Set to OFF to make Buyin Type inoperative.
Adj. 35	Extra Ball Buyin Count	1, 0 or UNLIMITED . Default is 1 . Allows the operator to adjust the number of Extra Ball (EB) Buyins allowed after normal game play. See page 5 Extra Ball (EB) Buyin Feature.
Adj. 36	Game Restart	Set to YES or NO . When set to YES , a new game may be started during any ball after the first ball is completed. (Note-Pressing start during the first ball will add additional players.) When set to NO , the game disables the start button after the first ball until the final ball is in play.
Adj. 37	Extra Ball Percentage	Set from 0 to 50 . Allows the operator to adjust how frequently the Extra Ball feature is made available to the player.
Adj. 38	Bill Validator	Set to YES or NO . When set to YES , the display, in game attract mode, will show an " <i>Insert Bill Animation</i> ". When set to NO , the display, in game attract mode will show " <i>Insert Coin Animation</i> ".
Adj. 39	Tournament Mode	Set to NONE , PINBALL EXPO , IFPA-PAPA or HOME . Tournament Mode determines the default conditions to quickly prepare a game for tournament play. When this setting is changed all audits will be reset and all adjustments will be initiated to the particular style selected. The game will then return to game over attract mode, as if a Factory Restore had been performed. NONE - Same as a Factory Reset conditions. IFPA -Straight 50¢ play, no replay, no Extra Ball, no High Scores, 2 Tilt Warnings and No Match. PINBALL EXPO-PAPA - Same as IFPA settings except Free Play is enabled. HOME -Sets game for Free Play, extra ball play, no replay, 10% Match & Extra Ball percent 30% .
Adj. 40	External Replay Kicker	Set to ON or OFF . When set to ON , the operator can enable the kicker in the cabinet to drive an external device without the game giving a replay.

SEGA ADJUSTMENTS (1-43) CONTINUED

Adj.#	Adjustment Name	Adjustment Definition
Adj. 41	Special Memory	Set to YES or NO . When set to YES , the lit 'Special' light will be retained in memory from ball to ball for the same player. When set to NO , the lit 'Special' light will go out at the end of each ball.
Adj. 42	Location ID	0 to 9999. Allows the operator to assign a location or game identification (respectively) number to the audit print-out sheet. (Will not be affected by Factory Restore.)
Adj. 43	& Game ID	

BAYWATCH ADJUSTMENTS (44-52)(GAME SPECIFIC)

Adj.#	Adjustment Name	Adjustment Definition
Adj. 44	Laser Kick Criterion	Set to MODERATE , HARD or EXHARD . Default is MODERATE . When set to MODERATE , the Laser Kick is ON at the beginning of each new ball. Set to HARD , the Laser Kick (whether in active mode or not) carries over from the last ball in play. Set to EXHARD , the Laser Kick is OFF at the beginning of each ball.
Adj. 45	Mball Restart Criterion	Set to EXEASY , EASY , MODERATE , HARD or EXHARD . Default is EASY . Determines how Multiball can restart.
Adj. 46	Extra Ball Memory	Set to YES or NO . When set to YES , the lit 'Extra Ball' light will be retained in memory from ball to ball for the same player. When set to NO , the lit 'Extra Ball' light will go out at the end of each ball.
Adj. 47	Lock Qualify Criterion	Set to EXEASY , EASY , MODERATE , HARD or EXHARD . Default is MODERATE . Determines how Lock Qualify can restart.
Adj. 48	Lock Qualify Timer	Set to EXEASY , EASY , MODERATE , HARD or EXHARD . Default is MODERATE . Determines how Lock Qualify Timer can restart.
Adj. 49	Mode Start Criterion	Set to EXEASY , EASY , MODERATE , HARD or EXHARD . Default is EASY . Determines how many shots it takes to start a Vertical or Horizontal Mode. EXEASY=3; EASY=4; MODERATE=4; HARD=5; EXHARD=6;
Adj. 50	Shark Flipper Control	Set to 0 to 99. Default is 2. Determines how the Upper Right Shark Fin Flipper energizes after Sw. #54 is closed to hit the ball correctly into the scoop. See coil test after Laser Kick Test.
Adj. 51	Returns Open Trapdoor	Set to YES or NO . Default is NO . When set to NO , the trapdoor will not re-open during Multiball.
Adj. 52	Modesty Feature	Set to YES or NO . Default is NO . When set to NO , video display is more revealing. Set to YES for video display to be "not so revealing."

More Adjustments are continued on the next page.

PRINTER ADJUSTMENTS (53-55)

Adj.#	Adjustment Name	Adjustment Definition
Adj. 53	'Quik': Printer Interface	Allows the operator to print by pressing the Start Button.
Adj. 54	Full: ALISON Interface	Allows the operator to down load to a lap top and process the information. Special equipment is needed.
Adj. 55	Reset: Reset Printer?	Provides the operator with the ability to reset the printer option.

RESET OPTIONS (Formerly Adj. 99)

Adjustment Name	Adjustment Definition
Factory Restore	Allows the operator to reset all adjustments to the factory settings.
Reset All Audits	Allows the operator to reset all audits to the factory settings.
Reset Coin Audits	Allows the operator to reset all Coin Audits to the factory settings.

GAME DIAGNOSTICS

Please note: If the Display Reads "**OPEN THE DOOR**," this indicates a faulty memory condition in RAM. Opening the Coin Door will initiate a Factory Restore, by opening the Memory Protect Switch. Check battery voltage at CMOS RAM with power off.

The Sega Pinball system provides tests for sounds, digital displays, lamps, switches, and solenoids. Each feature may be tested manually or automatically using the **STEP** and **FORWARD/REVERSE** push-button switches inside the coin door and the white "Clear Ticket" button located next to the Diagnostic Switches. The automatic tests may be used for a quick verification of automatic test functions and the manual tests, for troubleshooting.

During game play, activation of switches and operation of coils with associated switches are monitored. If a switch is not made for 50 games it is considered faulty. When operation of a coil should close or open a switch and does not, the coil is considered faulty. In Game Over Attract Mode, faulty switches and coils (if any) are reported (See Tech Alert description below). Note that reporting of an unused switch does not constitute a problem and that a bad coil could mean that the associated switch requires adjustment.

Wiring to switches, solenoids and controlled lamps uses color-coded wires that basically follows a resistor color-code scheme for the eight rows and eight columns. During the switch tests and during the discrete lamp test, identification of the color of the row and column wires are indicated in the Dot Matrix Display. For example, making the right coin switch during the Switch Test results in the switch functional name (RIGHT COIN), the row (WHT-YEL) and column (GRN-BRN) wire color codes, and the switch number are shown in the display.

Entering Diagnostics

With the game in the game-over mode, open the coin door and make sure that the **FORWARD/REVERSE** push-button switch is set to **REVERSE** (down) and depress the **STEP** push-button switch. The Player displays will show the toll-free Customer Service number 1-800-KICKERS, that is 1-800-542-5377 (U.S. including Illinois) and the toll number (708) 345-7700 (Outside the United States). This indicates entry into game diagnostics.

Service Credits

With the phone number displayed depress the **STEP** push-button switch. The game now gives the technician the option of adding 1 to 5 service credits. These credits allow the technician to test-play the game without adding any counts to the coin audits (Au. 01 & Au. 05 - 08). When the message appears, press and hold the Game Start pushbutton until the desired number of credits are shown on the display. Then press the step button again to add these credits to the game and enter Tech Alert. If no Service Credits are desired, press the step button with the initial message displayed.

Tech Alert

The display will now indicate if there are any faulty switches (i.e., Switches that are normally closed but remain open or open switches that have not been closed (activated) in 50 games.

Easy Trough Clear

Pressing the step button again displays the **EASY TROUGH CLEAR** message and instructs the technician to operate either flipper button to easily remove the balls from the trough. This is provided to allow the technician a simple method of removing the balls from the trough prior to entering the Active Switch Test , thereby reducing the number of switches closed. Also, to test functionality of trough, ensure proper trough operation.

Burn-In Minutes

Pressing the step button while in Tech Alert mode will step game into Burn-in Mode (factory use). At this stage pressing the game start button will cause the game to exercise all CPU I/O Functions. This is provided to constantly exercise sounds, solenoids, etc...

To stop the test press the start button again. Cumulative Burn-In minutes will be displayed. To reset Burn-In minutes to 00, you must perform an Audit Reset (Adj. 10) or a Factory Restore (Adj. 99).

Sound Tests

The Data East Pinball sound system produces true digital stereo sound on left and right speakers and mono on a center speaker. During Sound tests, the display shows the sound board circuit under test and the corresponding sounds are selected by operating the left and right flipper buttons to choose the circuit to be tested. Now press the start button to initiate the sound. Refer to the Sound Test Chart for the sound circuits displayed and the sounds produced.

The sound functions allow verification that all channels are functioning properly and that the speaker connections are correct. Speaker Phase Testing Procedures follow for checking speaker connections.

Sound Test Chart

Auto/Manual Tests	Sounds Produced	Auto/Manual Tests	Sounds Produced
Left Speaker	LEFT SINE	Voice Rom2 (Loc U21)	SPEECH PATTERN 2
Both Lt & Rt Speakers	CENTER SINE	Voice Rom3 (Loc U36)	SPEECH PATTERN 3
Right Speaker	RIGHT SINE	Music Test (Sound Rom, Loc U7)	LEVEL 1-3 MUSIC
Voice Rom1 (Loc U17)	SPEECH PATTERN 1		

Speaker Phase Testing

Connections to each of the three speakers are polarized and each must be connected appropriately for the best quality sound. If one speaker has the positive and negative connections reversed with respect to the other two, bass frequencies will not be produced properly and the overall sound quality will be poor.

To test for proper speaker phasing, use the sound test to cycle through the Left, Center, and Right Sine functions. If the Center Sine produces more volume and bass than the Left and Right Sines, the speakers are connected properly. If it produces the same or less, one speaker is connected improperly. To isolate and correct reversed speaker connections, one of two methods may be used.

1. Check each speaker for polarity markings. If the speakers have polarity markings, verify that the single-color wire (BLK, YEL or RED) is connected to the negative (-) terminal.
2. Disconnect the speaker output connector from the Sound Board and connect a 1.5-volt battery across each speaker pair one at a time while observing the speakers. Make sure the positive battery terminal is connected to the positive lead (CN1- Pin 1, 3 or 6) each time. As the connection is made, check speaker cone movement; proper connections are indicated by outward movement.

Dot Matrix Display Explained

The display utilizes a Micro-Processor Control Board mounted in piggyback fashion to the Dot Matrix Display Driver Board. The purpose behind this board is to provide more information (192 X 64 Dots) to the operator as well as displaying graphics to the player.

The board is controlled by a 68000 Microprocessor and its personality ROMs (Unique to the Game). It receives Data, Reset & Clock Information from the CPU Board via the ribbon cable and sends back multiple Status and Busy Signals to the CPU. This is to insure synchronized communication between the CPU and the Display Controller Board.

The Drivers for the rows and columns are provided on 5 surface mounted integrated circuits on the Dot Matrix Display Driver Board.

Dot Matrix Display Test

To enter Dot Matrix Display Test, operate the STEP push-button switch after the Speaker Phase Test. The display will immediately illuminate one vertical column of dots, turning it off and illuminating the next column, until each column has been individually lit, while the other columns are off. It will make one pass. The display will then illuminate the top horizontal row of dots, and test by lighting the row of the display, then turning it off and illuminating the next row, until each row has been individually lit, while the other rows are off. The test will then illuminate all the dots in the display, except for one column. It will cycle this blank column from left to right for one pass. The display will then again illuminate all the dots except for the top row, and then turning it on and blanking the next row, until each row has been individually blanked, while the other rows are on. It will cycle this blank row for one pass. The next test begins with every other dot lit, in both the rows and columns. These dots then go out, and the unlit dots light, resulting in an alternating checkerboard pattern for approximately 4 seconds. An intensity test is also displayed at 30%, 70% & 100% brightness. The test will repeat these cycles indefinitely until advanced to the next test or until the power is removed. (Please Note: These tests may be interrupted at any time by operating the STEP push-button switch to advance to the next test.)

Laser Kick Test

This test is provided to insure proper interaction between certain switches and their associated solenoids without entering game play. For example, by rolling the ball over the left outlane switch, the Laser Kick should fire. If it kicks too early or too late, the switch actuator should be adjusted to compensate for this error. If it fails to fire, use the switch test or coil test to help determine the cause of the failure. (Note: During this function, similar tests may be performed on the Vertical Up Kickers or Ejects in the game.)

Shark Fin Flipper Flip: Test & Adjustment

Place a pinball on the playfield *above* the Wire Form Actuator of Switch #54 (Upper Right Shark Fin Flipper Rollover Switch). Release ball so that it actuates Switch #54 and rolls in front of the Upper Right Flipper. The flipper will energize and send the ball into the **Shark Super Scoop**. If the pinball misses the *Scoop*, adjust values accordingly using the **Left (-)** and **Right (+) Flipper Buttons**. Too high or rears to the right: **INCREASE VALUE**. Too low or rears to the left: **DECREASE VALUE**.

PLEASE NOTE: THIS VALUE CAN BE CHANGED WITH ADJUSTMENT 50, SHARK FLIPPER CONTROL.

SWITCH TESTS

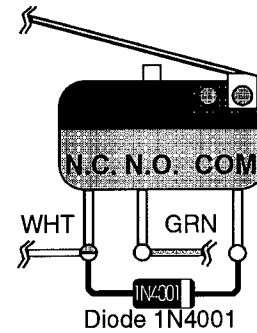
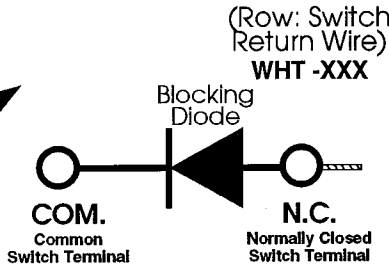
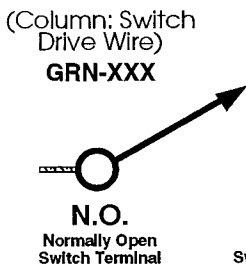
Switches are configured in an 8 x 8 matrix of columns (switch drives) and rows (switch returns) with up to 64 switches possible. The switch tests include two parts: Switch Test & Active Switches. Column and Row wire colors are indicated in each test using corresponding resistor color code numbers.

Switch Test

To initiate, push the STEP push-button switch, until the display indicates **SWITCH TEST**. Close each switch and observe the display. The display will indicate the switch name, column wire colors, row wire colors and the switch number. When a switch is released, the name and number disappear until another switch is closed or the test is exited.

Active Switches

Push the STEP push-button switch from the Switch Test. The display will indicate **ACTIVE SWITCHES**. If any switches are stuck closed (or made from the presence of a ball), the display sequences through switch names, and indicates the row and column wire colors, and the switch numbers are indicated in the display. This cycle continues until all switches are cleared or until the STEP push-button switch is depressed.



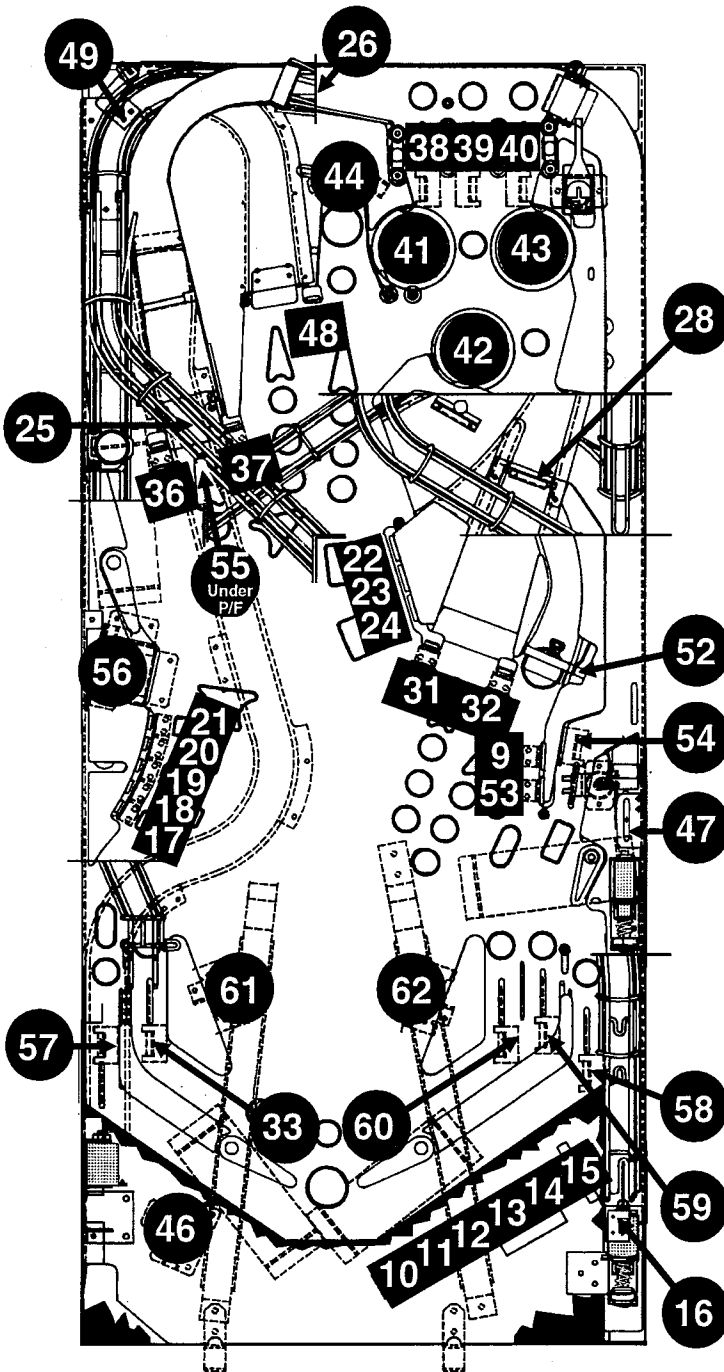
SWITCH MATRIX CHART

Column (Drive)	1 Q55 GRN-BRN CN8-1	2 Q54 GRN-RED CN8-2	3 Q53 GRN-ORG CN8-3	4 Q52 GRN-YEL CN8-4	5 Q51 GRN-BLK CN8-5	6 Q50 GRN-BLU CN8-7	7 Q49 GRN-VIO CN8-8	8 Q48 GRN-GRY CN8-9
1 WHT-BRN CN10-9	PLUMB BOB TILT 1	2-BANK STAND-UP (TOP) 9	5-BANK S-U (S)HARK (BOTTOM) 17	LEFT RAMP ENTER 25	LEFT RETURN LANE 33	LEFT TURBO BUMPER 41	CENTER RAMP EXIT 49	LEFT OUTLANE 57
2 WHT-RED CN10-8	4TH COIN SLOT 2	#1 BALL TROUGH (LEFT) 10	5-BANK S-U S(H)ARK (MIDDLE BOTTOM) 18	LEFT RAMP EXIT 26	NOT USED 34	BOTTOM TURBO BUMPER 42	BALL LAUNCH BUTTON 50	RIGHT OUTLANE 58
3 WHT-ORG CN10-7	START BUTTON 3	#2 BALL TROUGH 11	5-BANK S-U SH(A)RK (MIDDLE) 19	NOT USED 27	NOT USED 35	RIGHT TURBO BUMPER 43	NOT USED 51	RIGHT OUTER RETURN LANE 59
4 WHT-YEL CN10-6	RIGHT COIN SLOT 4	#3 BALL TROUGH 12	5-BANK S-U SHA(R)K (MIDDLE TOP) 20	RIGHT RAMP ENTER 28	LEFT RAMP STAND-UP (LEFT) 36	UPPER VUK 44	SPINNER 52	RIGHT INNER RETURN LANE 60
5 WHT-GRN CN10-5	CENTER COIN SLOT 5	#4 BALL TROUGH 13	5-BANK S-U SHAR(K) (TOP) 21	NOT USED 29	LEFT RAMP STAND-UP (RIGHT) 37	LEFT ORBIT ROLLOVER 45	2-BANK STAND-UP (BOTTOM) 53	LEFT SLINGSHOT 61
6 WHT-BLU CN10-3	LEFT COIN SLOT 6	#5 BALL TROUGH (RIGHT) 14	3-BANK DROPS (TOP) 22	RIGHT RAMP EXIT 30	TOP LANE ROLLOVER (LEFT) 38	LOWER SUPER VUK (UNDER ARCH) 46	UPPER RIGHT SHARK FIN FLIPPER 54	RIGHT SLINGSHOT 62
7 WHT-VIO CN10-2	SLAM TILT 7	5-BALL TROUGH VUK OPTO 15	3-BANK DROPS (MIDDLE) 23	RIGHT RAMP STAND-UP (LEFT) 31	TOP LANE ROLLOVER (MIDDLE) 39	UPPER BALL LAUNCH 47	UNDER PLAYFIELD RAMP ENTER 55	LT FLIPPER BUTTON VIA Q7, ON SSFB X2 63
8 WHT-GRY CN10-1	EXTRA BALL BUY-IN/ LEAGUE BUTTON 8	SHOOTER LANE 16	3-BANK DROPS (BOTTOM) 24	RIGHT RAMP STAND-UP (RIGHT) 32	TOP LANE ROLLOVER (RIGHT) 40	CENTER RAMP STAND-UP 48	SHARK SUPER SCOOP 56	RT FLIPPER BUTTON VIA Q5, ON SSFB X2 64

Switch Matrix Locations, Descriptions & Switch Part Numbers†

Switch Matrix No. & Description	Part No.
1* PLUMB BOB TILT (See Item 17, Cabinet Parts, Pg. 43)	
2* 4TH COIN SLOT (On Coin Door)	---
3* START BUTTON (Left of Coin Door)	500-5097-02
4* RIGHT COIN SLOT (On Coin Door)	180-5024-00
5* CENTER COIN SLOT (On Coin Door)	180-5024-00
6* LEFT COIN SLOT (On Coin Door)	180-5024-00
7* SLAM TILT	180-5022-00
8* EXTRA BALL BUY-IN/LEAGUE BUTTON	180-5073-00
9 2-BANK STAND-UP (TOP)	180-5133-00
10 #1 BALL TROUGH (LEFT)	180-5119-00
11 #2 BALL TROUGH	180-5119-00

Switch Matrix No. & Description	Part No.
12 #3 BALL TROUGH	180-5119-00
13 #4 BALL TROUGH	180-5119-00
14 #5 BALL TROUGH (RIGHT)	180-5119-00
15 5-BALL TROUGH VUK OPTO (TRANS) (REC)	520-5124-00 520-5125-00
16 SHOOTER LANE (Diode Loc. Terminal Strip)	500-5707-00
17 5-BANK STAND-UP (S)HARK (BOTTOM)	180-5132-00
18 5-BANK STAND-UP S(H)ARK	180-5132-00
19 5-BANK STAND-UP SH(A)RK	180-5132-00
20 5-BANK STAND-UP SHA(R)K	180-5132-00
21 5-BANK STAND-UP SHAR(K) (TOP)	180-5132-00
22 3-BANK DROPS (TOP)	180-5104-00
23 3-BANK DROPS (MIDDLE)	180-5104-00
24 3-BANK DROPS (BOTTOM)	180-5104-00
25 LEFT RAMP ENTER	180-5090-00
26 LEFT RAMP EXIT	180-5057-00
27 NOT USED	---
28 RIGHT RAMP ENTER	180-5090-00
29 NOT USED	---
30 RIGHT RAMP EXIT (Not Shown)	180-5051-00
31 RIGHT RAMP STAND-UP (LEFT)	180-5132-00
32 RIGHT RAMP STAND-UP (RIGHT)	180-5132-00
33 LEFT RETURN LANE	500-5706-00
34 NOT USED	---
35 NOT USED	---
36 LEFT RAMP STAND-UP (LEFT)	180-5132-00
37 LEFT RAMP STAND-UP (RIGHT)	180-5132-00
38 TOP LANE ROLLOVER (LEFT)	500-5706-00
39 TOP LANE ROLLOVER (MIDDLE)	500-5707-00
40 TOP LANE ROLLOVER (RIGHT)	500-5707-00
41 LEFT TURBO BUMPER	180-5015-02
42 BOTTOM TURBO BUMPER	180-5015-02
43 RIGHT TURBO BUMPER	180-5015-02
44 UPPER VUK (Vertical Up-Kicker)	180-5116-00
45* LEFT ORBIT ROLLOVER (Under "49")	500-5707-00
46 LOWER SUPER VUK (UNDER ARCH)	180-5116-00
47 UPPER BALL LAUNCH	500-5706-00
48 CENTER RAMP STAND-UP	180-5132-00
49 CENTER RAMP EXIT	180-5051-00
50* BALL LAUNCH BUTTON	500-5973-00
51 NOT USED	---
52 SPINNER	180-5010-04
53 2-BANK STAND-UP (BOTTOM)	180-5133-00
54 UPPER RIGHT SHARK FIN FLIPPER	500-5142-00
55 UNDER PLAYFIELD RAMP ENTER	180-5093-00
56 SHARK SUPER SCOOP	180-5116-00
57 LEFT OUTLANE	515-5138-00
58 RIGHT OUTLANE	500-5706-00
59 RIGHT OUTER RETURN LANE	500-5706-00
60 RIGHT INNER RETURN LANE	500-5706-00
61 LEFT SLINGSHOT	180-5054-00
62 RIGHT SLINGSHOT	180-5054-00
63* UPPER & LOWER LEFT FLIPPER SWITCH STACK	180-5122-00
64* UPPER & LOWER RIGHT FLIPPER SWITCH STACK	180-5122-00



Note: Partial Ramps not shown for clarity.

* Location - In or On Cabinet

† Specify Game N^o (33) & decal description if applicable.

LAMP TESTS

Controlled lamps are configured in an 8 x 8 matrix of columns (lamp drives) and rows (lamp returns) with up to 64 lamps possible. The lamp tests include four parts, all lamps, lamp return (row), lamp drive (column), and discrete (individual) lamps. Row and column wire colors are indicated in the discrete lamp test using corresponding resistor color code numbers.

All Lamps

From the Active Switch test, operate the STEP push-button switch. The dot matrix display will indicate ALL LAMPS and all controlled lamps will light.

Lamp Returns (Row)

From the ALL LAMPS test, depress the STEP push-button switch. The display indicates LAMP RETURNS, wire color and the LAMP RETURN driver transistor. All controlled lamps in row 1 should be lit. Operating the Game Start push-button switch cycles through each of the rows separately.

Lamp Drives (Column)

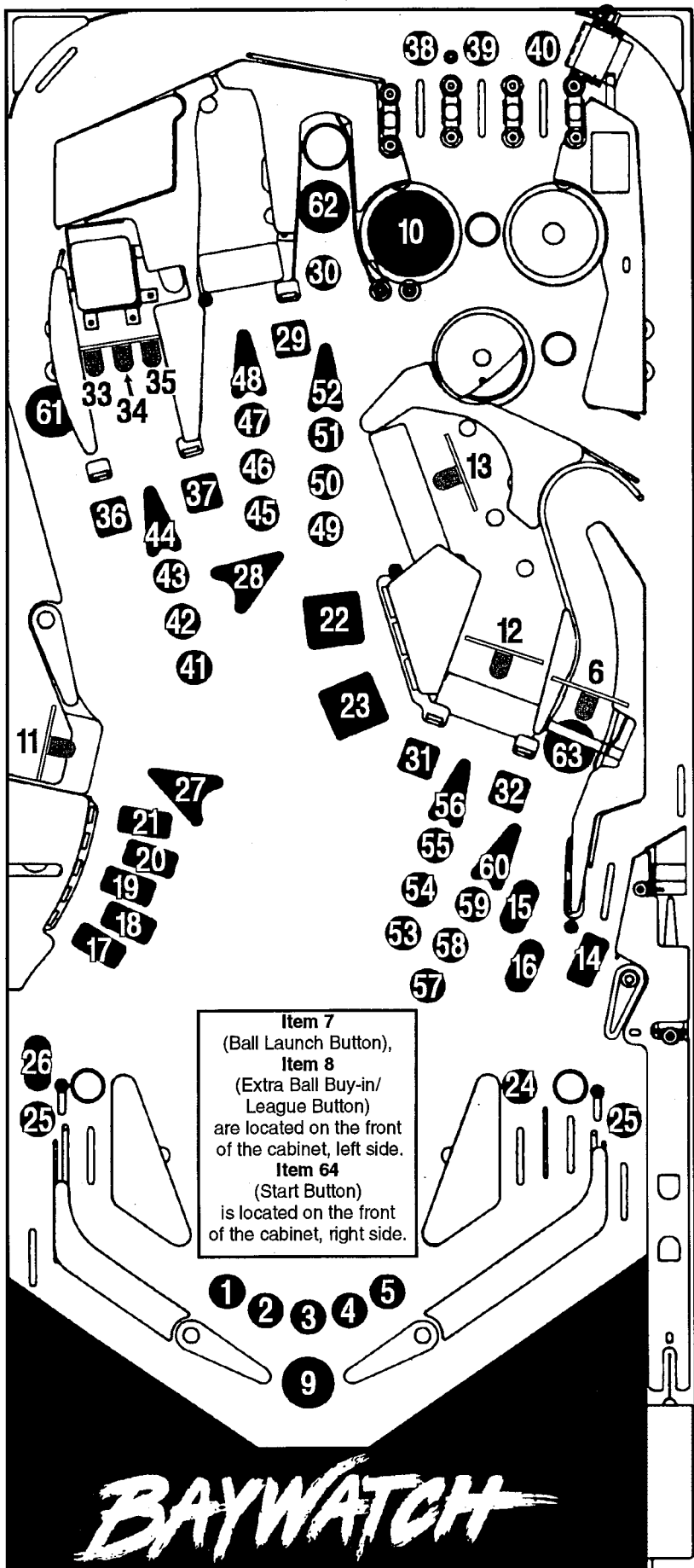
From the LAMP RETURNS test, depress the STEP push-button switch. The display will indicate LAMP COLUMNS, wire color and the LAMP DRIVES driver transistor. All controlled lamps in column 1 should be lit. Operating the Game Start push-button switch, cycles through each of the columns separately.

Lamp Test Continued on page 38.

LAMP MATRIX CHART

Column (18v)	1 Q71 YEL-BRN CN7-1	2 Q70 YEL-RED CN7-2	3 Q69 YEL-ORG CN7-3	4 Q68 YEL-BLK CN7-4	5 Q67 YEL-GRN CN7-5	6 Q66 YEL-BLU CN7-7	7 Q65 YEL-VIO CN7-8	8 Q64 YEL-GRY CN7-9
1 Q72 RED-BRN CN6-1	10 MIL + VIDEO MODE 1	SHOOT AGAIN 9	5-BANK S-U (S)HARK (BOTTOM) 17	SPECIAL (LT & RT OUTLANES) 25	LOCK 1 (LEFT RAMP ENTER) 33	(G)UARD 41	GU(A)RD 49	GUAR(D) 57
2 Q73 RED-BLK CN6-2	20 MIL + LASER KICK 2	LEFT TURBO BUMPER 10	5-BANK S-U S(H)ARK (MIDDLE BOTTOM) 18	LASER KICK (MIDDLE OUT- LANE) 26	LOCK 2 (LEFT RAMP ENTER) 34	MITCH 42	C.J. 50	STEPHANIE 58
3 Q74 RED-ORG CN6-3	30 MIL + SHARK 3	SHARK SUPER VUK (MIDDLE LEFT) 11	5-BANK S-U SH(A)RK (MIDDLE) 19	SHARK JACKPOT 27	LOCK 3 (LEFT RAMP ENTER) 35	CPR 43	DIVER TRAPPED 51	TIDAL WAVE 59
4 Q75 RED-YEL CN6-5	50 MIL + LITE EXTRA BALL 4	RIGHT RAMP ENTER 12	5-BANK S-U SHA(R)K (MIDDLE TOP) 20	JACKPOT (SIDE RAMP) 28	ATV (STAND-UP LEFT RAMP LEFT) 36	SURF BOARD (LEFT RAMP) 44	SURF BOARD (UPPER VUK) 52	SURF BOARD (SPINNER) 60
5 Q76 RED-GRN CN6-6	100 MIL + EARTH QUAKE 5	SPELL IRONMAN 13	5-BANK S-U SHAR(K) (TOP) 21	HELICOPTER (STAND-UP CENTER RAMP) 29	RESCUE TRUCK (S-U LEFT RAMP RIGHT) 37	G(U)ARD 45	GUA(R)D 53	TIDAL WAVE (LEFT ORBIT) 61
6 Q77 RED-BLU CN6-7	SEARCH & RESCUE MYSTERY 6	SHARK FLIP 14	LITE (3-BANK DROPS) 22	EXTRA BALL (UPPER VUK) 30	S (TOP LANE LEFT ROLLOVER) 38	MATT 46	CAROLINE 54	EARTH QUAKE (UPPER VUK) 62
7 Q78 RED-VIO CN6-8	BALL LAUNCH BUTTON 7	LASER (2-BANK S-U TOP) 15	LOCK (3-BANK DROPS) 23	WAVE RUN- NER (S-U RT RAMP LEFT) 31	P (TOP LANE MID ROLLOVER) 39	COPTER RESCUE 47	SHARK COVE 55	TIDAL WAVE (SPINNER) 63
8 Q79 RED-GRY CN6-9	EXTRA BALL BUY-IN/ LEAGUE BUTTON 8	KICK (2-BANK S-U BOTTOM) 16	SQUID POPS (INNER RT RETURN LANE) 24	SCARAB (STAND-UP RT RAMP RIGHT) 32	F (TOP LANE RIGHT ROLLOVER) 40	SURF BOARD (CENTER RAMP) 48	SURF BOARD (RIGHT RAMP) 56	START BUTTON 64

Lamp Matrix Location and Descriptions



Lamp Matrix No. & Description

1	10 MIL + VIDEO MODE
2	20 MIL + LASER KICK
3	30 MIL + SHARK
4	50 MIL + LITE EXTRA BALL
5	100 MIL + EARTH QUAKE
6	SEARCH & RESCUE MYSTERY
7	BALL LAUNCH BUTTON
8	EXTRA BUTTON
9	SHOOT AGAIN
10	LEFT TURBO BUMPER
11	SHARK SUPER VUK
12	RIGHT RAMP ENTER
13	SPELL IRONMAN
14	SHARK FLIP
15	LASER (2-BANK STAND-UP TOP)
16	KICK (2-BANK STAND-UP BOTTOM)
17	5-BANK STAND-UP S OF SHARK
18	5-BANK STAND-UP H OF SHARK
19	5-BANK STAND-UP A OF SHARK
20	5-BANK STAND-UP R OF SHARK
21	5-BANK STAND-UP K OF SHARK
22	LITE (3-BANK DROP TARGETS)
23	LOCK (3-BANK DROP TARGETS)
24	SQUID POPS (INNER RT RETURNLANE)
25	SPECIAL (LEFT & RIGHT OUTLANES)
26	LASER KICK (LEFT OUTLANE)
27	SHARK JACKPOT
28	JACKPOT (SIDE RAMP)
29	HELICOPTER (S-U CENTER RAMP)
30	EXTRA BALL (UPPER VUK)
31	WAVE RUNNER (S-U RT RAMP LT)
32	SCARAB (STAND-UP RT RAMP RT)
33	LOCK 1 (OVER LEFT RAMP ENTER)
34	LOCK 2 (OVER LEFT RAMP ENTER)
35	LOCK 3 (OVER LEFT RAMP ENTER)
36	ATV (STAND-UP LEFT RAMP LEFT SIDE)
37	RESCUE TRUCK (S-U LEFT RAMP RT)
38	S OF SPF (TOP LANE LEFT ROLLOVER)
39	P OF SPF (TOP LANE MID ROLLOVER)
40	F OF SPF (TOP LANE RIGHT ROLLOVER)
41	G OF (G)UARD
42	MITCH
43	CPR
44	SURF BOARD (LEFT RAMP)
45	U OF G(U)ARD
46	MATT
47	COPTER RESCUE
48	SURF BOARD (CENTER RAMP)
49	A OF GU(A)RD
50	C.J.
51	DIVER TRAPPED
52	SURF BOARD (UPPER VUK)
53	R OF GUA(R)D
54	CAROLINE
55	SHARK COVE
56	SURF BOARD (RIGHT RAMP)
57	D OF GUAR(D)
58	STEPHANIE
59	TIDAL WAVE
60	SURF BOARD (SPINNER)
61	TIDAL WAVE (LEFT ORBIT)
62	EARTH QUAKE (UPPER VUK)
63	TIDAL WAVE (SPINNER)
64	START BUTTON

Please Note: General Illumination (G.I.) Lamps are not shown.
For Bulb Types & Sockets, see pages 53 through 56.

LAMP TESTS CONTINUED

Single Lamp

From the LAMP DRIVES test, depress the STEP push-button switch. The display will indicate the lamp name. The display indicates the row and column wire colors and the lamp matrix number. Lamp 01 should light. With the FORWARD/REVERSE push-button switch in the FORWARD (up) position, operating the Game Start push-button switch selects higher-numbered lamps; with it in the REVERSE (down) position, Game Start selects lower-numbered lamps.

FLASH LAMP / COIL TESTS

Twenty-Two regular (pulsed under microprocessor control) coil drivers are provided to switch ground to coils. The Left/Right Relay is used in conjunction with drives 1 through 8 to switch +32 volts between coils or flash lamps; these sets are termed "left" and "right". This relay is located on the PPB board which provides isolation diodes and current limiting resistors. This effectively provides 29 regular coils.

Flash Lamp

From the Single Lamp test, depress the STEP push-button switch. All Flash lamps will fire randomly. This allows the Technician to easily spot any burned out bulbs and replace them without stepping through the tests below.

Automatic Test

From the Flash Lamps test, depress the STEP push-button switch. The dot matrix display will indicate ALL COILS. The test pulses each regular solenoid or flash lamp sequentially with the coil/flash lamp names and the wire colors indicated in the display.

Select Coil

From the Coil Test, depress the STEP push-button switch. The display will indicate SELECT COIL and then the name of 1st drive and the wire colors. Operate either Flipper push-button switch to select the coil or flash lamp to be tested. With the desired drive number indicated in the display, depress the START push-button switch to cause it to be pulsed repeatedly.

Return To Game Over

From the Select Coil test, depress the STEP push-button switch once. The game returns to the game-over mode.

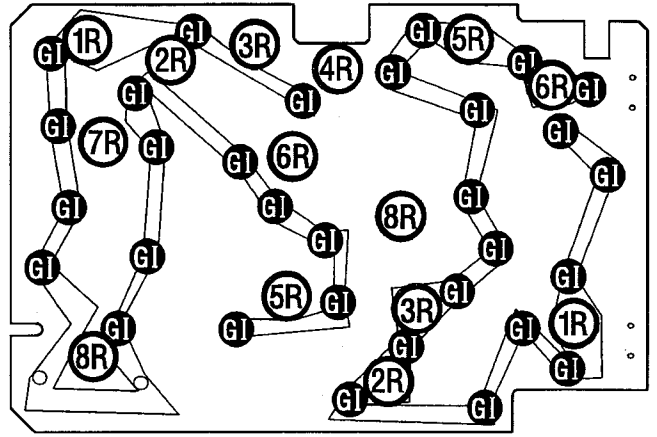
PLAYFIELD COILS / BACKBOX & PLAYFIELD FLASH LAMP LOCATIONS

The remaining pages of this section will identify the coils and flash lamp locations on the playfield and back box. The next page illustrates this with a mini-table naming each one. The last two pages of this section describe in detail both coils & flash lamps in the "Switched, CPU Controlled Auxillary & Constant Power Solenoids" Table and the "Flipper Solenoids" Table. The page after next is the Coil Chart Schematic. For more information see the "Schematics / Troubleshooting" Yellow Section at the end of this manual.

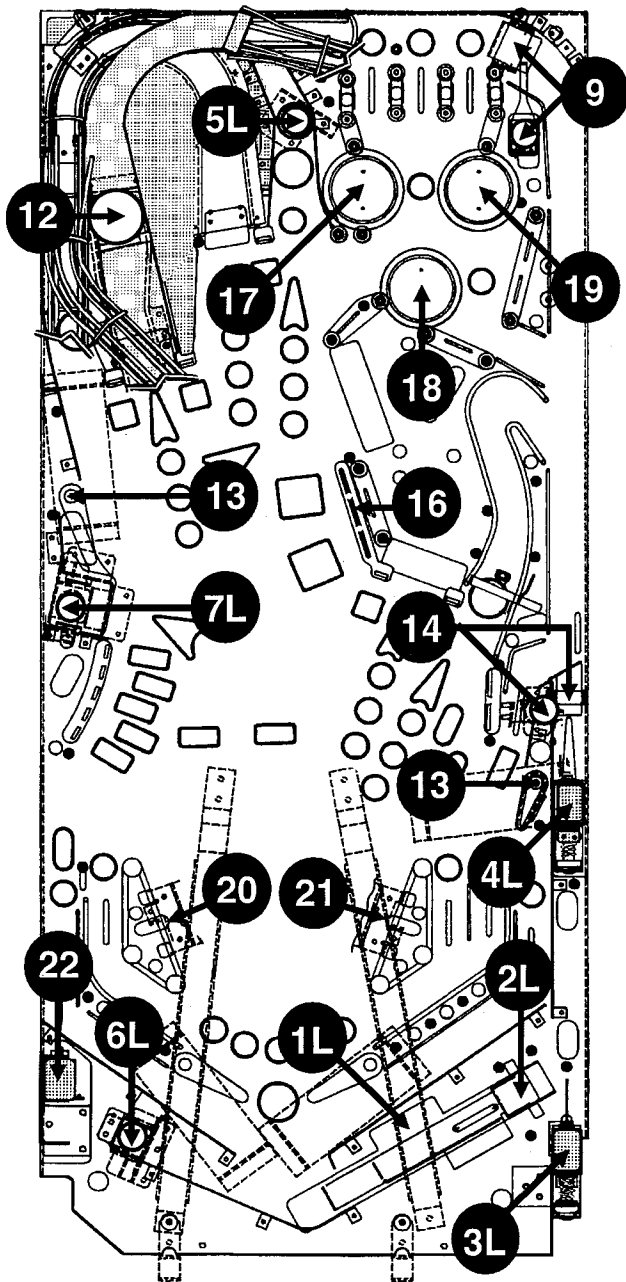
1L	5-Ball Trough Lock Ball	8R	Flashes: P/F X2, Ins. X2
1R	Flashes: Styrene X2, Ins. X2	09	Upper Control Gate
2L	Trough Up-Kicker	10	Left/Right (A/B) Relay
2R	Flashes: P/F X2, Ins. X2	11	G.I. Relay
3L	Auto Ball Launch 50v	12	Lock Trap to Under P/F Ramp
3R	Flashes: P/F X2, Ins. X2	13	Upper Left & Right Flippers
4L	Upper Ball Launch	14	Lower Control Gate
4R	Flashes: P/F X3, Ins. X1	15	Not Used
5L	Upper VUK 50v	16	3-Bank Drop Target Reset
5R	Flashes: P/F X2, Ins. X2	17	Left Turbo Bumper
6L	Super VUK 50v (Under Arch)	18	Bottom Turbo Bumper
6R	Flashes: P/F X2, Ins. X2	19	Right Turbo Bumper
7L	Shark Super Scoop 50v	20	Left Slingshot
7R	Flashes: P/F X3, Ins. X1	21	Right Slingshot
8L	Knocker 32v	22	Laser Kick 32v

Note: Shaded areas not shown on Diagrams.
G.I. = General Illumination Lamps

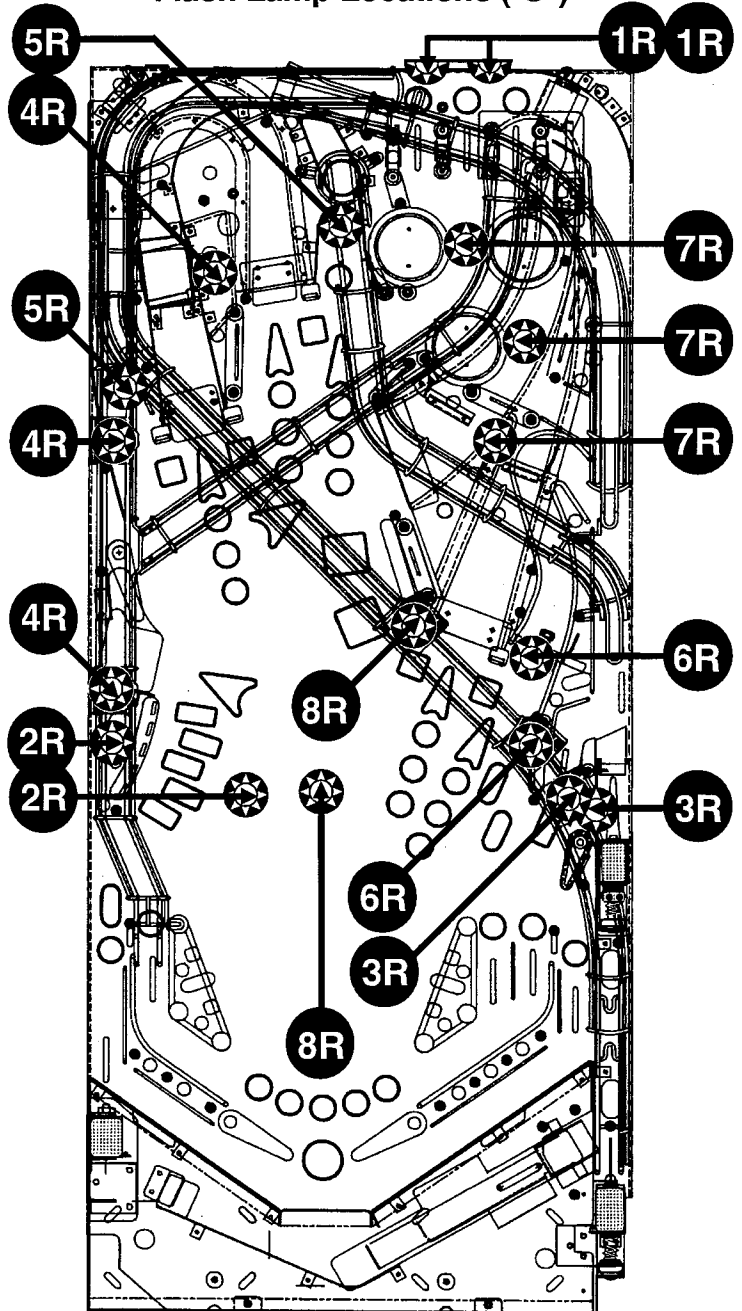
Backbox (Insert) Flash Lamps & G.I.s



Coil Locations



Flash Lamp Locations (⊗)

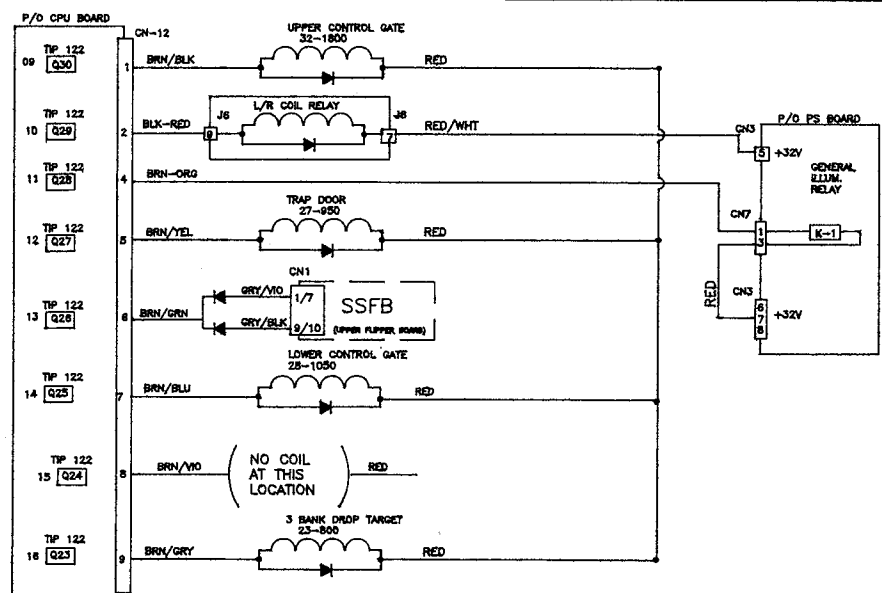
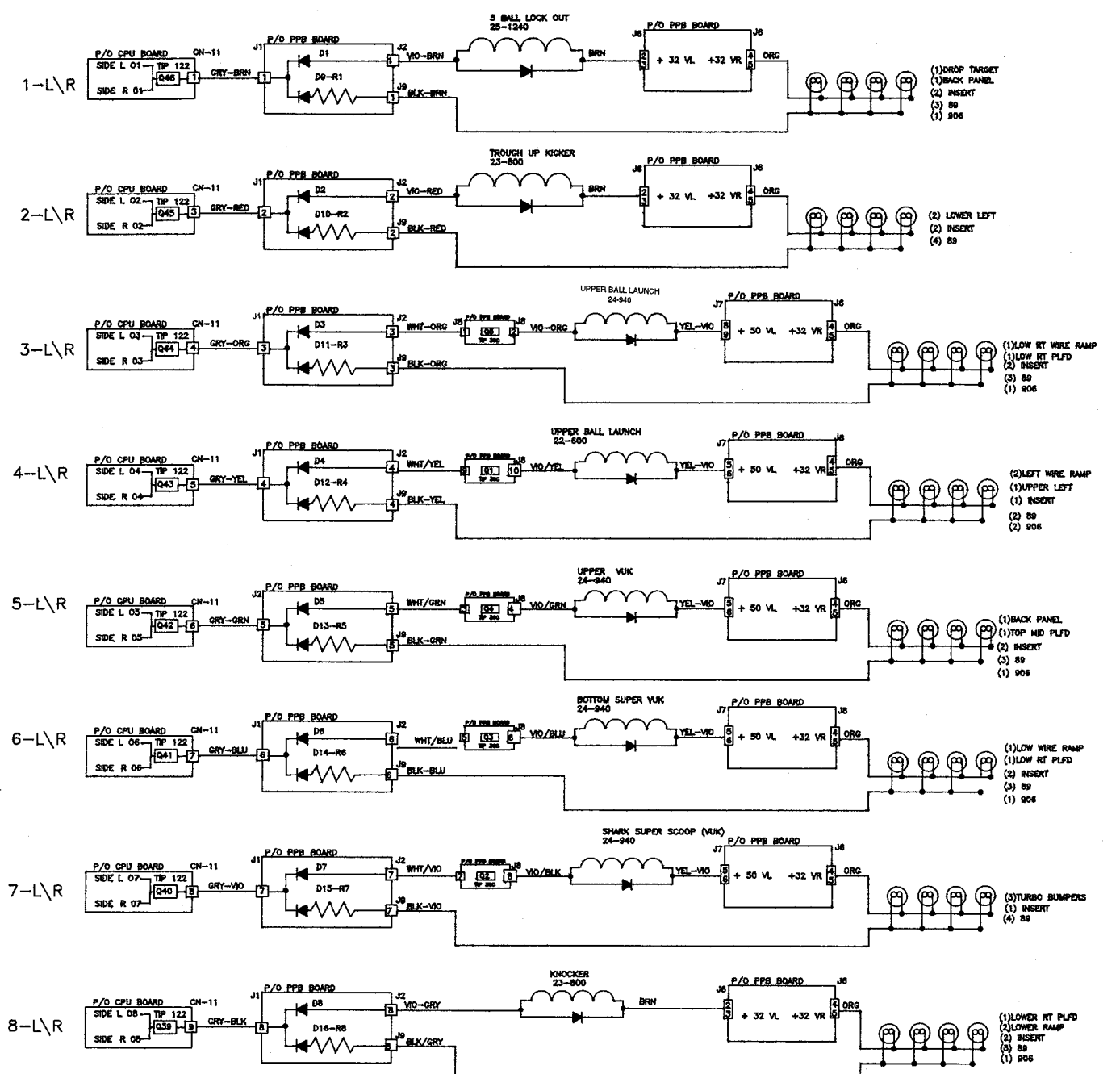


Switched, CPU Controlled Auxillary & Constant Power Solenoids

Coil No.	Coil or Flashlamp Description	Drive Transistor (D.Tr.)	On Which Board?	D.T. Control Line	D.T. Control Line Connect	Power Line	Power Line Connection	Power Description	Coil or Flash Type
1L	COIL: 5-BALL TROUGH LOCK BALL	Q46	CPU	VIO-BRN	PPB J2-1	BRN	PPB J6-1, 2	32v L	25-1240
1R	Flashlamp: X0 P/F, Insert X2, X2 B/P Flashes on Back Panel			BLK-BRN	PPB J9-1	ORG	PPB J6-4, 5	32v R	Bulb #89
2L	COIL: TROUGH UP-KICKER	Q45	CPU	VIO-RED	PPB J2-2	BRN	PPB J6-1, 2	32v L	23-800
2R	Flashlamp: X2 P/F, Insert X2 Over 5-Bank Stand-Up/Slings.			BLK-RED	PPB J9-2	ORG	PPB J6-4, 5	32v R	Bulb #89
3L	COIL: AUTO BALL LAUNCH 50V	Q44/Q5	CPU/PPB	VIO-ORG	PPB J8-2	YEL-VIO	PPB J7-8	50v L	23-800
3R	Flashlamp: X2 P/F, Insert X2 Flashes by Upper Right Flipper	Q44	CPU	BLK-ORG	PPB J9-3	ORG	PPB J6-4, 5	32v R	Bulb #89
4L	COIL: UPPER BALL LAUNCH 50V	Q43/Q1	CPU/PPB	VIO-YEL	PPB J8-9, 10	YEL-VIO	PPB J7-8, 9	50v L	24-940
4R	Flashlamp: X3 P/F, Insert X1 Flashes by Upr. Lt. Flip. & Ramp	Q43	CPU	BLK-YEL	PPB J9-4	ORG	PPB J6-4, 5	32v R	Bulb #89
5L	COIL: UPPER VUK 50V	Q42/Q4	CPU/PPB	VIO-GRN	PPB J8-4	YEL-VIO	PPB J7-8	50v L	24-940
5R	Flashlamp: X2 P/F, Insert X2 Flashes over Upper VUK	Q42	CPU	BLK-GRN	PPB J9-5	ORG	PPB J6-4, 5	32v R	Bulb #89
6L	COIL: SUPER VUK 50V (UNDER ARCH)	Q41/Q3	PPB	VIO-BLU	PPB J8-6	BRN	PPB J6-1, 2	32v L	24-940
6R	Flashlamp: X2 P/F, Insert X2 Flashes over Spinner Enter	Q41	CPU	BLK-BLU	PPB J9-6	ORG	PPB J6-4, 5	32v R	Bulb #89
7L	COIL: SHARK SUPER SCOOP 50V	Q40/Q2	CPU/PPB	VIO-BLK	PPB J8-9	YEL-VIO	PPB J7-8, 2	50v L	24-940
7R	Flashlamp: X3 P/F, Insert X1 Flashes around Turbo Bumpers	Q40	CPU	BLK-VIO	PPB J9-7	ORG	PPB J6-4, 5	32v R	Bulb #89
8L	COIL: KNOCKER 32V (IN CABINET)	Q39	CPU	VIO-GRY	PPB J2-8	BRN	PPB J6-1, 2	32v L	23-800
8R	Flashlamp: X2 P/F, Insert X2 Flashes by Rt. Sling. & Ramp			BLK-GRY	PPB J9-8	ORG	PPB J6-4, 5	32v R	Bulb #89
09	COIL: UPPER CONTROL GATE	Q30	CPU	BRN-BLK	CPU CN 12-1	RED	PS CN 3-6, 7	32v	32-1800
10	COIL: LEFT & RIGHT (A/B) RELAY Loc: PPB	Q29	CPU	BLK-RED	CPU CN 12-2	RED	PS CN 6-7	32v	24v DC 10A DPDT
11	COIL: G.I. RELAY Loc: Power Supply	Q28	CPU	BRN-ORG	CPU CN 12-4	RED	PS CN 3-6, 7	32v	24v DC 10A DPDT
12	COIL: LOCK TRAP TO UNDER PLAYFIELD RAMP	Q27	CPU	BRN-YEL	CPU CN 12-5	RED	PS CN 3-6, 7	32v	27-950
13	COIL: UPPER LEFT & RIGHT FLIPPERS (via SSFB CN1)	Q26	CPU	BRN-GRN	CPU CN 12-6	RED	PS CN 3-6, 7	32v	LT 24-1570 RT 23-1100
14	COIL: LOWER CONTROL GATE	Q25	CPU	BRN-BLU	CPU CN 12-7	RED	PS CN 3-6, 7	32v	28-1050
15	COIL: NOT USED	---	---	---	---	---	---	---	---
16	COIL: 3-BANK DROP TARGET RESET	Q23	CPU	BRN-GRY	PPB J8-12	RED	PS CN 3-6, 7	32v	23-800
17	COIL: LEFT TURBO BUMPER	Q11	CPU	BLU-BRN	CPU CN 19-7	RED	PS CN 3-6	32v	23-700
18	COIL: BOTTOM TURBO BUMPER	Q9	CPU	BLU-RED	CPU CN 19-4	RED	PS CN 3-6	32v	23-700
19	COIL: RIGHT TURBO BUMPER	Q8	CPU	BLU-ORG	CPU CN 19-3	RED	PS CN 3-6	32v	23-700
20	COIL: LEFT SLINGSHOT	Q10	CPU	BLU-YEL	CPU CN 19-6	RED	PS CN 6-6, 7	32v	23-800
21	COIL: RIGHT SLINGSHOT	Q12	CPU	BLU-GRN	CPU CN 19-8	RED	PS CN 6-6, 7	32v	23-800
22	COIL: LASER KICK 32V	Q13	CPU	BLU-BLK	CPU CN 19-9	RED	PS CN 6-6, 7	32v	23-700

Flipper Solenoids

SSFB No.	Flipper Coil	Cabinet Switch	Switch Drive	Switch Return	E.O.S.	GND	Flipper 50vDC Power	Flipper 8vAC Hold	Flipper Coil Output
SSFB 1	Lwr. Rt. Flipper 23-900	BLU-VIO SSFB CN1-7	GRN-GRY CPU CN8-9 TO SSFB CN1-4	WHT-GRY CPU CN10-1 TO SSFB CN1-3	BRN-VIO RT. EOS SW. TO CN1-1	BLK CPU CN5 TO CN1-6	BLK-WHT PPB J7-1, -5 to SSFB CN2-8, -9	GRY-GRN-GRY P/S CN1-10, -11, to SSFB CN2-7, -8	50v Q2, Q3, I SR1 CN2-4,5
SSFB 1	Lwr. Lt. Flipper 23-1100	BLU-GRY SSFB CN1-10	GRN-GRY CPU CN8-9 TO SSFB CN1-4	WHT-VIO CPU CN10-2 TO SSFB CN1-5	BRN-GRY LT. EOS SW. TO CN1-9	BLK CPU CN5 TO CN1-6	BLK-WHT PPB J7-1, -5 to SSFB CN2-8, -9	GRY-GRN-GRY P/S CN1-10, -11, to SSFB CN2-7, -8	50v Q1, Q10, I SR2 CN2-1,2
SSFB 2	Upr. Rt. Flipper 23-1100	GRY-VIO SSFB CN1-10	GRN-GRY CPU CN8-9 TO SSFB CN1-4	WHT-GRY CPU CN10-1 TO SSFB CN1-3	Not Used	BLK CPU CN5 TO CN1-6	BLK-WHT PPB J7-1, -5 to SSFB CN2-8, -9	GRY-GRN-GRY P/S CN1-10, -11, to SSFB CN2-7, -8	50v Q2, Q3, I SR1 CN2-4,5
SSFB 2	Upr. Lt. Flipper 24-1570	GRY-BLK SSFB CN1-10	GRN-GRY CPU CN8-9 TO SSFB CN1-4	WHT-VIO CPU CN10-1 TO SSFB CN1-3	Not Used	BLK CPU CN5 TO CN1-6	BLK-WHT PPB J7-1, -5 to SSFB CN2-8, -9	GRY-GRN-GRY P/S CN1-10, -11, to SSFB CN2-7, -8	50v Q9, Q10, I SR2 CN2-1,2



PARTS IDENTIFICATION (PINK SECTION) Page Guide

Page 46
Playfield:
Major Assemblies

Page 47
Playfield:
Ramps & Rails

Page 48
Playfield:
Butyrate

Page 49
Playfield:
Parts

Page 50 & 51
Playfield:
Metal & Plastic
Posts and Spacers

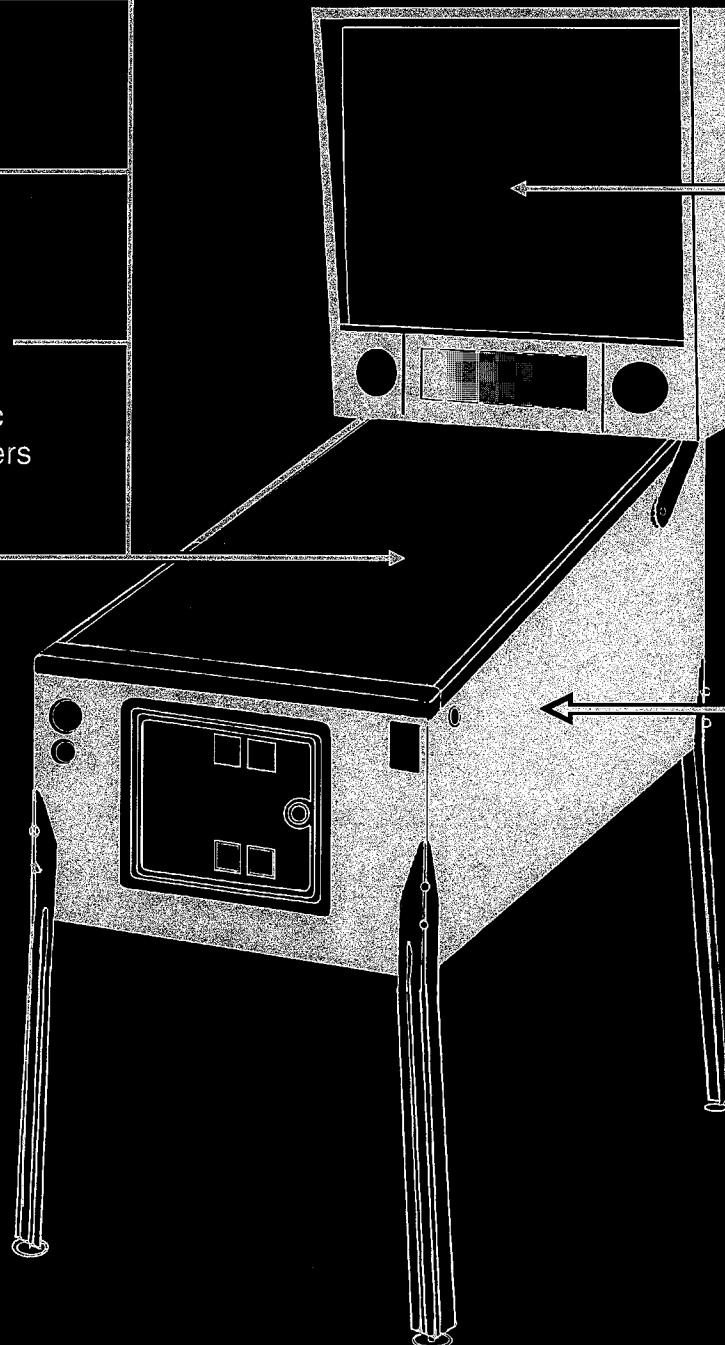
Page 52
Playfield:
Rubber Parts

Page 44
Backbox
Parts

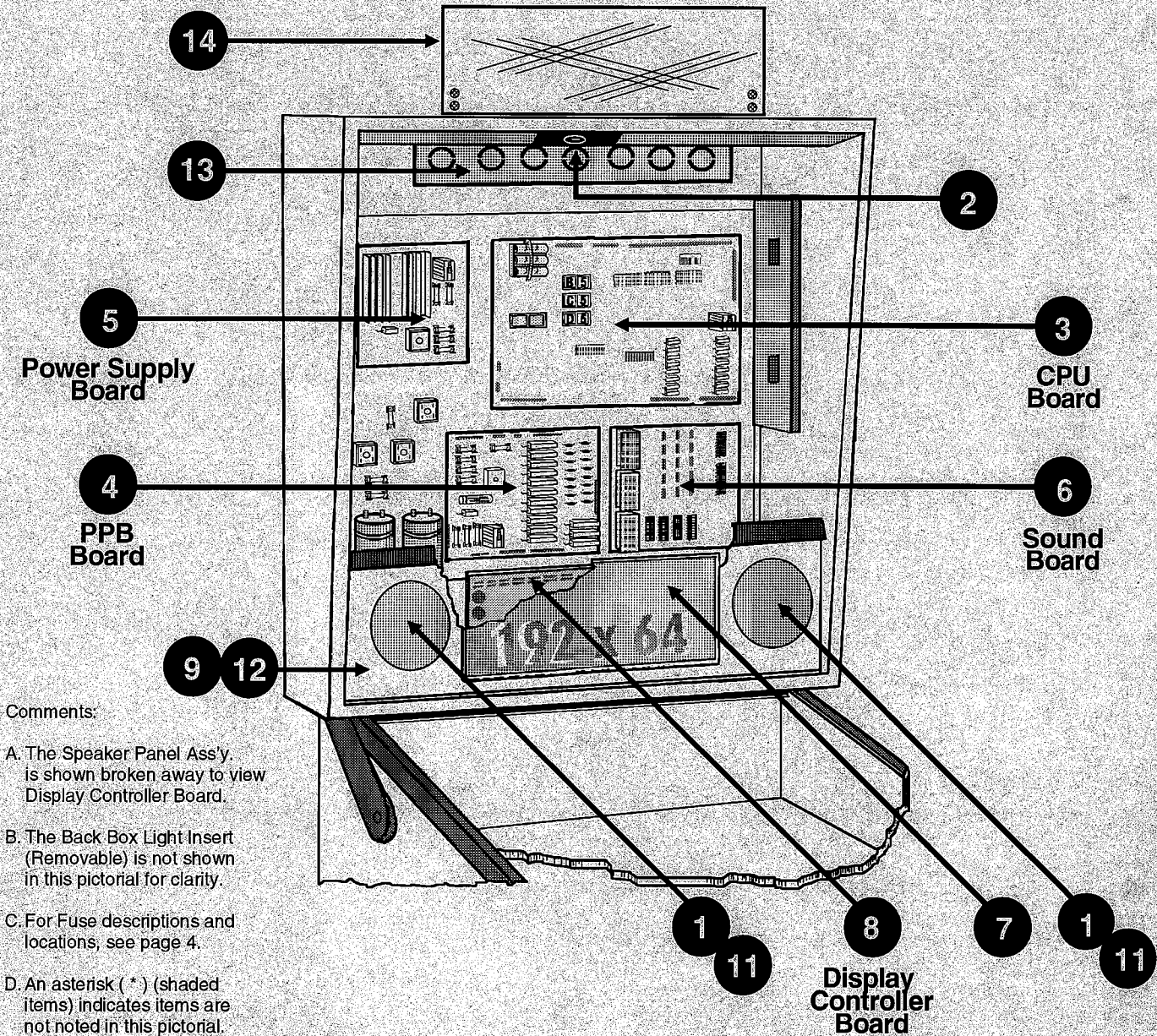
Pages 54 & 55
Backbox
Bulbs & Sockets

Page 45
Cabinet
Parts

Pages 53 - 56
Under Playfield:
Bulbs, Sockets
& Lamp Boards



Backbox - Parts



Comments:

A. The Speaker Panel Ass'y. is shown broken away to view Display Controller Board.

B. The Back Box Light Insert (Removable) is not shown in this pictorial for clarity.

C. For Fuse descriptions and locations, see page 4.

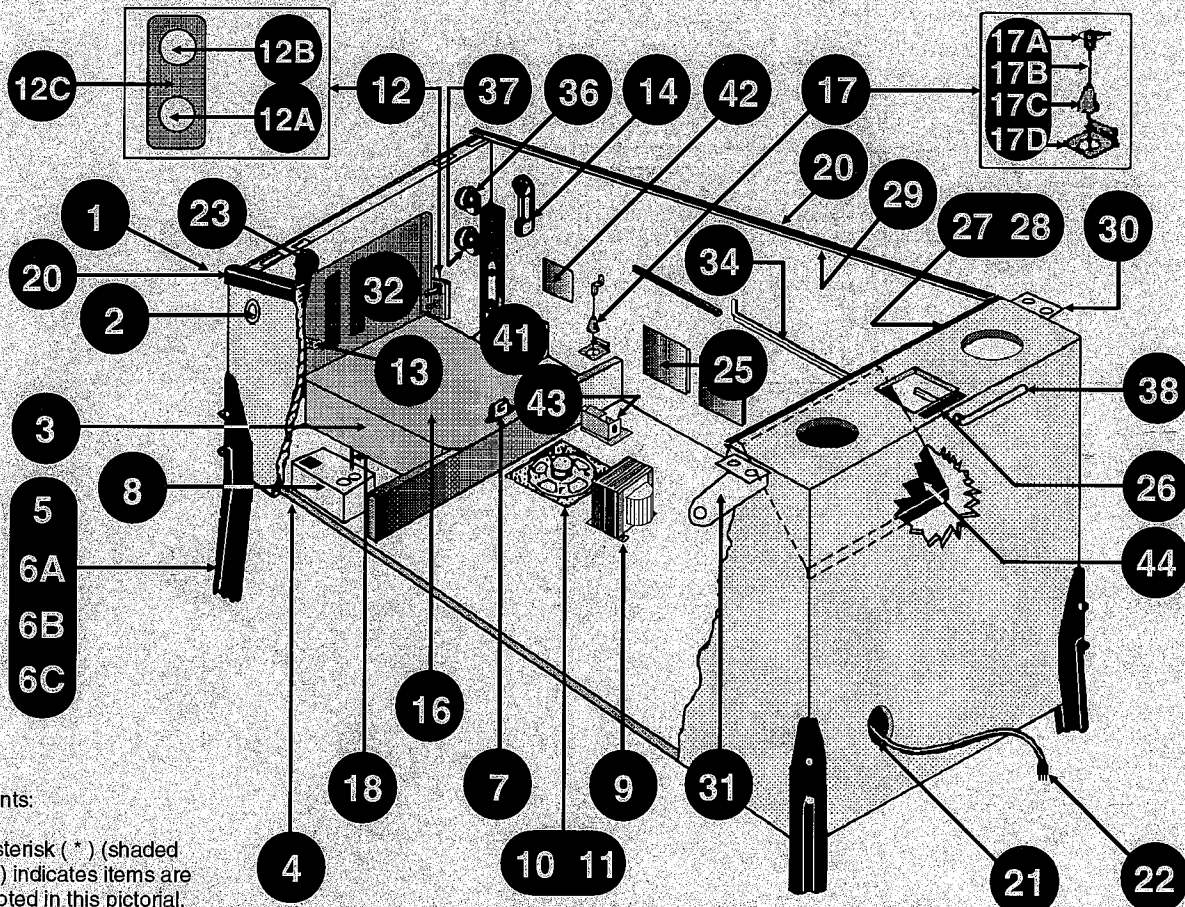
D. An asterisk (*) (shaded items) indicates items are not noted in this pictorial.

Item	Description	Part N°	Item	Description	Part N°
1	Speakers 4X4 Quam 89-9572 (Qty. 2)	031-5004-00	16 *	Backglass Clear 26½" x 19¾" * *	660-5018-00
2	Back Box Lock	355-5008-00	17 *	26-7/16" Plastic Extrusion *	545-5018-08
3	CPU Board Non-Reflective †	520-5003-04	18 *	18¾" Plastic Extr. * (Qty. 2)	545-5018-09
4	PPB Board Assembly †	520-5021-05	19 *	Glass Channel 26-7/16" *	545-5021-02
5	Power Supply Board	520-5047-03	20 *	Baywatch Lights Insert Assembly *	505-6003-33-33
6	Sound Board 2X 4MB †	500-5126-02	21 *	Ribbon Cable, 14-Pin * Display to Display	602-5005-14
7	New Large Dot Matrix Display Board 192 X 64! ††	520-5075-00	22 *	Ribbon Cable, 20-Pin * CPU to Sound Board	602-5005-20
8	Display Controller Board †	520-5092-01	23 *	Ribbon Cable, 26-Pin * CPU to Display	602-5005-26
9	Speaker Panel Assembly	500-5920-00-33	24 *	Insert Door Slide Latch *	535-5001-00
10 *	Baywatch Backglass Artwork *	830-5233-00	25 *	Insert Door Hinge with Pin *	390-5014-01
11	Baywatch Speaker Grill with Artwork	830-5639-00	26 *	Insert Door Hinge without Pin *	390-5014-00
12	Baywatch Speaker Plexi with Artwork	830-5638-00	27 *	Speaker Panel Metal Hooks * (Qty. 2)	535-7009-01
13	7-Vent Hole Grill 2½" x 18"	545-5072-02			
14	Baywatch Header Assembly (Buty -50)	515-6327-00-33			
15 *	Static Shield *	535-6227-00			

† Note 1: When ordering PC Boards with ROMS, please specify the Game.

†† Note 2: Indicate Manufacturer.

Cabinet - Parts

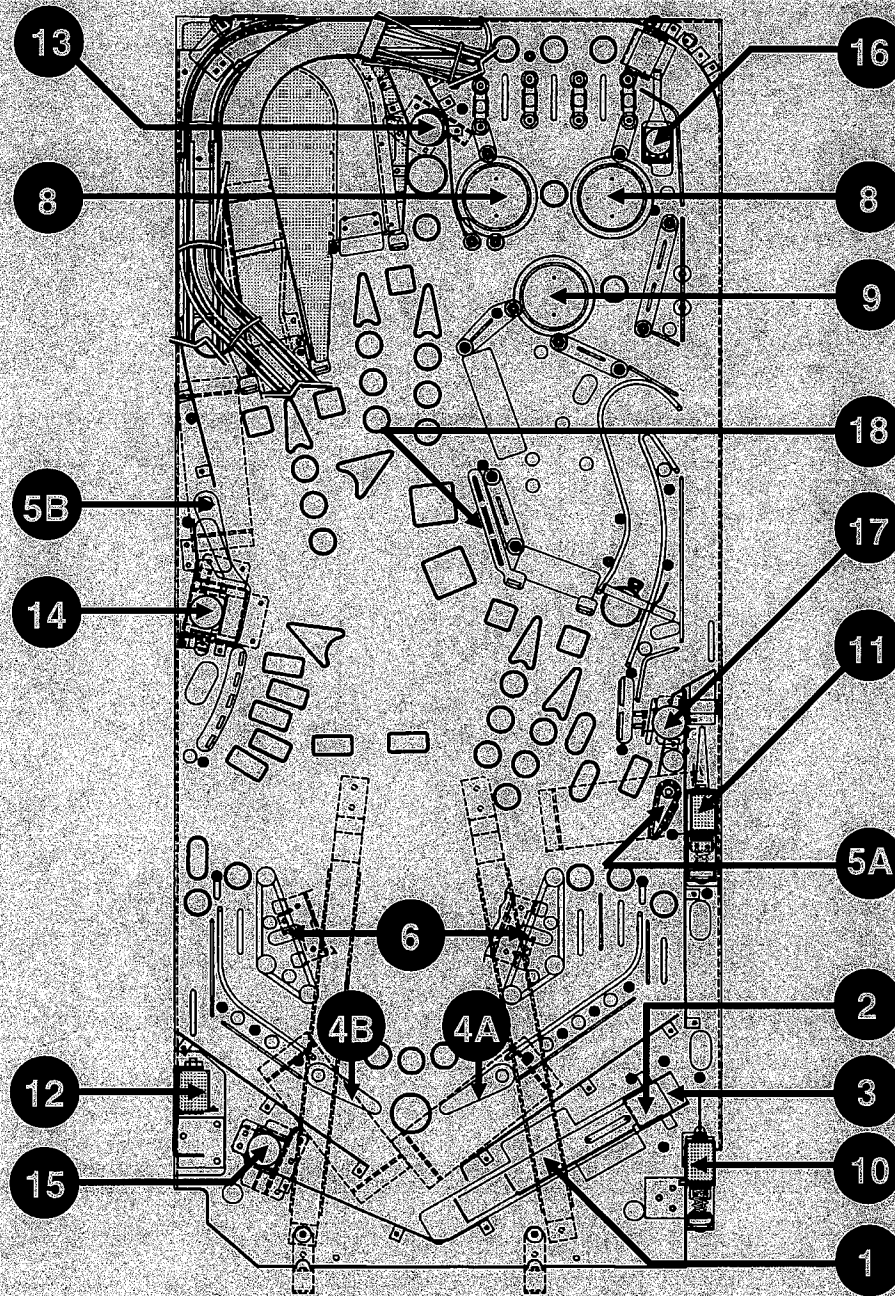


Comments:

An asterisk (*) (shaded items) indicates items are not noted in this pictorial.

Item	Description	Part N°	Item	Description	Part N°
1	Launch Button Assembly	500-5973-00-33	19 *	Playfield Glass (T.P.) 21" x 43" *	660-5001-00
2	Flipper Button Assembly Red (Qty. 2)	500-5026-32	20	Side Armor - Left & Right	535-7297-00
3	Cash Box Plastic Bottom	545-5090-00	21	Recessed Cup for Line Cord	545-5122-00
4	Power Sw. DPST Toggle (Under Cab.)	180-5001-00	22	Line Cord 10' ROJ 3" Maximum	034-5000-01
5	Leg (Black) (Qty. 4)	535-5020-50	23	Front Molding Lockdown Assembly	500-5020-01
6A	Leg Bolt 3/8-16 x 2 1/2 Hex 3/8 Hd. (Qty. 8)	231-5001-01	24 *	Front Molding - Black *	500-5757-01-00
6B	Leg Bolt Back Plate (Qty. 4)	535-5703-00	25	Solid State 2-Flipper Board (Qty. 2)	520-5080-00
6C	Leg Leveler 3/8-16 x 3" (Qty. 4)	500-5017-00	26	#1 Roto Lock Male, (Female -02) *	355-5006-01
7	Cash Box Lock Bracket	535-5215-00	27	Rear Plastic Ext. Playfield Glass 20 3/8"	545-5038-00
8	Service Outlet	180-5008-01	28	Mounting Foam Rubber for Ext.	626-5001-00
9	Transformer	010-5008-00	29	Plastic Channel Left & Right	545-5017-00
10	Speaker - Round - 8" ø	031-5005-00	30	Backbox Hinge Left	515-5987-00
11	Speaker Grill 7" x 7"	535-6830-00	31	Backbox Hinge Right	515-5987-01
12	Dual Switch Assembly (Incl. 12A-12C)	500-5808-00	32	Coin Door (with Validator) USA only	500-5018-17
12A	Memory Protect Switch	180-5000-00	33 *	Slide & Pivot Support Bracket Right *	535-5989-00
12B	Interlock Switch	180-5136-00		Slide & Pivot Support Bracket Left	535-5990-00
12C	Bracket	535-6958-00	34 *	Edge Slide Bracket *	535-5988-00
13	Service Switch Set (Step Up / Down) Located on the Coin Door by Lock.	180-5012-00		Playfield Support Slide *	535-6862-00
14	Flipper Power Switch, Left (Upr./Lwr.)	180-5048-00	35 *	Playfield Support Bar (Stay Arm) *	535-5019-00
15 *	Flipper Power Switch, Right (Upr./Lwr.)	180-5048-00	36	Start Button Switch Assembly	500-5728-07
16	Cash Box Cover (Validator)	535-5013-03	37	Extra Ball Buyin/League Button	500-5815-01
17	Plumb Bob Tilt Assy. (Incl. 17A-17D)	500-5023-00	38	5/16" Hex Key Allen Wrench	777-0001-00
17A	Hanger Bracket (Tilt)	535-5221-00	39 *	Backbox / Cabinet Matrix / Fuse Info *	820-6104-07
17B	Hanger Wire (Tilt) (Attached to "17A")	535-5319-00	40 *	2-Flipper Board Cover *	545-5165-00
17C	Plumb Bob (Tilt) (Attached to "17B")	535-5029-00	41 *	Shaker Motor (Not used in this game.)	515-5893-00
17D	Contact Bracket (Tilt)	535-5220-00	42 *	Shaker Motor P.C. Board (Not Used)	520-5065-00
18	Volume Control Single 10K Pot	123-5000-02	43	Knocker Assembly (see page 58.)	500-5081-00
			44	Styrene (Plastic) Filler Assembly	500-5974-00-33

Playfield - Major Assemblies †



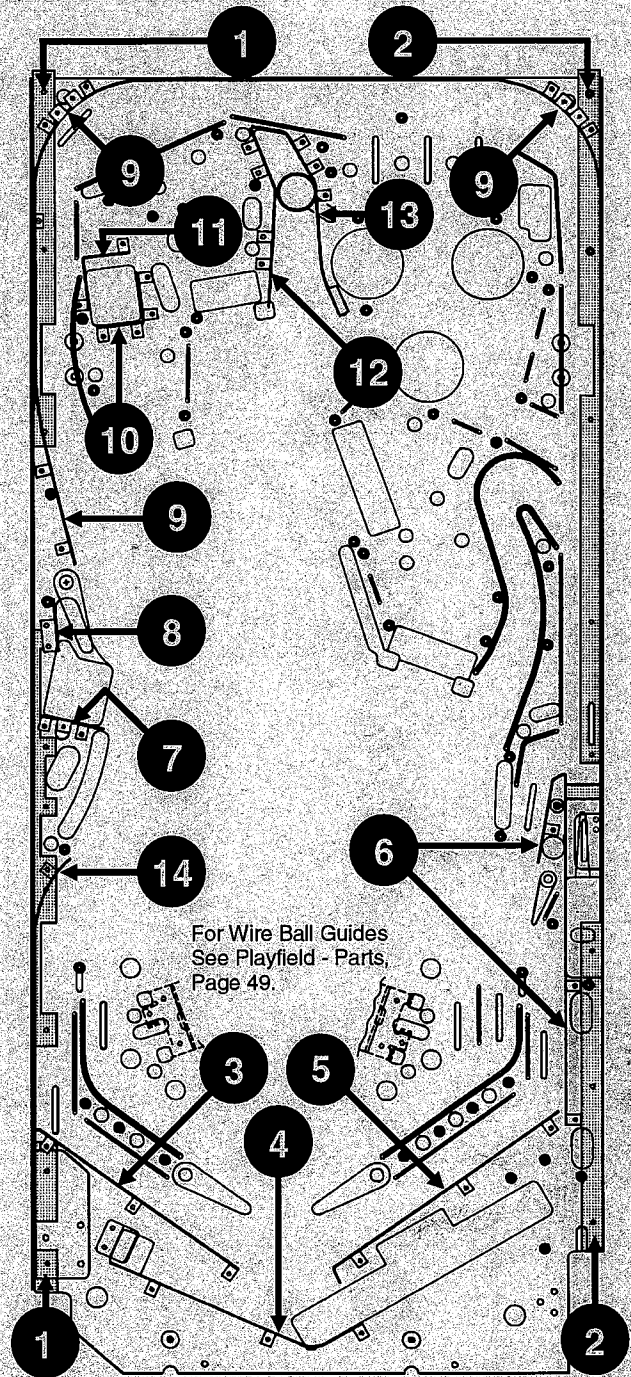
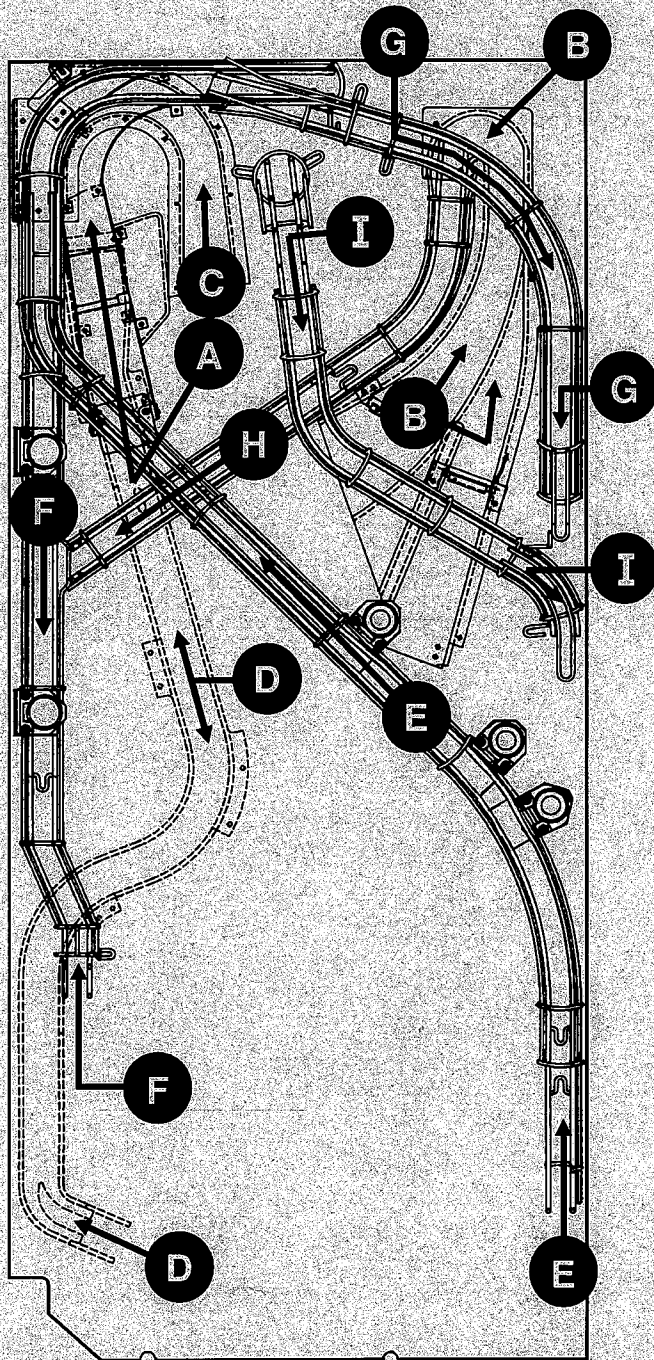
Comments:

An asterisk (*) (shaded items) indicates items are not noted in this pictorial.

Item	Description	Pg.†	Part N°	Item	Description	Pg.†	Part N°
1	5-Ball Trough Assy. (Under P/F)	pg 59	500-5965-00-33	10	Auto Ball Launch Assembly	pg 66	500-5969-00-33
2	Lock Ball Assy. (Under Arch)	pg 59	500-5684-01-33	11	Upper Ball Launch Assembly	pg 66	500-5862-06-33
3	Ball Trough Exit Scoop Assy.	pg 59	535-7329-00	12	Laser Kick Assembly	pg 67	500-5838-01-33
4A	Flipper Assembly, Lower Right	pg 60	500-5693-01-33	13	Upper VUK Assembly	pg 67	500-5839-00-33
4B	Flipper Assembly, Lower Left	pg 60	500-5832-02-33	14	Shark Super Scoop (VUK)	pg 68	500-5953-00-33
5A	Flipper Assembly, Upper Right	pg 61	500-5971-01-33	15	Super VUK (Under Arch)	pg 68	500-5880-00-33
5B	Flipper Assembly, Upper Left	pg 62	500-5983-02-33	16	Mini-Coil for Upper Control Gate	pg 69	500-5968-00-33
6	Slingshot Assemblies (Qty. 2)	pg 63	500-5849-00-33	17	Mini-Coil for Lower Control Gate	pg 69	500-5957-00-33
7*	Knocker Assy. (In Cabinet) *	pg 63	500-5081-00-33	18	3-Bank Drop Target	pg 70	500-5970-00-33
8	Turbo Bumper Assy. Lt. & Rt.	pg 64	500-5227-02-33	19*	Baywatch Lock Tower Assy.	pg 73	500-5006-00-33
9	Turbo Bumper Assy. Bottom	pg 65	500-5227-03-33				

† See Unique Parts (Blue Section) for Major Assy. Breakdowns.

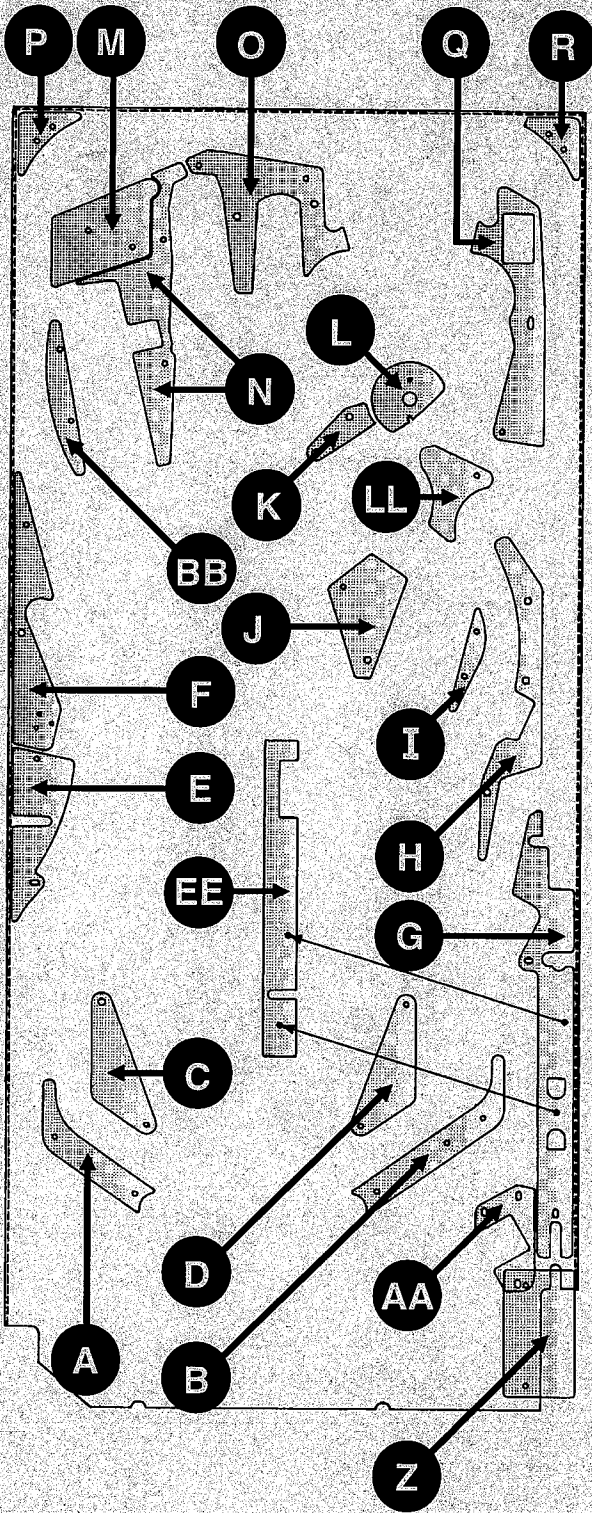
Playfield - Ramps † and Rails



Item	Desc.: Ramps	Pg.†	Part N°	Item	Desc.: Rails	Part N°
A	Left Metal Ramp (Tower) Assy.	pg 72	500-5943-00-33	1	Steel Rail Left	535-7229-01
B	Dual Plastic (Rt./Side) Ramp Assy.	pg 74	500-5941-00-33	2	Steel Rail Right	535-7228-01
C	Center Plastic Ramp Assembly	pg 75	500-5954-00-33	3	Flat Rail Under Arch Left	535-7238-00
D	Under Playfield Plastic Ramp Assy.	pg 76	515-6247-00-33	4	Flat Rail Under Arch Bottom	535-7233-00
E	Shooter Entry Wire Ramp Assy.	pg 76	500-5976-00-33	5	Flat Rail Under Arch Right	535-7239-00
F	Center Exit Wire Ramp Assy.	pg 77	500-5975-00-33	6	Flat Rail Shooter Lane 1-Way Gate Assy.	515-6286-00
G	Tower Wire Ramp (Lt. Exit) Assy.	pg 77	500-5979-00-33	7	Flat Rail Under Super Scoop	535-7230-00
H	Right Exit Wire Ramp Assembly	n/a	515-6291-00	8	Flat Rail Behind Upper Left Flipper	535-7314-00
I	Upper VUK Wire Ramp Assy.	n/a	515-6307-00	9	Flat Rail Full Top Orbit	500-5927-00-33
				10	Flat Rail Trap Door Right/Bottom	535-7316-00
				11	Flat Rail Trap Door Top/Left	535-7317-00
				12	Flat Rail Upper VUK Left Side	535-7357-00
				13	Flat Rail Upper VUK Right Side	535-7358-00
				14	Flat Rail Left Outlane	535-7363-00

† See Unique Parts (Blue Section) for Ramp Breakdowns.

Playfield - Butyrate and Decals



Item	Desc.: Butyrate	Part N°
XX	Butyrate Pieces Screened (1-56)	830-5475-XX
For entire sheet, order with the Part N° ending in -XX		
To order individual replacement Screened Butyrate, replace "-XX" with the correct 2-number ending as noted below:		
A	Left Return Lane	830-5475-01
B	Right Return Lane	830-5475-02
C	Left Slingshot	830-5475-03
D	Right Slingshot	830-5475-04
E	Lower Left Side	830-5475-05
F	Upper Left Side	830-5475-06
G	Shooter Lane Bottom	830-5475-07
H	Spinner Right Side	830-5475-08
I	Spinner Left Side	830-5475-09
J	3-Bank Drops	830-5475-10
K	Under Side Ramp	830-5475-11
L	Bottom Pop Bumper Cover	830-5475-12
M	Under Left Ramp	830-5475-13
N	Around Trap Door	830-5475-14
O	Around VUK	830-5475-15
P	Upper Left Corner	830-5475-16
Q	Top Right Side	830-5475-17
R	Right Corner	830-5475-18
S*	Clear: Right Dual Ramp Cover Lower	830-5475-20
T*	Baywatch Keychain	830-5475-22
U*	Back Panel Butyrate Large	830-5475-23
V*	Center Ramp Enter "Venice Beach"	830-5475-26
W*	Side Ramp Enter "Spell IRONMAN"	830-5475-27
X*	Right Ramp Enter	830-5475-28
Y*	Super-Scoop Enter	830-5475-29
Z	Arch-Shooter Lane	830-5475-30
AA	Trough Up-Kicker	830-5475-32
BB	Left Orbit	830-5475-35
CC*	Clear: Center Ramp Cover	830-5475-36
DD*	Clear: Mini-Mar/Ramp Short Protection These are interchangeable: -37, -39, -42, -43, -44 & -52	830-5475-37
EE	Shooter Lane Cover	830-5475-45
FF*	Back Panel Butyrate Small	830-5475-46
GG*	Spinner Lane Enter "Search & Rescue"	830-5475-47
HH*	Clear: Top Left Corner Ball Trap	830-5475-48
II*	Back Box Header (Baywatch)	830-5475-50
JJ*	Clear: Right Dual Ramp Cover Upper	830-5475-53
KK*	Clear: Upper VUK Ball Trap	830-5475-54
LL	Under Right Ramp	830-5475-55
MM*	Upper Ball Trap	830-5475-56

The following last two digits were not used:
-19, -21, -25, -24, -31, -33, -34, -49, -51

* - An asterisk indicates item is not noted in the illustration.

EXTRA NOTE: For the butyrate piece(s) which are part of an assembly, for shape, size and part number see unique parts for the assembly which holds that piece.

Item	Desc.: Mylar (M)	Part N°	Item	Desc.: Decals (D)	Part N°
M1*	Mylar Pieces (Clear Pre-Scored)	820-5849-00	D1*	Complete Decal Sheet for Playfield	820-6124-XX
M2*	Mylar Pad (Clear : 1"*) (Qty. 3)	820-5815-00	Bottom Arch Left -01, Bottom Arch Right -02, Spinner Front -04, Spinner Back -05, Pop Bumpers -11 & -12, Left Ramp -13 thru -19, 3-Bank Drop Targets: Top (Cross), Middle ('X'), Bottom (Red Sq.)		
M3*	Slingshot Area (Clear) (Qty. 2)	820-5821-00	D2*	Complete Decal Sheet for Right Ramp	820-6127-XX
M4*	Full Complete Playfield Sheet	820-5850-00	D3*	Round Flo. Org. S-U Targets (Qty. 2)	820-5140-00

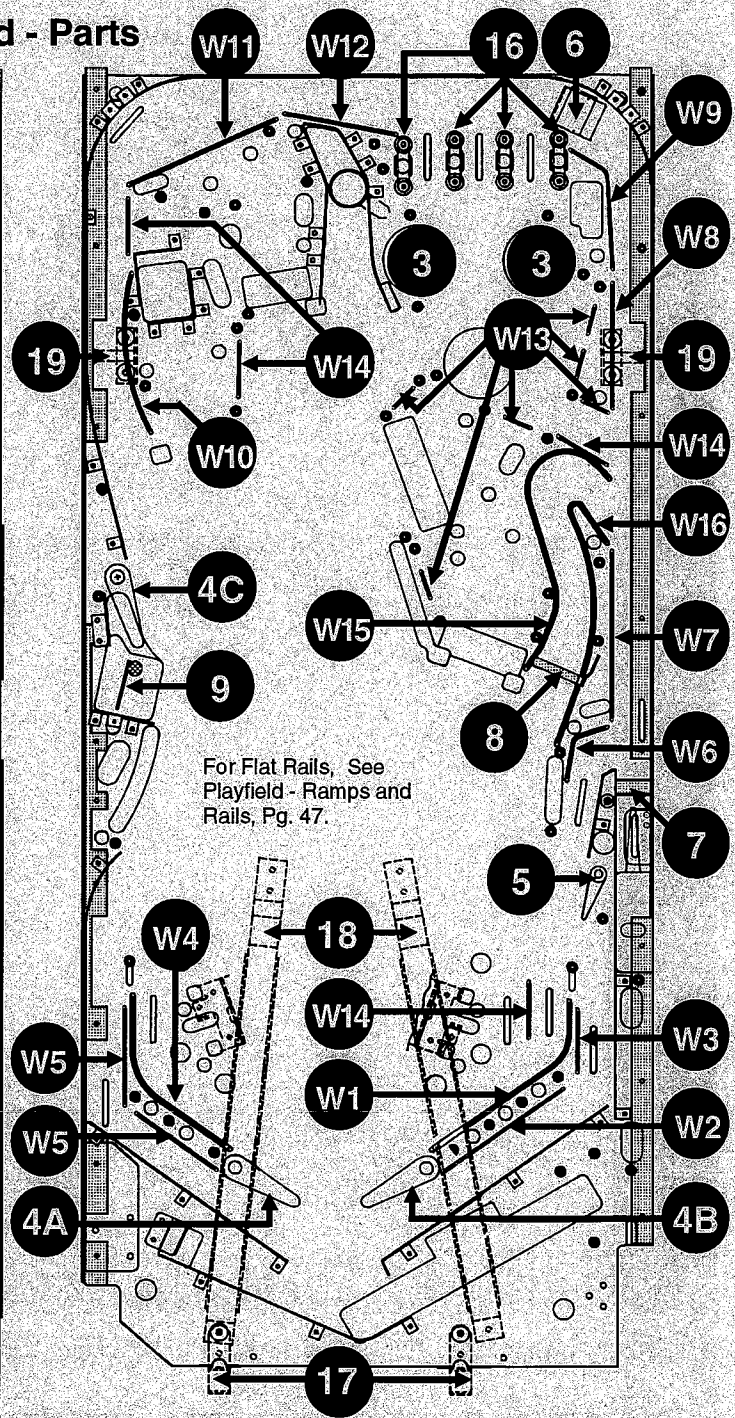
* - An asterisk indicates item is not noted in the illustration.

Playfield - Parts

Item	Desc.: Gen. Parts atop P/F	Part N ^o
1 *	Bottom Arch Assembly (Metal) Bottom Arch (Plain)	500-5964-00-33 535-7294-00
2 *	1 1/16" Steel Balls (Qty. 5)	260-5000-00
3	Pop Bumper Cap Flo. Org. (Qty. 2)	550-5057-10
4A	Lwr. Rt. Flipper & Shaft Assembly WHT with Sonic the Hedgehog™ Logo	515-5133-01-03
4B	Lwr. Lt. Flipper & Shaft Assembly WHT with Sonic the Hedgehog™ Logo	515-5133-01-04
4C	Upr. Lt. Flipper & Shaft Assembly Flo. Org. w/Sonic™ Logo	515-5133-10-04
5	"Shark Fin" Flipper & Shaft Assy. Gray	500-5977-00-33
	Flipper Bat (Gray) Alone	515-6315-14
	"Shark Fin" Gray	545-5614-00
	#6-19 X 3/8 PPH H/L 240/254 Head	237-5963-00
6	Upper Control Gate Bracket Assembly	500-5952-00-33
Ordering above (Item 6) Sub-Assembly Part N ^o will include:		
6A *	Upper Control Gate Flap	535-7291-00
6B *	Bracket	535-7292-00
6C *	Hinge Pin	535-5372-02
7	Lower Control Bracket Riveted to Item 6, Pg. 47, Flat Rails	
	Lower Control Gate Flap	535-7323-00
	Hinge Pin Long	535-5372-03
8	Spinner Assembly	500-5972-00-33
Ordering above (Item 8) Sub-Assembly Part N ^o will include:		
8A *	Bracket	535-7370-00
8B *	Spinner	515-5553-00
8C *	Switch	180-5010-04
8D *	2-56 X 1/2 PHMS Screw (Qty. 2)	237-5937-00
8E *	Butyrate Assembly -47	515-6314-00
8F *	6 X 3/8 HHWSMS Screw (Qty. 2)	234-5000-00
9	Shark Scoop Butyrate Assembly -6	515-6303-00
Ordering above (Item 9) Sub-Assembly Part N ^o will include:		
9A *	Butyrate 6	830-5475-06
9B *	Butyrate Sign Bracket for Buty. 29	535-7267-00
9C *	1/8 X 3/16 Rivet (Qty. 5)	249-5001-00
9D *	# Washer (Qty. 5)	246-5000-00
9E *	Scoop Sign Butyrate 29 Assembly.	515-6318-00
Butyrate 29 (830-5475-29), 1/8 X 3/16 Rivet (249-5001-00), #6 Washer (246-5000-00), Wedge Socket (077-5029-00), #555 Bulb (165-5002-00), Rubber Lite Cover-Teal Green (545-5014-13), and Wire Harness (036-5373-14-33)		
10 *	Back Panel Assembly	500-5942-00-33
11 *	Mini-Mars Lite Red Snap-on (Qty. 2)	550-5031-02
12 *	Rubber Lite Cover-Red (Qty. 2)	545-5014-02
13 *	Rubber Lite Cover-Blue (Qty. 1)	545-5014-05
14 *	Rubber Lite Cover-Yellow (Qty. 1)	545-5014-06
15 *	Rubber Lite Cover-Teal Green (Qty. 3)	545-5014-13
16	Top Lane Mini-Hoods Flo. Org. (Qty. 4)	550-5061-10

Item	Desc.: Gen. Parts under P/F	Part N ^o
17	Playfield Hanging Brackets (Qty. 2)	535-5216-03
18	Playfield "Slide" Brackets (Qty. 2)	535-6862-01
19	Pivot Pin Bracket Assembly (Qty. 2)	500-5329-00
	with Pivot Bracket Screws (Qty. 4)	237-5907-00
	with T-Nuts (Qty. 4)	240-5101-00

Item	Desc.: Wire Ball Guides (W)	Part N ^o
W1	Right Return Lane Special Curve	535-7360-00
W2	Right Outlane Bottom, 5 1/8"	535-5300-14

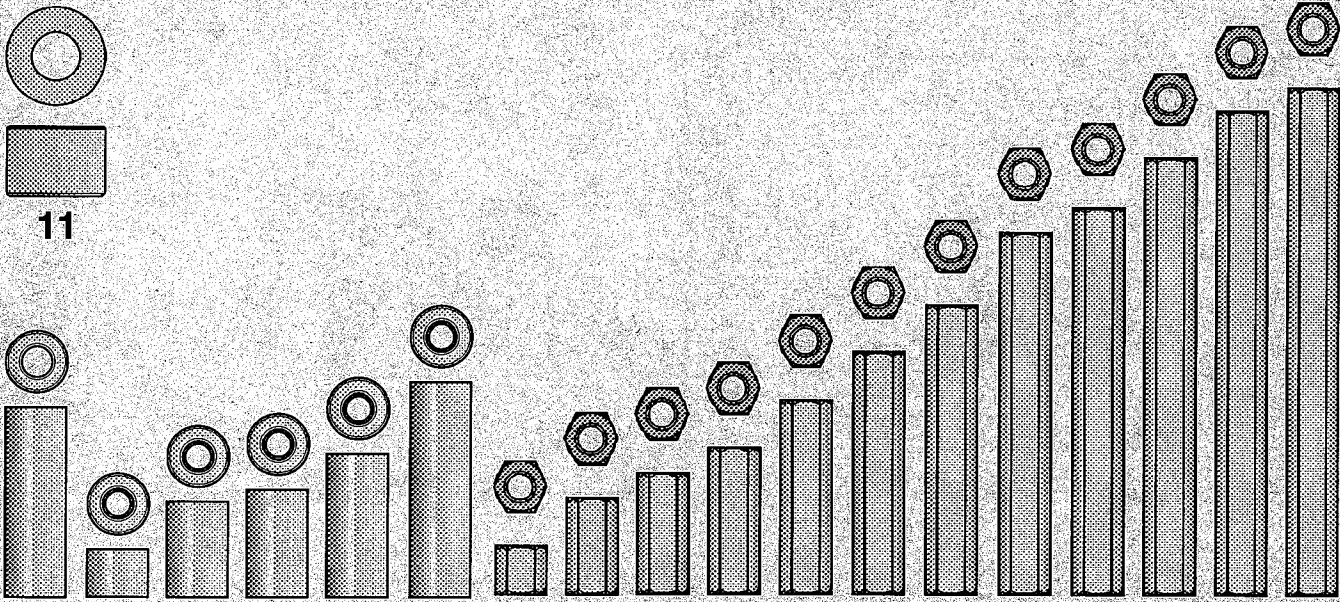
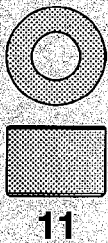
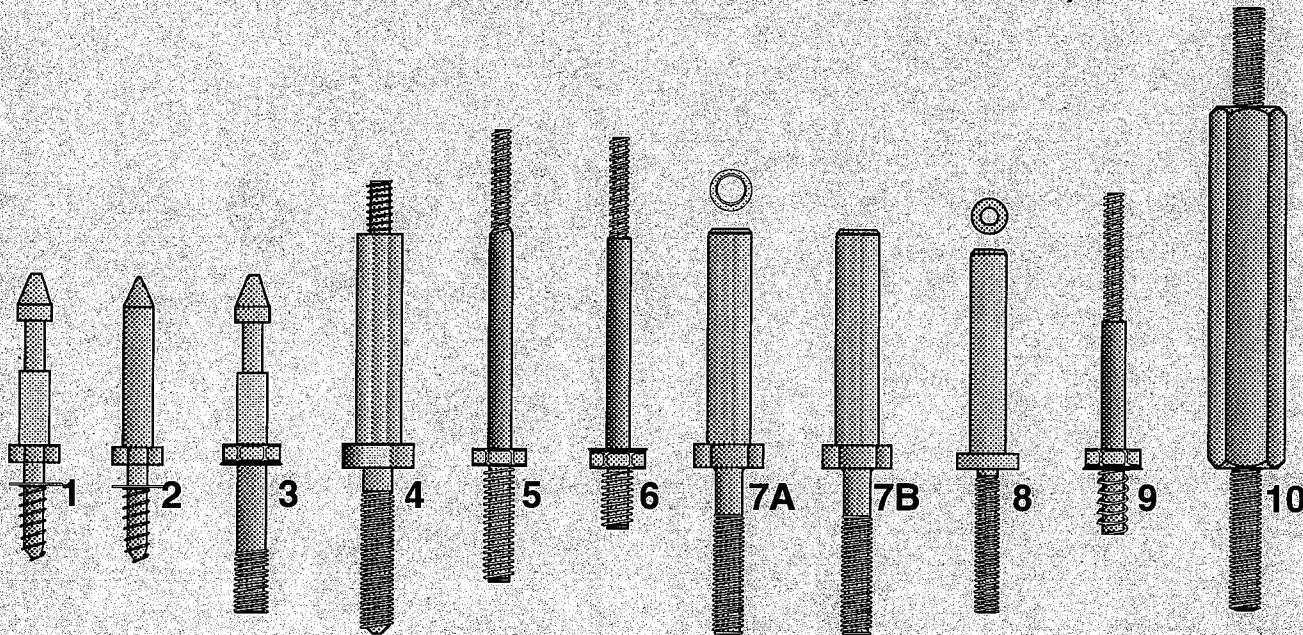


Item	Desc.: Wire Ball Guides (W)	Part N ^o
W3	Right Outlane Side, 2 1/4"	535-5300-12
W4	Left Return Lane Special Curve	535-7359-00
W5	Left Outlane Bot./Side (Qty. 2), 3 1/2"	535-5300-03
W6	Right Orbit Bottom	535-7374-00
W7	Right Orbit Left Side Bottom, 6"	535-5356-07
W8	Right Orbit Left Side Middle, 4 1/2"	535-5300-18
W9	Right Orbit Left Side Top Special Curve	535-7308-00
W10	Left Orbit Special Curve	535-7309-00
W11	Left Orbit Left Side, 5 3/4"	535-5356-07
W12	Left Orbit Right Side, 4"	535-6492-11
W13	Misc. (Qty. 7), 1"	535-5300-05
W14	Misc. (Qty. 4), 2"	535-5300-10
W15	Spinner Lane Left Special Curve	535-7373-00
W16	Spinner Lane Right Special Curve	535-7375-00

† Note: Butyrate, Light Inserts & Ramps are not shown on above diagram for clarity. See Playfield - Ramps and/or Unique Parts (Pgs. 57-78) for other Top Parts.

* An asterisk indicates item is not noted in the illustration.

Playfield - Metal Posts & Spacers (Actual Size) †



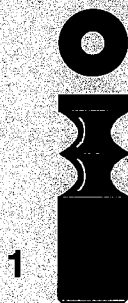
12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29
 1 1/4 1/2 9/16 3/4 1 1/8 1/4 1/2 5/8 3/4 1 1 1/4 1 1/2 1 1/8 2 2 1/4 2 1/2 2 5/8

Item	Description	Qty.	Part N°	Item	Description	Qty.	Part N°
1	Mini-Post-Wood Threaded	1	530-5004-00	15	Spacer 9/16" Long X 5/16" X .144 I.D.	3	254-5014-04
2	Mini-Post-Wood Thd. No Cut-Away	2	530-5004-01	16	Spacer 3/4" Long X 5/16" X .144 I.D.	0	254-5014-01
3	Mini-Post-Machine Threaded	2	530-5005-00	17	Spacer 1 1/8" Lg. X 5/16" X .144 I.D.	6	254-5014-02
4	Bumper Post -Machine Threaded	0	530-5007-00	18	Spacer 1/4" Hex Tapped 6-32	0	254-5008-00
5	Machine Post Screw Long	9	530-5008-00	19	Spacer 1/2" Hex Tapped 6-32	5	254-5008-03
6	Post Machine Screw	35	530-5012-02	20	Spacer 5/8" Hex Tapped 6-32	1	254-5008-02
7A	Bumper Post Hex Base 8-32 Tap.	0	530-5332-01	21	Spacer 3/4" Hex Tapped 6-32	1	254-5008-04
7B	Bumper Post Hex Base Untapped	3	530-5332-00	22	Spacer 1" Hex Tapped 6-32	0	254-5008-06
8	Bumper Post 6-32 Tapped	0	530-5127-00	23	Spacer 1 1/4" Hex Tapped 6-32	0	254-5008-11
9	Post Machine Screw	0	530-5263-01	24	Spacer 1 1/2" Hex Tapped 6-32	0	254-5008-09
10	Mini-Playfield Support	0	530-5285-00	25	Spacer 1 7/8" Hex Tapped 6-32	0	254-5008-20
11	Spacer Backbox Hinge	2	530-5099-00	26	Spacer 2" Hex Tapped 6-32	1	254-5008-07
12	Spacer 1" Lg Metal 5/16" X .144 I.D.	0	254-5001-00	27	Spacer 2 1/4" Hex Tapped 6-32	1	254-5008-18
13	Spacer 1/4" Long X 5/16" X .144 I.D.	4	254-5014-03	28	Spacer 2 1/2" Hex Tapped 6-32	0	254-5008-16
14	Spacer 1/2" Long X 5/16" X .144 I.D.	3	254-5014-00	29	Spacer 2 5/8" Hex Tapped 6-32	0	254-5008-08

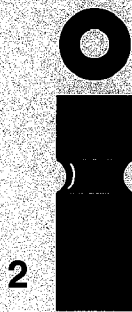
† Items with 0 Qty. are not used in this game.

Please Note, the size and/or quantities may change as production continues.

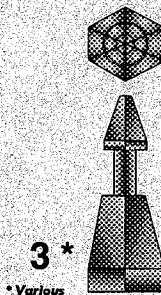
Playfield - Plastic Posts & Spacers (Actual Size) †



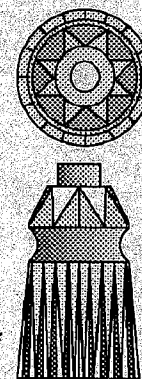
1



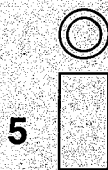
2



3*
* Various Colors



4*
* Various Colors



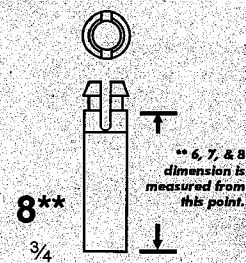
5



6**
1/4



7**
3/8



8**
3/4

** 6, 7, & 8
dimension is
measured from
this point.



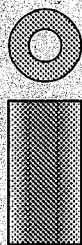
9

1/4



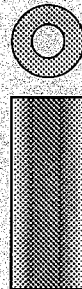
10

1/2



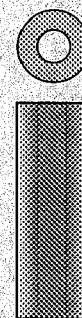
11

3/4



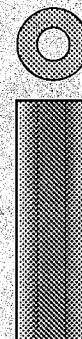
12

1



13

1 1/8



14

1 1/4

Item	Description	Qty.	Part N°	Item	Description	Qty.	Part N°
1	Stand-Off Double Groove 1-1/16"	0	530-5102-01	8**	Spacer 3/4" Plastic Slf. Rtn. SRS6-12-01	0	254-5007-03
2	Plastic Post (Black)	45	550-5059-00	9	Spacer 1/4" Plastic 3/8" (Gray)	1	254-5000-02
3*	Mini-Jewel Post (Clear)	2	550-5052-01	10	Spacer 1/2" Plastic (Gray) 3/8"	0	254-5000-01
4*	Small Jewel Post (Flo. Org.)	6	550-5034-10	11	Spacer 3/4" Plastic 3/8" (Gray)	1	254-5000-07
5	Spacer 1/2" Plstc. Narrow (White) 3/8"	0	254-5000-03	12	Spacer 1" Plastic 3/8" (Gray)	1	254-5000-04
6**	Spacer 1/4" Plastic Slf. Rtn. SRS6-4-01	8	254-5007-02	13	Spacer 1 1/8" Plastic 3/8" (Gray)	0	254-5000-06
7**	Spacer 3/8" Plastic Slf. Rtn. SRS6-6-01	22	254-5007-01	14	Spacer 1 1/4" Plastic 3/8" (Gray)	0	254-5000-05

* For various colors of these items (Jewel Posts), see Color Chart at the end of Unique Parts or Glossary of Terms.

** Dimension is measured from bottom to just under cut-away.

† Items with Ø Qty. are not used in this game.

Please Note, the size and/or quantities may change as production continues.

Playfield - Rubber Parts (Rings Actual Size) †

H

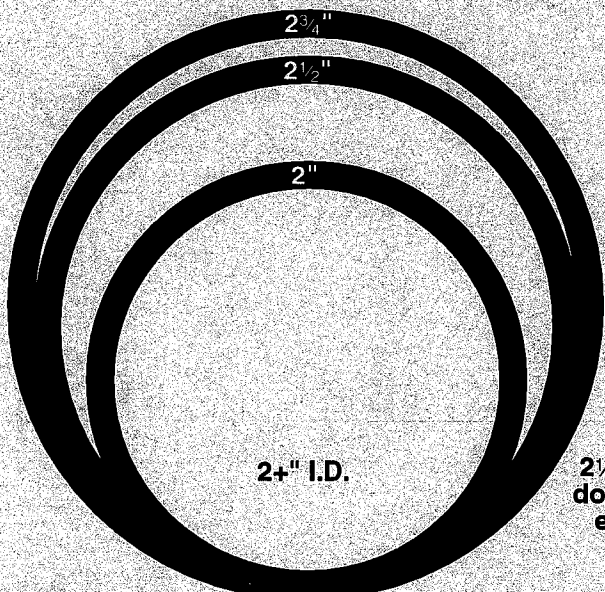
2 3/4" I.D.

I

2 1/2" I.D.

J

2" I.D.

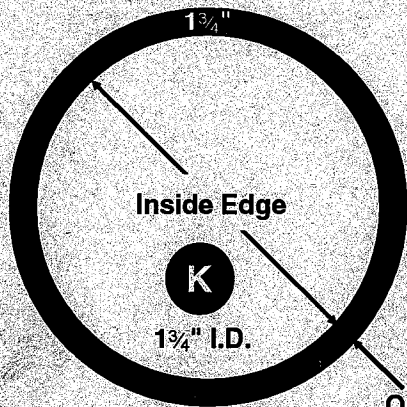


2+\"/>

2 1/4\"/>

How to measure:

Lay ring over circle of closest size. If you see the outside edge of the circle, move to one ring smaller. With the correct size you will see the inside edge of the circle around the inside of the rubber ring. Please note: The rings will stretch with use. Always go to the size smaller. (I.D.=Inside Diameter; O.D.=Outside Diam.)

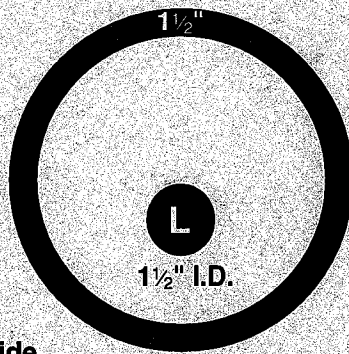


Inside Edge

K

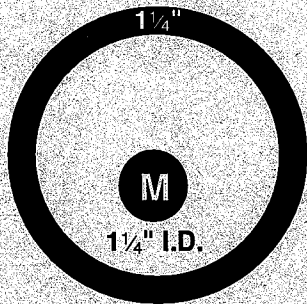
1 3/4\"/>

Outside Edge



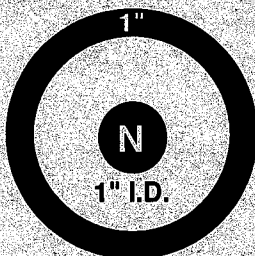
L

1 1/2\"/>



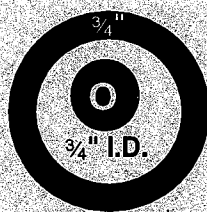
M

1 1/4\"/>



N

1\"/>



O

3/4\"/>



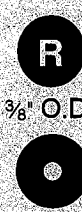
P

5/16\"/>



Q

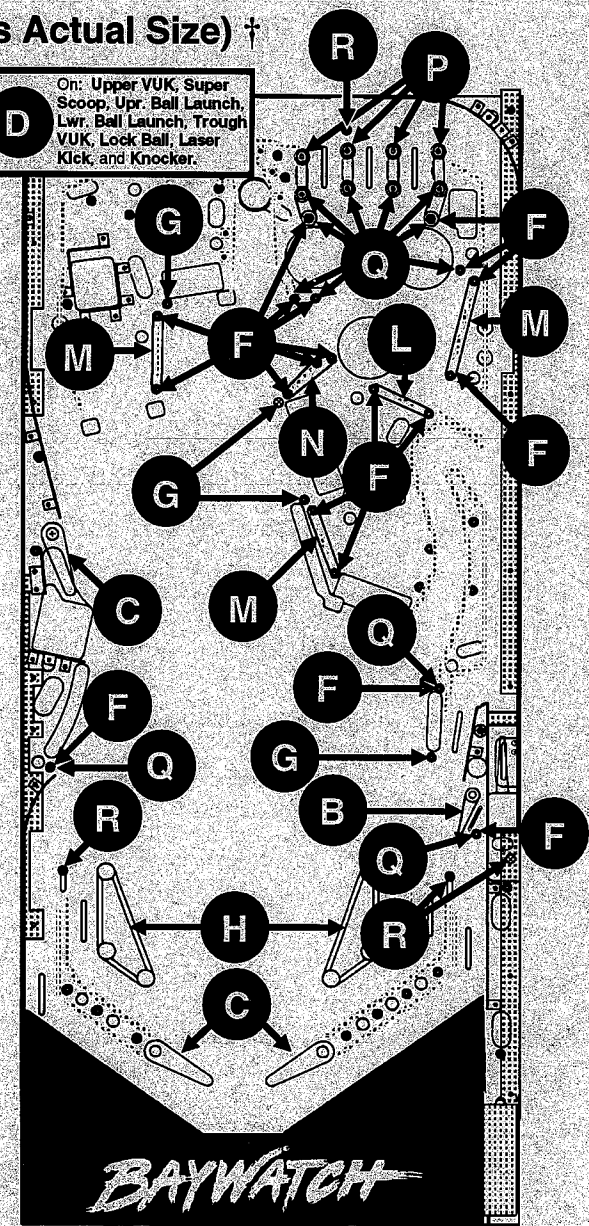
3/16\"/>



R

3/8\"/>

D On: Upper VUK, Super Scoop, Upr. Ball Launch, Lwr. Ball Launch, Trough VUK, Lock Ball, Laser Kick, and Knocker.



BAYWATCH

Item	Description	Qty.	Part N°	Item	Description	Qty.	Part N°
A	Flipper Bushing (Small)	0	545-5192-00	J	2" I.D. Black Rubber Ring	0	545-5348-08
B	Small Flipper Rubber Ring	1	545-5207-00	K	1 3/4" I.D. Black Rubber Ring	0	545-5348-21
C	Large Flipper Rubber Ring	3	545-5277-00	L	1 1/2" I.D. Black Rubber Ring	1	545-5348-07
D	Rubber Bumper (Grommet)	8	545-5105-00	M	1 1/4" I.D. Black Rubber Ring	3	545-5348-06
E	Bumper Post Rubber	0	545-5009-00	N	1" I.D. Black Rubber Ring	1	545-5348-05
F	Post Rubber (Sleeve Short)	19	545-5151-00	O	3/4" I.D. Black Rubber Ring	0	545-5348-04
G	Post Rubber (Sleeve Tall)	4	545-5308-00	P	5/16" I.D. Black Rubber Ring	4	545-5348-02
H	2 3/4" I.D. Black Rubber Ring	2	545-5348-20	Q	3/16" I.D. Black Rubber Ring	12	545-5348-01
I	2 1/2" I.D. Black Rubber Ring	0	545-5348-09	R	3/8" O.D. Black Rubber Ring	4	545-5348-19

† Items with a Zero Qty. are not used in this game.

Please Note, the size and/or quantities may change as production continues.

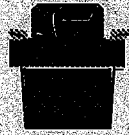
Playfield - Wedge Base Type Bulbs & Sockets (Actual Size) †



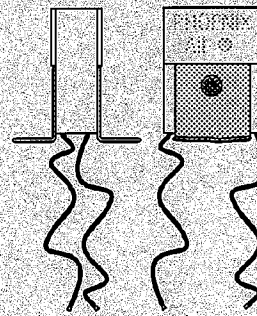
A



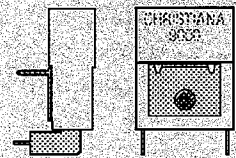
1



2

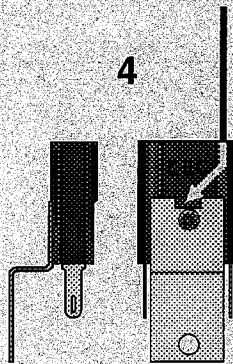


3

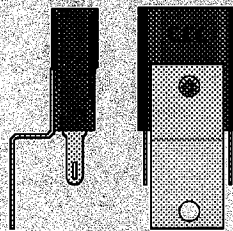


Note the notch in the bracket.
Normally used with Reflectors.

4

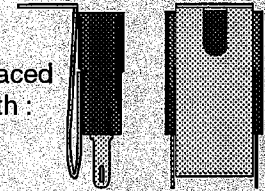


5

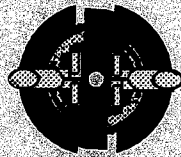


6

replaced with :



B



7

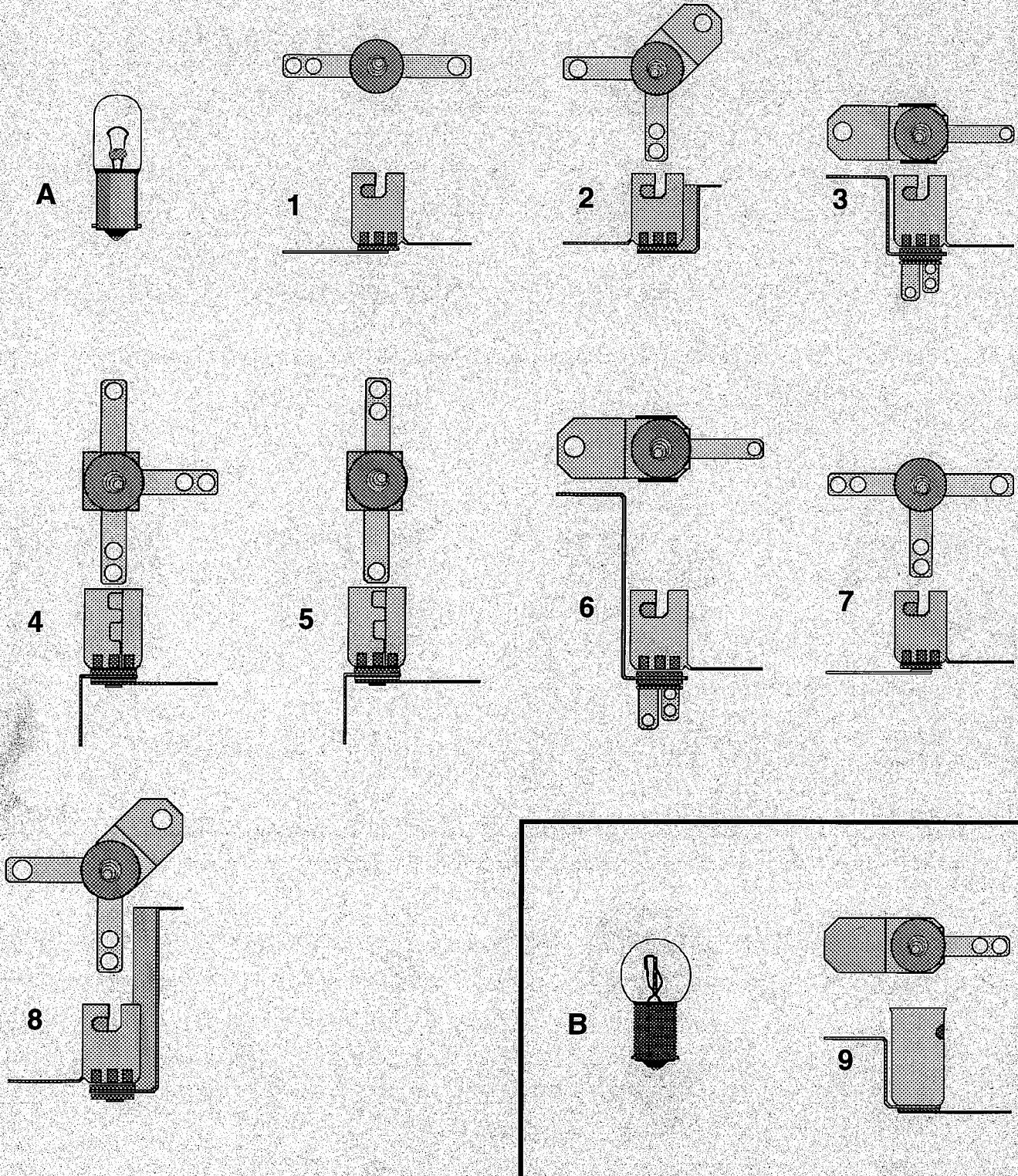
Item	Description	Qty.	Part N ^o	Item	Description	Qty.	Part N ^o
A	#555 Wedge Base Bulb (see note)	50	165-5002-00	4	Laydown Wedge Base L/R Black	2	077-5026-01
1	555 Wedge Base Socket	27	077-5007-00	5	Laydown Wedge Base Black	0	077-5026-00
2	Turbo Pcb Bumper Socket	3	077-5205-00	6	Wedge Offset Brckt. Socket 2-Styles	5	077-5029-00
3	Lamp Board Laydown Wedge Base	13	077-5207-00	B	#906 Wedge Base Bulb	5	165-5004-00
Note: Item 3 normally used only on Lamp Boards.				7	906 Wedge Base Socket	5	077-5016-00

† Items with a Zero Qty. are not used in this game.

-#906 Bulbs used only with 906 Wedge Base Sockets; This game, all are located in the Mini-Mars on the Wire Ramps.

Please Note, the quantities may change as production continues.

Playfield - Bayonet Type Bulbs & Sockets (Actual Size) †

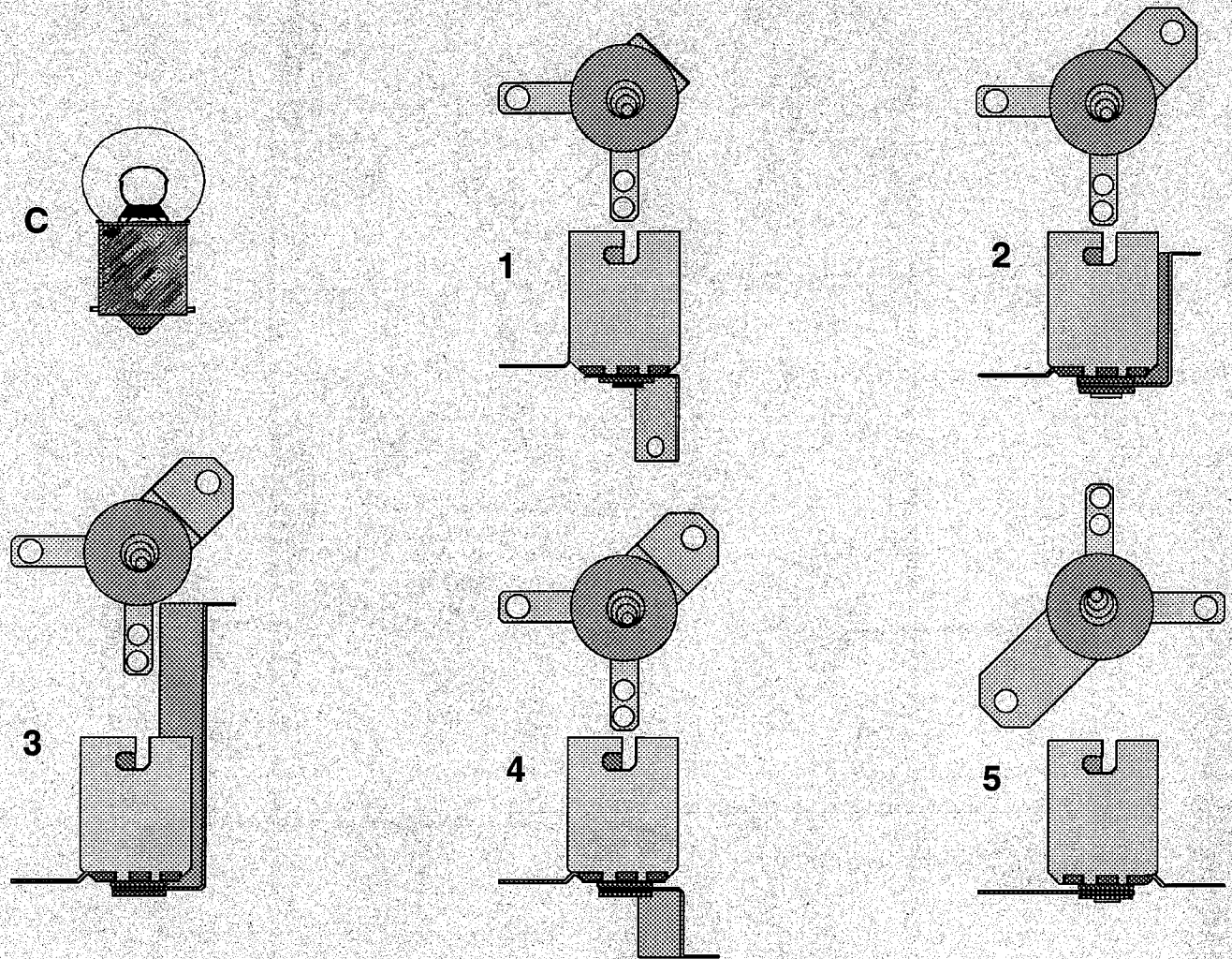


Item	Description	Qty.	Part N°	Item	Description	Qty.	Part N°
A	#44 Bulb	78	165-5000-44	6	3-Lug Stand-Up Long Socket	10	077-5009-00
1	2-Lug Staple-Down Socket	61	077-5000-00	7	3-Lug Staple Down Socket	0	077-5001-00
2	2-Lug Stand-Up Short Socket	2	077-5002-00	8	2-Lug Stand-Up Long Socket	2	077-5005-00
3	3-Lug Stand-Up Short Socket	0	077-5008-00				
4	3-Lug Laydown Socket	3	077-5006-00	B	#455 Twinkle Bulb	0	165-5003-00
5	2-Lug Laydown Socket	0	077-5003-00	9	1-Lug Stand-Up Long Socket	0	077-5012-00

† Items with a Ø Qty. not used in this game. 1 bulb per socket. Item B Bulb normally goes with Item 9 but can be used with Items 1-8.

Please Note, the quantities may change as production continues.

Playfield - Large Bayonet Type Bulb & Sockets (Actual Size) †

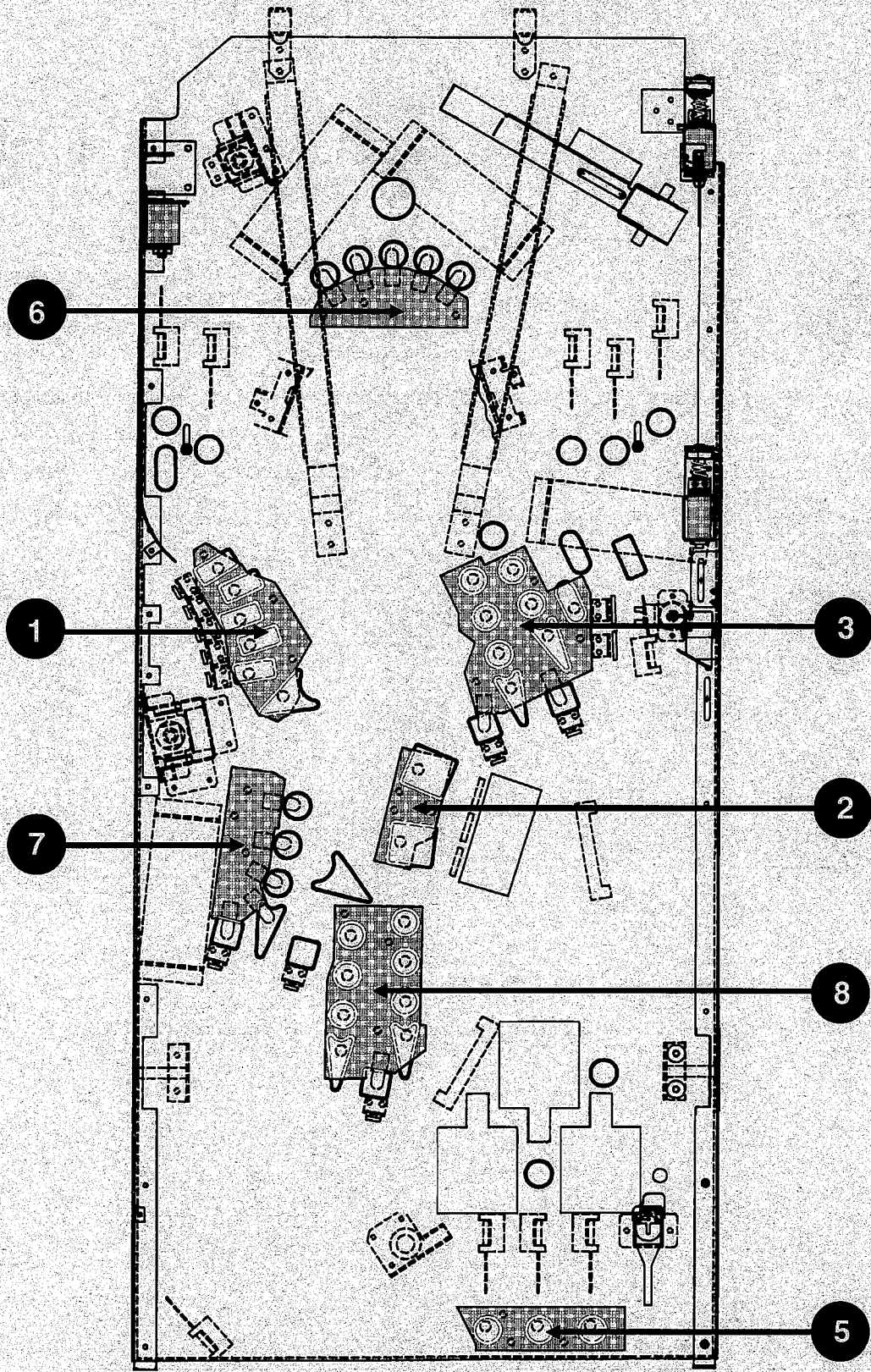


Item	Description	Qty.	Part N°	Item	Description	Qty.	Part N°
C	#89 Bulb	24	165-5000-89	3	Stand-Up, Long Socket	3	077-5102-00
1	Laydown Standard Socket	3	077-5100-00	4	Stand-Up, Socket Rev. Short	0	077-5103-00
2	Stand-Up, Short Socket	18	077-5101-00	5	Straight Leg Socket	0	077-5107-00

† Items with a Ø Qty. not used in this game.

Please Note, the quantities may change as production continues.

Playfield - Lamps Boards †

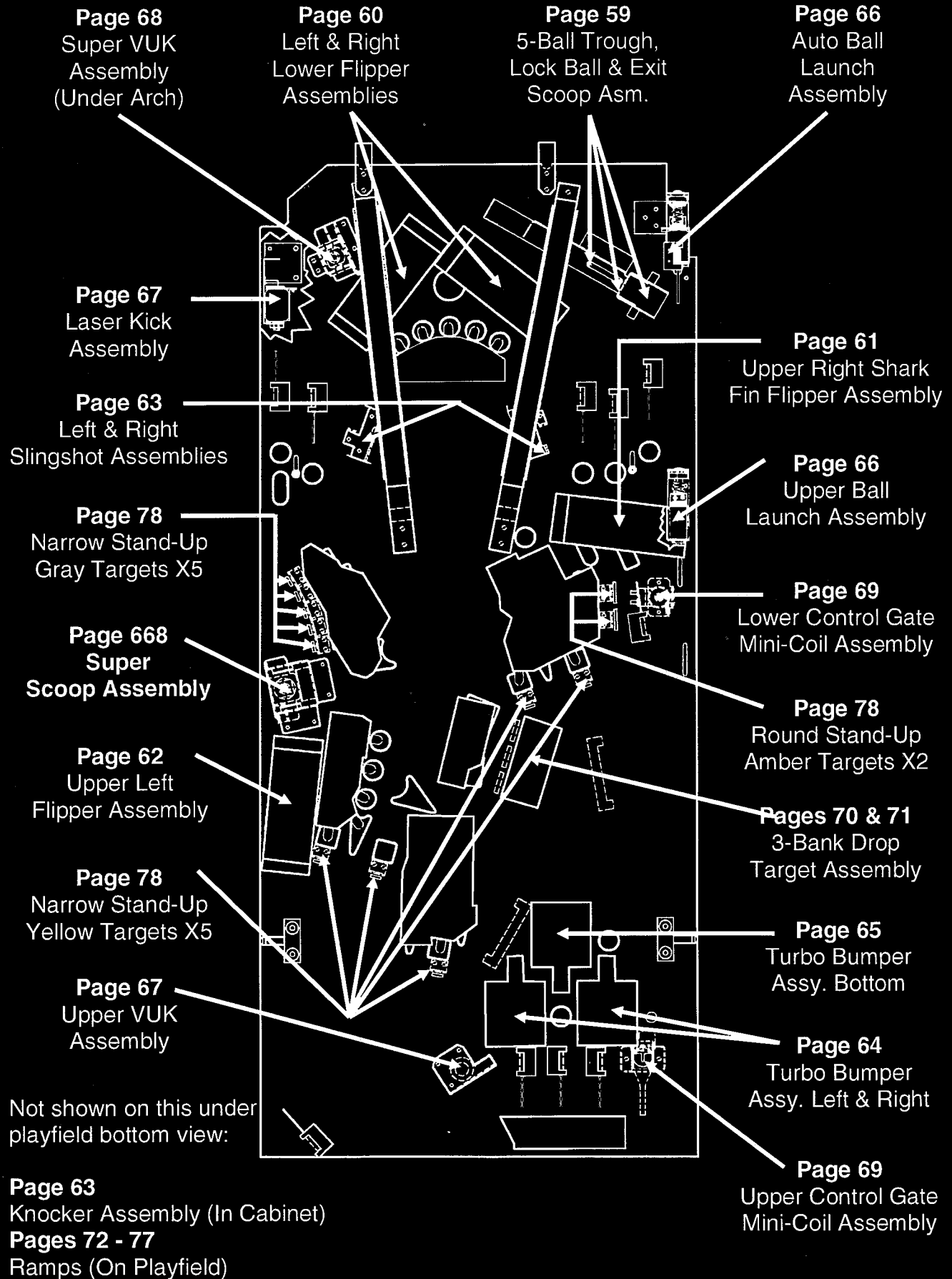


Item	Lamp Board Part N°	Item	Lamp Board Part N°	Item	Lamp Board Part N°	Item	Lamp Board Part N°
1	520-5114-01	3	520-5114-03	5	520-5114-05	7	520-5114-07
2	520-5114-02	4	Not Used	6	520-5114-06	8	520-5114-08

Note: 2 types of sockets are being used with the #555 Wedge Base Bulbs (165-5000-00): Black Wedge Base Socket (077-5007-00) and White Laydown Wedge Base Sockets (077-5207-00).

UNIQUE PARTS IDENTIFICATION (BLUE SECTION)

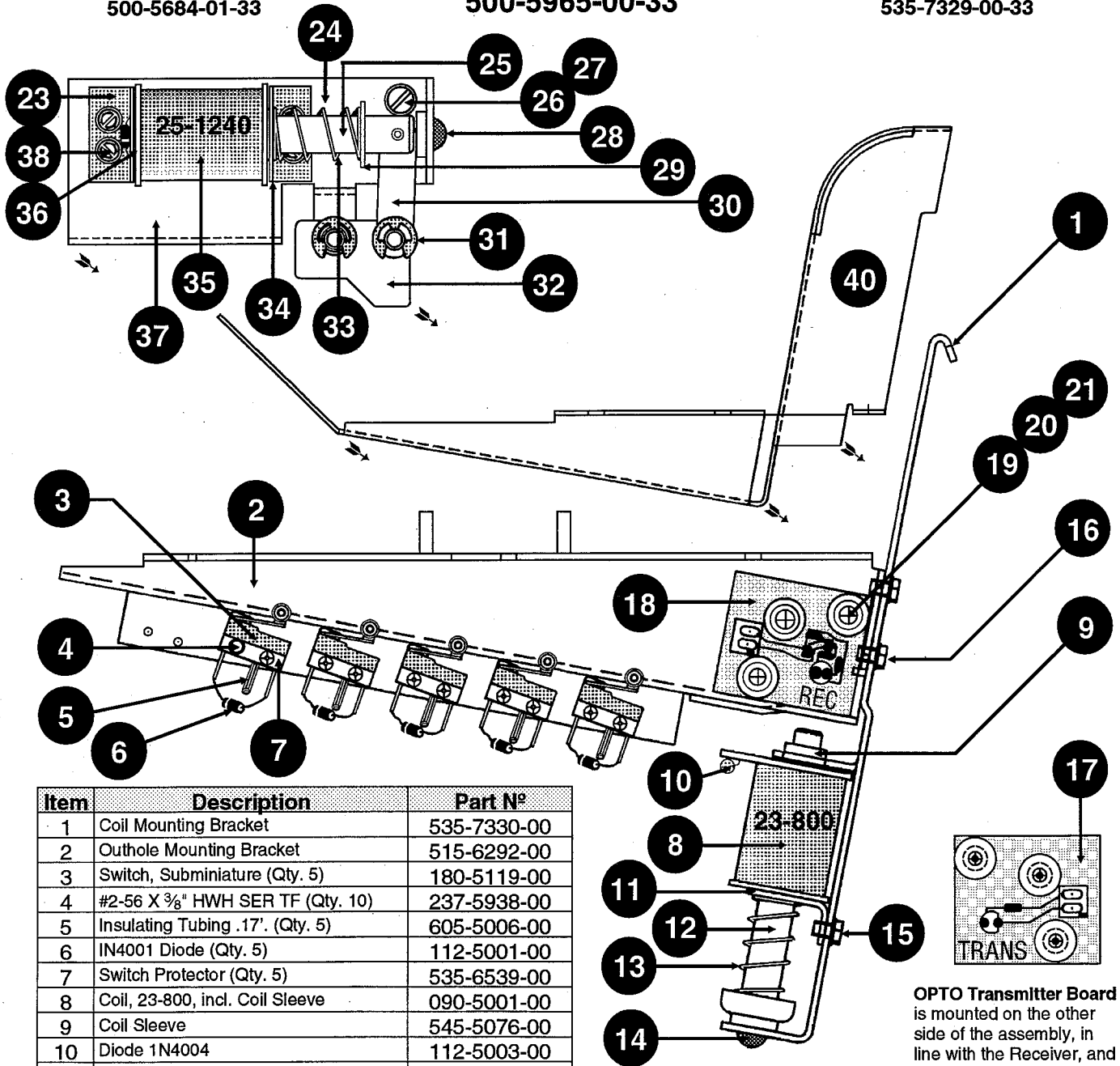
Page Guide



with
Lock Ball Assembly
500-5684-01-33

5-Ball Trough (OPTO) Assembly 500-5965-00-33

with
Ball Trough Exit Scoop
535-7329-00-33

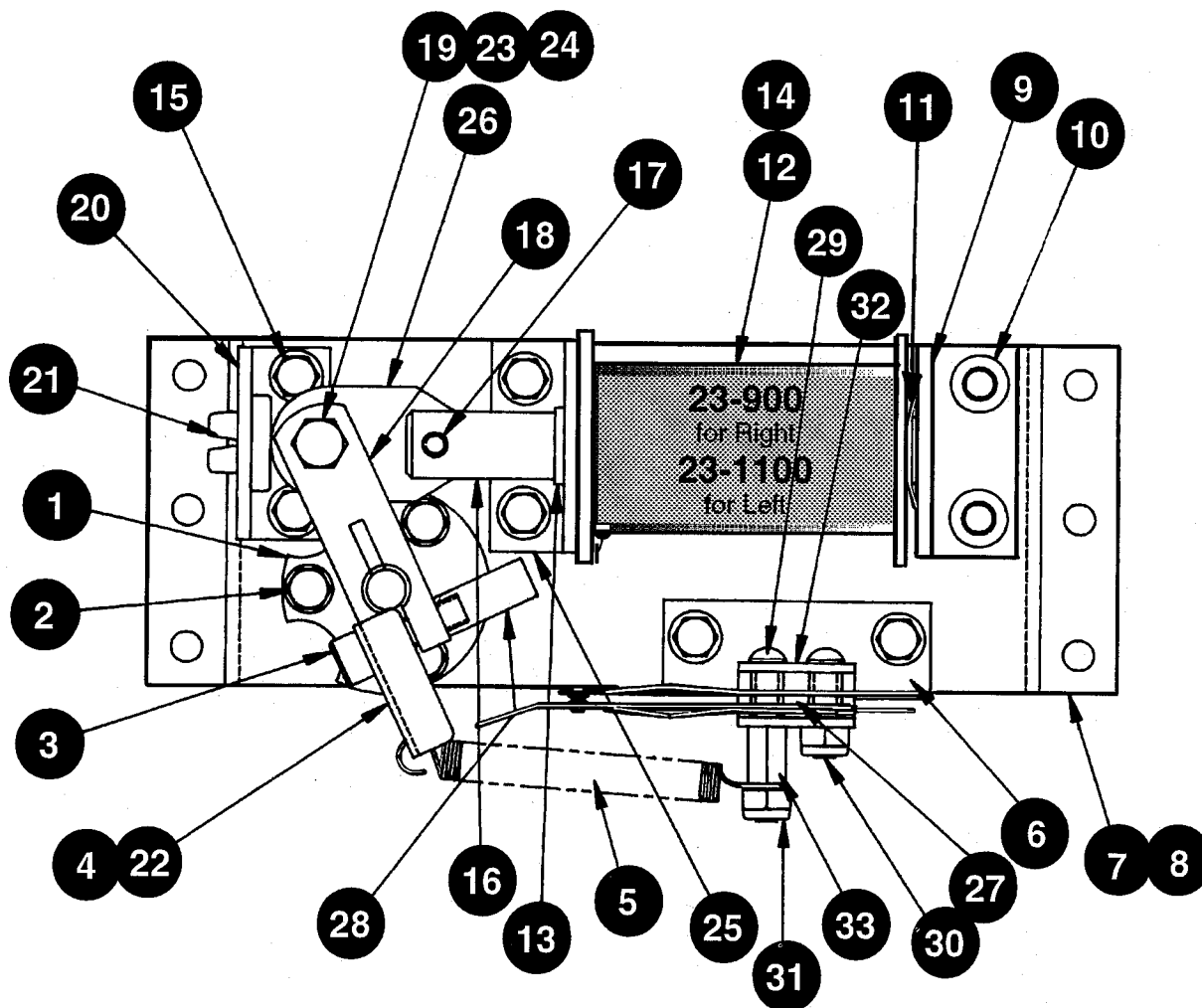


OPTO Transmitter Board is mounted on the other side of the assembly, in line with the Receiver, and with the same hardware.

Item	Description	Part N°
1	Coil Mounting Bracket	535-7330-00
2	Outhole Mounting Bracket	515-6292-00
3	Switch, Subminiature (Qty. 5)	180-5119-00
4	#2-56 X 3/8" HWH SER TF (Qty. 10)	237-5938-00
5	Insulating Tubing .17' (Qty. 5)	605-5006-00
6	1N4001 Diode (Qty. 5)	112-5001-00
7	Switch Protector (Qty. 5)	535-6539-00
8	Coil, 23-800, incl. Coil Sleeve	090-5001-00
9	Coil Sleeve	545-5076-00
10	Diode 1N4004	112-5003-00
11	Coil Retaining Bracket	535-5203-01
12	Plunger Assembly	515-5941-01
13	Spring	266-5020-00
14	Rubber Bumper	545-5105-00
15	#8-32 X .25" HWH SER MS (Qty. 2)	237-5964-00
16	#8-32 X 3/8" HWH SER TF (Qty. 4)	237-5903-00
17	OPTO Transmitter (TRANS) Board	520-5124-00
18	OPTO Receiver (REC) Board	520-5125-00
19	OPTO PCB Tube Spacer (Qty. 6)	530-5308-00
20	OPTO PCB Rubber Grommet (Qty. 6)	545-5518-00
21	#6-32 X 5/8" HWH TF (Qty. 6)	237-5928-00
22	Ball Trough Wire Harness (Not Shown)	036-5377-01
23	Core Stop Assembly	515-5088-00
24	Lock Ball Bracket Assembly	515-5817-01
25	Plunger $\varnothing 7/16"$ X 2.25" LG	530-5250-01
26	Spacer	545-5400-00

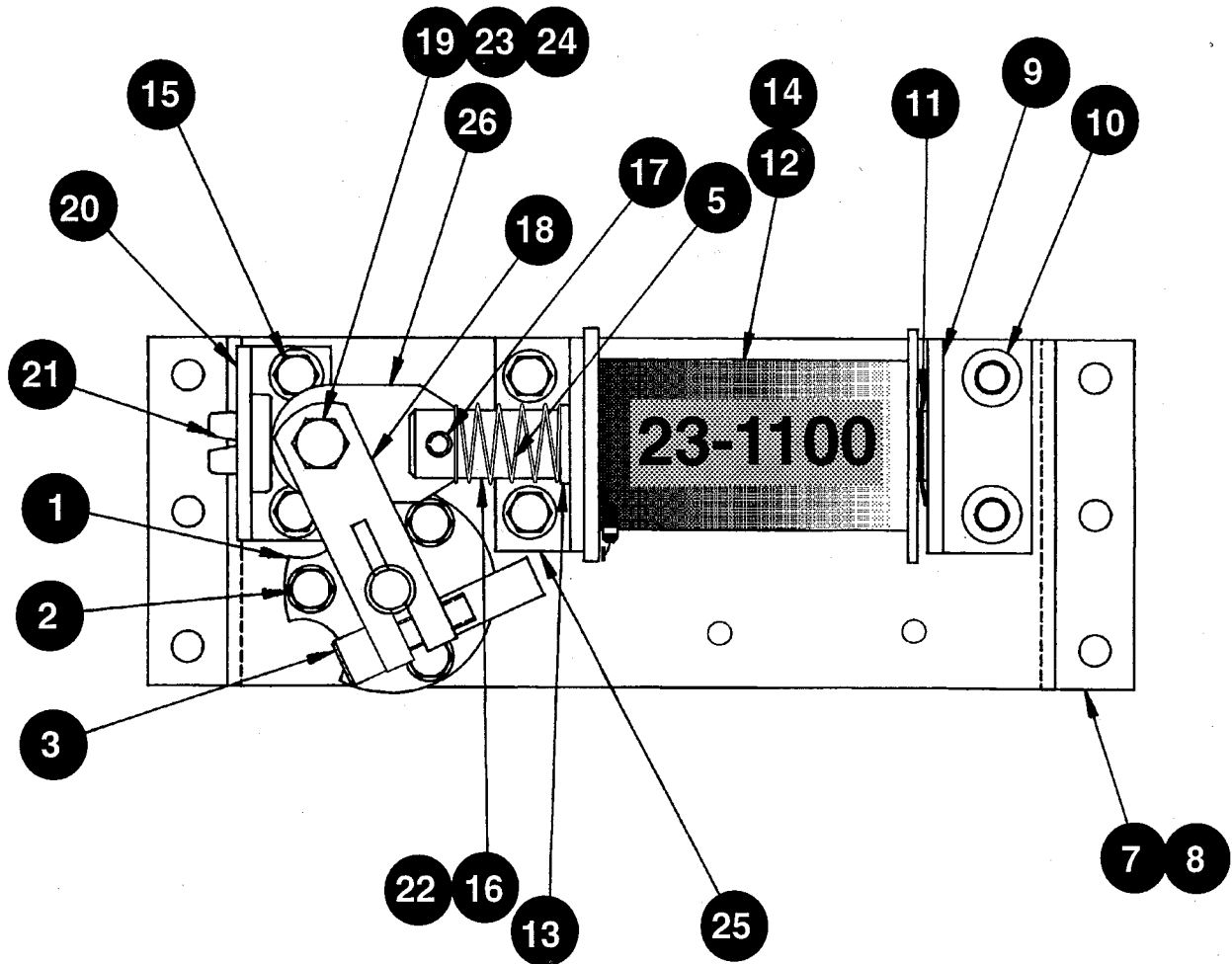
Item	Description	Part N°
27	#8-32 PPH X 1" LG	232-5606-00
28	Rubber Bumper	545-5105-00
29	E-Ring $\varnothing .44$ Shaft	270-5005-00
30	Link, Lock Ball	545-5058-00
31	E-Ring, .25 Shaft (Qty. 2)	270-5002-00
32	Lock Ball Cam Assembly	515-5815-01
33	Spring	266-5000-00
34	Coil Retaining Bracket	535-6658-00
35	Coil, 25-1240, incl. Coil Sleeve	090-5034-00
36	Coil Sleeve	545-5411-00
37	Diode 1N4004	112-5003-00
38	#6-32 HWH TC X .38 LG (Qty. 4)	237-5898-00
39	Lock Ball Wiring Harness (Not Shown)	036-5301-01
40	Ball Trough Exit Scoop	535-7329-00

Flipper Assemblies, Lower
500-5693-01-33 (Right), 500-5832-02-33 (Left)



Item	Description	Part N°	Item	Description	Part N°
1	Flipper Bushing	545-5070-00	17	ϕ 5/32 X 5/8 Roll Pin	251-5000-00
2	#6-32 X .38 LG HWH (Qty. 3)	237-5910-00	18	Pawl	530-5070-00
3	#10-32 SOC HD X .75 LG	237-5864-00	19	#10-32 X .75 LG Shoulder Bolt	231-5019-00
4	Spring Bracket (Left)	535-6663-02	20	Plunger Stop Bracket	535-5279-01
5	Flipper Return Spring	265-5029-02	21	Nylon Stop	545-5445-00
6	Switch Mounting Bracket	535-6664-00	22	Spring Bracket (Right)	535-6663-01
7	Flipper Base (Left)	515-5077-02	23	Bushing	530-5139-00
8	Flipper Base (Right)	515-5077-01	24	#10-32 Elastic Stop Nut	240-5203-00
9	Coil Stop Bracket	515-5346-00	25	Front Bracket	535-6453-00
10	1/4-20 SOC HD X .38 LG (Qty. 2)	237-5861-00	26	Flipper Link	545-5401-00
11	Spring Washer	269-5002-00	27	Power Switch	180-5124-01
12A	RIGHT: Coil 23-900, incl. Coil Sleeve	090-5020-30	28	Plastic Cap	545-5084-00
12B	LEFT: Coil 23-1100, incl. Coil Sleeve	090-5030-00	29	#6-32 X 1" LG PPH	237-5506-00
13	Coil Sleeve	545-5388-00	30	#6-32 X .63 LG PPH	237-5899-00
14	Diode 1N4004	112-5003-00	31	#6-32 Elastic Stop Nut	240-5005-00
15	#8-32 X .38 LG HWH (Qty. 6)	237-5903-00	32	Switch Plate	535-5045-00
16	Plunger and Link Assembly	515-5822-00	33	1/4 Hex Spacer (3/8" Long)	254-5008-12

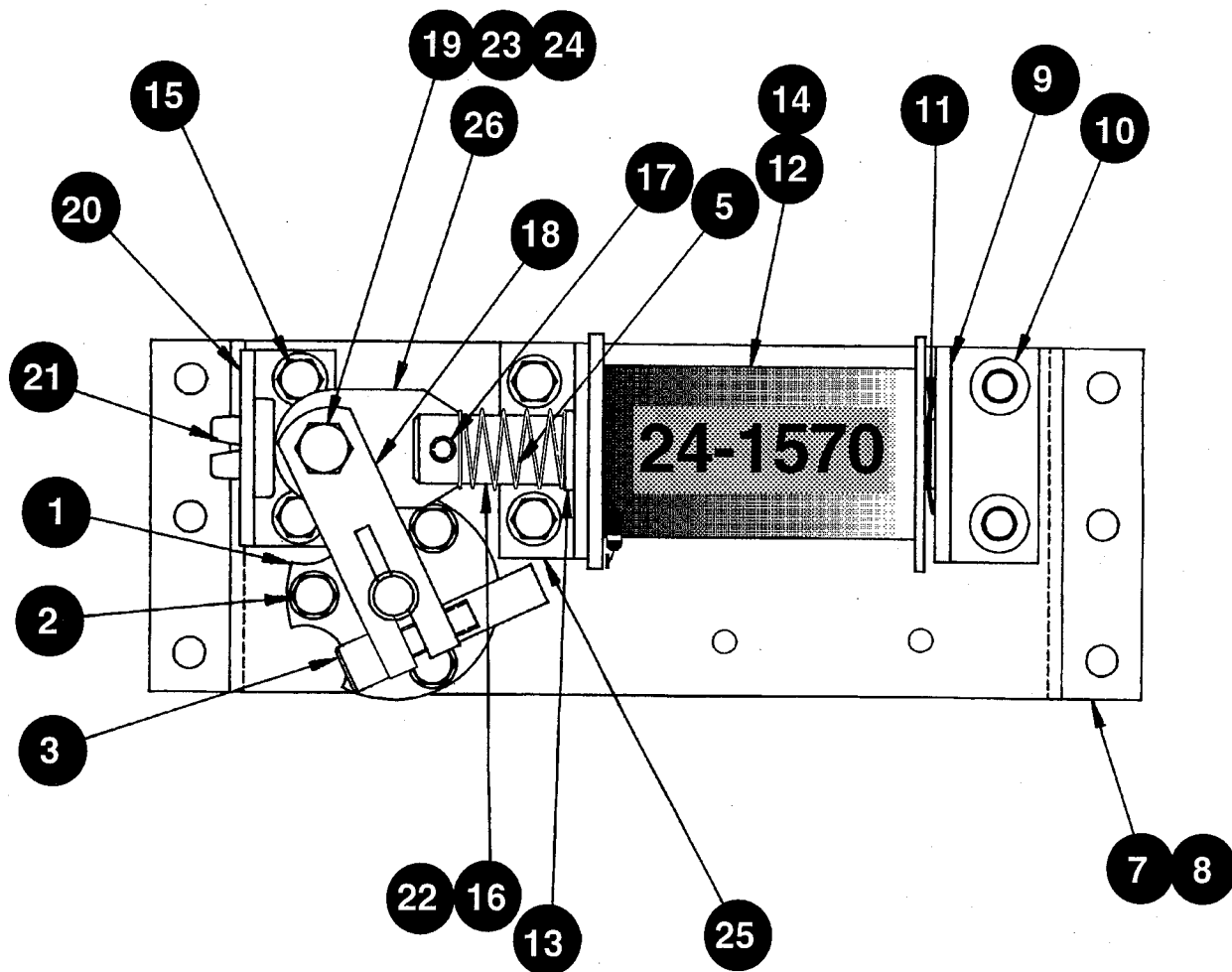
Flipper Assembly, Upper Right 500-5971-01-33



Item	Description	Part N°	Item	Description	Part N°
1	Flipper Bushing	545-5070-00	14	Diode 1N4004	112-5003-00
2	#6-32 X .38 LG HWH (Qty. 3)	234-5000-00	15	#8-32 X .38 LG HWH (Qty. 6)	234-5100-00
3	#10-32 SOC HD X .75 LG	237-5864-00	16	Plunger and Link Assembly	515-5822-00
4	Item Number Not Used.	-----	17	∅ 5/32 x 5/8 Roll Pin	251-5000-00
5	Flipper Return Spring (Compression)	266-5020-00	18	Pawl	530-5070-00
6	Item Number Not Used.	-----	19	#10-32 X .75 LG Shoulder Bolt	231-5019-00
7	Flipper Base (Left)	515-5077-02	20	Plunger Stop Bracket	535-5279-01
8	Flipper Base (Right)	515-5077-01	21	Nylon Stop	545-5445-00
9	Coil Stop Bracket	515-5346-00	22	Flipper Plunger	530-5069-00
10	1/4-20 SOC HD X .38 LG (Qty. 2)	237-5861-00	23	Bushing	530-5139-00
11	Spring Washer	269-5002-00	24	#10-32 Elastic Stop Nut	240-5206-00
12	Coil 23-1100, incl. Coil Sleeve	090-5030-00	25	Front Bracket	535-6453-00
13	Coil Sleeve	545-5388-00	26	Flipper Link	545-5401-00

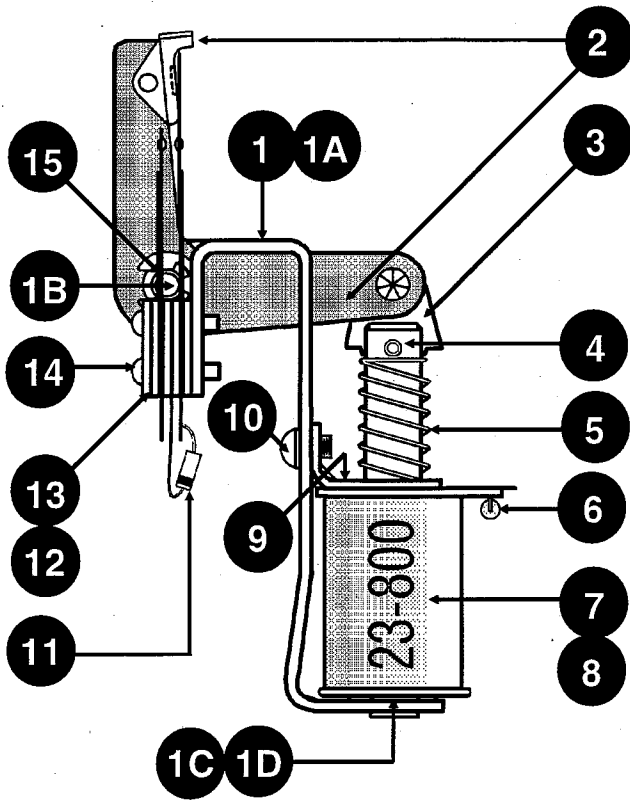
Flipper Assembly, Upper Left

500-5983-02-33



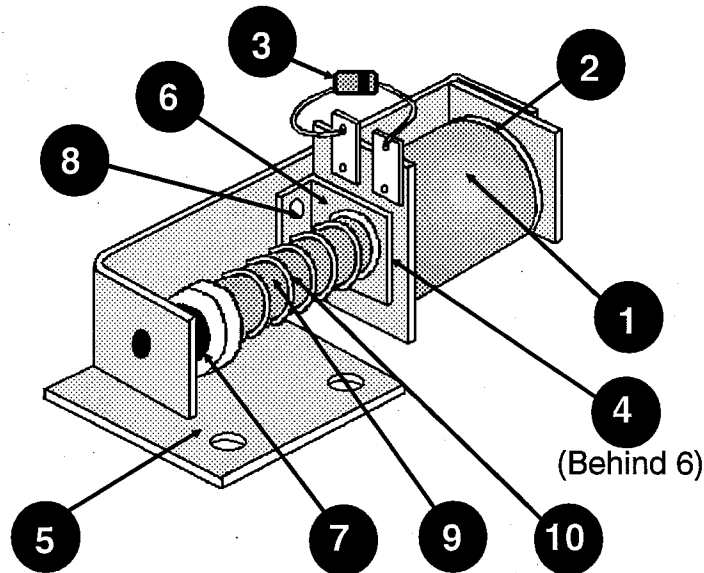
Item	Description	Part N°	Item	Description	Part N°
1	Flipper Bushing	545-5070-00	14	Diode 1N4004	112-5003-00
2	#6-32 X .38 LG HWH (Qty. 3)	234-5000-00	15	#8-32 X .38 LG HWH (Qty. 6)	234-5100-00
3	#10-32 SOC HD X .75 LG	237-5864-00	16	Plunger and Link Assembly	515-5822-00
4	Item Number Not Used.	-----	17	∅ 5/32 X 5/8 Roll Pin	251-5000-00
5	Flipper Return Spring (Compression)	266-5020-00	18	Pawl	530-5070-00
6	Item Number Not Used.	-----	19	#10-32 X .75 LG Shoulder Bolt	231-5019-00
7	Flipper Base (Left)	515-5077-02	20	Plunger Stop Bracket	535-5279-01
8	Flipper Base (Right)	515-5077-01	21	Nylon Stop	545-5445-00
9	Coil Stop Bracket	515-5346-00	22	Flipper Plunger	530-5069-00
10	1/4-20 SOC HD X .38 LG (Qty. 2)	237-5861-00	23	Bushing	530-5139-00
11	Spring Washer	269-5002-00	24	#10-32 Elastic Stop Nut	240-5206-00
12	Coil 24-1570, incl. Coil Sleeve	090-5025-00	25	Front Bracket	535-6453-00
13	Coil Sleeve	545-5388-00	26	Flipper Link	545-5401-00

Slingshot Assemblies 500-5849-00-33



Item	Description	Part N°
1	Slingshot Bracket Assembly	515-5339-01
1A	Slingshot Bracket	535-5919-01
1B	Hinge Stud	530-5034-01
1C	Armature Stop	530-5017-01
1D	Shading Ring	530-5307-00
2	Arm & Tip Assembly	515-5340-01
3	Link	545-5062-00
4	Plunger & Link Assembly	515-5338-00
5	Comp. Spring	266-5020-00
6	Diode 1N4004	112-5003-00
7	Coil 23-800, incl. Coil Sleeve	090-5001-02
8	Coil Sleeve	545-5031-00
9	Coil Retaining Bracket	535-5203-03
10	#8-32 X 1/4" Screw (Qty. 2)	232-5300-00
11	Diode 1N4001	112-5001-00
12	Slingshot Switch (Qty. 2)	180-5054-00
13	Tension Switch Plate (Qty. 2)	535-5846-00
14	#4-40 X 1/2" Screw (Qty. 4)	237-5837-00
15	1/4" Retaining Ring (Qty. 2)	270-5002-00

Knocker Assembly (In Cabinet) 500-5081-00-33*

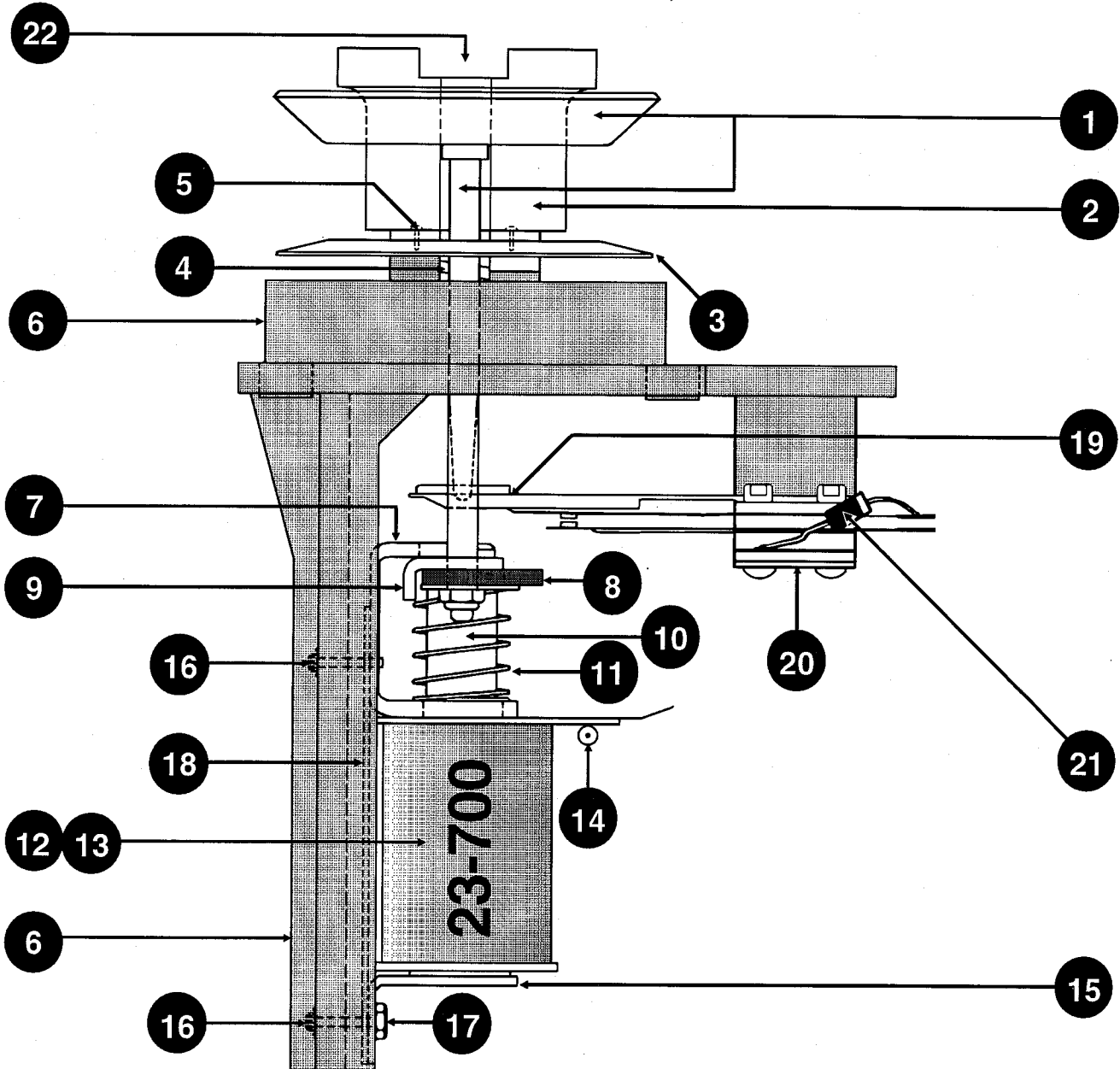


Item	Description	Part N°	Item	Description	Part N°
1	Coil 23-800, incl. Coil Sleeve	090-5001-01	6	Coil Retainer Bracket	535-5203-03
2	Coil Sleeve	545-5076-00	7	Bumper Pad	545-5105-00
3	Diode 1N4004	112-5003-00	8	#8-32 X 1/4" PH PAN SEMS (Qty. 2)	232-5300-00
4	Crescent Spring Washer	269-5002-00	9	Plunger Assembly	515-5000-02
5	Kickback/Knocker Bracket	535-5265-00	10	Spring	266-5020-00

* NOTE: The Knocker Assembly is interchangeable with the Laser Kick Assembly (500-5838-00) except for the Diode Position @ 90° Diff.

Turbo Bumper Assemblies, Upper Left & Right

500-5227-02-33 †



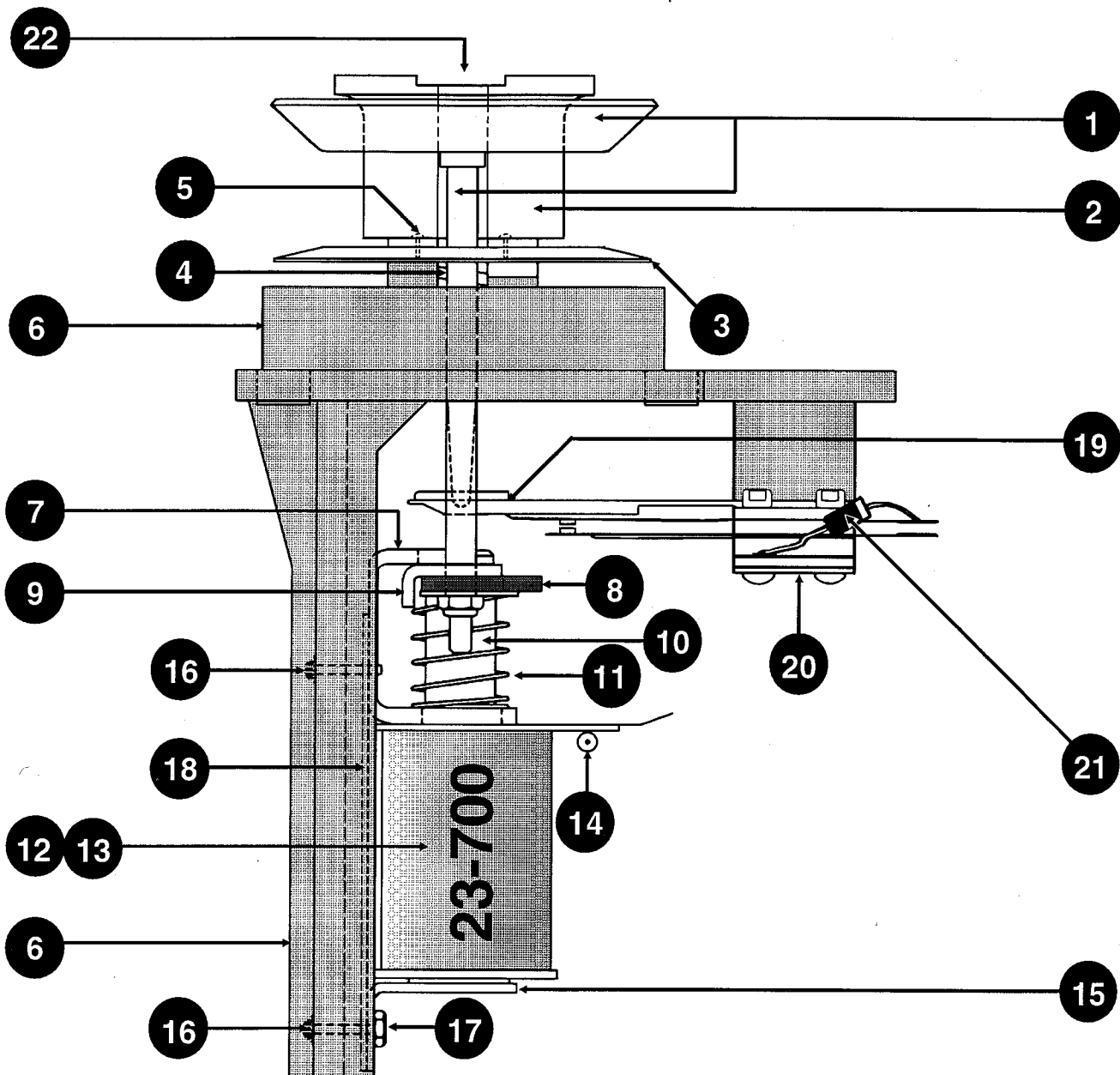
Item	Description	Part N°	Item	Description	Part N°
1	Rod & Ring Assembly	515-5085-00	12	Coil 23-700, incl. Coil Sleeve	090-5022-02
2	Bumper Housing	545-5197-00	13	Coil Sleeve	545-5031-00
3	Bumper Skirt	545-5098-00	14	Diode 1N4004	112-5003-00
4	Bumper Skirt Spring	266-5048-00	15	Coil Stop Assembly	515-5088-00
5	#6-32 X 3/4 PPH Screw (Qty. 2)	237-5504-00	16	#6-32 X 1/2 PPH Screw (Qty. 4)	237-5502-00
6	Bumper Body	545-5100-00	17	#6-32 Nyloc Nut (Qty. 2)	240-5005-00
7	Plunger Bracket	535-5277-00	18	Backplate	535-7419-00
8	Fiber Yoke	545-5120-00	19	Spoon Switch	545-5542-00
9	Metal Yoke	535-5877-00	20	Switch	180-5015-02
10	Plunger	530-5062-00	21	Diode 1N4001	112-5001-00
11	Spring	266-5009-00	22	Lamp Socket	077-5205-00

† Bumper Cover(s) (not shown) not included with above assembly, it must be ordered separately.

Note Bumper Cover (See Playfield Parts) 550-5057-XX This game the -XX should be replaced with "-10" Flo. Orange. See Color Chart at the end of this chapter for alternate colors.

Turbo Bumper Assembly, Bottom

500-5227-03-33 †

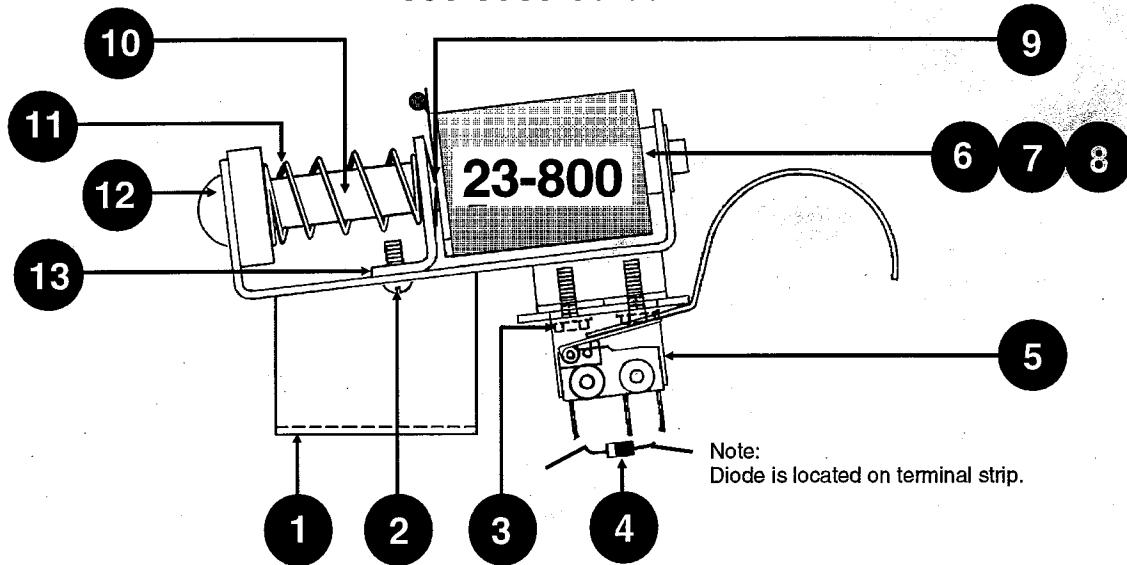


Item	Description	Part N°	Item	Description	Part N°
1	Rod & Ring Assembly	515-5085-00	12	Coil 23-700, incl. Coil Sleeve	090-5022-02
2	Bumper Housing	545-5197-01	13	Coil Sleeve	545-5031-00
3	Bumper Skirt	545-5098-00	14	Diode 1N4004	112-5003-00
4	Bumper Skirt Spring	266-5048-00	15	Coil Stop Assembly	515-5088-00
5	#6-32 X 3/4 PPH Screw (Qty. 2)	237-5504-00	16	#6-32 X 1/2 PPH Screw (Qty. 4)	237-5502-00
6	Bumper Body	545-5100-00	17	#6-32 Nyloc Nut (Qty. 2)	240-5005-00
7	Plunger Bracket	535-5277-00	18	Backplate	535-7419-00
8	Fiber Yoke	545-5120-00	19	Spoon Switch	545-5542-00
9	Metal Yoke	535-5877-00	20	Switch	180-5015-02
10	Plunger	530-5062-00	21	Diode 1N4001	112-5001-00
11	Spring	266-5009-00	22	Lamp Socket	077-5205-00

† Bottom Turbo Bumper does not use a Cover, instead a butyrate is used (830-5475-12).

Auto Ball Launch Assembly

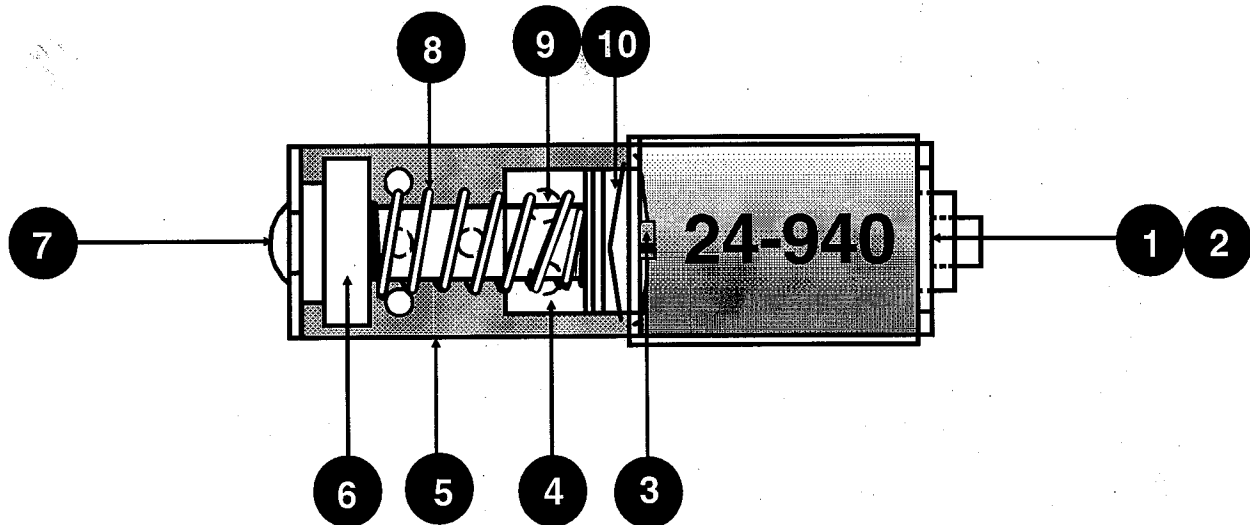
500-5969-00-33



Item	Description	Part N°	Item	Description	Part N°
1	Shooter Mounting Bracket	535-7331-00	8	Diode, 1N4004	112-5003-00
2	8-32 X .25" PPH SEMS (Qty. 2)	232-5300-00	9	.531" ID X .75" OD X .01 THK.	269-5002-00
3	#6 X 3/8" HWH TC (Qty. 2)	234-5000-00	10	Plunger Assembly	515-5000-02
4	Diode 1N4001	112-5001-00	11	Relay Spring	266-5020-00
5	Micro Switch Assembly	500-5707-00	12	Rubber Bumper (Grommet)	545-5105-00
6	Coil, 23-800, incl. Coil Sleeve	090-5001-01	13	Coil Retainer Bracket	535-5203-01
7	Coil Sleeve	545-5076-00			

Upper Ball Launch (Kick Big) Assembly

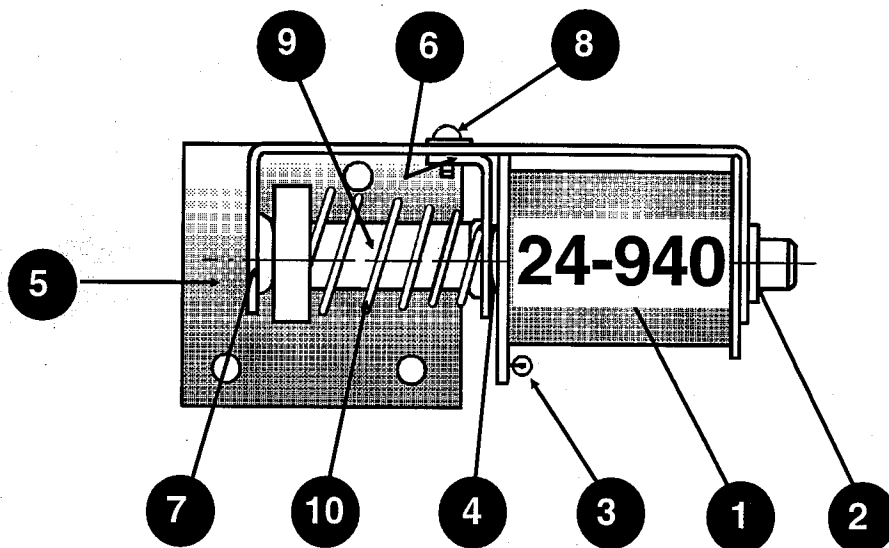
500-5862-06-33



Item	Description	Part N°	Item	Description	Part N°
1	Coil 24-940, incl. Coil Sleeve	090-5036-01	6	Plunger Assembly	515-5000-02
2	Coil Sleeve	545-5076-00	7	Rubber Bumper (Grommet)	545-5105-00
3	Diode 1N4004	112-5003-00	8	Spring	266-5020-00
4	Bracket	535-5203-01	9	8-32 X 1/4 SEMS (Qty. 2)	232-5300-04
5	Frame	535-6730-00	10	Spring Washer	269-5002-00

Laser Kick Assembly (Under Arch)

500-5838-01-33*



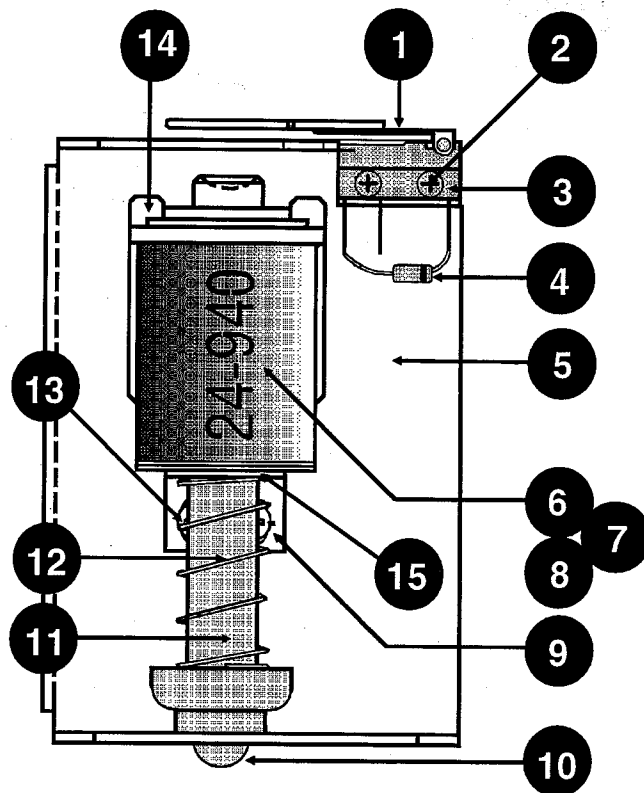
Item	Description	Part N°	Item	Description	Part N°
1	Coil 23-700, incl. Coil Sleeve	090-5022-01	6	Coil Retainer Bracket	535-5203-03
2	Coil Sleeve	545-5076-00	7	Bumper Pad	545-5105-00
3	Diode 1N4004	112-5003-00	8	#8-32 X 1/4 " PH PAN SEMS (Qty. 2)	232-5300-00
4	Crescent Spring Washer	269-5002-00	9	Plunger Assembly	515-5000-02
5	Kickback/Knocker Bracket	535-5265-00	10	Spring	266-5020-00

* NOTE: The Laser Kick Assembly is interchangeable with the Knocker Assembly (500-5081-00) except for the Diode Position @ 90° Diff.

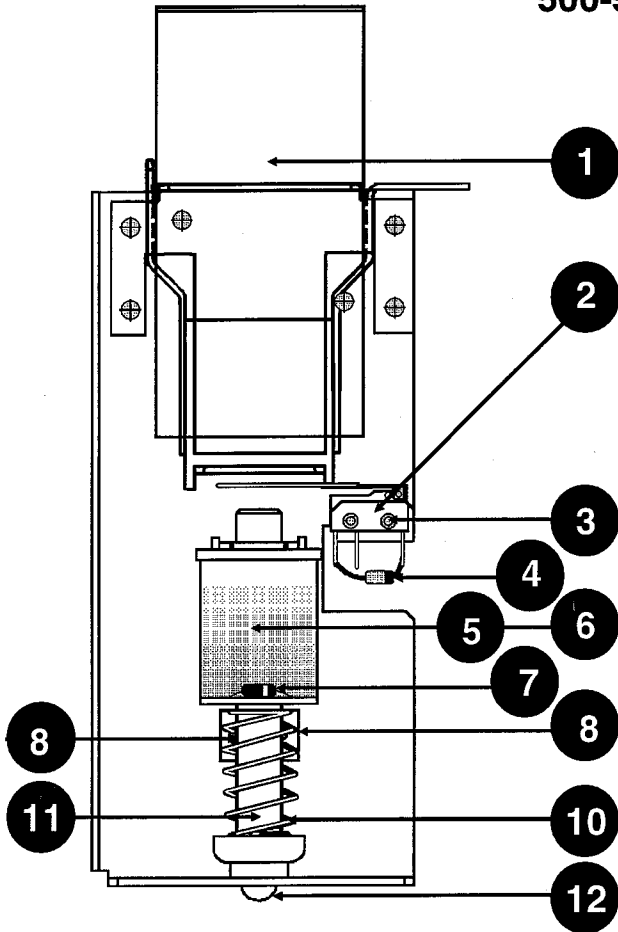
Vertical Up-Kicker (VUK) Assembly

500-5839-01-33

Item	Description	Part N°
1	Switch	180-5116-00
2	Screw (Qty. 2)	237-5806-00
	Washer (Qty. 2)	244-5001-00
3	Protector	535-6539-00
4	Diode 1N4001	112-5001-00
5	Bracket	535-6607-01
6	Coil 24-940, incl. Coil Sleeve	090-5036-01
7	Coil Sleeve	545-5076-00
8	Diode, 1N4004	112-5003-00
9	Bracket	535-5203-01
10	Bumper Pad	545-5105-00
11	Spring	266-5020-00
12	Plunger	515-5941-01
13	Screw (Qty. 2)	232-5300-00
14	Insulation	545-5431-00
15	Crescent Spring Washer	269-5000-02

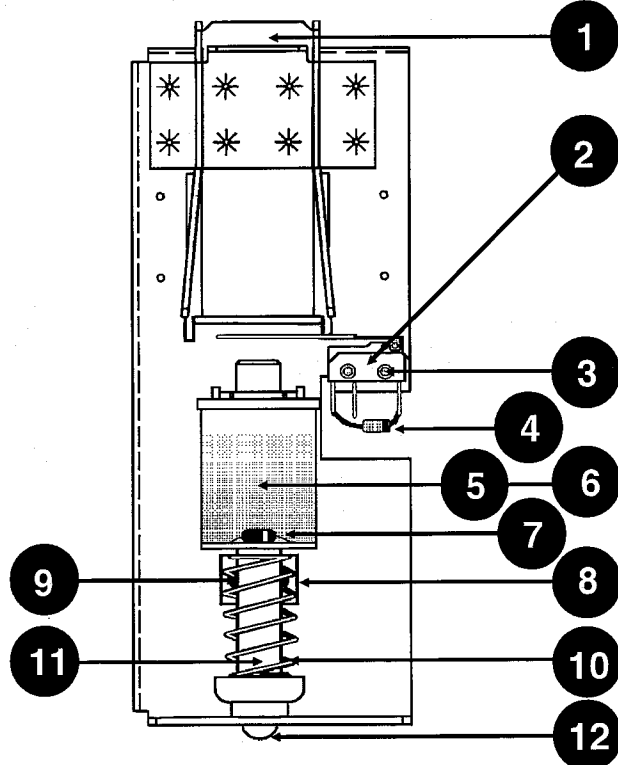


Super Scoop (VUK) Assembly 500-5953-00-33



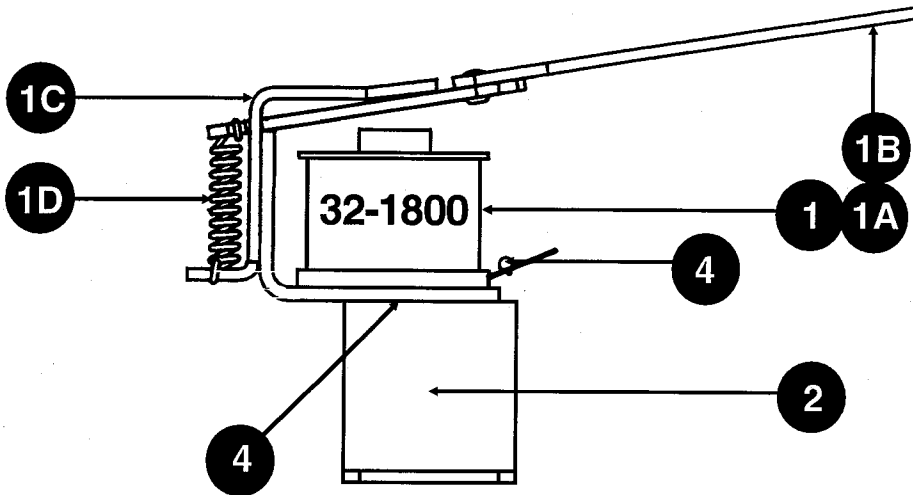
Item	Description	Part N°
1	Super Scoop Weld Assembly	515-6280-00
2	Switch	180-5116-00
3	Screw (Qty. 2)	232-5937-00
4	Diode, 1N4001	112-5001-00
5	Coil, 24-940, incl. Coil Sleeve	090-5036-01
6	Coil Sleeve	545-5076-00
7	Diode, 1N4004	112-5003-00
8	Bracket	535-5203-01
9	Screw (Qty. 2)	232-5300-00
10	Spring	266-5020-00
11	Plunger	515-5941-01
12	Bumper Pad (Grommet)	545-5105-00

Super VUK Assembly (Under Arch) 500-5880-00-33



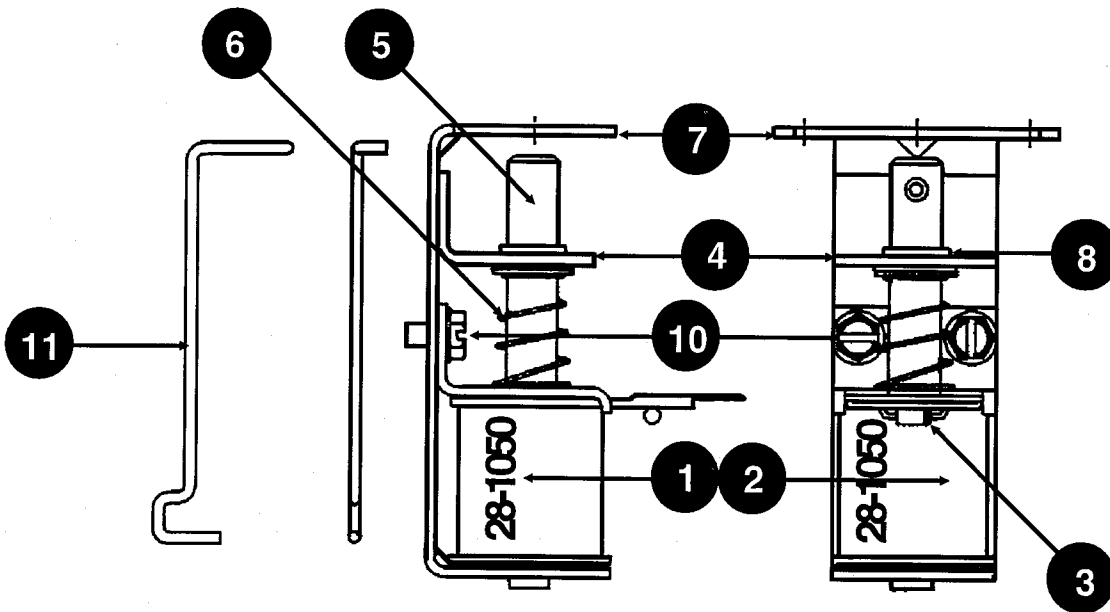
Item	Description	Part N°
1	Super VUK Weld Assembly	515-6123-00
2	Switch	180-5116-00
3	Screw (Qty. 2)	232-5937-00
4	Diode, 1N4001	112-5001-00
5	Coil, 24-940, incl. Coil Sleeve	090-5036-01
6	Coil Sleeve	545-5076-00
7	Diode, 1N4004	112-5003-00
8	Bracket	535-5203-01
9	Screw (Qty. 2)	232-5300-00
10	Spring	266-5020-00
11	Plunger	515-5941-01
12	Bumper Pad (Grommet)	545-5105-00

Mini-Coil Assembly (for Upper Control Gate*)
500-5968-00-33



Item	Description	Part N°	Item	Description	Part N°
1	Gate Lift Coil and Plate Assembly	515-6277-00	1D	Spring	265-5024-00
1A	Mini-Coil (Small Bobin), 32-1800	090-5031-00	2	Mini-Coil Support	535-7296-00
1B	Armature Assembly	515-6278-00	3	8-32 X 3/8 PHMS SEMS	232-5301-00
1C	Frame	535-6198-00	4	Diode, 1N4004	112-5003-00

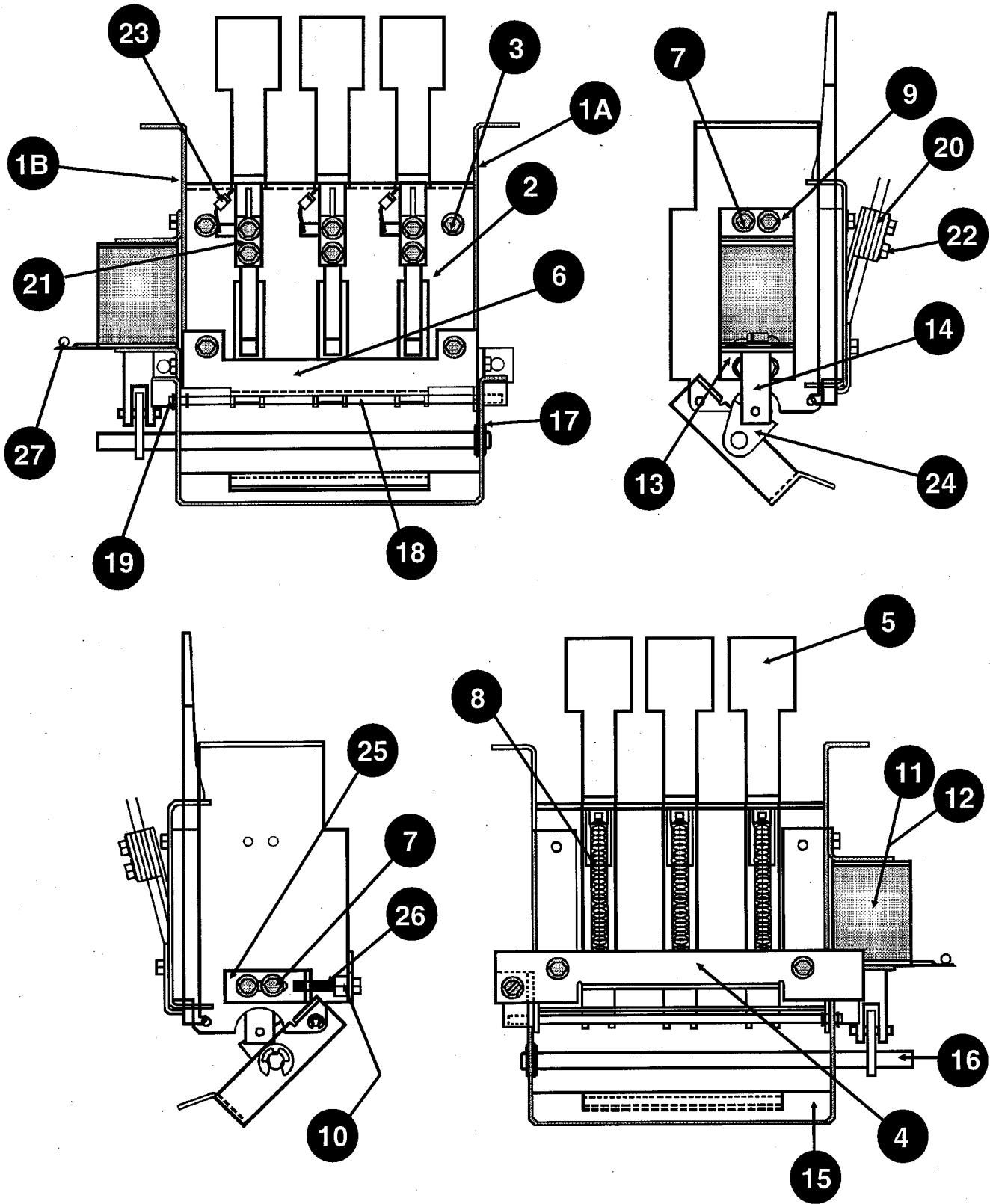
Mini-Coil Assembly (for Lower Control Gate*)
500-5957-00-33



Item	Description	Part N°	Item	Description	Part N°
1	Mini-Coil, 28-1050 (Small Bobin)	090-5046-00	7	Bracket Weldment	515-6287-00
2	Mini-Coil Sleeve (Small Bobin)	545-5442-00	8	Nyliner	545-5485-00
3	Diode, 1N4004	112-5003-00	9	Retaining Ring	270-5003-00
4	Mini-Coil Retainer (Mount)	535-7321-01	10	6-32 X .25" HWTF (Qty. 2)	237-5952-00
5	Plunger	530-5347-00	11	Wire Actuator	535-7322-00
6	Mini-Eject Spring	266-5043-00	* Note: See Playfield Parts (Pink Section) for Control Gate Parts.		

3-Bank Drop Target Assembly

500-5970-00-33



(See Next Page for Table & Notes)

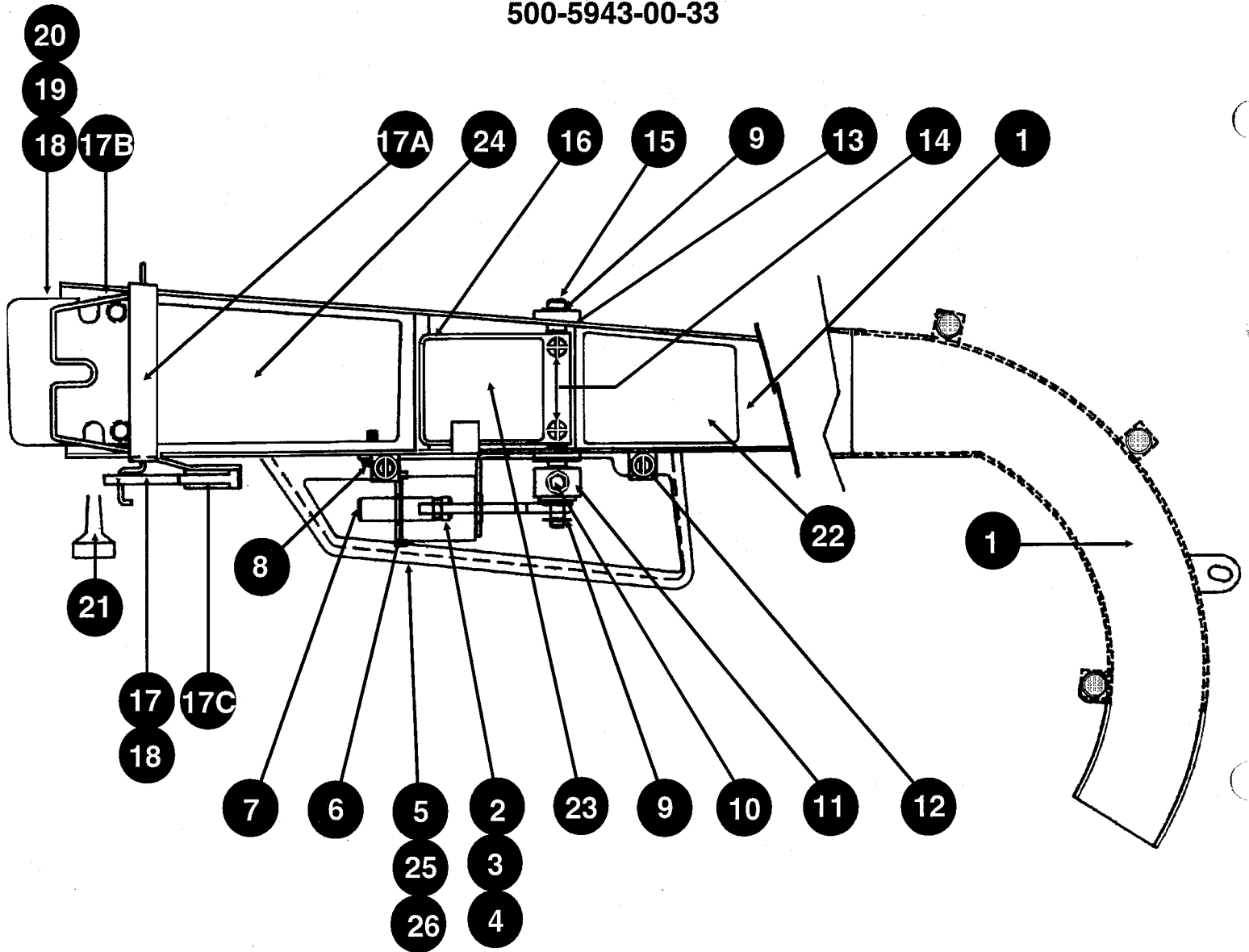
3-Bank Drop Target Assembly † 500-5970-00-33

Item	Description	Part N°	Item	Description	Part N°
1A	Target End Plate	535-6162-00	13	Plunger Stop Bracket	515-5088-00
1B	Target End Plate Notched (This Assy.)	535-6162-01	14	Plunger/Link Assembly	515-5338-00
2	Target Frame for 5-Bank	535-6159-05	15	Target Lift Bracket for 5-Bank	535-6509-05
2	Target Frame for 4-Bank	535-6159-04	15	Target Lift Bracket for 4-Bank	535-6509-04
2	Target Frame for 3-Bank	535-6159-03	15	Target Lift Bracket for 3-Bank	535-6509-03
3	8-32 X 3/8 (Qty. 6)	237-5879-00	16	Target Shaft for 5-Bank	530-5179-05
4	Spring Mount. Plate for 5-Bank	535-6510-05	16	Target Shaft for 4-Bank	530-5179-04
4	Spring Mount. Plate for 4-Bank	535-6510-04	16	Target Shaft for 3-Bank	530-5179-03
4	Spring Mount. Plate for 3-Bank	535-6510-03	17	E-Ring (1/4")	270-5002-00
5	Target (Specify Game)	545-5048-01	18	Pivot Shaft for 5-Bank	530-5180-05
6	Trgt. Retaining Brkt. for 5-Bank	535-5042-05	18	Pivot Shaft for 4-Bank	530-5180-04
6	Trgt. Retaining Brkt. for 4-Bank	535-5042-04	18	Pivot Shaft for 3-Bank	530-5180-03
6	Trgt. Retaining Brkt. for 3-Bank	535-5042-03	19	E-Ring (1/8")	270-5000-00
7	6-32 X 3/8 SHWHTCS Type 23 (Qty. 6)	237-5891-00	20	Switch Assembly	180-5104-00
8	Target Reset Spring	265-5003-00	21	Switch Plate	535-5045-00
9	Coil Support Bracket	535-6154-00	22	6-32 X 1/2	237-5878-00
10	8-32 Nyloc	240-5102-00	23	Diode 1N4001 on Switch	112-5001-00
11	23-700 Coil for 5-Bank *	090-5022-02	24	Plunger Link	545-5293-00
11	23-700 Coil for 4-Bank *	090-5022-02	25	Adjustment Bracket	535-6508-00
11	23-800 Coil for 2 & 3-Bank *	090-5001-02	26	8-32 X 7/8 (1)	237-5890-00
12	Coil Sleeve	545-5031-00	27	Diode 1N4004 on Coil	112-5003-00

* Coil Sleeve included with above Coil Part Number.

† - Note: Table above shows common parts and unique parts for the 3, 4 & 5 Bank Drop Target Assemblies. The shaded areas (X-Bank D.T.) are not used in this game. Quantity is designated by bank size (see Dwg.) (e.g. 1 diode per target, thus if a 3-Bank is ordered, diode qty. is 3.) *When ordering any part always reference game name for proper decals (See Butyrate & Decals, Pg. 48 for description of target decals.)*

Left Metal Ramp (Tower) Assembly 500-5943-00-33

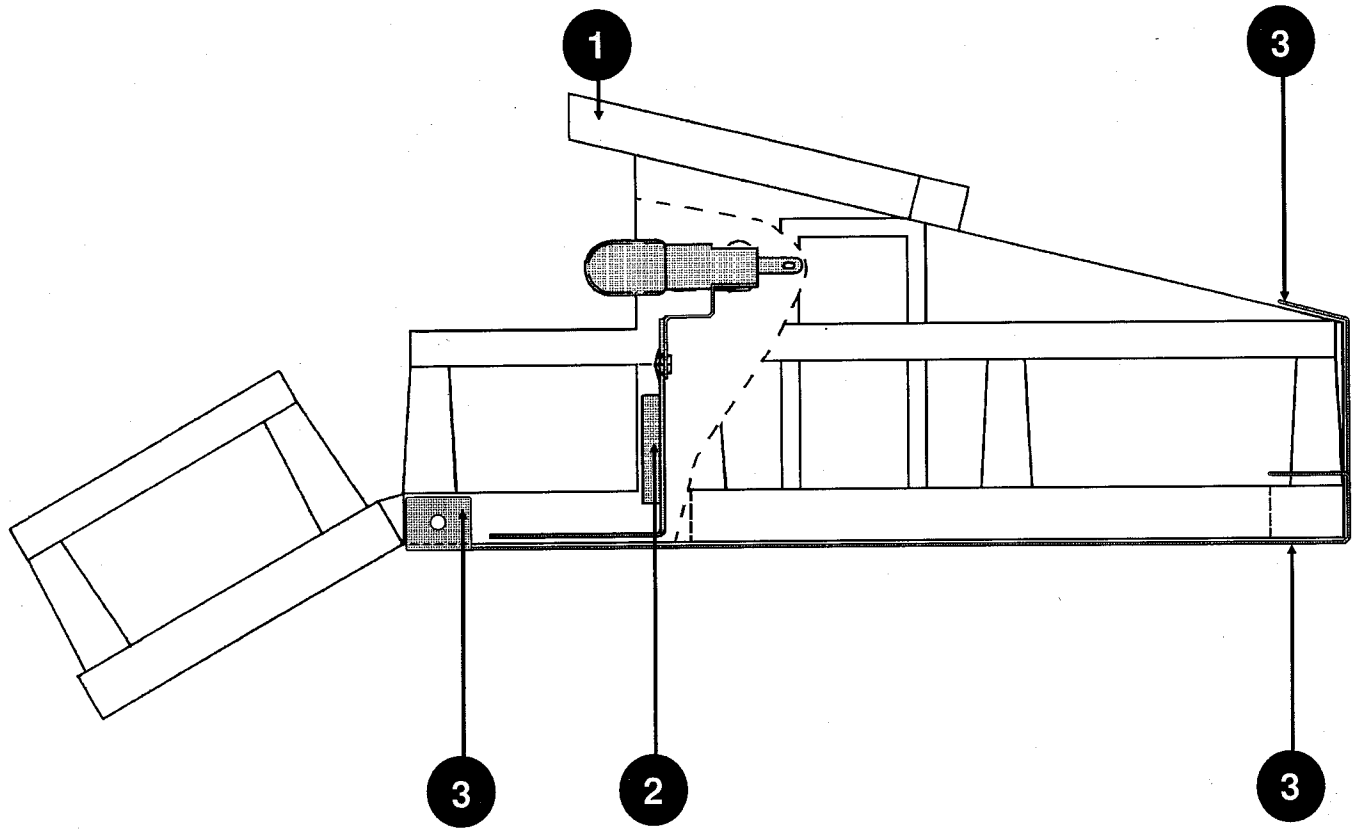


Item	Description	Part N°	Item	Description	Part N°
1	Tower Ramp	515-6263-01	17	Rollunder Assembly	515-6273-00
2	Coil, 27-950 incl. Coil Sleeve	090-5046-01	Ordering above (Item 17) Sub-Assembly Part N° will include:		
3	Diode, 1N4004	112-5003-00	17A:	Gate Bracket	535-7287-01
4	Coil Sleeve	545-5500-00	17B:	Wire Form	535-5399-01
5	Trap Door Cover	545-5600-00	17C:	Micro Switch	180-5090-00
6	Coil Mounting Bracket	535-7313-00	17D*:	Diode, 1N4001	112-5001-00
7	Plunger Assembly	515-6057-00	17E*:	2-56 X 3/8 HWH TF Screws (Qty. 2)	237-5938-00
8	6-32 X 3/16 PPH SEMS (Qty. 2)	232-5209-00	17F*:	Switch Protect Plate	535-6539-00
9	3/16 Truarc (Qty. 2)	270-5001-00	17G*:	Wiring Harness	036-5373-01-33
10	8-32 SOC. HD. CAP	237-5897-00	18	1/8 X 5/32 Rivet (Qty. 4)	249-5009-00
11	Crank Arm Assembly	515-6184-00	19	Ramp Flap	535-7284-00
12	#6 X 1/2 HWH TC (Qty. 2)	234-5001-02	20	#6 Washer (Qty. 2)	246-5000-00
13	Nyliner (Qty. 2)	545-5050-00	21	Wire Harness	036-5373-01-03
14	6-32 X 3/8 PFH MS (Qty. 2)	237-5871-00	22	Decal 13	820-6124-13
15	Shaft	530-5343-00	23	Decal 14	820-6124-14
16	Plate	535-7283-00	24	Decal 15	820-6124-15
For a Complete Decal Sheet order 820-6124-XX. See Butyrate and Decals, Pg. 48 for other decals.			25	Decal 18	820-6124-18
			26	Decal 19	820-6124-19

* An asterisk (*) indicates item is not noted in the pictorial.

Baywatch Lock Tower Assembly †

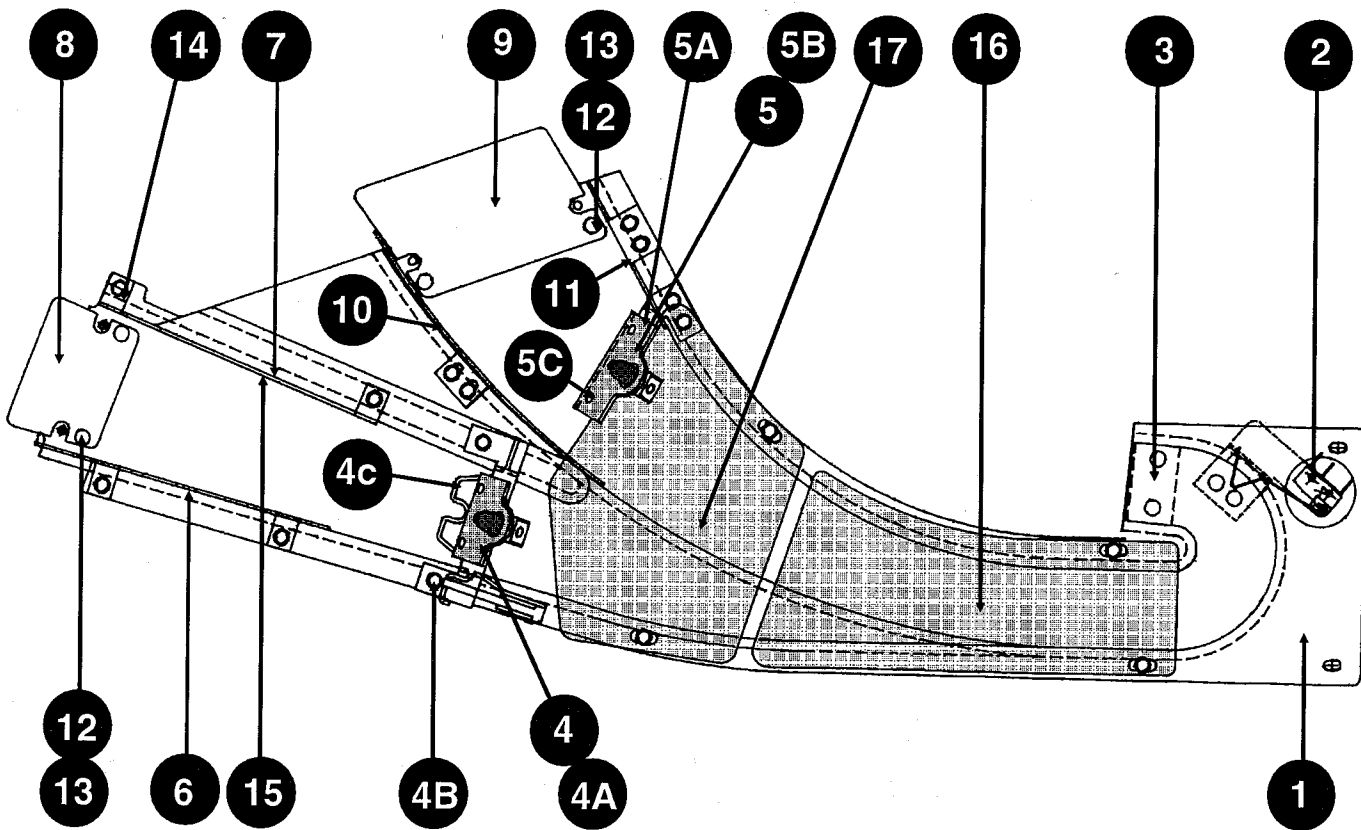
500-6006-00-33



Item	Description	Part N°	Item	Description	Part N°	
1	Baywatch Lock Tower	545-5606-00	3 †	Mounting Plate	535-7417-00	
2	Light Bracket Sub-Assembly	515-6340-00		Note: The mounting plate is not a part of this assembly. If replacement is required, use 535-7417-00. The plate is screwed on the above part of the Left Ramp with 3 of the below screws. The Lock Tower then slides onto this plate and is secured with the remaining 2 screws at the front sides.		
Ordering above (Item 2) Sub-Assembly Part N° will include:						
2A:	Light Bracket	535-7398-00				
2B:	1/8 X 1" Foam Tape (3/4" x .06")	626-5033-00				
2C:	1/8 X 5/32 Rivet (Qty. 3)	249-5009-00	4 *		#6 X 1/2 PTH Screws (Qty. 5)	237-5809-00
2D:	Wedge Base Socket (Qty. 3)	077-5029-00				
2E:	#555 Bulb (Qty. 3)	165-5002-00				
2F:	Rubber Lite Cover-Teal Green (Qty. 3)	545-5014-13				
2G:	Wire Harness	036-5373-18-33				

* Screws not noted in the diagram and are not a part of this assy.

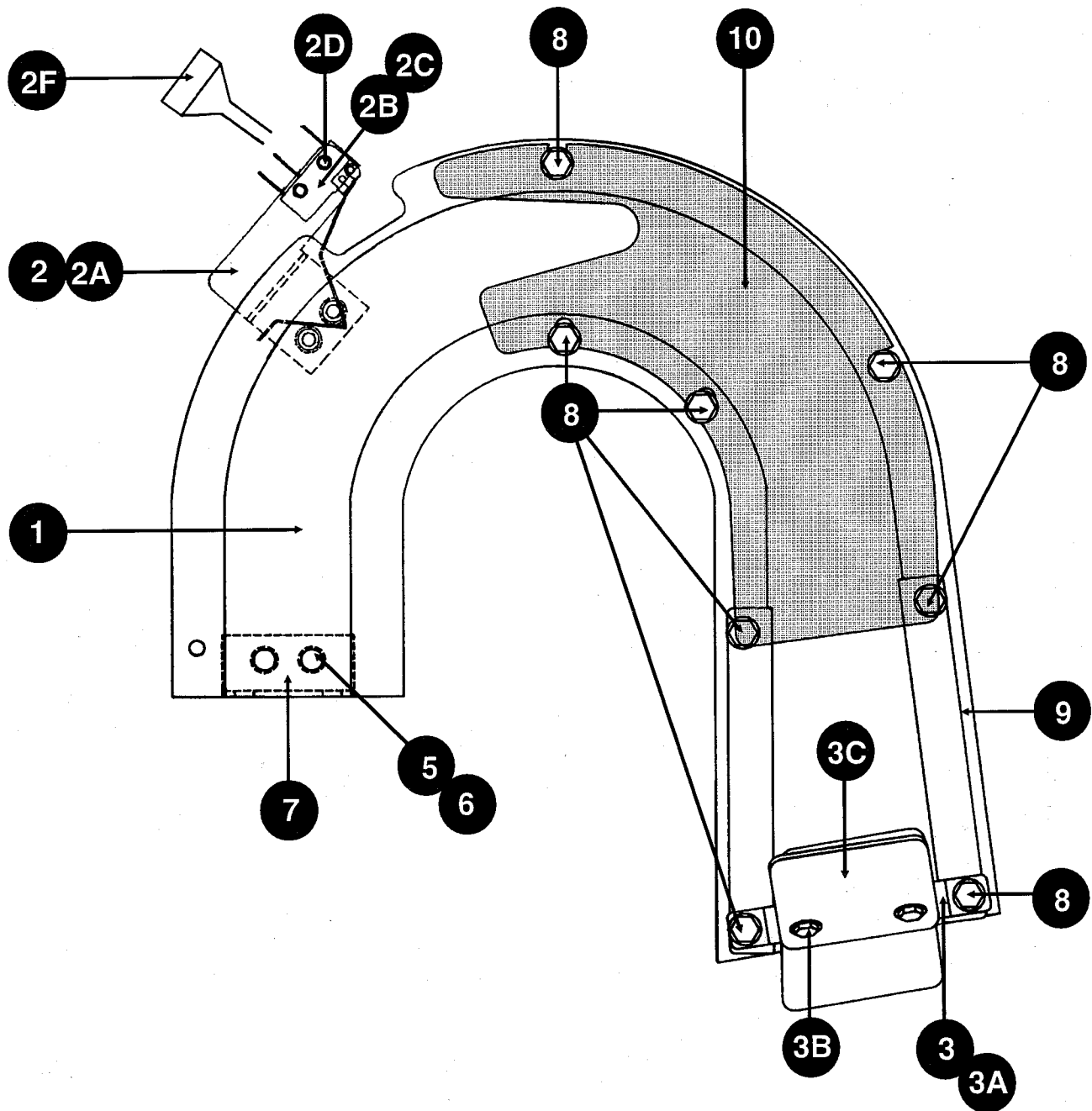
Dual Plastic (Right & Side) Ramp 500-5954-00-33



Item	Description	Part N°	Item	Description	Part N°
1	Dual Plastic (Right & Side) Ramp	545-5527-03	5	Side Ramp Sign Bracket Assembly	515-6354-00
2	Switch & Bracket Assembly	515-6357-00	Ordering above (Item 5) Sub-Assembly Part N° will include:		
Ordering above (Item 2) Sub-Assembly Part N° will include:			5A:	Butyrate Assembly #27	515-6317-00
2A:	Switch Bracket	535-7327-00		Side Ramp Enter Butyrate -27	830-5475-27
2B:	Micro Switch	180-5051-00		Wedge Socket	077-5029-00
2C:	Switch Plate (Qty. 2)	535-6539-00		#555 Wedge Base Bulb	165-5002-00
2D:	2-56 X 3/8 HWH SER TF	237-5938-00		Rubber Lite Cover-Yellow	545-5014-06
2E:	Diode, 1N4001	112-5001-00		1/8 X 3/16 Rivet	249-5001-00
2F:	Wire Harness	036-5373-08-33		#6 Washer	246-5000-00
3	Exit Mounting Bracket	535-5291-00	5B:	Side Ramp Sign Bracket	535-7376-00
4	Right Entry Gate Assembly	515-6353-00	5C:	#6 X 3/8 HWH SM (Qty. 2)	234-5000-00
Ordering above (Item 4) Sub-Assembly Part N° will include:			5D*:	Wire Harness	036-5373-16-33
4A:	Butyrate Assembly #28	515-6319-00	6	Right Ent. Protect Right Side	535-7307-00
	Right Ramp Enter Butyrate -28	830-5475-28	7	Right Ent. Protect Left Side	535-7306-00
	Wedge Socket	077-5029-00	8	Right Entrance Flap	535-7305-00
	#555 Wedge Base Bulb	165-5002-00	9	Side Entrance Flap	535-7300-01
	Rubber Lite Cover-Red	545-5014-02	10	Side Ent. Protect Right Side	535-7302-00
	1/8 X 3/16 Rivet	249-5001-00	11	Side Ent. Protect Left Side	535-7301-01
	#6 Washer	246-5000-00	12	1/8 X 1/4 Brass Rivet (Qty. 8)	249-5003-00
4B:	Right Entry Bracket Sub-Assembly	515-6359-00	13	#6 Star Washer (Qty. 8)	246-5000-00
	Rollunder Wire Form	535-7304-00	14	#6 X 1/2 HWH Screw (Qty. 16)	234-5001-02
	Gate Bracket	535-7303-00	15	Double Side Spec. Tape 1.46"	626-5027-00
	Micro Switch	180-5090-00	16	Butyrate Cover Upper	830-5475-53
	Diode, 1N4001	112-5001-00	17	Butyrate Cover Lower	830-5475-20
	2-56 3/8 HWH TF Screw (Qty. 2)	237-5938-00	18	Butyrate Cover Upper Switch	830-5475-56
4C:	#6 X 3/8 HWH SM Screw (Qty. 2)	234-5000-00	19 *	Wire Harness	036-5373-XX-33
4D*:	Wire Harness	036-5373-02-33			

* An asterisk (*) indicates item is not noted in the pictorial.

Center Plastic Ramp Assembly 500-5941-00-33

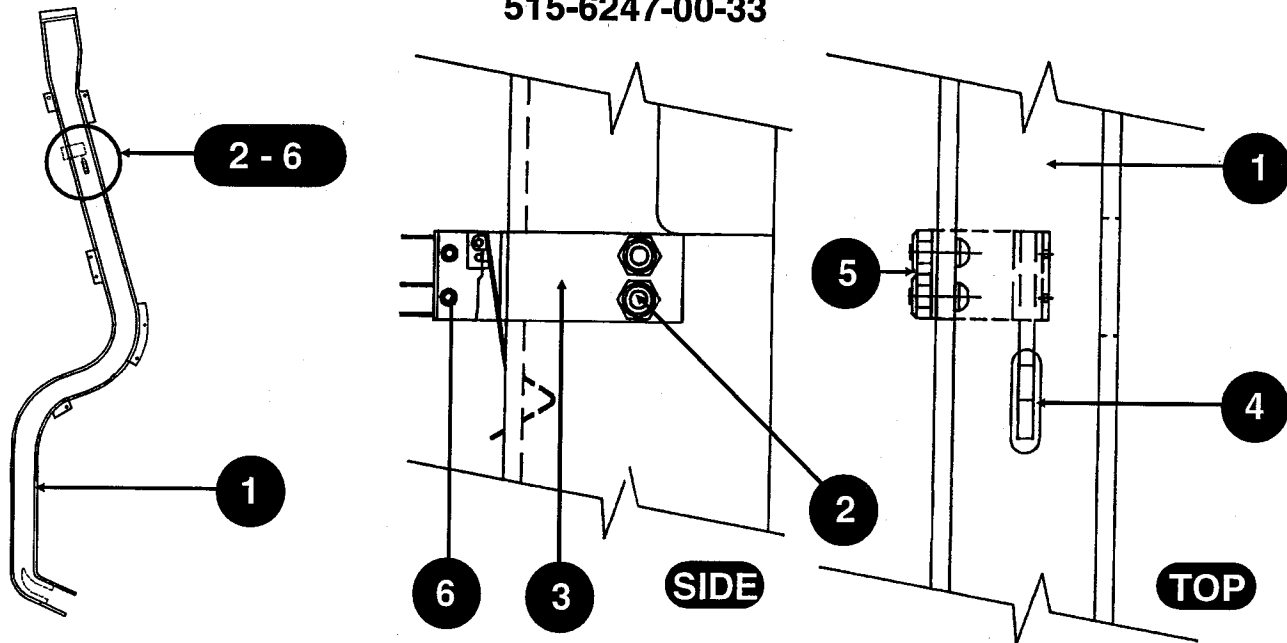


Item	Description	Part N°	Item	Description	Part N°
1	Center Plastic Ramp	545-5526-00	Ordering (Item 3) Sub-Assembly Part N° will include:		
2	Switch and Bracket Assembly	515-6357-00	3A:	Sign Bracket	535-7326-00
Ordering above (Item 2) Sub-Assembly Part N° will include:			3B:	#6 X 3/8 HWH SM (Qty. 2)	234-5000-00
2A:	Switch Bracket	535-7327-00	3C:	Center Ramp Enter Butyrate -26	830-5475-26
2B:	Micro Switch	180-5051-00	4	Ramp Flap	535-7325-00
2C:	Switch Plate (Qty. 2)	535-6539-00	5	1/8 X 1/4 Rivet (Qty. 6)	249-5003-00
2D:	2-56 X 3/8 HWH SER TF	237-5938-00	6	#6 Washer (Qty. 6)	246-5000-00
2E*:	Diode, 1N4001	112-5001-00	7	Ramp Exit Bracket	535-7328-00
2F:	Wire Harness	036-5373-08-33	8	#6 X 1/2 HWH TC (Qty. 8)	234-5001-02
3	Center Ramp Entrance Sign Assembly	515-6358-00	9	Ramp Protector (Qty. 2)	535-6707-00
Ordering above (Item 3) Sub-Assembly Part N° will include:			10	Butyrate Ramp Cover -36	830-5475-36

* An asterisk (*) indicates item is not noted in the pictorial.

Under Playfield Plastic Ramp (Trough) Assembly

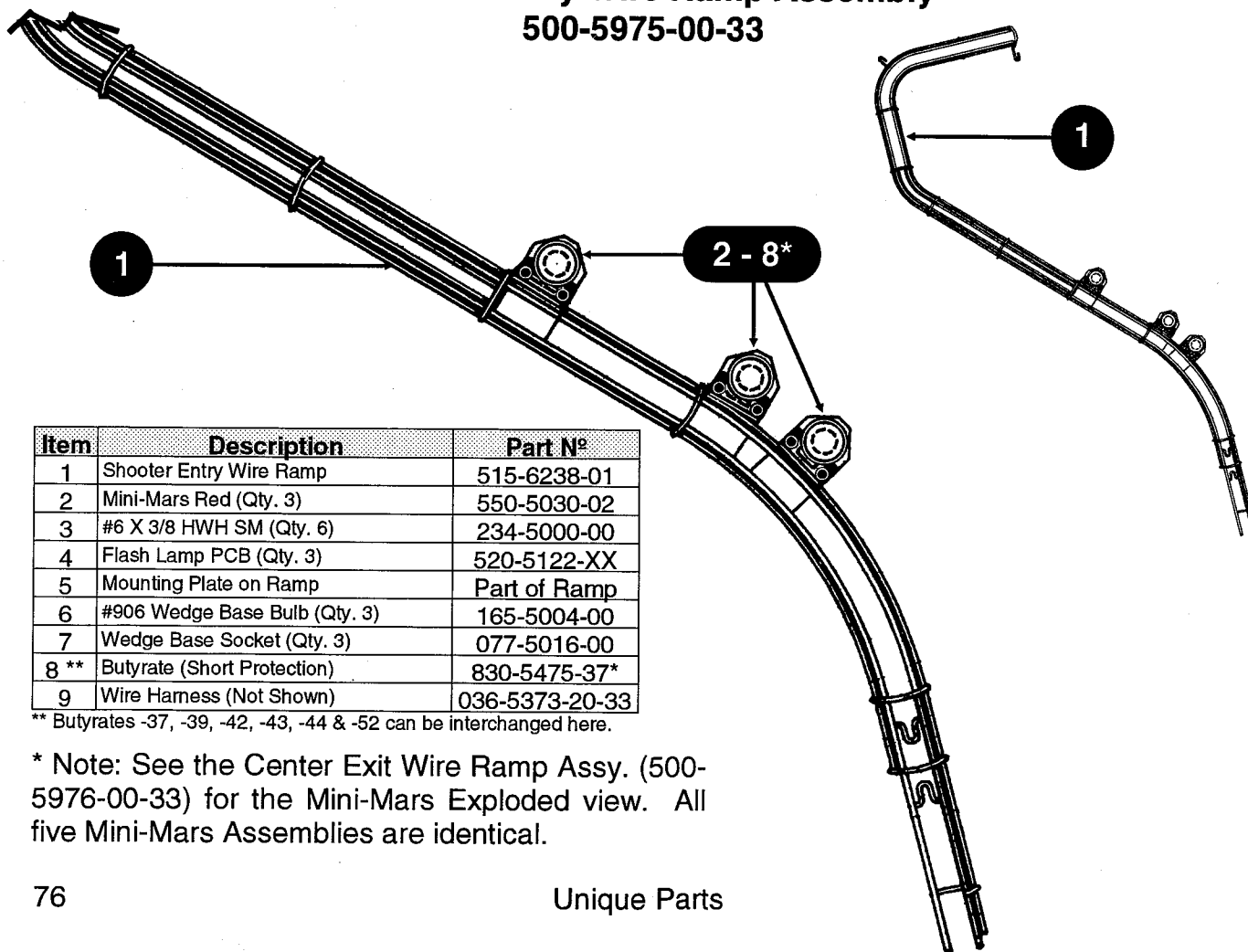
515-6247-00-33



Item	Description	Part N°	Item	Description	Part N°
1	Undertrough (Ramp)	545-5591-01	4	Microswitch	180-5093-00
2	#6 Nylloc	240-5005-00	5	#6-32 X 1/2 PH	237-5502-00
3	Switch Bracket	535-7282-01	6	#2-56 X 3/8 HEX TF	237-5938-00

Shooter Entry Wire Ramp Assembly

500-5975-00-33



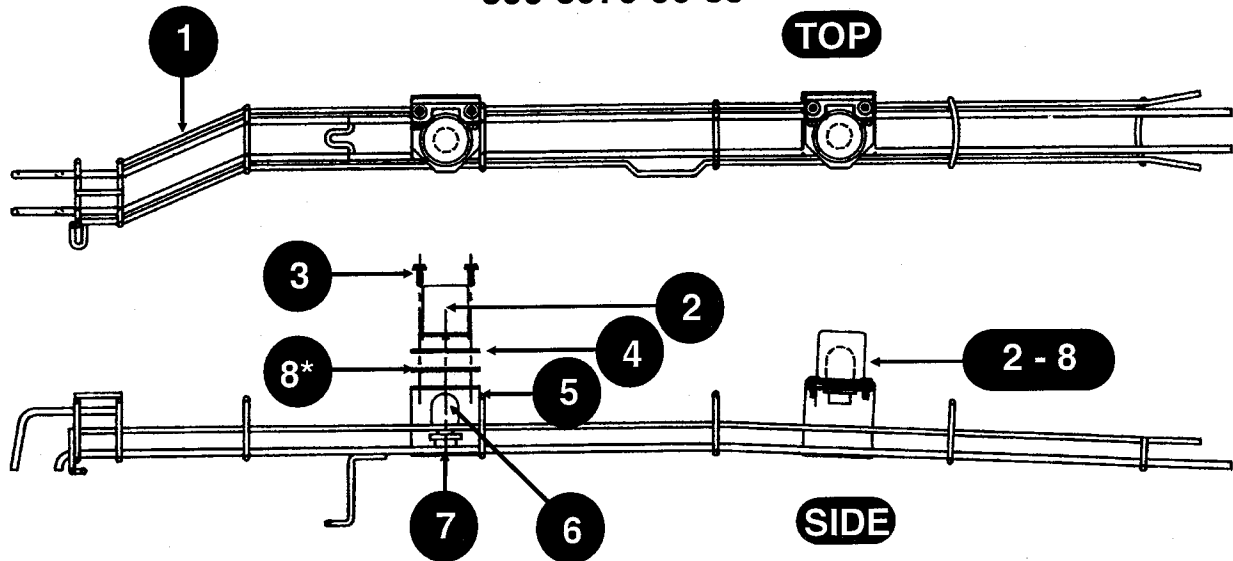
Item	Description	Part N°
1	Shooter Entry Wire Ramp	515-6238-01
2	Mini-Mars Red (Qty. 3)	550-5030-02
3	#6 X 3/8 HWH SM (Qty. 6)	234-5000-00
4	Flash Lamp PCB (Qty. 3)	520-5122-XX
5	Mounting Plate on Ramp	Part of Ramp
6	#906 Wedge Base Bulb (Qty. 3)	165-5004-00
7	Wedge Base Socket (Qty. 3)	077-5016-00
8 **	Butyrate (Short Protection)	830-5475-37*
9	Wire Harness (Not Shown)	036-5373-20-33

** Butyrates -37, -39, -42, -43, -44 & -52 can be interchanged here.

* Note: See the Center Exit Wire Ramp Assy. (500-5976-00-33) for the Mini-Mars Exploded view. All five Mini-Mars Assemblies are identical.

Center Exit Wire Ramp Assembly

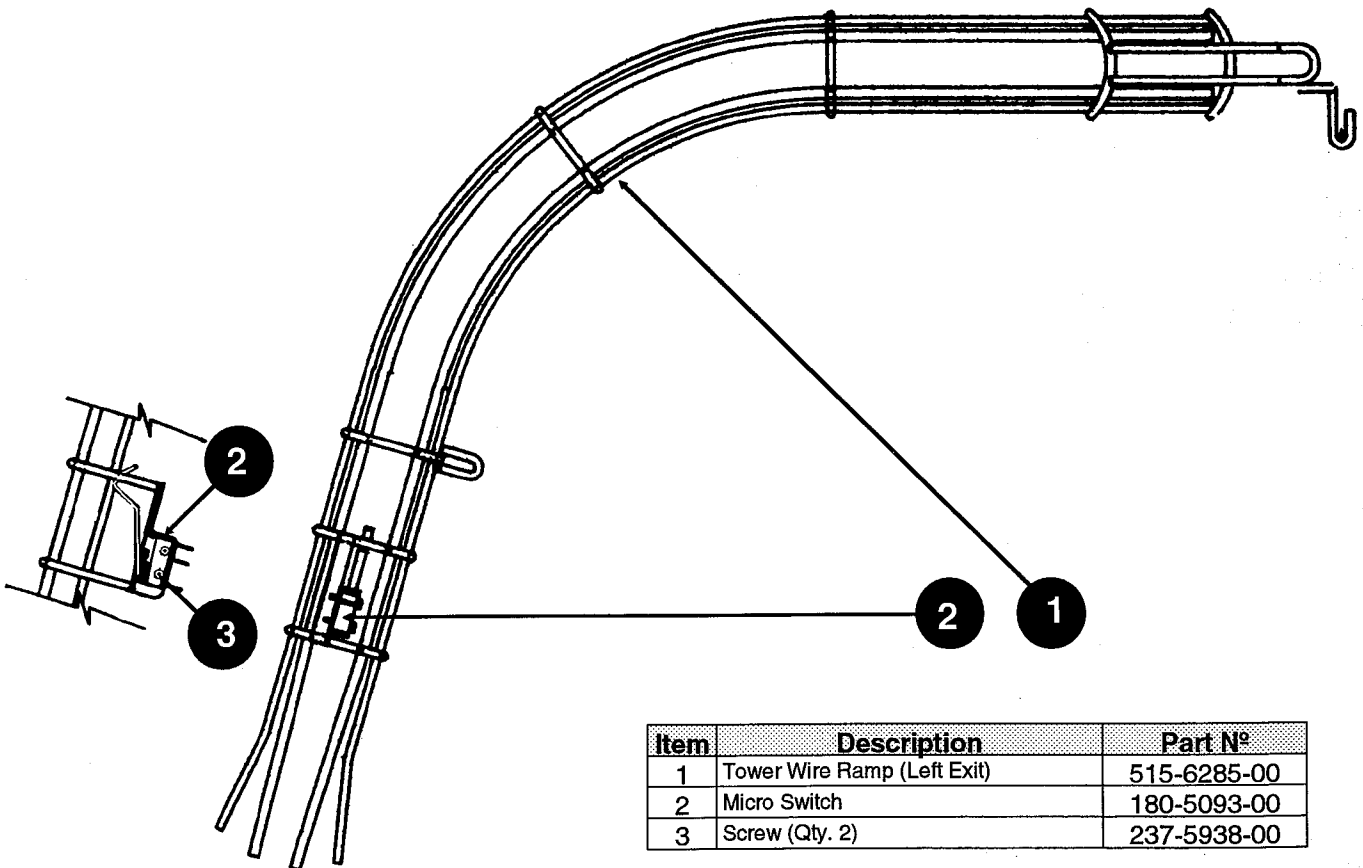
500-5976-00-33



Item	Description	Part N°	Item	Description	Part N°
1	Center Exit Wire Ramp	515-6245-00	6	#906 Wedge Base Bulb (Qty. 2)	165-5004-00
2	Mini-Mars Red (Qty. 2)	550-5030-02	7	Wedge Base Socket (Qty. 2)	077-5016-00
3	#6 X 3/8 HWH SM (Qty. 4)	234-5000-00	8 *	Butyrates (Short Protection) -37	830-5475-37*
4	Flash Lamp PCB (Qty. 2)	520-5122-XX	9	Wire Harness (Not Shown)	036-5373-21-33
5	Mounting Plate on Ramp	Part of Ramp	* Butyrates -37, -39, -42, -43, -44 & -52 can be interchanged here.		

Tower Wire Ramp (Left Exit) Assembly

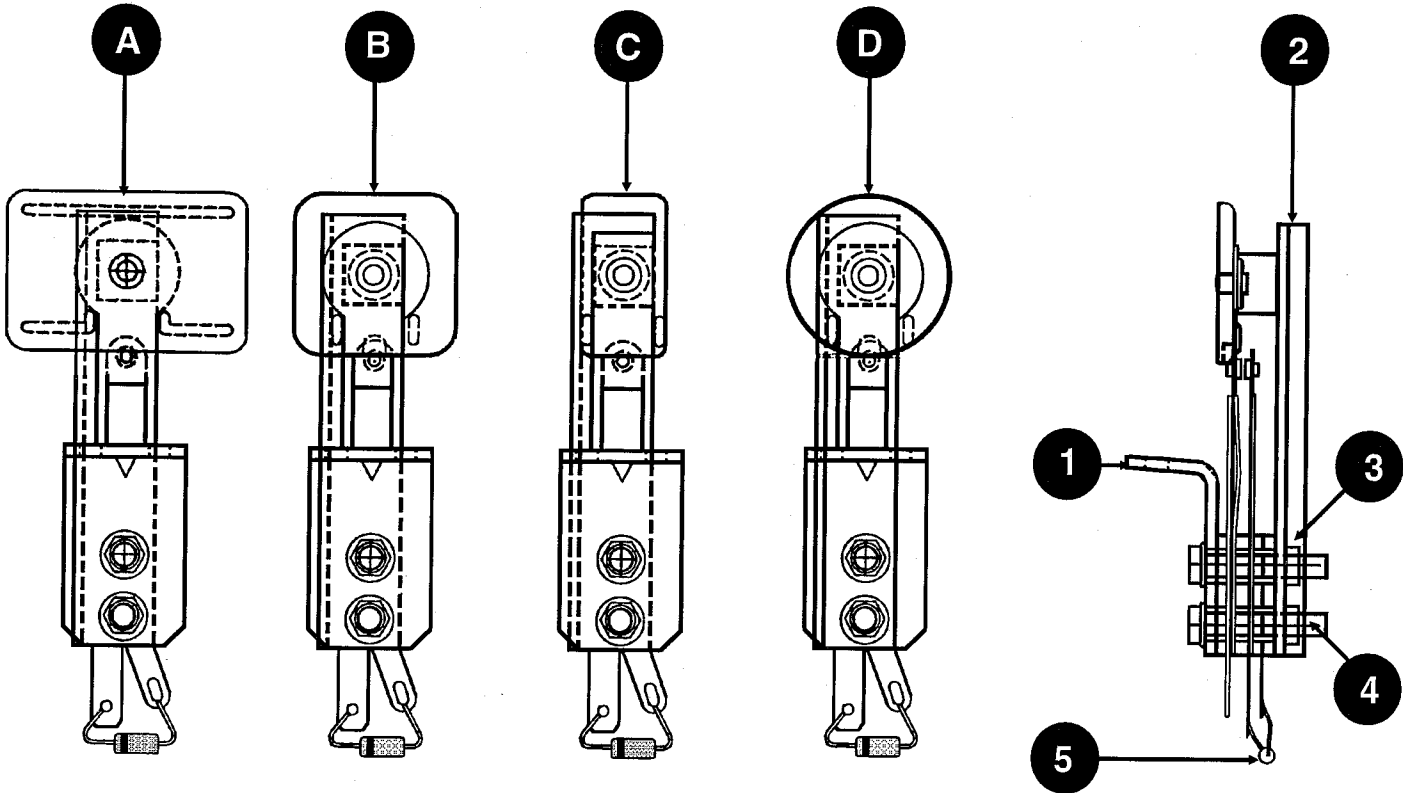
500-5979-00-33



Item	Description	Part N°
1	Tower Wire Ramp (Left Exit)	515-6285-00
2	Micro Switch	180-5093-00
3	Screw (Qty. 2)	237-5938-00

Stand-Up Target Assemblies: †

500-5321-XX 1" X 1-1/2" Rectangle (Front View)	500-5232-XX 1" Square (Front View)	500-5857-XX Narrow Rectangle (Front View)	500-5835-XX 1" Round (Front View)	All (Side View)
---	---	--	--	---------------------------



Item	Description	Qty.	Part N ^o	Item	Description for A, B, C & D	Part N ^o
A	Switch & Target Assembly 1" X 1 1/2" Rectangle (Flat)	0	515-6027-XX	1	Mounting Bracket	535-6896-00
B	Switch & Target Assembly 1" Square (Flat)	0	515-5162-XX	2	Back Plate	535-6542-00
C	Switch & Target Assembly Narrow Rectangle (Flat)	10	515-5967-XX	3	6-32 Nyloc	240-5010-00
D	Switch & Target Assembly 1" Round	2	515-5966-XX	4	6-32 X 3/4 HWH Ser. (Type C)	237-5958-00
				5	Diode 1N4001	112-5001-00

† Items with a 0 quantity are not used in this game. The following are the color breakdowns for items C & D. C: 5 ea. "-14, Gray", C: 5 ea. "-06, Yellow" and D: 2 ea. "-03, Amber".

Color Chart (as applicable for all parts which can come in various colors):
The "-XX" should be replaced with the following 2-digit number for the color desired.

-01: Clear	-06: Yellow	-10: Fluorescent Orange
-02: Red	-07: Orange	-11: Fluorescent Green
-03: Amber	-08: White	-12: Fluorescent Blue
-04: Green	-09: Purple	-13: Teal Green
-05: Blue		-14: Gray

SCHEMATICS / TROUBLESHOOTING (YELLOW SECTION) Page Guide

Pages 84-85
Coils & Flashlamps
Diagrams

Page 86
Switches
Diagrams

Page 87
Lamps
Diagrams

Page 83
Backbox
Wiring Diagram

Pages 88-92
CPU Board Asm. &
Logic Diagrams

Page 93
Power Supply
Bd. Schematic &
Component Layout

Pages 94-95
Sound Board
Component Layout
& Schematic

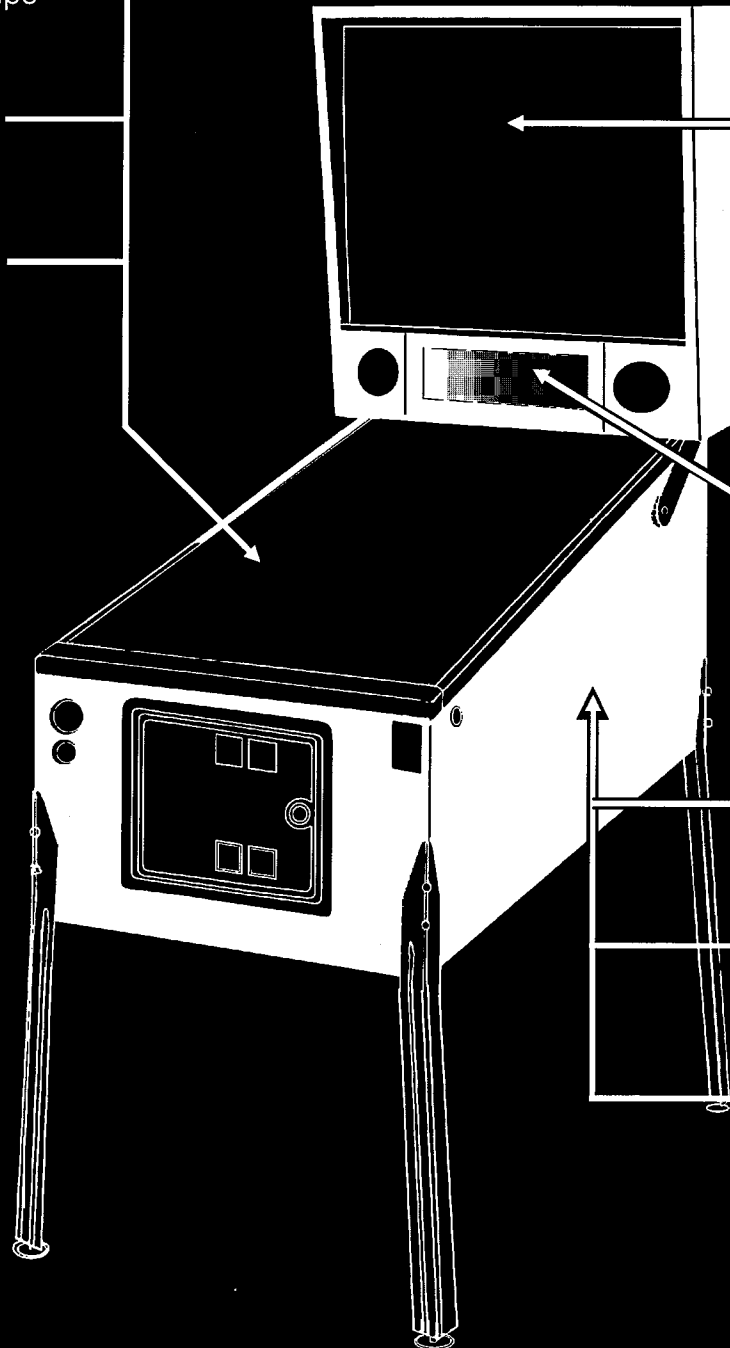
Page 106
PPB
Diagram

Pages 96-101
Display Controller
& Driver Bds.
Schematics &
Component Layouts

Page 81
Power
Wiring Diagram

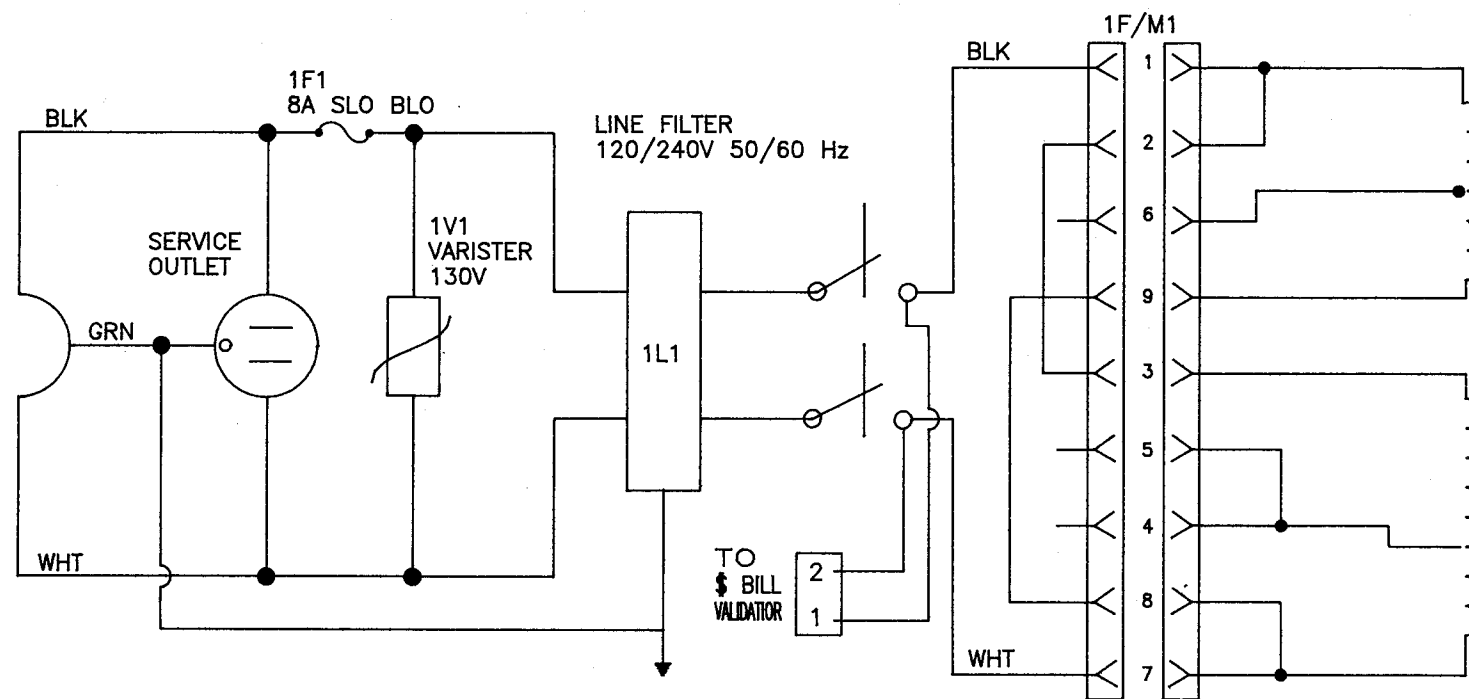
Page 82
Cabinet
Wiring Diagram

Pages 102-105
Solid State 2-
Flipper Board
Theory of Op. &
Circuit Trouble-
shooting Flowchart,
Board & Wiring
Diagrams



THIS CONFIGURATION FOR 115V

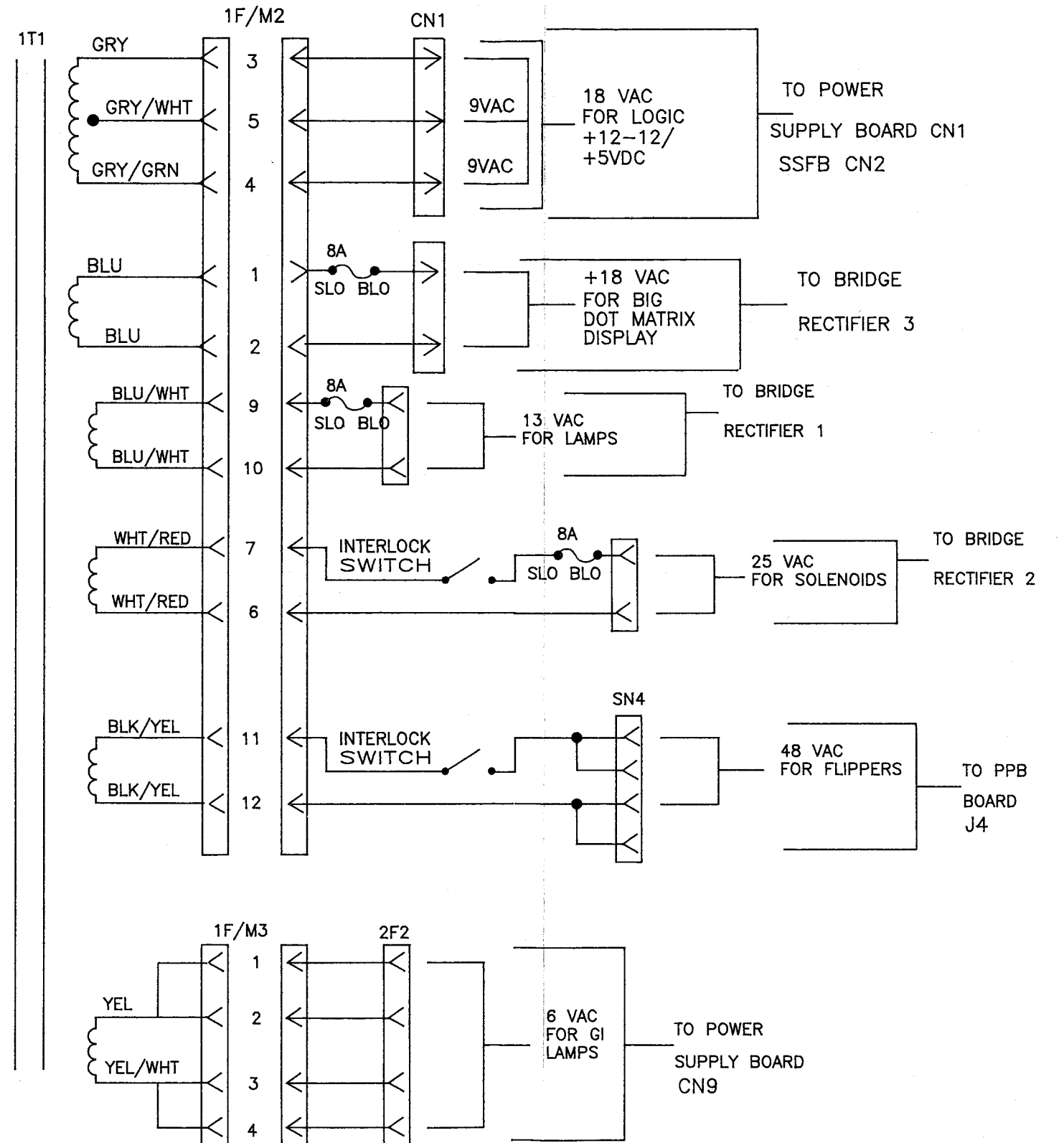
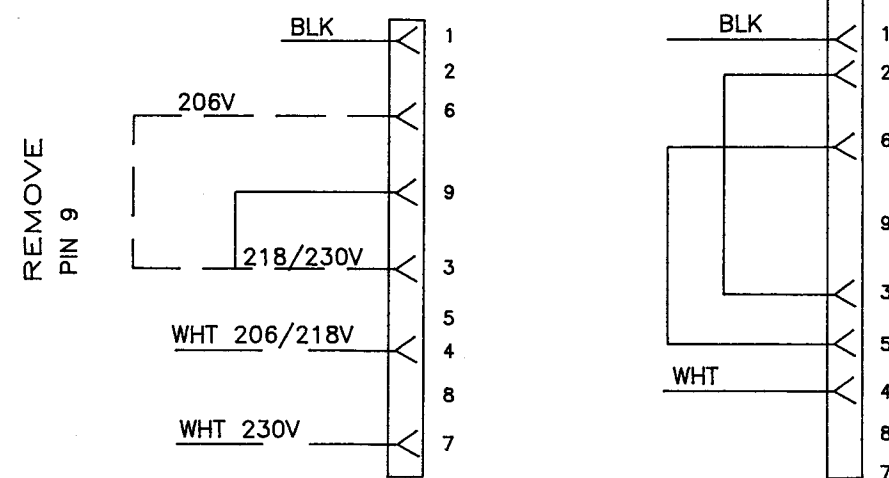
FOR LOWER LINE VOLTAGES
OR 220 VOLT OPERATION
SEE SAMPLES BELOW

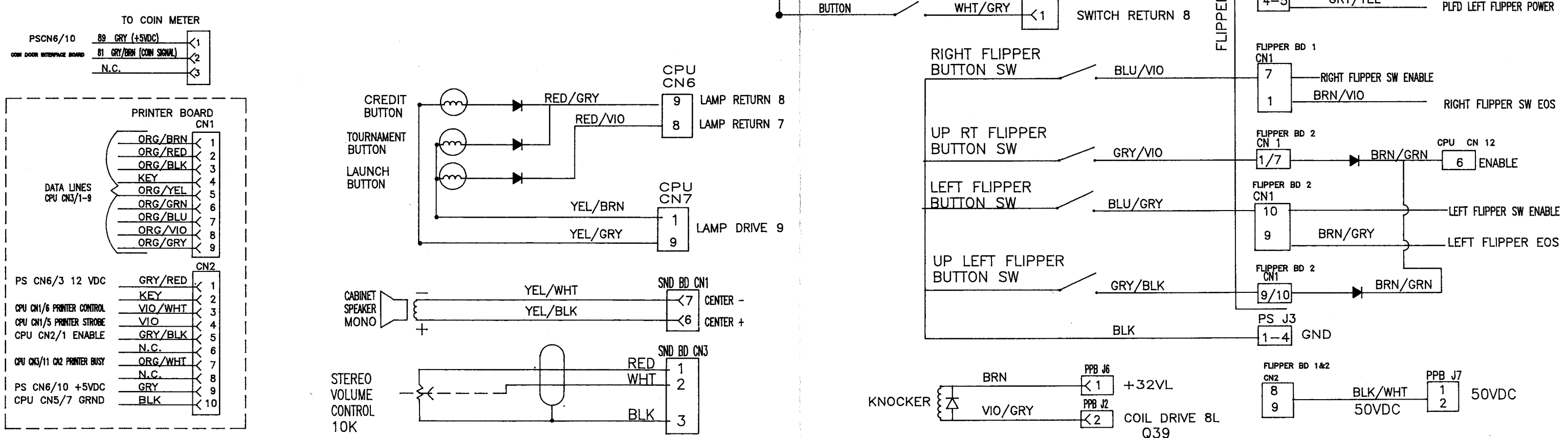
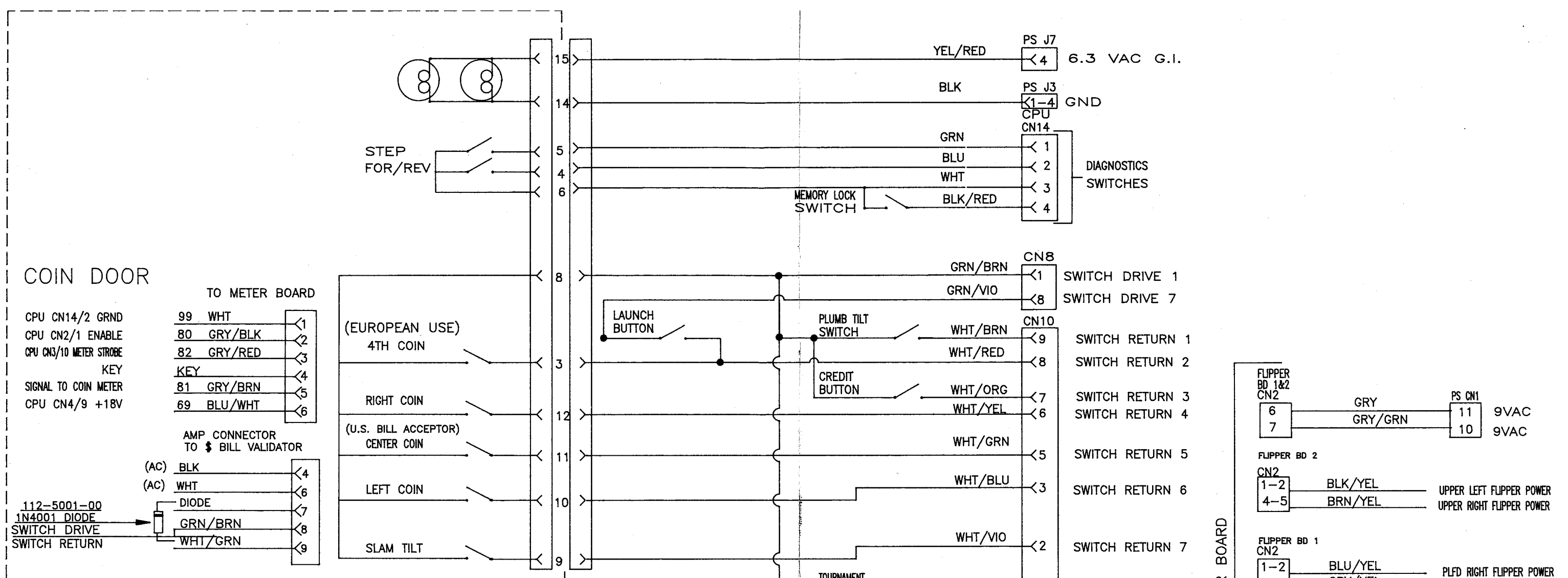


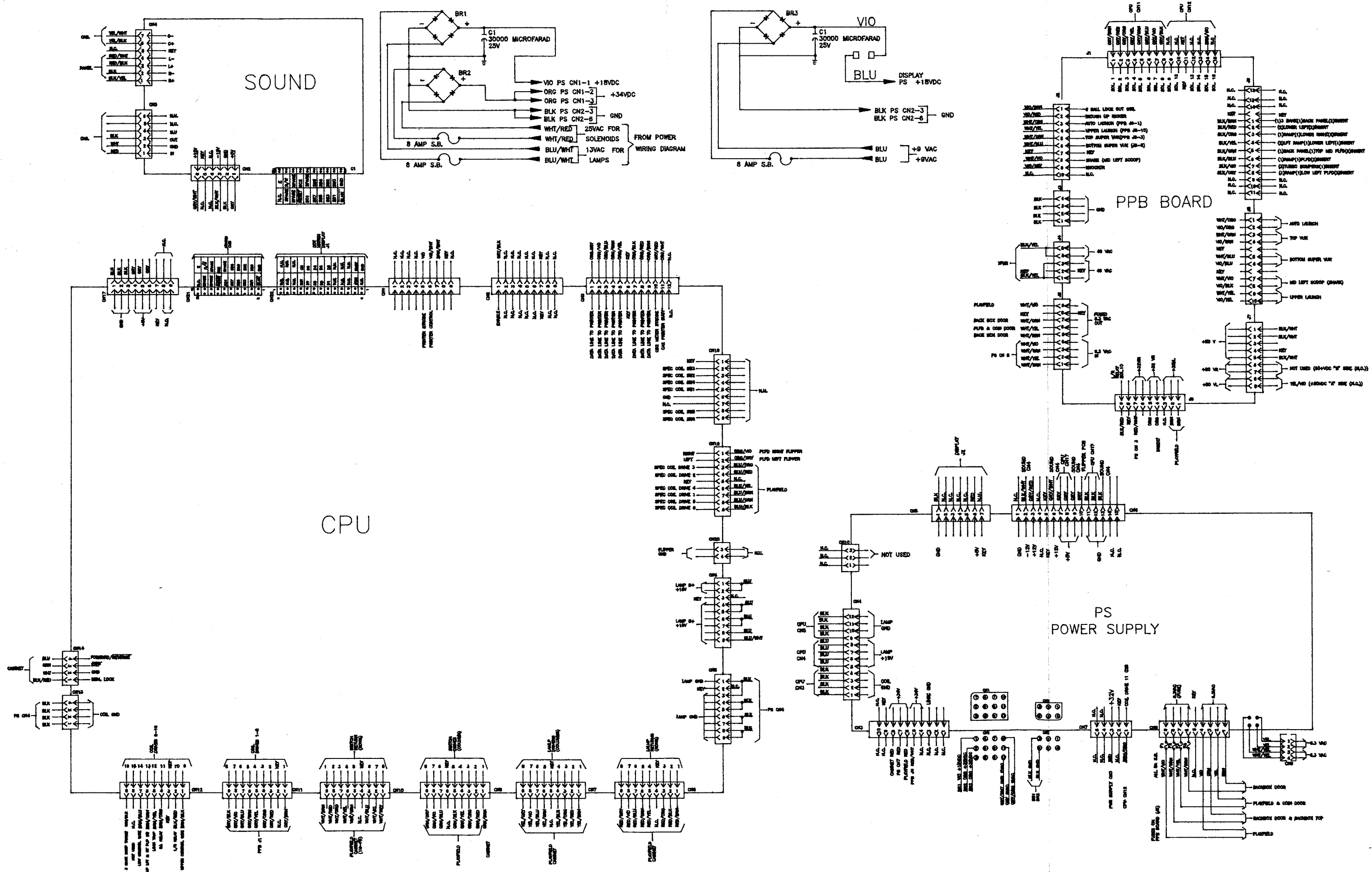
JUMPER FOR VOLTAGE VARIATION

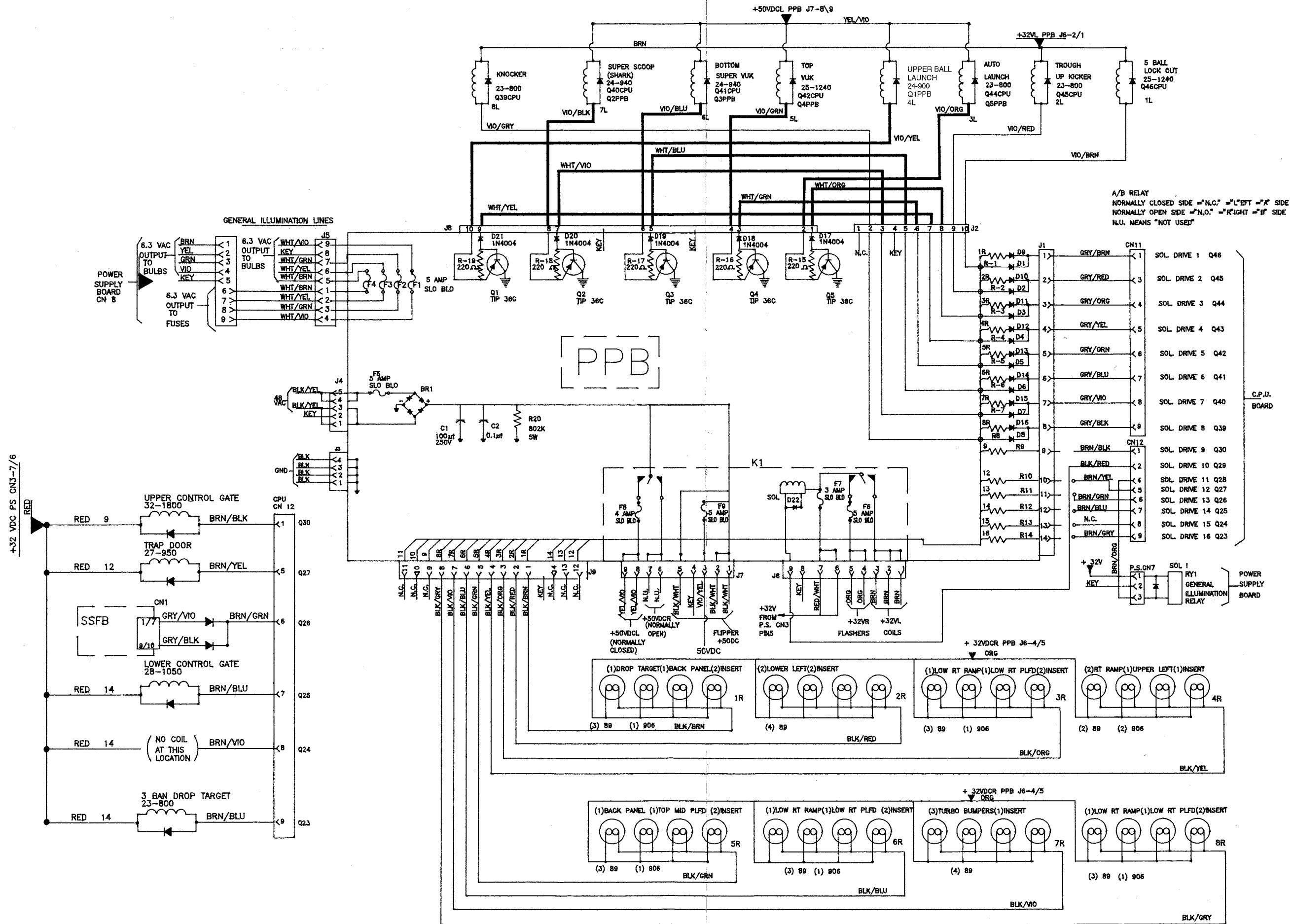
230/218/206 VOLTS
1F1= 4A SLO BLO
1V1=275V VARISTOR

100/105 VOLTS
1F1= 8A SLO BLO
1V1= 130V VARISTOR









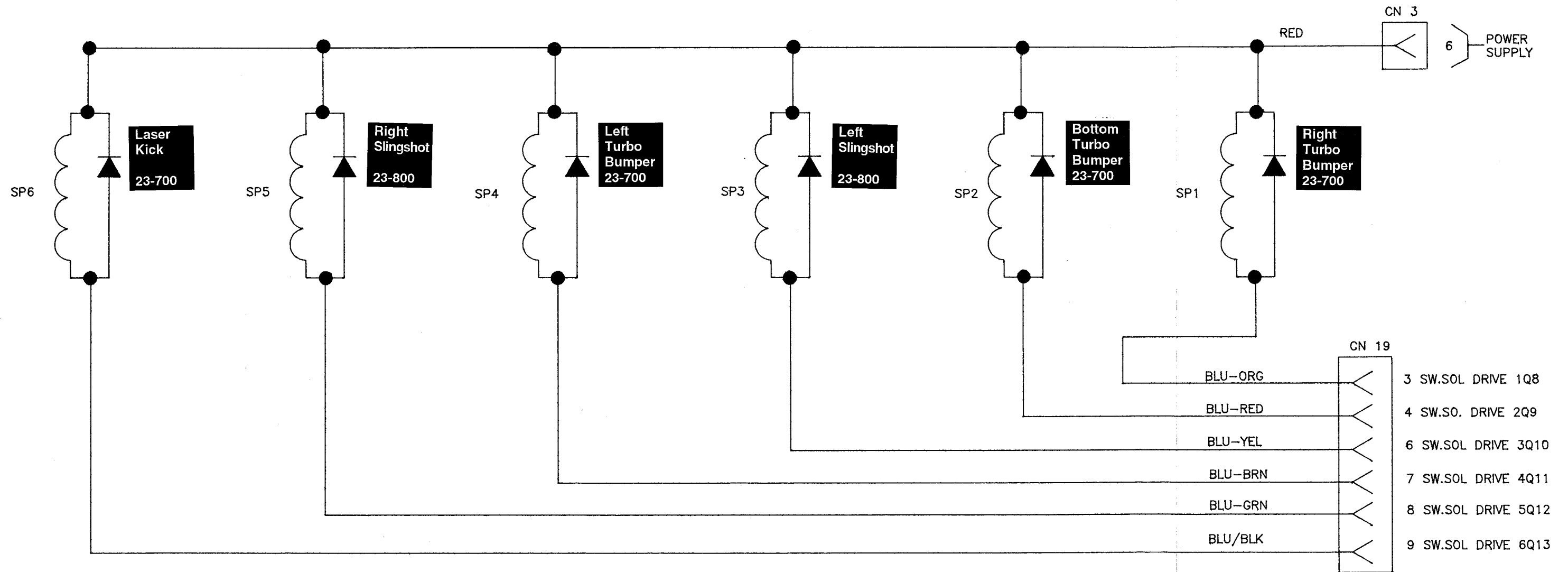
A/B RELAY
 NORMALLY CLOSED SIDE = "N.C." = "LEFT" = "A" SIDE
 NORMALLY OPEN SIDE = "N.O." = "RIGHT" = "B" SIDE
 N.U. MEANS "NOT USED"

C.P.U. BOARD

POWER SUPPLY BOARD

Playfield Coil / Flashlamp
 Wiring Diagram

Playfield Coil / Flashlamp
 Wiring Diagram

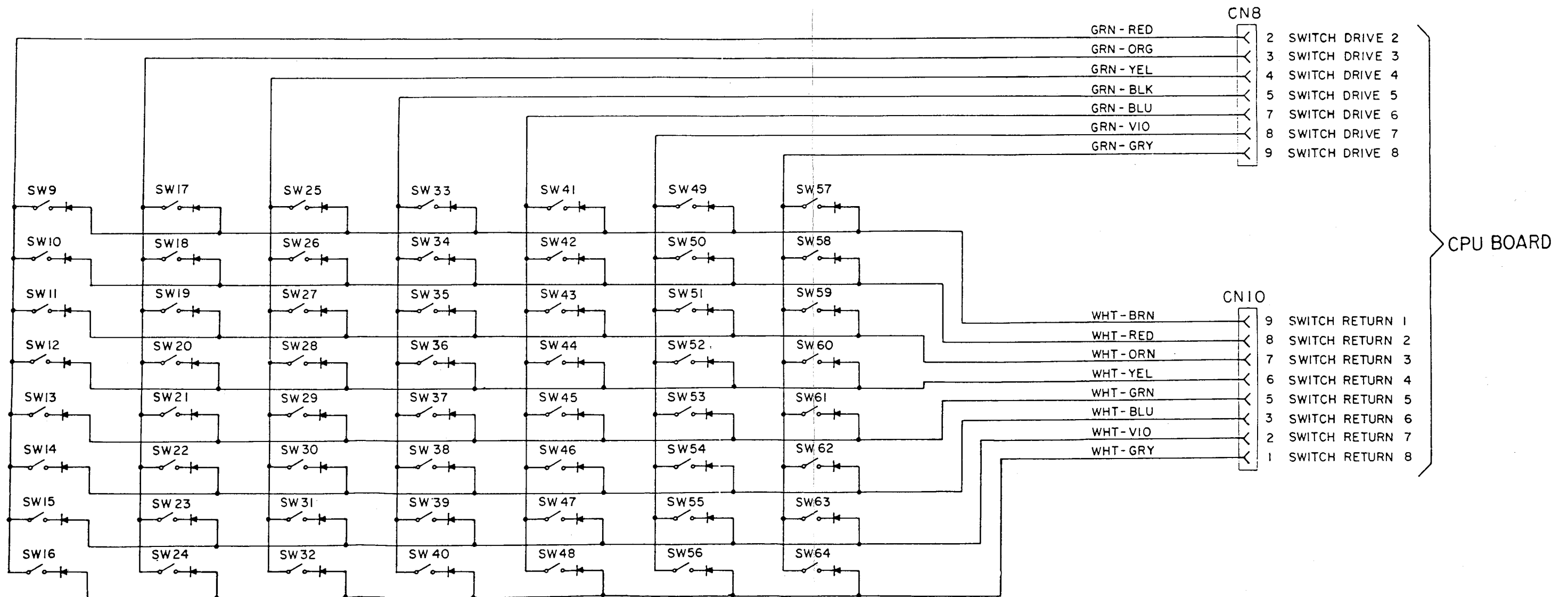


Switch Matrix No. & Description	Part No.
1* PLUMB BOB TILT (See Item 17, Cabinet Parts, Pg. 43)	
2* 4TH COIN SLOT (On Coin Door)	---
3* START BUTTON (Left of Coin Door)	500-5097-02
4* RIGHT COIN SLOT (On Coin Door)	180-5024-00
5* CENTER COIN SLOT (On Coin Door)	180-5024-00
6* LEFT COIN SLOT (On Coin Door)	180-5024-00
7* SLAM TILT	180-5022-00
8* EXTRA BALL BUY-IN/LEAGUE BUTTON	180-5073-00
9 2-BANK STAND-UP (TOP)	180-5133-00
10 #1 BALL TROUGH (LEFT)	180-5119-00
11 #2 BALL TROUGH	180-5119-00
12 #3 BALL TROUGH	180-5119-00
13 #4 BALL TROUGH	180-5119-00
14 #5 BALL TROUGH (RIGHT)	180-5119-00
15 5-BALL TROUGH VUK OPTO (TRANS)	520-5124-00
(REC)	520-5125-00

Switch Matrix No. & Description	Part No.
16 SHOOTER LANE	500-5707-00
17 5-BANK STAND-UP (S)HARK (BOTTOM)	180-5132-00
18 5-BANK STAND-UP S(H)ARK	180-5132-00
19 5-BANK STAND-UP SH(A)RK	180-5132-00
20 5-BANK STAND-UP SHA(R)K	180-5132-00
21 5-BANK STAND-UP SHAR(K) (TOP)	180-5132-00
22 3-BANK DROPS (TOP)	180-5104-00
23 3-BANK DROPS (MIDDLE)	180-5104-00
24 3-BANK DROPS (BOTTOM)	180-5104-00
25 LEFT RAMP ENTER	180-5090-00
26 LEFT RAMP EXIT	180-5057-00
27 NOT USED	---
28 RIGHT RAMP ENTER	180-5090-00
29 NOT USED	---
RIGHT RAMP EXIT (Not Shown)	180-5051-00
31 RIGHT RAMP STAND-UP (LEFT)	180-5132-00
32 RIGHT RAMP STAND-UP (RIGHT)	180-5132-00

Switch Matrix No. & Description	Part No.
33 LEFT RETURN LANE	500-5706-00
34 NOT USED	---
35 NOT USED	---
36 LEFT RAMP STAND-UP (LEFT)	180-5132-00
37 LEFT RAMP STAND-UP (RIGHT)	180-5132-00
38 TOP LANE ROLLOVER (LEFT)	500-5706-00
39 TOP LANE ROLLOVER (MIDDLE)	500-5707-00
40 TOP LANE ROLLOVER (RIGHT)	500-5707-00
41 LEFT TURBO BUMPER	180-5015-02
42 BOTTOM TURBO BUMPER	180-5015-02
43 RIGHT TURBO BUMPER	180-5015-02
44 UPPER VUK (Vertical Up-Kicker)	180-5116-00
45* LEFT ORBIT ROLLOVER (Under *49*)	500-5707-00
46 LOWER SUPER VUK (UNDER ARCH)	180-5116-00
47 UPPER BALL LAUNCH	500-5706-00
48 CENTER RAMP STAND-UP	180-5132-00
49 CENTER RAMP EXIT	180-5051-00

Switch Matrix No. & Description	Part No.
50* BALL LAUNCH BUTTON	500-5973-00
51 NOT USED	---
52 SPINNER	180-5010-04
53 2-BANK STAND-UP (BOTTOM)	180-5133-00
54 UPPER RIGHT SHARK FIN FLIPPER	500-5142-00
55 UNDER PLAYFIELD RAMP ENTER	180-5093-00
56 SHARK SUPER SCOOP	180-5116-00
57 LEFT OUTLANE	515-5138-00
58 RIGHT OUTLANE	500-5706-00
59 RIGHT OUTER RETURN LANE	500-5706-00
60 RIGHT INNER RETURN LANE	500-5706-00
61 LEFT SLINGSHOT	180-5054-00
62 RIGHT SLINGSHOT	180-5054-00
63* UPPER & LOWER LEFT FLIPPER SWITCH STACK	180-5122-00
64* UPPER & LOWER RIGHT FLIPPER SWITCH STACK	180-5122-00



Lamp Matrix No. & Description

1	10 MIL + VIDEO MODE
2	20 MIL + LASER KICK
3	30 MIL + SHARK
4	50 MIL + LITE EXTRA BALL
5	100 MIL + EARTH QUAKE
6	SEARCH & RESCUE MYSTERY
7	BALL LAUNCH BUTTON
8	EXTRA BUTTON
9	SHOOT AGAIN
10	LEFT TURBO BUMPER
11	SHARK SUPER VUK
12	RIGHT RAMP ENTER
13	SPELL RESCUE
14	SHARK FLIP
15	LASER (2-BANK STAND-UP TOP)
16	KICK (2-BANK STAND-UP BOTTOM)

Lamp Matrix No. & Description

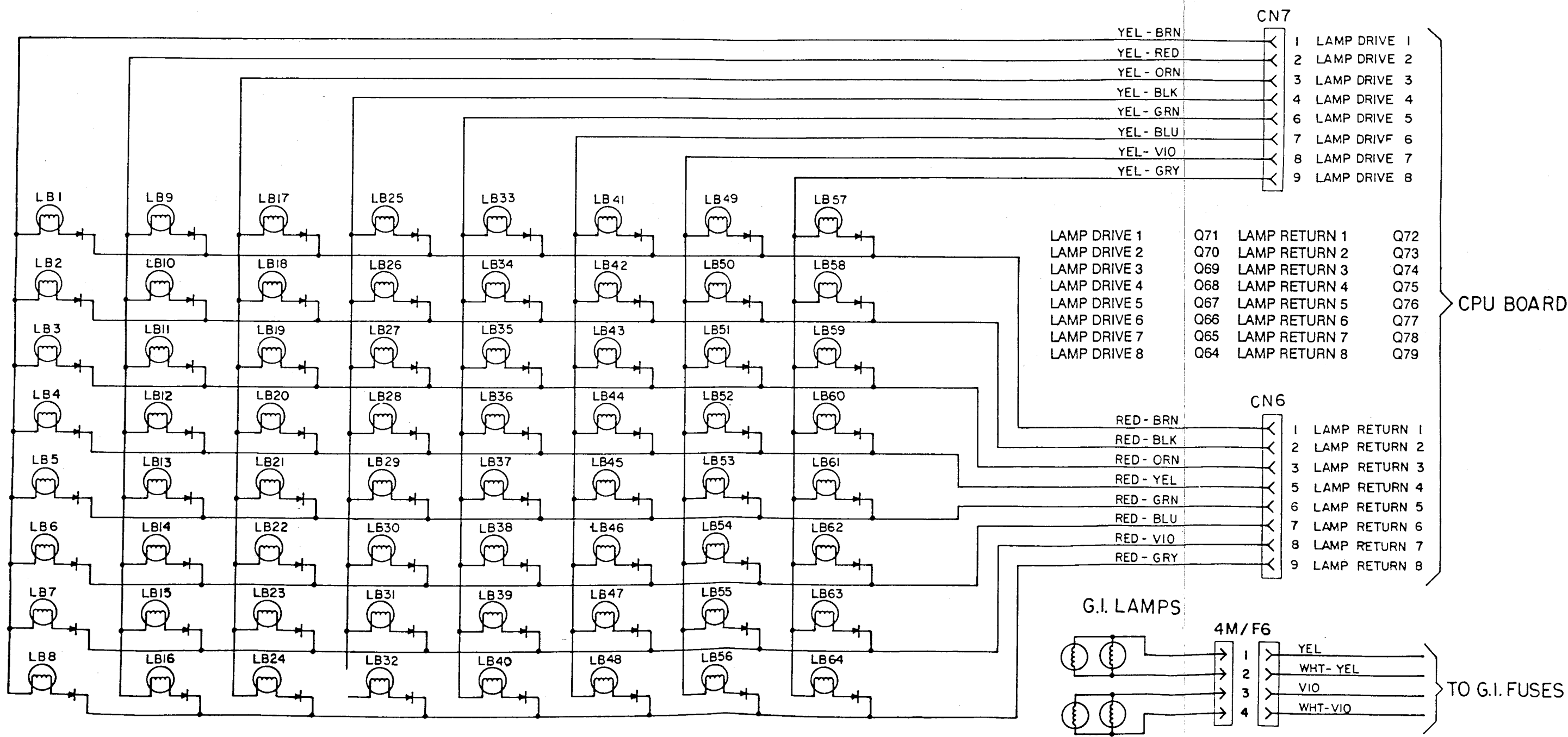
17	5-BANK STAND-UP S OF SHARK
18	5-BANK STAND-UP H OF SHARK
19	5-BANK STAND-UP A OF SHARK
20	5-BANK STAND-UP R OF SHARK
21	5-BANK STAND-UP K OF SHARK
22	LITE (3-BANK DROP TARGETS)
23	LOCK (3-BANK DROP TARGETS)
24	SQUID POPS (INNER RT RETURN LANE)
25	SPECIAL (LEFT & RIGHT OUTLANES)
26	LASER KICK (LEFT OUTLANE)
27	SHARK JACKPOT
28	JACKPOT (SIDE RAMP)
29	HELICOPTER (S-U CENTER RAMP)
30	EXTRA BALL (UPPER VUK)
31	WAVE RUNNER (S-U RT RAMP LT)
32	SCARAB (STAND-UP RT RAMP RT)

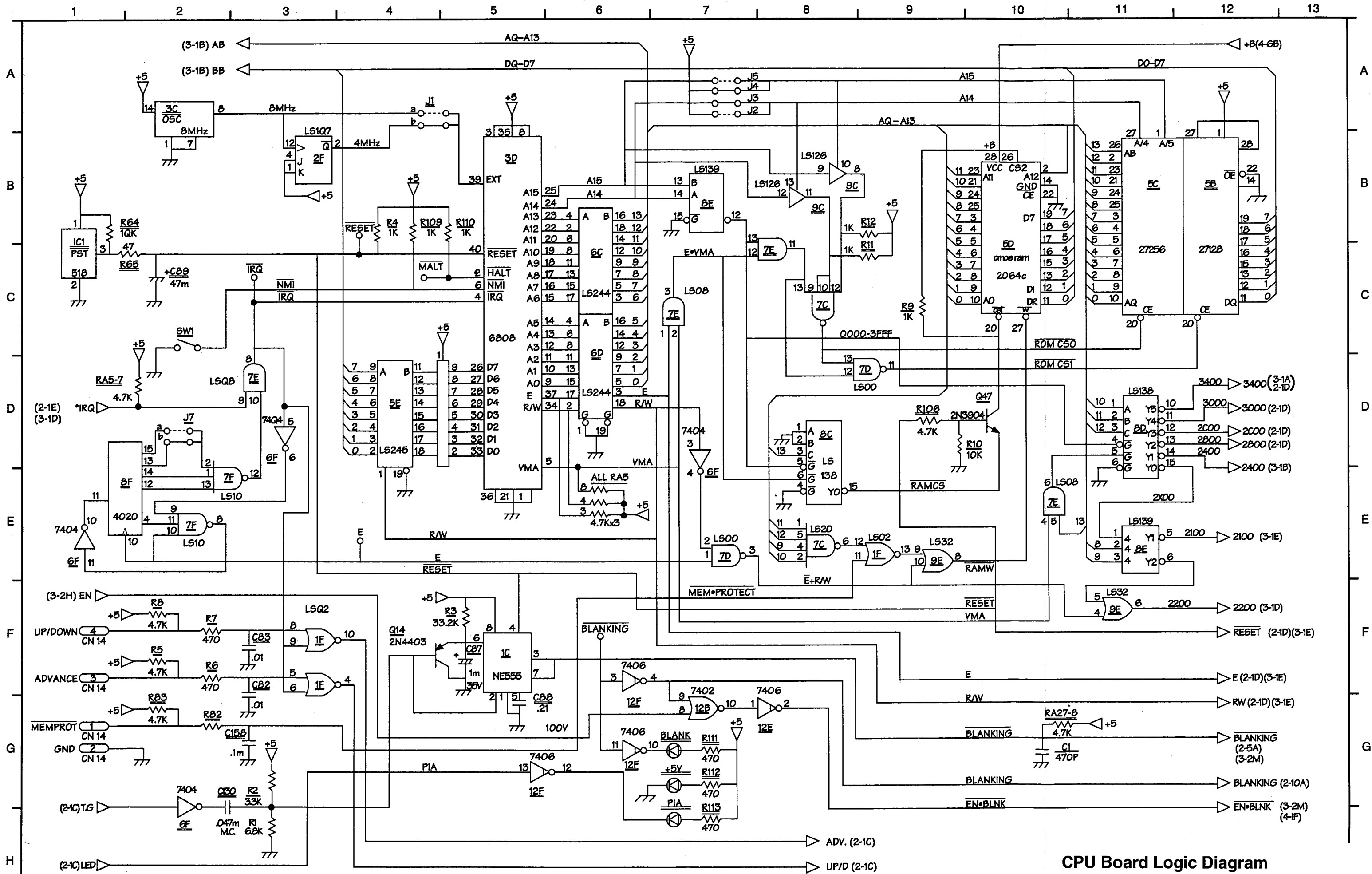
Lamp Matrix No. & Description

33	LOCK 1 (OVER LEFT RAMP ENTER)
34	LOCK 2 (OVER LEFT RAMP ENTER)
35	LOCK 3 (OVER LEFT RAMP ENTER)
36	ATV (STAND-UP LEFT RAMP LEFT SIDE)
37	RESCUE TRUCK (S-U LEFT RAMP RT)
38	S OF SPF (TOP LANE LEFT ROLLOVER)
39	P OF SPF (TOP LANE MID ROLLOVER)
40	F OF SPF (TOP LANE RIGHT ROLLOVER)
41	G OF (G)UARD
42	MITCH
43	CPR
44	SURF BOARD (LEFT RAMP)
45	U OF G(U)ARD
46	MATT
47	COPTER RESCUE
48	SURF BOARD (CENTER RAMP)

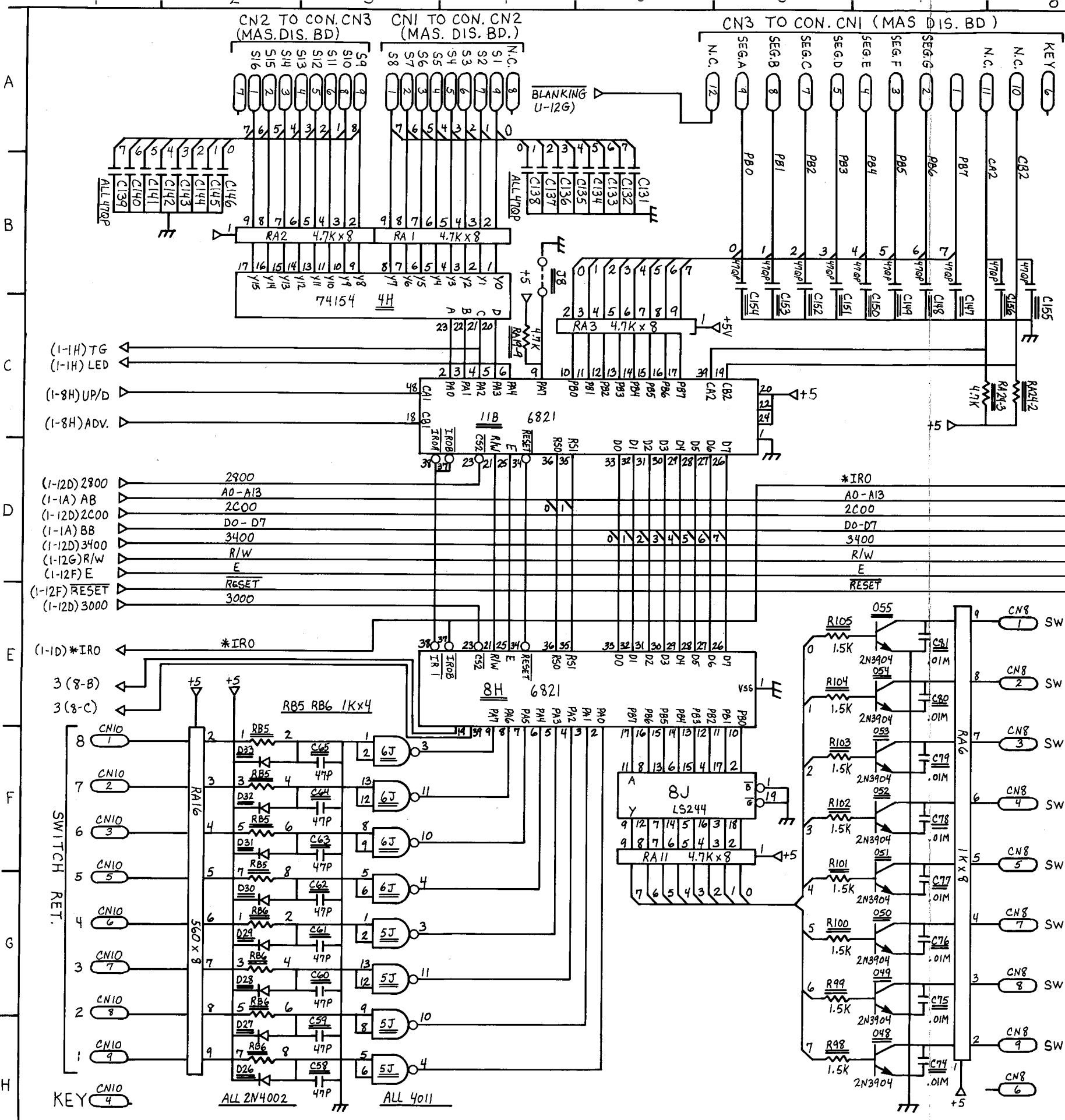
Lamp Matrix No. & Description

49	A OF GU(A)RD
50	C.J.
51	DIVER TRAPPED
52	SURF BOARD (UPPER VUK)
53	R OF GUA(R)D
54	CAROLINE
55	SHARK COVE
56	SURF BOARD (RIGHT RAMP)
57	D OF GUAR(D)
58	STEPHANIE
59	TIDAL WAVE
60	SURF BOARD (SPINNER)
61	TIDAL WAVE (LEFT ORBIT)
62	EARTH QUAKE (UPPER VUK)
63	TIDAL WAVE (SPINNER)
64	START BUTTON

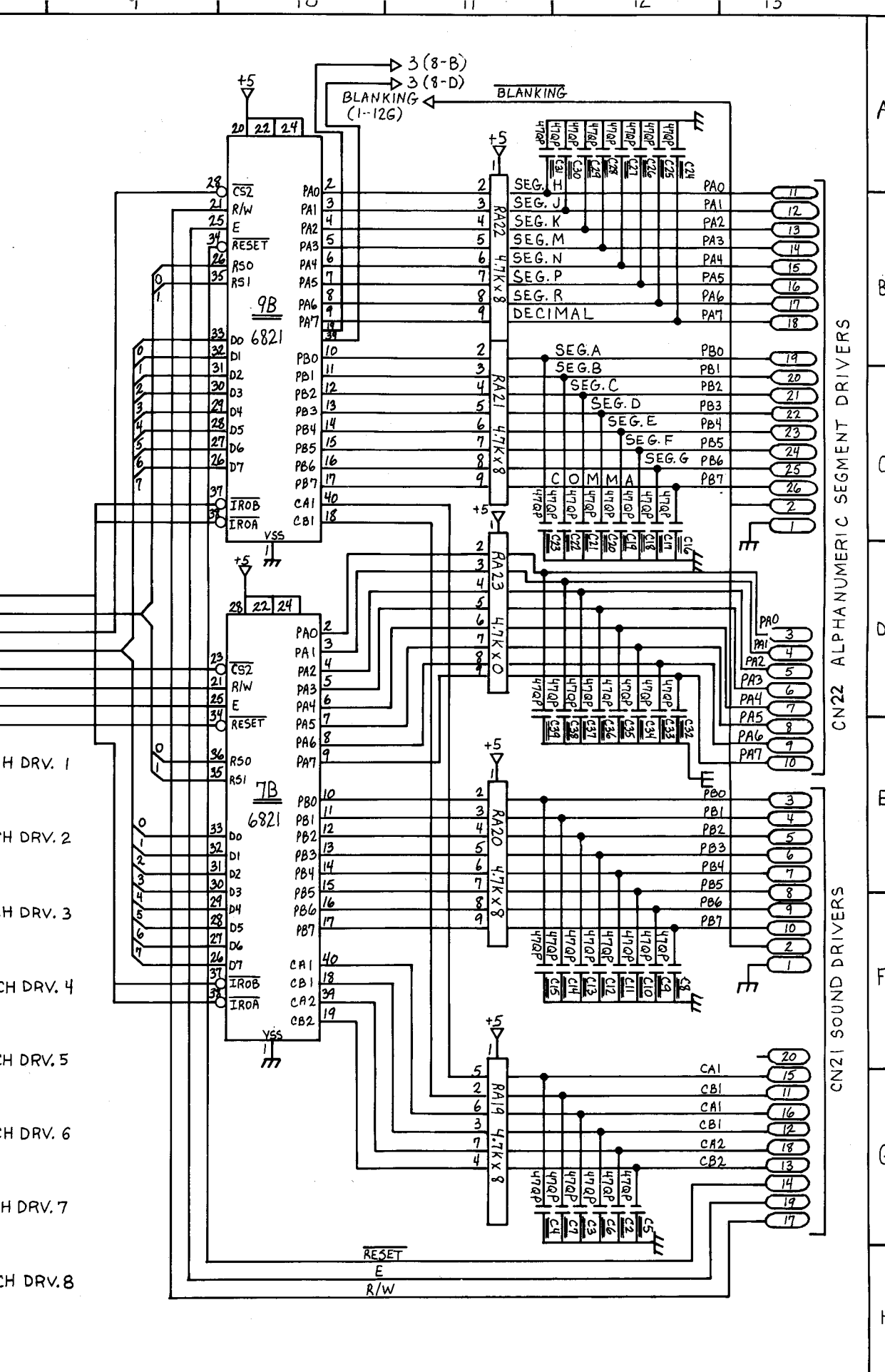




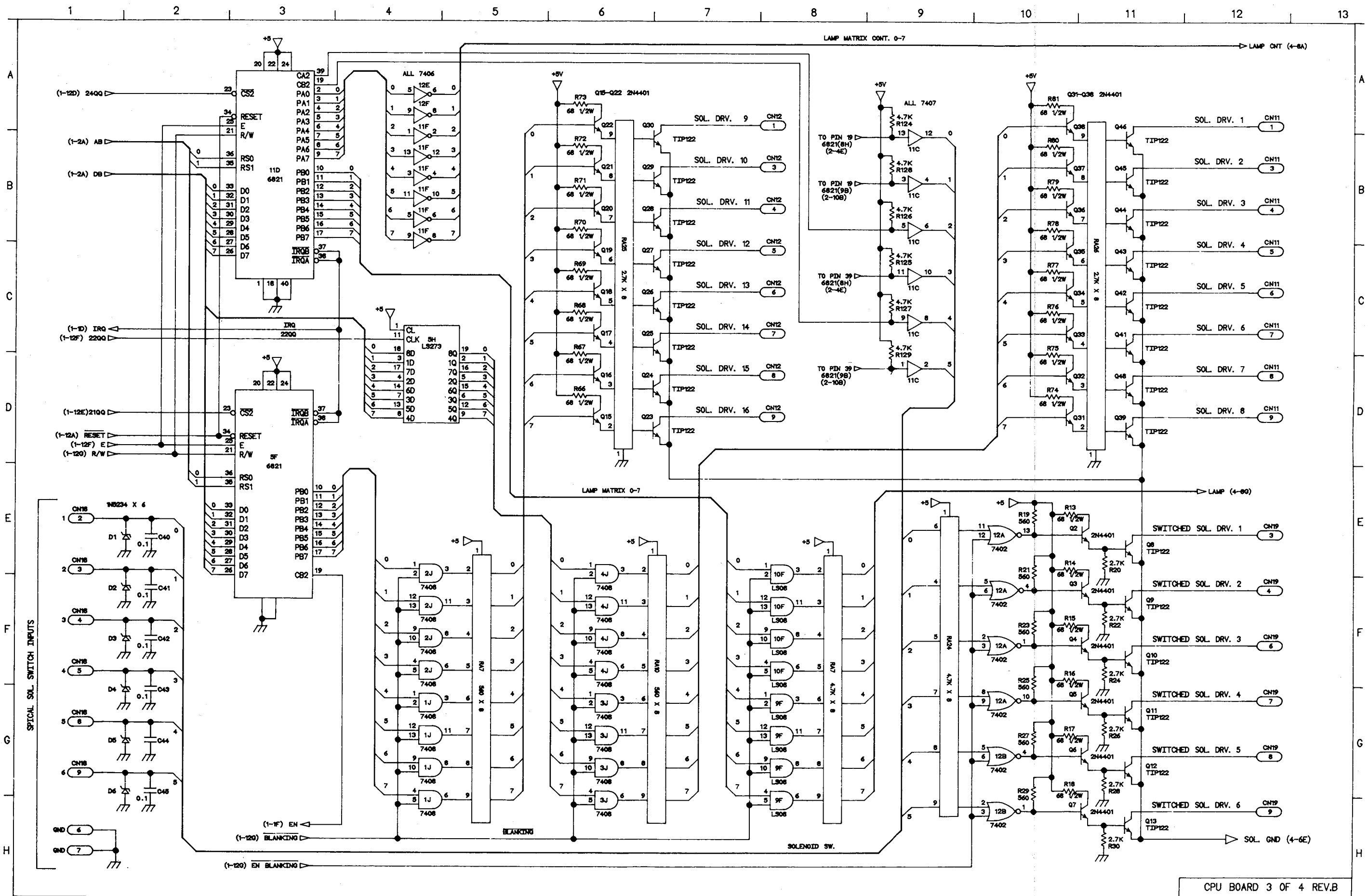
CPU Board Logic Diagram
(Sheet 1 of 4)



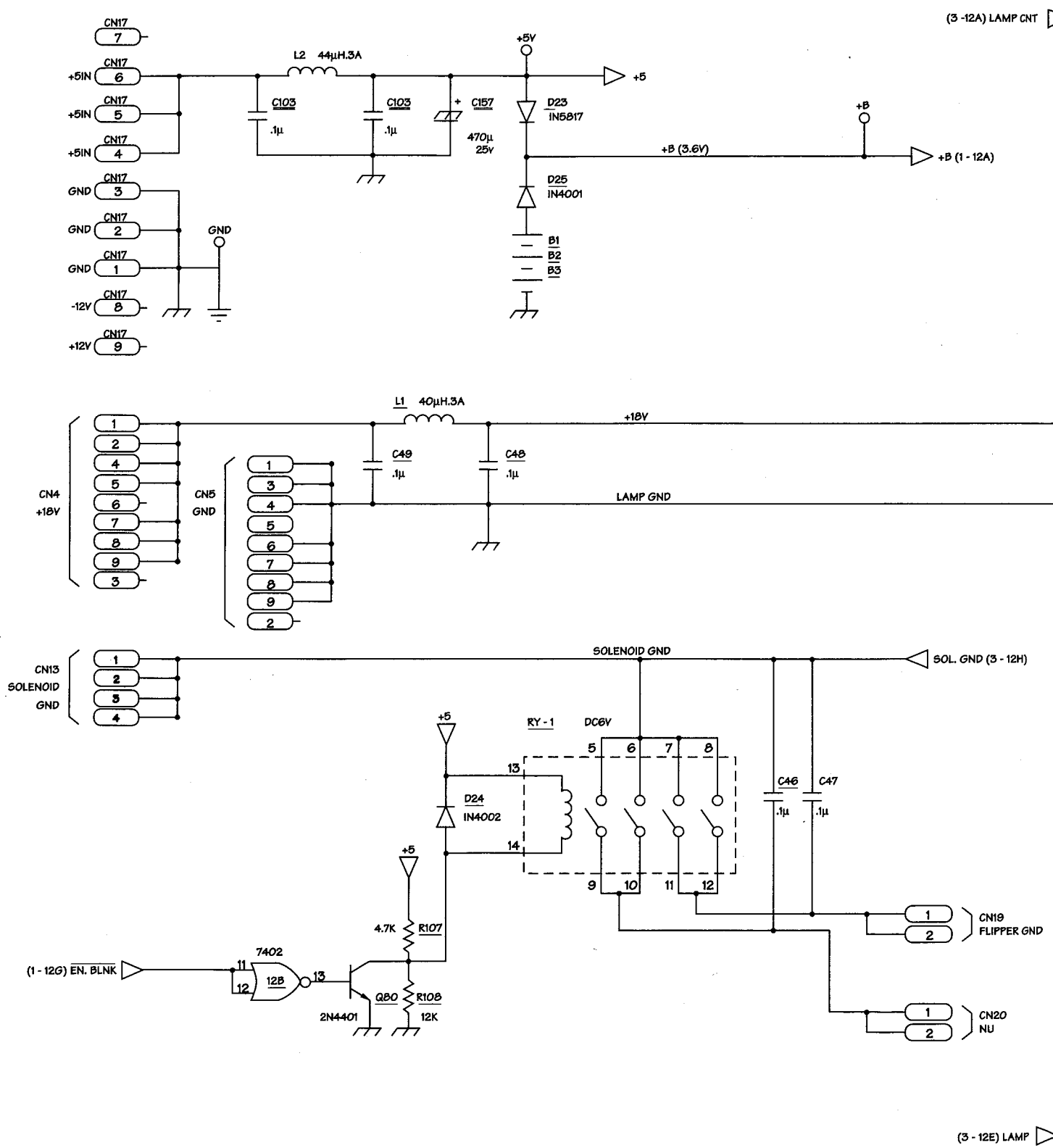
CPU Board Logic Diagram
(Sheet 2 of 4)



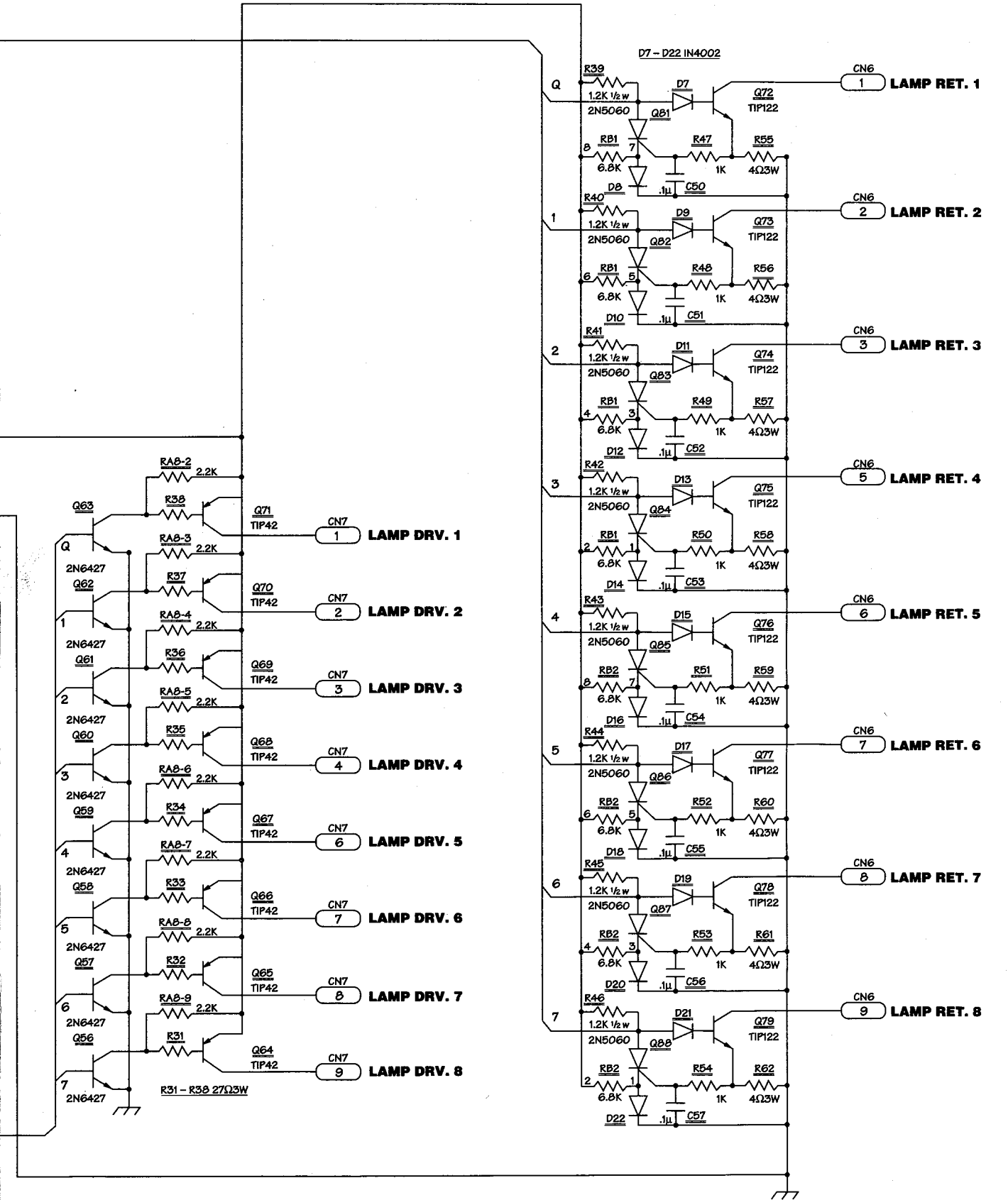
CPU Board Logic Diagram
(Sheet 2 of 4)



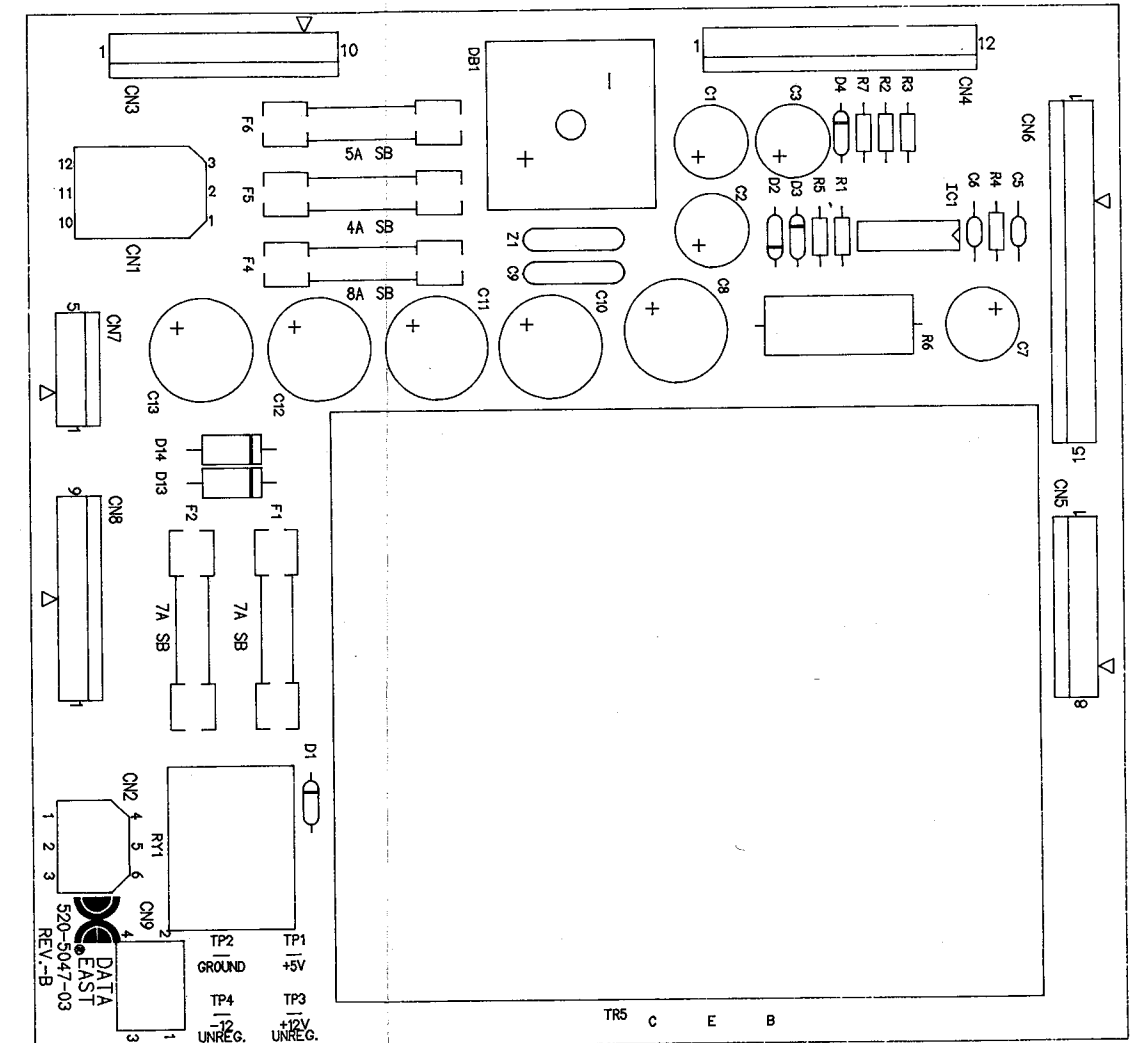
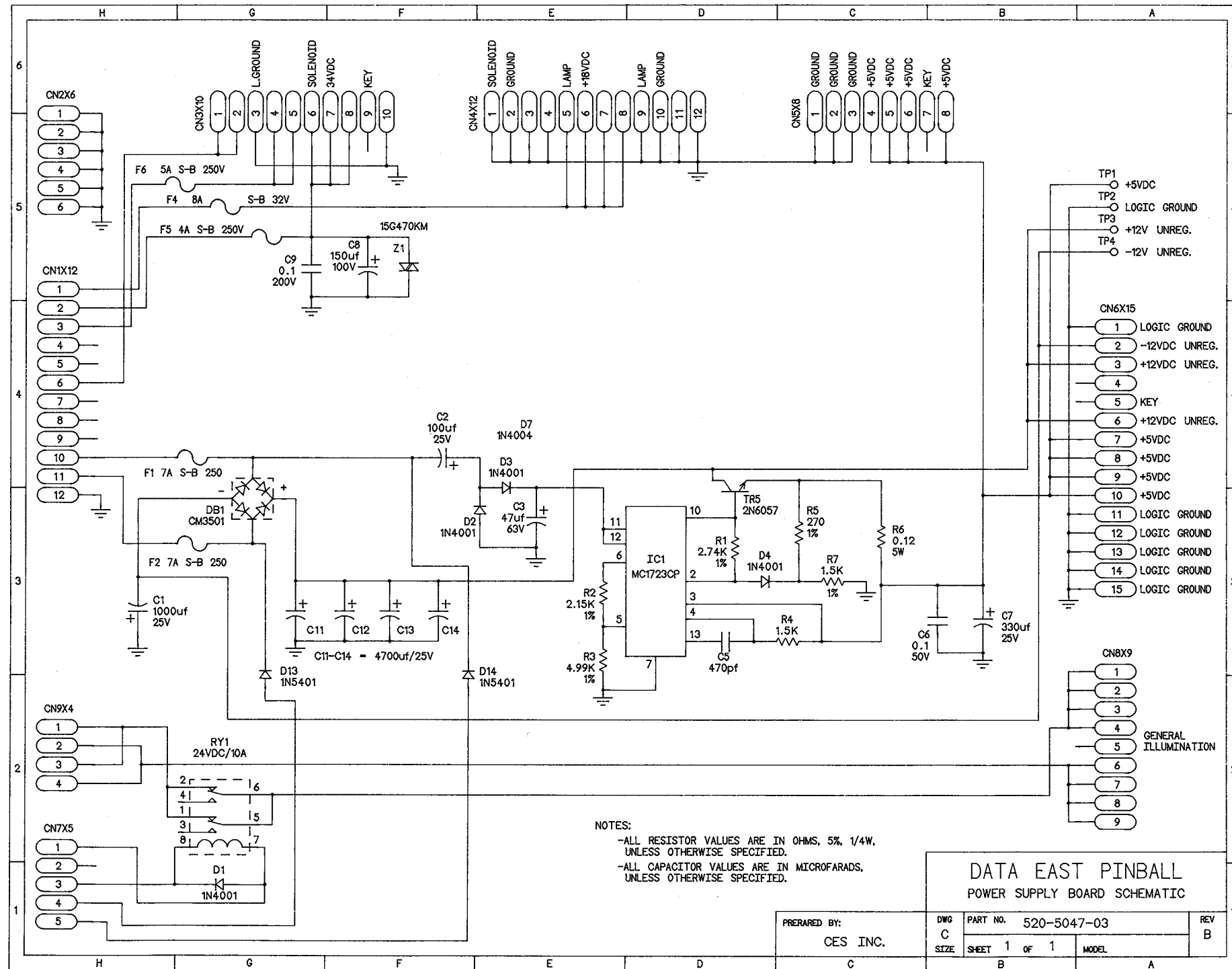
CPU Board Logic Diagram
(Sheet 3 of 4) 91



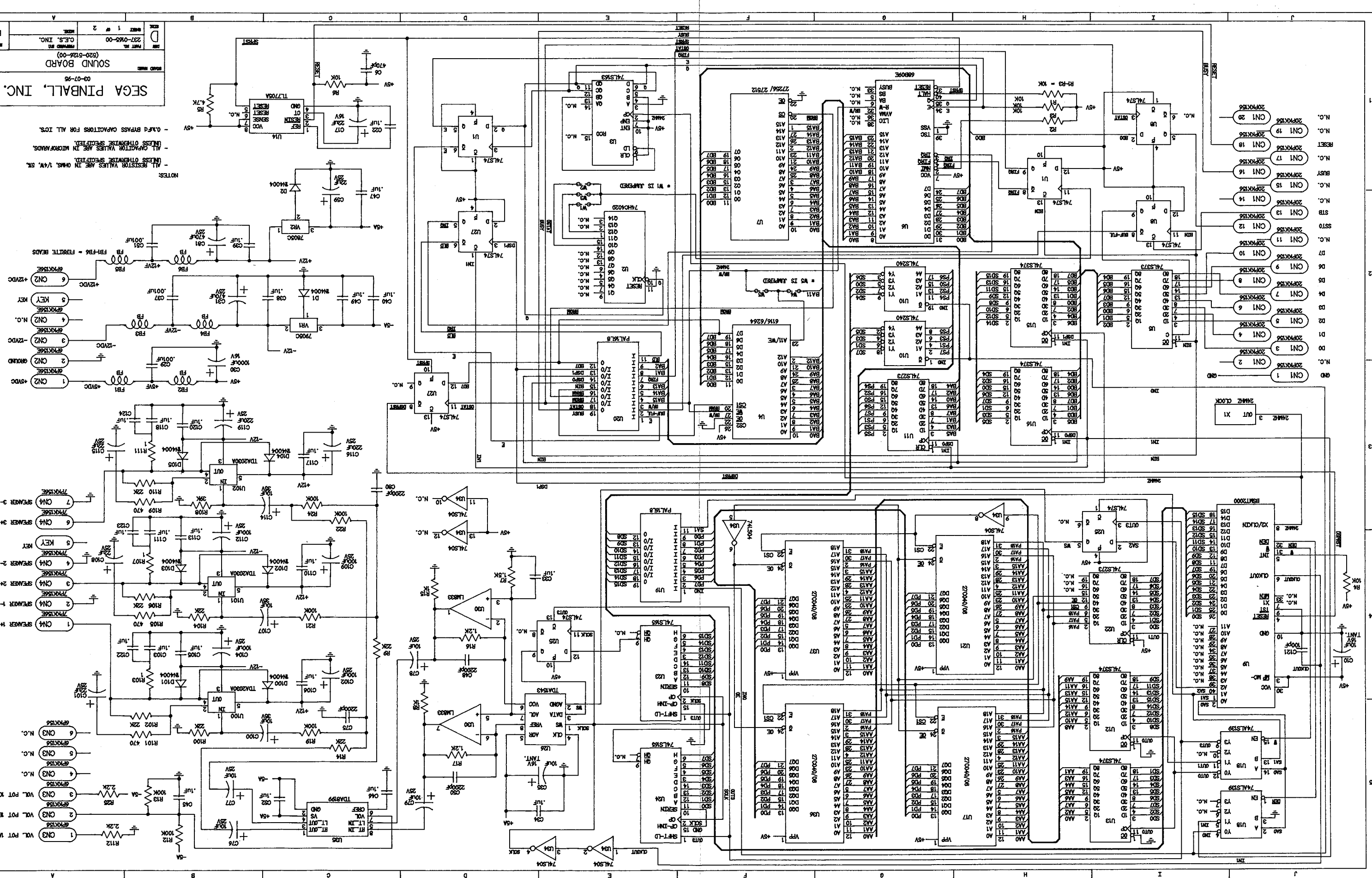
CPU Board Logic Diagram (Sheet 4 of 4)



CPU Board Logic Diagram (Sheet 4 of 4)

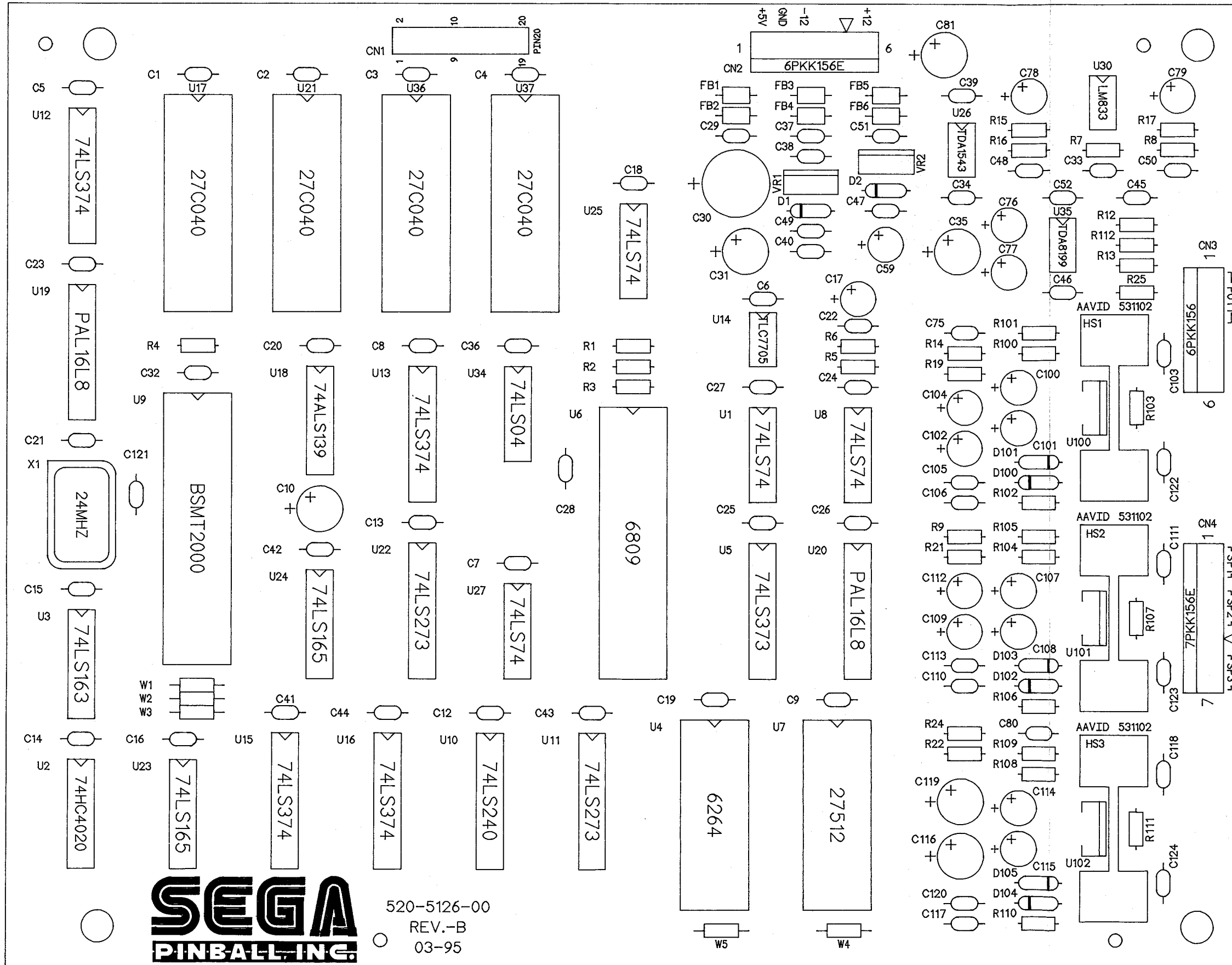


NOTES:
 - ALL RESISTOR VALUES ARE IN OHMS, 1/4W, 5%.
 - ALL CAPACITOR VALUES ARE IN MICROFARADS.
 - UNLESS OTHERWISE SPECIFIED.
 - 0.1UF BYPASS CAPACITORS FOR ALL IC'S.

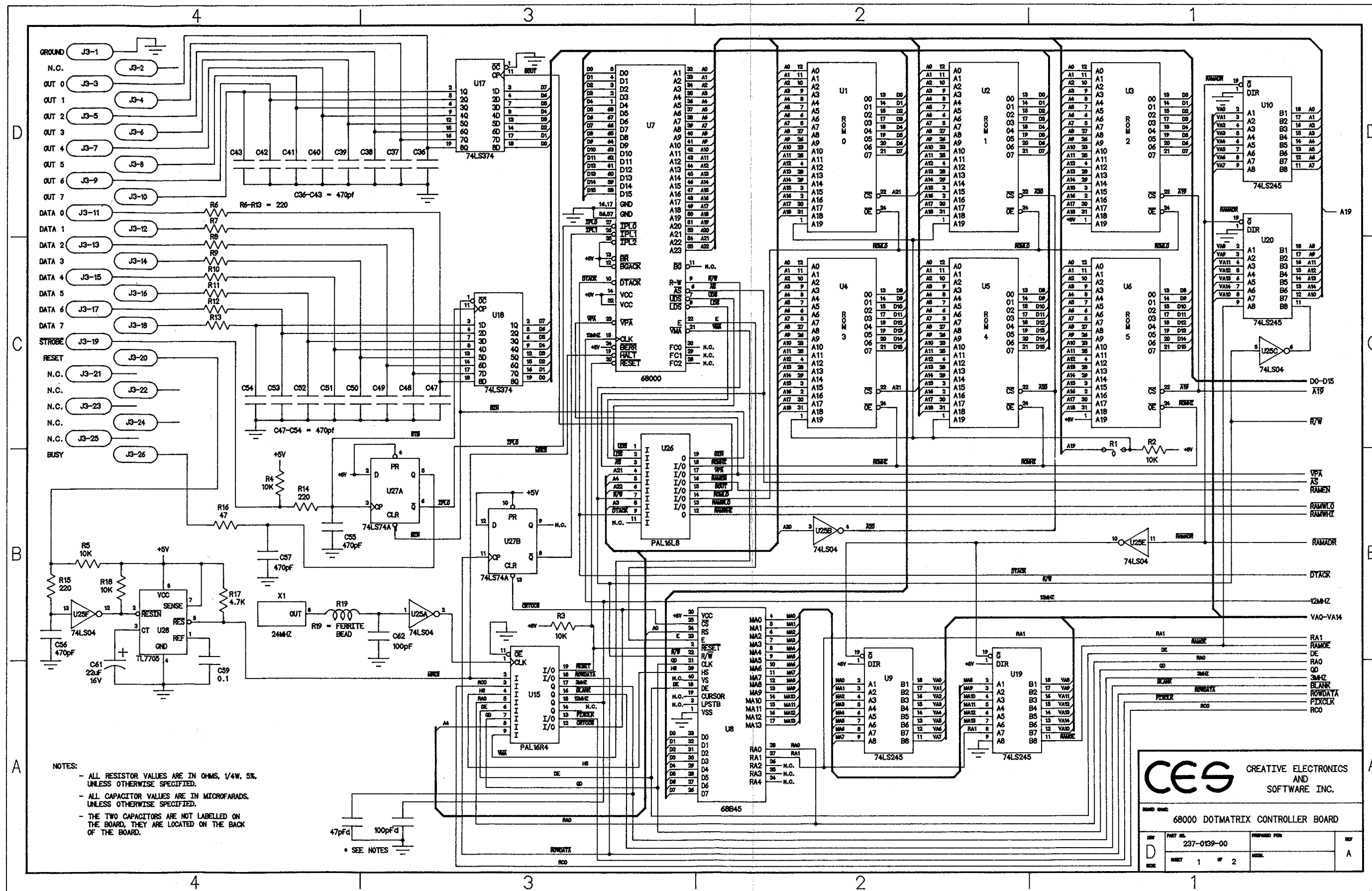


Sound Board Schematic
 (520-5126-XX)

Sound Board Schematic
 (520-5126-XX)



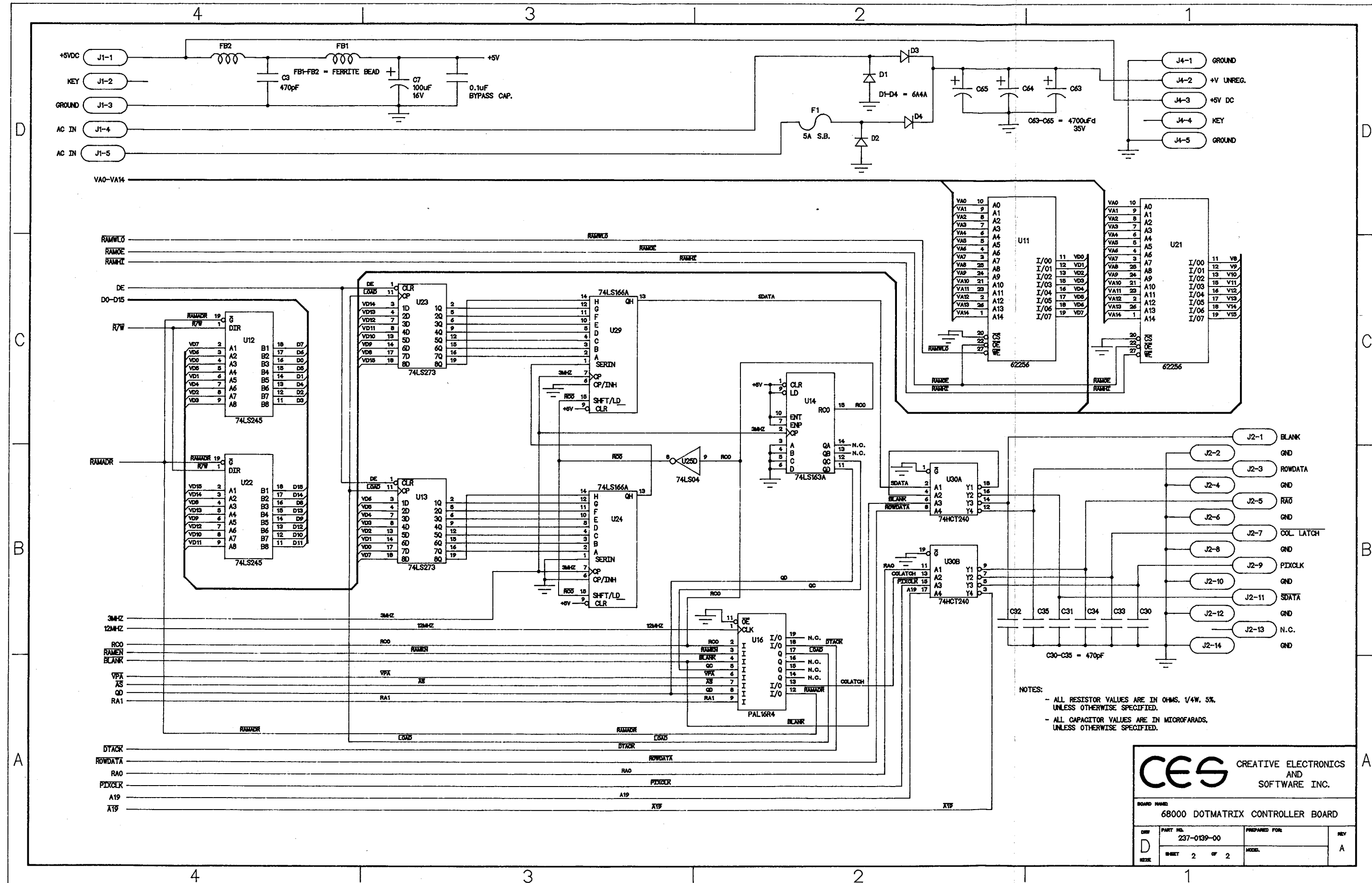
520-5126-00
 REV.-B
 03-95



Display Controller Board Schematic (Page 1 of 2)

Display Controller Board Schematic (Page 1 of 2)

CES CREATIVE ELECTRONICS AND SOFTWARE INC.
 BOARD NAME: 68000 DOTMATRIX CONTROLLER BOARD
 PART NO. 237-0139-00
 SHEET 1 OF 2

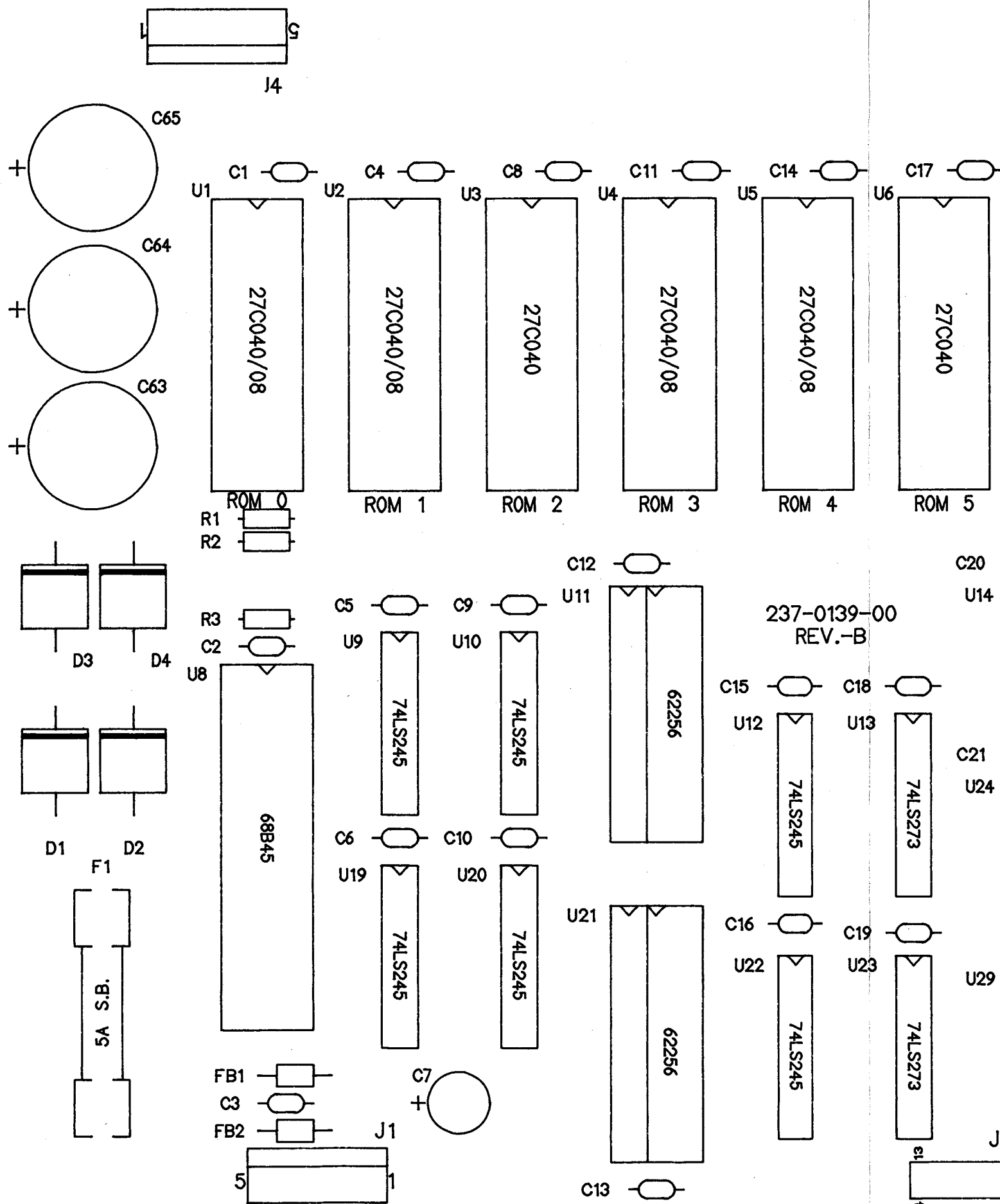


Display Controller Board Schematic (Page 2 of 2) 97

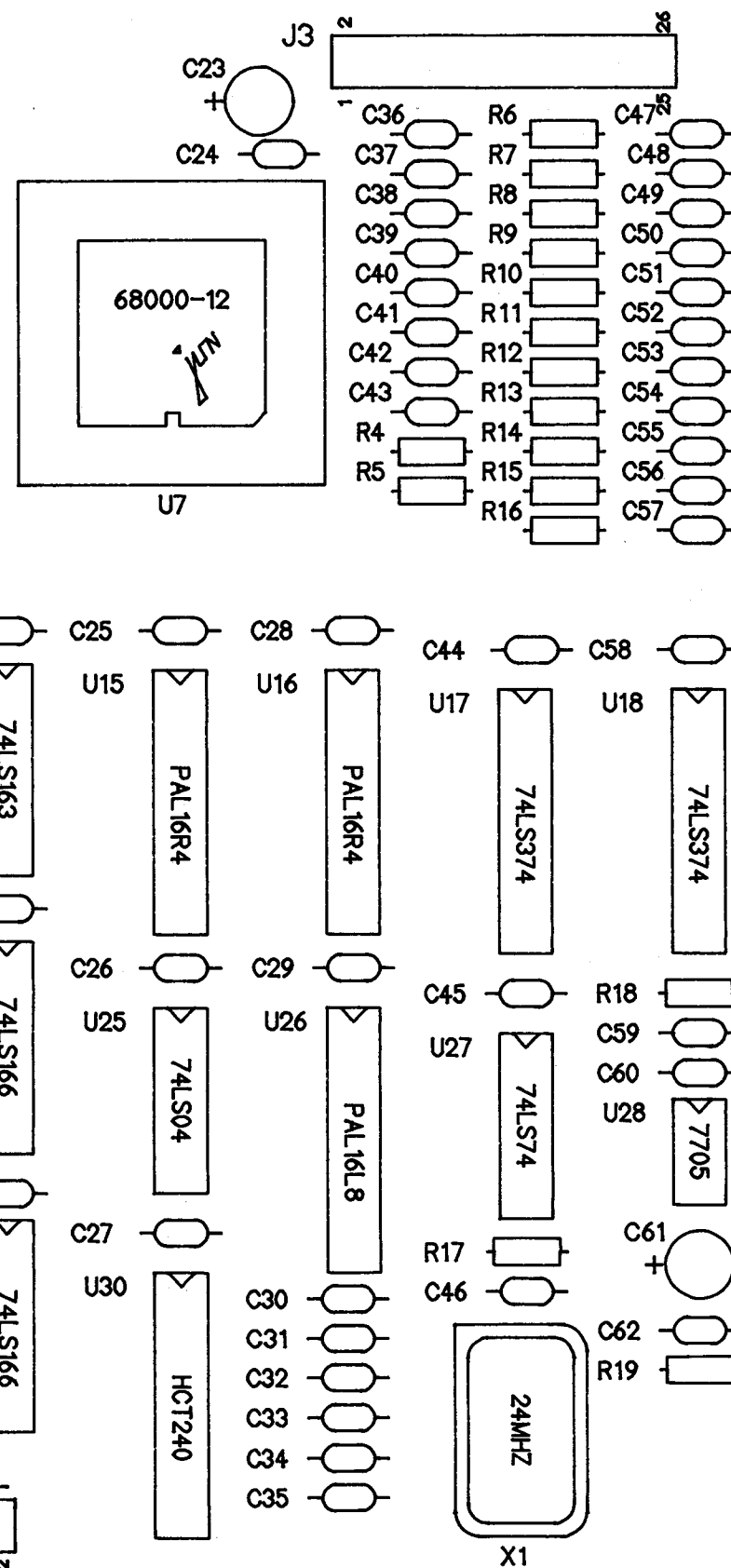
CES CREATIVE ELECTRONICS AND SOFTWARE INC.

BOARD NAME: 68000 DOTMATRIX CONTROLLER BOARD

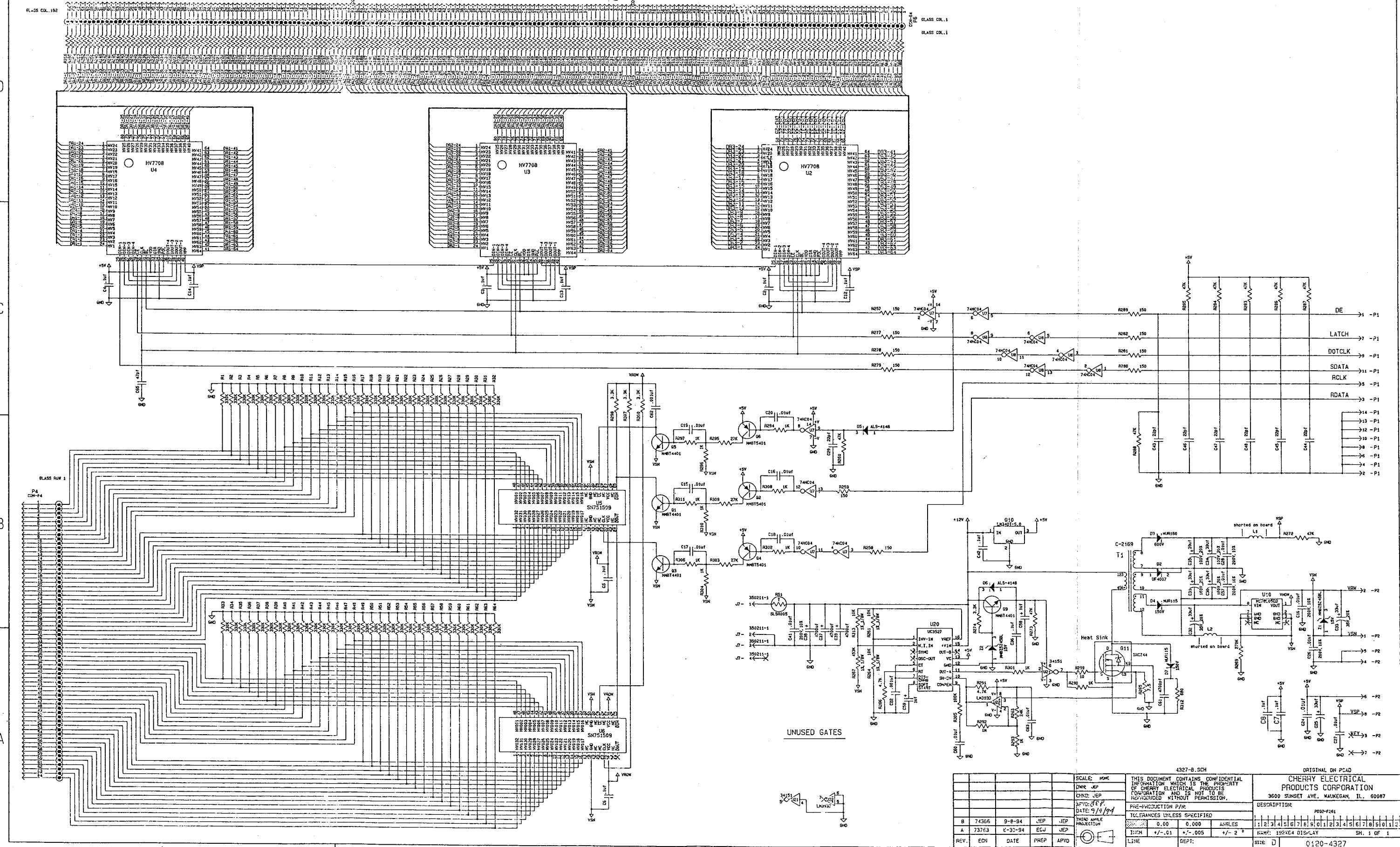
REV	PART NO.	PREPARED FOR	REV
D	237-0139-00		A
SIZE	SHEET 2 OF 2	MODEL	



Display Controller Board
Component Layout



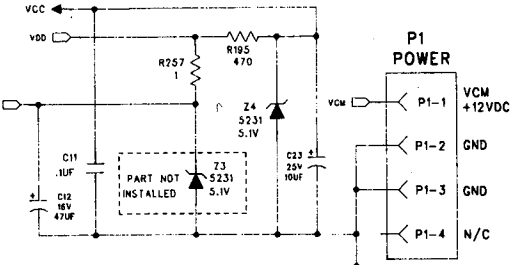
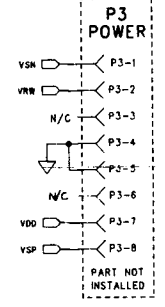
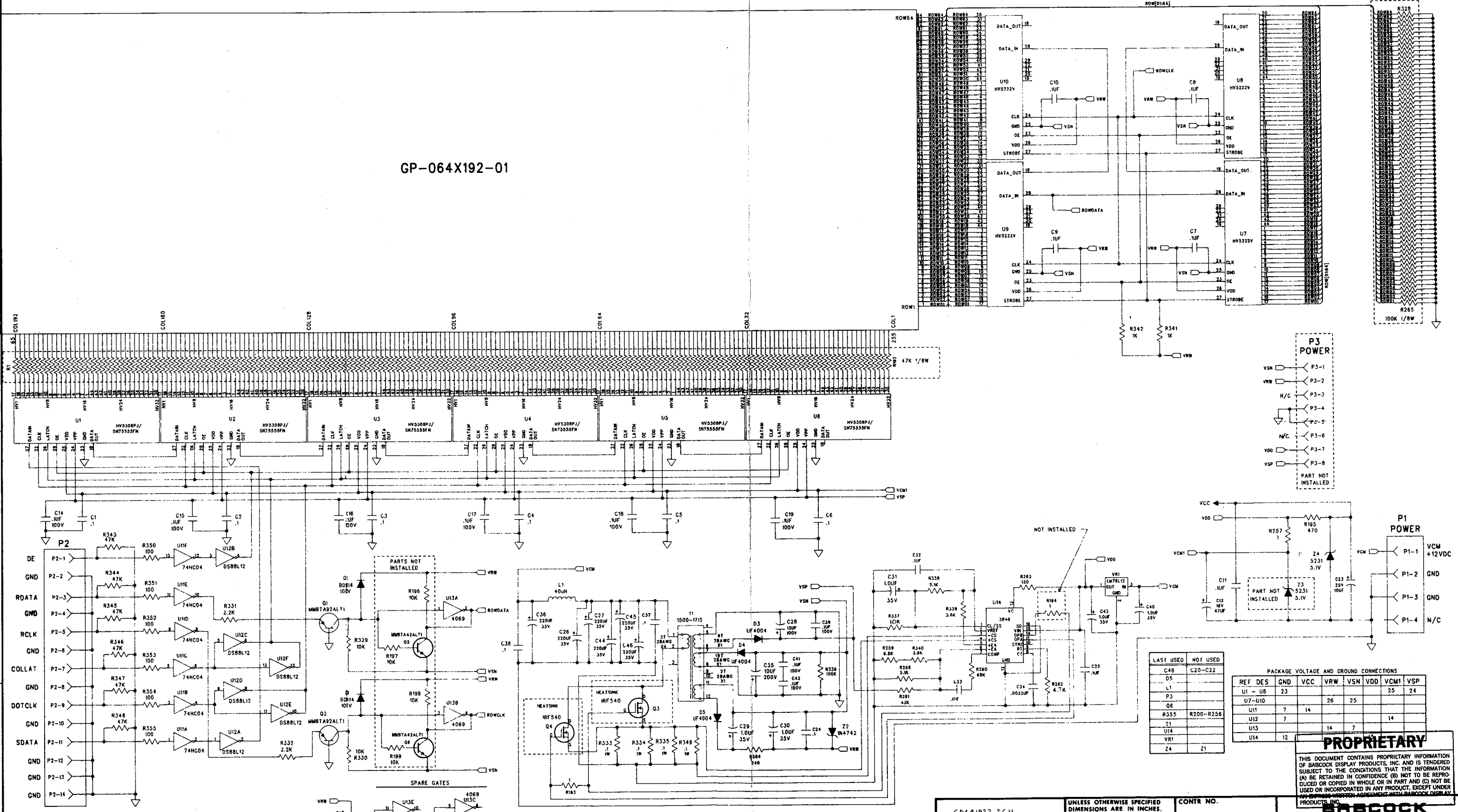
Display Controller Board
Component Layout



4327-B.SCH ORIGINAL ON PCAD				
THIS DOCUMENT CONTAINS CONFIDENTIAL INFORMATION WHICH IS THE PROPERTY OF CHERRY ELECTRICAL PRODUCTS CORPORATION AND IS NOT TO BE REPRODUCED WITHOUT PERMISSION.				
PRE-PRODUCTION P/R				
TOLERANCES UNLESS SPECIFIED				
INCH	+/-.01	+/-.005	+/-.003	+/-.002
REV.	ECH	DATE	PREP	APVD
B 74306		9-8-84		JEP
A 73763		E-30-84		ECJ
DESCRIPTION: 9030-F04				
NAME: 192K4 D15-CAY SH. 1 OF 1				
REV.		DEPT:		SIZE: D

Display Driver, Dwg. 1 (Cherry) 99

GP-064X192-01



LAST USED	NOT USED
C46	C20-C22
D5	
L1	
P3	
O6	
R355	R200-R258
T1	
U4	
VR1	
Z4	Z1

PACKAGE VOLTAGE AND GROUND CONNECTIONS						
REF	DES	GND	VCC	VRW	VSH	VDD
U1 - U6		23				25
U7 - U10				26	25	
U11		7	14			
U12		7				14
U13						14
U14		12				

PROPRIETARY
 THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF BABCOCK DISPLAY PRODUCTS, INC. AND IS TENDERED SUBJECT TO THE CONDITIONS THAT THE INFORMATION (A) BE RETAINED IN CONFIDENCE (B) NOT TO BE REPRODUCED OR COPIED IN WHOLE OR IN PART AND (C) NOT BE USED OR INCORPORATED IN ANY PRODUCT, EXCEPT UNDER AN EXPRESS WRITTEN AGREEMENT WITH BABCOCK DISPLAY PRODUCTS, INC.

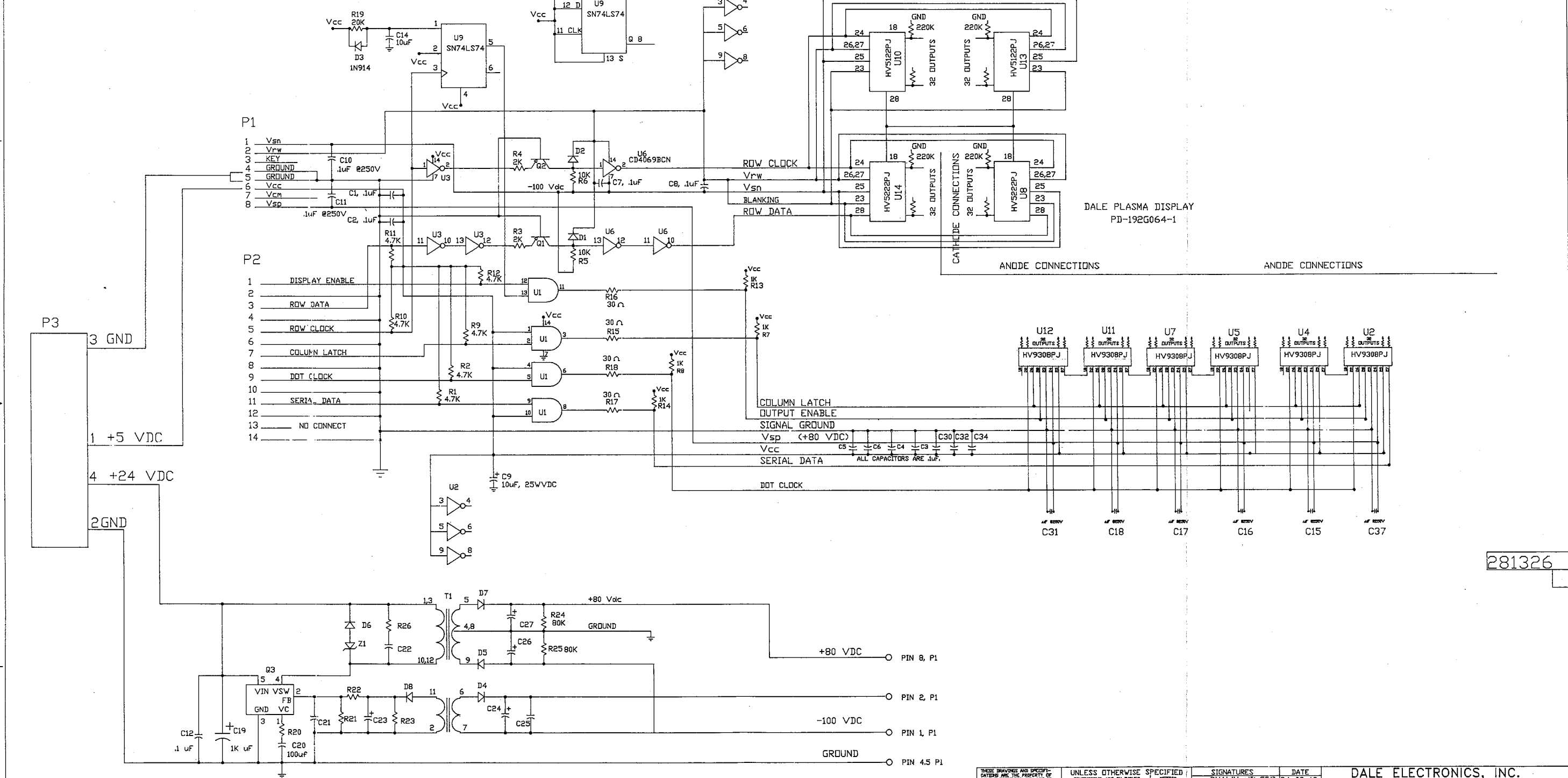
2. RESISTOR VALUES ARE IN OHMS, 1/8 WATT, 5%.
 1. CAPACITOR VOLTAGES ARE 50V, 20%.
 NOTES: UNLESS OTHERWISE SPECIFIED.

G0641922 SCH		CONTR. NO.	
KEY 2,3A PCB		DRAWN BY KEN M	DATE 7-6-94
		CHECK BY	DATE
		APPR BY	DATE
		DO NOT SCALE PRINT	
NEXT ASSY USED ON APPLICATION		THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF BABCOCK AND IS TENDERED SUBJECT TO THE CONDITIONS THAT THE INFORMATION (A) BE RETAINED IN CONFIDENCE (B) NOT TO BE REPRODUCED OR COPIED IN WHOLE OR IN PART AND (C) NOT BE USED OR INCORPORATED IN ANY PRODUCT, EXCEPT UNDER AN EXPRESS WRITTEN AGREEMENT WITH BABCOCK DISPLAY PRODUCTS, INC.	
G064192-01C		CODE IDENT. 66646	1510-0124
		SCALE	SIZE D SHEET 1 OF 1

Display Driver, Dwg. 2 (Babcock)

Display Driver, Dwg. 2 (Babcock)

PART NO.	INTL CODE
281326-01	ST



ZONE	SYM	REVISIONS	DATE	APPROVED

NOTES

<p>UNLESS OTHERWISE SPECIFIED</p> <p>FRACCTIONS DECIMALS ANGLES</p> <p>1/64 XXX 2.005 0°30'</p> <p>XXX 2.005 0°30'</p> <p>XXX 2.005 0°30'</p>	<p>MATERIAL</p> <p>FINISH</p>	<p>SIGNATURES</p> <p>DR SHAWN HILGER 94-08-12</p>	<p>DATE</p> <p>94-08-12</p>	<p>DALE ELECTRONICS, INC.</p> <p>A COMPANY OF VISHAY</p> <p>COLUMBUS, NEBRASKA</p>		
		<p>CHKD</p>	<p>TITLE</p> <p>ELECTRICAL SCHEMATIC -</p> <p>APD-192G064/ 1</p>			
		<p>DSGN</p>	<p>SIZE</p> <p>D</p>		<p>CODE IDENT NO.</p> <p>91637</p>	<p>DRAWING NO.</p> <p>281326</p>
		<p>SECT</p>	<p>SCALE</p> <p>NONE</p>		<p>SHEET</p> <p>1 OF 1</p>	

New Solid State Flipper Board

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

Theory of Operation for the Solid State Flippers

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

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

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

E.O.S. Switch Theory of Operation

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

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

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

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

E.O.S. Switch Adjustment

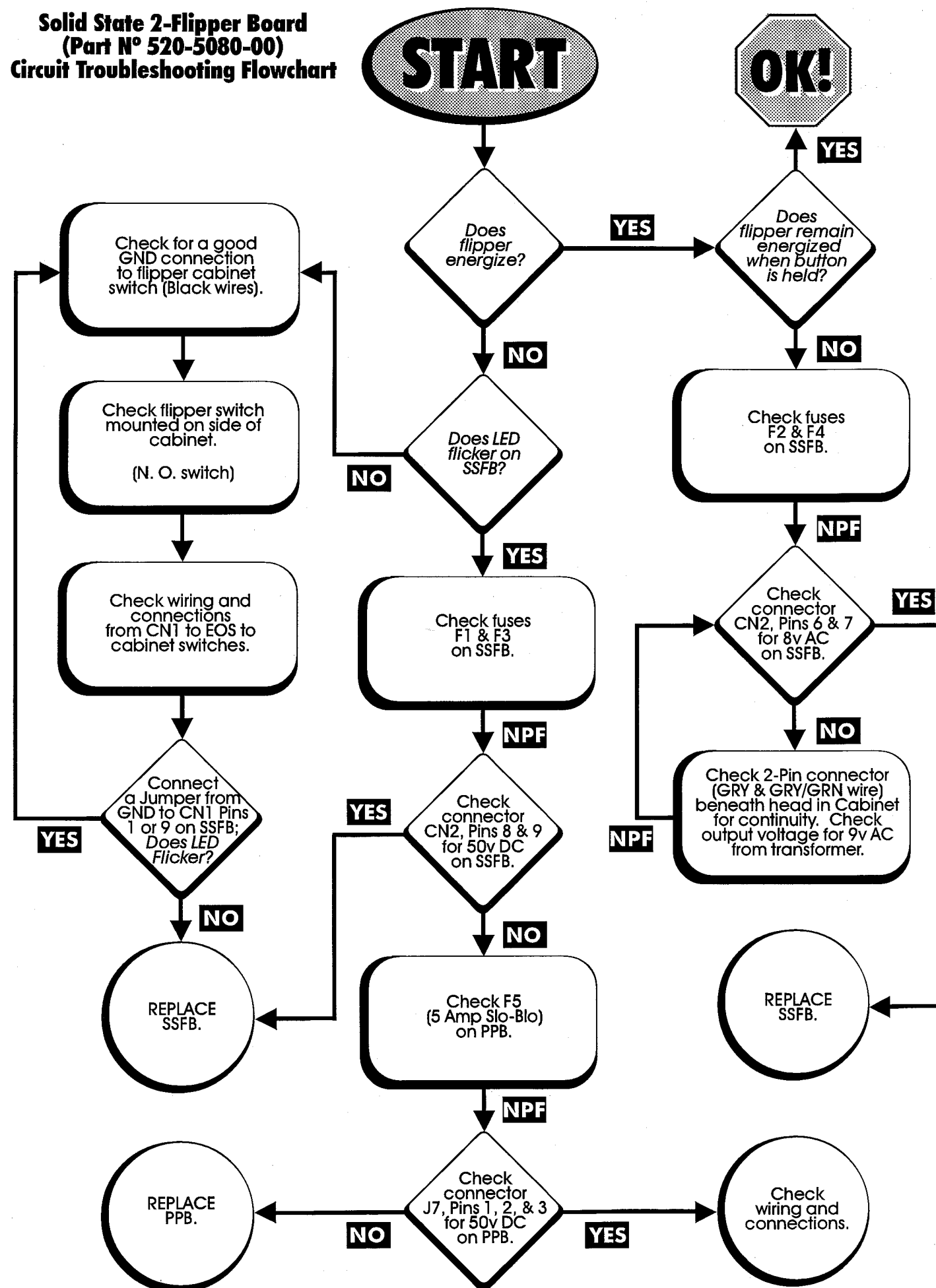
The switch contacts should be adjusted so that when the solenoid is energized, the contacts stay closed for almost the full travel of the plunger. The contacts should open 1/16" before the plunger bottoms out or reaches maximum travel.

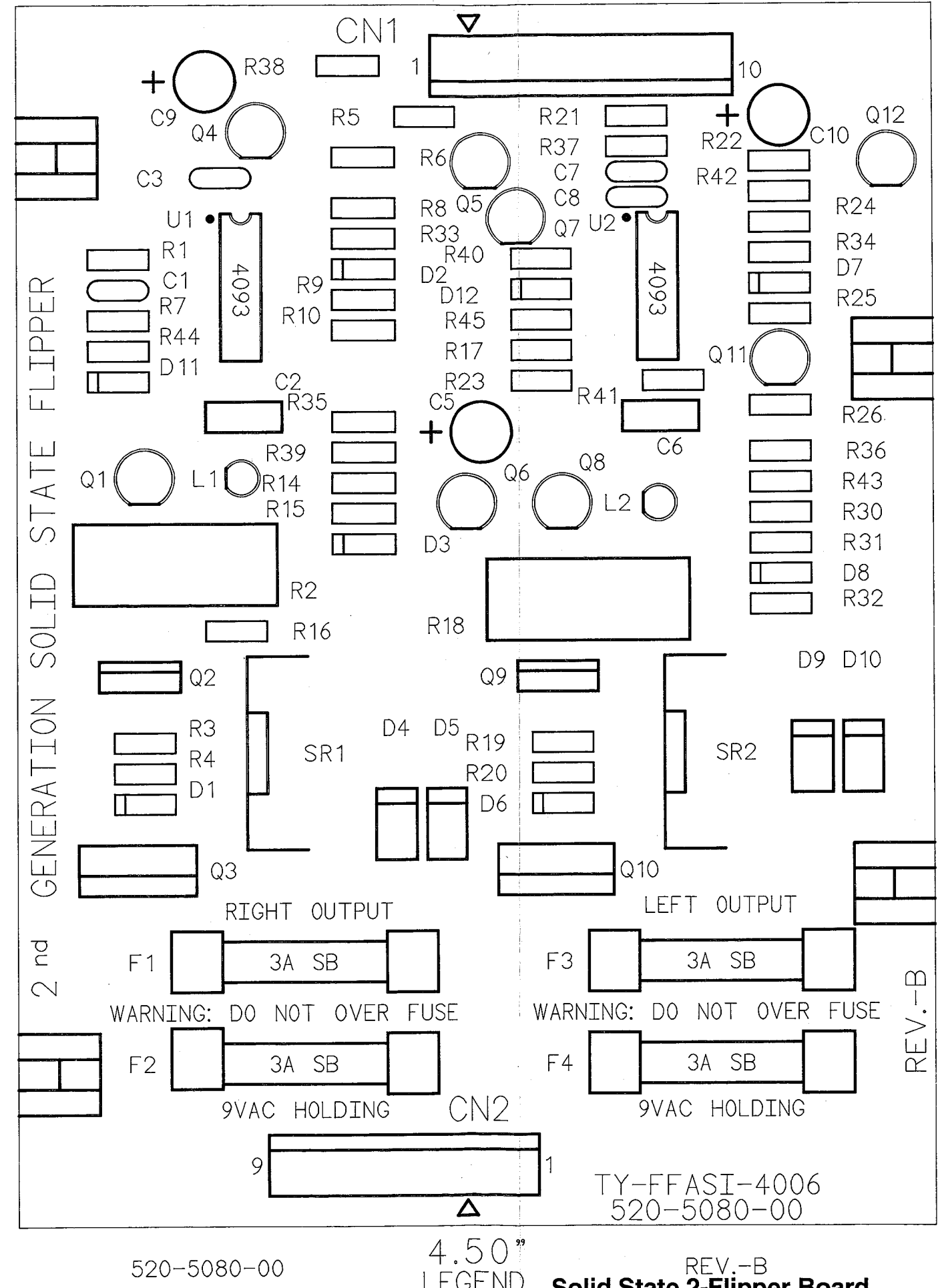
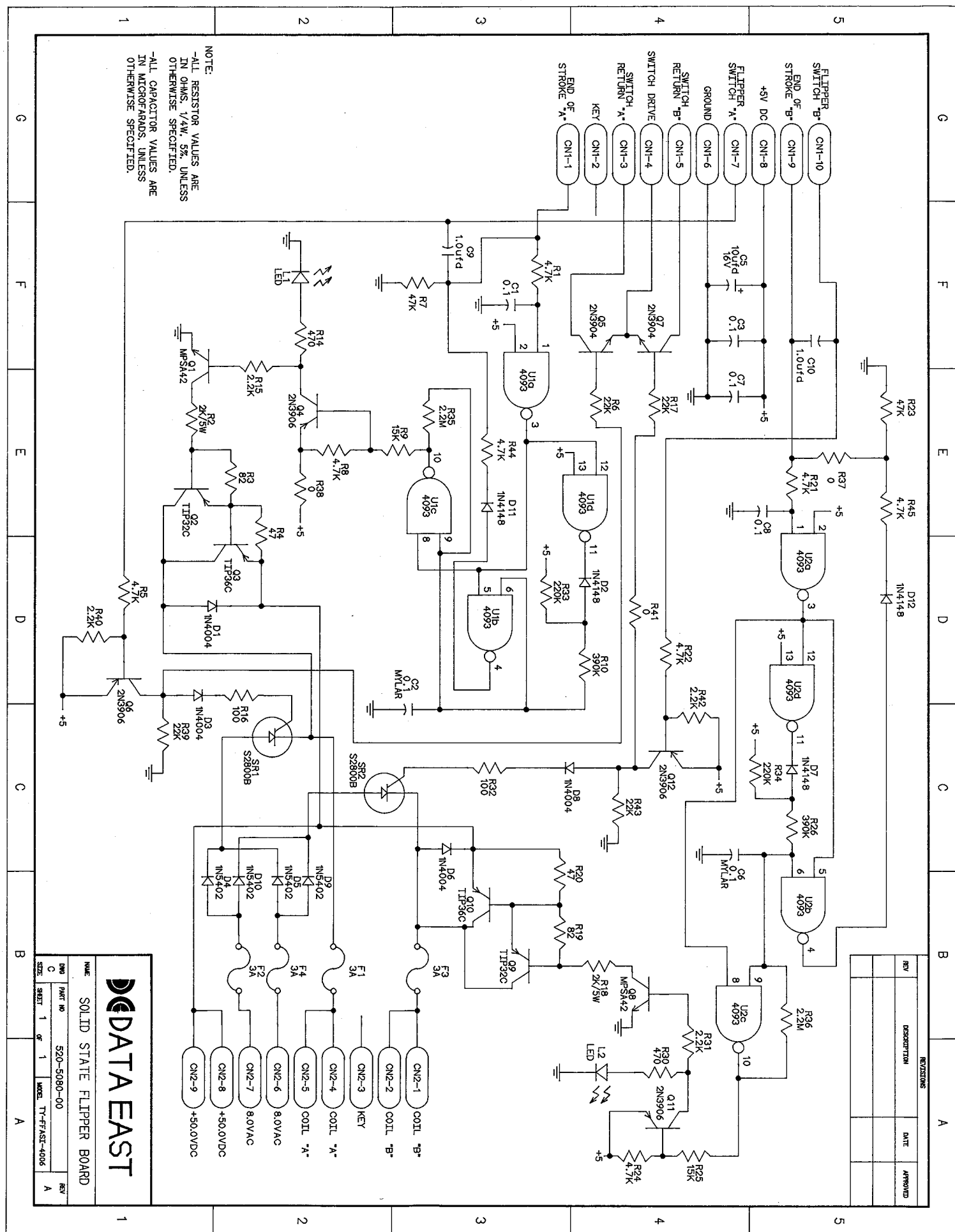
Troubleshooting Tips

The only indication of a problem you will have is the player complaining that when the flipper bat is being held in the up position, a high velocity shot from one of the playfield solenoids causes the ball to hit the flipper bat and physically knock it back. This will not occur if the E.O.S. is working. Check switch for alignment and continuity, replace if necessary.

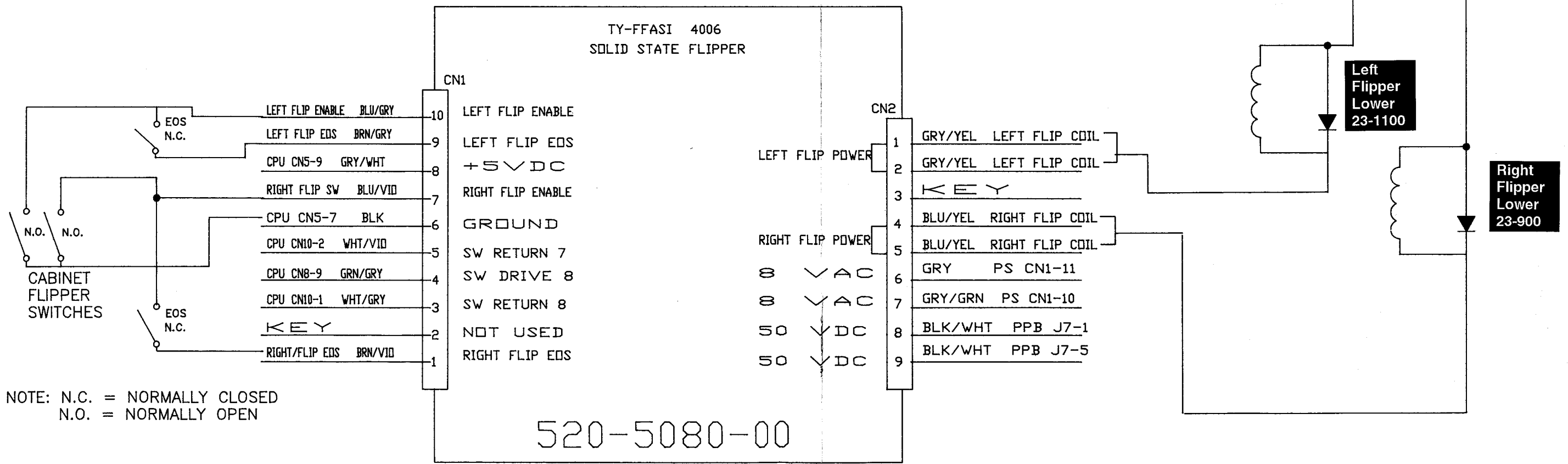
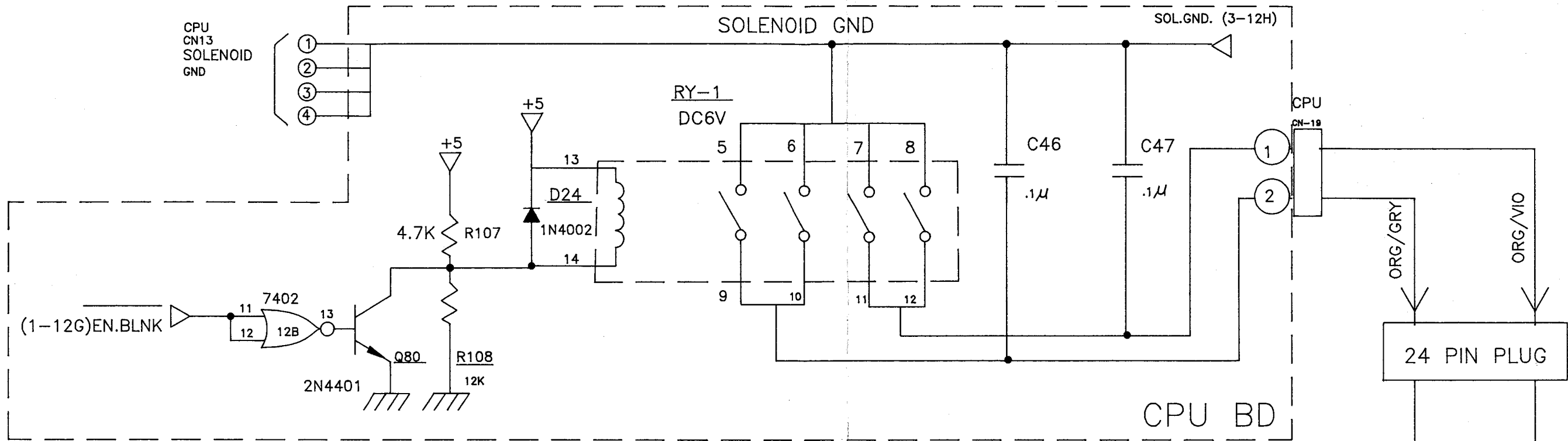
Solid State 2-Flipper Board Theory of Operation &

Solid State 2-Flipper Board (Part N° 520-5080-00) Circuit Troubleshooting Flowchart



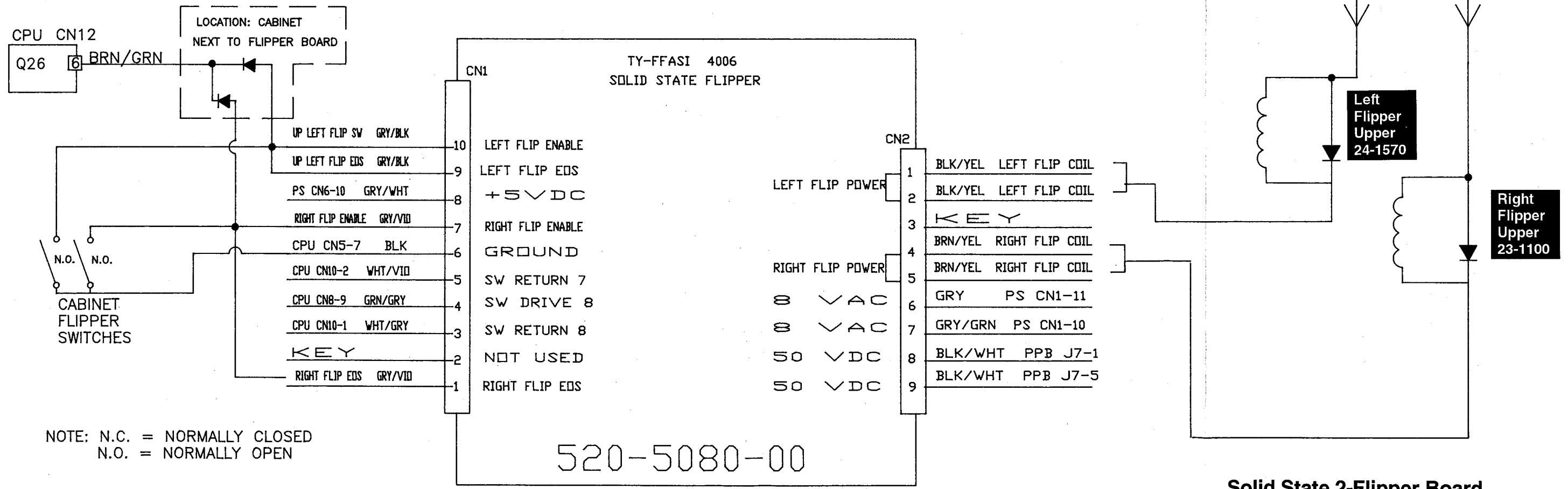
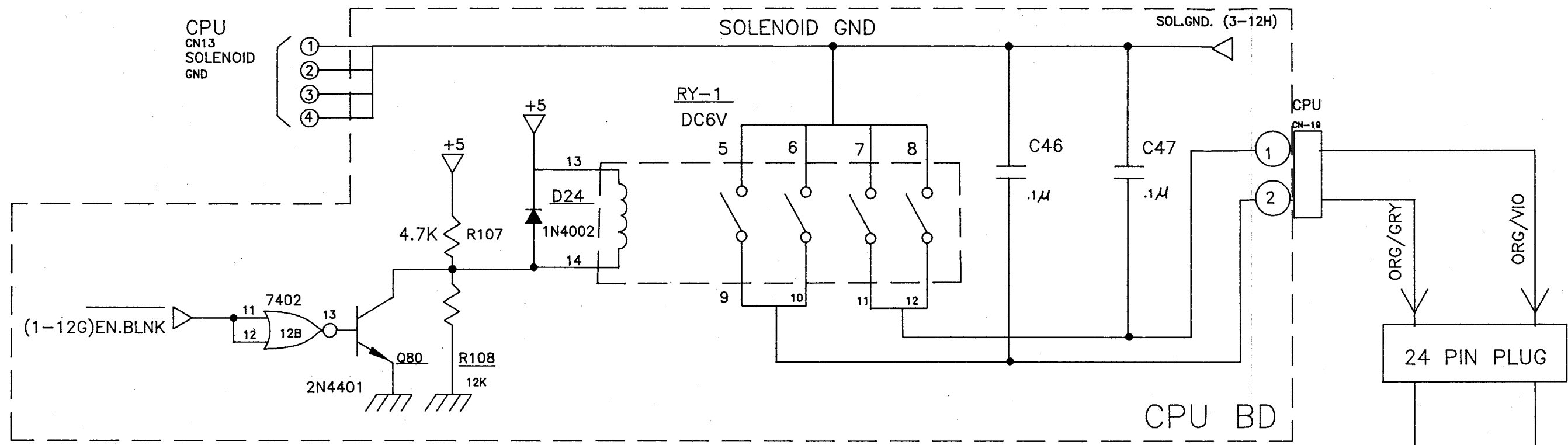


REV.-B
Solid State 2-Flipper Board
(520-5080-00) Diagram



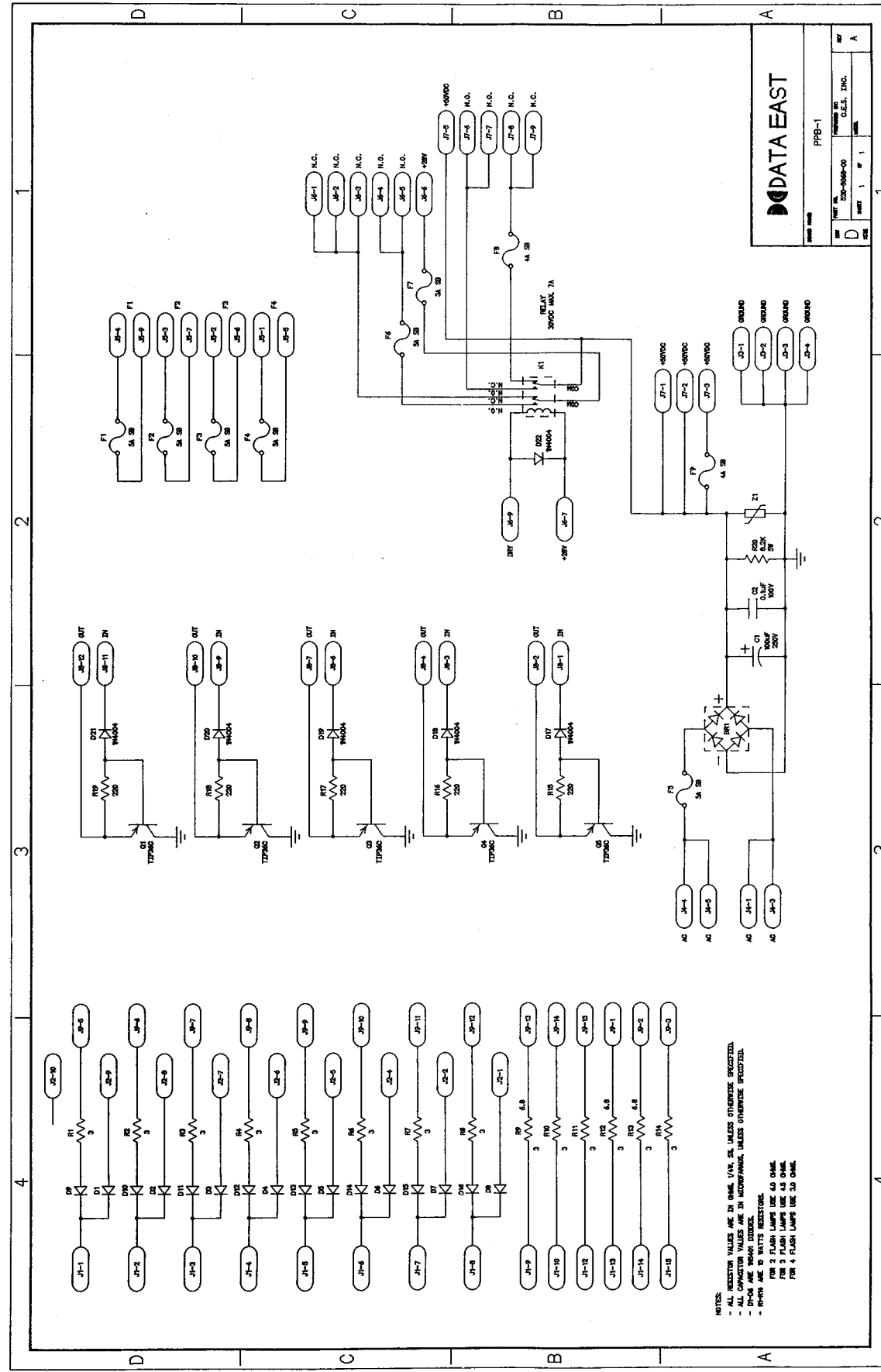
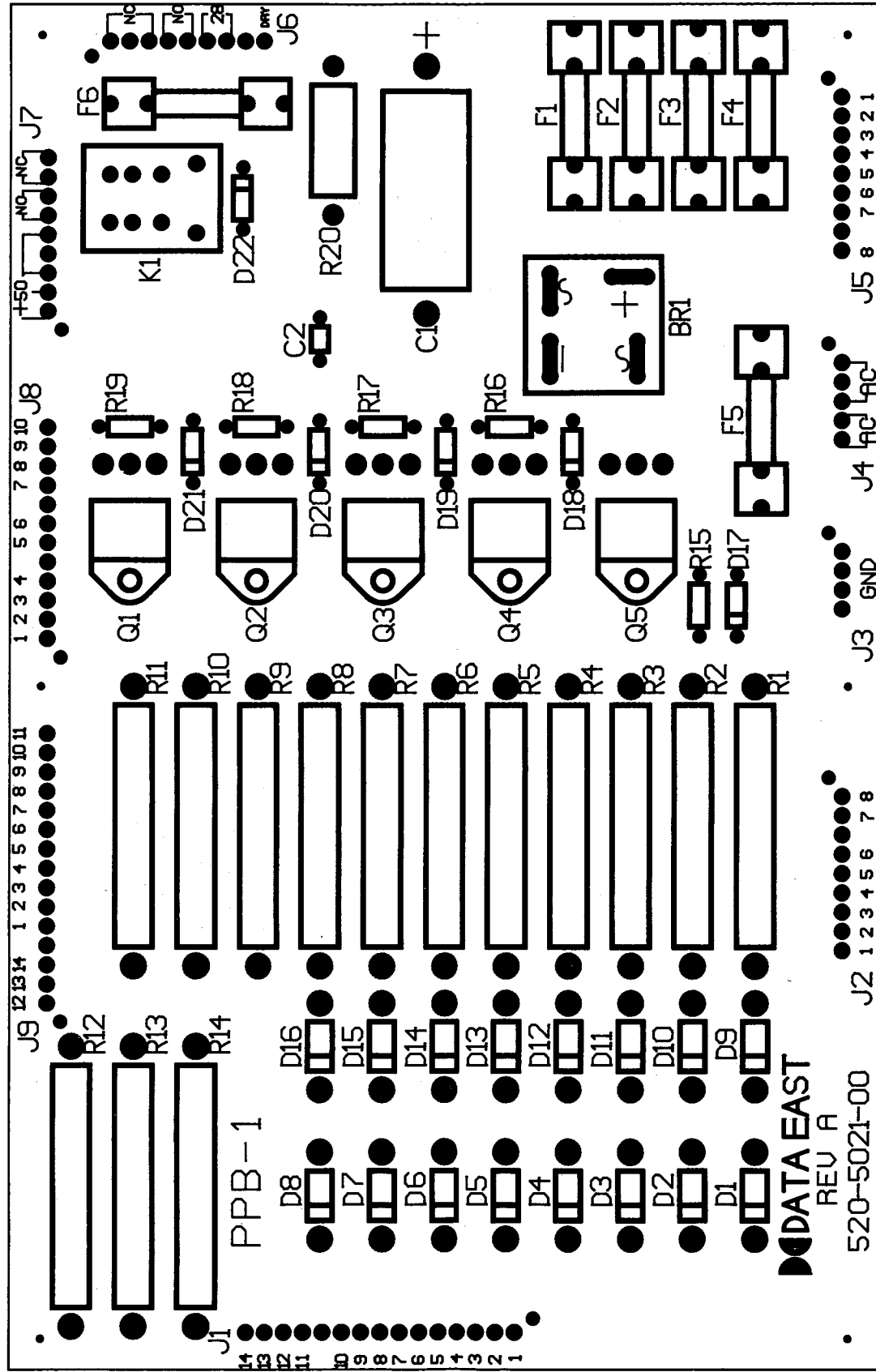
**Solid State 2-Flipper Board
(520-5080-00) Wiring Diagram
Lower (Page 1 of 2)**

**Solid State 2-Flipper Board
(520-5080-00) Wiring Diagram
Lower (Page 1 of 2)**



NOTE: N.C. = NORMALLY CLOSED
N.O. = NORMALLY OPEN

**Solid State 2-Flipper Board
(520-5080-00) Wiring Diagram
Upper (Page 2 of 2)**

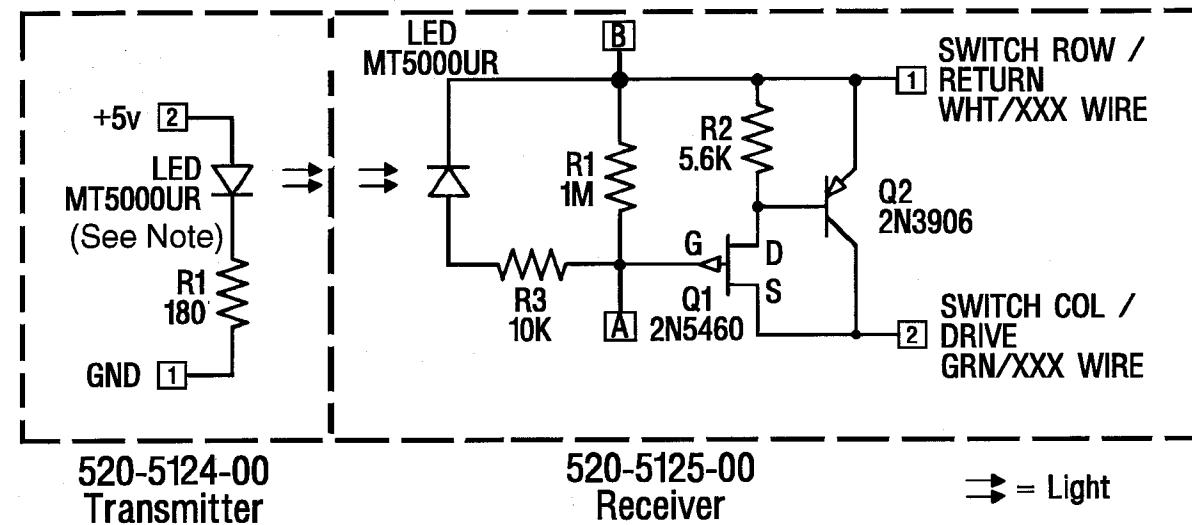


Trough Up-Kicker OPTO Theory of Operation & Schematic

Theory of Operation

As light from the Transmitter falls on the Receiver LED, it generates a Positive Bias Voltage (0.7v to 1.5v) which is applied to the gate of **Q1**, turning **Q1** off. When **Q1** is held off, no current flows through **Q2**'s Base, the transistor is off acting as an *OPEN SWITCH*. When the light is interrupted (*BLOCKED*) **R1** bleeds the gate voltage off of **Q1** allowing it to conduct, switching **Q2** on, which acts as a *CLOSED SWITCH*.

Fig. 1



Note: The RADIO SHACK part number for the LED MT5000UR is 276-087.

Troubleshooting

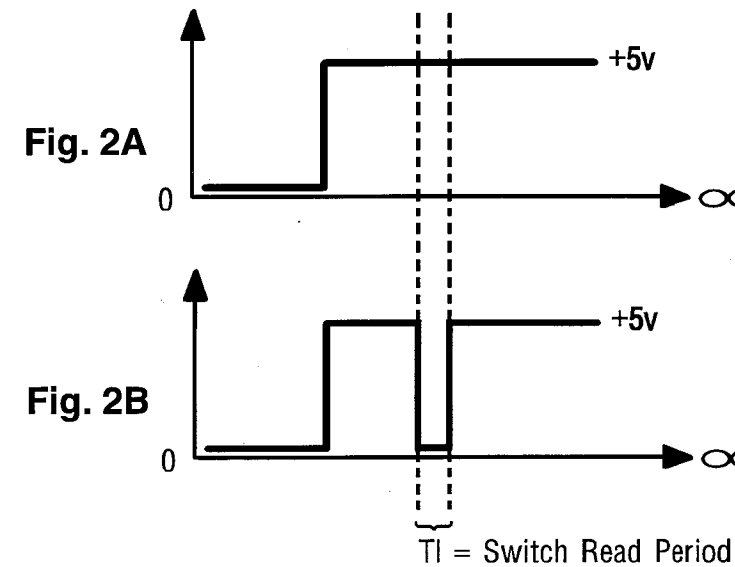
(The following tests indicate normal operating conditions)

1. Volt Meter Test:

- A. **OPEN OPTO** (Light Falling on LED) = *SWITCH OPEN*. Place meter leads across points **A** and **B** (Refer to Schematic Drawing Fig. 1 above). It should read approximately 0.8 - 1.2v DC.
- B. **CLOSED OPTO** (Light Blocked) = *SWITCH CLOSED*. Place meter leads across points **A** and **B** (Refer to Schematic Drawing Fig. 1 above). It should read approximately 0.0 - 0.1v DC.

Troubleshooting Continued

2. Oscilloscope Test:

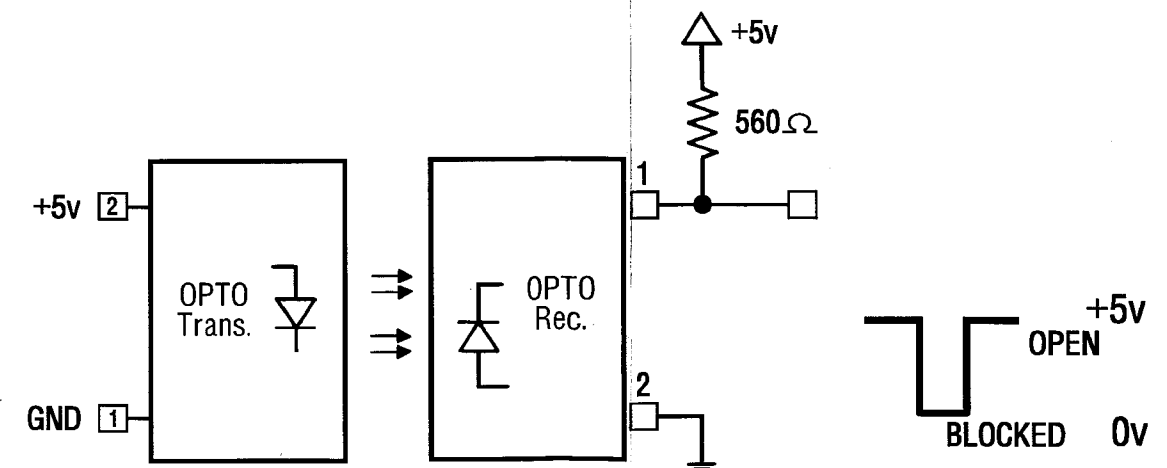


- A. **OPEN OPTO** (Light Falling on LED) = *SWITCH OPEN*. Place Scope lead at **Pin-1** of OPTO Rec. Bd. with Scope Grounded. (See Fig. 1). The Scope should display a **STEADY +5v** as shown in Fig. 2A, Wave Form Diagram.
- B. **CLOSED OPTO** (Light Blocked) = *SWITCH CLOSED*. Place Scope lead at **Pin-1** of OPTO Rec. Bd. with Scope Grounded. (See Fig. 1). The Scope should display a **PULSE STREAM** indicating **Q2** has switched "On" as shown in Fig. 2B, Wave Form Diagram. This is your Switch Drive Pulse.

3. Bench Test (See Fig. 3 Below):

Disconnect the OPTO Transmitter / Receiver Board from the circuit. Connect one side of a 560Ω Pull-up Resistor to **Pin-1** of the OPTO Receiver Bd. and the other side of the resistor to a 5v DC source. Connect **Pin-2** to Ground. Connect a +5v DC source to **Pin-1** of the Transmitter and GND to **Pin-2**. Align with the Receiver OPTO approximately 3" distance. Using your Volt-Meter or an Oscilloscope, monitor **Pin-1** while *BLOCKING* and *UN-BLOCKING* the *BEAM* from the Transmitter. The output will be approximately +5v DC when the *BEAM* is not *BLOCKED* and approximately 0 volts when the *BEAM* is *BLOCKED*.

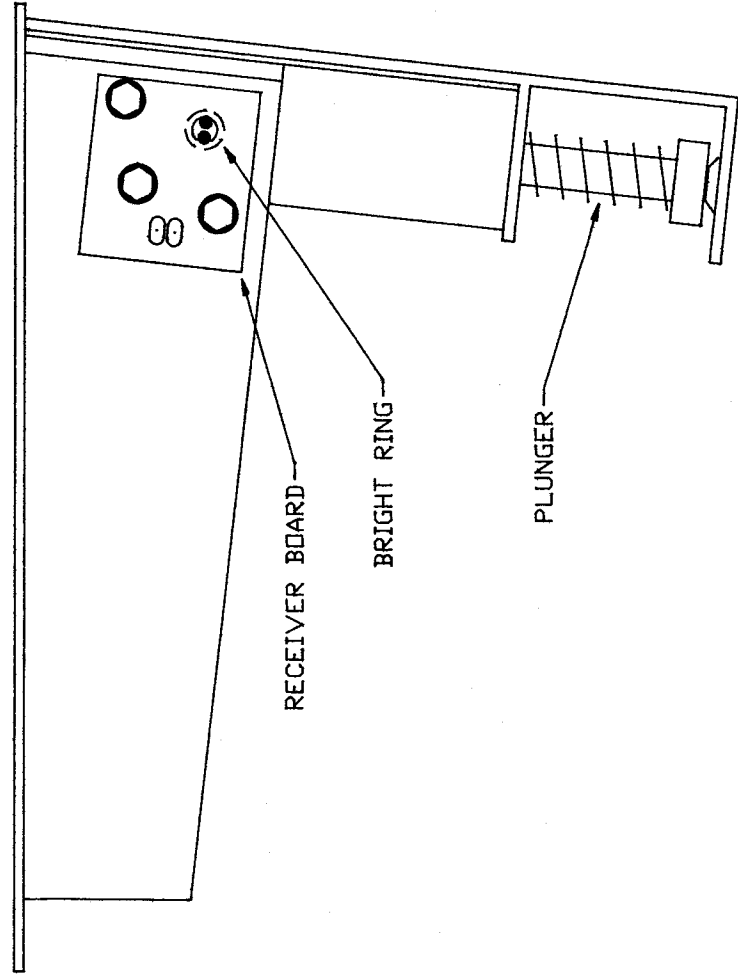
Fig. 3



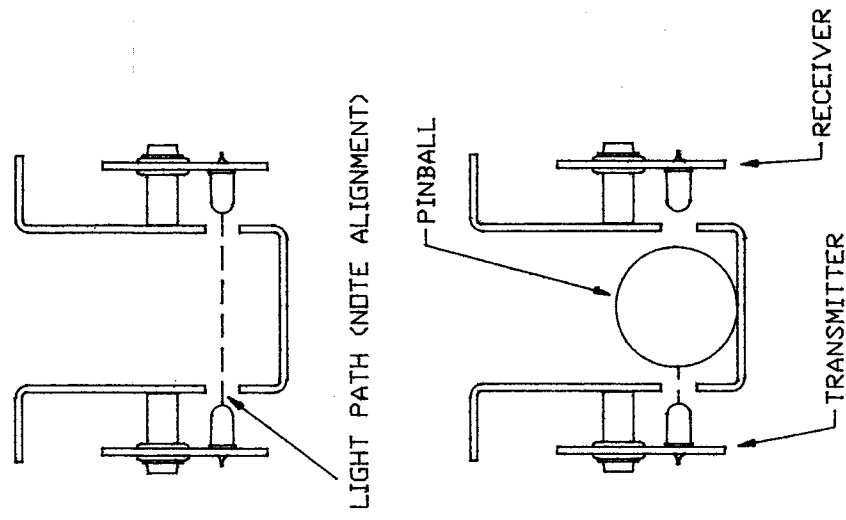
Single Trough OPTO Alignment / Test

When a working OPTO is installed and connected in a game, the transmitter should light when the power is switched on. With the playfield in Service Position #1 (playfield pulled forward resting on the playfield support brackets) and the game on, the light should show up as a "RED RING" through the back of the Receiver Board around the Receiver LED. With the game in Switch Test Mode, lifting the Trough Plunger with a fingertip should block the Beam and cause the Switch Position to trigger.

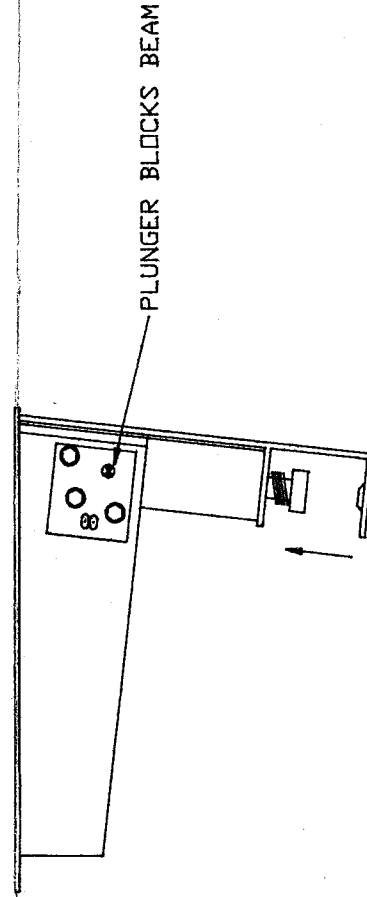
VIEW FACING TROUGH
(PLAYFIELD IN SERVICE POSITION #1)



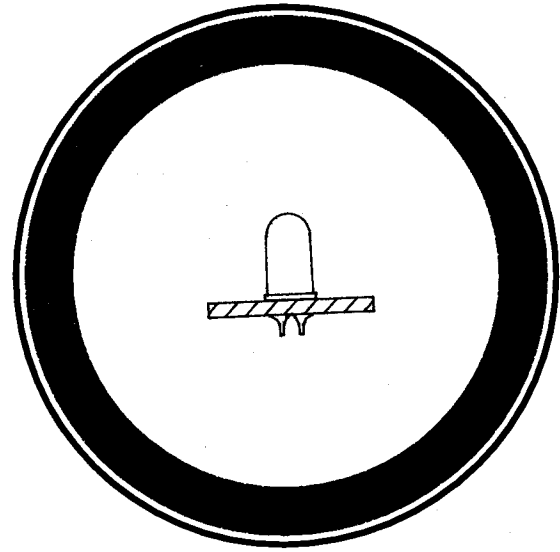
SECTIONAL VIEW FROM RIGHT



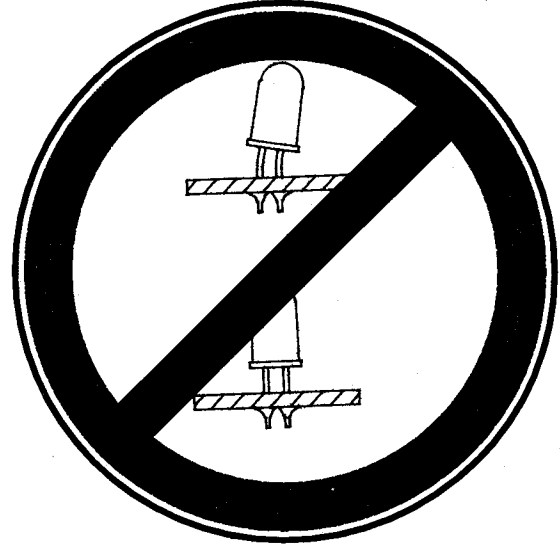
LIFT PLUNGER TO CHECK SWITCH AS SHOWN



NOTE: If replacement of L.E.D. is required, insure that it is mounted correctly before and after soldering. See example below:



CORRECT POSITION



INCORRECT POSITION

APPENDIX A - H (GREEN SECTION) Page Guide

Page 111
Appendix A
CPU Jumper Table

Pages 112-113
Appendix B
Pinball
Game
Firmware

Pages 114-115
Appendix C
Board Type Table

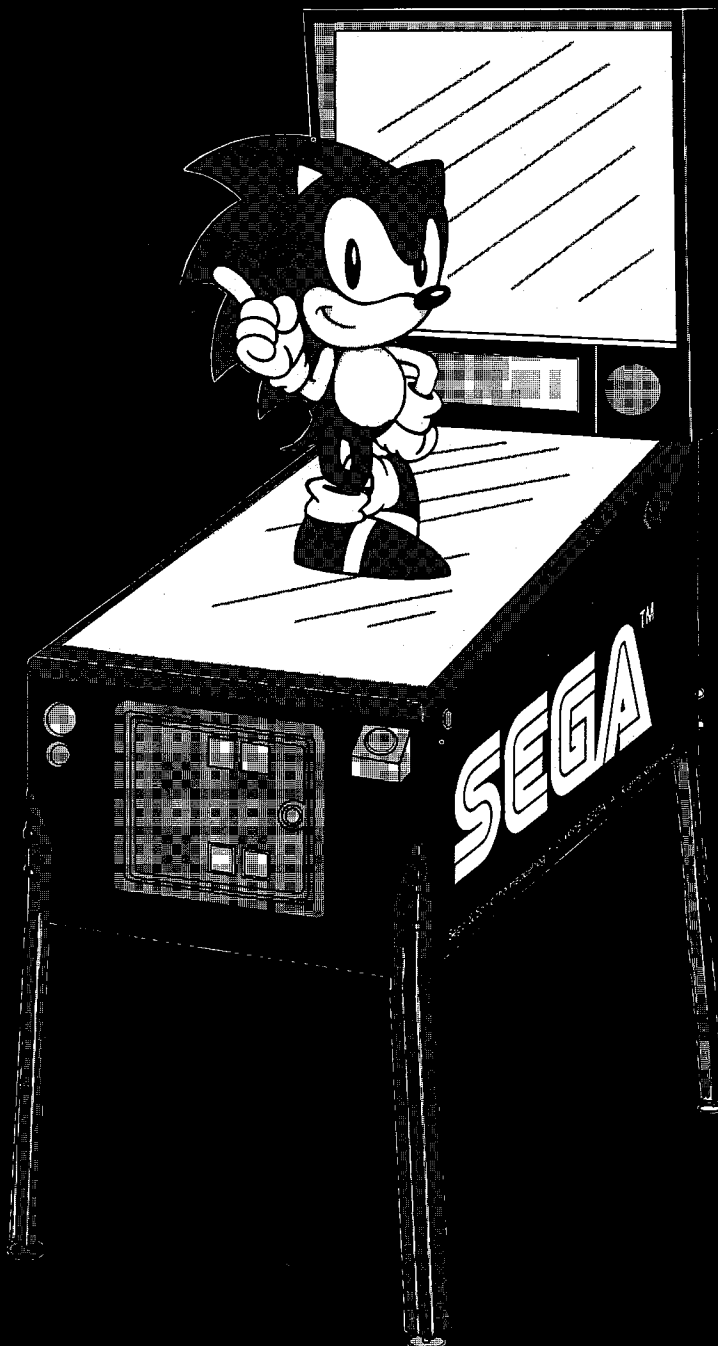
Pages 116-117
Appendix D
Generic Coil Cross-
Reference Guide
and
Flipper Coil Table

Pages 118-119
Appendix E
Motor
Specifications Table

Pages 120-121
Appendix F
Semi-Conductors/
Integrated Circuits/
Relays Cross-
Reference Guide

Page 122
Appendix G
Part Number
Prefix Classification
Codes Explanation

Page 123
Appendix H
Playfield Inserts
(Plastic Light Covers)



Appendix A

CPU Jumper Table

Game Name	Game Mfg. Date and Manual PN	CPU Ver.	EPROM Position	Jumpers Installed	Jumpers Removed	Game Name	Game Mfg. Date and Manual PN	CPU Ver.	EPROM Position	Jumpers Installed	Jumpers Removed
1. Laser War	MAY 87 780-5001-00	1	5C	J4 J6a J7a	J5 J6 J7b	27. Baywatch	MAR 95 780-5033-00	3	5C	J5	J4
2. Secret Service	MAR 88 780-5002-00	2	5B, 5C	J4	J5						
3. Torpedo Alley	AUG 88 780-5003-00	2	5B, 5C	J4	J5						
4. Time Machine	DEC 88 780-5004-00	2	5B, 5C	J4	J5						
5. Playboy 35th Anniversary	MAY 89 780-5005-00	2	5B, 5C	J4	J5						
6. ABC Monday Night Football	SEP 89 780-5007-00	2	5B, 5C	J4	J5						
7. Robocop	NOV 89 780-5006-00	2	5B, 5C	J4	J5						
8. Phantom of the Opera	JAN 90 780-5008-00	2	5B, 5C	J4	J5						
9. Back to the Future	JUN 90 780-5009-00	3	5B, 5C	J4	J5						
10. The Simpsons	SEP 90 780-5012-00	3	5B, 5C	J4	J5						
11. Checkpoint	FEB 91 780-5010-00	3	5B, 5C	J4	J5						
12. Teenage Mutant Ninja Turtles	MAY 91 780-5017-00	3	5B, 5C	J4	J5						
13. Batman	JUL 91 780-5011-00	3	5B, 5C	J4	J5						
14. Star Trek 25th Anniversary	OCT 91 780-5014-00	3	5C	J5	J4						
15. Hook	JAN 92 780-5019-00	3	5C	J5	J4						
16. Lethal Weapon 3	JUN 92 780-5026-00	3	5C	J5	J4						
17. Star Wars	OCT 92 780-5024-00	3	5C	J5	J4						
18. Rocky & Bullwinkle & Friends	FEB 93 780-5022-00	3	5C	J5	J4						
19. Jurassic Park	APR 93 780-5020-00	3	5C	J5	J4						
20. Last Action Hero	AUG 93 780-5027-00	3	5C	J5	J4						
21. Tales from the Crypt	NOV 93 780-5018-00	3	5C	J5	J4						
22. The Who's Tommy	FEB 94 780-5028-00	3	5C	J5	J4						
23. WWF Royal Rumble	MAY 94 780-5023-00	3	5C	J5	J4						
24. Guns N' Roses	JUL 94 780-5029-00	3	5C	J5	J4						
25. Maverick	SEP 94 780-5031-00	3	5C	J5	J4						
26. Mary Shelley's Frankenstein	DEC 94 780-5036-00	3	5C	J5	J4						

† Additional Information for Installed / Removed Jumpers

Board Combinations with ROM at Location 5C (Game 1, Ver1) Installed J1b, J3, J4, J6a, J7a & J8 Removed J1a, J2, J5, J6 & J7b

Board Combinations w/ ROM at Locations 5B, 5C (Game 1, Ver2) Installed J1b, J3, J4, J5a, J6a, J7b & J8 Removed J1a, J2, J5, J5b, J6b, & J7a

Board Combinations w/ ROM at Locations 5B, 5C (Games 2-12, Ver2/3) Installed J1b, J3, J4, J5b, J6b, J7b & J8 Removed J1a, J2, J5, J5a, J6a & J7a

Board Combinations with ROM at Locations 5C (Games 14+, Ver3) Installed J1b, J3, J5, J5b, J6b, J7b & J8 Removed J1a, J2, J4, J5a, J6a & J7a

* Version 1 has a 2K RAM which is a 24-pin IC in Position 5D; Versions 2 & 3 have a 8K RAM which is a 28-PIN IC in Position 5D.

Appendix B

PINBALL GAME FIRMWARE

EPROM	Program Size	Part N°	Ver.	Loc.	Raw Part N°
Laser Wars					
CPU	(256K)	965-0004-00		C5	960-5007-00
Sound (Old)	(256K)	965-0005-00		J5	960-5007-00
Sound (Old)	(256K)	965-0006-00		J6	960-5007-00
Sound (Old)	(256K)	965-0007-00		J7	960-5007-00
- OR -					
Sound	(256K)	965-0008-00		7F	960-5007-00
Sound 1	(512K)	965-0009-00		6F	960-7001-02
Sound 2	(512K)	965-0010-00		4F	960-7001-02
Secret Service					
CPU	(256K)	965-0011-00	A-6	B5	960-5007-00
CPU	(256K)	965-0012-00	A-6	C5	960-5007-00
Voice 1	(512K)	965-0014-00		6F	960-7001-02
Voice 2	(512K)	965-0015-00		4F	960-7001-02
Sound	(256K)	965-0013-00		7F	960-5007-00
Torpedo Alley					
CPU	(256K)	965-0016-00	A02-1	B5	960-5007-00
CPU	(256K)	965-0017-00	A02-1	C5	960-5007-00
Voice 1	(512K)	965-0019-00		6F	960-7001-02
Voice 2	(512K)	965-0020-00		4F	960-7001-02
Sound	(256K)	965-0018-00		7F	960-5007-00
Time Machine					
CPU	(256K)	965-0021-00	A02-3	B5	960-5007-00
CPU	(256K)	965-0022-00	A02-3	C5	960-5007-00
Voice 1	(512K)	965-0024-00		6F	960-7001-02
Voice 2	(512K)	965-0025-00		4F	960-7001-02
Sound	(256K)	965-0023-00		7F	960-5007-00
Playboy 35th Anniversary					
CPU	(256K)	965-0046-00	A02-3	B5	960-5007-00
CPU	(256K)	965-0047-00	A02-3	C5	960-5007-00
Voice 1	(512K)	965-0049-00		6F	960-7001-02
Voice 2	(512K)	965-0050-00		4F	960-7001-02
Sound	(256K)	965-0048-00		7F	960-5007-00
ABC Monday Night Football					
CPU	(256K)	965-0031-00	A02-7	B5	960-5007-00
CPU	(256K)	965-0032-00	A02-7	C5	960-5007-00
Voice 1	(512K)	965-0034-00		6F	960-7001-02
Voice 2	(512K)	965-0035-00		4F	960-7001-02
Sound	(256K)	965-0033-00		7F	960-5007-00
Robocop					
CPU	(256K)	965-0036-00	A03-4	B5	960-5007-00
CPU	(256K)	965-0037-00	A03-4	C5	960-5007-00
Voice 1	(512K)	965-0039-00		6F	960-7001-02
Voice 2	(512K)	965-0040-00		4F	960-7001-02
Sound	(256K)	965-0038-00		7F	960-5007-00
Phantom of the Opera					
CPU	(256K)	965-0026-00	A03-2	B5	960-5007-00
CPU	(256K)	965-0027-00	A03-2	C5	960-5007-00
Voice 1	(512K)	965-0029-00		6F	960-7001-02
Voice 2	(512K)	965-0030-00		4F	960-7001-02
Sound	(256K)	965-0028-00		7F	960-5007-00
Back to the Future					
CPU	(256K)	965-0041-00	SA-2	B5	960-5007-00
CPU	(256K)	965-0042-00	SA-2	C5	960-5007-00
Voice 1	(512K)	965-0044-00		6F	960-7001-02
Voice 2	(512K)	965-0045-00		4F	960-7001-02
Sound	(256K)	965-0043-00		7F	960-5007-00
The Simpsons					
CPU	(256K)	965-0051-00	A02-7	B5	960-5007-00
CPU	(256K)	965-0052-00	A02-7	C5	960-5007-00
Voice 1	(512K)	965-0054-00		6F	960-7001-02
Voice 2	(512K)	965-0055-00		4F	960-7001-02
Sound	(256K)	965-0053-00		7F	960-5007-00
Checkpoint					
CPU	(256K)	965-0056-00	A1-7	B5	960-5007-00
CPU	(256K)	965-0134-00	A1-7	C5	960-5007-00
Voice 1	(1M)	965-0057-00		F7	960-5009-00
Voice 2	(1M)	965-0058-00		F5	960-5009-00
Sound	(256K)	965-0059-00		F4	960-5007-00
Display	(512K)	965-0060-00	CP80	U8	960-7001-02

PINBALL GAME FIRMWARE

EPROM	Program Size	Part N°	Ver.	Loc.	Raw Part N°
Teenage Mutant Ninja Turtles					
CPU	(256K)	965-0061-00	A1.04	B5	960-5007-00
CPU	(256K)	965-0062-00	A1.04	C5	960-5007-00
Voice 1	(1M)	965-0063-00		F5/6	960-5009-00
Voice 2	(1M)	965-0064-00		F4/5	960-5009-00
Sound	(256K)	965-0065-00		F7	960-5007-00
Display	(512K)	965-0066-00		U8	960-7001-02
Batman					
CPU	(128K)	965-0067-00	A1.06	B5	960-5006-00
CPU	(256K)	965-0135-00	A1.06	C5	960-5007-00
Voice 1	(2M)	965-0068-00		U17	960-5010-00
Voice 2	(1M)	965-0069-00		U21	960-5009-00
Sound	(256K)	965-0070-00		U7	960-5007-00
Display	(1M)	965-0071-00	A1.02	U8	960-5009-00
Star Trek 25th Anniversary					
CPU	(512K)	965-0072-00	A2.00	B5	960-7001-02
Voice 1	(2M)	965-0073-00		U17	960-5010-00
Voice 2	(2M)	965-0074-00		U21	960-5010-00
Sound	(256K)	965-0075-00		U7	960-5007-00
Display	(1M)	965-0076-00	A1.09	U8	960-5009-00
Hook					
CPU	(512K)	965-0077-00	A4.08	C5	960-7001-02
Voice 1	(2M)	965-0078-00		U17	960-5010-00
Voice 2	(2M)	965-0079-00		U21	960-5010-00
Sound	(256K)	965-0080-00		U7	960-5007-00
Display	(1M)	965-0081-00	A4.01	U8	960-5009-00
Lethal Weapon 3					
CPU	(512K)	965-0082-00	A2.07	C5	960-7001-02
Voice 1	(2M)	965-0083-00		U17	960-5010-00
Voice 2	(2M)	965-0084-00		U21	960-5010-00
Sound	(256K)	965-0085-00		U7	960-5007-00
Display	(2M)	965-0086-00		ROM 1	960-5010-00
Display	(2M)	965-0087-00		ROM 2	960-5010-00
Display	(4M)	965-0087-04	A2.06	ROM 0	960-5015-00
Star Wars					
CPU	(512K)	965-0119-00	A1.03	C5	960-7001-02
Voice 0	(4M)	965-0132-00		U17	960-5015-00
Voice 1	(2M)	965-0133-00		U21	960-5010-00
Sound	(256K)	965-0131-00		U7	960-5007-00
Display	(2M)	965-0120-00	A1.04	ROM 0	960-5010-00
Display	(2M)	965-0121-00	A1.04	ROM 1	960-5010-00
-OR-					
Display	(4M)	965-0122-00	A1.05	ROM 0	960-5015-00
(Used on Display PCB 520-5055-01)					
Rocky & Bullwinkle & Friends					
CPU	(512K)	965-0138-00	A1.30	C5	960-7001-02
Voice 0	(4M)	965-0139-00		U17	960-5015-00
Voice 1	(2M)	965-0140-00		U21	960-5010-00
Sound	(256K)	965-0141-00		U7	960-5007-00
Display	(4M)	965-0142-00	A1.30	ROM 0	960-5015-00
Jurassic Park					
CPU	(512K)	965-0143-00	A5.10	C5	960-7001-02
Voice 0	(4M)	965-0144-00		U17	960-5015-00
Voice 1	(2M)	965-0145-00		U21	960-5010-00
Sound	(256K)	965-0146-00		U7	960-5007-00
Display	(4M)	965-0147-00	A5.10	ROM 0	960-5015-00
Last Action Hero					
CPU	(512K)	965-0148-00	A1.12	C5	960-7001-02
Voice 0	(4M)	965-0149-00		U17	960-5015-00
Voice 1	(2M)	965-0150-00		U21	960-5010-00
Sound	(256K)	965-0151-00		U7	960-5007-00
Display	(4M)	965-0152-00	A1.06	ROM 0	960-5015-00
Tales from the Crypt					
CPU	(512K)	965-0157-00	A3.00	C5	960-7001-02
Voice 0	(4M)	965-0158-00		U17	960-5015-00
Voice 1	(2M)	965-0159-00		U21	960-5010-00
Sound	(256K)	965-0160-00		U7	960-5007-00
Display	(4M)	965-0161-00	A3.00	ROM 0	960-5015-00

Table Notes: Game Revisions can be updated after the production run. This table is accurate as of the printing of this manual. To see if any changes occurred, the next game manual will include updates. The version stated is USA. If there is a question of what revision number any particular ROM is and the next game manual(s) are not available, call our Technical Support Department.

Appendix B

PINBALL GAME FIRMWARE

EPROM	Program Size	Part N°	Ver.	Loc.	Raw Part N°
The Who's Tommy					
CPU	(512K)	965-0162-00	A4.00	C5	960-7001-02
Voice 1	(4M)	965-0165-00		U17	960-5015-00
Voice 2	(4M)	965-0166-00		U21	960-5015-00
Voice 3	(4M)	965-0167-00		U36	960-5015-00
Voice 4	(4M)	965-0168-00		U37	960-5015-00
Sound	(512K)	965-0164-00		U7	960-7001-02
Display	(4M)	965-0163-00	A4.00	ROM 0	960-5015-00
WWF Royal Rumble					
CPU	(512K)	965-0169-00	A1.06	C5	960-7001-02
Voice 1	(4M)	965-0172-00		U17	960-5015-00
Voice 2	(4M)	965-0173-00		U21	960-5015-00
Voice 3	(4M)	965-0174-00		U36	960-5015-00
Sound	(512K)	965-0171-00		U7	960-7001-02
Display	(4M)	965-0170-00	A1.02	ROM 0	960-5015-00
Guns N' Roses					
CPU	(512K)	965-0175-00	A3.00	C5	960-7001-02
Voice 1	(4M)	965-0178-00		U17	960-5015-00
Voice 2	(4M)	965-0179-00		U21	960-5015-00
Voice 3	(4M)	965-0180-00		U36	960-5015-00
Voice 4	(4M)	965-0181-00		U37	960-5015-00
Sound	(512K)	965-0177-00		U7	960-7001-02
Display	(4M)	965-0176-00	A3.00	ROM 0	960-5015-00
Maverick					
CPU	(512K)	965-0182-00	A4.04	C5	960-7001-02
Voice 1	(4M)	965-0186-00		U17	960-5015-00
Voice 2	(4M)	965-0187-00		U21	960-5015-00
Voice 3	(4M)	965-0187-01		U36	960-5015-00
Sound	(512K)	965-0185-00		U7	960-7001-02
Display*	(4M)	965-0183-00	A4.01	ROM 0	960-5015-00
Display*	(4M)	965-0184-00	A4.01	ROM 3	960-5015-00
Mary Shelley's Frankenstein					
CPU	(512K)	965-0188-00	A1.03	C5	960-7001-02
Voice 1	(4M)	965-0192-00		U17	960-5015-00
Voice 2	(4M)	965-0193-00		U21	960-5015-00
Voice 3	(4M)	965-0194-00		U36	960-5015-00
Sound	(512K)	965-0191-00		U7	960-7001-02
Display*	(4M)	965-0189-00	A1.03	ROM 0	960-5015-00
Display*	(4M)	965-0190-00	A1.03	ROM 3	960-5015-00
Baywatch					
CPU	(512K)	965-0195-00	IN PRODUCTION	C5	960-7001-02
Voice 1	(4M)	965-0196-00		U17	960-5015-00
Voice 2	(4M)	965-0197-00		U21	960-5015-00
Voice 3	(2M)	965-0198-00		U36	960-5015-00
Sound	(512K)	965-0199-00		U7	960-7001-02
Display*	(4M)	965-0200-00		ROM 0	960-5015-00
Display*	(4M)	965-0201-00		ROM 3	960-5015-00

* Note: Display EPROMS (4M) for Maverick and games thereafter require an access time of 120 Nsec or faster.

Table Notes:
Game Revisions can be updated after the production run. This table is accurate as of the printing of this manual. To see if any changes occurred, the next game manual will include updates. The version stated is USA. If there is a question of what revision number any particular ROM is and the next game manual(s) are not available, call our Technical Support Department.

Appendix C

Board Type Table

Game Name	Flippers	Sound	Power Supply	Display
Laser War	NO FLIPPER BOARD (NFB) 2-Flipper	Initial: 520-5002-00 Replaced with: 520-5002-02 520-5002-01 was not used.	520-5000-00	Master: 520-5004-00 plus: 7 Digit Alpha/Numeric 520-5005-00 (Qty. 2) 7 Digit Numeric 520-5006-00 (Qty. 2) 4 Digit Numeric 520-5007-00
Secret Service	NFB 3-Flipper	520-5002-02	520-5000-00	7 Digit A/N Combined: 520-5014-01
Torpedo Alley	NFB 3-Flipper	520-5002-02	520-5000-00	7 Digit A/N Combined: 520-5014-01
Time Machine	NFB 2-Flipper	520-5002-02	520-5000-00	7 Digit A/N Combined: 520-5014-01
Playboy 35th Anniversary	520-5033-00 2-Flip. (for 100 games)	520-5002-02	520-5000-00	7 Digit A/N Combined: 520-5014-01
ABC Monday Night Football	520-5033-00 2-Flip. (for 100 games)	520-5002-02	520-5000-00	16 Digit A/N Combined: 520-5030-00
Robocop	520-5033-00 2-Flipper	520-5002-02	520-5000-00	16 Digit A/N Combined: 520-5030-00
Phantom of the Opera	520-5033-00 2-Flipper	520-5002-02	520-5000-00	16 Digit A/N Combined: 520-5030-00
Back to the Future	520-5033-00 2-Flipper	520-5002-02	520-5000-00	16 Digit A/N Combined: 520-5030-00
The Simpsons	520-5033-00 2-Flipper	520-5002-03	520-5000-00	16 Digit A/N Combined: 520-5030-00
Checkpoint	520-5033-00 2-Flipper	520-5002-03	520-5047-00	128 X 16 Dot Matrix 520-5042-00
Teenage Mutant Ninja Turtles	520-5033-00 2-Flipper	520-5002-03	520-5047-00	128 X 16 Dot Matrix 520-5042-00
Batman	520-5033-00 2-Flipper	520-5050-01	520-5047-00	128 X 16 Dot Matrix 520-5042-00
Star Trek 25th Anniversary	520-5033-00 2-Flipper	520-5050-01	520-5047-00	128 X 16 Dot Matrix 520-5042-00
Hook	520-5033-00 2-Flipper	520-5050-01	520-5047-00	128 X 16 Dot Matrix 520-5042-00
Lethal Weapon 3	520-5033-00 2-Flipper	520-5050-01	520-5047-01	128 X 32 Dot Matrix 520-5052-00
Star Wars	520-5033-00 2-Flipper	520-5050-02	520-5047-01	128 X 32 Dot Matrix 520-5052-00
Rocky & Bullwinkle & Friends	520-5033-00 2-Flipper	520-5050-02	520-5047-01	128 X 32 Dot Matrix 520-5052-00
Jurassic Park	520-5076-00 3-Flipper	520-5050-02	520-5047-02	128 X 32 Dot Matrix 520-5052-00
Last Action Hero	520-5070-00 2-Flipper	520-5050-03	520-5047-02	128 X 32 Dot Matrix 520-5052-00
Tales from the Crypt	520-5076-00 3-Flipper	520-5050-03	520-5047-02	128 X 32 Dot Matrix 520-5052-00
The Who's Tommy	520-5076-00 3-Flipper	520-5077-00	520-5047-02	128 X 32 Dot Matrix 520-5052-00
WWF Royal Rumble	520-5070-00 (Qty. 2) 4-Flipper (2X2)	520-5077-00	520-5047-02	128 X 32 Dot Matrix 520-5052-00

Appendix D

Generic Coil Cross-Reference Guide

SPI Part N°	GA-Turns	SPI Part N°	GA-Turns	SPI Part N°	GA-Turns	SPI Part N°	GA-Turns
090-5000-00	22-700	090-5011-00	22-750	090-5020-00	Not Used	090-5030-00	23-1100
090-5001-00	23-800	090-5012-00	26-800	090-5020-01	21-900	090-5032-00	22-1080
090-5001-01	23-800	090-5013-00	23-700	090-5020-02	22-900	090-5034-00	25-1240
090-5002-00	24-900	090-5014-00	23-600	090-5020-10	21-900	090-5036-00	24-940
090-5003-00	27-1300	090-5015-00	27-1400	090-5020-20	22-900	090-5036-01	24-940
090-5004-00	27-1500	090-5016-00	29-2000	090-5020-30	23-900	090-5037-03	23½-765
090-5005-00	23-840	090-5017-00	22-500	090-5021-00	20-400		
090-5006-00	23-800	090-5018-00	23-800	090-5022-00	23-700	090-5041-00	25-1800
090-5008-00	23-1200	090-5019-00	23-750	090-5023-00	22-600	090-5046-00	28-1050
				090-5025-00	24-1570		

Flipper Coil Table

Game Name	Flipper Coil Lower Right Part N°/GA-Turns	Flipper Coil Lower Left Part N°/GA-Turns	Flipper Coil Upper Right Part N°/GA-Turns	Flipper Coil Upper Left Part N°/GA-Turns
Laser Wars	090-5011-00 22-750/30-2600	SAME AS LOWER RIGHT	Not Used	Not Used
Secret Service	090-5006-00 23-620/30-2600	SAME AS LOWER RIGHT	SAME AS LOWER RIGHT	Not Used
Torpedo Alley	090-5013-00 23-700/30-2600	090-5011-00 22-750/30-2600	090-5012-00 26-800	Not Used
Time Machine	090-5011-00 22-750/30-2600	SAME AS LOWER RIGHT	Not Used	Not Used
Playboy 35th Anniversary †	090-5020-02 22-900	SAME AS LOWER RIGHT	Not Used	Not Used
ABC Monday Night Football †	090-5020-02 22-900	SAME AS LOWER RIGHT	Not Used	Not Used
Robocop	090-5020-20 22-900	SAME AS LOWER RIGHT	Not Used	Not Used
Phantom of the Opera	090-5020-20 22-900	SAME AS LOWER RIGHT	Not Used	Not Used
Back to the Future	090-5020-20 22-900	SAME AS LOWER RIGHT	Not Used	Not Used
The Simpsons	090-5020-20 22-900	SAME AS LOWER RIGHT	Not Used	Not Used
Checkpoint	090-5020-20 22-900	SAME AS LOWER RIGHT	Not Used	Not Used
Teenage Mutant Ninja Turtles	090-5020-30 23-900	SAME AS LOWER RIGHT	Not Used	Not Used
Batman	090-5020-30 23-900	SAME AS LOWER RIGHT	Not Used	Not Used
Star Trek 25th Anniversary	090-5020-30 23-900	SAME AS LOWER RIGHT	Not Used	Not Used
Hook	090-5020-30 23-900	090-5030-00 23-1100	Not Used	Not Used
Lethal Weapon 3	090-5030-00 23-1100	SAME AS LOWER RIGHT	Not Used	Not Used
Star Wars	090-5032-00 22-1080	SAME AS LOWER RIGHT	Not Used	Not Used

† A very small % of these games used a 090-5020-20 coil which used a proto-type Solid State Flipper System. The two types of coils both are 22-900 coils; the only difference being the addition of the 1N5404 Diode on the (-02) coils which was used in the Deger Design.

Appendix D

Flipper Coil Table Continued

Game Name	Flipper Coil Lower Right Part N°/GA-Turns	Flipper Coil Lower Left Part N°/GA-Turns	Flipper Coil Upper Right Part N°/GA-Turns	Flipper Coil Upper Left Part N°/GA-Turns
Rocky & Bullwinkle & Friends	090-5020-30 23-900	SAME AS LOWER RIGHT	Not Used	Not Used
Jurassic Park	090-5020-30 23-900	SAME AS LOWER RIGHT	090-5030-00 23-1100	Not Used
Last Action Hero	090-5020-30 23-900	SAME AS LOWER RIGHT	Not Used	Not Used
Tales from the Crypt	090-5032-00 22-1080	SAME AS LOWER RIGHT	090-5041-00 25-1800	Not Used
The Who's Tommy	090-5020-30 23-900	SAME AS LOWER RIGHT	Not Used	090-5041-00 25-1800
WWF Royal Rumble	090-5032-00 22-1080	SAME AS LOWER RIGHT	090-5041-00 25-1800	SAME AS UPPER RIGHT
Guns N' Roses	090-5032-00 22-1080	SAME AS LOWER RIGHT	Not Used	090-5030-00 23-1100
Maverick	090-5032-00 22-1080	SAME AS LOWER RIGHT	090-5032-00 22-1080	Not Used
Mary Shelley's Frankenstein	090-5030-00 23-1100	SAME AS LOWER RIGHT	090-5030-00 23-1100	Not Used
Baywatch	090-5020-30 23-900	090-5030-00 23-1100	SAME AS LOWER LEFT	090-5025-00 24-1570

Appendix E

Motor Specification Table

Game Name	Function	Specifications	Part N ^o
Laser Wars			
Secret Service			
Torpedo Alley			
Time Machine			
Playboy 35th Anniversary			
Shaded Games: No Motor Used.			
ABC Monday Night Football	Goal Post Up/Down	Motor 24v A.C. 60 RPM CW	515-5222-00
Robocop			
Phantom of the Opera	Organ Up/Down	Bowman Motor 24v 60hz 3W 11 RPM CCW	515-5256-00
Back to the Future	Shaker	Motor Vibrator	041-5029-00
The Simpsons			
Checkpoint	Shaker	Johnson Motor (Vibrator)	041-5002-00
Teenage Mutant Ninja Turtles	Spinning Pizza Ball Deflector	Gear Motor 24v A.C. 325 RPM CW	515-5397-00
Batman	Bar Target Up/Down	Bowman Motor 24v 60hz 3W 11 RPM CCW	515-5256-00
Star Trek 25th Anniversary	Swinging Target	Bowman Motor 24v 22½ RPM	515-5534-00
	Transporter F/X	Gear Motor 24v A.C. 3.5 RPM	500-5421-00
	Cooling Fan for Transporter F/X	4½" Motor 12v	041-5014-00
Hook			
Lethal Weapon 3	Spinning Light	Motor 2.5v A.C.	041-5017-00
Star Wars	Bar Target Up/Down	Bowman Motor 24v 60hz 3W 11 RPM CCW	515-5256-00
	R2D2 Robot Movement	Bowman Motor 24v A.C. 22½ RPM CW	515-5571-00
	Death Star Rotation	Bowman "G" Motor 24v A.C. 60hz 6 RPM CW	515-5570-00
Rocky & Bullwinkle & Friends	Nell Log "Cutting Blade" Movement	Bowman Model E Motor 24v 11 RPM CCW	041-5023-00
Jurassic Park	Shaker	Johnson Motor Vibrator	041-5002-00
	T-Rex Left/Right Movement	Multi Motor 5v D.C.	041-5025-00
	T-Rex Up/Down Movement	Bowman Motor 24v 11 RPM CW	041-5026-00

Appendix E

Motor Specification Table Continued

Game Name	Function	Specifications	Part N ^o
Last Action Hero	Crane Left/Right Movement	Multi Mod #3312 Motor OSC 12v D.C.	041-5027-00
	Shaker	Motor Vibrator	041-5029-00
Tales from the Crypt	Shaker	Motor Vibrator	041-5029-00
	Tombstone Up/Down	Bowman Motor 24v A.C. 6 RPM	515-5900-00
The Who's Tommy	Mirror Up/Down	Bowman Motor 24v A.C. 6 RPM	515-5900-00
	Flipper Blinders	Servo Motor	041-5032-00
	Spinning Airplane Propellers	Motor D.C.	041-5033-00
WWF Royal Rumble	Shaker	Motor Vibrator	041-5029-00
Guns N' Roses			
Maverick, The Movie	Turning Paddle Wheel	Motor 24v A.C. 10 RPM	041-5036-00
Mary Shelley's Frankenstein	Creature Head Left/Right Movement	Servo Motor	041-5032-00

Baywatch

Appendix F

Semi-Conductors / Integrated Circuits / Relays Cross-Reference Guide

Table 1 Diodes	Source N°	SGCA PARTIAL INC Part N°	NTE N°	ECG N°	Radio Shack® Part N°	RCA® Part N°
Rectification, Blocking and/or Dampening						
Diode	1N4001	112-5001-00	NTE552	ECG552	-----	SK9000
Diode	1N4004	112-5003-00	NTE116	ECG116	276-1103	SK3312
Diode	1N5401	112-0056-00	NTE5801	ECG5801	276-1143	SK9004
Diode	1N5404	112-5004-00	NTE5804	ECG5804	276-1144	SK9007

Table 2 Diodes	Source N°	SGCA PARTIAL INC Part N°	NTE N°	ECG N°	Radio Shack® Part N°	RCA® Part N°
Zener						
Diode	1N4742A 12v	112-0061-00	NTE142A	ECG142A	276-563	SK12V
Diode	1N4760B 68v	112-0062-00	NTE5092A	ECG5092A	-----	SK68V
Diode	1N4764 100v	112-0049-00	NTE5096A	ECG5096A	-----	SK100V
Diode	1N5228 3.9v	112-0053-00	NTE5007A	ECG5007A	-----	SK3A9
Diode	1N5234B 6.2v	112-0047-00	NTE5013A	ECG5013A	276-561	SK6A2
Diode	1N5379 110v	112-0072-00	NTE5157	ECG5157	-----	SK110X

Table 3 Bridge Rectifiers	Source N°	SGCA PARTIAL INC Part N°	Comments
Bridge Rectifier	CM3501	112-0052-00	35 Amp @ 100v P.I.V.
Bridge Rectifier	MDA2501	112-0054-00	25 Amp @ 100v P.I.V.
Bridge Rectifier	MDA3502	112-0057-00	35 Amp @ 200v P.I.V.

Table 4 Transistors	Source N°	SGCA PARTIAL INC Part N°	NTE N°	ECG N°	Radio Shack® Part N°	RCA® Part N°
Transistor	2N4401	-----	NTE85	ECG85	276-2009	SK3124A
Transistor	2N5060, SCR	110-0074-00	NTE5400	ECG5400	276-1067	SK3950
Transistor	2N5401	110-0078-00	NTE288	ECG288	-----	SK3434
Transistor	2N6427	110-0070-00	NTE48	ECG48	-----	SK4906
Transistor	MJE15031	110-0103-00	NTE375	ECG375	-----	SK9118
Transistor	MJE340	110-0071-00	NTE157	ECG157	-----	SK3747
Transistor	MJE350	110-0072-00	NTE374	ECG374	-----	SK9042
Transistor	MPSA92	110-0100-00	NTE288	ECG278	-----	SK3434
Transistor	MPSA42	110-0082-00	NTE287	ECG287	-----	SK3232
Transistor	NPN, 2N3904	110-0069-00	NTE85	ECG85	276-2009	SK3124A
Transistor	NPN, TIP122	110-0067-00	NTE261	ECG261	276-2068	SK3896
Transistor	PNP, TIP42	110-0068-00	NTE332	ECG332	-----	SK9236
Transistor	TIP32C	110-0071-00	NTE292	ECG292	-----	SK3441
Transistor	TIP36C	110-0077-00	NTE393	ECG393	-----	SK3961

Appendix F

Semi-Conductors / Integrated Circuits / Relays Cross-Reference Guide

Table 5 IC	Source N°	SCCA Part N°	NTE N°	ECG N°	Radio Shack® Part N°	RCA® Part N°
IC-Voice Synthesizer	M5205	100-0005-00	-----	-----	-----	-----
IC-Audio Amplifier	MB3730 10 Watts	100-0081-00	-----	-----	-----	-----
IC-Voltage Regulator	MC1723C	100-0266-00	NTE923D	ECG923D	276-1740	SK3165
IC-PIA	MC6821	100-0255-00	NTE6821	ECG6821	-----	SK1900
IC-Sound Chip	BSMT2000	105-0116-00	-----	-----	-----	-----
IC-Quad 2- Input AND GATE	74ALS08	100-0144-00	NTE74S08	ECG74S08	-----	SK74LS08

Table 6 Relays	Source N°	SCCA Part N°	Comments
PPB Relay	FRL264 P024/02CK	190-5002-00	24v DC 10 Amp DPDT
Power Supply Relay	-----	190-5003-00	-----
CPU Relay	-----	190-5001-00	6v DC 5 Amp 4 Pole








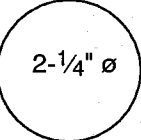
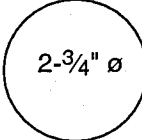




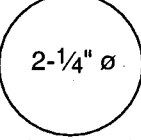
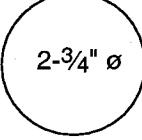




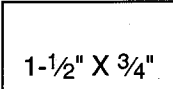
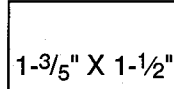
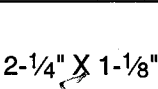
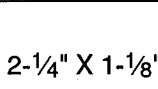
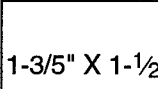
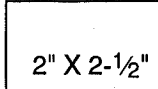

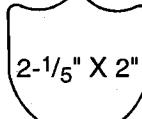
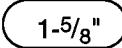
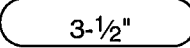
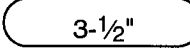

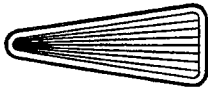
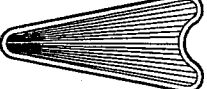
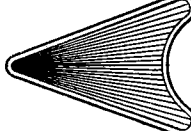


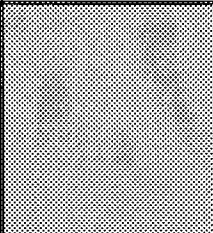
Appendix G

Part Number Prefix Classification Codes Explanation

I.	ELECTRICAL SOURCE AND ENERGY AND SIGNAL CONVERTERS
	010- Transformers
	031- Speakers
	090- Solenoids
II.	CONDUCTORS, CONNECTORS AND INSULATORS
	034- Line Cords
	036- Cable and Harness Assemblies
	041- Motors
	045- Connectors (All Types)
	077- Lamp Sockets
III.	CIRCUITS AND CIRCUIT ELEMENTS
	100- ICs
	110- Transistors
	112- Diodes
	121- Resistors
	123- Resistors (Variable & Adjustable)
	125- CAPS
	140- Crystals
	165- Light Bulbs
	180- Switches
	190- Relays
IV.	BOLTS, SCREWS, NUTS, AND WASHERS
	231- Bolts
	232- Screws (Pan Head)
	234- Screws (HXW)
	237- Screws (Misc.)
	240- Nuts (Misc.)
	242- Washers (Flat, Round)
	244- Washers (Split Lock)
	246- Washers (Lockers, External Tooth)
V.	MECHANICAL COMPONENTS
	249- Rivets
	251- Pins (Dowel)
	254- Stand-Offs, Spacers and Shims
	260- Steel Ball
	265- Springs (Extension)
	266- Springs (Compression)
	269- Springs (Washers - Belleville, Wave)
	280- Grommets and Bushing
VI.	HANDLES, LOCKS, CATCHES & LATCHES, KEYS & HINGES
	355- Handles, Locks, Catches & Latches and Keys
	390- Hinges
VII.	FABRICATED PARTS (IN-HOUSE ASSEMBLIES)
	500- End Product (Systems and Models)
	515- Sub-Assemblies
	520- P.C. Boards
	522- Display Glass
	525- Wood Parts
	530- Screw Machined Parts
	535- Fabricated Parts
	545- Molded (Extruded) Parts (Rubber Rings, Molded Plastic)
	550- Molded (Inserts)
VIII.	BULK MATERIALS
	600- Braided Ground Wire
	601- Stranded Wire
	602- Ribbon Cable
	605- Sleeving (Shrink Tubing)
	626- Foam Rubber
IX.	MISCELLANEOUS
	705- Packing & Shipping Items
	820- Decals and Labels (Sets & Misc.)
	820- Butyrate
	900- Game Posters
	960- EPROM (Raw Part)
	965- EPROM (Programmed Part)

Appendix H

Playfield Inserts (Plastic Light Covers)

Patterns: STARBURST  STIPPLE 	STARBURST CIRCULAR  550-5000-XX	STARBURST CIRCULAR  550-5001-XX	STARBURST CIRCULAR  550-5002-XX	STARBURST CIRCULAR  550-5003-XX	STARBURST CIRCULAR  550-5004-XX
STARBURST CIRCULAR  550-5005-XX	STARBURST CIRCULAR  550-5006-XX	PLAIN CIRCULAR  550-5007-XX	PLAIN CIRCULAR  550-5008-XX	PLAIN CIRCULAR  550-5009-XX	PLAIN CIRCULAR  550-5010-XX
PLAIN CIRCULAR  550-5011-XX	PLAIN CIRCULAR  550-5012-XX	STIPPLE CIRCULAR  550-5048-XX	STIPPLE 1" SQUARE  550-5019-XX	ROLLOVER BUTTON BASE  550-5026-XX	WHITE STAR (only in white)  545-5015-00
STIPPLE RECTANGULAR  550-5018-XX	STIPPLE RECTANGULAR  550-5051-XX	STARBURST RECTANGULAR  550-5044-XX	PLAIN RECTANGULAR  550-5049-XX	PLAIN RECTANGULAR  550-5050-XX	PLAIN RECTANGULAR  550-5063-XX
STARBURST MINI SHIELD  550-5024-XX	STARBURST LARGE SHIELD  550-5025-XX	MINI HOT DOG  550-5020-XX	BEVEL HOT DOG  550-5021-XX	PLAIN HOT DOG  550-5022-XX	BANANA  550-5023-XX
STARBURST ARROW-SHORT  550-5013-XX	STARBURST ARROW-LARGE  550-5014-XX	STARBURST ARROW-HEAD  550-5015-XX	STARBURST BULLET  550-5016-XX	STARBURST TRIANGLE  550-5017-XX	

Note: The shapes and sizes shown above are not to scale.
 Some colors of desired shapes may no longer be available. Check with your distributor.

Color Chart (as applicable for all parts which can come in various colors):
 The "-XX" should be replaced with the following 2-digit number for the color desired.

-01: Clear	-06: Yellow	-10: Fluorescent Orange
-02: Red	-07: Orange	-11: Fluorescent Green
-03: Amber	-08: White	-12: Fluorescent Blue
-04: Green	-09: Purple	-13: Teal Green
-05: Blue		-14: Gray

Glossary of Terms

A	Followed after a number means "Amp." or Ampage in an expression relating to an electrical object. e.g. 8A (eight amps).
AC	Acronym: Alternating Current.
Adj.	Abbreviation: Adjustment(s).
A.L.I.S.O.N. Interface	See Au. 60 in Audit Section.
Au.	Abbreviation: Audit(s).
BLK	Abbreviation: Black.
BLU	Abbreviation: Blue.
BOT	Abbreviation: Bottom.
Bridge Rectifier	A configuration of a diode that allows current to flow in one direction producing both positive and negative pulsating DC Voltages.
BRN	Abbreviation: Brown.
CLR	Abbreviation: Clear.
COLOR CODING	All wire colors are coded to help in tracing wire(s). Colors are abbreviated in this manual as follows: BLK - Black. BRN - Brown. RED - Red. ORN - Orange. YEL - Yellow. GRN - Green. BLU - Blue. VIO - Violet. GRY - Grey. WHT - White. CLR - Clear. Colors represented in a part number for targets are numeric and are represented by the last two (2) digits of the part number as follows: -01: Clear. -02: Red. -03: Amber. -04: Green. -05: Blue. -06: Yellow. -07: Orange. -08: White. -09: Purple. -10: Fluorescent Orange. -11: Fluorescent Green. -12: Fluorescent Blue. -13: Teal Green. -14: Gray.
Combination (Combo)	[Shot]. Any variable pinball shot(s) made succesively.
CMOS	Short for COSMOS (Complementary Symmetry M.O.S.); Complementary Metal-Oxide Semi-Conductor.
CPU	A board used for...
CT	Abbreviation: Center.
DC	Abbreviation: Direct Current.
DT	Abbreviation: Drop Target(s).
EB	Acronym: Extra Ball.
Eject	Playfield surface device to kick ball back into play.
EPROM	Acronym: Erasable Programmable Read Only Memory. Can be erased using UV Light and re-programmed.

Glossary of Terms

e.g.	Abbreviation: Latin- Exempla gratia. For Example.
EOS	Acronym: End-of-Stroke.
Flo.	Abbreviation: Fluorescent.
GND	Abbreviation: Ground (electrical).
GRN	Abbreviation: Green.
GRY	Abbreviation: Gray (or Grey).
G.I.	Abbreviation: General Illumination (Lamps).
IC	Acronym: Integrated Circuit (As in after 24-Pin IC)
i.e.	Abbreviation: Latin- Id est. That is.
LT	Abbreviation: Left.
Laser Kick	A coil/plunger used above the playfield to kick pinball back into play.
LED	Light emitting diode.
Loop	[Shot] Continuously up a ramp and back to the flipper.
Lwr.	Abbreviation: Lower.
Orbit	[Shot] From the left or right flipper around the back rail of the playfield back to the flipper.
MB	Acronym: Magnet Board.
M-BALL or MBALL	Abbreviation: Multiball.
MID	Abbreviation: Middle
Non-Reflexive	See Reflexive.
No. or N ^o or #	Abbreviation: Number
NPF	Acronym: No Problem Found.
N.C. or NC	Abbreviation: Normally Closed.
N.O. or NO	Abbreviation: Normally Open.
ORG	Abbreviation: Orange.
PCB	Acronym: Printed Circuit Board
PIA LED	Acronym: Peripheral Interface Adapter. This is a diagnostic LED on the CPU; it should not be lit during normal operation of a pinball game.

Glossary of Terms

Plumb Bob Tilt	Weight on Tilt Assembly.
Pop(s)	Another term for Turbo Bumper(s).
PPB	Playfield Power Board (Generic Term to describe Acronym with no true definition).
PSB	Acronym: Power Supply Board
P/F	Abbreviation: Playfield
RAM	Acronym: Random Access Memory. RAM can store input instructions and supply output information.
RED	Abbreviation: Red.
Reflexive/Non-Reflexive	Reflexive—Solenoid Drive Transistor is enabled directly by a switch closure on the solenoid assembly. (Non-Reflexive—Solenoid Drive Transistor is enabled by the CPU after reading a switch closure in the Switch Matrix.
Relay	An automatic switch operated by current in a coil.
ROM	Acronym: Read Only Memory. ROM cannot store input instructions but can supply output information. ROM can be programmed only once.
RT	Abbreviation: Right.
RO	Abbreviation: Rollover (switches).
Saucer	See Eject.
Scoop	A hole into the playfield. A metal scoop is in place to guide the ball into the kick-back under the playfield.
Slam Tilt	Explain.
Slo-Blo or Slow-Blow	A type of fuse.
SMB	Acronym: Shaker Motor Board.
Solenoid	A coil used for Electro Magnetic devices such as relays, flippers, slingshots, etc.
SSFB	Acronym: Solid State Flipper Board.
STEP	Refers to the service switches on the coin door.
S-U	Abbreviation: Stand-Up (targets).
TM	Acronym: Trademark

Glossary of Terms

Transfer	[Shot] Maneuvering the ball in play from one flipper to the other. With flipper in the up position and the ball cradled by that flipper one would activate the flipper button in a quick repetitive manner to bounce the ball to the other side. Skilled players can rebound the ball off the slingshot.
TTL	Acronym: Transistor-Transistor Logic
Upr.	Abbreviation: Upper.
V or v	Abbreviation: Volt(s).
Ver.	Abbreviation: Version.
VIO	Abbreviation: Violet
VUK	Acronym: Vertical Up-Kicker.
WHT	Abbreviation: White.
X	Acronym: "Times" A multiplier.
YEL	Abbreviation: Yellow.
Zener Diode	A semi-conductor diode used for voltage regulation. Application depends on reverse break-down voltage.