

featuring our Portals Service Menu
and our unique

Find-It-In-Front: Dr. Pinball Section



SEGA™

PINBALL, INC.



**TO DISABLE GRAPHIC ADULT ORIENTED SPEECH SET
ADJUSTMENT 56 (ADULT SPEECH ENABLED) TO "NO".**

REFER TO SECTION 3, CHAPTER 1, PORTALS SERVICE MENU INTRODUCTION FOR HELP.



This document has been downloaded from:



FLIPPERSPILL.COM



Joe Blackwell
DIRECTOR,
Parts Sales &
Technical Support



Susan Molitor
Parts
Sales
MANAGER



Patty Schraps
Parts
Stockroom
MANAGER



Doug Lemons
Technical
Support
ENGINEER



Linda Garza
Customer
Service
REPRESENTATIVE



Jay Alfer
Technical Support
Documentation
ADMINISTRATOR



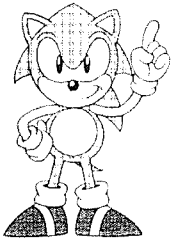
Sega Pinball, Inc. TM & © 1999.
All Rights Reserved. Printed in the U.S.A.

March 1999 - Print Copy

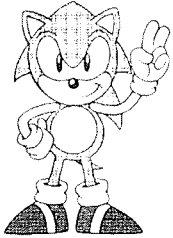
**Please call us at 1-800-542-5377 or
1-708-345-7700 for Technical Support.**

SPI PN#: 780-5071-00

WOW! Look what's new at Sega Pinball!



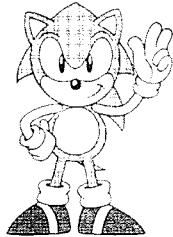
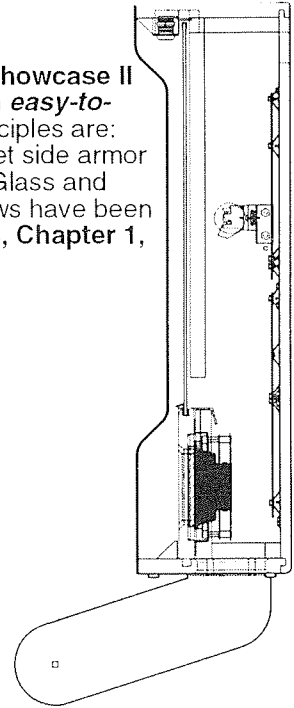
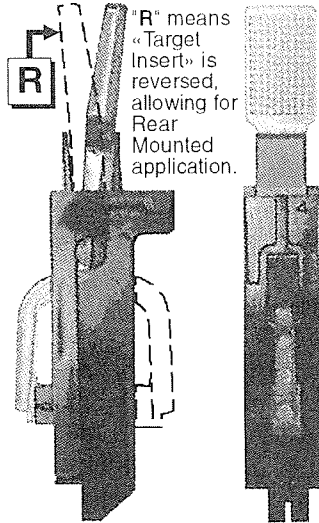
THE BACK BOX: First introduced in *Lost In Space™* Pinball is the **Sega Showcase II Backbox!** An innovative and **bold look!** A Backbox using a single lock and an **easy-to-remove** Back Glass & Speaker Panel / Dot Matrix Display. The operating principles are: it still folds down (using the original allen wrench key) and lays upon the cabinet side armor molding. And, you can service the PCBs from either side of the game. Back Glass and Speaker Panel / Dot Matrix Display cleaning and removal is easier. The reviews have been great, just look at your own game! For more on Backbox Parts, see **Section 4, Chapter 1, Parts Identificaion (The Pink Pages)**.



MODULAR STAND-UP TARGETS:

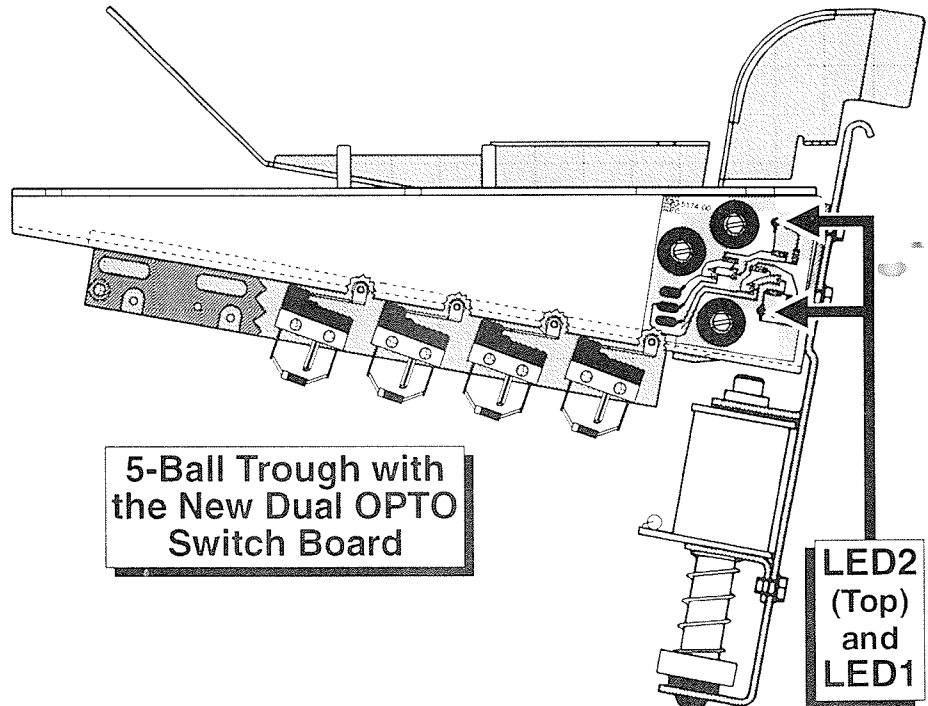
See **Appendix I** in this manual (at the back). You can now buy just the Target Insert instead of the entire Target Assembly (if just the Target Insert is broke). Target Assemblies which are "Rear Mounted" (reversed) would use the same SPI Part N° but add an "R" to the end.

When you order the Target Insert(s) from your distributor, it should come with an *Assembly / Disassembly Instruction Sheet*. If it does not, ask your distributor for a copy of **Sega Pinball, Inc. Service Bulletin N° 110** (or call Technical Support at below numbers). You can also use *Service Bulletin N° 110* to reverse the Target Insert installation if you have spare "regular" mounted targets (the Switch Actuator would need to be reversed as well). **Appendix I** will give details on the Part N°s & the Colors the targets are available in.



TROUGH DUAL OPTO BOARDS: We have been using **Single OPTO Switch Boards** in our Ball Troughs (as the switch for the Trough Up-Kicker) for a long while now and with great success! Through long-term field testing and design we have produced the **Dual OPTO Switch Board**. Why? Increased reliability and handling of the flow of pinballs in and out of the Ball Trough. In our past games *Baywatch™* through *Viper™* the Ball

Trough Design used only a **Single OPTO Switch** at the Trough Up-Kicker. This designed proved itself reliable. However, as we strive continuously for improvements, we have found by using a **Dual OPTO Switch Board** it will now act as a monitoring device in the event a "double-ball" stack occurs at the Trough Up-Kicker (a double-ball stack is when a ball sits upon the top of the bottom ball over the Trough Up-Kicker). First introduced in *Lost In Space™* the **Dual OPTO Switch Board** will identify this and allow ball transition to process faster and fluently. For more on troubleshooting, see **Section 3, Chapter 2, Go To Diagnostics Menu** (then Go To Switch Menu) or **Section 5, Chapter 4, Printed Circuit Boards (PCBs), Trough Up-Kicker Dual OPTO Boards Theory of Operation & Schematic, ...Component Layout & Parts, OPTO Troubleshooting and Trough Dual OPTO Boards Alignment (Test for LED1 & LED2).**



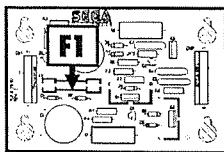
5-Ball Trough with the New Dual OPTO Switch Board

LED2 (Top) and LED1

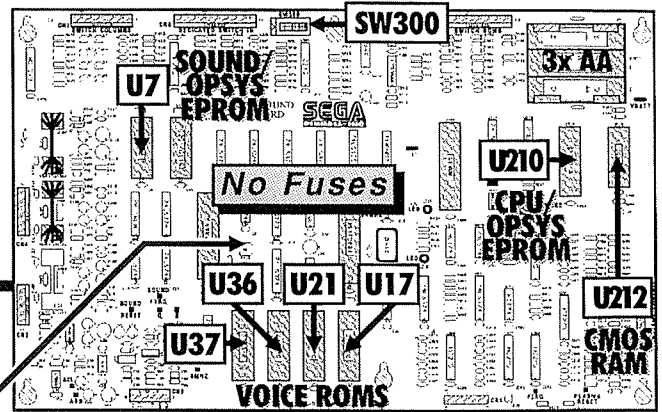
New to our Pinball Games?

Don't forget to go over **Section 3, Chapter 1, Portals™ Service Menu Introduction**. If using *Diagnostics...very useful!* And, as always, if you get stuck? Comments? Questions? Call Technical Support at 800-542-5377 or 708-345-7700.

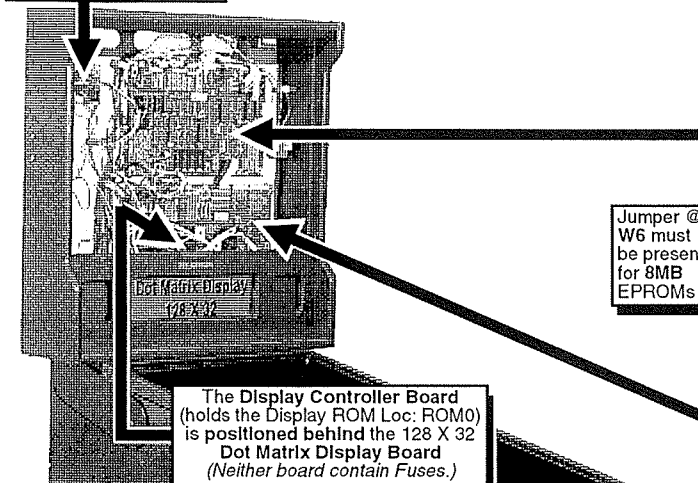
▼ BACKBOX LAYOUT LOCATIONS: FUSES, BRIDGES, RELAYS & ROMs ▼



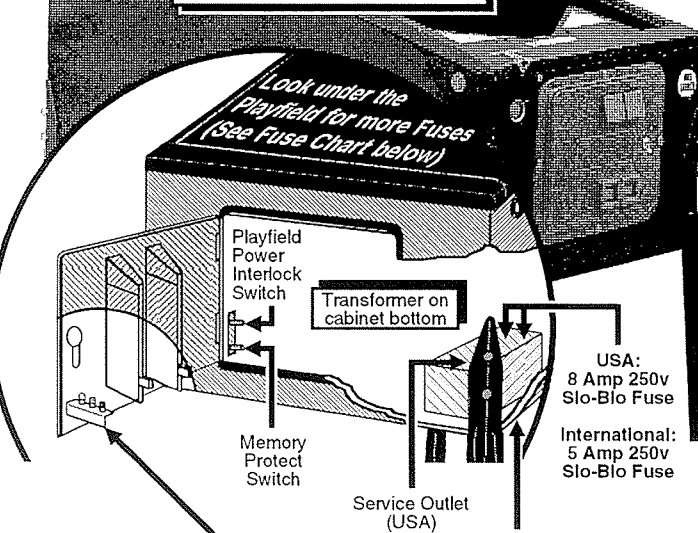
Display Power Supply Bd.



CPU / Sound Board



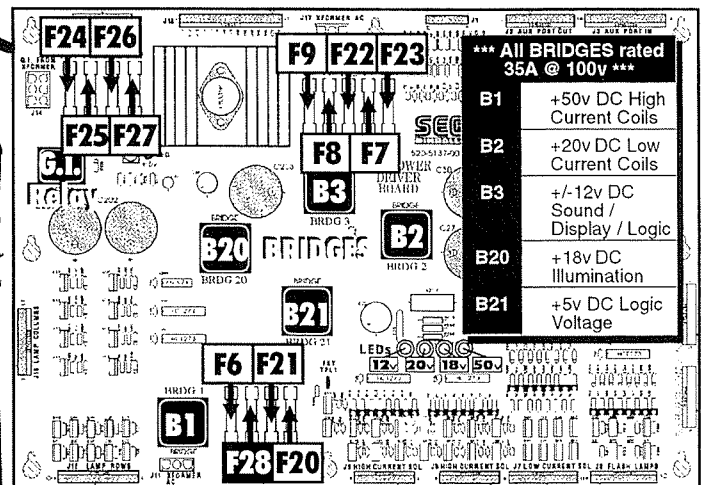
The Display Controller Board (holds the Display ROM Loc: ROM0) is positioned behind the 128 X 32 Dot Matrix Display Board (Neither board contain Fuses.)



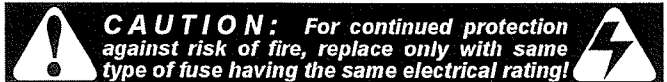
Volume Control & Service Switches
For operational usage, see
Section 3, Chapter 1, Portals Service
Menu Introduction

For Backbox & Cabinet General Parts, see Section 4, Chapter 1,
Parts Identification & Location (The Pink Pages)

For Schematics and/or Component Parts on above Boards, see
Sec. 5, Chp. 4, Printed Circuit Boards (PCBs) (The Yellow Pages)



I/O Power Driver Board



QUICK REFERENCE FUSE CHART

Backbox Fuses

LOC: DISPLAY POWER SUPPLY (P.S.) BOARD

F1 3/4A 250v S.B. 90v DC High Voltage Display

LOC: I / O POWER DRIVER BOARD

F6 7A 250v S.B. 50v DC Primary High Power Coils/Flippers

F7 5A 250v S.B. 20v DC Low Power Coils

F8 5A 250v S.B. 12v DC Logic Power

F9 5A 250v S.B. 12v DC Logic Power

F20 3A 250v S.B. 50v DC Not Used / Spare

F21 3A 250v S.B. 50v DC Coils

F22 8A 250v S.B. 18v DC Controlled Lamps

F23 4A 250v S.B. 5v DC Logic

F24 5A 250v S.B. 6.3v AC G.I. Lamps (BRN-WHT to WHT-BRN)

F25 5A 250v S.B. 6.3v AC G.I. Lamps (YEL to WHT-YEL)

F26 5A 250v S.B. 6.3v AC G.I. Lamps (GRN to WHT-GRN)

F27 5A 250v S.B. 6.3v AC G.I. Lamps (VIO to WHT-VIO)

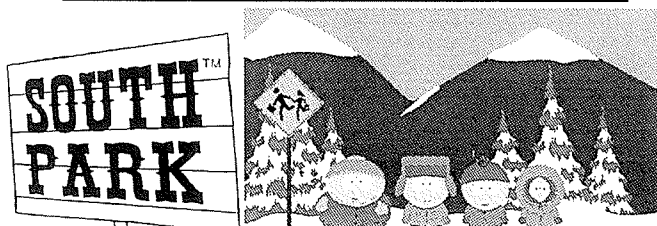
F28 3A 250v S.B. 24v AC Not Used / Spare

Cabinet Fuses

LOC: SERVICE (AC) OUTLET BOX (Cabinet Bottom)

n/a 8A 250v S.B. 115v AC Main Fuse Line (Domestic or USA)

n/a 5A 250v S.B. 220v AC Main Fuse Line (International)



QUICK REFERENCE FUSE CHART

South Park Playfield Fuses

LOC: UNDER PLAYFIELD (By Assemblies Listed)

n/a 3A 250v S.B. 50v DC Rt. Flipper (BLU-YEL↔RED-YEL)

n/a 3A 250v S.B. 50v DC Lt. Flipper (GRY-YEL↔RED-YEL)

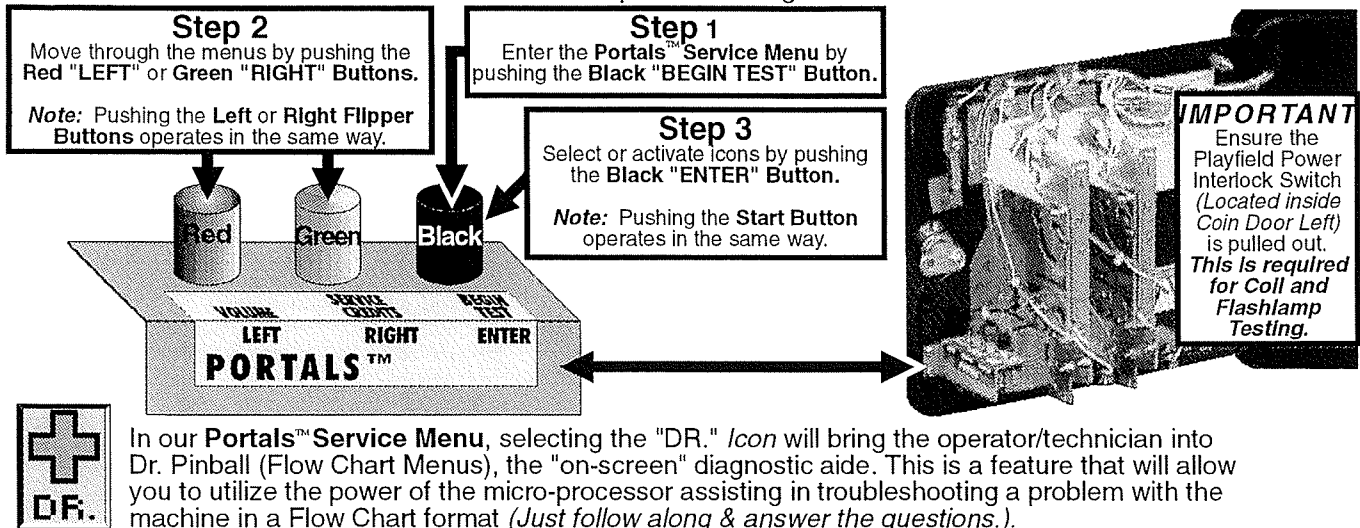


Find-It-In-Front:
Dr. Pinball



▼ FIND-IT-IN-FRONT: DR. PINBALL SECTION EXPLAINED ▼

The key technical data from various parts of the manual were extracted and combined into the "Find-It-In-Front: Dr. Pinball Section." This section (pages DR. ① - ⑩) will assist the technician in locating important technical information needed to troubleshoot the Pinball Machine. Dr. Pinball is also available on the game in the **Portals™ Service Menu**. This variation is in a Flow Chart Help Format. To get into the **Portals™ Service Menu**:

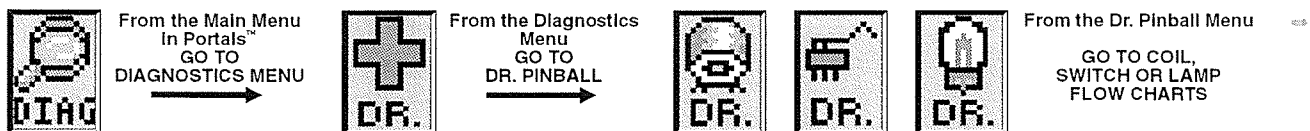


▼ HOW IT WORKS ▼

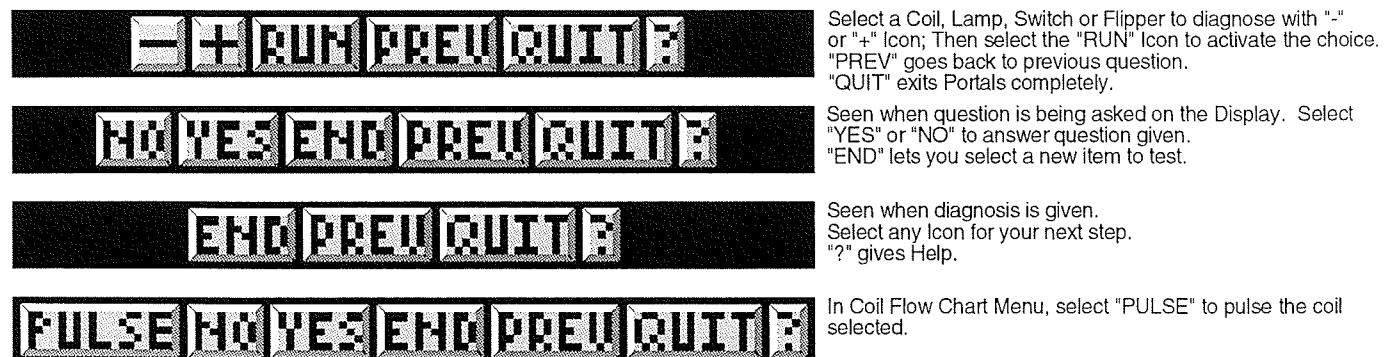
First, the operator/technician must enter the Service Mode (for a complete description of the **Portals™ Service Menu** and **ICONS** see Section 3, Chapter 1). To get into the Service Menu Mode: • Power-up game (if not already) & open the Coin Door. • On the Coin Door is the **Portals™ Service Switch Set (Red, Green & Black Buttons)**. Push down the **Black "BEGIN TEST" Button**. Looking at the Video Display you will momentarily see the introductory screen "Service Menu" with a satellite flying from right to left pulling a banner "Portals™ © SEGA PINBALL, INC.," followed by the **MAIN MENU**.

While in the **MAIN MENU**, select the "DIAG" Icon, then select the Cross "DR." Icon. This will bring you (the operator / technician) into **DR. PINBALL** (Flow Chart Menus) which offers you a choice of three (3) Sub-Menus: Coil "DR.," Switch "DR.," and Lamp "DR." Icons. Selecting a particular sub-menu will give you a choice of which specific Flipper, Coil, Switch or Lamp circuit needs to be diagnosed. The display will now ask a question or give a procedure to follow such as "Does the lamp turn on?" or "Check bridge rectifier BR-20, if short replace." When Dr. Pinball asks a question or request a procedure the Dr. will expect a response such as "no" or "yes" (see below examples of the *Mini-Icons* which will prompt the operator). You the operator/technician must respond by using your **Flipper Buttons** to "SELECT" a *Mini-Icon* and the **Start Button** to "ENTER" your selection.

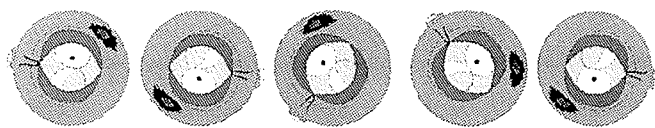
Note: The "Portals" service switches located on the coin door can also be used to select and enter *Mini-Icons*. In switch test this is required since flipper and start switches are part of the test.



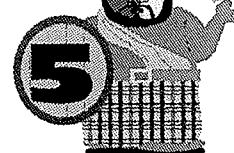
The following are the *Mini-Icons* with explanations for the Dr. Pinball Sub-Menus:



INSTALL 5 BALLS!



This is a 5-Ball
Pinball
children...



▼ DIAGNOSTIC AIDS ▼

The *display reads* "OPERATOR ALERT..." — A message displayed during Game Mode or Power-Up to alert the operator of a problem.

OPERATOR ALERT works by monitoring any *switch activated coil* that has the potential to trap a ball when disabled (e.g. in the Auto Launch, Scoop, Eject, etc.). If this assembly has a closed switch indicating a ball is stuck or the switch is *stuck closed*, the CPU Board will activate the coil ten times. If the switch remains closed, the game will display a message indicating there is a problem (e.g. "OPERATOR ALERT AUTO LAUNCH NOT WORKING"). This not only warns the operator of a problem immediately, but indicates exactly where the operator should look to resolve it.

The *display flashes* "OPEN THE COIN DOOR" — This indicates that CMOS RAM memory (CPU Loc. U212) has been corrupted.

This is caused by either failure in memory (e.g. batteries are dead or faulty RAM) or upon installation of updated version of code. Opening the Coin Door will initiate a Factory Restore, by opening the Memory Protect Switch. Check battery voltage at CMOS RAM with power off.

▼ CPU DIP SWITCH SETTINGS, LOC. SW300 CPU/SOUND BOARD ▼ CUSTOM FACTORY ADJUSTMENTS BY COUNTRY*

CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
USA *	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF	▼	▼	▼	▼	▼	▼	▼	▼
CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
AUSTRIA	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF	▼	▼	▼	▼	▼	▼	▼	▼
CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
BELGIUM	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF	▼	▼	▼	▼	▼	▼	▼	▼
CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
BRAZIL	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF	▼	▼	▼	▼	▼	▼	▼	▼
CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
CANADA	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF	▼	▼	▼	▼	▼	▼	▼	▼

CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
FRANCE	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF	▼	▼	▼	▼	▼	▼	▼	▼
CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
GERMANY	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF	▼	▼	▼	▼	▼	▼	▼	▼
CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
ITALY	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF	▼	▼	▼	▼	▼	▼	▼	▼
CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
JAPAN	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF	▼	▼	▼	▼	▼	▼	▼	▼
CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
NETHERLANDS (HOLLAND / DUTCH)	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF	▼	▼	▼	▼	▼	▼	▼	▼

CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
NORWAY	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF	▼	▼	▼	▼	▼	▼	▼	▼
CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
SWEDEN	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF	▼	▼	▼	▼	▼	▼	▼	▼
CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
SWITZERLAND	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF	▼	▼	▼	▼	▼	▼	▼	▼
CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
UK	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF	▼	▼	▼	▼	▼	▼	▼	▼
CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
UK FOR NEW 50p, 2E COIN MECH	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF	▼	▼	▼	▼	▼	▼	▼	▼

*All countries not noted use the "USA Setting"

▼ ROM SUMMARY TABLE ▼

* Note: The CPU/Sound Board must have a Jumper at W6 to accept 8MB ROMs.

I.C. NAME	TYPE	BOARD NAME	LOC.	PART N8
Game ROM	1MB	CPU / Sound Board	U210	965-0301-71
Voice ROM 1 *	8MB	CPU / Sound Board	U17	965-0302-71
Voice ROM 2 *	8MB	CPU / Sound Board	U21	965-0303-71
Voice ROM 3 *	8MB	CPU / Sound Board	U36	965-0304-71
Voice ROM 4 *	8MB	CPU / Sound Board	U37	965-0305-71
Sound EPROM	512K	CPU / Sound Board	U7	965-0306-71
Display EPROM	4MB	Display Controller Bd.	ROM 0	965-0307-71
Display EPROM	Not Used	Display Controller Bd.	ROM 1	Not Used



Find-It-In-Front:
Dr. Pinball





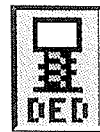
From the Main Menu
In Portals™
GO TO DIAGNOSTICS
MENU



From the Diagnostics
Menu
GO TO SWITCH
MENU



From the Switch
Menu
GO TO SWITCH OR
ACTIVE SWITCH TEST



From the Switch
Menu
GO TO DEDICATED
SWITCH TEST

D iode O n T e r m i n a l S t r i p

SWITCH MATRIX GRID & DEDICATED SWITCHES

Column (Drive)	1: Q1	2: Q2	3: Q3	4: Q4	5: Q5	6: Q6	7: Q7	8: Q8	GND	Ground
Row (Return)	GRN-BRN CN5-P1	GRN-RED CN5-P3	GRN-ORG CN5-P4	GRN-YEL CN5-P5	GRN-BLK CN5-P6	GRN-BLU CN5-P7	GRN-VIO CN5-P8	GRN-GRY CN5-P9	IC U206 INPUTS	BLK CN6-P1, -P11
1: U400 WHT-BRN CN7-P9	LEFT BUTTON (UK ONLY) On Cabinet side	NOT USED	LEFT 5-BANK BOTTOM Under P/F	RIGHT RAMP ENTER Above P/F	NOT USED	NOT USED	LEFT TURBO BUMPER Under P/F	LEFT OUTLANE Under P/F	1: U206 GRY-BRN CN6-P2	#1 LEFT FLIPPER BUTTON in Cabinet side DS-1
2: U400 WHT-RED CN7-P8	4TH COIN SLOT On Coin Door	5-BALL TROUGH #1 (LEFT) Under P/F	LEFT 5-BANK #2 Under P/F	RIGHT RAMP EXIT Above P/F	RIGHT 3-BANK BOTTOM Under P/F	KENNY OPTO Under P/F	RIGHT TURBO BUMPER Under P/F	LEFT RETURN LANE Under P/F	2: U206 GRY-RED CN6-P3	#2 LEFT FLIPPER E.O.S. (End-of-Stroke) in Cabinet side DS-2
3: U400 WHT-ORG CN7-P7	6TH COIN SLOT On Coin Door	5-BALL TROUGH #2 Under P/F	LEFT 5-BANK #3 Under P/F	NOT USED	RIGHT 3-BANK MIDDLE Under P/F	UNDER-TROUGH (TOILET) Under P/F	BOTTOM TURBO BUMPER Under P/F	LEFT SLINGSHOT Under P/F	3: U206 GRY-ORG CN6-P4	#3 RIGHT FLIPPER BUTTON in Cabinet side DS-3
4: U400 WHT-YEL CN7-P6	RIGHT COIN SLOT On Coin Door	5-BALL TROUGH #3 Under P/F	LEFT 5-BANK #4 Under P/F	NOT USED	RIGHT 3-BANK TOP Under P/F	UNDER-TROUGH (KENNY) Under P/F	NOT USED	RIGHT OUTLANE Under P/F	4: U206 GRY-YEL CN6-P6	#4 RIGHT FLIPPER E.O.S. (End-of-Stroke) in Cabinet side DS-4
5: U401 WHT-GRN CN7-P5	CENTER COIN SLOT / DBA On Coin Door	5-BALL TROUGH #4 Under P/F	LEFT 5-BANK TOP Under P/F	NOT USED	POP BUMPER TARGET LT Under P/F	SVUK Under P/F	NOT USED	RIGHT RETURN LANE Under P/F	5: U206 NOT USED GRY-GRN CN6-P7	NOT USED DS-5
6: U401 WHT-BLU CN7-P3	LEFT COIN SLOT On Coin Door	5-BALL TROUGH VUK OPTO Under P/F	CENTER 3-BANK LEFT Under P/F	NOT USED	POP BUMPER TARGET RT Under P/F	VUK Under P/F	START BUTTON Cabinet Front	RIGHT SLINGSHOT Under P/F	6: U206 GRY-BLU CN6-P8	#6 VOLUME (RED BUTTON) (In Test: LEFT) on Coin Door DS-6
7: U401 WHT-VIO CN7-P2	5TH COIN SLOT On Coin Door	5-BALL STACKING OPTO Under P/F	CENTER 3-BANK MIDDLE Under P/F	NOT USED	NOT USED	LEFT ORBIT (TO VUK) Under P/F	SLAM TILT On Coin Door	NOT USED	7: U206 GRY-VIO CN6-P9	#7 SERV. CRED. (GREEN BUTTON) (In Test: RIGHT) on Coin Door DS-7
8: U401 WHT-GRY CN7-P1	RIGHT BUTTON (UK ONLY) on Cabinet side	SHOOTER LANE Under P/F	CENTER 3-BANK RIGHT Under P/F	NOT USED	NOT USED	UNDER-TROUGH SVUK Under P/F	PLUMB BOB TILT Inside Cabinet	NOT USED	8: U206 GRY-BLK CN6-P10	#8 BEGIN TEST (BLACK BUTTON) (In Test: ENTER) on Coin Door DS-8



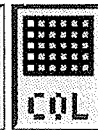
From the Diagnostics
Menu
GO TO LAMP
MENU



From the Lamp
Menu
GO TO SINGLE
LAMP TEST



From the Lamp
Menu
GO TO TEST
ALL LAMPS



From the Lamp
Menu
GO TO ROW OR
COLUMN TEST

D iode O n T e r m i n a l S t r i p

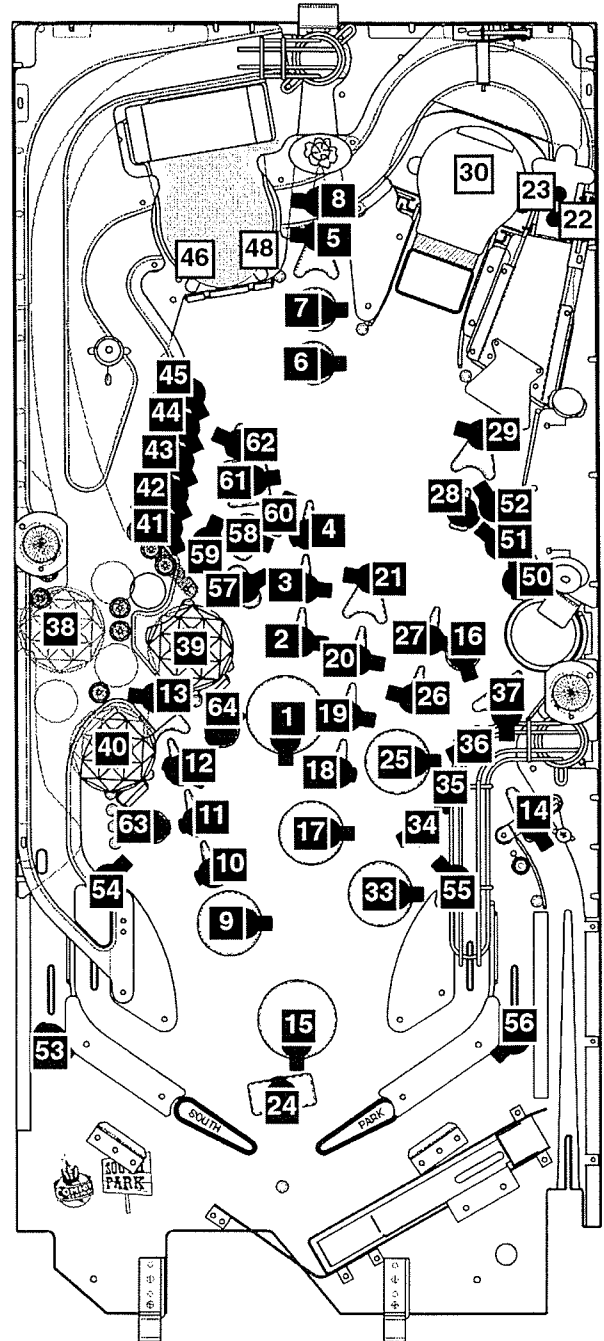
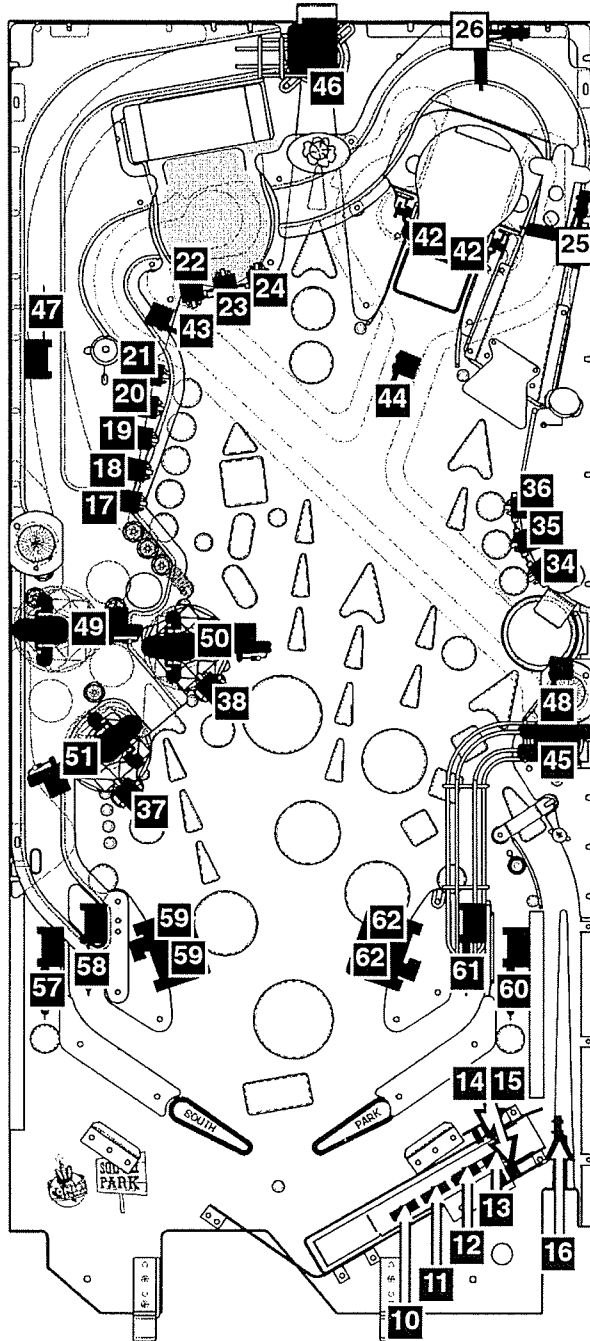
LAMP MATRIX GRID

Column (18v)	1: U17	2: U16	3: U15	4: U14	5: U13	6: U12	7: U11	8: U10
Row (GND)	YEL-BRN J13-P9	YEL-RED J13-P8	YEL-ORG J13-P7	YEL-BLK J13-P6	YEL-GRN J13-P5	YEL-BLU J13-P4	YEL-VIO J13-P3	YEL-GRY J13-P1
1: Q33 RED-BRN J12-P1	CHEF FACE #555 Bulb	CHEF #2 #555 Bulb	CHEF #3 #555 Bulb	CHEF #4 #555 Bulb	CHEF ARROW #555 Bulb	MYSTERY #555 Bulb	SPOOKY VISION #555 Bulb	EXTRA BALL #555 Bulb
2: Q34 RED-BLK J12-P2	STAN FACE #555 Bulb	STAN #2 #555 Bulb	STAN #3 #555 Bulb	STAN #4 #555 Bulb	STAN ARROW #555 Bulb	SKILL SHOT #555 Bulb	VOLCANO #555 Bulb	ANAL PROBE #555 Bulb
3: Q35 RED-ORG J12-P3	KENNY FACE #555 Bulb	KENNY #2 #555 Bulb	KENNY #3 #555 Bulb	KENNY #4 #555 Bulb	KENNY ARROW #555 Bulb	SUPER JACKPOT #555 Bulb	MULTIBALL READY 555# ulb	SOUTH PARK SIGN #555 Bulb
4: Q36 RED-YEL J12-P4	KYLE FACE #555 Bulb	KYLE #2 #555 Bulb	KYLE #3 #555 Bulb	KYLE #4 #555 Bulb	KYLE ARROW #555 Bulb	KENNY ASSEMBLY #555 Bulb	NOT USED	NOT USED
5: Q37 RED-GRN J12-P5	CARTMAN FACE #555 Bulb	CARTMAN #2 #555 Bulb	CARTMAN #3 #555 Bulb	CARTMAN #4 #555 Bulb	CARTMAN ARROW #555 Bulb	LEFT TUR-BO BUMPER 555# Bulb	RIGHT TUR-BO BUMPER 555# Bulb	BTM TUR-BO BUMPER 555# Bulb
6: Q38 RED-BLU J12-P6	LEFT 5-BANK BOTTOM #555 Bulb	LEFT 5-BANK #2 #555 Bulb	LEFT 5-BANK #3 #555 Bulb	LEFT 5-BANK #4 #555 Bulb	LEFT 5-BANK TOP #555 Bulb	TOILET S-U LT #555 Bulb	NOT USED	TOILET S-U RT #555 Bulb
7: Q39 RED-VIO J12-P8	NOT USED	RT. 3-BANK BOTTOM #555 Bulb	RT. 3-BANK MIDDLE #555 Bulb	RT. 3-BANK TOP #555 Bulb	LEFT OUTLANE #555 Bulb	LEFT RE-TURN LANE #555 Bulb	RIGHT RE-TURN LANE #555 Bulb	RIGHT OUTLANE #555 Bulb
8: Q40 RED-GRY J12-P9	MR. HANKEY: BOTTOM #555 Bulb	MR. HANKEY: BODY #555 Bulb	MR. HANKEY: LT HAND #555 Bulb	MR. HANKEY: RT HAND #555 Bulb	MR. HANKEY: HEAD #555 Bulb	MR. HANKEY: HAT #555 Bulb	POP BUMPER TARGET LT #555 Bulb	POP BUMPER TARGET RT #555 Bulb
9: Q41 NOT USED RED-WHT J12-P10	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED
10: Q42 NOT USED RED J12-P11	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED



SWITCH MATRIX GRID LOCATIONS

LAMP MATRIX GRID LOCATIONS

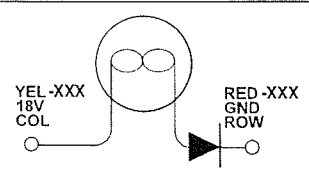
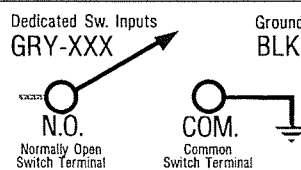
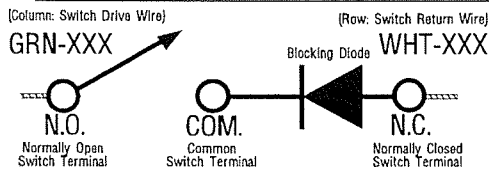


Legend Note: = Switches/Lamps mounted above playfield. = Switches/Lamps mounted below the playfield.

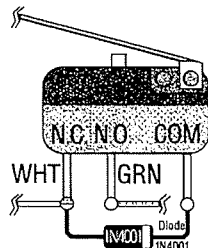
TYPICAL SWITCH SCHEMATIC

DEDICATED SWITCH SCHEMATIC

TYPICAL LAMP SCHEMATIC



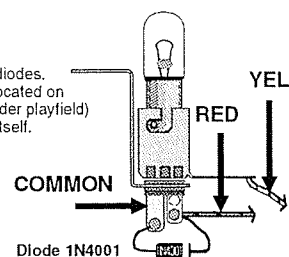
Note:
All Switches require diodes.
Some diodes are located on
Terminal Strips (under playfield)
& not on the switch itself.
D iode
O n
T ermi-
n al
S trip



Find-It-In-Front:
Dr. Pinball

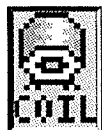


Note:
All Lamps require diodes.
Some diodes are located on
Terminal Strips (under playfield)
& not on the lamp itself.
D iode
O n
T ermi-
n al
S trip

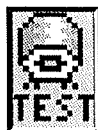




From the Main Menu
In Portals™
GO TO DIAGNOSTICS
MENU



From the Diagnostics
Menu
GO TO COIL
MENU



From the Coil
Menu
GO TO COIL
TEST



From the Coil
Menu
GO TO CYCLING
COILS

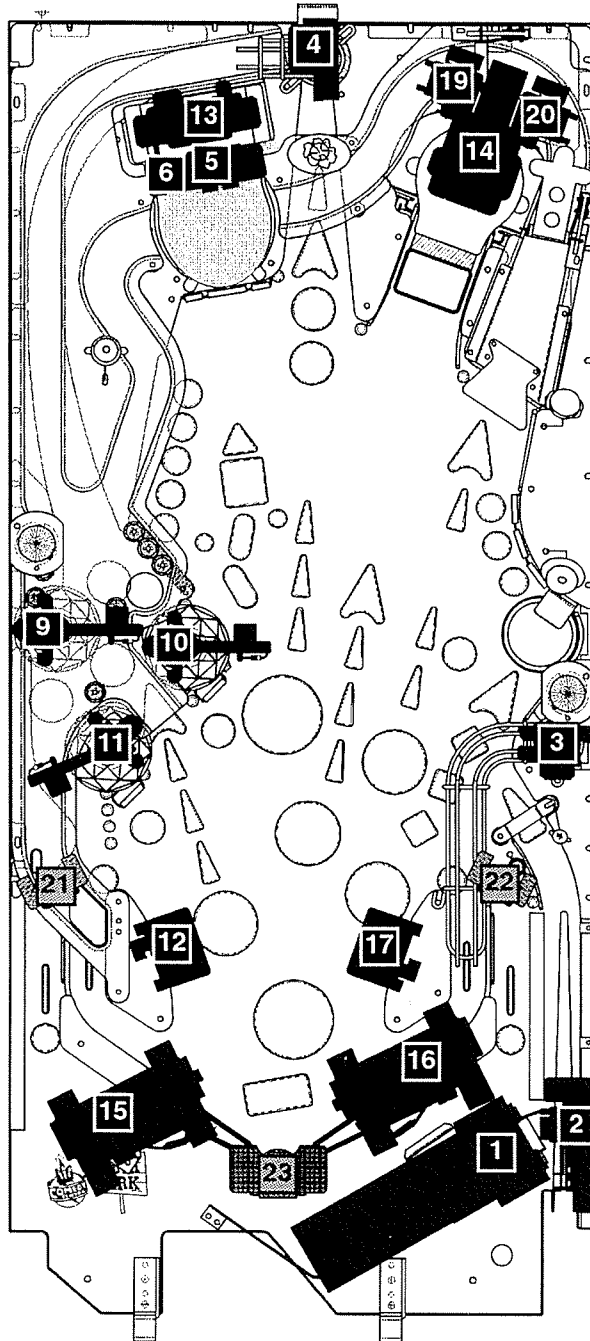
COILS DETAILED CHART TABLE

High Current Coils Group 1		Drive Trans- istor (D.T.)	Driver Output Board	D.T. Control Line Color	D.T. Control Line Connect	Power Line Color	Power Line Connection	Power Voltage	Coil GA/Turn or Bulb Type
#1	TROUGH UP-KICKER	Q1	I/O Pwr. Drvr.	BRN-BLK	J8-P1	YEL-VIO	J10-P4/5	50v DC	26-1200 090-5044-00T
#2	AUTO LAUNCH	Q2	I/O Pwr. Drvr.	BRN-RED	J8-P3	YEL-VIO	J10-P4/5	50v DC	24-940 090-5036-00T
#3	SUPER VUK	Q3	I/O Pwr. Drvr.	BRN-ORG	J8-P4	YEL-VIO	J10-P4/5	50v DC	24-940 090-5036-00T
#4	TOP VUK	Q4	I/O Pwr. Drvr.	BRY-YEL	J8-P5	YEL-VIO	J10-P4/5	50v DC	26-1200 090-5044-00T
#5	TOILET SEAT LID	Q5	I/O Pwr. Drvr.	BRN-GRN	J8-P6	BRN	J7-P1	20v DC	23-1100 090-5030-00T
#6	MR. HANKEY LATCH	Q6	I/O Pwr. Drvr.	BRN-BLU	J8-P7	YEL-VIO	J10-P4/5	50v DC	29-1000 090-5059-00
#7	FLASH POPS *4	Q7	I/O Pwr. Drvr.	BRN-VIO	J8-P8	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89
#8	EUROPEAN TOKEN DISPENSER	Q8	I/O Pwr. Drvr.	BRN-GRY	J8-P9	YEL-VIO	J10-P4/5	50v DC	DL4SS 515-6076-01
High Current Coils Group 2		Drive Trans- istor (D.T.)	Driver Output Board	D.T. Control Line Color	D.T. Control Line Connect	Power Line Color	Power Line Connection	Power Voltage	Coil GA/Turn
#9	LEFT TURBO BUMPER	Q9	I/O Pwr. Drvr.	BLU-BRN	J9-P1	YEL-VIO	J10-P4/5	50v DC	26-1200 090-5044-00T
#10	RIGHT TURBO BUMPER	Q10	I/O Pwr. Drvr.	BLU-RED	J9-P2	YEL-VIO	J10-P4/5	50v DC	26-1200 090-5044-00T
#11	BOTTOM TURBO BUMPER	Q11	I/O Pwr. Drvr.	BLU-ORG	J9-P4	YEL-VIO	J10-P4/5	50v DC	26-1200 090-5044-00T
#12	LEFT SLINGSHOT	Q12	I/O Pwr. Drvr.	BLU-YEL	J9-P5	BRN	J7-P1	20v DC	23-800 090-5001-00T
#13	MR. HANKEY (DOWN)	Q13	I/O Pwr. Drvr.	BLU-GRN	J9-P6	YEL-VIO	J10-P4/5	50v DC	23-1100 090-5030-00T
#14	KENNY PIVOT (DEAD)	Q14	I/O Pwr. Drvr.	BLU-BLK	J9-P7	YEL-VIO	J10-P4/5	50v DC	22-1080 090-5032-00T
#15	LEFT FLIPPER (50v RED/YEL)	Q15	I/O Pwr. Drvr.	ORG-GRY	J9-P8	RED-YEL GRY-YEL	J10-P1/2	50v DC	23-1100 090-5030-00T
#16	RIGHT FLIPPER (50v RED/YEL)	Q16	I/O Pwr. Drvr.	ORG-VIO	J9-P9	RED-YEL BLU-YEL	J10-P1/2	50v DC	23-1100 090-5030-00T
Low Current Coils Group 1		Drive Trans- istor (D.T.)	Driver Output Board	D.T. Control Line Color	D.T. Control Line Connect	Power Line Color	Power Line Connection	Power Voltage	Coil GA/Turn Bulb or Meter
#17	RIGHT SLINGSHOT	Q17	I/O Pwr. Drvr.	VIO-BRN	J7-P2	BRN	J7-P1	20v DC	23-800 090-5001-00T
#18	FLASH TOP VUK *1	Q18	I/O Pwr. Drvr.	VIO-RED	J7-P3	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89
#19	KENNY LT	Q19	I/O Pwr. Drvr.	VIO-ORG	J7-P4	BRN	J7-P1	20v DC	24-940 090-5036-00T
#20	KENNY RT	Q20	I/O Pwr. Drvr.	VIO-YEL	J7-P6	BRN	J7-P1	20v DC	24-940 090-5036-00T
#21	LT OUTLANE (UK ONLY)	Q21	I/O Pwr. Drvr.	VIO-GRN	J7-P7	BRN	J7-P1	20v DC	28-1050 090-5046-00
#22	RT OUTLANE (UK ONLY)	Q22	I/O Pwr. Drvr.	VIO-BLU	J7-P8	BRN	J7-P1	20v DC	28-1050 090-5046-00
#23	UP/DOWN POST (UK ONLY)	Q23	I/O Pwr. Drvr.	VIO-BLK	J7-P9	BRN	J7-P1	20v DC	23-1100 090-5030-00T
#24	OPTIONAL COIN METER	Q24	I/O Pwr. Drvr.	VIO-GRY	J7-P10	RED	J16-P7	5v DC	Meter 5v 091-6000-00
Diode On Terminal Strip (if noted)									
Flash Lamps (FLASH)		Drive Trans- istor (D.T.)	Driver Output Board	D.T. Control Line Color	D.T. Control Line Connect	Power Line Color	Power Line Connection	Power Voltage	Bulb Type
#F1	FLASH STAN *2	Q25	I/O Pwr. Drvr.	BLK-BRN	J6-P1	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89
#F2	FLASH CHEF *2	Q26	I/O Pwr. Drvr.	BLK-RED	J6-P2	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89
#F3	FLASH KENNY *2	Q27	I/O Pwr. Drvr.	BLK-ORG	J6-P3	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89
#F4	FLASH KYLE *2	Q28	I/O Pwr. Drvr.	BLK-YEL	J6-P4	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89
#F5	FLASH CARTMAN *2	Q29	I/O Pwr. Drvr.	BLK-GRN	J6-P5	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89
#F6	FLASH KENNY *1 BACK *2	Q30	I/O Pwr. Drvr.	BLK-BLU	J6-P6	ORG	J6-P10	20v DC	#906 Bulb 165-5004-00 #89 Bulb 165-5000-89
#F7	FLASH MR HANKEY/TOILET *2	Q31	I/O Pwr. Drvr.	BLK-VIO	J6-P7	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89
#F8	FLASH SUPER VUK *1	Q32	I/O Pwr. Drvr.	BLK-GRY	J6-P8	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89

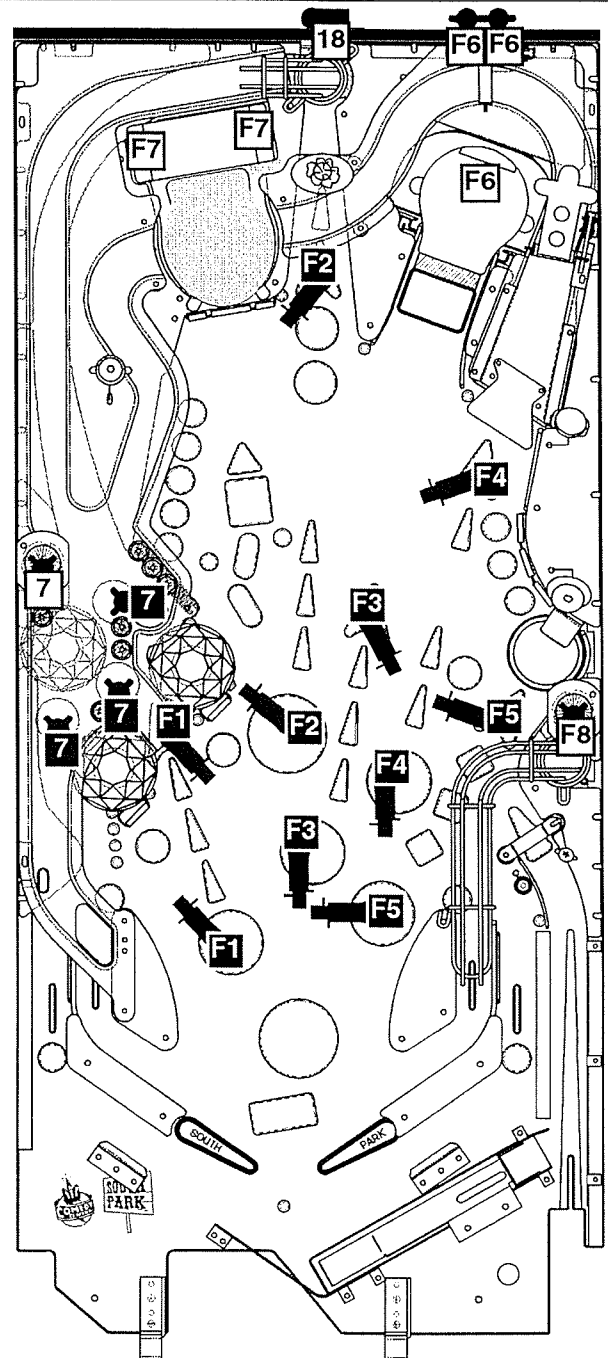
Note: In Test Flash Lamps Menu ("Flash" icon), Flashers tested are Flash Lamps F1-F8 ONLY. Test all others in Single or Cycling Coil Tests.



COIL LOCATIONS

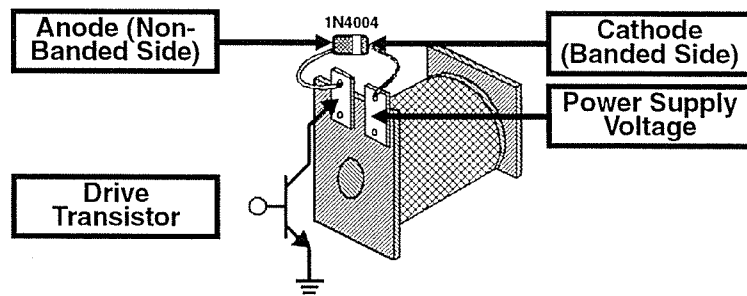


FLASH LAMP LOCATIONS



Legend Note: = Coils/Flashes mounted above playfield. = Coils/Flashes mounted below the playfield.

TYPICAL COIL WIRING



Note:
All Coils require diodes. Some diodes are located on Terminal Strips (under playfield) & not on the coil itself.

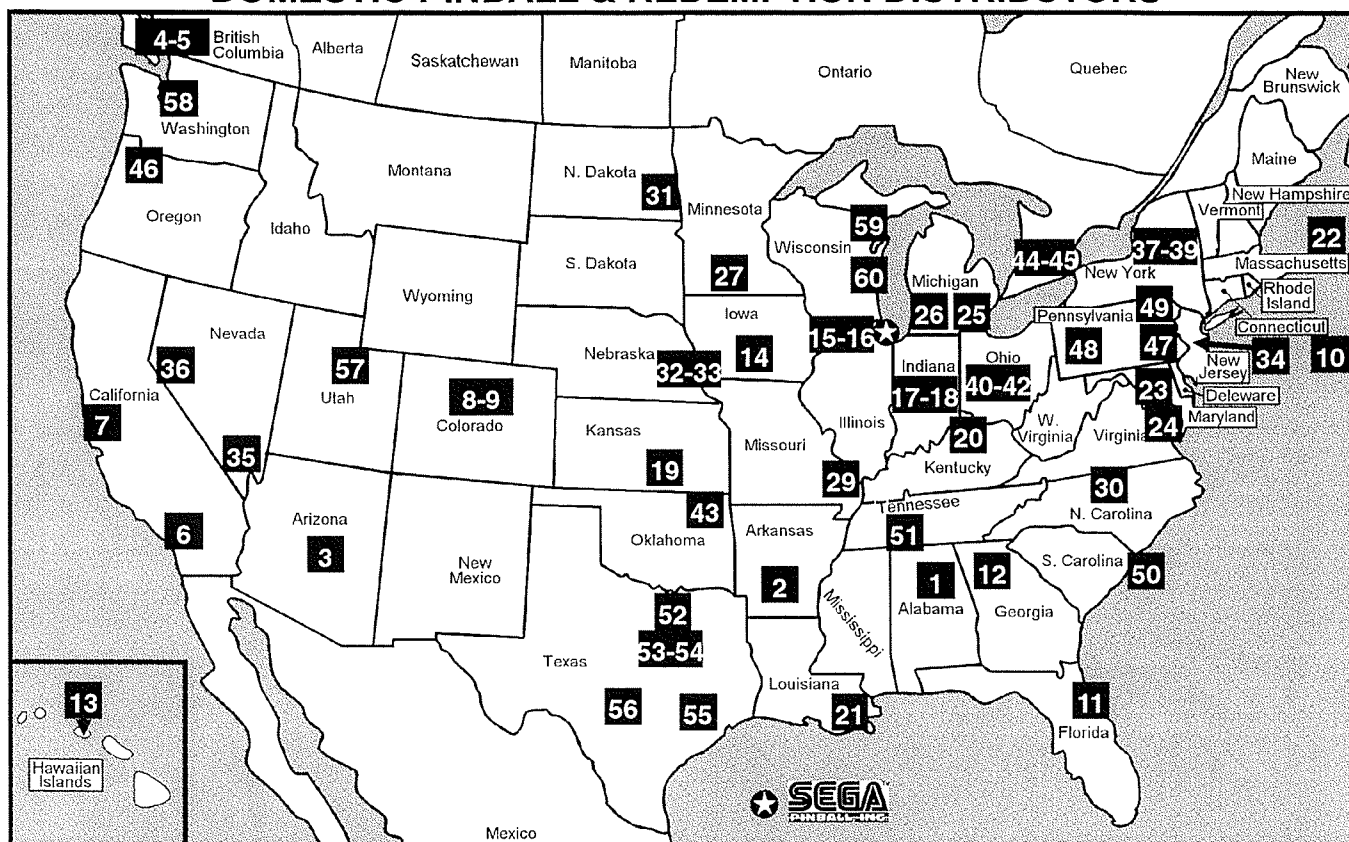
D iode
O n
T ermin
S trip



Find-It-In-Front:
Dr. Pinball



DOMESTIC PINBALL & REDEMPTION DISTRIBUTORS



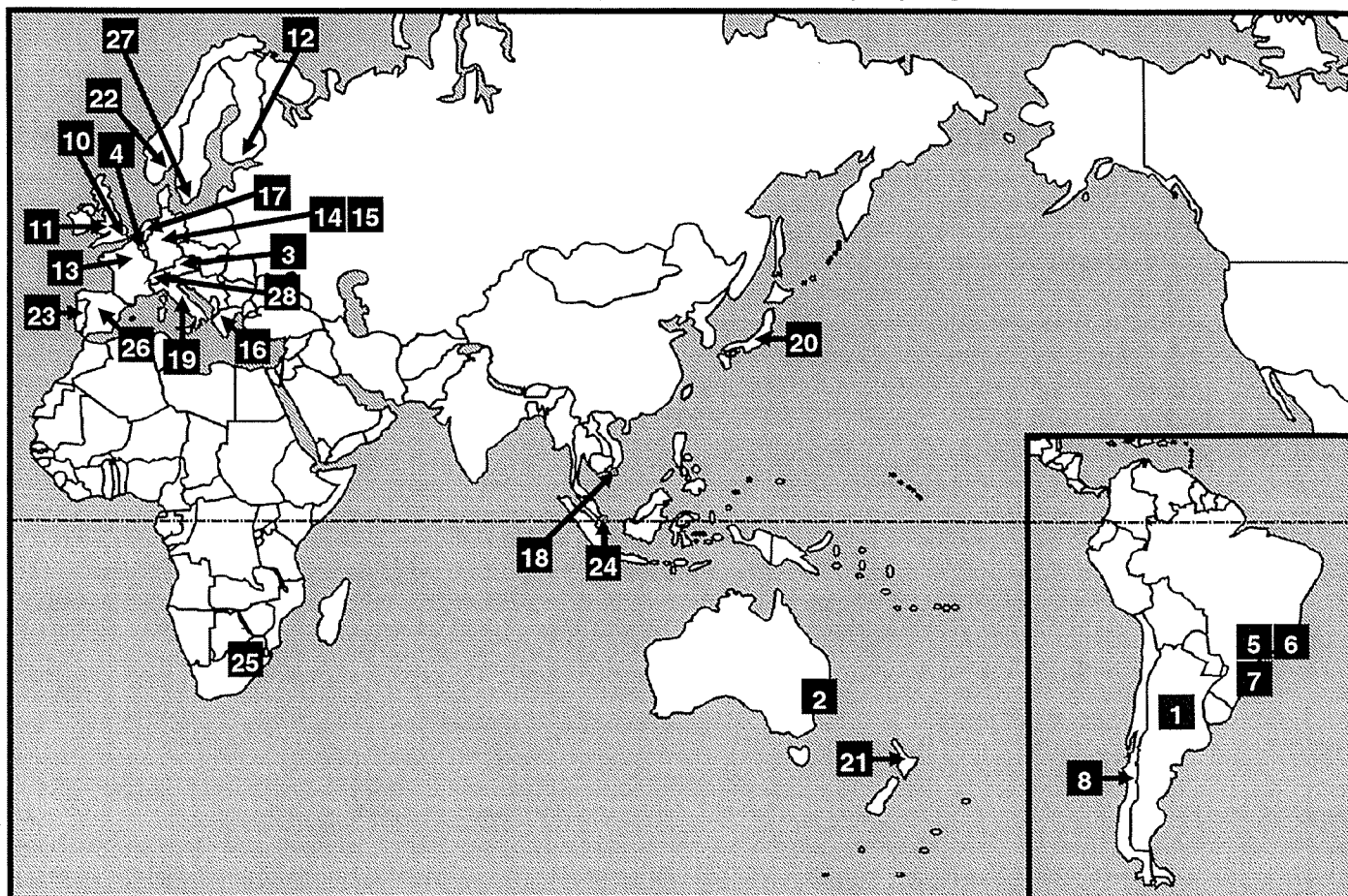
#	STATE/PROVINCE AND CITY	NAME	PHONE	#	STATE/PROVINCE AND CITY	NAME	PHONE
1	AL Birmingham	Birmingham Vending	205-324-7526	31	ND Fargo	M.H. Associates, Inc.	701-282-7877
2	AR N. Little Rock	Godwin Distributing	501-753-1138	32	NE Omaha	Greater American Dist.	402-553-2812
3	AZ Phoenix	Betson West	602-233-0190	33	NE Omaha	Mid-City Dist.	402-341-5300
4	BC Burnaby (Can.)	Can. Coin Machine	604-420-4008	34	NJ Springfield	State Sales & Service	973-467-9700
5	BC Vancouver (Can.)	Pacific Vending	604-324-2164	35	NV Las Vegas	Betson West	702-740-8484
6	CA Buena Park	Betson West	714-228-7500	36	NV Reno	Reno Game Sales	702-829-2080
7	CA S. San Francisco		415-952-4220	37	NY Garden City Park	T & M Distributing	516-747-0034
8	CO Denver	Warehouse of Games	303-893-8652	38	NY Roslyn Heights	Deith Distributing	516-621-1234
9	CO Denver	Mountain Coin	303-427-2133	39	NY Syracuse	T & M Distributing	315-432-1932
10	CT Williamantic	T & M Distributing	860-456-4231	40	OH Cincinnati	Atlas Distributing	513-771-1909
11	FL Orlando	Birmingham Vending	407-425-1505	41	OH Columbus	Shaffer Distributing, Co.	614-421-6800
12	GA Roswell	Game Exchange/SE, Inc.	770-594-0000	42	OH Macedonia		330-467-4850
13	HI Ewa Beach	50th State Coin Op.	808-682-4561	43	OK Tulsa	Galaxy Distributing, Co.	918-835-1166
14	IA Des Moines	Greater American Dist.	515-244-2828	44	ON Rexdale (Can.)	New Way Sales	416-674-8000
15	IL Elk Grove Village	Atlas Distributing	847-952-7500	45	ON Toronto (Can.)	Starburst Coin Machines	416-251-2122
16	IL Bensenville	Namco Cyberainment	630-238-2200	46	OR Portland	American Coin	503-233-7000
17	IN Indianapolis	Atlas Distributing	317-786-6892	47	PA Bensalem	State Sales & Service	215-638-1122
18	IN Indianapolis	Shaffer Distributing, Co.	317-899-2530	48	PA Pittsburgh	Green Coin	412-881-8804
19	KS Wichita	United Distributors, Inc.	316-263-6181	49	PA Wilkes-Barre	Superior	717-824-9994
20	KY Louisville	Atlas Distributing	502-966-5266	50	SC Myrtle Beach	Green Coin	803-629-1900
21	LA Metairie	AMA Distributors, Inc.	504-835-3232	51	TN Memphis	Green G.A.M.E.S.	901-353-1000
22	MA E. Long Meadow	Gekay Sales	413-525-2700	52	TX Carrollton	Nickels & Dimes	972-492-3262
23	MD Baltimore	Automated Services	410-646-4100	53	TX Corsicana	Master Sales	903-874-4740
24	MD Baltimore	Weiner Distributing	410-525-2600	54	TX Dallas	Commercial Music	214-741-6381
25	MI Redford	Atlas Distributing	313-794-4880	55	TX Houston	H.A. Franz, & Co.	713-523-7366
26	MI Wyoming	Atlas Distributing	616-241-1472	56	TX San Antonio		210-226-6322
27	MN Bloomington	Hanson Distributing	612-884-6604	57	UT Salt Lake City	Struve Distributing	801-328-1636
28				58	WA Seattle	American Coin	206-764-9020
29	MO St. Louis	Shaffer Distributing, Co.	314-645-3393	59	WI Green Bay	Pioneer Sales & Svc.	920-468-5200
30	NC Archdal	Operators Distributing	910-884-5714	60	WI Menomonee Falls	Pioneer Sales & Svc.	414-781-1420



For Parts and Service, call your local distributor. The numbered locations are general areas. View table and map for corresponding numbered distributor. If your state/province does not have a distributor, call the nearest state/province. Distributors and phone numbers are subject to change. Call Sega Pinball, Inc. Technical Support with any questions or if your distributor cannot help you, at 1-800-542-5377 (USA or Canada or elsewhere at 1-708-345-7700).



INTERNATIONAL DISTRIBUTORS



#	COUNTRY AND CITY	NAME	PHONE (-011)	#	COUNTRY AND CITY	NAME	PHONE (-011)
1	Argentina, Urquiza	Florencia	54-232-5532	15	Germany, Hannover	Bally Wulff	49-511-358-5343
2	Australia, Matraville	Amusement Mach. Dist.	61-29-316-6000	16	Greece, Athens	Greece Coin	30-1-554-1608
3	Austria, Grazerstrasse	Rupp Austria	43-34-528-6105	17	Holland, 's-Hertogenbosch	Érrel Industries	31-73-645-6111
4	Belgium, Brussels	Splin S.A.	32-43-62-7677	18	Hong Kong, Kwai Fong	Bondeal Limited	85-2-487-9089
5	Brazil, Sao Paulo	Parkland	55-11-792-42864	19	Italy (RSM), Serravalle	Technoplay Sa	39-54-990-0361
6		Unimax	55-11-533-5615	20	Japan, Tokyo	Data East, Corp.	81-35-370-0708
7		Universe	55-11-575-0731	21	New Zealand, Auckland	Amco Machine Supp.	64-9-846-7606
8	Chile, Santiago	Cuinsa	56-2-696-0167	22	Norway, Oslo	Vendcomatic	47-2-216-0830
9		Universe Electronics	56-2-235-7822	23	Portugal, Amadora	Jacinto & Martins	35-11-495-1868
10	England, London	Electrocoin	44-181-965-2055	24	Singapore, Singapore	Valibel Technologies	65-748-8404
11	So. Wales, Cardiff	Electrocoin	44-22-261-5100	25	South Africa, Lalucia	Unimac	27-3-152-5544
12	Finland, Espoo	Pelika Ray Oy	35-8-943-7091	26	Spain, Madrid	Sente S.A.	34-1-541-7112
13	France, Aubervilliers	PLF Sa	33-14-811-3131	27	Sweden, Malmo	Truemax AB	46-40-153-635
14	Germany, Berlin	Bally Wulff	49-3-062-0020	28	Switzerland, Harkingen	Novomat Ag	41-62-398-4061



For Parts and Service, call your local distributor. The numbered locations are general areas. View table and map for corresponding numbered distributor. If your country does not have a distributor, call the nearest country. Distributors and phone numbers are subject to change. Call Sega Pinball, Inc. Technical Support with any questions or if your distributor cannot help you, at 1-708-345-7700.



Dr. Pinball
Find-It-In-Front:



DR. ⑨

POWER REQUIREMENTS



This game **must be connected to a properly grounded outlet to reduce shock hazard** & insure proper game operation. See Sec. 5, Schematics & Troubleshooting, Chp. 3, Cabinet Wiring (Transformer Power Wiring), for transformer connections required for **Normal, High, and Low Line** conditions.



Normal Line:		110v AC - 125v AC @ 60Hz	
Domestic uses an 8AMP 250v Slo-Blo Fuse.	AVG OPERATION	MAX OPERATION	
	CURRENT: 2.8AMP WATTAGE: 329w	CURRENT: 8AMP WATTAGE: 940w	
High Line:		218v AC - 240v AC @ 50Hz	
Export uses 5AMP 250v Slo-Blo Fuses. (*England & Hong Kong use an 8AMP 250v S/B Fuse.)	AVG OPERATION	MAX OPERATION	
	CURRENT: 1.8AMP WATTAGE: 412w	CURRENT: 5AMP WATTAGE: 1145w	8AMP* 1832w* <small>England & Hong Kong use an 8A.F.</small>
Low Line:		95v AC - 108v AC @ 50Hz / 60Hz	
Export Japan Only uses an 8AMP 250v Slo-Blo Fuse.	AVG OPERATION	MAX OPERATION	
	CURRENT: 2.6AMP WATTAGE: 264w	CURRENT: 8AMP WATTAGE: 812w	

BEFORE TRANSPORTING



Remove the legs & secure the game within the transporting vehicle. **Save and retain all printed information on the game.**

TRANSPORTATION

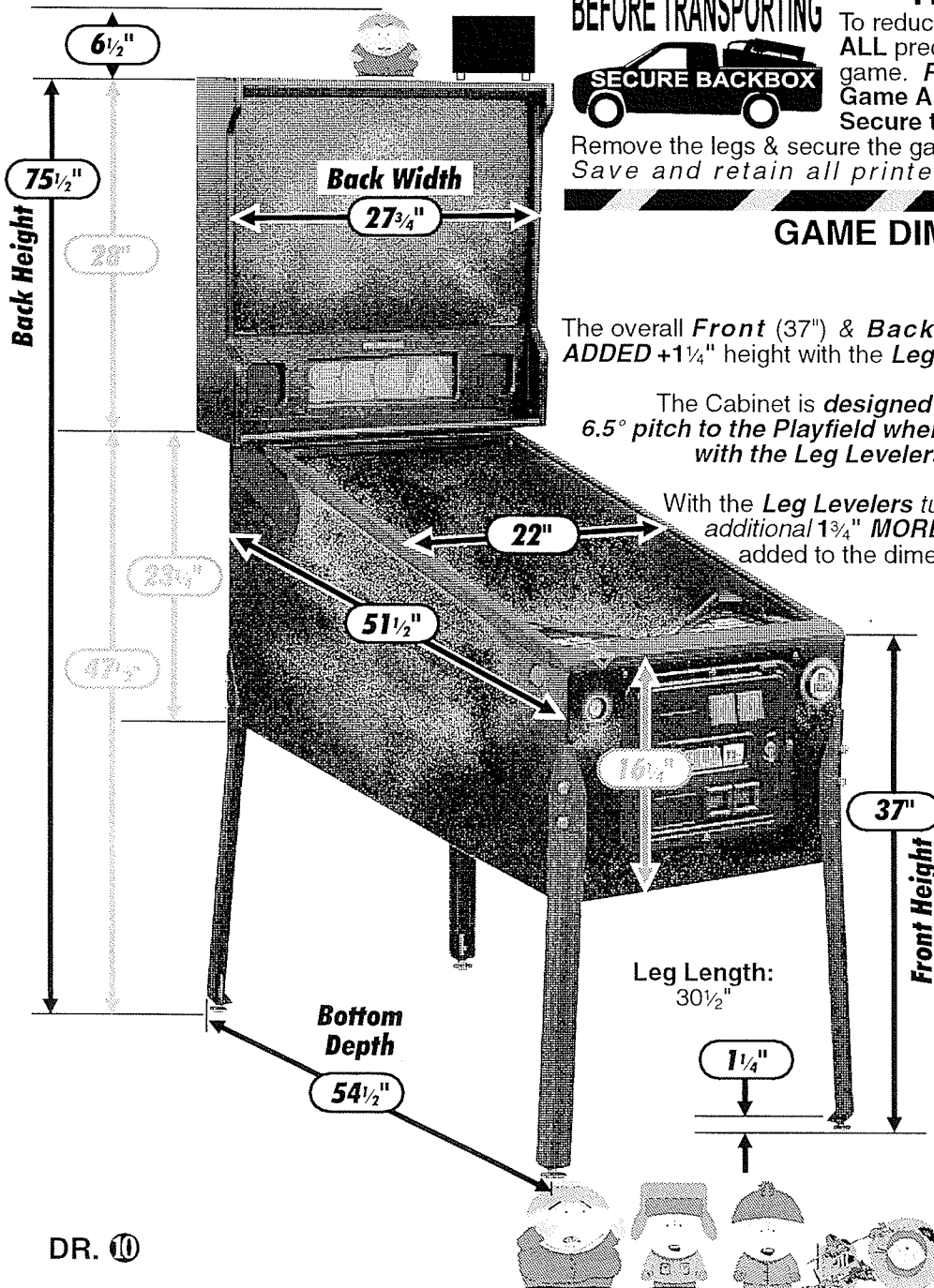
To reduce the possibility of damage, observe **ALL** precautions whenever transporting the game. **Read & follow Section 1, Chapter 1, Game Assembly Procedures, & How to Secure the Backbox for Transporting.**

GAME DIMENSIONS

The overall **Front** (37") & **Back** (75½") dimensions reflect the **ADDED +1¼"** height with the **Leg Levelers** turned all the way in;

The Cabinet is **designed** to give the recommended **6.5° pitch to the Playfield** when all four (4) **Legs** are installed with the **Leg Levelers** turned all the way in.

With the **Leg Levelers** turned all the way out, an additional **1¼" MORE** to the overall height should be added to the dimensions.



Shipping Box Dimensions

Height: 55½"

Width: 30½"

Depth: 31"

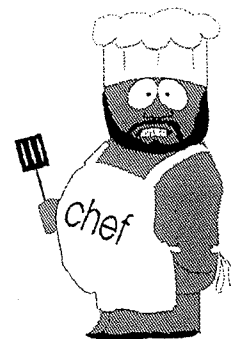
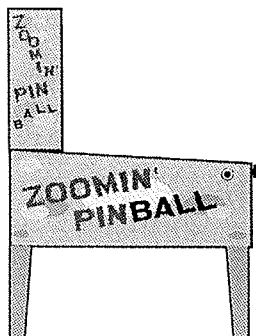
Weight: 250lbs. (+/- 3)

CAUTION



At least 2 people are required to move and maneuver this game. Use proper moving equipment & extreme care while handling!





General Table of Contents

See Sections 3 & 5, Table Of Contents, for details of that Section and it's Chapters.

WOW! Look what's new at Sega Pinball! Inside Front

* Backbox Layout Locations: Fuses, Bridges, Relays & ROMs.....	DR. ①
* Find-It-In-Front: Dr. Pinball Section Explained.....	DR. ②
* Install 5-Balls * Diagnostic Aides * CPU DIP Switch Settings * ROM Summary Table.....	DR. ③
* Switch Matrix Grid & Dedicated Switches * Lamp Matrix Grid.....	DR. ④
* Switch & Lamp Matrix Grid Locations * Typical Switch, Dedicated Switch & Lamp Schematics.....	DR. ⑤
* Coils Detailed Chart Table.....	DR. ⑥
* Coil & Flash Lamp Locations * Typical Coil Wiring.....	DR. ⑦
* Domestic Pinball & Redemption Distributors	DR. ⑧
* International Distributors.....	DR. ⑨
* Power Requirements * Transportation * Game Dimensions.....	DR. ⑩

Game Manual General Table of Contents i-ii

SECTION 1 1-2

Chapter 1, Game Set-Up.....	1
Game Assembly Procedures.....	1
* How to Secure the Backbox for Transporting * Leg Leveler Adjustment * Easy Access Service System - 3 Positions.....	2

SECTION 2 3-4

Chapter 1, Game Operation & Features.....	3
* Start of Game Features * During Game Features * End of Game Features	3-4
* Instruction Card	4

SECTION 3 5-46

Chapter 1, Portals™ Service Menu Introduction.....	5
Portals™ Service Menu Table of Contents (View for an outline of this section)	5
* Portals™ Service Menu Access & Use * How to Use This Section.....	6-7
* Portals™ Service Menu Icon Tree.....	8-9
* Portals™ Service Menu Example.....	10-11
Chapter 2, Go To Diagnostics Menu	12-25
Chapter 3, Go To Audits Menu.....	26-31
Chapter 4, Go To Adjustments Menu.....	32-40
Chapter 5, Go To Reset Menu	41-42
Chapter 6, Go To Fuses List	43-44
Chapter 7, Go To Help Screen	45-46

General Table of Contents Continued on the Next Page



January 1999



SECTION 4 47-78

Chapter 1, Parts Identification & Location (The Pink Pages)	47
Overview	47
Backbox (Showcase II) Assembly	48
Speaker Panel Assy. for the Backbox (Showcase II) & Associated Parts	49
Cabinet - General Parts	50
Cabinet & Playfield - Switches	51
Playfield - General Parts (Below) & Playfield - General Parts (Above)	52-53
Playfield - Rubber Parts (Rings Actual Size)	54
Playfield - Plastic (Butyrate), Decals and Mylar	55
Playfield - Rails and Ball Guides	56
Playfield - Metal Posts and Nuts (Actual Size)	57
Playfield - Metal Spacers (Actual Size)	58
Playfield - Plastic Posts and Spacers (Actual Size)	59
Playfield - Small Bayonet Type Bulbs and Sockets (Actual Size)	60
Playfield - Large Bayonet Type Bulb and Sockets (Actual Size)	61
Playfield - Wedge Base Bulbs and Sockets (Actual Size)	62
Chapter 2, Drawings for Major Assemblies & Ramps (The Blue Pages)	63
Overview	63
Ball Shooter (Plunger) Assembly, 500-6146-00-04	(Top) 64
Autoplunger Coil Assy., 500-6092-02 and Arm Weld Assy., 500-6091-00	(Bot) 64
5-Ball Trough Assembly, 500-6318-25 and A.P.: Ball Trough Enter/Exit Scoop	65
Flipper (Left) Assembly, 500-5944-14 and A.P.: Yellow Flipper Bat & Shaft Assy.	66
Flipper (Right) Assembly, 500-5944-04 and A.P.: Yellow Flipper Bat & Shaft Assy.	67
Turbo (Pop) Bumper Top Assy., 515-6459-01 (Qty. 3) and A.P.: Red Pop Cap (Qty. 3)	68
Turbo (Pop) Bumper Switch Assy., 515-6459-03 (Qty. 3)	68
Turbo (Pop) Bumper Bottom Assy., 515-6459-04 (Qty. 3)	68
Left & Right Slingshot Assemblies, 500-5849-00 (Qty. 2)	(Top) 69
VUK (Right Style) Assembly, 500-6290-01	(Bot) 69
Toilet & Frame Assembly, 500-6360-00-71	70-71
Toilet Lid Coil Assembly, 500-6392-00-71	70-71
Mr. Hankey & Tank Lid Lift Coil Assembly, 500-6391-00-71	70-71
Kenny Assembly, 500-6358-00-71	72-73
Super VUK Assembly, 500-6184-04-71	74
Under-Trough Assembly, 500-6385-00-71	(Top) 75
OPTO Assembly, 500-6242-02-71	(Bot) 75
Left Ramp Assembly, 500-6389-00-71	76
Right Ramp Assembly, 500-6383-00-71	77
UK ONLY OPTIONAL: Left & Right Outlane Ball Deflector Assemblies, 500-5788-03 (Qty. 2)	(Top) 78
UK ONLY OPTIONAL: Up/Down Post Assembly, 500-6293-00	(Bot) 78

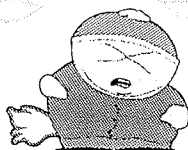
SECTION 5 79-110

➤ <i>Schematics & Troubleshooting Table of Contents (outline of this section)</i>	79
Chapter 1, Backbox Wiring (The Yellow Pages)	81-82
Chapter 2, Playfield Wiring (The Yellow Pages)	83-86
Chapter 3, Cabinet Wiring (The Yellow Pages)	87-88
Chapter 4, Printed Circuit Boards (PCBs) (The Yellow Pages)	89-110

APPENDIXES A-I 111-126

Appendixes A-I Table of Contents (outline of this section)	111
Appendixes A-I	112-124
Plastic Part Color Chart	(Bottom) 123 + (Top) 124
Glossary of Terms	125
Parts Order Checklist Notes	126

Limited Warranty, Cautions, Warnings & Notices Inside Back



Game Set-Up


Game Assembly Procedures

(Reference Find-It-In-Front: Dr. Pinball)

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. **CAUTION: At least 2 people are required to move and maneuver game. Use proper moving equipment & extreme care while handling. Pinball game is 250 lbs.+. Refer to DR. 10 for Power Requirements, Transportation and Game Dimensions.**
2. Remove all packing material. The four (4) Cabinet Leg Assemblies (Leg Levelers are attached) are in the corner packing material of the crate. A large Allen Wrench (use for securing the backbox) is inserted and taped to the rear of the cabinet. Leg Bolts, Steel Balls and any miscellaneous parts are in the cash box.
3. Support rear of cabinet and attach rear legs using two leg bolts for each leg. Support front of cabinet and attach front legs using two leg bolts for each leg.
4. 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° (¾ turn).
5. Remove the Coin Door Keys from the playfield glass, and open the Coin Door. Remove the Backbox Keys hanging inside the Coin Door, unlock the Backbox and open.
6. 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/Sound Board, I/O Power Driver Board, and the Display Power Bd. to check that they are properly seated. Ensure Fluorescent Light Tube is seated correctly. Check that all fuses are seated properly. Close and lock the Backbox and secure its' keys back inside the Coin Door.
7. Remove the Front Molding & carefully remove the playfield glass and set it aside.
8. Remove all shipping tie downs, shipping blocks, packing foam, shipping instruction pages, etc. (if any) inside the cabinet. **READ ALL PRINTED INFORMATION!** Shipping instructions, labels and/or decals describe warnings, cautions, and/or important information specific to the game.
9. Raise the playfield and support it, by lifting the Prop Rod (located either on the left or right side, inside the cabinet) and placing the notched end into the hole on the under playfield. See the illustration "Easy Access Service System" opposite this page.
10. Visually inspect all cabinet cables and connector terminations; ensure no wires or cables are pinched and that cable harnesses are not pulled tight.
11. Remove the Plumb Bob tilt from the parts package and install on the pendulum wire on the inside left of the cabinet. Check the plumb tilt and adjust as required. See Section 4, Chapter 1, Parts Identification & Location.
12. Lower the playfield and ensure game is level side-to-side by adjusting Leg Levelers, if required. See the illustration "Leg Leveler Adjustment" opposite this page.
13. With the Leg Levelers turned all the way in (1.25" from floor to bottom of leg), the game pitch is 6.5°; depending on the condition of the floor, adjust the Leg Levelers as required.

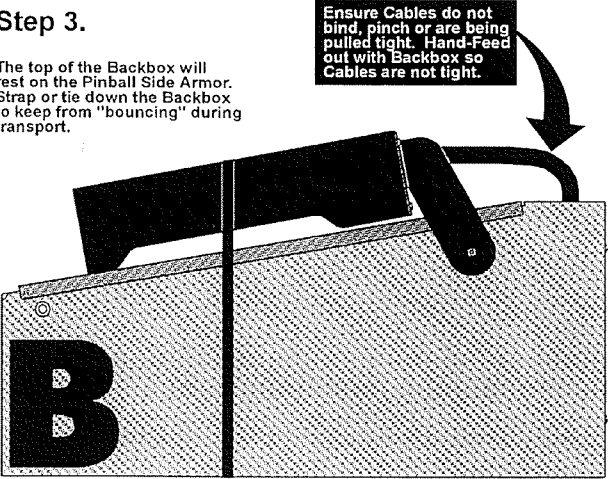
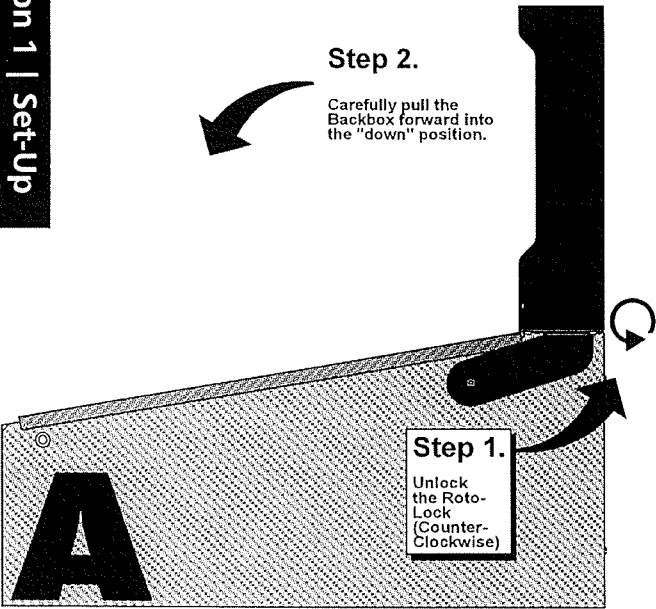
The playfield incline affects difficulty of play. Use the recommended incline; Game difficulty is best varied using game adjustments.

14. If desired, perform any self tests at this time. See Section 3, Chapter 1, Portals™ Service Menu Introduction, and Chapter 2, Go To Diagnostics Menu, for instructions on how to enter "Begin Play Test" and "Game Specific" to test components on the game.
15. **INSTALL 5 BALLS** on the playfield near the outhole and carefully reinstall the playfield glass. (Amount of balls are always specified on decal attached to the lock down assembly.)
16. If desired, make Game Pricing (Standard and/or Custom) and Add-A-Ball, Novelty, or X-Ball Play adjustments at this time. See Section 3, Chapter 4, Go To Adjustments Menu, for instructions on how to enter adjustments. Follow instructions in the tables provided in the manual for suggestions of customizing changes.

➡ Per  "The appliance has to be placed in a horizontal position."
 "This appliance is not to be cleaned by a Water Jet."



How to Secure the Backbox for Transporting



See Section 4, Chapter 1, Backbox (Back Side/ Front Side) Assemblies, for part numbers.

Leg Leveler Adjustment

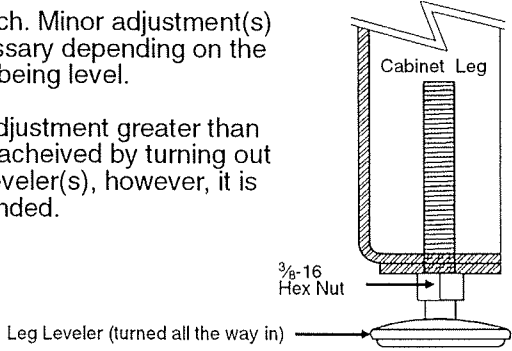
This cabinet is designed to automatically have a 6.5° pitch without any Leg Leveler adjustment!

Attach the four (4) Leg Assemblies to cabinet corners with the eight (8) leg bolts provided. See Section 4, Chapter 1, Cabinet - General Parts, for part numbers.

YOUR PLAYFIELD PITCH IS NOW AT 6.5° AS REQUIRED FOR PROPER GAME PLAY!

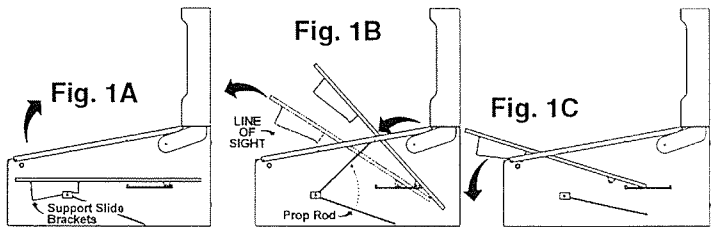
Verify 6.5° pitch. Minor adjustment(s) may be necessary depending on the location floor being level.

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

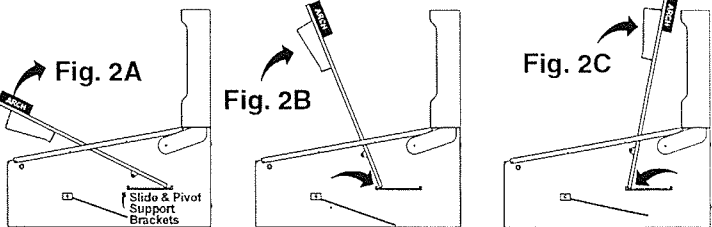


Easy Access Service System - 3 Positions

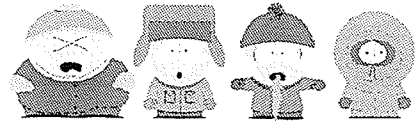
Carefully lift the playfield *using the Left and Right Ball Guides* upward.



Positions 1 & 2
When lifted high enough, the **Playfield Support Slide Brackets** (Fig. 1A) can be seen & can clear the cabinet front. At this time, pull the playfield toward the front of the cabinet, checking that the mechanical components clear the cabinet front, then rest the playfield on the **Playfield Support Slide Brackets** at the front channel of cabinet (Fig. 1C); Or, the **Prop Rod** (located on the right inside of cabinet) can be used by positioning the **Prop Rod** end into the receiving playfield hole (Fig. 1B).



Position 3
With the playfield at rest, hold the sides & pull toward the front of the cabinet (approx. 6" to 8"), until resistance is felt from **Edge Slide Brackets** stopping against the **Slide & Pivot Support Brackets** located on either side of the cabinet (Fig. 2A). At this time, *swivel the playfield* toward the Backbox, then rest on the top edge (Fig. 2B & 2C).



Game Operation & Features

Start of Game Features

Starting a Normal Game

Insert coin(s). The game generates a sound for the first coin & for each subsequent coin with the display indicating the number of credits posted. Press the **START BUTTON** and a start-up sound is produced, and the posted credits are reduced by one. Subsequent players can be added (**up to 6 can play!**) by pressing the **START BUTTON** before the end of ball 1 (with sufficient credit in the game).

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*. An introduction is shown followed by Skill Shot Graphics and/or instructions. Pressing the **START BUTTON** after ball 1 of any player will start a new game (if credits are available), **but only** if the **START 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.)

Starting Team Play (Doubles!)

Team Play is a four player game. The totals for players 1 & 3 (Team 1) and players 2 & 4 (Team 2) are displayed individually as well as the combined score for both teams. Team Play only works in a 4-Player game. In all other cases, the individual scores are shown.

Starting League/Tournament Play

After credit is posted, while holding in the **LEFT FLIPPER BUTTON**, press the **START BUTTON**. League Play has now begun. The differences between Normal Game Play and League/Tournament Play are: There is no "auto-percentaging" (awarding extra balls, specials, etc. to players with very low scores on the second or third ball). Mystery Features are awarded in a set order rather than random in Normal Game Play. Percentage Game Features are not automatically advanced as they are for the Regular Play Features.

Starting Pinball Wizard Play

After credit is posted, while holding in the **RIGHT FLIPPER BUTTON**, press the **START BUTTON**. Pinball Wizard Play has now begun. The same as League/Tournament Play, but ooooooh! so much gosh darn harder!

During Game Features

Feature Mode & Combination Shots

Features are lit on the playfield and started by completing certain play shots (e.g. completion of target banks, orbit(s), ramp(s) and/or any combination of the shots). Combination shots (combos) are a series of shots completed in many different variations. For example, a shot to the Ramp with the ball being returned to the Left Inlane then immediately shot to the Orbit of the playfield returning to a Flipper and then shot to another Ramp would be a hard combo shot worthy of many points. These combinations vary per game. For feature modes & combos certain points or awards are given after completion.

Multiball

Multiball is started after completion of certain Feature Modes or may be a mode itself depending on game Modes/play. Multiball may vary with the amount of balls used in Multiball depending on game style. Typically, if Multiball play was short, a "restart" option is given. Watch the Display for instructions on the restart.

Replay Feature

Replay awards are given as the player exceeds a High Score Level during game play. This can be adjusted with Adjustment 3, Replay Awards (Default=**CREDIT**, adjustable). Players exceeding the High Score Levels can receive: **CREDIT**, **EXTRA BALL**, or **SPECIAL**. Adjust to **NONE** if a replay award is not desired.

Video Mode

The video modes **may** require the player to "play on-screen". The interactive video play **may** require the player to use the flipper buttons to play the mode.

End of Game Features

Game Endings

When all player(s) have played all balls (including any Extra Balls), the game ends. If power is interrupted during the course of a game, it will end that game (**see Starting a Normal Game**). Closure of the Plumb Bob Tilt Switch according to the number of tilts set (Default = 2, adjustable) or its prolonged closure will end the current Ball-In-Play. Closure of the Slam Tilt Switch on the coin door ends the current game(s).

Match Feature

At the end of each ball, earned bonuses are collected. At the end of the last ball of a game (including any extra balls, if applicable), earned bonuses are collected, then the system produces a random 2-digit number (a multiple of 10; 00 to 90). Matching the last 2 digits of the player's score with this number awards a credit. In Adj. 11, Match Percentage (Default=7%, adjustable) can be changed from 0-10%. Changing the percentage to 0% displays the "Match Animation" at the end of the game, however, will never match (to award a credit). Changing this adjustment to **OFF** will not display the "Match Animation" nor award a credit.

Continued Next Page.



End of Game Features Continued

Entering Initials

If player achieved a new high score in any of the 3 categories (Regular, Novice or Wizard), the player may enter his/her initials. To enter your initials, use the Left & Right Flipper Buttons to choose letter or character as seen on the Dot Display. Hitting the Start Button locks in the letter or character and proceeds to the next letter. The game then proceeds into the *Game-Over Mode* and then to the *Attract Mode*. (Note: A custom message (adjustable) can be displayed during the *Attract Mode*; enter letters in the same fashion.)

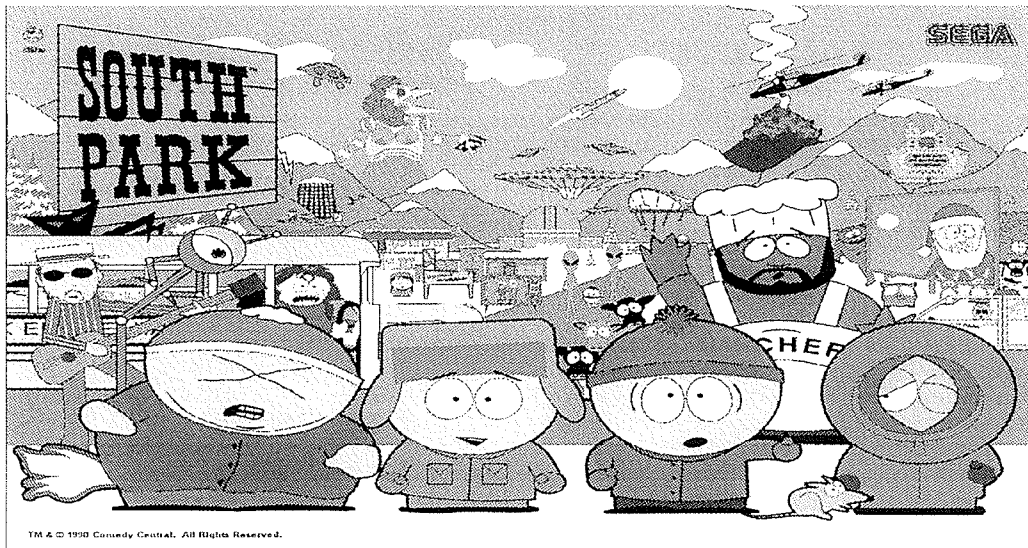
Manual Percentaging

This game is equipped with a Manual Percentage Adjustment. As with our previous games, you can either set operator adjustments for a replay percent or you can set a fixed replay score. See Section 3, Chapter 4, Go To Adjustments Menu, Adjustments 1 & 2. 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 if the replay is too high or low and make a sound to alert the operator. By pressing the Start Button, the score to beat will be changed to a more appropriate level. If you close the Coin Door or enter the **Portals™ Service Menu**, 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. 2, Replay Levels.

Instruction Card

Below is a **COPY** of the game instruction card which is included with every game. If your card is lost or damaged, simply **COPY** this page and **cut out** the Instruction Card as a *temporary replacement* until a *new card* is ordered. (**Suggestion:** **COPY & CUT** along the dotted line and fold in the center to keep the "COPY" sturdy.)

COPY &
CUT



FOLD
HERE

SKILL SHOT Collect **Flashing Light** on the side **Targets** for points. Use **Flippers** to *change lights*.

MULTIBALL Shoot **Targets** below **Toilet** until completed. Then *shoot Ramp* to begin **Multiball**.

FEATURES Shoot a **Character** the *indicated number of times* to **START Feature**:

- ★ **STAN** Shoot **STAN** to collect **Jackpots**. Collect indicated **Jackpots** to "Complete."
- ★ **CHEF** Shoot **Flashing Shots** to collect awards. Complete all **Flashing Shots** to "Complete."
- ★ **KYLE** Shoot **Ramp** to "Complete."
- ★ **KENNY** Shoot **KENNY** to collect award and "Complete."
- ★ **CARTMAN** Shoot **CARTMAN** to collect award. Collect indicated awards to "Complete."

Note: *If the face of a character is lit solid, then he has been completed.*

If the face of a character is flashing, then he has been "Played but not completed."

SPOOKY VISION Playing all character's features, lights **CHEF Shot** for **SPOOKY VISION**. During **Spooky Vision**, completing all shots increases **Jackpot**.

VOLCANO Completing all character's features, lights **CHEF Shot** for **VOLCANO**. During **Volcano**, complete all characters (each shot three (3) times) to receive **WIZARD AWARD**.

EXTRA BALL **Mystery** or **Consolation** may light **Extra Ball**.

SPECIAL **Consolation** or **Features** may light **Special**.

Note to Beginners: To score better, shoot at the ((**FLASHING SHOTS**)) !!
Be sure to **LOOK UP** at the Dot Display for instructions when possible.








Sega Pinball, Inc. TM & © 1998 South Park, Comedy Central TM & © 1998. All Rights Reserved.

Sega Part N° 755-5171-00



Portals™ Service Menu Introduction

Section 3 Table of Contents

Chapter 1, • INTRODUCTION	5
 Service Switch Set Access & Use / How to Use This Section.....	6-7
Portals™ Service Menu Icon Tree	8-9
Portals™ Service Menu Example and Exiting the Portals™ Service Menu.....	10-12
Chapter 2, • GO TO DIAGNOSTICS MENU.....	13
 •• Go To Switch Menu	14
••• Switch Test / Active Switch Test / Dedicated Switch Test	14
✕ Switch Matrix Grid & Dedicated Switches	14
✕ Switch Matrix Grid Descriptions with Part Numbers and Locations.....	15
•• Go To Coil Menu	16
••• Single Coil Test / Cycling Coil Test	16
✕ Coil & Flash Lamp Descriptions	16
✕ Coil & Flash Lamp Locations	17
✕ Coils Detailed Chart Table	18
✕ Backbox I/O Power Driver Board Detailed Wiring Diagram.....	19
•• Go To Lamp Menu	20
••• Single Lamp Test / Test All Lamps / Row & Column Lamp Tests	20
✕ Lamp Matrix Grid	20
✕ Lamp Matrix Grid Locations.....	21
•• Test Flash Lamps	22
•• Clear Ball Trough	22
•• Technician Alert.....	22
•• Service Phone #.....	22
•• Begin Play Test.....	22
•• Fire Knocker	22
•• Sound / Speaker Test.....	22
✕ Speaker Phase Testing.....	23
•• Begin Burn In.....	23
•• Dot Matrix Test & Dot Matrix Display Explained.....	23
•• South Park Specific (Mr. Hankey Test).....	24
•• Dr. Pinball (Flow Chart Menus: Coil, Switch & Lamp).....	25
Chapter 3, • GO TO AUDITS MENU	27
 ✕ Game Audit Table	26
•• Earnings Audits (Audits 1-12).....	27
•• Sega Audits (Audits 13-55).....	28-29
•• South Park Audits (Audits 56-99).....	29-31
•• Go To Printer Menu	31
••• ...Printer Interface, ...Alison Interface, ...Nº of Copies Printed (Adjustments).....	31
Chapter 4, • GO TO ADJUSTMENTS MENU.....	33
 ✕ Game Adjustment Table	32
•• Sega Adjustments (Adjustments 1-48).....	33-37
•• South Park Adjustments (Adjustments 49+)	38
•• Custom Message (Direct Access to Adjustment 34).....	40
•• Film Star Reset (Special Factory Reset Settings for the Home Environment).....	40
Chapter 5, • GO TO RESET MENU.....	41
 •• Reset Coin Audits / Reset Game Audits / Factory Reset.....	41
✕ Example.....	42
Chapter 6, • GO TO FUSES LIST	43
 •• Go To Fuses List	43
✕ Example and Backbox Layout Locations: Fuses, Bridges, Relays & ROMs	43-44
Chapter 7, • Go To Help Screen.....	45
 •• Go To Help Screens (Multi-Level)	45
✕ Problem / Solution Table.....	46



Service Switch Set (Red, Green & Black Buttons) Access & Use

Open Coin Door and view Service Switch Set (see figures below). The Memory Protect Switch is now disabled; when changing adjustments, leave the coin door open, so changes can be made. **Important:** The **Playfield Power Interlock Switch** must be pulled out for electro-mechanical device testing (this is required).

① Entering Portals™ Service Menu (will not operate in Volume Mode):

Step 2
Move through the menus by pushing the Red "LEFT" or Green "RIGHT" Buttons.
Note: Pushing the Left or Right Flipper Buttons operates in the same way.

Step 1 (Black Button 1st)
Enter the Portals™ Service Menu by pushing the Black "BEGIN TEST" Button.
Note: Pushing the Start Button operates in the same way.

Step 3
Select or activate icons by pushing the Black "ENTER" Button.
Note: Pushing the Start Button operates in the same way.

IMPORTANT
Ensure the Playfield Power Interlock Switch (Located inside Coin Door Left) is pulled out. **This is required for COIL and FLASH LAMP Testing.**

② Adding Service Credits (will not operate in Service or Volume Modes):

Step 1 (Green Button 1st)
Receive service credits by pushing the Green "SERVICE CREDITS" Button.

This button allows the technician to add Service Credits without adding any counts to the Coin Audits. Up to 30 credits can be applied.

LEFT FLIPPER BUTTON (Move Left) or (Decrease)
START BUTTON (Enter)
RIGHT FLIPPER BUTTON (Move Right) or (Increase)

IMPORTANT NOTE:
Ensure the Playfield Power Interlock Switch is pulled out for all electro-mechanical device testing.

③ Entering the Volume Menu (will not operate in Service Mode):

Step 1 (Red Button 1st)
Enter the Volume Menu by pushing the Red "VOLUME" Button.

Step 2
* Decrease volume by pushing the Red "LEFT" Button.
* Increase volume by pushing the Green "RIGHT" Button.
Note: Pushing the Left or Right Flipper Buttons operates in the same way. Once adjustments are made, this menu will automatically exit in a few seconds.

-Red Button- "Volume" or "Left"
-Green Button- "Service Credits" or "Right"
-Black Button- "Begin Test" or "Enter"

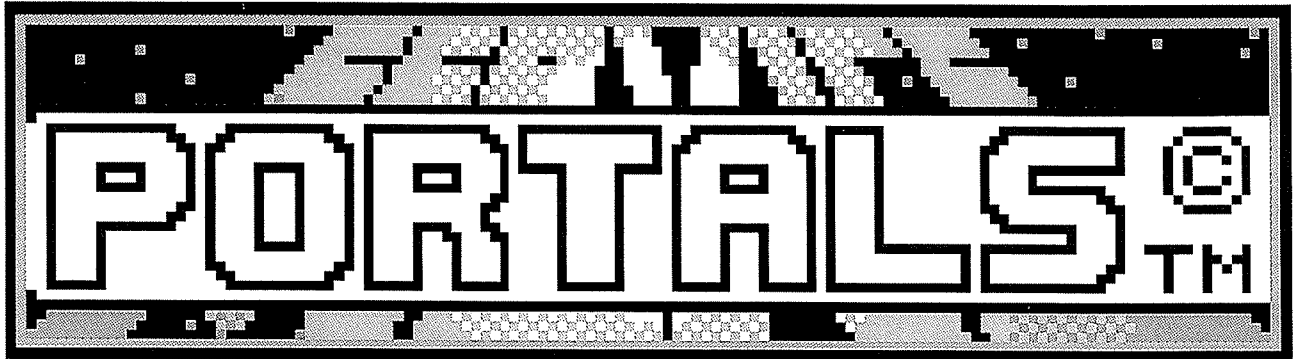


How to Use This Section

This section will cover all functions available in the **Portals™ Service Menu** in a *Step-By-Step* process. This section is divided into chapters which coincide with the **MAIN MENU**. The following pages in this chapter will instruct the operator on how to move through the menus. It's simple, easy and fun to use!

To get into the Service Menu Mode: • Power-up game (if not already) & open the Coin Door. • On the Coin Door is the Service Switch Set (**Red, Green & Black Buttons**). Push down the **Black "BEGIN TEST" Button**.

Looking at the Video Display you will momentarily see the introductory screen "**Service Menu**" with a *satellite flying from right to left pulling a banner "Portals™ ©"* followed by the **MAIN MENU**:

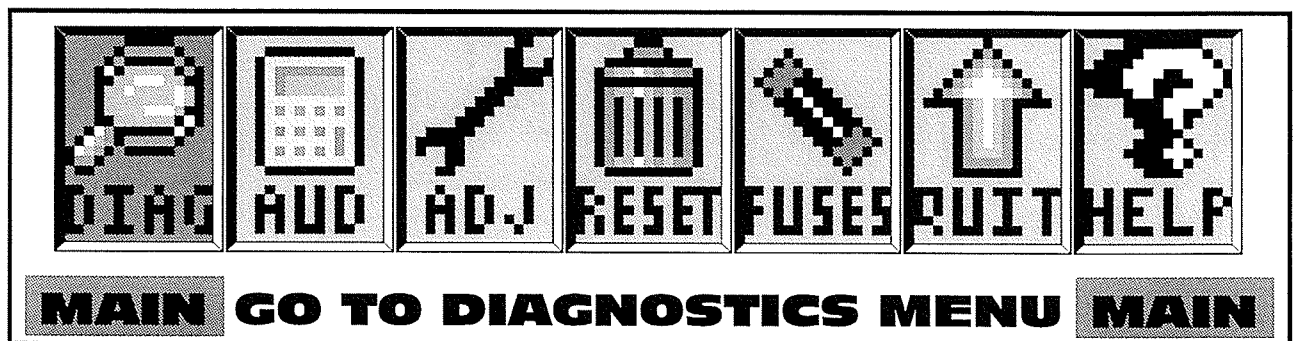




The Coin Door may be closed for security, however, please note with the Coin Door closed, the game's **MEMORY PROTECT** is enabled; *meaning any changes that are made will be not be written to memory*. If changing adjustments is required, ensure the Coin Door is open.

Use the **Red "LEFT" & Green "RIGHT" Buttons** (or **Left & Right Flipper Buttons**) to move the selected **ICON** left or right, and the **Black "ENTER" Button** (or **Start Button**) to activate the selected **ICON**. The use of the Service Switch Set (**Red, Green, & Black Buttons**) *is required* in Switch Test or Active Switch Test, as the **Start & Flipper Buttons** are a part of this test.

For diagnostic purposes, be sure the **Playfield Power Interlock Switch** is pulled out so **Playfield Power** is not disabled.

The **MAIN MENU** now appears with the "**DIAG**" *Icon* (**DIAGNOSTICS MENU**) flashing:

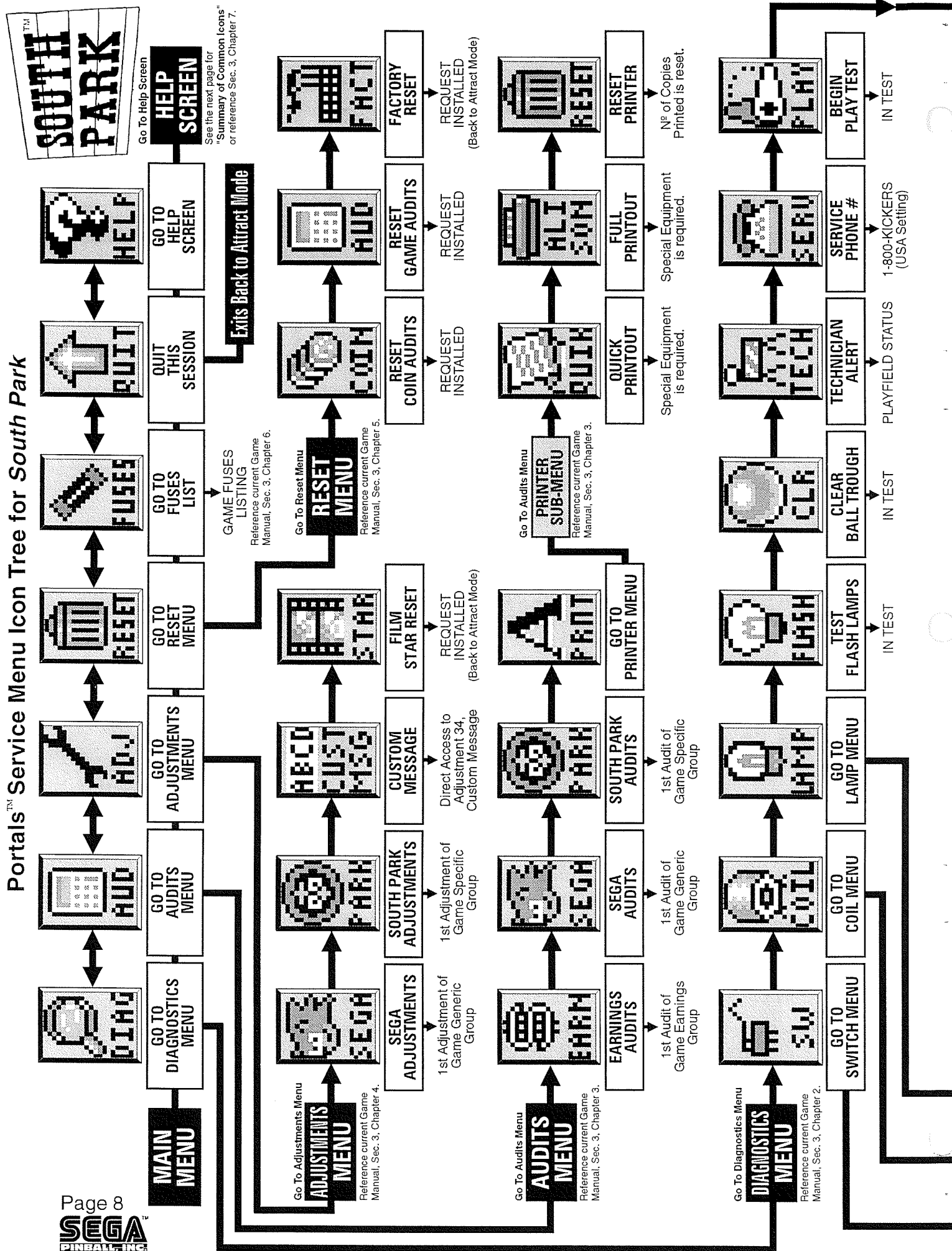


As the operator views the Menu Screen(s), the   symbols indicates that there are more *Icons* to select in each direction. The *Icon* selected will blink. Pushing the **Black "ENTER" Button** (or **Start Button**) will select the *Icon* and the Menu Screen will change to the menu selected. Select the "**PREV**" *Icons* to move backwards through the menu levels. Select the "**QUIT**" *Icon* to completely exit the Service Mode.

View the **Portals™ Service Menu Icon Tree** on the next pages for a complete overview of all menus used in this system. View the last chapter (**HELP**) if more information is required. Selecting the "**QUIT**" *Icon* with the **Red "LEFT"** or **Green "RIGHT" Buttons** (or either **Flipper Button**), then pressing the **Black "ENTER" Button** (or **Start Button**) will exit the Service Mode. This applies to the large and small "**QUIT**" *Icons*.

The **chapters** in this **section**, which coincide with the **MAIN MENU**, will also provide more detailed information which could not fit in the display. Use both the manual and the display to help customize, troubleshoot and/or diagnose faults, if any.

Portals™ Service Menu Icon Tree for South Park



Portals™ Service Menu Example

This example will demonstrate activation of *Icons* in the **DIAGNOSTICS MENU**. The example will show activation of the "SW" *Icon* (GO TO SWITCH MENU). In this menu, the switches can be tested individually and also all active switches can be tested. Use the same technique to access all the *Icons* in the **Portals™ Service Menu**. Follow **Portals™ Service Menu Icon Tree** on the previous pages as a guide to help navigate through the entire system (Also, go to the chapter in this manual explaining the icon(s) selected.).

If the display is in any other menu other than the **MAIN MENU**, use the Red "LEFT" & Green "RIGHT" Buttons to select the "PREV" *Icon* and press the Black "ENTER" Button to activate the **ICON** thus moving back to the previous menu. Do so until **MAIN MENU** appears.

Chapters 2 through 7 will cover all menu items within the **Portals™ Service Menu**. The *Icon* is shown preceding the text. Find the *Icon* in the **Portals™ Service Menu** by navigating with the Red or Green Buttons. Each chapter started is from the **MAIN MENU**. Within the chapter, the sub-menu's will be covered sequentially with their explanation & function. If the operator "gets lost", select and activate the "PREV" *Icon* until the display indicates **MAIN MENU**. For more help, see Chapter 7.



The "MORE" symbols are indicating that "more icons" are available which don't appear in the display and which way to move the selection to view the *Icons*.



Important Note:



PREV

Exit any sub-menu and return to the **MAIN MENU** by selecting & activating the "PREV" *Icons*. If no *Icons* appear in the display because of a testing function or special display (e.g. Help, Schematic Display, etc.), press any service button to exit to the previous menu or sub-menu.



QUIT

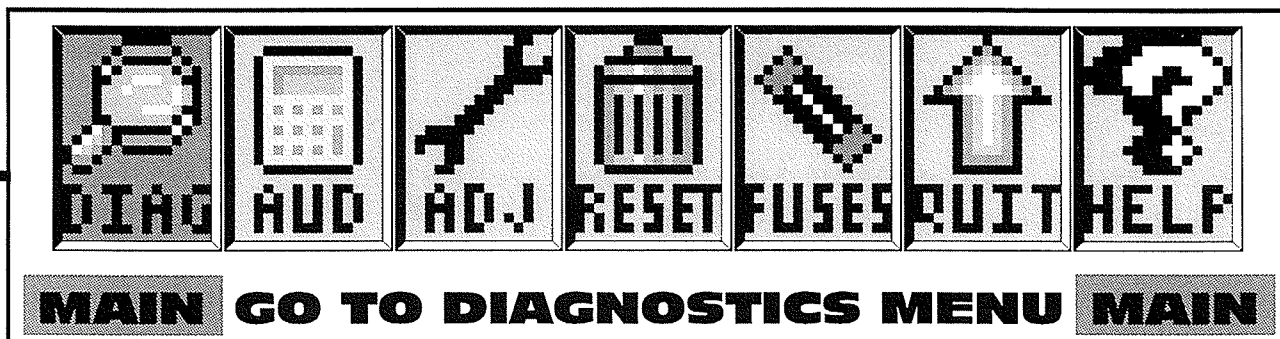
Selecting & activating the "QUIT" *Icon* from any display will exit the Service Session.



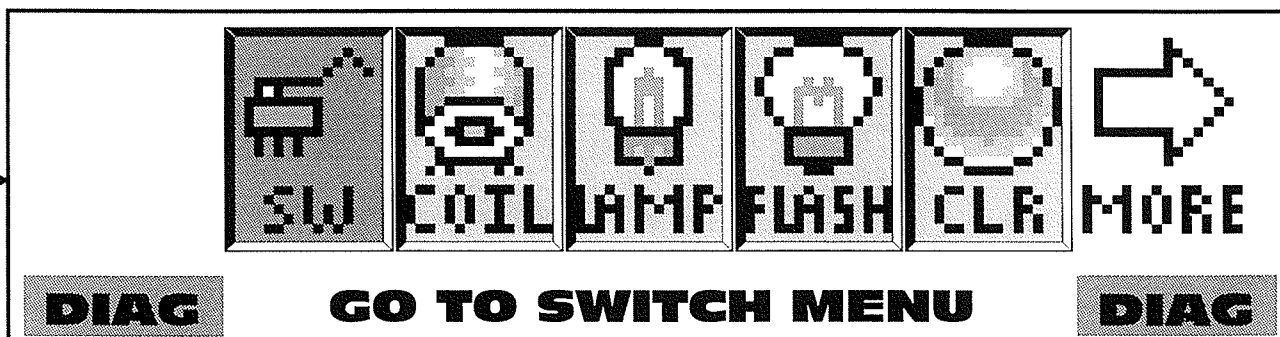
HELP

Selecting & activating the "HELP" *Icon* will show a help screen. (An explanation of each *Mini-Icon* at that level will cycle continuously until any active button is pressed.)

Example: From the **MAIN MENU**, use the Red "LEFT" or Green "RIGHT" Buttons to select the "DIAG" *Icon* (GO TO DIAGNOSTICS MENU).



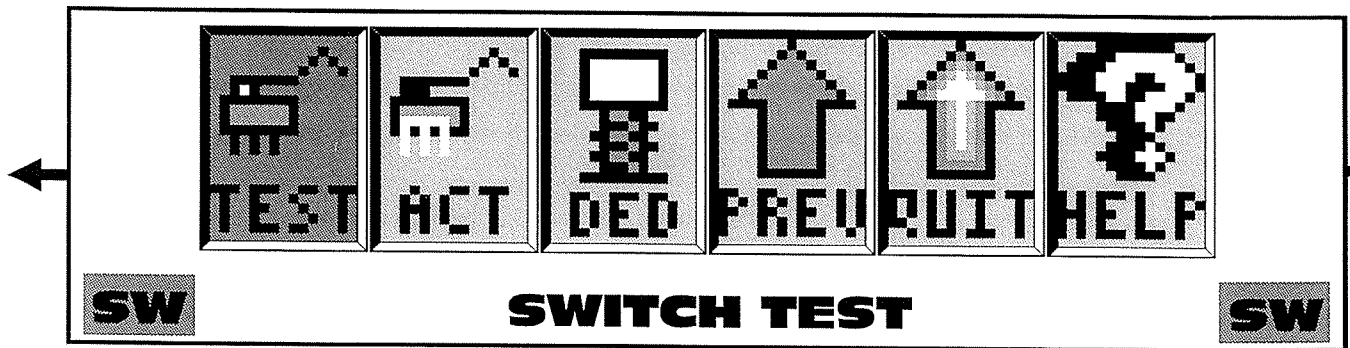
Press the Black "ENTER" Button to activate this **ICON**. This will bring up the **DIAGNOSTICS MENU**.



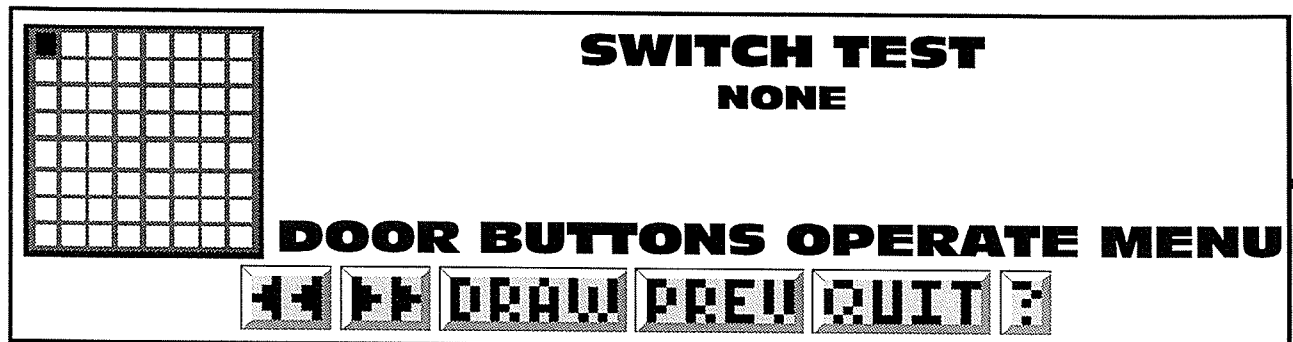
The **DIAGNOSTICS MENU** now appears with the "SW" *Icon* (GO TO SWITCH MENU) flashing. Press the Black Button to activate this icon. This will bring up the **SWITCH TEST MENU**.



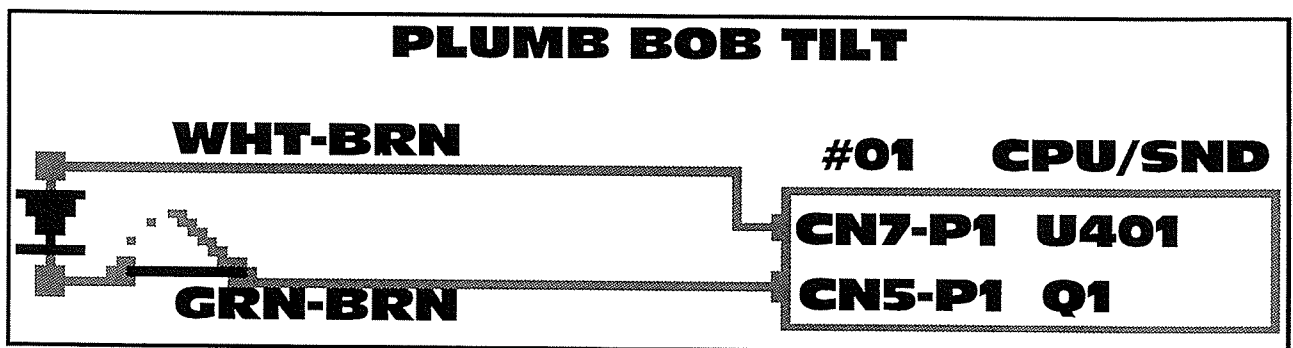
The **SWITCH TEST MENU** now appears with the "TEST" *Icon* (SWITCH TEST) flashing:
Press the **Black "ENTER" Button** to *activate* this icon. This will bring up the **Switch Test Display**.



The **Switch Test Display** now appears.



All switches can be tested one at a time (When possible, use a pinball to close any playfield switches; rolling the ball at Stand-Up Targets or over/under switches is suggested. Use finger for all non-playfield switches.) As each switch is closed, the respective Switch Matrix Grid Position (1-64) will be lit. To view the schematic for the switch selected, press the **Red** or **Green Buttons** to select the "DRAW" *Icon*. Press the **Black Button** to *activate* this icon. This will bring up the **Switch Schematic Display** for the switch being closed.



An example is shown with Switch #01, Plumb Bob Tilt, selected. The display describes the switch in the Switch Matrix which includes the name of the switch, the Return (Row) Wire and the Drive (Column) Wire, drive transistor, the part number (not shown in the above example) and the "Pin-Outs" from the CPU/Sound Board.

While in Switch or Active Switch Tests, the **Flipper & Start Buttons** are deactivated. Use the **Red "LEFT," Green "RIGHT"** and/or **Black "ENTER" Buttons** to select and activate the "MINI-ICONS" at the bottom of the display. In Switch Test, if the "Left Arrow" or "Right Arrow" *Icon* is activated, the display will go to the previous tests (Active and Dedicated Switch Tests). Use the **Red** or **Green Buttons** to change the selected **ICON** to "PREV" *Icon*. Press the **Black "ENTER" Button** to go to the previous menu.

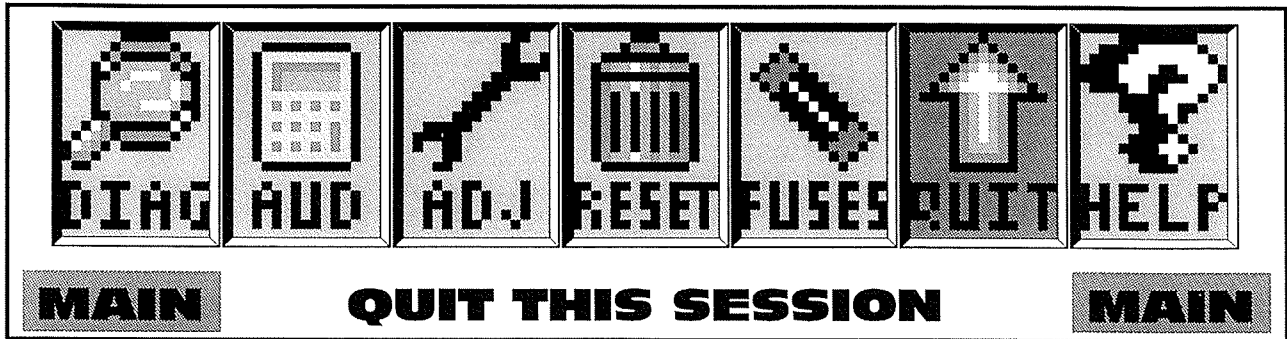
Note:

In **Dedicated Switch Test**, the **Flipper & Start Buttons** are to be used instead of the **Red, Green & Black Service Buttons**, as these buttons are deactivated for this test.

Exit out of the sub-menu by activating the big "PREV" *Icon* in the menu. This will bring up the **DIAGNOSTICS MENU**. The Switch Test Session is now complete. See the next page about exiting the **Portals™ Service Menu**.

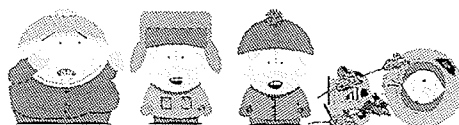
Exiting the Portals™ Service Menu

All *Icons* will be covered in the chapters of this section with the exception of the "QUIT" *Icon*, in the **MAIN MENU**. Both the large and small *Icons* if selected and activated, will exit the user from the **Portals™ Service Menu**. The display will return back to the **ATTRACT MODE!** To re-enter the **Portals™ Service Menu** follow the instructions at the beginning of this chapter.



If more help is required, see Chapter 7 of this section, and view the various help displays in the game.

Your Notes

This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. On the left side, there is a vertical margin line, creating a narrow left margin. The paper appears to be from a notebook or a standard writing template. There is no handwriting or other markings on the page.

Go To Diagnostics Menu

Special Note: If the **display flashes "OPEN THE DOOR"** the game is indicating that memory has been corrupted. This is caused by either failure in memory (e.g. batteries are dead and/or faulty **RAM**) or upon installation of updated version of game code. Opening the Coin Door will initiate a **Factory Restore**, by opening the **Memory Protect Switch**. Check battery voltage at **CMOS RAM** with the power off.

Overview

The **Portals™ Service Menu System** provides tests for sounds, display, lamps, switches and coils. Each feature may be tested manually or automatically after entering the **Portals™ Service Menu** (see Chapter 1 of this section). Select the **"DIAG" Icon** from the **MAIN MENU** to go to the **DIAGNOSTICS MENU**. The automatic tests (e.g. **Cycling Coils, Test Flash Lamps**) may be used for a quick verification of automatic test functions and the manual tests (**Begin Play Test, Single Lamp / All / Row / Column Tests**, and **Game Specific Test**.) may be used for troubleshooting. All **Icons** and their usages are explained throughout this chapter.

During game play, activation of switches and operation of coils with associated switches are monitored. If the **CPU/Sound Board** does not detect a switch transition ("Stuck Open" / "Stuck Closed") 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 the Attract Mode, faulty switches and coils (if any) are reported (Select the **"TECH" Icon, Technician Alert**, from the **DIAGNOSTICS MENU**). *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.*

CAUTION: Remove pinballs from the Ball Trough prior to lifting the playfield for servicing. This can easily be done in the **Portals™ Service Menu System**. Select the **"DIAG" Icon** from the **MAIN MENU** to go to the **DIAGNOSTICS MENU**. Select the **"CLR" Icon** to enter the **CLEAR BALL TROUGH MENU**. Select the **"RUN" Icon** & press the **Start Button** to remove one ball at a time. This is also useful to retrieve one ball for game testing in **Begin Play Test & Game Specific Test**. **Important:** The **Power Interlock Switch** must be pulled out.



GO TO DIAGNOSTICS MENU

With the game in the Attract Mode, open the Coin Door and press the **Black "BEGIN TEST" Button**. Select the **"DIAG" Icon** in the **MAIN MENU** with either **Flipper** or **Red "LEFT" & Green "Right" Buttons** (upon entry of the **Portals™ Service Menu**, the system defaults with the selection of the **"DIAG" Icon** flashing) and press the **Start** or **Black "ENTER" Buttons**. The **DIAGNOSTICS MENU** appears.



The **"MORE" symbols** are indicating that **"more icons"** are available which don't appear in the display and which way to move the selection to view the **Icons**.



Important Notes:



Exit any sub-menu and return to the **MAIN MENU** by selecting & activating the **"PREV" Icons**. If no **Icons** appear in the display because of a testing function or special display (e.g. **"Help"**), press any button to exit.



Selecting & activating the **"HELP" Icon** from any display will show a help screen. (An explanation of each **Mini-Icon** at that level will cycle continuously until any active button is pressed.)



Selecting & activating the **"QUIT" Icon** from any display will exit the Service Session.



In Diagnostics, selecting & activating the **"-"** or **"+" Icons** moves test forwards/backwards.



Selecting & activating the **"RUN" Icon** repeats the test on the coil or flash lamp left off at.



Selecting & activating the **"ARROW" Icons** moves between tests in the sub-menu.



Selecting & activating the **"DRAW" Icon** will show the schematic for that switch or coil.

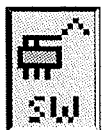
Some tests require navigation through the menu(s) and selection of the **Icons** with **ONLY** the **Red "LEFT," Green "RIGHT" and Black "ENTER" Buttons**. This is required in **Switch & Active Switch Tests**, as the **Flipper & Start Buttons** are a part of the test.



In **Single Coil Test, Cycling Coil Test, Test Flash Lamps, Clear Ball Trough, Begin Play Test & South Park Specific Menu's**, the **Power Interlock Switch** (inside Coin Door) must be pulled out. (See **Access & Use** in Chapter 1 of this section for the location.)

If the **Power Interlock Switch** is not pulled out, all electro-mechanical devices (such as Coils) cannot be tested (20v & 50v DC power is disabled). Closing the Coin Door will automatically reset this switch.





Go To Switch Menu

From the **DIAGNOSTICS MENU**, select the "SW" *Icon* with either **Red "LEFT"** or **Green "RIGHT"** **Button** and press the **Black "ENTER" Button**. 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 Test Menu consists of three (3) parts: Switch Test, Active Switches, and Dedicated Switch Test.

Note: The Flipper & Start Buttons are deactivated during Switch Tests.



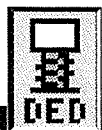
Switch Test

To initiate, from the **SWITCH MENU**, select the "TEST" *Icon* with the **Red** or **Green Button** & press the **Black Button**. In Switch Test, close each switch and observe the display. The display will describe the switch in the Switch Matrix, which includes the switch name, Return (Row) Wire, Drive (Column) Wire, Part N^o, and the "Pin-Outs" from the CPU/SOUND Board. When the switch is released, the information of the last switch closed will remain in the display until another switch is closed or the test is exited. To view the switch schematic, select the "DRAW" *Mini-Icon* with the **Red** or **Green Button** & press the **Black Button**.



Active Switch Test

To initiate, from the **SWITCH MENU**, select the "ACT" *Icon* with either **Red** or **Green Button** & press the **Black Button**. If still in a previous test, select the "PREV" *Icon* to return to Switch Menu or selecting either of the "ARROW" *Icons* will move through the tests. If any switches are stuck closed (or made from the presence of a pinball), the display sequences through the Switch Names, Return (Row) Wire, Drive (Column) Wire, Drive Transistor, Part N^o, and the "Pin-Outs" from the CPU/SOUND Board. This cycle continues until all switches are cleared or until the test is exited.



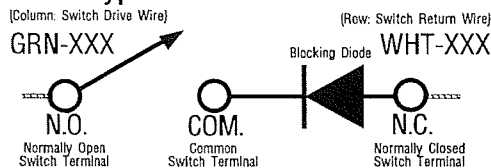
Dedicated Switch Test

To initiate, from the **SWITCH MENU**, select the "DED" *Icon* with either **Flipper Button** & press the **Start Button** (The service switches are deactivated during this test.). The display will describe the switch which includes the Switch Name, Return (Row) Wire, Drive (Column) Wire, Part N^o, and the "Pin-Outs" from the CPU/SOUND Board.

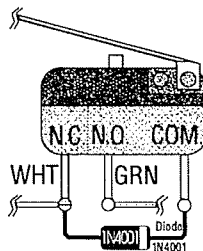
SWITCH MATRIX GRID & DEDICATED SWITCHES

D i o d e O n T e r m i n a l S t r i p										GND	
Column (Drive)	1: Q1	2: Q2	3: Q3	4: Q4	5: Q5	6: Q6	7: Q7	8: Q8		IC U206 INPUTS	Ground
Row (Return)	GRN-BRN CN5-P1	GRN-RED CN5-P3	GRN-ORG CN5-P4	GRN-YEL CN5-P5	GRN-BLK CN5-P6	GRN-BLU CN5-P7	GRN-VIO CN5-P8	GRN-GRY CN5-P9		BLK CN6-P1, -P11	
1: U400	LEFT BUTTON (UK ONLY) on Cabinet side	NOT USED	LEFT 5-BANK BOTTOM	RIGHT RAMP ENTER	NOT USED	NOT USED	LEFT TURBO BUMPER	LEFT OUTLANE		1: U206 GRY-BRN CN6-P2	#1 LEFT FLIPPER BUTTON on Cabinet side DS-1
2: U400	4TH COIN SLOT On Coin Door	5-BALL TROUGH #1 (LEFT) Under P/F	LEFT 5-BANK #2 Under P/F	RIGHT RAMP EXIT Above P/F	RIGHT 3-BANK BOTTOM Under P/F	KENNY OPTO Under P/F	RIGHT TURBO BUMPER Under P/F	LEFT RETURN LANE Under P/F		2: U206 GRY-RED CN6-P3	#2 LEFT FLIPPER E.O.S (End-of-Stroke) on Cabinet side DS-2
3: U400	6TH COIN SLOT On Coin Door	5-BALL TROUGH #2 Under P/F	LEFT 5-BANK #3 Under P/F	NOT USED	RIGHT 3-BANK MIDDLE Under P/F	UNDER-TROUGH (TOILET) Under P/F	BOTTOM TURBO BUMPER Under P/F	LEFT SLINGSHOT Under P/F		3: U206 GRY-ORG CN6-P4	#3 RIGHT FLIPPER BUTTON on Cabinet side DS-3
4: U400	RIGHT COIN SLOT On Coin Door	5-BALL TROUGH #3 Under P/F	LEFT 5-BANK #4 Under P/F	NOT USED	RIGHT 3-BANK TOP Under P/F	UNDER-TROUGH (KENNY) Under P/F	NOT USED	RIGHT OUTLANE Under P/F		4: U206 GRY-YEL CN6-P6	#4 RIGHT FLIPPER E.O.S (End-of-Stroke) on Cabinet side DS-4
5: U401	CENTER COIN SLOT / DBA On Coin Door	5-BALL TROUGH #4 Under P/F	LEFT 5-BANK TOP Under P/F	NOT USED	POP BUMPER TARGET LT Under P/F	SVUK Under P/F	NOT USED	RIGHT RETURN LANE Under P/F		5: U206 NOT USED GRY-GRN CN6-P7	NOT USED DS-5
6: U401	LEFT COIN SLOT On Coin Door	5-BALL TROUGH VUK OPTO Under P/F	CENTER 3-BANK LEFT Under P/F	NOT USED	POP BUMPER TARGET RT Under P/F	VUK Under P/F	START BUTTON Cabinet Front	RIGHT SLINGSHOT Under P/F		6: U206 GRY-BLU CN6-P8	#6 VOLUME (RED BUTTON) (In Test: LEFT) on Coin Door DS-6
7: U401	5TH COIN SLOT On Coin Door	5-BALL STACKING OPTO Under P/F	CENTER 3-BANK MIDDLE Under P/F	NOT USED	NOT USED	LEFT ORBIT (TO VUK) Under P/F	SLAM TILT On Coin Door	NOT USED		7: U206 GRY-VIO CN6-P9	#7 SERV. CRED. (GREEN BUTTON) (In Test: RIGHT) on Coin Door DS-7
8: U401	RIGHT BUTTON (UK ONLY) on Cabinet side	SHOOTER LANE Under P/F	CENTER 3-BANK RIGHT Under P/F	NOT USED	NOT USED	UNDER-TROUGH SVUK Under P/F	PLUMB BOB TILT Inside Cabinet	NOT USED		8: U206 GRY-BLK CN6-P10	#8 BEGIN TEST (BLACK BUTTON) (In Test: ENTER) on Coin Door DS-8

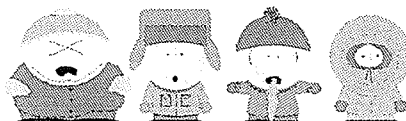
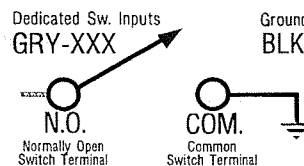
Typical Switch Schematic & Wiring



Note:
All Switches require diodes. Some diodes are located on Terminal Strips (under playfield) & not on the switch itself.
D i o d e O n T e r m i n a l S t r i p

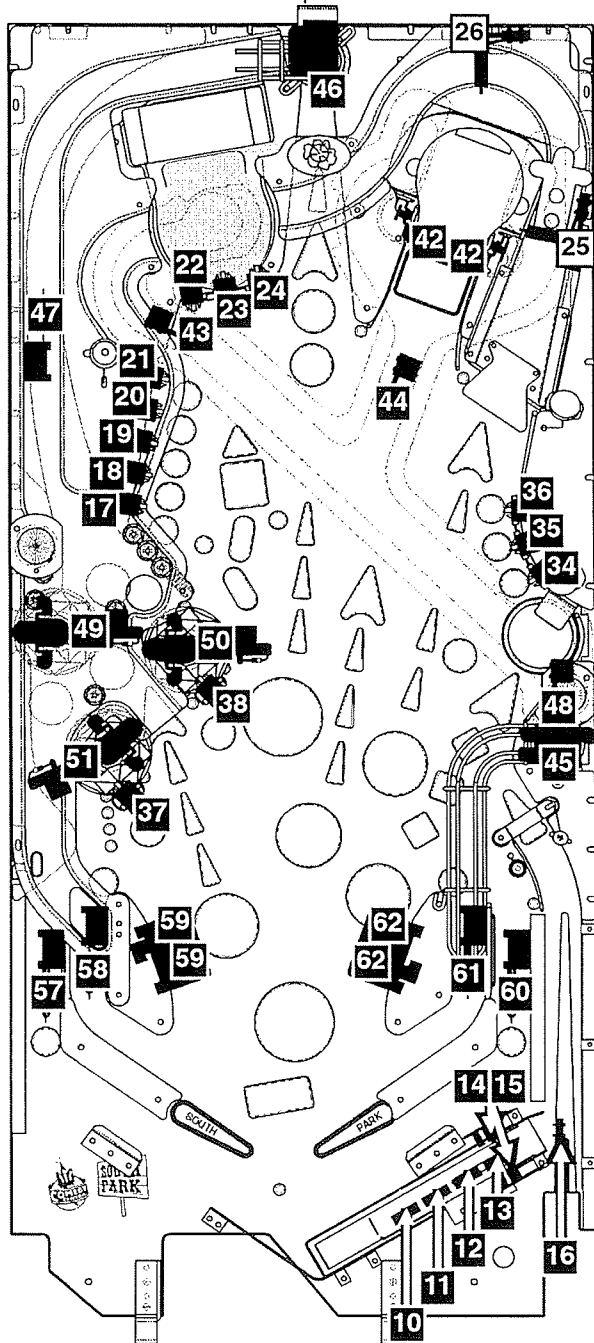


Dedicated Switch Schem.



Switch Matrix Grid Descriptions with Part Numbers and Locations

The Switch locations correspond with the Switch N^o in the Part Number Table shown & the Switch Matrix Grid (previous page).



‡ Sw. 14 / Sw. 15 have both REC/TRANS on 1 board respectively.

"R": The "R" following the Part Number on Stand-Up Targets means reverse (rear) mounted Target & Switch Actuator.

DOTS: Diode On Terminal Strip, if noted.

Legend Note:

□ = Switches mounted above playfield.

■ = Switches mounted below playfield.

* The following switches are located in the cabinet and are not noted in the diagram above:

2 4 5 6 54 55 56

The following switches are not used:

9 27-33 39-41 52-53 63-64

Switches for UK only: **1 + 8**

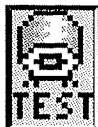
Sw. N ^o	Col. N ^o	Row N ^o	Notes	Switch Matrix Description	Part N ^o
Note: The ¥ Coin Switch (for Japan) is 180-5091-00					
1	1	1		LT BUTTON (UK ONLY)	180-5160-00
2*	1	2		4TH COIN SLOT	180-5024-00
3*	1	3		6TH COIN SLOT	(Future Use)
4*	1	4		RIGHT COIN SLOT	
5*	1	5		CENTER COIN SLOT / DBA	180-5024-00
6*	1	6		LEFT COIN SLOT	
7*	1	7		5TH COIN SLOT	(Future Use)
8	1	8		RT BUTTON (UK ONLY)	180-5160-00
9	2	1		NOT USED	
10	2	2		5-BALL TROUGH #1 (LEFT)	180-5119-02
11	2	3		5-BALL TROUGH #2	
12	2	4		5-BALL TROUGH #3	
13	2	5		5-BALL TROUGH #4	
14	2	6	‡	5-BALL TROUGH BOT TRANS: VUK OPTO BOT REC:	520-5173-00 520-5174-00
15	2	7	‡	5-BALL STACKING OPTO TOP TRANS: TOP REC:	520-5173-00 520-5174-00
16	2	8	DOTS	SHOOTER LANE	180-5157-00
17	3	1	R	LEFT 5-BANK BOT. (Prp. Sq. Rear Mnt.)	500-6139-09R
18	3	2	R	LEFT 5-BANK #2 (Purple Sq. Rear Mnt.)	
19	3	3	R	LEFT 5-BANK #3 (Purple Sq. Rear Mnt.)	
20	3	4	R	LEFT 5-BANK #4 (Purple Sq. Rear Mnt.)	
21	3	5	R	LEFT 5-BANK TOP (Purp. Sq. Rear Mnt.)	
22	3	6	R	CENTER 3-BANK LT. (Grn. Nar. Rear Mnt.)	500-6138-04R
23	3	7		CENTER 3-BANK MID. (Red Rect. Fwd.)	500-6228-02
24	3	8		CENTER 3-BANK RT. (Grn. Narrow Fwd.)	500-6138-04
25	4	1		RIGHT RAMP ENTER	180-5087-00
26	4	2		RIGHT RAMP EXIT	
27	4	3		NOT USED	
28	4	4			
29	4	5			
30	4	6			
31	4	7			
32	4	8			
33	5	1			
34	5	2	R	RT 3-BANK BOT. (Flo.Grn. Rnd. Rear Mnt.)	500-6075-11R
35	5	3	R	RT 3-BANK MID. (Flo.Grn. Rnd. Rear Mnt.)	
36	5	4	R	RT 3-BANK TOP (Flo.Grn. Round Rear Mnt.)	
37	5	5		POP BUMPER TARGT LT (Flo. Grn. Sq.)	500-6139-11
38	5	6		POP BUMPER TARGT RT (Flo. Grn. Sq.)	
39	5	7		NOT USED	
40	5	8			
41	6	1			
42	6	2		KENNY (OPTO) TRANS REC	520-5082-00 520-5083-01
43	6	3		UNDERTROUGH (TOILET)	180-5057-00
44	6	4		UNDERTROUGH (KENNY)	
45	6	5	DOTS	SVUK (Super Vertical Up-Kicker Switch)	180-5052-00
46	6	6	DOTS	VUK (Vertical Up-Kicker Switch)	180-5116-01
47	6	7		LEFT ORBIT (TO VUK)	500-6227-02
48	6	8		UNDERTROUGH SVUK	180-5057-00
49	7	1		LEFT TURBO BUMPER	180-5015-03
50	7	2		RIGHT TURBO BUMPER	
51	7	3		BOTTOM TURBO BUMPER	
52	7	4		NOT USED	
53	7	5			
54*	7	6		START BUTTON (Red)	500-6090-02
55*	7	7		SLAM TILT (On Coin Door)	180-5022-00
56*	7	8		PLUMB BOB TILT HANGER CONTACT	535-5319-00 535-7563-01
57	8	1		LEFT OUTLANE (Rt. Mount R/O)	500-6227-02
58	8	2		LEFT RETURN LANE (Rt. Mnt. R/O)	
59	8	3		LEFT SLINGSHOT (Double-Switch)	180-5054-00
60	8	4		RIGHT OUTLANE (Rt. Mount R/O)	500-6227-02
61	8	5		RIGHT RETURN LANE	
62	8	6		RIGHT SLINGSHOT (Double-Switch)	180-5054-00
63	8	7		NOT USED	
64	8	8			





Go To Coil Menu

From the **DIAGNOSTICS MENU**, select the "COIL" *Icon* with either **Red "LEFT"** or **Green "RIGHT" Button** and press the **Black "ENTER" Button**. The coils are listed in groups. Coils 01-16 are typically High Current Coils (although Low Current Coils may be used in positions 01-07). Coils 17-24 are typically Low Current Coils. The remaining positions (F1-F8) are typically for Flash Lamps (although they may be used any positions 01-24, read **Single Coil Test**). **Important:** The **Power Interlock Switch** must be pulled out.



Single Coil Test

To initiate, from the **COIL MENU**, select the "TEST" *Icon* with either **Red** or **Green Button** and press the **Black Button**. Ensure the **Power Interlock Switch** is pulled out. Select either the "-" or "+" *Icons*. Start with the "+" *Icon* to start the manual Coil Test from #1 (The test runs through Coils 1-24 and Flash Lamps F1-F8; *Note: Some Flash Lamps are used in Coil Positions; this game: #7 & #18.*). Press the **Black Button** on the "+" *Icon*, as each coil is selected, the display will describe the Coil or Flash Lamp Name with the corresponding number, the wire with colors, the "Pin-Outs" from the I/O Power Driver Board, the Coil Voltage & Gauge-Turns (e.g. 23-800). Press the **Black Button** again to move forward in the test. To test and view a particular Coil or Flash Lamp, select the "RUN" *Icon* and press the **Black Button**. Each time the **Black Button** is pushed, the Coil or Flash Lamp will fire on the Playfield and/or Backbox, with the display indicating the Coil or Flash Lamp information. Continue with the same procedure to run through the entire test.

Important: The **Power Interlock Switch** must be pulled out.



Cycling Coil Test

To initiate, from the **COIL MENU**, select the "CYC" *Icon* with either **Red** or **Green Button** and press the **Black Button**. If still in a previous test, select the "PREV" *Icon* to return to Coil Menu or selecting either of the "ARROW" *Icons* will move to Cycling Coil Test (selecting again will return to Coil Test). The test pulses each regular Coil or Flash Lamp sequentially (cycling) on the Playfield and Backbox. The display indicates "CYCLING COILS." **Important:** The **Power Interlock Switch** must be pulled out.

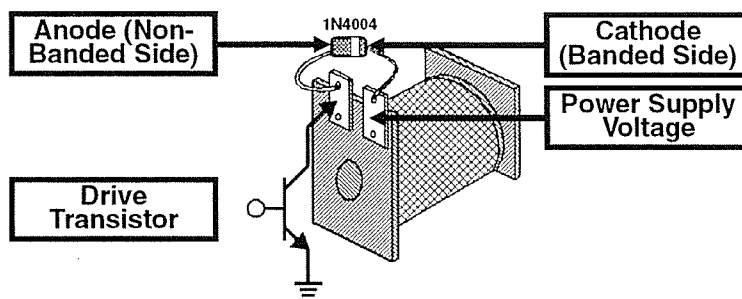
Coil & Flash Lamp Descriptions

Type	Coil / Flash Lamp Descriptions
COIL 1	TROUGH UP-KICKER (VUK) (26-1200)
COIL 2	AUTO LAUNCH (50V) (24-940)
COIL 3	SUPER VUK (24-940)
COIL 4	TOP VUK (26-1200)
COIL 5	TOILET SEAT LID (23-1100)
COIL 6	MR. HANKEY LATCH (29-1000)
COIL 7	FLASH POPS *4
COIL 8	(EUROPEAN TOKEN DISPENSER)
COIL 9	LEFT TURBO BUMPER (26-1200)
COIL 10	RIGHT TURBO BUMPER (26-1200)
COIL 11	BOTTOM TURBO BUMPER (26-1200)
COIL 12	LEFT SLINGSHOT (23-800)
COIL 13	MR. HANKEY (DOWN) (23-1100)
COIL 14	KENNY PIVOT (DEAD) (22-1080)
COIL 15	LEFT FLIPPER [50V RED/YEL] (23-1100)
COIL 16	RIGHT FLIPPER [50V RED/YEL] (23-1100)

Type	Coil / Flash Lamp Descriptions
COIL 17	RIGHT SLINGSHOT (23-800)
COIL 18	FLASH TOP VUK *1
COIL 19	KENNY LT (24-940)
COIL 20	KENNY RT (24-940)
COIL 21	LT OUTLANE (UK ONLY) (28-1050)
COIL 22	RT OUTLANE (UK ONLY) (28-1050)
COIL 23	UP/DOWN POST (UK ONLY) (23-1100)
COIL 24	(OPTIONAL COIN METER)
#F1	FLASH STAN *2 (#89 Bulb)
#F2	FLASH CHEF *2 (#89 Bulb)
#F3	FLASH KENNY *2 (#89 Bulb)
#F4	FLASH KYLE *2 (#89 Bulb)
#F5	FLASH CARTMAN *2 (#89 Bulb)
#F6	FLASH KENNY *1 BACK *2 (#906 (1) #89 (2))
#F7	FLASH MR HANKEY/TOILET *2 (#89 Bulb)
#F8	FLASH SUPER VUK *1 (#89 Bulb)

See the next three (3) pages for the **Coil & Flash Lamp Location Maps** (corresponds to above tables), **Coils Detailed Chart Table** & the **Backbox I/O Power Driver Board Detailed Wiring Diagram**.

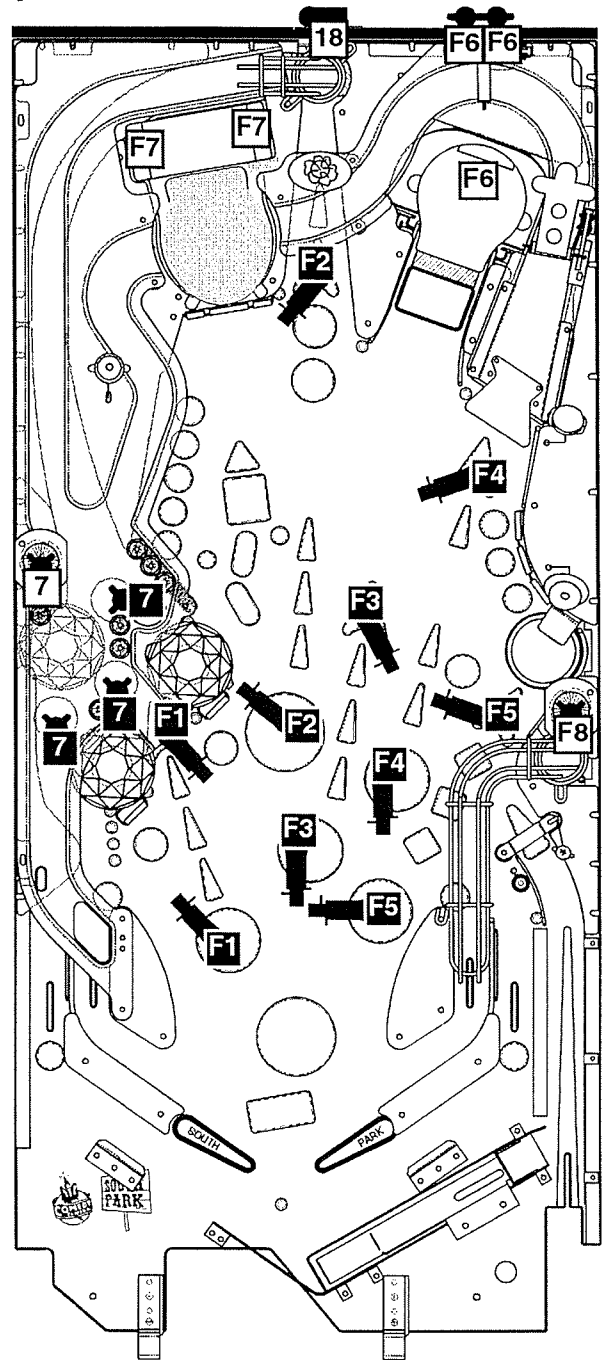
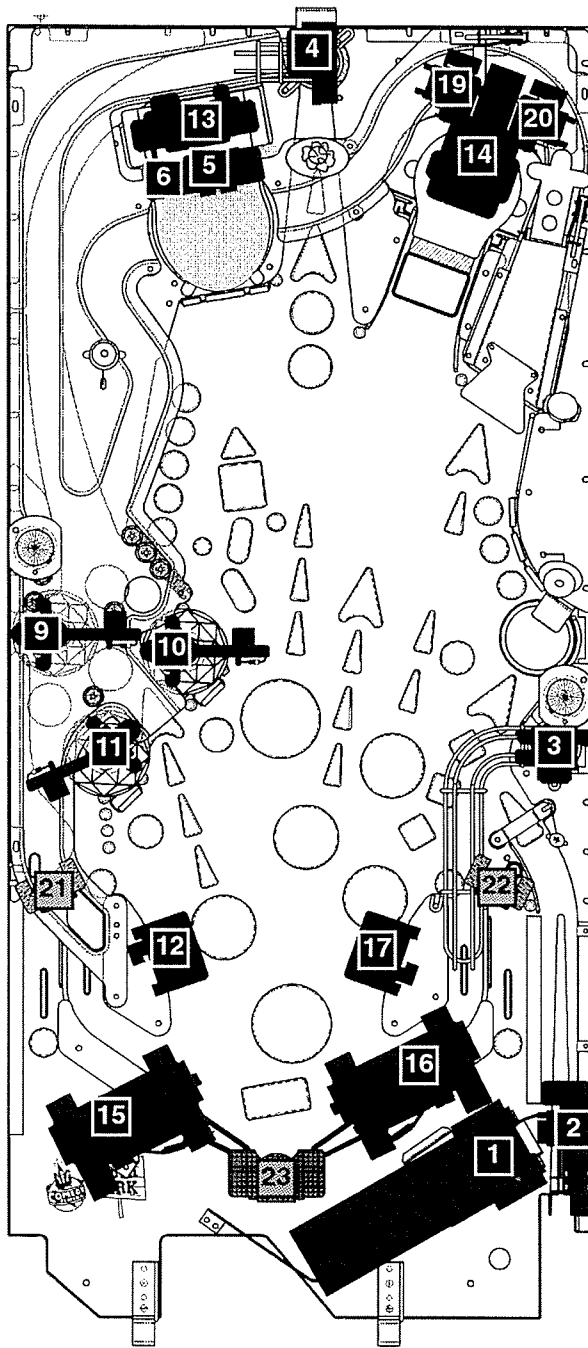
Typical Coil Wiring



Note:
All Coils require diodes. Some diodes are located on Terminal Strips (under playfield) & not on the coil itself.
D iode
O n
T ermin al
S trip




Coil & Flash Lamp Locations



Use the previous page and the following two (2) pages in conjunction with above Coil and Flash Lamp Maps.

Legend Note:

 = Coils and Flash Lamps mounted above playfield.

 = Coils and Flash Lamps mounted below playfield.

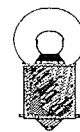
The following Coils are optional for UK Only:



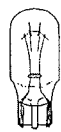
The following Coils are Optional:



The following Bulb Type is used for Flash Lamps:



#89 Bulb
(Bayonet)
165-5000-89

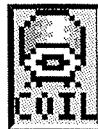


#906 Bulb
(Wedge Base)
165-5004-00





From the Main Menu
In Portals™
GO TO DIAGNOSTICS
MENU



From the Diagnostics
Menu
GO TO COIL
MENU



From the Coil
Menu
GO TO COIL
TEST



From the Coil
Menu
GO TO CYCLING
COILS

COILS DETAILED CHART TABLE

High Current Coils Group 1		Drive Trans-istor (D.T.)	Driver Output Board	D.T. Control Line Color	D.T. Control Line Connect	Power Line Color	Power Line Connection	Power Voltage	Coil GA/Turn or Bulb Type
#1	TROUGH UP-KICKER	Q1	I/O Pwr. Drvr.	BRN-BLK	J8-P1	YEL-VIO	J10-P4/5	50v DC	26-1200 090-5044-00T
#2	AUTO LAUNCH	Q2	I/O Pwr. Drvr.	BRN-RED	J8-P3	YEL-VIO	J10-P4/5	50v DC	24-940 090-5036-00T
#3	SUPER VUK	Q3	I/O Pwr. Drvr.	BRN-ORG	J8-P4	YEL-VIO	J10-P4/5	50v DC	24-940 090-5036-00T
#4	TOP VUK	Q4	I/O Pwr. Drvr.	BRY-YEL	J8-P5	YEL-VIO	J10-P4/5	50v DC	26-1200 090-5044-00T
#5	TOILET SEAT LID	Q5	I/O Pwr. Drvr.	BRN-GRN	J8-P6	BRN	J7-P1	20v DC	23-1100 090-5030-00T
#6	MR. HANKEY LATCH	Q6	I/O Pwr. Drvr.	BRN-BLU	J8-P7	YEL-VIO	J10-P4/5	50v DC	29-1000 090-5059-00
#7	FLASH POPS *4	Q7	I/O Pwr. Drvr.	BRN-VIO	J8-P8	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89
#8	EUROPEAN TOKEN DISPENSER	Q8	I/O Pwr. Drvr.	BRN-GRY	J8-P9	YEL-VIO	J10-P4/5	50v DC	DL4SS 515-8076-01
High Current Coils Group 2		Drive Trans-istor (D.T.)	Driver Output Board	D.T. Control Line Color	D.T. Control Line Connect	Power Line Color	Power Line Connection	Power Voltage	Coil GA/Turn
#9	LEFT TURBO BUMPER	Q9	I/O Pwr. Drvr.	BLU-BRN	J9-P1	YEL-VIO	J10-P4/5	50v DC	26-1200 090-5044-00T
#10	RIGHT TURBO BUMPER	Q10	I/O Pwr. Drvr.	BLU-RED	J9-P2	YEL-VIO	J10-P4/5	50v DC	26-1200 090-5044-00T
#11	BOTTOM TURBO BUMPER	Q11	I/O Pwr. Drvr.	BLU-ORG	J9-P4	YEL-VIO	J10-P4/5	50v DC	26-1200 090-5044-00T
#12	LEFT SLINGSHOT	Q12	I/O Pwr. Drvr.	BLU-YEL	J9-P5	BRN	J7-P1	20v DC	23-800 090-5001-00T
#13	MR. HANKEY (DOWN)	Q13	I/O Pwr. Drvr.	BLU-GRN	J9-P6	YEL-VIO	J10-P4/5	50v DC	23-1100 090-5030-00T
#14	KENNY PIVOT (DEAD)	Q14	I/O Pwr. Drvr.	BLU-BLK	J9-P7	YEL-VIO	J10-P4/5	50v DC	22-1080 090-5032-00T
#15	LEFT FLIPPER (50v RED/YEL)	Q15	I/O Pwr. Drvr.	ORG-GRY	J9-P8	RED-YEL GRY-YEL	J10-P1/2	50v DC	23-1100 090-5030-00T
#16	RIGHT FLIPPER (50v RED/YEL)	Q16	I/O Pwr. Drvr.	ORG-VIO	J9-P9	RED-YEL BLU-YEL	J10-P1/2	50v DC	23-1100 090-5030-00T
Low Current Coils Group 1		Drive Trans-istor (D.T.)	Driver Output Board	D.T. Control Line Color	D.T. Control Line Connect	Power Line Color	Power Line Connection	Power Voltage	Coil GA/Turn Bulb or Meter
#17	RIGHT SLINGSHOT	Q17	I/O Pwr. Drvr.	VIO-BRN	J7-P2	BRN	J7-P1	20v DC	23-800 090-5001-00T
#18	FLASH TOP VUK *1	Q18	I/O Pwr. Drvr.	VIO-RED	J7-P3	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89
#19	KENNY LT	Q19	I/O Pwr. Drvr.	VIO-ORG	J7-P4	BRN	J7-P1	20v DC	24-940 090-5036-00T
#20	KENNY RT	Q20	I/O Pwr. Drvr.	VIO-YEL	J7-P6	BRN	J7-P1	20v DC	24-940 090-5036-00T
#21	LT OUTLANE (UK ONLY)	Q21	I/O Pwr. Drvr.	VIO-GRN	J7-P7	BRN	J7-P1	20v DC	28-1050 090-5048-00
#22	RT OUTLANE (UK ONLY)	Q22	I/O Pwr. Drvr.	VIO-BLU	J7-P8	BRN	J7-P1	20v DC	28-1050 090-5048-00
#23	UP/DOWN POST (UK ONLY)	Q23	I/O Pwr. Drvr.	VIO-BLK	J7-P9	BRN	J7-P1	20v DC	23-1100 090-5030-00T
#24	OPTIONAL COIN METER	Q24	I/O Pwr. Drvr.	VIO-GRY	J7-P10	RED	J16-P7	5v DC	Meter 5v 091-5000-00
Diode On Terminal Strip (if noted)									
Flash Lamps (FLASH)		Drive Trans-istor (D.T.)	Driver Output Board	D.T. Control Line Color	D.T. Control Line Connect	Power Line Color	Power Line Connection	Power Voltage	Bulb Type
#F1	FLASH STAN *2	Q25	I/O Pwr. Drvr.	BLK-BRN	J6-P1	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89
#F2	FLASH CHEF *2	Q26	I/O Pwr. Drvr.	BLK-RED	J6-P2	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89
#F3	FLASH KENNY *2	Q27	I/O Pwr. Drvr.	BLK-ORG	J6-P3	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89
#F4	FLASH KYLE *2	Q28	I/O Pwr. Drvr.	BLK-YEL	J6-P4	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89
#F5	FLASH CARTMAN *2	Q29	I/O Pwr. Drvr.	BLK-GRN	J6-P5	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89
#F6	FLASH KENNY *1 BACK *2	Q30	I/O Pwr. Drvr.	BLK-BLU	J6-P6	ORG	J6-P10	20v DC	#906 Bulb 165-5004-00 #89 Bulb 165-5000-89
#F7	FLASH MR HANKEY/TOILET *3	Q31	I/O Pwr. Drvr.	BLK-VIO	J6-P7	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89
#F8	FLASH SUPER VUK *1	Q32	I/O Pwr. Drvr.	BLK-GRY	J6-P8	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89

Note: In Test Flash Lamps Menu ("Flash" Icon), Flashers tested are Flash Lamps F1-F8 ONLY. Test all others in Single or Cycling Coil Tests.



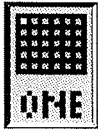
Section 3 | Disas





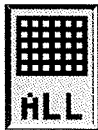
Go To Lamp Menu

From the **DIAGNOSTICS MENU**, select the "LAMP" *Icon* with either **Red "LEFT"** or **Green "RIGHT"** **Button** and press the **Black "ENTER" Button**. Controlled lamps are configured in and 8 x 10 Matrix of Columns (Lamp Drives) and Rows (Lamp Returns) with up to 80 lamps possible. The Lamp Test Menu consists of four (4) parts: Single Lamp Test, Test All Lamps, Row Lamp Test and Column Lamp Test.



Single Lamp Test

To initiate, from the **LAMP MENU**, select the "ONE" *Icon* with either **Red** or **Green Button** and press the **Black Button**. Select either the "-" or "+" *Icons*. Start with the "+" *Icon* to start the manual Lamp Test from Column 1, Row 1, Switch 1. Press the **Black Button** on the "+" *Icon*, as each lamp is selected, the lamp will light at it's location on the playfield as well as the display, indicating the Lamp Matrix Grid Position, lamp name with the corresponding number, Return (Row) Wire & Color, Drive (Column) Wire & Color, and associated drive transistors. Press the **Black Button** again to move forward in the test. To test and view a particular lamp, select the "RUN" *Icon* and press the **Black Button**. Each time the **Black Button** is pushed, the lamp will light-up on the playfield, with the display indicating the lamp information. Continue with the same procedure to run through the entire test.



Test All Lamps

To initiate, from the **LAMP MENU**, select the "ALL" *Icon* with either **Red** or **Green Button** and press the **Black Button**. If still in Single Lamp Test (or any 1 of the 4 tests), select the "PREV" *Icon* to return to Lamp Menu or selecting either of the "ARROW" *Icons* will move through the tests, keep activating until Test All Lamps is displayed. The display will indicate "ALL LAMPS ON" and the lamps on the playfield will be lit, alternating between the rows in the Lamp Matrix Grid.



Row & Column Lamp Tests

To initiate, from the **LAMP MENU**, select the "ROW" or "COL" *Icon* with either **Red "LEFT"** or **Green "RIGHT"** **Button** and press the **Black Button**. If still in a previous test, select the "PREV" *Icon* to return to Lamp Menu or selecting either of the "ARROW" *Icons* will move through the tests, keep activating until Row or Column Lamp Test (whichever desired) is displayed. In this test, each set of lamps in each Row or Column of the Lamp Matrix Grid (respective to each test) will light-up on the playfield and is indicated in the display.



LAMP MATRIX GRID

Diode On Terminal Strip									
Column (18v)	1: U17	2: U16	3: U15	4: U14	5: U13	6: U12	7: U11	8: U10	
Row (GND)	YEL-BRN J13-P9	YEL-RED J13-P8	YEL-ORG J13-P7	YEL-BLK J13-P6	YEL-GRN J13-P5	YEL-BLU J13-P4	YEL-VIO J13-P3	YEL-GRY J13-P1	
1: Q33 RED-BRN J12-P1	CHEF FACE #555 Bulb 1	CHEF #2 #555 Bulb 2	CHEF #3 #555 Bulb 3	CHEF #4 #555 Bulb 4	CHEF ARROW #555 Bulb 5	MYSTERY #555 Bulb 6	SPOOKY VISION #555 Bulb 7	EXTRA BALL #555 Bulb 8	
2: Q34 RED-BLK J12-P2	STAN FACE #555 Bulb 9	STAN #2 #555 Bulb 10	STAN #3 #555 Bulb 11	STAN #4 #555 Bulb 12	STAN ARROW #555 Bulb 13	SKILL SHOT #555 Bulb 14	VOLCANO #555 Bulb 15	ANAL PROBE #555 Bulb 16	
3: Q35 RED-ORG J12-P3	KENNY FACE #555 Bulb 17	KENNY #2 #555 Bulb 18	KENNY #3 #555 Bulb 19	KENNY #4 #555 Bulb 20	KENNY ARROW #555 Bulb 21	SUPER JACKPOT #555 Bulb 22	MULTIBALL READY 555# ulb 23	SOUTH PARK SIGN #555 Bulb 24	
4: Q36 RED-YEL J12-P4	KYLE FACE #555 Bulb 25	KYLE #2 #555 Bulb 26	KYLE #3 #555 Bulb 27	KYLE #4 #555 Bulb 28	KYLE ARROW #555 Bulb 29	KENNY ASSEMBLY #555 Bulb 30	NOT USED 31	NOT USED 32	
5: Q37 RED-GRN J12-P5	CARTMAN FACE #555 Bulb 33	CARTMAN #2 #555 Bulb 34	CARTMAN #3 #555 Bulb 35	CARTMAN #4 #555 Bulb 36	CARTMAN ARROW #555 Bulb 37	LEFT TUR-BO BUMPER 555# Bulb 38	RIGHT TUR-BO BUMPER 555# Bulb 39	BTTM TUR-BO BUMPER 555# Bulb 40	
6: Q38 RED-BLU J12-P6	LEFT 5-BANK BOTTOM #555 Bulb 41	LEFT 5-BANK #2 #555 Bulb 42	LEFT 5-BANK #3 #555 Bulb 43	LEFT 5-BANK #4 #555 Bulb 44	LEFT 5-BANK TOP #555 Bulb 45	TOILET S-U LT #555 Bulb 46	NOT USED 47	TOILET S-U RT #555 Bulb 48	
7: Q39 RED-VIO J12-P8	NOT USED 49	RT. 3-BANK BOTTOM #555 Bulb 50	RT. 3-BANK MIDDLE #555 Bulb 51	RT. 3-BANK TOP #555 Bulb 52	LEFT OUTLANE #555 Bulb 53	LEFT RE-TURN LANE #555 Bulb 54	RIGHT RE-TURN LANE #555 Bulb 55	RIGHT OUTLANE #555 Bulb 56	
8: Q40 RED-GRY J12-P9	MR. HANKEY: BOTTOM #555 Bulb 57	MR. HANKEY: BODY #555 Bulb 58	MR. HANKEY: LT HAND #555 Bulb 59	MR. HANKEY: RT HAND #555 Bulb 60	MR. HANKEY: HEAD #555 Bulb 61	MR. HANKEY: HAT #555 Bulb 62	POP BUMPER TARGET LT #555 Bulb 63	POP BUMPER TARGET RT #555 Bulb 64	
9: Q41 NOT USED RED-WHT J12-P10	NOT USED 65	NOT USED 66	NOT USED 67	NOT USED 68	NOT USED 69	NOT USED 70	NOT USED 71	NOT USED 72	
10: Q42 NOT USED RED J12-P11	NOT USED 73	NOT USED 74	NOT USED 75	NOT USED 76	NOT USED 77	NOT USED 78	NOT USED 79	NOT USED 80	



Lamp Matrix Grid Locations

The lamp locations correspond with the Lamp N° in the Lamp Matrix Grid on the previous page.

Legend Note:

□ = Lamps mounted above playfield.

■ = Lamps mounted below playfield.

The following Lamps are not used:

31 - 32 47 49 65 - 80

The following Bulbs are used in the Lamp Matrix Grid (See Table Grid on previous page for details):

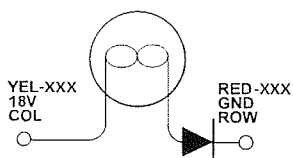


#555 Bulb
(Wedge)
165-5002-00

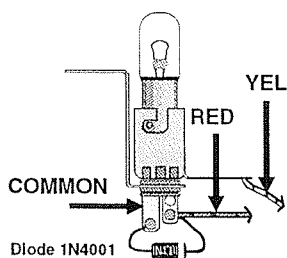


#44 Bulb
(Bayonet)
165-5000-44

Typical Lamp Schematic



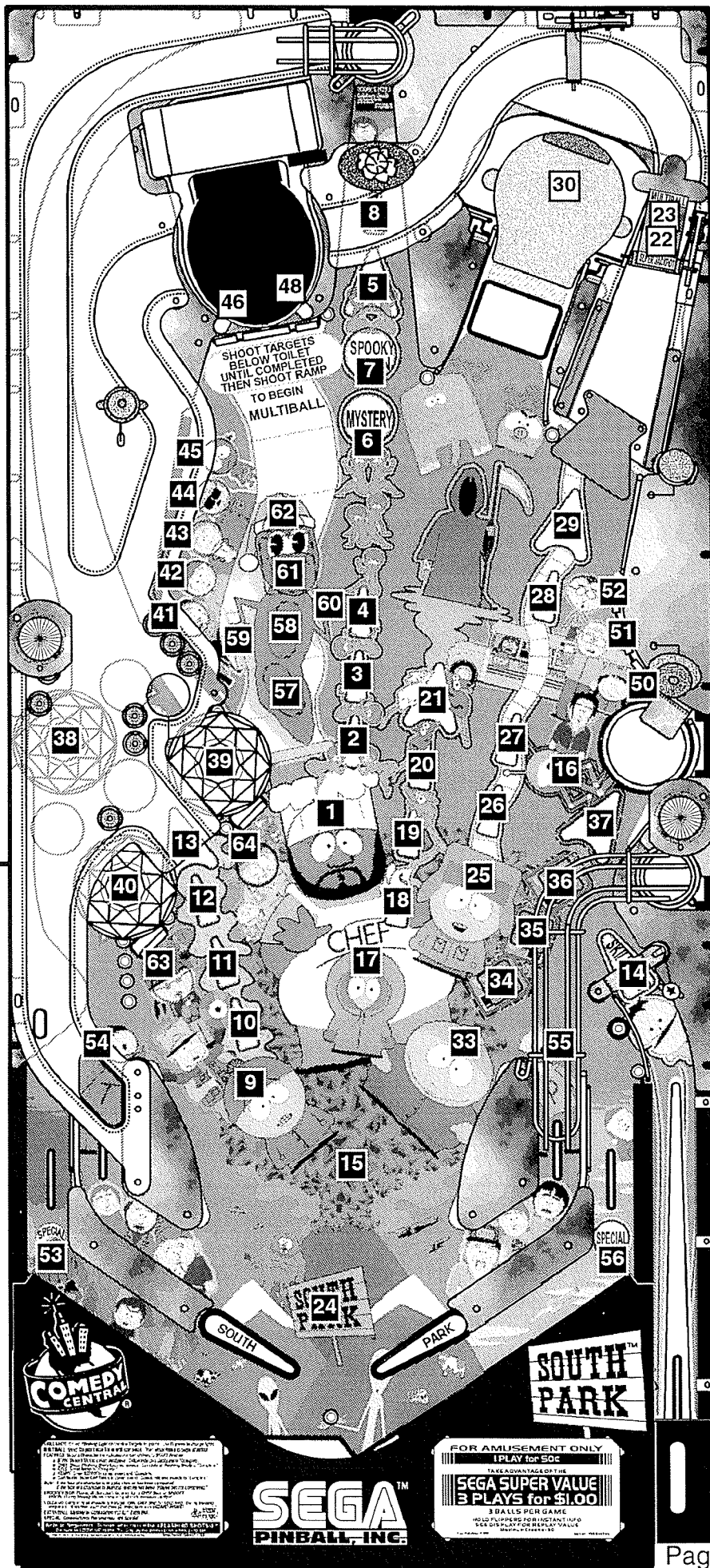
Typical Lamp Wiring



Note:

All Lamps require diodes.
Some diodes are located on
Terminal Strips (under playfield)
& not on the lamp itself.

D iode
O n
T ermin
S trip





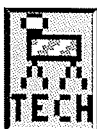
Test Flash Lamps

From the **DIAGNOSTICS MENU**, select the "FLASH" *Icon* with either **Red "LEFT"** or **Green "RIGHT"** **Button** and press the **Black "ENTER" Button**. After selecting this *Icon* the display will indicate "CYCLING FLASHERS" and all the Flash Lamps will cycle continuously until the test is exited. This test allows the technician to easily spot any burned-out bulbs and replace them. Flashers tested are Flash Lamps in Positions F1-F8 (Q25-Q32) Only. Test all others in Single or Cycling Coil Tests. **Important:** The **Power Interlock Switch** must be pulled out. **Note:** In this game Flash Lamps are also located in Coil Positions #6 & #7. **TO TEST USE Single or Cycling Coil Tests.**



Clear Ball Trough

From the **DIAGNOSTICS MENU**, select the "CLR" *Icon* with either **Red "LEFT"** or **Green "RIGHT"** **Button** and press the **Black "ENTER" Button**. This is provided to allow the technician a simple method of removing the balls from the trough and also, to test functionality of the trough, ensuring proper trough operation. After selecting this *Icon* the display will show a graphic of the ball trough with balls in the trough with it's corresponding switch number. Select the "RUN" *Icon* to eject the ball in the first position. Simultaneously, the display and the playfield will eject the ball to the Trough Up-Kicker, eject from the Trough Up-Kicker into the Shooter Lane and will be ejected onto the playfield where the technician can easily retrieve the pinball or allow the ball(s) to re-enter the trough to continue Clear Ball Trough Test. **Important:** The **Power Interlock Switch** must be pulled out. **⚠ Caution:** Continuous use of above test may overheat the Trough Up-Kicker Coil. **⚠**



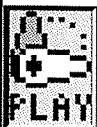
Technician Alert

From the **DIAGNOSTICS MENU**, select the "TECH" *Icon* with either **Red "LEFT"** or **Green "RIGHT"** **Button** and press the **Black "ENTER" Button**. After selecting this *Icon* the display will 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.)



Service Phone

From the **DIAGNOSTICS MENU**, select the "SERV" *Icon* with either **Red "LEFT"** or **Green "RIGHT"** **Button** and press the **Black "ENTER" Button**. After selecting this *Icon* the display will indicate a phone number to call if technical assistance is required (the phone number is different for each *Country Dip Switch Setting*).



Begin Play Test

From the **DIAGNOSTICS MENU**, select the "PLAY" *Icon* with either **Red "LEFT"** or **Green "RIGHT"** **Button** and press the **Black "ENTER" Button**. After selecting this *Icon* the technician can test certain play functions to insure all switch activated coils function without entering game play. For example, by rolling the ball over the Shooter Lane switch, the Autoplunger should fire. If it kicks to 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. During this function, similar tests may be performed on the "Ejects", Slingshots, Vertical Up-Kickers, Pop Bumpers, etc. in the game. For unique Play Test functions, select the "GAME SPECIFIC" *Icon* in the **DIAGNOSTICS MENU**. **Important:** The **Power Interlock Switch** must be pulled out.



Fire Kicker

From the **DIAGNOSTICS MENU**, select the "KNOCKER" *Icon* with either **Red "LEFT"** or **Green "RIGHT"** **Button** and press the **Black "ENTER" Button**. The digitally mastered "Knocker" is sounded.

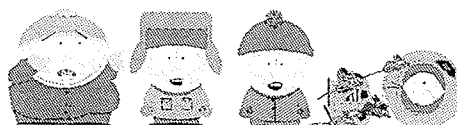


Sound / Speaker Test

From the **DIAGNOSTICS MENU**, select the "SPKR" *Icon* with either **Red "LEFT"** or **Green "RIGHT"** **Button** and press the **Black "ENTER" Button**. The BSMT 2000 Sound System produces true digital stereo sound from Backbox & Cabinet Speakers or "Mono" on the Cabinet Speaker (when used by itself). After selecting this *Icon*, select the "-" or "+" *Icons* and press the **Black "ENTER" Button** to activate the first test. Repeat to visually see & hear all tests. Select the "RUN" *Icon* to activate the test chosen without moving to the next test.

Note: During Sound Tests, the display shows the speaker identification and the corresponding sound(s). The sound functions allow verification that both channels are functioning properly & that the speaker connections are correct.

Sound / Speaker Test Continued Next Page





Speaker Phase Testing

Continued

Connections to each of 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 one, 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 Backbox & Cabinet, and Backbox Sine (repeated) functions. If the Cabinet Sine produces more volume and bass than the Left Sine, 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 Backbox Speaker RED/WHT Wire and the Cabinet Speaker YEL/WHT Wire is connected to the negative (-) terminal.
2. Disconnect the speaker output connector from the CPU / 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 (CN4, Pin-3 (RED/BLK) or Pin-6 (YEL/BLK)) each time. As the connection is made, check speaker cone movement; proper connections are indicated by outward movement.

Auto / Manual Tests	Sounds Produced
Speaker Test	Tone
Sound/OPSYS EPROM (Loc. U7)	Level 1-3 (Music Test)
Voice ROM 1 (Loc. U17)	Speech Pattern 1
Voice ROM 2 (Loc. U21)	Speech Pattern 2
Voice ROM 3 (Loc. U36)	Speech Pattern 3
Voice ROM 4 (Loc. U37)	Speech Pattern 4

Note: Voice ROMs 1 - 4 = 8MB. The CPU/Sound Board must have a Jumper at W6 to accept 8MB ROMs.



Begin Burn In

From the **DIAGNOSTICS MENU**, select the "BURN" *Icon* with either Red "LEFT" or Green "RIGHT" Button and press the Black "ENTER" Button. After selecting this *Icon* the Begin Burn-In Test will start. At this stage the game will exercise all CPU I/O Functions (Dot Matrix Display Test, Coil Testing, Lamp Testing, Sound, etc.). This is provided to constantly exercise sounds, coils, etc... Cumulative Burn-In minutes will be displayed. To reset Burn-In minutes to 00, select the "RESET" *Icon* in the **MAIN MENU** and select the "FACT" *Icon* (Factory Reset). See Chapter 5, Go To Reset Menu, of this section.



Dot Matrix Test

From the **DIAGNOSTICS MENU**, select the "DOT TEST" *Icon* with either Red "LEFT" or Green "RIGHT" Button and press the Black "ENTER" Button. After selecting this *Icon* the Dot Matrix Test immediately begins. The display will immediately illuminate & cycle for 1 pass of each test continuously for each of the following tests:

1. Illuminates 1 vertical column of dots, turning it off & illuminating the next column, until each column has been individually lit, while the other columns are off.
2. Illuminates 1 horizontal row of dots, turning it off & illuminating the next row, until each row has been individually lit, while the other rows are off.
3. Illuminates all the dots, except for one column from left to right.
4. Illuminates all the dots, except for one row from top to bottom.
5. Illuminates every other dot lit, in both the rows and columns.
6. Illuminates all dots at 30%, 70% & 100% brightness.

Note: Pressing any button will exit the test & return to **DIAGNOSTICS MENU**.

Dot Matrix Display Explained

The display utilizes a Micro-Processor Control Board mounted in piggyback fashion to the Dot Matrix Display (128 X 32) Driver Board. The purpose behind this board is to provide more information to the operator as well as displaying graphics to the player.

The board is controlled by a 6809E Microprocessor and its personality ROM (Unique to the Game). It receives Data, Reset & Clock Information from the CPU/Sound 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.





South Park Specific (Mr. Hankey Test)

To initiate, from the **DIAGNOSTICS MENU**, select the "PARK" *Icon* with either the Red "LEFT" or Green "RIGHT" Button and press the Black "ENTER" Button. This will bring up the **SOUTH PARK SPECIFIC MENU**. Similar to "BEGIN PLAY TEST," this menu is used to test and adjust Game Specific Features. The feature in this game is **MR. HANKEY TEST**.

MR. HANKEY TEST

PULSE LENGTH: 30



This test allows you to operate the **MR. HANKEY LATCH** (Coil Q6) [UP] and the **MR. HANKEY (DOWN)** (Coil Q13) outside of Game Mode for the purpose of troubleshooting and adjustment.

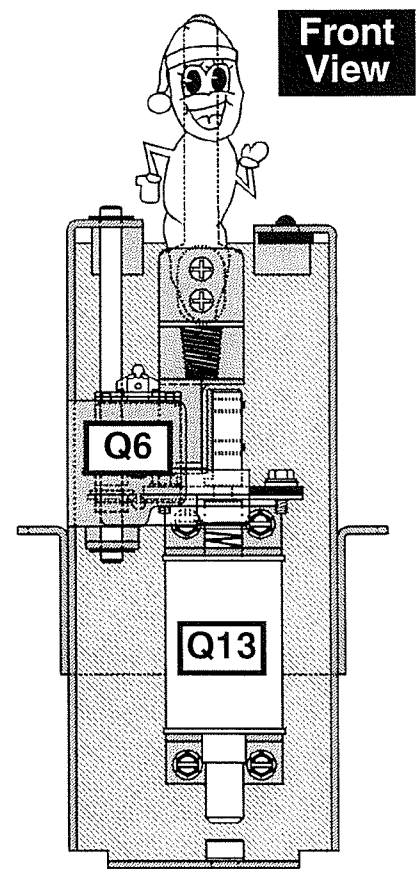
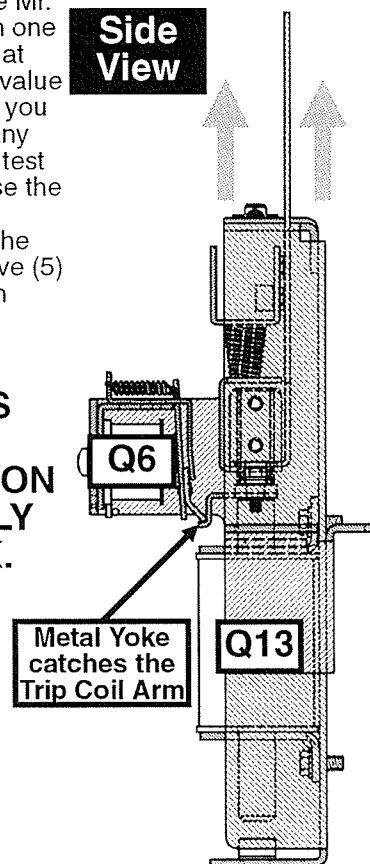
Test Procedure:

Select the "UP" *Icon* with either the Red "LEFT" or Green "RIGHT" Button and press the Black "ENTER" Button. This will energize the **MR. HANKEY LATCH** Coil (Q6) releasing the spring loaded Mr. Hankey Device. Select the "DOWN" *Icon* with either the Red "LEFT" or Green "RIGHT" Button and press the Black "ENTER" Button. The **MR. HANKEY (DOWN)** Coil (Q13) will energize, pulling Mr. Hankey back into the Toilet Tank and re-latching the assembly (...the Metal Yoke on the Plunger catches under the Trip Coil Arm Assembly.).

Adjustment Procedure:

Using the or Icons you can vary the strength of the [DOWN] Coil (Q13) (the Display will indicate this.). The **Adjustment Range** is 10 (SOFT) to 60 (HARD). The **Factory Setting** is 30. Your goal is to have the [DOWN] Coil pull the Mr. Hankey Assembly into the Toilet Tank in one **PULSE** (with no "chattering"). Starting at the lowest value of "10", increment the value by two (2) (e.g. 10-12, 12-14, etc.) until you get a smooth "One-Shot-Pull" without any chattering. Select the "DOWN" *Icon* to test the "pull"; select the "UP" *Icon* to release the Mr. Hankey Assembly so you may try another Pulse Length, if desired. Test the action of this assembly a minimum of five (5) times ensuring each time was a smooth "One-Shot-Pull."

BEFORE EXITING THIS MENU, ENSURE YOU SELECT THE "DOWN" ICON TO PULL THE ASSEMBLY BACK INTO THE TANK.





Dr. Pinball (Flow Chart Menus)

To initiate, from the **DIAGNOSTICS MENU**, select the Cross "DR." *Icon* with either the **Red "LEFT"** or **Green "RIGHT" Button** and press the **Black "ENTER" Button**. This will bring you (the operator / technician) into **DR. PINBALL** (Flow Chart Menus) which offers you a choice of three sub-menus: Coil "DR.", Switch "DR." and Lamp "DR." *Icons*. Selecting a particular sub-menu will give you a choice of which specific Coil (any and all coil assemblies such as Flippers, VUKs, Magnets, etc.), Switch or Lamp circuit needs to be diagnosed. The display will now ask a question or give a procedure to follow such as "Does the lamp turn on?" or "Check bridge rectifier BR-20, if short replace." When Dr. Pinball asks a question or request a procedure the Dr. will expect a response such as "no" or "yes" (see below examples of the *Mini-Icons* which will prompt the operator). You the operator/technician must respond by using your **Flipper Buttons** to "SELECT" a *Mini-Icon* and the **Start Button** to "ENTER" your selection.

The following are the *Mini-Icons* with explanations for the Dr. Pinball Sub-Menus to follow:



→ Select a Coil, Lamp or Switch to diagnose with "-" or "+" *Icon*; Then select the "RUN" *Icon* to activate the choice. "PREV" goes back to previous question. "QUIT" exits Portals completely. Help "?" gives direction on button usage.



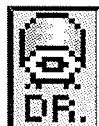
→ Seen when question is being asked on the Display. Select "YES" or "NO" to answer question given. "END" lets you select a new item to test. "PREV", "QUIT" and "?" (see first example above).



→ Seen when diagnosis is given. Select any *Icon* for your next step. "END" lets you select a new item to test. "PREV", "QUIT" and "?" (see first example above).



→ In Coil Flow Chart Menu, select "PULSE" to pulse the coil selected. "END" lets you select a new item to test. "PREV", "QUIT" and "?" (see first example above).



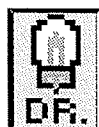
Coil Flow Chart

To initiate, from the **DR. PINBALL MENU**, select the Coil "DR." *Icon* with either the **Red** or **Green Button** and press the **Black Button**. This is the Coil Flow Chart. Follow the questions, answering by using the *Mini-Icons* in the display.



Switch Flow Chart

To initiate, from the **DR. PINBALL MENU**, select the Switch "DR." *Icon* with either the **Red** or **Green Button** and press the **Black Button**. This is the Switch Flow Chart. Follow the questions, answering by using the *Mini-Icons* in the display.



Lamp Flow Chart

To initiate, from the **DR. PINBALL MENU**, select the Lamp "DR." *Icon* with either the **Red** or **Green Button** and press the **Black Button**. This is the Lamp Flow Chart. Follow the questions, answering by using the *Mini-Icons* in the display.



SOUTH PARK GAME AUDIT TABLE



Copy for Field Audit Tracking Performance (Use blank columns to fill-in Audit Info.).



Earnings Audits 1-12

Audit Name	Fill-In	Audit Name	Fill-In	Audit Name	Fill-In
1 TOTAL PAID CREDITS		5 COINS THRU LEFT SLOT		9 TOTAL COINS	
2 FREE GAME PERCENTAGE		6 COINS THRU RIGHT SLOT		10 TOTAL EARNINGS	
3 AVERAGE BALL TIME		7 COINS THRU CENTER SLOT		11 METER CLICKS	
4 AVERAGE GAME TIME		8 COINS THRU 4TH SLOT		12 SOFTWARE METER	



Sega Audits 13-55

Audit Name	Fill-In	Audit Name	Fill-In	Audit Name	Fill-In
13 TOTAL BALLS PLAYED		28 20M—49.9M SCORES		43	
14 TOTAL EXTRA BALLS		29 50M—69.9M SCORES		44	
15 EXTRA BALL PERCENT		30 70M—99.9M SCORES		45	
16 REPLAY 1 AWARDS		31 100M—129.9M SCORES		46	
17 REPLAY 2+ AWARDS		32 130M+ SCORES		47	
18 TOTAL REPLAYS		33 AVERAGE SCORES		48	
19 REPLAY PERCENT		34 SERVICE CREDITS		49	
20 TOTAL SPECIALS		35 BALL SEARCH STARTED		50	
21 SPECIAL PERCENT		36 LOST BALL FEEDS		51	
22 TOTAL MATCHES		37 LOST BALL GAME STARTS		52 LEFT FLIPPER USED	
23 HIGH SCORE AWARDS		38 LEFT DRAINS		53 RIGHT FLIPPER USED	
24 HIGH SCORE PERCENT		39 CENTER DRAINS		54	
25 TOTAL FREE PLAYS		40 RIGHT DRAINS		55	
26 TOTAL PLAYS		41 SLAM TILTS			
27 0—19.9M SCORES		42 TOTAL BALLS SAVED			

Section 3 | Audits



South Park Audits 56-99 (All Audits Subject to Change)

Audit Name	Fill-In	Audit Name	Fill-In	Audit Name	Fill-In
56 LEFT ORBIT		72 MBALL RESTARTED		88 VOLCANO STARTED	
57 TOP VUK VIA ORBIT		73 MBALL JACKPOTS		89 VOLCANO COMPLETED	
58 RAMP		74 SUPER JACKPOTS LIT		90 SUPER FART BUMPERS LIT	
59 RIGHT 3-BANK COMP		75 SUPER JACKPOTS		91 POP BUMPER HITS	
60 LEFT 5-BANK COMP		76 CARTMAN MODE STARTED		92 MYSTERY LIT	
61 CENTER 3-BANK HITS		77 CARTMAN MODE COMPLETED		93 MYSTERY SCORED	
62 KENNY OPTO		78 KYLE MODE STARTED		94 SKILL SHOT MADE	
63 KENNY UNDERTROUGH		79 KYLE MODE COMPLETED		95	
64 TOILET UNDERTROUGH		80 KENNY MODE STARTED		96	
65 CARTMAN UNDERTROUGH		81 KENNY MODE COMPLETED		97	
66 SUPER VUK		82 CHEF MODE STARTED		98	
67 TOP VUK		83 CHEF MODE COMPLETED		99	
68 MBALL READY		84 STAN MODE STARTED		CPU Version: Display Version: Date Audited: Audited By:	
69 MULTIBALL START		85 STAN MODE COMPLETED			
70 2+ MBALL START		86 SPOOKY VISION LIT			
71 MULTIBALL RESTART LIT		87 SPOOKY VISION STARTED			

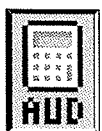
Location:



Go To Audits Menu

Overview

The **Portals™ Service Menu System** provides 99 Audit Functions for accounting purposes and for evaluation of *Game Difficulty Adjustments*. The Audit Functions are divided into 3 groups: 1st— **Earnings (Coin) Audits**, are the first 12 most-used Audits; 2nd— **Sega Audits**, are the Game Play Generic Audits 13-55; 3rd— **South Park Audits**, are the Game Play Specific Audits 56-99; Audits left open (blank space in gray, e.g. Audits 43-51, 54 & 55, 95-99) are currently **Not Used**, allowing for *Future Expansion*, if any, or are **Proprietary**. If the code version is upgraded, view Audits in the display & write the audit(s) in the blank(s) if any audit(s) were added. Each group may be viewed in the **Portals™ Service Menu** (see Chapter 1, Portals Service Menu Introduction, of this Section). View all audits with the **Game Audit Table** provided on the previous page. Copy page to fill-in important audit information as required.



GO TO AUDITS MENU

With the game in the Attract Mode, open the Coin Door and press the **Black "BEGIN TEST" Button**. Select the "AUD" *Icon* in the **MAIN MENU** with either **Red "LEFT"** or **Green "RIGHT" Button** and press the **Black "ENTER" Button**. The **AUDITS MENU** appears.

Important Notes:



Exit any sub-menu and return to the **MAIN MENU** by selecting & activating the "PREV" *Icons*. If no *Icons* appear in the display because of a testing function or special display (e.g. "Help"), press any button to exit.



Selecting & activating the "QUIT" *Icon* from any display will exit the Service Session.



Selecting & activating the "HELP" *Icon* from any display will show a help screen. (An explanation of each *Mini-Icon* at that level will cycle continuously until any active button is pressed.)



Selecting & activating the "ARROW" *Icons* selects the next or previous audit in the group.

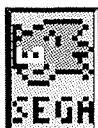


Earnings Audits (1-12)

From the **AUDITS MENU**, select the "EARN" *Icon* with either **Red "LEFT"** or **Green "RIGHT" Button** and press the **Black "ENTER" Button**. Select and activate the "RIGHT ARROW" *Icon* to view the 1st audit in this group. Continue to select either of the "ARROW" *Icons* to view each audit one at a time. The display will describe the audit number, the audit name, and the audit total or value. The current audit will remain in the display until the next audit is chosen or when the sub-menu is exited.

Au. Nº	Audit Name	Audit Definition
Au. 1	Total Paid Credits	Provides the total number of paid credits.
Au. 2	Free Game Percentage	This percentage is derived from dividing Audit 25, Total Free Plays, by Audit 26, Total Plays.
Au. 3	Average Ball Time	In seconds, the average ball time is derived from the total play time divided by Audit 13, Total Balls Played.
Au. 4	Average Game Time	The average game time is expressed in minutes and seconds.
Au. 5	Coins Thru Left Slot	Provides the total number of times Coin Switch (Sw. 6) was closed.
Au. 6	Coins Thru Right Slot	Provides the total number of times Coin Switch (Sw. 4) was closed.
Au. 7	Coins Thru Center Slot	Provides the total number of times Coin Switch (Sw. 5) was closed.
Au. 8	Coins Thru 4th Slot	Provides the total number of times Coin Switch (Sw. 2) was closed.
Au. 9	Total Coins	Provides the total amount of coins registered through all the slots.
Au. 10	Total Earnings	The total cash value accumulated since the last <i>Factory Restore</i> occurred (see Chapter 5, Go to Reset Menu, of this section).
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 continuing total of Meter Clicks. This audit cannot be reset; the display shows the constant addition of Meter Clicks.





Sega Audits (13-55)

From the **AUDITS MENU**, select the "SEGA" *Icon* with either **Red "LEFT"** or **Green "RIGHT" Button** and press the **Black "ENTER" Button**. Select and activate the "RIGHT ARROW" *Icon* to view the 1st audit in this group. Continue to select either of the "ARROW" *Icons* to view each audit one at a time. The display will describe the audit number, the audit name, and the audit total or value. The current audit will remain in the display until the next audit is chosen or when the sub-menu is exited.

Au. Nº	Audit Name	Audit Definition
Au. 13	Total Balls Played	Provides the total number of regular and extra balls.
Au. 14	Total Extra Balls	Provides the total number of extra balls awarded.
Au. 15	Extra Balls Percent	Provides the percentage total from dividing Audit 14, Total Extra Balls, by Audit 26, Total Plays.
Au. 16	Replay 1 Awards	Provides the total awards (Credit, Extra Ball, Or Audit) for level 1.
Au. 17	Replay 2+ Awards	Provides the total awards (Credit, Extra Ball, Or Audit) for level(s) 2 or higher.
Au. 18	Total Replays	Provides the total awards (Credits, Extra Balls, Or Audit Only) for exceeding replay score levels.
Au. 19	Replay Percent	Provides the percentage total from dividing Audit 18, Total Replays, by Audit 26, Total Plays. The percentage reflects replay total awards for exceeding replay score levels.
Au. 20	Total Specials	Provides the total awards (Credits, Extra Balls, Or Scores) for making specials.
Au. 21	Special Percent	This percentage is derived from dividing Audit 20, Total Specials, by Audit 26, Total Plays.
Au. 22	Total Matches	Provides 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 is adjustable from 0% to 10% by Adjustment 11, Match Percentage, if enabled. (See Chapter 4, Go to Adjustments Menu, of this section.)
Au. 23	High Score Awards	Provides the total credits awarded for exceeding the High-Score-To-Date scores.
Au. 24	High Score Percent	This percentage is derived from dividing Audit 23, High Score Awards, by Audit 26, Total Plays.
Au. 25	Total Free Plays	Provides the total free credits for replays, High-Score-To-Date, Specials, and Match.
Au. 26	Total Plays	This total is derived by adding the sum of Audit 1, Total Paid Credits, and Audit 25, Total Free Plays. Note that free credits are not recorded in the Audit until they are actually used.
Au. 27	0—19.9M Scores	Provides the total number of games the Player's final score was between 0 and 19,900,000 points.
Au. 28	20M—49.9M Scores	Provides the total number of games the Player's final score was between 20,000,000 and 49,900,000 points.
Au. 29	50M—69.9M Scores	Provides the total number of games the Player's final score was between 50,000,000 and 69,900,000 points.
Au. 30	70M—99.9M Scores	Provides the total number of games the Player's final score was between 70,000,000 and 99,900,000 points.
Au. 31	100M—129.9M Scores	Provides the total number of games the Player's final score was between 100,000,000 and 129,900,000 points.
Au. 32	130M+ Scores	Provides the total number of games the Player's final score was over 130,000,000 points.
Au. 33	Average Scores	This total is derived from adding the Final Score of each game to a table and dividing this sum by Audit 26, Total Plays.
Au. 34	Service Credits	Provides the total number of times Dedicated Switch (DS-7) was closed, not in the Portals™ Service Menu. (See Chapter 1, Introduction [Access & Use] for instructions on how to receive Service Credits.)
Au. 35	Ball Search Started	Provides the total number of times the game performed a ball search.
Au. 36	Lost Ball Feeds	Provides the total number of times the game added a ball to play when it could not find a ball after ball search.





Sega Audits Continued.

Audit Name		Audit Definition
Au. 37	Lost Ball Game Starts	Provides the total number of times the game started with a ball missing from the ball trough at the start of a game.
Au. 38	Left Drains	Provides the total number of times Rollover Switch 57 was closed.
Au. 39	Center Drains	Provides the total number of times the game ball had drained with the last switch closed was not Sw. 57 or Sw. 60.
Au. 40	Right Drains	Provides the total number of times Rollover Switch 60 was closed.
Au. 41	Slam Tilts	Provides the total number of times Contact Switch 55 was closed.
Au. 42	Total Balls Saved	Provides the total number of times this 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.
Au. 43- Au. 51		These audits are Not Used , allowing for Future Expansion , if any, and/or Proprietary (used for programming).
Au. 52	Left Flipper Used	Provides the total number of times Dedicated Switch (DS-1) was closed.
Au. 53	Right Flipper Used	Provides the total number of times Dedicated Switch (DS-3) was closed.
Au. 54- Au. 55		These audits are Not Used , allowing for Future Expansion , if any, and/or Proprietary (used for programming).



South Park Audits (56-99) (All Audits Subject to Change)

From the AUDITS MENU, select the "PARK" Icon with either Red "LEFT" or Green "RIGHT" Button and press the Black "ENTER" Button. Select and activate the "RIGHT ARROW" Icon to view the 1st audit in this group. Continue to select either of the "ARROW" Icons to view each audit one at a time. The display will describe the audit number, the audit name, and the audit total or value. The current audit will remain in the display until the next audit is chosen or when the sub-menu is exited.

Au. N°	Audit Name	Audit Definition
Au. 56	Left Orbit	Provides the total number of times this feature was completed. †
Au. 57	Top VUK Via Orbit	Provides the total number of times this feature was completed. †
Au. 58	Ramp	Provides the total number of times this feature was completed. †
Au. 59	Right 3-Bank Comp(leted)	Provides the total number of times this feature was completed. †
Au. 60	Left 5-Bank Comp(leted)	Provides the total number of times this feature was completed. †
Au. 61	Center 3-Bank Hits	Provides the total number of times this feature was completed. †
Au. 62	Kenny OPTO	Provides the total number of times OPTO Switch 42 was closed.
Au. 63	Kenny Undertrough	Provides the total number of times Rollover Switch 44 was closed.
Au. 64	Toilet Undertrough	Provides the total number of times Rollover Switch 43 was closed.
Au. 65	Cartman Undertrough	Provides the total number of times Rollover Switch 48 was closed.
Au. 66	Super VUK	Provides the total number of times SVUK Switch 45 was closed.
Au. 67	Top VUK	Provides the total number of times VUK Switch 46 was closed.
Au. 68	MBall Ready	Provides the total number of times this feature was ready (lit) awaiting Multiball. † ‡
Au. 69	Multiball Start	Provides the total number of times Multiball was played. †
Au. 70	2+ MBall Start	Provides the total number of times Multiball was played more than once by a single player in one game. †
Au. 71	Multiball Restart Lit	Provides the total number of times Multiball was played and no Jackpots were collected. ‡
Au. 72	Multiball Restarted	Provides the total number of times Multiball was restarted after Multiball Restart was lit. ‡
Au. 73	MBall Jackpots	Provides the total number of times this feature was awarded. †
Au. 74	Super Jackpot Lit	Provides the total number of times this feature was lit. ‡

† Multiple variations of switch closures (see Diagnostics) are used to determine completion of the feature stated.

‡ Multiple variations of switch closures (see Diagnostics) are used to determine the lighting of the feature stated.





South Park Audits Continued (All Audits Subject to Change)

Audit Name		Audit Definition
Au. 75	Super Jackpots	Provides the total number of times this feature was awarded. †
Au. 76	Cartman Mode Started	Provides the total number of times this feature was started. †
Au. 77	Cartman Mode Completed	Provides the total number of times this feature was completed. †
Au. 78	Kyle Mode Started	Provides the total number of times this feature was started. †
Au. 79	Kyle Mode Completed	Provides the total number of times this feature was completed. †
Au. 80	Kenny Mode Started	Provides the total number of times this feature was started. †
Au. 81	Kenny Mode Completed	Provides the total number of times this feature was completed. †
Au. 82	Chef Mode Started	Provides the total number of times this feature was started. †
Au. 83	Chef Mode Completed	Provides the total number of times this feature was completed. †
Au. 84	Stan Mode Started	Provides the total number of times this feature was started. †
Au. 85	Stan Mode Completed	Provides the total number of times this feature was completed. †
Au. 86	Spooky Vision Lit	Provides the total number of times this feature was lit. ‡
Au. 87	Spooky Vision Started	Provides the total number of times this feature was started. †
Au. 88	Volcano Started	Provides the total number of times this feature was started. †
Au. 89	Volcano Completed	Provides the total number of times this feature was completed. †
Au. 90	Super Fart Bumpers Lit	Provides the total number of times this feature was lit. ‡
Au. 91	Pop Bumper Hits	Provides the total number of times this feature was completed. †
Au. 92	Mystery Lit	Provides the total number of times this feature was lit. ‡
Au. 93	Mystery Scored	Provides the total number of times this feature was awarded. †
Au. 94	Skill Shot Made	Provides the total number of times this feature was completed. †
Au. 95- Au. 99	At time of printing, these audits are Not Used , allowing for Future Expansion , if any.	

- † Multiple variations of switch closures (see Diagnostics) are used to determine completion of the feature stated.
‡ Multiple variations of switch closures (see Diagnostics) are used to determine the lighting of the feature stated.

Use the below space for any additions and/or changes, if any (see the Dot Matrix Display):

Au.

Au.

Au.

Au.

Au.

Au.

Au.

Au.

Au.

Au.

Au.

Au.





Go To Printer Menu

From the **AUDITS MENU**, select the "PRNT" *Icon* with either **Red "LEFT"** or **Green "RIGHT" Button** and press the **Black "ENTER" Button**. The **PRINTER MENU** appears.



Special equipment is required for this Sub-Menu

The **Portals™ Service Menu System** provides 3 Audit Printing Adjustment Functions to print information on a "Hand-Held" printer, download game information to a Laptop PC or clear the printout count. A printer interface board, hand-held printer and/or a special software program is required to run this menu. Entering this menu and selection/activation of the *Icons* without this equipment/software will not affect the game.



Adjustment 57, Printer Interface (Quick Printout)

From the **PRINTER MENU**, select the "QUICK" *Icon* with either **Red** or **Green Button** and press the **Black Button**. Select the "+" *Icon* and press the **Black Button** to start the printout. Only the Earnings Audits can be printed out to a "Hand-Held" Printer.



Adjustment 58, Alison Interface (Full Printout)

From the **PRINTER MENU**, select the "ALISON" *Icon* with either **Red** or **Green Button** and press the **Black Button**. Select the "+" *Icon* and press the **Black Button** to start the download. A special software program and a Lap Top PC is required. All game audits (Earnings, Sega & Game Specific) can be retrieved.



Adjustment 59, N° of Copies Printed (Reset Printer)

From the **PRINTER MENU**, select the "RESET" *Icon* with either **Red** or **Green Button** and press the **Black Button**. Select the "+" *Icon* and press the **Black Button** to start the clear the "N° of copies printed" count total.

RESETTING AUDIT NOTES:



Audit Note: 1st Way to Reset Audits

To reset audits, from the **MAIN MENU**, select the "ADJ" *Icon*. See Chapter 4, Go to Adjustments Menu, of this section.



Select the "SEGA" *Icon*, from the **ADJUSTMENT MENU**, and advance to Adj. 8, Reset Coin Audits, with the "RIGHT ARROW" *Icon*. Select the "+" *Icon* to change setting to **YES**. When enabled, the *Coin Audits* (5-11) will be reset to zero.

Advance to Adj. 9, Reset Game Audits, with the "RIGHT ARROW" *Icon*. Select the "+" *Icon* to change setting to **YES**. When enabled, *all the audits* will be reset to zero, **except** for the *Coin Audits* (5-11) **and** Audit 12, Software Meter (the only audit which cannot be reset to zero).



Audit Note: 2nd Way to Reset Audits

To reset audits, from the **MAIN MENU**, select the "RESET" *Icon*. See Chapter 5, Go to Reset Menu, of this section.



Selection of the "COIN" *Icon*, from the **RESET MENU**, will reset the *Coin Audits* (5-11) to zero.



Selection of the "AUD" *Icon*, from the **RESET MENU**, will reset all audits to zero, **except** for the *Coin Audits* (5-11) **and** Audit 12, Software Meter (the only audit which cannot be reset to zero).





SOUTH PARK

GAME ADJUSTMENT TABLE

Some adjustments have a "Drop-Down" Table for further customization.



Sega Adjustments 1-48

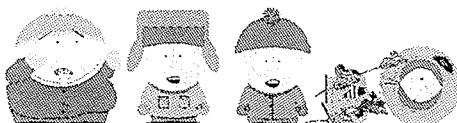
Adjustment Name	USA Default	Your Setting	Adjustment Name	USA Default	Your Setting
1 REPLAYS: FIXED/MANUAL ‡	...10%...		25 DEFAULT HIGH SCORE #5	300,000,000	
2 REPLAY LEVELS ‡	1 ...		26 DEFAULT HIGH SCORE #6	275,000,000	
3 REPLAY AWARD	CREDIT		27 DEFAULT HIGH SCORE #7	250,000,000	
4 FREE GAME LIMIT	05		28 DEFAULT HIGH SCORE #8	225,000,000	
5 EXTRA BALL LIMIT	03		29 DEFAULT HIGH SCORE #9	200,000,000	
6 GAME DIFFICULTY ‡	MODERATE		30 DEFAULT HIGH SCORE #10	175,000,000	
7 GAME PRICING ‡	USA3		31 HSTD RESET COUNT	2,000	
8 RESET COIN AUDITS	NO		32 HIGH SCORE INITIALS	3 Initials	
9 RESET GAME AUDITS	NO		33 FREE PLAY	NO	
10 RESET HIGH SCORES	NO		34 CUSTOM MESSAGE	ON	
11 MATCH PERCENTAGE	9%		35 ATTRACT MODE MUSIC	ON	
12 BALLS PER GAME	03		36 FLASH LAMP POWER	NORMAL	
13 TILT WARNINGS	01		37 COIL PULSE POWER	NORMAL	
14 REPLAY BOOST	YES		38 KNOCKER VOLUME	NORMAL	
15 CREDIT LIMIT	30		39 MINIMUM GAME TIME	OFF	
16 ALLOW HIGH SCORES	YES		40 BKGRND MUSIC VOLUME	01	
17 HIGH SCORE #1 AWARDS	01		41 GAME RESTART	YES	
18 HIGH SCORE #2 AWARDS	00		42 EXTRA BALL PERCENTAGE	25%	
19 HIGH SCORE #3 AWARDS	00		43 BILL VALIDATOR	NO	
20 HIGH SCORE #4 AWARDS	00		44 TOURNAMENT MODE	NONE	
21 DEFAULT HIGH SCORE #1	400,000,000		45 EURO. TOKEN DISP.	OFF	
22 DEFAULT HIGH SCORE #2	375,000,000		46 SPECIAL MEMORY	YES	
23 DEFAULT HIGH SCORE #3	350,000,000		47 LOCATION ID	00	
24 DEFAULT HIGH SCORE #4	325,000,000		48 GAME ID	00	

PLEASE NOTE: All Factory Settings (Defaults) described in the tables above/below and within the Adjustment Definitions are for USA Settings only (CPU/Snd Bd. Dip Sw. 300 Settings 1-8 are all "OFF"). Different countries may have different Factory Settings (Defaults). ‡ Adj. 1, 2, 6 & 7 have "Drop-Down" Tables, see definitions.



South Park Adjustments 49-56

Adjustment Name	USA Default	Your Setting	Adjustment Name	USA Default	Your Setting
49 EXTRA BALL MEMORY	ON		54 UK POST SAVE ENABLED	NO	
50 MBALL RESTART	MODERATE		55 UK COIN MECH. TYPE	CURRENT:	
51 MULTIBALL CRITERION	MODERATE		ADJ. 54 CAN ONLY BE ADJUSTED IF THE GAME HAS THE UK EPROM INSTALLED (UK ONLY). ADJ. 55 CAN ONLY BE ADJUSTED IF USING UK DIP SWITCH OPTION SETTING 2.		
52 TOILET MECH ENABLED	YES		56 ADULT SPEECH ENABLED	YES	
53 KENNY MECH ENABLED	YES		57-59 are Special Audit Adjustments (see previous pg.)		



Go To Adjustments Menu

Overview

The **Portals™ Service Menu System** provides 56 Adjustment Functions to vary game difficulty or to customize (e.g. Adjusting: High Score Levels; Balls per game; Game Pricing; Default High Scores; etc.). The Adjustment Functions are divided into 2 groups: 1st— **Sega Adjustments**, are the Game Play Generic Adjustments (1-48); 2nd— **South Park Adjustments**, are the Game Play Specific Adjustments (49-56); Any Adjustment(s) left open or are currently *Not Used*, are allowing for Future Expansion, if any, or are Proprietary. If the code version is upgraded, view Adjustments in the display & write the adjustment(s) in the blank(s) if any adjustment(s) were added. Each group may be viewed manually after entering the **Portals™ Service Menu** (see Chapter 1, Portals™ Service Menu Introduction, of this Section). All adjustments can be viewed at a glance with the **Game Adjustment Table** provided on the previous page. If a value is changed, the display will indicate **REQUEST INSTALLED**.



GO TO ADJUSTMENTS MENU

With the game in the Attract Mode, open the Coin Door and press the **Black "BEGIN TEST" Button**. Select the "ADJ" *Icon* in the **MAIN MENU** with either **Red "LEFT"** or **Green "RIGHT"** Button and press the **Black "ENTER" Button**. The **ADJUSTMENTS MENU** appears.

Important Notes:



Exit any sub-menu and return to the **MAIN MENU** by selecting & activating the "PREV" *Icons*. If no *Icons* appear in the display because of a testing function or special display (e.g. "Help"), press any button to exit.



Selecting & activating the "QUIT" *Icon* from any display will exit the Service Session.



Selecting & activating the "HELP" *Icon* from any display will show a help screen. (An explanation of each *Mini-Icon* at that level will cycle continuously until any active button is pressed.)



In Adjustments, selecting & activating the "-" *Icon* decrements the value setting. Selecting & activating the "+" *Icon* increments the value setting.



Selecting & activating the "ARROW" *Icons* selects the next or previous adj. in the group.



Sega Adjustments (1-48)

From the **ADJUSTMENTS MENU**, select the "SEGA" *Icon* with either **Red "LEFT"** or **Green "RIGHT"** Button and press the **Black "ENTER" Button**. Select and activate the "RIGHT ARROW" *Icon* to view the 1st adjustment in this group. Continue to select either of the "ARROW" *Icons* to view each adjustment one at a time. Select either the "-" or "+" *Icons* to change the value, if desired. The display will describe the adjustment number, the adjustment name, and the adjustment total or value. The current adjustment will remain in the display until the next adjustment is chosen or when the sub-menu is exited.

Adj. Nº	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 indicated Fixed. 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 Black "ENTER" Button . (If the Coin Door is closed or the operator enters the Portals™ Service Menu, the replay level is not changed.)
Adj. 2	Replay Levels	Adjust the number of replay levels to be active (1 to 4). Once the number of Replay Levels has been selected, a "Drop-Down" Table appears showing Replay Level 1. Adjust Replay Level 1 between 10M - 9.99B. Adjust Replay Level 2, 3 and/or 4 respectively.
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.)





Sega Adjustments Continued.

Adjustment Name	Adjustment Definition
-----------------	-----------------------

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 Set to **EXTRA EASY, EASY, MODERATE, HARD** or **EXTRA HARD**. (Note: Additional game features which are not adjusted may also change when adjusting this adjustment; see below table.) Default is **MODERATE**. Any one of the **INSTALL** settings (in a "Drop-Down" Table) for this adjustment may be activated to automatically select settings for multiple adjustments affecting game difficulty. Select and activate the "-" or "+" icons to choose the difficulty level required. After activation, the individual adjustments may be readjusted, if desired. Refer to the **Install Adjustment Table** below for details.

Adjustments which change when set to:	Extra Easy	Easy	Moderate	Hard	Extra Hard
(49) Extra Ball Memory	ON	ON	ON	ON	OFF
(50) MBall Restart	EXTRA EASY	EASY	MODERATE	HARD	EXTRA HARD
(51) Multiball Criterion	EXTRA EASY	EASY	MODERATE	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.	Adjustment Name	Setting	Adj.	Adjustment 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	High Score #1 Awards	1
4	Free Game Limit	0	18	High Score #2 Awards	0

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

Adj.	Adjustment Name	Setting	Adj.	Adjustment 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	High Score #1 Awards	1
			18	High Score #2 Awards	0

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

Adj.	Adjustment Name	Setting	Adj.	Adjustment Name	Setting
3	Replay Award	Extra Ball	16	Allow High Scores	No
4	Free Game Limit	00	17-20	High Score #1 - #4 Awards	0
11	Match Percentage	Off			

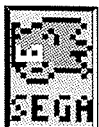
Adj. 7 Game Pricing

There are two methods available for coin switch programming: Standard & Custom. Standard pricing uses a single adjustment as seen in the first display. See the Standard Pricing Table. If "Custom" is selected, a "Drop-Down" Table appears. Select a pricing scheme shown in the **Custom Pricing Table** as seen below.

With Adjustment 7 set to **CUSTOM** operating the **Black "Enter" Button** again initiates a drop down menu representing coin switch pulses for the LEFT, CENTER, RIGHT and 4TH Coin Slots. The prescribed the number of pulses are required for 1 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 2 Credits. Further, if *Left Coin Pulses*, was set to 01 and *Coin Switch Pulses Required for 1 Credit*, to 02, 2 Coins in the Left Slot would be required for 1 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, 1 Credit would be posted for each of the first 3 Coins in the Left Slot and 2 Credits for the 4th Coin.





Sega Adjustment 7 Continued.

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 pulses required to post one credit; 00 to 99 .
Coin Switch Pulses Required for Bonus Credit	Set the number of pulses required to award the 1st Bonus credit(s); 00 to 99 .
Coin Switch Pulses Required for 2nd Bonus Credit	Set the number of 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 Mechanisms				<<< Adjustments >>>								
LEFT	CENTER	RIGHT	4TH	Plays/Coins	LEFT Pulses	CENTER Pulses	RIGHT Pulses	4TH Pulses	Pulses/ Credit	Pulses/ Bonus	Pulses /2nd Bonus	Credit /1st Bonus
25¢	\$1.00	25¢	N/U	1/25¢ 3/50¢ 1/25¢ 5/\$1.00 1/25¢ 6/\$1.00	01 01 05	04 04 20	01 01 05	00 00 00	01 01 04	02 04 20	00 00 00	01 01 01
5SCH	10SCH	10SCH	N/U	1/10 S 1/10 S 4/30 S	01 04	02 08	02 08	00 00	02 06	00 00	00 00	00 00
10p	50p	£1	20p	1/30p 2/50p 5/£1 1/50p 3/£1 1/30p 4/£1	01 01 01	06 05 05	15 15 12	02 02 02	03 05 03	00 00 00	00 00 00	00 00 00
20¢	N/U	\$1.00	N/U	1/60¢ 2/\$1.00	01	00	05	00	03	05	00	01

Below and the following page is the **Standard Pricing Select Table** for the individual countries listed. The **Pricing Scheme** is determined in two ways - **1:** The CPU/Sound Board Dip Switch (Sw. 300) Setting; and, **2:** The Country Setting Option. For each country listed, the Dip Switch Setting is shown (Column 1). At this time, not all countries have a *unique* Dip Switch Setting. For the countries without a unique setting, the USA Setting (or all positions in the "OFF" position) is used. In lieu of determining the best *Pricing Scheme* for your location, "pre-sets" were made available which would best suit any given situation. If the Factory Default setting is not the selection you feel is best for your location, choose any of the other pre-set settings. If any of these settings do not suit your needs, then **CUSTOM PRICING** will need to be accomplished (however, any "custom" changes made here will be lost after a **FACTORY RESET** so it is suggested to write down your unique set-up).

The Standard Pricing Select Table Explained:

Column 1: CPU/Sound Board Dip Switch 300 Settings: (self-explanatory). **Column 2:** Country Setting Option: The different available pre-sets are listed. **Columns 3-6:** Coin Mechanisms - These show the coinage through the available slots on the Coin Doors. Different countries use different Coin Doors. For example, USA style Coin Doors, which have only 2 coin acceptors (left & right) may utilize the "Center" slot cable for an optional Bill Validator. Different Coin Doors may have up to 4 coin acceptors. **Columns 7-10:** Pricing Scheme Explained - Shows the number of plays received for the monies required determined by the setting selected.

Standard Pricing Select Table

CPU/SOUND BOARD DIP SWITCH 300 SETTINGS		COUNTRY SETTING OPTION	Coin Mechanisms				Pricing Scheme Explained			
			COINS THRU ... SLOT:				Number of "Plays" for Price Amount Shown			
			LEFT	CENTER	RIGHT	4TH				
<div>Pos. 1 2 3 4 5 6 7 8</div> <div>ON</div> <div>OFF</div>		USA1	25¢	\$1.00	25¢		1 /25¢			
		USA2	25¢	\$1.00	25¢		1 /50¢	2 /75¢	3 /\$1.00	
		USA3 (Default)	25¢	\$1.00	25¢		1 /50¢			
		USA4	25¢		25¢		1 /50¢			
		USA5	25¢	\$1.00	25¢		1 /50¢	5 /\$2.00		
		USA6	25¢	\$1.00	25¢		1 /50¢	2 /'4 X 25¢	3 /\$1.00 Bill	← Used to promote the Bill Validator
		USA7	25¢	\$1.00	25¢		1 /50¢	4 /\$1.50	6 /\$2.00	
		USA8	25¢	\$1.00	25¢		1 /50¢	3 /\$1.00		

Used to promote the Bill Validator

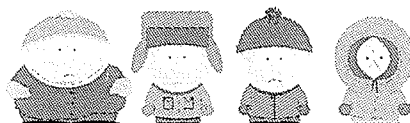


Standard Pricing Select Table - (Continued)

CPU DIP SWITCH SETTINGS, Location SW300 CPU/SOUND BOARD								COUNTRY SETTING OPTION † ‡	Coin Mechanisms COINS THRU ... SLOT: LEFT CENTER RIGHT 4TH				Pricing Scheme Explained Number of "Plays" for Price Amount Shown			
Pos. 1 2 3 4 5 6 7 8									Please Note: for all USA Settings, see previous page (bottom).							
ON ▲								Austria †	5S	10S	10S		1 /10S	2 /15S	3 /20S	
OFF ▼								Australia 1 ‡	20¢	\$A 1	\$A 2		1 /\$A 1	2 /\$A 2		
Pos. 1 2 3 4 5 6 7 8								Australia 2 ‡	20¢	\$A 1	\$A 2		1 /\$A 1	2 /\$A 2		
ON ▲																
OFF ▼								Belgium †	5 BF	20 BF	50 BF		1 /20 BF	3 /50 BF		
Pos. 1 2 3 4 5 6 7 8									This country uses unique Tokens and/or Debit Cards only (pricing varies).							
ON ▲								Brazil †	1 'coin'	4 'coins'	1 'coin'		1 /'2 coins'			
OFF ▼																
Pos. 1 2 3 4 5 6 7 8																
ON ▲								Canada †	25¢	25¢	Can\$ 1		1 /50¢	2 /75¢	3 / Can\$ 1	
OFF ▼																
Pos. 1 2 3 4 5 6 7 8								Denmark 1 ‡	1 DKr	5 DKr	10 DKr	20 DKr	1 /3 DKr	2 /5 DKr		
ON ▲								Denmark 2 ‡	1 DKr	5 DKr	10 DKr	20 DKr	1 /2 DKr	3 /5 DKr	7 /10DKr	
OFF ▼																
Pos. 1 2 3 4 5 6 7 8																
ON ▲								Finland ‡	1 Fmk	5 Fmk			1 /5 Fmk	4 /10 Fmk		
OFF ▼																
Pos. 1 2 3 4 5 6 7 8								France 1 †	1 Fr	5Fr	10 Fr	20 Fr	1 /3 Fr	2 /5 Fr	5 /10 Fr	11 /20 Fr
ON ▲								France 2	1 Fr	5 Fr	10 Fr	20 Fr	1 /5 Fr	3 /10 Fr	7 /20 Fr	
OFF ▼								France 3	1 Fr	5 Fr	10 Fr	20 Fr	1 /3 Fr	2 /5 Fr	4 /10 Fr	9 /20 Fr
Pos. 1 2 3 4 5 6 7 8																
ON ▲								Germany 1	1 DM	2 DM	5 DM		1 /1 DM	6/'1 X 5 DM'		
OFF ▼								Germany 2	1 DM	2 DM	5 DM		1 /2 DM	2 /3 DM	3 /4 DM	4 /5 DM
Pos. 1 2 3 4 5 6 7 8								Germany 3 †	1 DM	2 DM	5 DM		1 /2 DM	2 /3 DM	3 /4 DM	5 /5 DM
ON ▲								Germany 4	1 DM	2 DM	5 DM		1 /1 DM	6 /5 DM		
OFF ▼																
Pos. 1 2 3 4 5 6 7 8																
ON ▲								Greece ‡	50 Dr		100 Dr		1 /50 Dr	3 /100 Dr		
OFF ▼																
Pos. 1 2 3 4 5 6 7 8																
ON ▲								Hong Kong ‡	1 HK\$	2 HK\$	5 HK\$		1 /5 HK\$			
OFF ▼																
Pos. 1 2 3 4 5 6 7 8																
ON ▲								Hungary ‡	10 Ft	10 Ft	20 Ft		1 /20 Ft	3 /40 Ft		
OFF ▼																
Pos. 1 2 3 4 5 6 7 8								Italy 1 †	500 Lit		500 Lit		1 /500 Lit			
ON ▲								Italy 2	500 Lit		500 Lit		1 /1000 Lit	3 /2000 Lit		
OFF ▼																
Pos. 1 2 3 4 5 6 7 8								Japan 1 †			100¥		1 /100¥			
ON ▲								Japan 2			100¥		1 /100¥	3 /200¥		
OFF ▼																
Pos. 1 2 3 4 5 6 7 8																
ON ▲								Korea ‡	100 Won		100 Won		1 /100 Won			
OFF ▼																
Pos. 1 2 3 4 5 6 7 8								Netherlands 1	1 Fls.	1 Fls.	2.5 Fls.		1 /1 Fls.	3 /2.5 Fls.		
ON ▲								Netherlands 2 †	1 Fls.	2.5 Fls.	5 Fls.		1 /1 Fls.	3 /2.5 Fls.	6 /5 Fls.	
OFF ▼																
Pos. 1 2 3 4 5 6 7 8								New Zealand 1 ‡	\$NZ 1		\$NZ 2		1 /\$NZ 1	2 /\$NZ 2		
ON ▲								New Zealand 2 ‡	\$NZ 1		\$NZ 2		1 /\$NZ 1	3 /\$NZ 2		
OFF ▼																
Pos. 1 2 3 4 5 6 7 8								Norway 1 †	10 NKr	5 NKr	20 NKr		2 /10 NKr	1 /5 NKr	4 /20 NKr	
ON ▲								Norway 2	10 NKr	5 NKr	20 NKr		1 /10 NKr	3 /20 NKr		
OFF ▼																
Pos. 1 2 3 4 5 6 7 8																
ON ▲								Spain ‡	100 Pts		500 Pts		1 /100 Pts	6 /500 Pts		
OFF ▼																
Pos. 1 2 3 4 5 6 7 8								Sweden 1 †	1 SKr	5 SKr	10 SKr		1 /10 SKr	2 /15 SKr	3 /20 SKr	
ON ▲								Sweden 2	1 SKr	5 SKr	10 SKr		1 /5 SKr			
OFF ▼																
Pos. 1 2 3 4 5 6 7 8								Switzerland 1 †	1 SwF	2 SwF	5 SwF		1 /1 SwF	6 /5 SwF		
ON ▲								Switzerland 2	1 SwF	2 SwF	5 SwF		1 /1 SwF	3 /2 SwF	9 /5 SwF	
OFF ▼																
Pos. 1 2 3 4 5 6 7 8								UK 1 †	10p	50p	£1	20p	3 /£1	7 /£2	The Pricing Scheme using the New UK Dip Sw. Setting (with 2, 3 & 4 = ON), is the same (UK1 - UK6). Use only with the New Style Coin Mech. The New 50p & £2 Coins can be accommodated in 5th & 6th Coin Slots.	
ON ▲								UK 2	10p	50p	£1	20p	4 /£1	8 /£2		
OFF ▼								UK 3	10p	50p	£1	20p	1 /50p	2 /£1		
Pos. 1 2 3 4 5 6 7 8								UK 4	10p	50p	£1	20p	1 /30p	2 /60p	3 /90p	4 /£1
ON ▲								UK 5	10p	50p	£1	20p	1 /£1	3 /£2	This is "software controlled" by noting the presence/non-presence of pulses via Normal Coin Slots 1-4 (Left, Center, Right & 4th). If an old style Coin Mech is used, see new adjustment to accommodate.	
OFF ▼								UK 6	10p	50p	£1	20p	3 /£2			
SEE NOTES IN PRICING SCHEME																

Notes: † Indicates Factory Default for that setting.

‡ Indicates a USA Dip Switch Setting (all positions in the "OFF" position).





Sega Adjustments Continued.

Adjustment Name		Adjustment Definition
Adj. 8	Reset Coin Audits	Default is NO . Select the "+" <i>Icon</i> to change to YES . ⚠ When enabled, all <i>Coin Audits</i> (Audits 5-11), will be reset to zero.
Adj. 9	Reset Game Audits	Default is NO . Select the "+" <i>Icon</i> to change to YES . ⚠ When enabled, all audits will be reset to zero, except for the <i>Coin Audits</i> (Audits 5-11) and Audit 12, Software Meter (the only audit which cannot be reset to zero).
Adj. 10	Reset High Scores	When enabled (set to YES) the High Score Levels and associated initials will be restored to the backup settings when the "+" <i>Icon</i> is selected and activated.
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	Default is 3 . 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	Default is 30 . Adjust the maximum number of credits that may be posted: 4 to 50 .
Adj. 16	Allow High Scores	Set to YES or NO . When set to YES if a player exceeds any 1 of the 4 High Scores, the player may receive an award (depending on Adj. 3, Replay Award). Set to NO to disable this feature. There are 10 High Scores that will allow the player to enter their initials (or name) (See Adj. 32, Initials), however, only the top 4 can receive an award if this adjustment is enabled.
Adj. 17	High Score #1 Awards	Adjust the number of awards (0 to 4) awarded for exceeding level 1 (the highest of the four levels).
Adj. 18	High Score #2 Awards	Adjust the number of awards (0 to 3) awarded for exceeding level 2.
Adj. 19	High Score #3 Awards	Adjust the number of awards (0 to 2) awarded for exceeding level 3.
Adj. 20	High Score #4 Awards	Adjust the number of awards (0 to 1) awarded for exceeding level 4.
Adj. 21-30	Default High Score #1 - #10	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. 31, HSTD Reset Count. Adjust the backup score to which levels 2 - 10 may be reset, respectively.
Adj. 31	HSTD Reset Count	Default is 2,000 . 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 9,900 or OFF (no reset or adjustment).
Adj. 32	High Score Initials	Default is 3 INITIALS . When set to 3 INITIALS , player is allowed only 3 initials to input. When set to 10 LETTER NAME , player is allowed to enter 10 initials to input.
Adj. 33	Free Play	When set to YES , no coins are required for game play.
Adj. 34	Custom Message	Set to ON or OFF . When set to ON , this function is used to establish a custom message periodically displayed during the attract mode. Set the feature to CHANGE selecting the "+" <i>Icon</i> . Using either of the Flipper Buttons or the " RED " and/or " GREEN " Buttons, select either of the " ARROW " <i>Icons</i> . Press the " BLACK " Button (<i>Request Installed</i> blinks at the top of the display and the letter A is indicated in the first position in the display. Vary the letter(s) by operating the Left and Right Flipper Buttons (or " RED " or " GREEN " Buttons). 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. Select the "<" or ">" characters to back-space (erase) and/or to move forward in an already typed message. After completion, press the " BLACK " Button.





Sega Adjustments Continued.

Adjustment Name	Adjustment Definition
Adj. 35 Attract Mode Music	Set to ON or OFF . When set to ON , attraction music / sounds are played between games.
Adj. 36 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 will not flash.
Adj. 37 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 decreased 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. Adjust as required.
Adj. 38 Knocker Volume	Set to NORMAL , LOW or OFF . Default is NORMAL . When set to LOW , the volume is decreased 50%. When set to OFF , no sound is heard when the "knocker" is sounded.
Adj. 39 Minimum Game Time	Set between 0:01 - 8:59 for minimum game time. Default is OFF . 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. 40 Bkgrnd (Background) Music Volume	Set between 01 - 15 . Default is 01 . After volume is set via Portals Service Buttons (See Sec. 3, Chp. 1, ...Intro) this adjustment can be utilized to adjust the background music (1 all the way on, 15 all the way off) while keeping the Special Sound FX the same level.
Adj. 41 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 (if credits are available). (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. Review Section 2, Chapter 1, Game Operations & Features for details.
Adj. 42 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. 43 Bill Validator	Set to YES or NO . When set to YES , the display, in game attract mode, will show an "Insert Bill Animation." When set to NO , the display, in game attract mode will show "Insert Coin Animation."
Adj. 44 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 <i>Game Over Attract Mode</i> , as if a <i>Factory Reset</i> 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 <i>Free Play is enabled</i> . HOME - Sets game for Free Play, Extra Ball Play, No Replay, 10% Match & 30% Extra Ball .
Adj. 45 Euro. Token Disp.	Set to ON or OFF . When set to ON , the operator can enable the BRN/BRN-GRY Wires (out of the Main Cabinet Cable Harness, by bottom speaker) to drive an external device (e.g. European Token Dispenser) without the game giving a replay. (Ref. Coil #8 or Q8)
Adj. 46 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. 47 Location ID	00 to 9999 . Allows the operator to assign a location identification number to the audit print-out sheet. (<i>Will not be affected by Factory Reset.</i>)
See the end of this Sec. 3, Chp. 3, Go To Audits Menu, & Chp. 5, Go to Reset Menu, for more details on Factory Reset & Printing.	
Adj. 48 Game ID	00 to 9999 . Allows the operator to assign a game identification number to the audit print-out sheet. (<i>Will not be affected by Factory Reset.</i>)
See the end of this Sec. 3, Chp. 3, Go To Audits Menu, & Chp. 5, Go to Reset Menu, for more details on Factory Reset & Printing.	





South Park Adjustments (49-56) + (57-59 Special Audit Adj.)

From the **ADJUSTMENTS MENU**, select the "PARK" *Icon* with either **Red "LEFT"** or **Green "RIGHT"** **Button** and press the **Black "ENTER" Button**. Select and activate the "RIGHT ARROW" *Icon* to view the 1st adjustment in this group. Continue to select either of the "ARROW" *Icons* to view each adjustment one at a time. Select either the "-" or "+" *Icons* to change the value, if desired. The display will describe the adjustment number, the adjustment name, and the adjustment total or value. The current adjustment will remain in the display until the next adjustment is chosen or when the sub-menu is exited.

Adj. N°	Adjustment Name	Adjustment Definition
Adj. 49	Extra Ball Memory	Set to ON or OFF . Default is ON . When set to ON , the lit 'Extra Ball' light will be retained in memory from ball-to-ball for the same player. When set to OFF , the lit 'Extra Ball' light will go out at the end of each ball.
Adj. 50	MBall Restart	Set to EXEASY, EASY, MODERATE, HARD or EXHARD . Default is MODERATE . Determines how Multiball can restart.
Adj. 51	Multiball Criterion	Set to EXEASY, EASY, MODERATE, HARD or EXHARD . Default is MODERATE . Determines how the Multiball Feature is started and played.
Adj. 52	Toilet Mech Enabled	Set to YES or NO . Default is YES . When set to YES , the Tank Lid Lift Coil (Mr. Hankey) is operational. When set to NO , the Coil on the assembly is disabled. Use the NO setting, if the Assembly is malfunctioning or is awaiting service and/or repair.
Adj. 53	Kenny Mech Enabled	Set to YES or NO . Default is YES . When set to YES , the Kenny Coils are operational. When set to NO , the Coils on the assembly are disabled. Use the NO setting, if the Assembly is malfunctioning or is awaiting service and/or repair.
///// THIS ADJUSTMENT CAN ONLY BE ADJUSTED IF THE GAME HAS THE UK EPROM INSTALLED FOR UK SETTINGS /////		
Adj. 54	UK Post Save Enabled	Set to YES or NO . Default is NO , (UK Default is YES). When set to YES this feature is available when lit. Set to NO to disable this feature. (UK Games have Outlane & Center Post Save Devices which are accessed in a different way. Domestic games should cannot adjust this setting.)
///// THIS ADJUSTMENT CAN ONLY BE ADJUSTED IF THE GAME HAS THE UK EPROM INSTALLED FOR UK SETTINGS and HAS THE DIP SWITCH SETTING OPTION 2 SET (2,3, & 4 ON) /////		
Adj. 55	UK Coin Mech. Type	Set to CURRENT: 2 POUND AT #5 if using a Coin Control Mech 74-1129-104U (latest version). Set to OLD: 2 POUND AT #6 if using older version Coin Control Mech 74-1129-104.
Adj. 56	Adult Speech Enabled	Set to YES or NO . Default is YES . When set to YES , the original game program Adult Graphic Sound & Speech is used. When set to NO , the Sound & Speech is suitable for the Family Style Environment.



Special equipment is required for these Adjustments

The **Portals™ Service Menu System** provides 3 Audit Printing Adjustment Functions to print information on a "Hand-Held" printer, download game information to a Laptop PC or clear the printout count. A printer interface board, hand-held printer and/or a special software program is required to run this menu. Entering this menu and selection/activation of the *Icons* without this equipment/software will not affect the game.

Adj. 57	Printer Interface (Quick Printout)	For explanation see the end of Sec. 3, Chp. 3, Go To Audits Menu where this Adjustment can also be accessed via the "Go To Printer Menu."
Adj. 58	Alison Interface (Full Printout)	For explanation see the end of Sec. 3, Chp. 3, Go To Audits Menu where this Adjustment can also be accessed via the "Go To Printer Menu."
Adj. 59	N° of Copies Printed (Reset Printer)	For explanation see the end of Sec. 3, Chp. 3, Go To Audits Menu where this Adjustment can also be accessed via the "Go To Printer Menu."





Custom Message

To go directly to **Adjustment 34, Custom Message**, from the **ADJUSTMENT MENU**, select the "CUST MSG" *Icon* either **Red "LEFT"** or **Green "RIGHT"** **Button** and press the **Black "ENTER"** **Button**. Set the feature to **CHANGE** selecting the "+" *Icon*. Using either of the Flipper Buttons or the **"RED"** and/or **"GREEN"** **Buttons**, select either of the **"ARROW"** *Icons*. Press the **"BLACK"** **Button** (*Request Installed* blinks at the top of the display and the letter **A** is indicated in the first position in the display. Vary the letter(s) by operating the Left and Right Flipper Buttons (or **"RED"** or **"GREEN"** **Buttons**). 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. Select the "<" or ">" characters to back-space (erase) and/or to move forward in an already typed message. After completion, press the **"BLACK"** **Button**.



Film Star Reset

To reset the game with *Special Home Settings (not the normal Factory Setting)*, from the **ADJUSTMENT MENU**, select the "STAR" *Icon* either **Red "LEFT"** or **Green "RIGHT"** **Button** and press the **Black "ENTER"** **Button**. This *Special Setting* automatically changes **Adjustment 6, Game Difficulty**, to **EASY** and **Adjustment 33, Free Play**, to **YES**. This setting is determined to be ideal for the home environment. See Chapter 5, Go to Reset Menu, of this section, to change to factory defaults if changes made are not desired.

RESETTING & PRINTING ADJUSTMENTS NOTES:



Adjustment Note: Resetting Adjustments

To reset adjustments, from the **MAIN MENU** select the "RESET" *Icon*. See Chapter 5, Go to Reset Menu, of this section.



Selection of the "FACT" *Icon*, from the **RESET MENU**, will reset all adjustments to the *Factory Settings* (except for Proprietary Adjustments). The display will return to the **Attract Mode**. To perform any other functions, the system must be entered again by pressing the **Black "BEGIN TEST"** **Button** on the coin door (see Chapter 1, Introduction, of this section).



Adjustment Note: Printing Audit Information

To print audits, from the **AUDITS MENU** select the "PRNT" *Icon*. See Chapter 3, Go to Audits Menu, at the end of that section (*special equipment is required*).



Selection of the "QUICK" *Icon*, from the **PRINTER MENU**, will start a quick print.



Selection of the "ALISON" *Icon*, from the **PRINTER MENU**, will start a Full Printout (Downloads to a PC).



Selection of the "RESET" *Icon*, from the **PRINTER MENU**, will reset the total N° of copies value to zero.



Go To Reset Menu

Overview

The **Portals™ Service Menu System** provides three (3) functions to reset adjustments and/or audits back to the *Factory Setting*. See Chapter 3, Go to Audits Menu, and Chapter 4, Go to Adjustments Menu, for the Game Audits & Adjustments Information. If a reset of **Coin** or **Game Audits** is performed, the display will indicate **REQUEST INSTALLED** and return to the **RESET MENU**. If a **Factory Reset** is performed, the display will indicate **REQUEST INSTALLED**, the **Service Session** is *exited* & returns to the **Attract Mode**. Please note that once reset, all customized settings are lost! Certain *Audits & Adjustments* cannot be reset (refer to the details below).



GO TO RESET MENU

With the game in the **Attract Mode**, open the Coin Door and press the **Black "BEGIN TEST" Button**. Select the "RESET" *Icon* in the **MAIN MENU** with either **Red "LEFT"** or **Green "RIGHT" Button** and press the **Black "ENTER" Button**. The **RESET MENU** appears.

Important Notes:



Exit any sub-menu and return to the **MAIN MENU** by selecting & activating the "PREV" *Icon*.



Selecting & activating the "QUIT" *Icon* from the display will exit the Service Session.



Selecting & activating the "HELP" *Icon* from the display will show a help screen. (An explanation of each *Mini-Icon* at that level will cycle continuously until any active button is pressed.)



Reset Coin Audits

From the **RESET MENU**, select the "COIN" *Icon* with either **Red** or **Green Button** and press the **Black Button**. **▲** All Coin Audits (See Fig. 1) will be reset to *Factory Settings*. The display will indicate **REQUEST INSTALLED** and return to the **RESET MENU**. Coin Audits can also be reset from the **ADJUSTMENTS MENU, SEGA ADJUSTMENT 8**. See Chapter 4, Go to Adjustments Menu, of this section. After selecting this *Icon*, all of the **Coin Audits (5-11)** are reset to zero.



Reset Game Audits

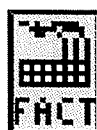
From the **RESET MENU**, select the "AUD" *Icon* with either **Red** or **Green Button** and press the **Black Button**. **▲** All Game Audits (See Fig. 2) will be reset to *Factory Settings*. The display will indicate **REQUEST INSTALLED** and return to the **RESET MENU**. Game Audits can also be reset from the **ADJUSTMENTS MENU, SEGA ADJUSTMENT 9**. See Chapter 4, Go to Adjustments Menu, of this section. After selecting this *Icon*, all of the **Audits** are reset to zero, except for the Coin Audits (Audits 5-11) and Audit 12, Software Meter. Audit 12 is the only audit which cannot be reset.

Fig. 1

• Reset Coin Audits	
Earnings Audits (Coin Audits Only 5-11)	
Au. N°	Description
1-4	The first 4 Audits in the game.
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
13 +	The remainder of the Audits.

Fig. 2

• Reset Game Audits	
Earnings (1-4), Generic/Specific Audits (13+)	
Au. N°	Description
1-4	The first 4 Audits in the game.
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
13 +	The remainder of the Audits.

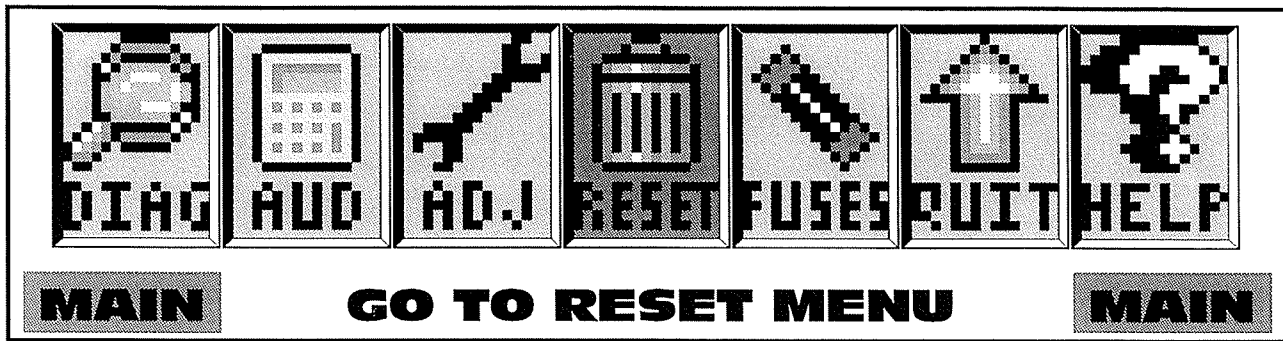


Factory Reset

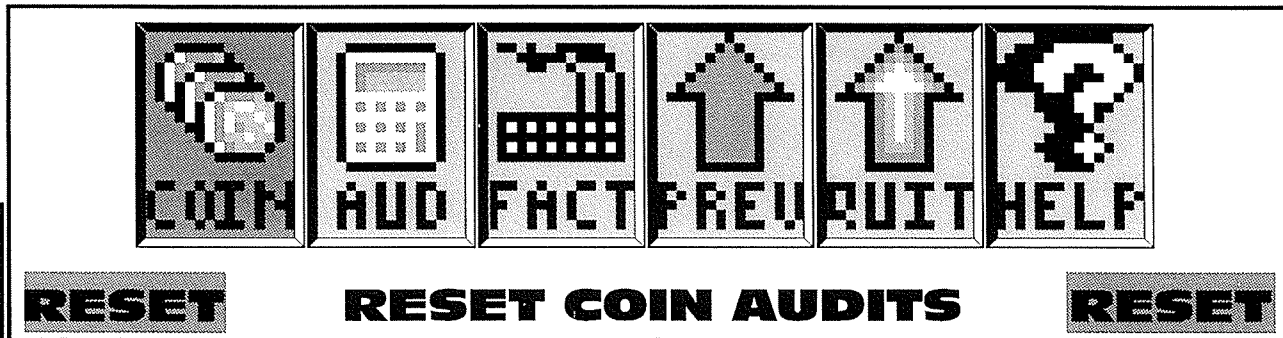
From the **RESET MENU**, select the "FACT" *Icon* with either **Red** or **Green Button** and press the **Black Button**. **▲** All adjustments will be reset to *Factory Settings* (except for Proprietary Adjustments). The display will indicate **REQUEST INSTALLED** and exit the Service Session. See Chapter 4, Go to Adjustments Menu, of this section, for the *Factory Settings* in the **Game Adjustment Table**.

Example:

From the **MAIN MENU**, use the **Red** or **Green Buttons** to select the "RESET" *Icon* (GO TO RESET MENU).



Press the **Black Button** to activate this **ICON**. This will bring up the **RESET MENU**.



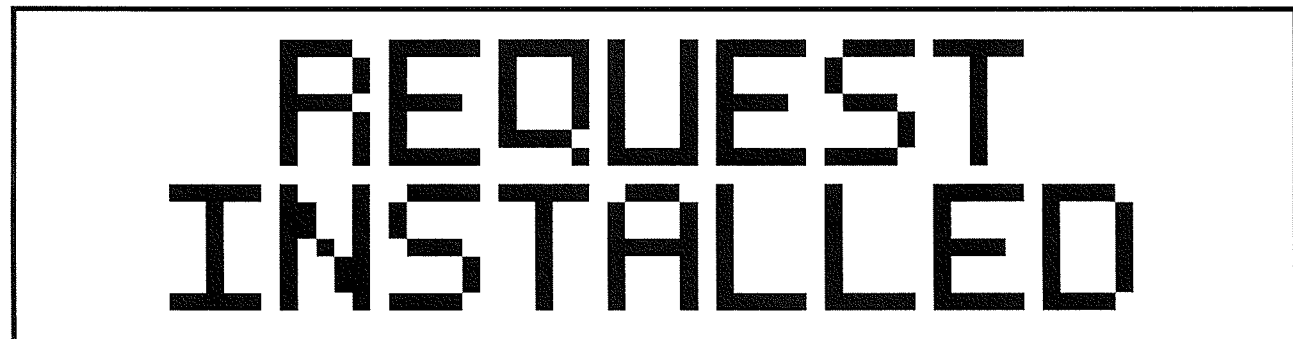
The **RESET MENU** now appears with the "COIN" *Icon* (RESET COIN AUDITS) flashing:



DO NOT PRESS THE START BUTTON AFTER SELECTING ANY THREE OF THESE ICONS UNLESS THIS IS WHAT IS DESIRED (SETTINGS WILL BE LOST)! PLEASE READ THE PREVIOUS PAGE FOR EXACTLY WHAT WILL HAPPEN IF ANY OF THESE THREE ICONS ARE ACTIVATED.



From the **RESET MENU**, select any of the *Icons* ("COIN", "AUD" or "FACT") with either **Red** or **Green Button** and press the **Black Button** to activate the **ICON** chosen.



If the "COIN" or "AUD" *Icons* are chosen and activated, the affected audits (see previous page) will be reset, the display will indicate **REQUEST INSTALLED** and the display will return to the **RESET MENU**.

If the "FACT" *Icon* is chosen and activated, all adjustments will be reset back to the *Factory Settings*. The display will indicate **REQUEST INSTALLED** (momentarily), the **Service Session** is automatically *exited* and returns to the **Attract Mode**.



Go To Fuses List

Overview

The **Portals™ Service Menu System** provides a current Fuse List for this game. The fuses are located in the Backbox (on the Display Power Supply Board and the I/O Power Driver Board), and also in the Cabinet (under the playfield by the Flippers and/or by any unique assembly, such as magnets). See the front of this manual (page DR. 1) for the complete Fuse List in the *Quick Reference Fuse Chart* and note the drawings.



GO TO FUSES LIST

With the game in the Attract Mode, open the Coin Door and press the **Black "BEGIN TEST" Button**. Select the "FUSES" *Icon* in the **MAIN MENU** with either **Red "LEFT" or Green "RIGHT" Button** and press the **Black "ENTER" Button**. Select and activate the "RIGHT ARROW" *Icon* to view the 1st fuse in this group. Continue to select either of the "ARROW" *Icons* to view each fuse one at a time. The display will describe the fuse identification number (e.g. F1, F6, F7, etc.), location of fuse (i.e. Backbox: Board name located on; or Cabinet: Under the playfield or in Service Outlet), rating of fuse (e.g. 5A 250v S.B. - i.e. 5 Amp, 250 volt, Slo-Blo), and 'use of fuse' (e.g. 90v DC High Voltage Power, etc.). The current fuse listed will remain in the display until the next fuse is chosen or when the sub-menu is exited.

Important Notes:



Exit any sub-menu and return to the **MAIN MENU** by selecting & activating the "PREV" *Icons*. If no *Icons* appear in the display because of a testing function or special display (e.g. "Help"), press any button to exit.



Selecting & activating the "QUIT" *Icon* from any display will exit the Service Session.



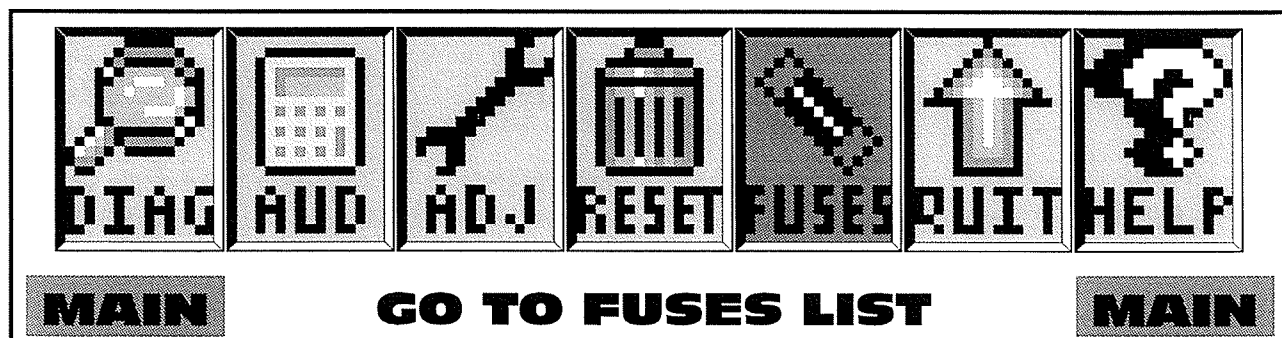
Selecting & activating the "HELP" *Icon* from any display will show a help screen. (An explanation of each *Mini-Icon* at that level will cycle continuously until any active button is pressed.)



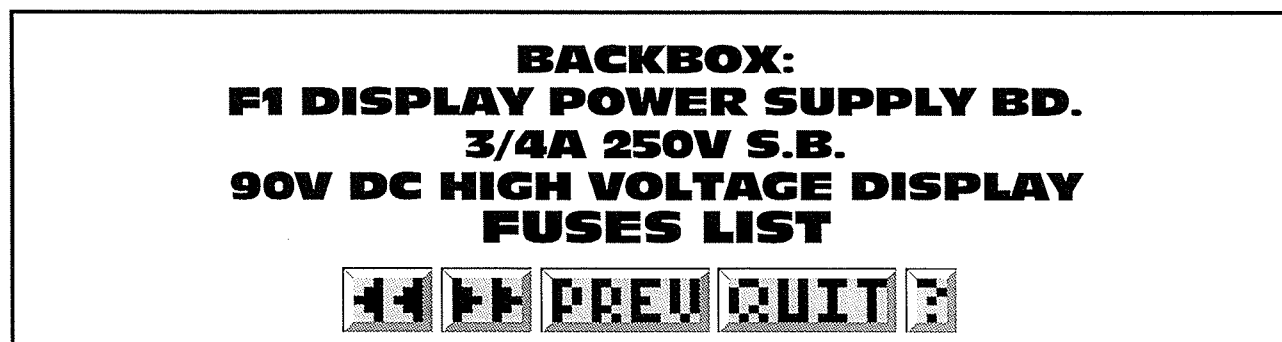
Selecting & activating the "ARROW" *Icons* selects the next or previous fuse in this group.

Example:

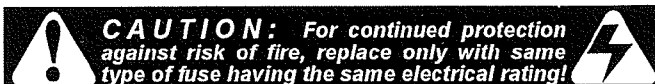
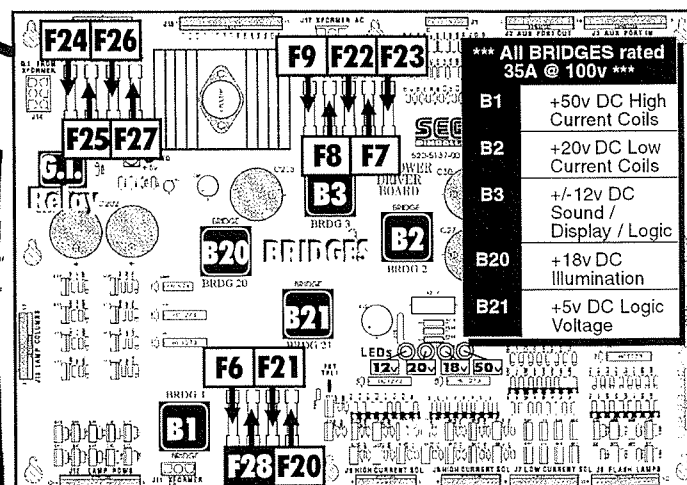
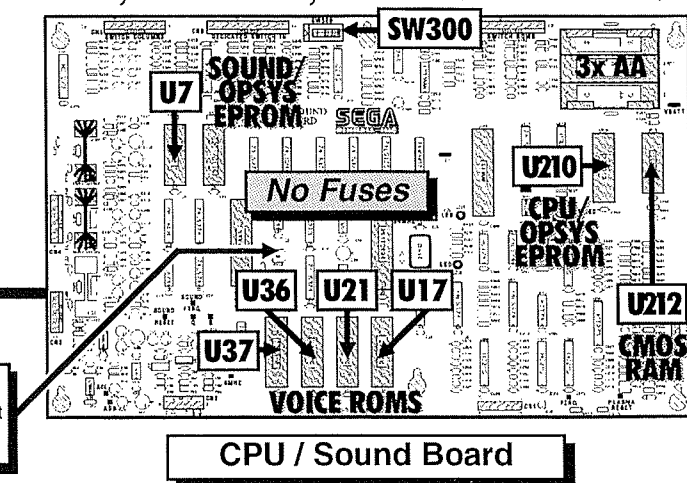
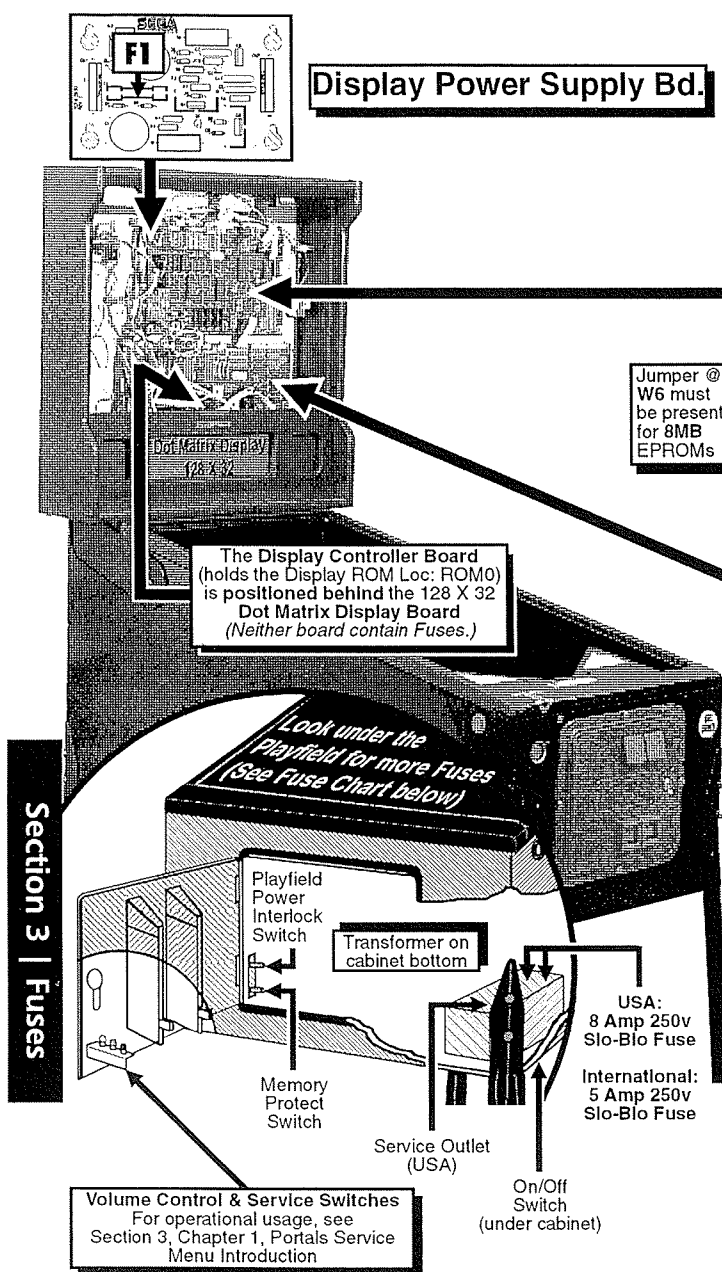
From the **MAIN MENU**, use the **Red or Green Buttons** to select the "FUSES" *Icon* (GO TO FUSES LIST).



Press the **Black Button** to activate this **ICON**. This will bring up the **FUSES LIST**.



▼ BACKBOX LAYOUT LOCATIONS: FUSES, BRIDGES, RELAYS & ROMs ▼



QUICK REFERENCE FUSE CHART			
Backbox Fuses			
LOC: DISPLAY POWER SUPPLY (P.S.) BOARD			
F1	¼A 250v S.B.	90v DC	High Voltage Display
LOC: I / O POWER DRIVER BOARD			
F6	7A 250v S.B.	50v DC	Primary High Power Coils/Flippers
F7	5A 250v S.B.	20v DC	Low Power Coils
F8	5A 250v S.B.	12v DC	Logic Power
F9	5A 250v S.B.	12v DC	Logic Power
F20	3A 250v S.B.	50v DC	Magnets
F21	3A 250v S.B.	50v DC	Coils
F22	8A 250v S.B.	18v DC	Controlled Lamps
F23	4A 250v S.B.	5v DC	Logic
F24	5A 250v S.B.	6.3v AC	G.I. Lamps (BRN-WHT to WHT-BRN)
F25	5A 250v S.B.	6.3v AC	G.I. Lamps (YEL to WHT-YEL)
F26	5A 250v S.B.	6.3v AC	G.I. Lamps (GRN to WHT-GRN)
F27	5A 250v S.B.	6.3v AC	G.I. Lamps (VIO to WHT-VIO)
F28	3A 250v S.B.	24v AC	Not Used / Spare
Cabinet Fuses			
LOC: SERVICE (AC) OUTLET BOX (Cabinet Bottom)			
n/a	8A 250v S.B.	115v AC	Main Fuse Line (Domestic or USA)
n/a	5A 250v S.B.	220v AC	Main Fuse Line (International)

QUICK REFERENCE FUSE CHART

South Park Playfield Fuses

LOC: UNDER PLAYFIELD (By Assemblies Listed)			
n/a	3A 250v S.B.	50v DC	Rt. Flipper (BLU-YEL↔RED-YEL)
n/a	3A 250v S.B.	50v DC	Lt. Flipper (GRY-YEL↔RED-YEL)



Go To Help Screen

Overview

The **Portals™ Service Menu System** provides help screens in each display (except if the display is in a testing mode). Each screen is basic and some terms may vary. At the beginning of each chapter in this section, *Icons* are shown and described to give detail of the particular function of the individual *Icons*. The table on the previous page was designed to help answer some questions of situations which may arise.



GO TO HELP SCREEN

With the game in the Attract Mode, open the Coin Door and press the **Black "BEGIN TEST" Button**. Select the "HELP" *Icon* in the **MAIN MENU** with either **Red "LEFT"** or **Green "RIGHT" Button** and press the **Black "ENTER" Button**. The **HELP SCREEN** appears cycling through the different icon usages pertinent to that menu level.

MENU HELP SCREEN
USE THE RED OR GREEN BUTTONS
TO CHANGE THE SELECTED ICON.
PRESS THE BLACK BUTTON TO
ACTIVATE THE SELECTED ICON.
THE FLIPPER & START BUTTONS
FUNCTION IN THE SAME WAY.

Important Notes:



Exit any sub-menu and return to the **MAIN MENU** by selecting & activating the "PREV" *Icons*. If no *Icons* appear in the display because of a testing function or special display (e.g. "Help"), press any button to exit.



Selecting & activating the "HELP" *Icon* from any display will show a help screen. (An explanation of each *Mini-Icon* at that level will cycle continuously until any active button is pressed.)



Selecting & activating the "QUIT" *Icon* from any display will exit the Service Session.



These "Mini-Icons" vary in functionality depending in what sub-menu they are used. Refer to the beginning of each chapter in this section for the function they serve in that menu or select the "HELP" *Icons* in the display where the *Icon* in question is being used.

Review Chapter 1, Introduction:

How to enter the **Portals™ Service Menu**. The chapter outlines the entire **Portals™ Service Menu**. View the **Icon Tree** in this manual which describes the names and menu descriptions of each *Icon*. View the display, after selecting and activating either of the "HELP" or "?" *Icons*.

Review Chapter 2, Go to Diagnostics Menu:

Find all the tests needed to troubleshooting the game.

Review Chapter 3, Go to Audits Menu:

Gather play information and printing functions (downloading).

Review Chapter 4, Go to Adjustments Menu:

Customize the game to vary difficulty of play or to change functions of the game.

Review Chapter 5, Go to Reset Menu:

Reset audits and adjustments to Factory Settings.

Review Chapter 6, Go to Fuses Menu:

View the location & descriptions of the game fuses (the same information is referenced in the Fuse Chart Table on DR. ①).

This concludes the **Portals™ Service Menu**. Review the Table of Contents at the beginning of this manual, and the detailed Table of Contents for Section 3 to quickly find the information required. The remainder of the sections in this manual will cover all the parts in this game and provide helpful information to aide in troubleshooting. If questions still arise after reading this section completely, call our Technical Support Department.





PORTALS™ SERVICE MENU PROBLEM/SOLUTION TABLE

Use this table for a quick simple solution(s) guide. For more technical assistance view Section 5.



PROBLEM	SOLUTION
Will not enter the Service Mode after depressing the Black "BEGIN TEST" Button .	<ul style="list-style-type: none"> • Check the Service Switch(es) (Red, Green & Black Buttons) for loose connections or bad Ground. • Check the associated wiring harness to/from the CPU Board Connector CN14. • Check CPU Board, possibly failed.
Service Buttons (Red, Green and Black) are nonfunctional.	<ul style="list-style-type: none"> • Check the Service Switches for poor connections or broken wires.
The display blanks out.	<ul style="list-style-type: none"> • Check the Dot Matrix Display for loose wiring harness connections. • Check Bridge Rectifier 3 & 8 Amp Slo Blo Fuse. Refer to Section 5, Chapter 4, Schematics & Troubleshooting.
Icons " <i>scroll</i> " along continuously in the MAIN MENU .	<ul style="list-style-type: none"> • If the Service Switch Set and/or the Coin Door was replaced, ensure the Locking Mechanism on the Green Button is removed. If the Green Button "<i>clicks</i>" and locks into an up/down position, the Green Button has this lock switch. Remove it. (Ref. to Service Bulletin #74.)
The Start and Flipper Buttons do not select or activate <i>Icons</i> in the SWITCH TEST MENU .	<ul style="list-style-type: none"> • This is normal. These switches are deactivated, as they are a part of the Switch Test. Use the Red "LEFT" or Green "RIGHT" & Black "ENTER" Buttons in this Sub-Menu (See Chapter 1).
Can't move selection of <i>Icon</i> with the Left and/or Right Flipper Buttons .	<ul style="list-style-type: none"> • Check the Flipper Buttons for loose connections or bad Ground and refer to the Game Manual Flipper Troubleshooting Flowchart. • This is normal only in Diagnostic's Switch & Active Switch Tests (see previous Problem).
Some <i>Icons</i> appear non-functional in the PRINTER MENU(S) .	<ul style="list-style-type: none"> • If no printing equipment is connected, the "<i>-</i>" <i>Icon</i>, "<i>+</i>" <i>Icon</i> and "RUN" <i>Icon</i> will appear not to function (See Chapter 5).
Some <i>Icons</i> appear non-functional in the GAME SPECIFIC MENU under the DIAGNOSTICS MENU .	<ul style="list-style-type: none"> • If there is no other test under this Menu, the "<i>Left Arrow</i>" & "<i>Right Arrow</i>" <i>Icons</i> will appear not to function. The remaining <i>Icons</i> should function as normal. Note: If there is no Game Specific Special Test, the "GAME SPECIFIC" <i>Icon</i> will not invoke another display.
The display returns to the ATTRACT MODE exiting the Service Session from the FACTORY RESET MENU .	<ul style="list-style-type: none"> • This is normal. After a FACTORY RESET, the Service Session is automatically exited (See Chapter 4 (end) or Chapter 6).
In COIL TEST MENU , the coils and flashlamps do not fire after activating the " RUN " <i>Icon</i> .	<ul style="list-style-type: none"> • Ensure the POWER INTERLOCK SWITCH (See figure on front inside cover) is pulled out.
In Portals™ Service Menu , the volume cannot be adjusted with the Red or Green Buttons .	<ul style="list-style-type: none"> • The Volume adjustment can only be made when the Service Menu is exited. The Volume Mode is entered by pressing the Red "VOLUME" Button. Then use the Red or Green Button to increase/decrease volume. (Red "LEFT" decrements; Green "RIGHT" increments.)
In Portals™ Service Menu , the display seems to lock up, or the Help Display appears to be non-functional.	<ul style="list-style-type: none"> • If you cannot clear the situation by exiting back one Menu, exit completely out of the Portals™ Service Menu, and re-enter. If the problem persists, call Tech. Support for additional help.



Parts Identification & Location (The Pink Pages)

Overview

This section provides the part numbers and locations of all the components in the pinball machine. The parts are arranged in basically 3 groups: Backbox, Cabinet, and Playfield. Generic parts which may change as production continues (quantity and/or size) are listed together. Quantities greater than 0 indicates that the part is used in this game. Since quantity changes *may occur*, an item indicating "0" may be used. Compare the item which needs to be replaced with the drawings provided (the posts, sockets, bulbs and rubber rings are drawn actual size). Major Assemblies & Ramps are detailed in the Blue Pages, Chapter 2. **Important:** Read all "Take Note:" items.

Section 4

Table of Contents

Chapter 1 (The Pink Pages)

Overview.....47

Backbox -

Backbox (Showcase II) Assy.
..... 48

Speaker Panel Assy. and
Assoc. Parts for the Backbox. 49

Cabinet -

General Parts 50

Cabinet & Playfield - Switches

..... 51

Playfield -

General Parts (Below)
..... 52

General Parts (Above)
..... 53

Rubber Parts
..... 54

Plastic, Decals and Mylar
..... 55

Rails and Ball Guides
..... 56

Metal Posts and Nuts
..... 57

Metal Spacers
..... 58

Plastic Posts and Spacers
..... 59

Small Bayonet Type Bulbs
and Sockets..... 60

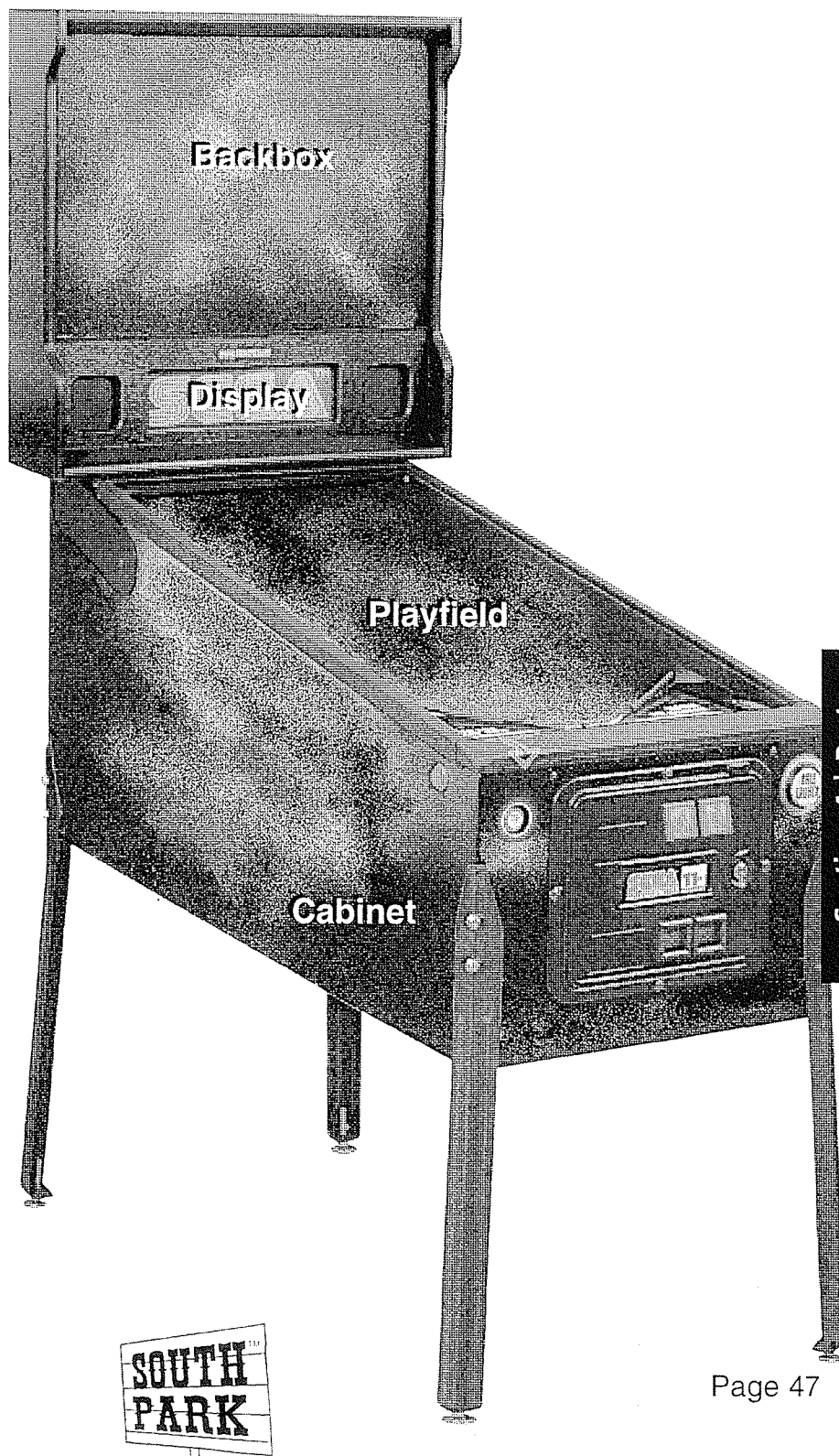
Large Bayonet Type Bulb
and Sockets..... 61

Wedge Base Bulbs
and Sockets62

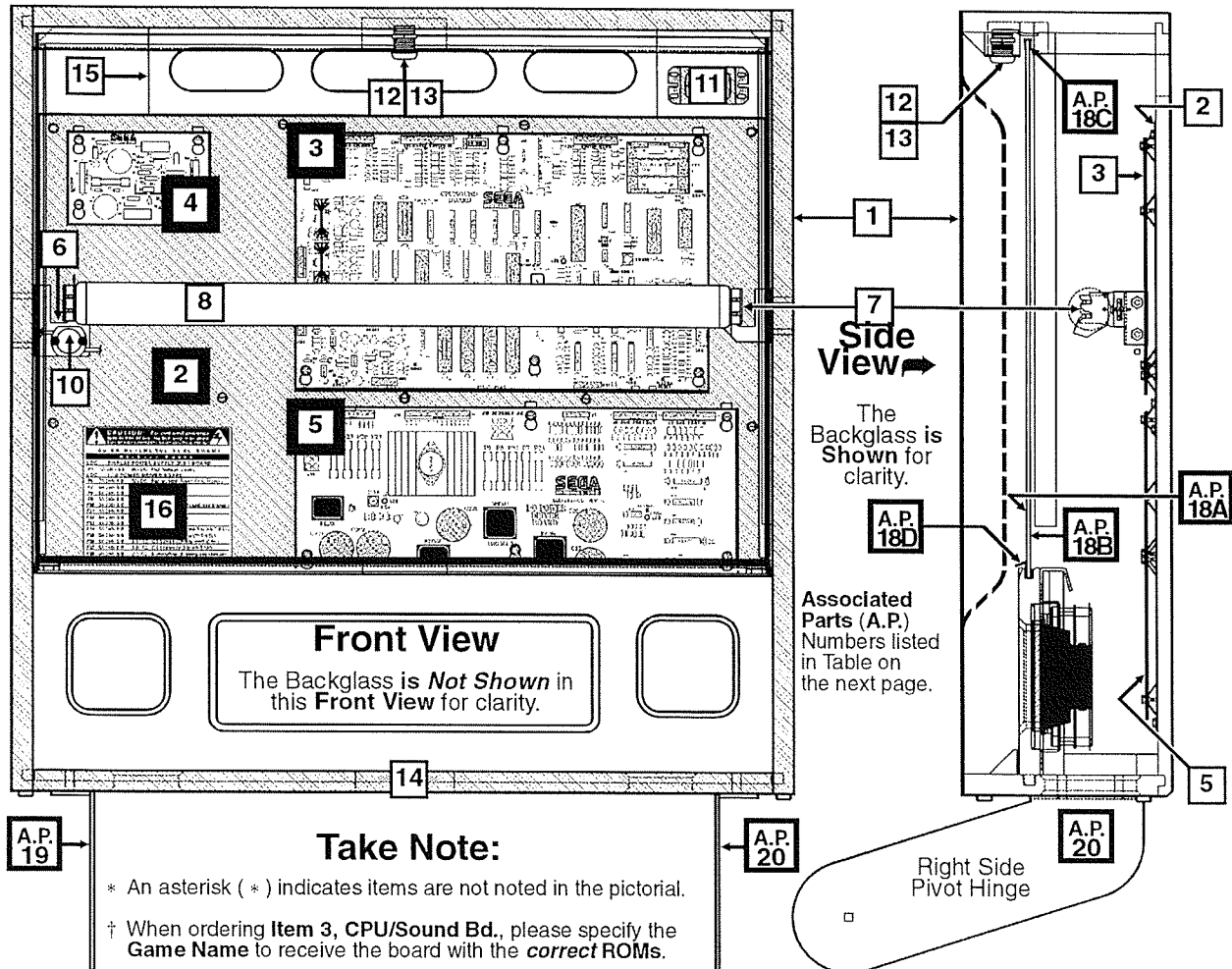
Chapter 2 (The Blue Pages)

Overview 63

Major Assembly Drawings
..... 64-78



Backbox (Showcase II) Assembly, 505-6002-71-71 (Items 1-27)



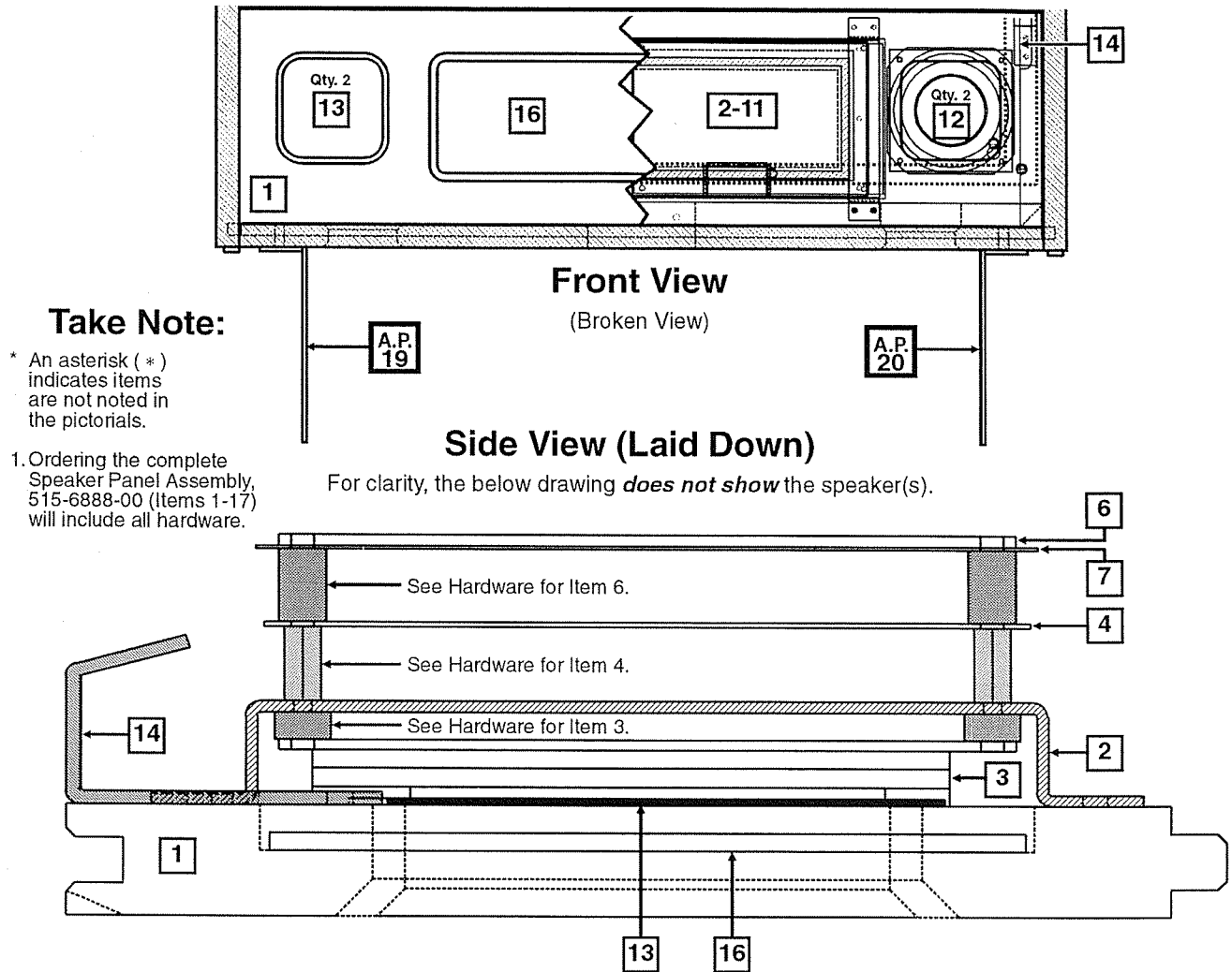
© "R" indicates item has a riveted-on part(s), if removing/adding rivets is not an option, order the entire
 © Sub-Assembly. **Please Note:** If the © Sub-Assembly **is not** available, call Technical Support.

Section 4 | Parts

Nº	Individual Part Name (Back)	QTY.	SPI Part Nº	Nº	Individual Part Name (Back)	QTY.	SPI Part Nº
1	Backbox Showcase II (Wood)	1	525-5505-20	14	#1 Roto Lock Female (R2-0002-02)	1	355-5006-02
Item 1 is Screened with South Park Art; Item 1 comes with Black T-Molding installed.				Item 14 is secured by: #10-24 X 1-3/4" CBSN (Qty. 1) (231-5022-00), #10-24 X 2" CB (Blk) (Qty. 1) (231-5045-00), #10-24 Keps Nut (Qty. 2) (240-5207-00) and #10 Washer 7/32" ID X .5" OD X 1/16" (Qty. 2) (242-5003-00)			
2	PCB Metal Mounting Plate	1	535-5809-04	Note: #1 Roto Lock Male (on Cabinet)			
Item 2 is secured to Item 1 by: #8 X 1/2" HWH AB (Zinc) Blue (Qty. 8) (234-5101-05)				15	Back Vent Grill 2-1/2" X 18"	1	545-5072-02
3	CPU/Sound Board (Mono) FCC-FEB98	1	520-5136-16	Item 15 is secured by: Staple 5/16" (Qty. 24) (631-5000-00)			
4	Display Power Supply Board	1	520-5138-00	16	Fuse Description Decal (Generic)	1	820-6152-00
5	I/O Power Driver Board	1	520-5137-01	17*	Fuse Description Decal Game Nº 71	1	820-6152-71
Items 3, 4 & 5 are secured to Item 2 by: #6-32 X 3/8" HWH MS (Qty. 19) (237-5903-00)				18*	Fuse Label (UL)	1	820-6143-00
6	Fluorescent Light Bracket Assy. Left	1	515-6545-00	19*	Backbox Date Label	1	820-5091-00
ORDERING ABOVE (ITEM 6) SUB-ASSY. PART Nº WILL INCLUDE:				20*	Ribbon Cable, 20-Pin	1	036-5000-04
6A	Fluorescent Light Bracket Left	1	535-7739-01	21*	Ribbon Cable, 26-Pin	1	036-5001-80
6B	Lamp Holder (Self-Locking)	1	077-5214-00	Item 20 (20-Pin) connects the CPU/Sound Board to the I/O Power Driver Board.			
6C	#6-32 X 5/8" PPH MS (Sems) Zinc	1	232-5203-00	Item 21 (26-Pin) connects the CPU/Sound Board to the Display Controller Board.			
6D	Starter Base (with Leads)	1	077-5213-00	22*	1/4" Clamp (Double)	3	040-5000-23
6E	#4-40 X 1/2" PPH MS (Sems) Zinc	2	237-5813-00	23*	1/2" Clamp (Single)	1	040-5000-06
7	Fluorescent Light Bracket Assy. Right	1	515-6545-01	24*	3/4" Clamp (Single)	3	040-5000-08
ORDERING ABOVE (ITEM 7) SUB-ASSY. PART Nº WILL INCLUDE:				25*	1" Clamp (Single)	5	040-5000-09
7A	Fluorescent Light Bracket Right	1	535-7739-00	Items 22-25 secured by: #8 X 1/2" HWH AB (Zinc) Blue (Qty. 12) (234-5101-05)			
7B-7C	Identical to Items 6B-6C above.	See 6B-6C		BACKBOX HEADERS:			
Items 6 & 7 are secured by: #10-24 X 1-1/4" Carriage Bolt Sq. Neck (Qty. 2/per) (231-5012-00) and #10-24 Keps Nut (Qty. 2/per) (240-5207-00)				26	South Park Cartman (6" Figurine)	1	880-5031-00
8	Fluorescent Tube (F20T12CW)	1	165-5031-02	Item 26 is secured by: 1/4"-20 X 2" PPH Bolt (Qty. 1) (237-6000-00), 1/4" Toggle Wing Nut (Qty. 1) (240-5324-00) and Washer 1/4" ID X 1" OD X .049" Thk. (Qty. 1) (242-5009-00)			
9*	3/4" X 3" Reinforced Strapping Tape	1	626-5040-00	27© Riveted Backbox Sign Disclaimer			
Above Item 9 is self-adhesive. It is located on Items 6 & 7. Sold in 12" Lengths only.				ORDERING ABOVE © RIVETED ASSY. PART Nº WILL INCLUDE:			
10	Starter - Fluorescent (FS2 Light)	1	165-5011-01	27A*	Screened Plastic Piece (Words) -22	1	830-5967-22
11	Ballast SP2/A 120v 60Hz 13W UL	1	010-5007-00	27B*	Sign "L" Bracket	2	535-6072-00
Item 11 is secured to Item 1 by: #6 X 3/8" HWH AB (Zinc) (Qty. 2) (234-5000-00)				27C*	Rivet, 1/8" Ø X 3/16" Lg. (2/per)	4	234-5003-00
12	Lock Mounting Plate	1	535-5860-00	Item 27 is secured by: #6 X 3/4" HWH AB (Zinc) (Qty. 2) (234-5003-00)			
13	Camlock (9231D-2) Cam 430V & Key	1	355-5008-01				
Items 12-13 are secured by: #8 X 5/8" TP Torx T20 (Qty. 2) (237-5947-00)							

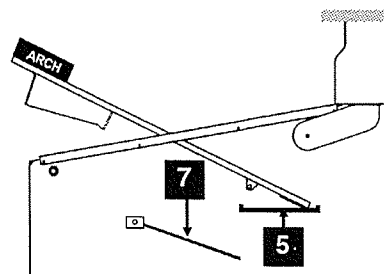
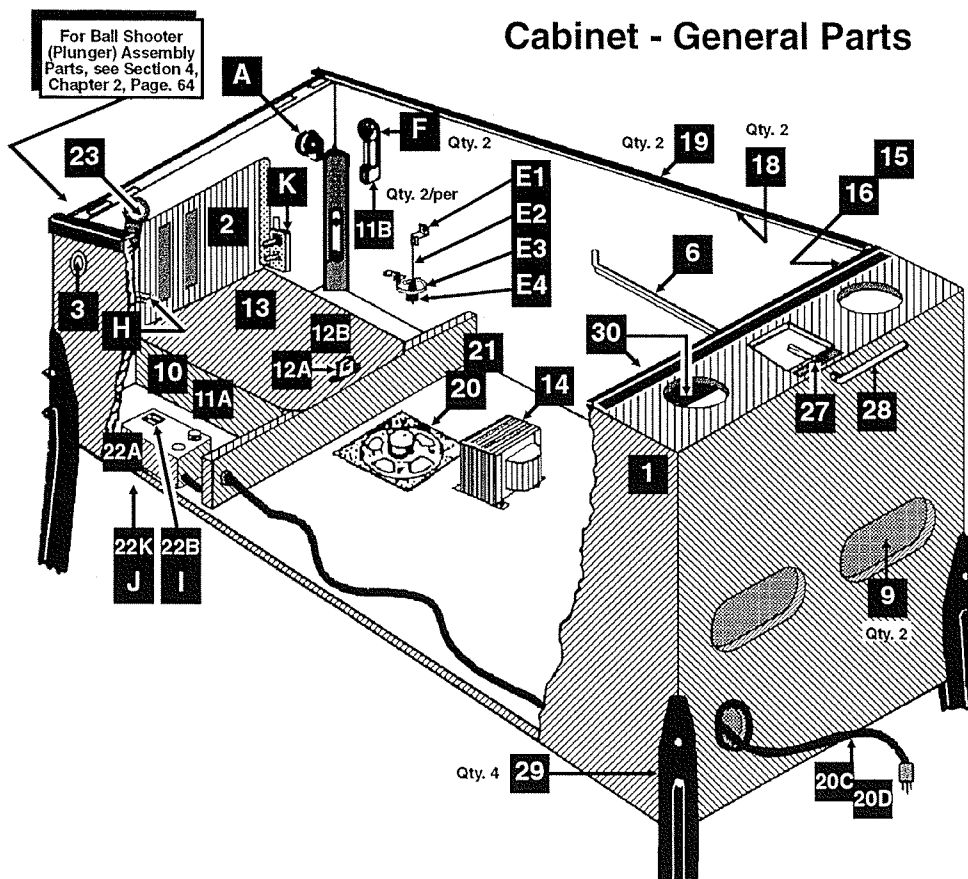


Speaker Panel Assy. for the Backbox (Showcase II), 515-6888-00 (Items 1-17) and Assoc. Parts: Backglass Assembly & Pivot Hinges (Left & Right) (Items 18-20)



Nº	Individual Part Name (Front)	QTY.	SPI Part Nº	Nº	Individual Part Name (Front)	QTY.	SPI Part Nº
1	Speaker Panel (for Showcase II)	1	525-5515-00	14	Speaker Panel Hook Bracket	2	535-7009-02
2	Dot Matrix Disp. Bd. Mounting Bracket	2	535-8368-01	Items 12, 13 & 14 secured by: #8 X 3/4" HWH AB (Zinc) (Items 12/13: Qty. 4/per; Item 14: Qty. 2/per) (234-5103-00)			
Item 2 secured to Item 1 by: #8 X 3/4" HWH AB (Zinc) (Qty. 4/per) (234-5103-00)				15*	Sega Logo (self-adhesive)	1	535-7877-00
3	Dot Matrix Display Board 128 X 32	1	520-5052-00	16	Plastic Shield (Display Cover)	1	545-5884-00
Item 3 secured to Item 2 by (at corners): 3/16" X 3/8" Spacer Gray (Qty. 4) (254-5000-18) and #6-32 X 1/2" HWH Swage (Serr) Zinc (Qty. 4) (237-5976-03)				Item 16 secured to Item 2 by: #6 X 3/8" HWH AB (Zinc) (Qty. 8) (234-5000-00)			
Item 3 secured to Item 4 (at the top center) by: 3/4" X 1/4" Hex Spacer #6-32 Tap (Qty. 1) (254-5008-04) and #6-32 X 1/4" PPH MS (Sems) Zinc (Qty. 1) (232-5200-00)				17*	Ground Strap (41")	2	600-5006-41
4	Static Shield (Steel Plate)	1	535-6437-00	The Associated Parts A.P. 18-20 are also noted in the Backbox (Showcase II) Assy. drawings on the previous page.			
Item 4 secured to Item 2 by: 1/2" X 1/4" Hex Spacer #6-32 Tap (Qty. 4) (254-5008-03) and #6-32 X 1/2" PPH MS (Sems) Zinc (Qty. 2, on Left Side only) (232-5202-00)				ASSOC. PARTS ARE NOT INCLUDED WITH BACKBOX/SPKR. PANEL ASSY'S.			
5*	Edge Protector (on Item 4)	2	545-5592-01	Nº	Assoc. Backbox Part Name	QTY.	SPI Part Nº
6	Display Controller Board FCC-FEB98	1	520-5055-03	18	Backglass Assembly (Game Nº 71)	1	515-5450-00-71
Item 6 secured to Item 4 by: 1/2" X 5/16" X .144 ID Spacer Tap (Qty. 3) (254-5014-00), #6-32 X 3/4" PPH MS (Sems) Zinc (Qty. 3) (237-5504-00), 1/2" X 1/4" Hex Spacer #6-32 Tap (Qty. 1) (254-5008-03) and #6-32 X 1/4" PPH MS (Sems) Zinc (Qty. 2) (232-5200-00)				ORDERING ABOVE (ITEM 18) SUB-ASSY. PART Nº WILL INCLUDE:			
7	RF Shield	1	820-5092-00	18A	Clear Backglass 25.906" X 19.187"	1	660-5038-02
Item 7 is secured inbetween: "Item 6" and its mounting hardware described.				18B	Screened Film (Game Nº 71)	1	830-5271-00
8*	Ground Strap (25") (on Items 4, 6, 12)	2	600-5006-25	18C	Top Plastic Channel - 26"	1	545-5018-15
9*	1/2" Clamp (Single) (on Item 4)	1	040-5000-06	18D	Bottom Plastic Lift Channel - 26-1/16"	1	545-5021-01
10*	Ribbon Cable, 14-Pin	1	036-5260-00	18E*	Plastic Edging (Left/Right) - 18-1/8"	2	545-5018-14
Item 10 (14-Pin) connects the Dot Matrix Disp. Board to the Disp. Controller Board.				18F*	Tape (double-sided) (12" Length)	1/2	626-5005-00
Above Item 11 is self-adhesive. Located between Items 3 & 17. Sold in 12" Lengths only.				Note: 18F secures 18E to 18A			
11*	Foam 3/16" Thk. X 1/4" X 36"	3	626-5026-00	19	Pivot Hinge Left	1	535-7999-00
12	Speaker (Shld.) 4" 8Ω MG Elec #4060SH	2	031-5004-01	20	Pivot Hinge Right	1	535-7999-01
13	Speaker Grill (Black w/no Artwork)	2	535-8081-00	Items 19 & 20 secured to Backbox by: 1/4"-20 X 1-1/4" C.B. Sq. Neck (Qty. 4) (231-5003-00) and 1/4"-20 Flange Nut (Qty. 4) (240-5300-00)			
				Items 19 & 20 secured to Cabinet by: 1/4"-20 X 7/8" Carriage Bolt Sq. Neck (Qty. 2) (231-5014-00), Hinge Spacer (Qty. 2) (530-5099-00), Washer 1/4" I.D. X 7/8" O.D. X 1/8" Yellow (Qty. 2) (242-5016-01), Washer 1/4" I.D. X 1" O.D. (Qty. 2) (242-5009-00) and 1/4"-20 Flange Nut (Qty. 2) (240-5300-00)			

Cabinet - General Parts



Take Note:

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

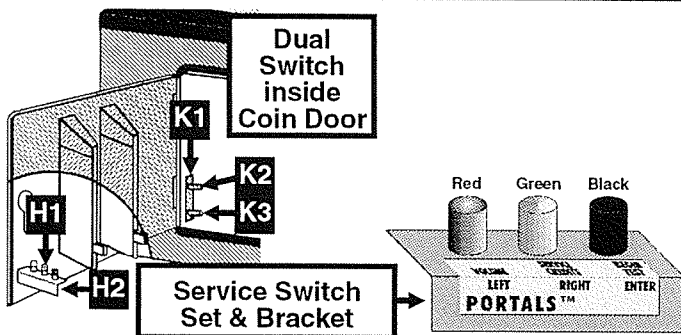
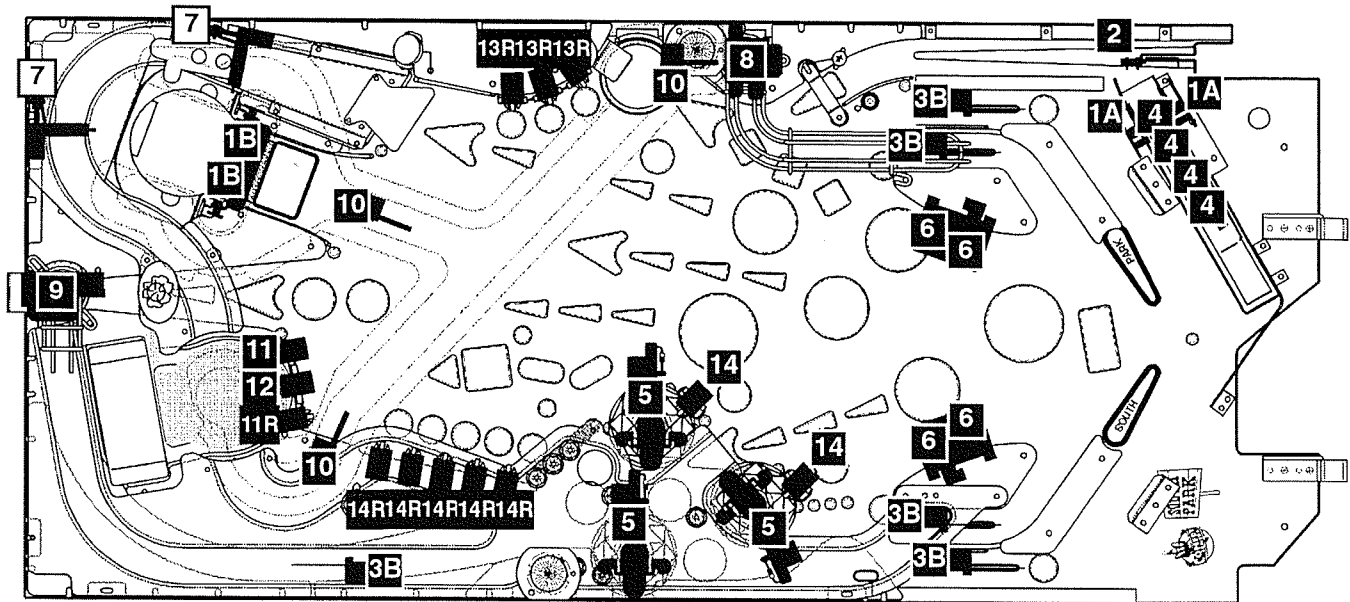
1. SEE NEXT PAGE FOR CABINET SWITCH NAME PART N° TABLE A-K.

2. See Playfield - General Parts (Below), Page 58, for associated brackets attached to the playfield.

Nº	Cabinet Part Name	QTY.	SPI Part N°	Nº	Cabinet Part Name	QTY.	SPI Part N°
1	Game 71 Screened Cabinet (Plain)	1	525-6000-71	19	Side Armor "with holes" (Lt. & Rt.)	2	535-7297-02
2	Coin Door (with Validator) USA only	1	500-5018-172	Item 19 is secured by: #10-24 X 1" Carriage Bolt Sq. Neck (2/per) (231-5021-00), #10-24 Hex Nut (2/per) (240-5202-00) and #8 X 5/8" T20 Tamper Proof (237-5947-00)			
Item 2 is secured by: 1/4"-20 X 1-1/4" Carriage Bolt Sq. Neck (Qty. 4) (231-5003-00) and 1/4"-20 Flange Nut (Qty. 4) (240-5300-00)				20	Speaker 8" ø Rd. 8010 4Ω	1	031-5007-00
NOTE: For Coin Door other than USA call Technical Support for SPI Part N°.				21	Speaker Grill 7" X 7"	1	545-5072-03
3	Flipper Button Assembly Red	2	500-5026-32	Items 20 & 21 are secured by: #6-32 X 1-1/4" Fin Shank Screw (Qty. 4) (237-5883-00) and #6-32 Keps Nut (Qty. 4) (240-5008-00)			
4*	Pal Nut for Flipper Button (Metal)	2	240-5003-01	22	Power Input Box Sub-Assy. (no Vol. pot)	1	515-5360-02
Item 4 is fitted with: O-Ring 11/32" X 7/32" X 1/16" (Qty. 1/per) (545-5850-00)				ORDERING ABOVE (ITEM 22) SUB-ASSY. PART N° WILL INCLUDE:			
5	Slide & Pivot Support Bracket - Right	1	535-5989-00	22A	Power Box (Plain)	1	535-5932-00
6	Slide & Pivot Support Bracket - Left	1	535-5990-00	22B	Service Outlet (for USA)	1	180-5008-01
Items 5 & 6 are secured by: #10-24 X 1-1/4" Carriage Bolt Sq. Neck (3/per) (231-5012-00) and #10-24 KEPS Nut (3/per) (240-5207-00)				22C	Line Cord 10' ROJ 3' Max.	1	034-5000-10
7	Prop Rod	1	535-7553-00	22D	Recessed Cup for Line Cord	1	545-5122-00
Item 7 is secured by: #10-24 X 1-3/4" Carriage Bolt Sq. Neck (231-5022-00), Washer #10 7/32" ID X .5" OD X 1/16" Thk and #10-24 Nylon Stop Nut (240-5206-00)				22E*	Line Filter	1	150-5000-00
8*	Mylar Carriage Bolt Cover Disc	2	820-5041-00	22F*	Varistor TNR159211KM	1	150-5001-00
9	Grills 2-1/2" X 18" (on Back & Bottom)	2	545-5072-02	22G*	Fuse 8 Amp 250v Slo-Blo (Domestic)	1	200-5000-05
10	Cash Box Plastic Bottom	1	545-5090-00	22I*	Fuse Holder	1	205-5001-00
11A	1/2" X 3/4" X 1-1/2" Black Foam Rubber Tape	1	626-5004-00	22J*	On/Off Switch Bracket	1	535-8318-00
Above Item 11A is self-adhesive. It is located behind Item 10. Sold in 12" Lengths only.				22K	On/Off Rocker SW. (Arcoelectric C1350AB)	1	180-5001-01
11B	Foam Strip (2/per Flipper Switch Front/Back)	4	626-5042-00	22L*	Power Box + Supplement Decals	1/1	820-6123-01/-04
12A	Cash Box Lock Bracket (wire)	1	535-7562-00	22M*	Fuse Label UL Decal	1	820-6143-00
12B	Large Hair-Pin Clip	1	535-7772-00	23	Front Molding Lockdown Assembly	1	500-5020-01
13	Cash Box Cover (Validator)	1	535-5013-03	Item 23 is secured by: #10-24 X 1-1/4" Carr. Bolt (Qty. 2) (231-5012-00), #10-24 Keps Nut (Qty. 2) (240-5207-00) and #10 Washer 7/32" ID X 1/2" OD X 1/16" (Qty. 2) (242-5003-00)			
14	Transformer with Ballast Winding	1	010-5012-00	24*	Front Molding Lockdown Spring	1	265-5008-00
Item 14 is secured by: 1/4"-20 X 5/8" PPH MS (Zinc) (Qty. 4) (237-5854-00) and 1/4" Split Lock Washer (Qty. 4) (244-5000-00)				25*	Front Molding - Black	1	500-5757-01-00
Item 14 Specifications: PRI 103.5 / 115 / 207 / 230V 50/60Hz 750VA Class 130 EPB0				26*	P/F Glass (Tmprd.) 21" X 43" X 3/16"	1	660-5001-00
15	Rear Glass Channel 20-3/8" Length	1	545-5038-00	27	#1 Roto Lock Male	1	355-5006-01
16	Foam Rubber 3/8" X 3/16" X 20-3/8"	2	626-5001-00	Note: #1 Roto Lock Female (on Backbox) 1 355-5006-02			
Above Item 16 is self-adhesive. It is located in Item 15. Sold in 12" Lengths only.				Item 27 is secured by: #10-24 X 1-3/4" Carriage Bolt Sq. Neck (Qty. 2) (231-5022-00) and #10-24 Nylon Stop Nut (Qty. 2) (240-5206-00)			
17*	Corrugated Tubing 1 1/4" ø (Black). (12')	2	605-5008-00	28	Hex Key Allen Wrench 5/16"	1	777-0001-00
Above Item covers the Cables Wiring Harnesses going into the Backbox from the Cabinet. Sold in 12" Lengths only.				29	Black Leg & Leveler Assembly	4	500-5921-50
18	Plastic Channel 42-5/8" Lg. (Lt. & Rt.)	2	545-5017-00	Item 29 is secured by: Leg Bolt Back Plate (535-5703-00) and Leg Bolt 3/8" X 16 X 2-1/2" Hex 5/8" Hd. (2/per) (231-5001-01) To order just a Leg Leveler (3/8" - 16 X 3") use SPI N°: 500-5017-00. A Leg "without" a Leg Leveler is not available.			
				30	Black Plastic Back Panel Shield	1	545-5928-00
				Item 30 is secured by: #6 X 1/2" PPH A Black (Qty. 3) (237-5805-00)			



Cabinet & Playfield - Switches



Take Note:

- * An asterisk (*) indicates items are not noted in the pictorial.
- 1. For switches used corresponding to the Switch Matrix Grid of this game, see Section 3, Chapter 2, ...Diagnostics.
- 2. For location of the Cabinet Switches, see the previous page.
- 3. See Appendix I for color choices, drawings and explanation on Normal & Rear mounted Modular Stand-Up Targets.
- 4. Legend Note: Items noted with a white square □ are mounted above the playfield; items noted with a black square ■ are mounted below the playfield or on/in the cabinet.

Nº	Cabinet Switch Name	QTY.	Part Nº	Nº	Playfield Switch Name	QTY.	Part Nº
A	Start Button Sw. Assy. (Red "Flipper" Style)	1	500-6090-02	1A	Dual OPTO TRANS Board	1	520-5173-00
B*	Coin Door Switch (USA)	4	180-5024-00		Dual OPTO REC Board		520-5174-00
	Coin Door Switch (¥ Japan)	n/a	180-5091-00	1B	Long Hop OPTO TRANS Board	1	520-5082-00
C	Large Round Auto Launch Assy.	0	Not Used		Long Hop OPTO REC Board		520-5083-01
D*	Slam Tilt Switch (On Coin Door)	1	180-5022-00	2	Shooter Lane Switch Assembly	1	500-6096-00
E	Cabinet Plumb Bob Tilt Switch	1	n/a	ORDERING ABOVE (ITEM 2) ASSEMBLY PART Nº WILL INCLUDE:			
ORDER ONLY INDIVIDUAL PARTS NEEDED (NO ASSY. NUMBER):				2A*	Micro Switch	1	180-5157-00
E1	Tilt Hanger Bracket	1	535-5221-00	2B*	Switch Mounting Bracket	1	535-6173-00
E2	Tilt Hanger Wire (Attached to bracket)	1	535-5319-00	2C*	#2-56 X 3/8" HWH MS (Ser) TF 3/16" Hd.	2	237-5938-01
E3	Tilt Contact Wire	1	535-7563-01	2D*	Diode, 1N4001	1	112-5001-00
E4	Tilt Plumb Bob (Atch'd to hanger wire)	1	535-5029-00	Item 2 is secured by: #6 X 1/2" HWH AB (Zinc) Red (Qty. 2) (234-5001-02)			
F	Flipper Cabinet Sw. - Self-Cleaning	2	180-5160-00	3A	P/F R/O Micro Sw. Assy. (Lt. Mount)	0	500-6227-01
G*	EOS Switch (on Lwr. Flippers)	2	180-5149-00	3B	P/F R/O Micro Sw. Assy. (Rt. Mount)	5	500-6227-02
H	Diagnostics Service Switches (X3)	1	180-5012-03	Item 3B is secured by: #6 X 1/2" HWH AB (Zinc) Blue (Qty. 2/per) (234-5101-05)			
Item H is secured to Diagnostics Switch Bracket (535-6860-01) on Coin Door.				4	Micro Switch (Roller Actuator, Lite-Force)	4	180-5119-02
I	Service Outlet - US	1	180-5008-01	5	Turbo Bumper Switch	3	180-5015-03
J	On/Off Rocker Sw. (Arcoelectric C1350AB)	1	180-5001-01	6	Slingshot Stack (Blade) Switch	4	180-5054-00
Item J is secured to On/Off Sw. Mounting Bracket (535-8318-00) on Cabinet Bottom.				7	Micro Switch (on Roll-Under Gates)	2	180-5087-00
K	Dual Switch Assembly	1	500-5808-00	8	Micro Switch (on Super VUK)	1	180-5052-00
ORDERING ABOVE (ITEM K) ASSEMBLY PART Nº WILL INCLUDE:				9	Micro Switch (on VUK, "Y" Actuator)	1	180-5116-01
K1*	Mounting Bracket	1	535-6958-00	10	Micro Switch (High Form, on Under-Trough)	3	180-5057-00
K2	Playfield Power Interlock Sw. (Top)	1	180-5136-00	11	Modular S-U Target Narrow (Green)	1	500-6138-04
K3	Memory Protect Switch (Bottom)	1	180-5000-00	11R	Mod. S-U Target Nar. Rear Mnt. (Green)	1	500-6138-04R
Item K is secured to Cabinet by: #8 X 1/2" HWH AB (Zinc) Blue (Qty. 2) (234-5101-05)				12	Modular S-U Target Rectangle (Red)	1	500-6228-02
SEE ABOVE PARTIAL CABINET DRAWING (H & K) AND PREVIOUS PAGE FOR CABINET SWITCH A-K LOCATIONS.				13R	Mod. S-U Trgt. Rnd. Rear Mnt. (Flo-Grn)	3	500-6075-11R
				14	Modular S-U Target Square (Flo-Green)	2	500-6139-11
				14R	Mod. S-U Target Sq. Rear Mnt. (Purple)	5	500-6139-09R
				Items 11-14 are secured by: #8 X 3/4" HWH AB (Zinc) (Qty. 2/per) (234-5103-00)			

Playfield - General Parts (Below)

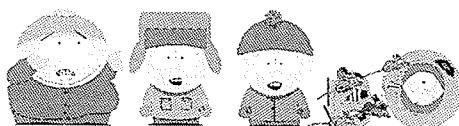
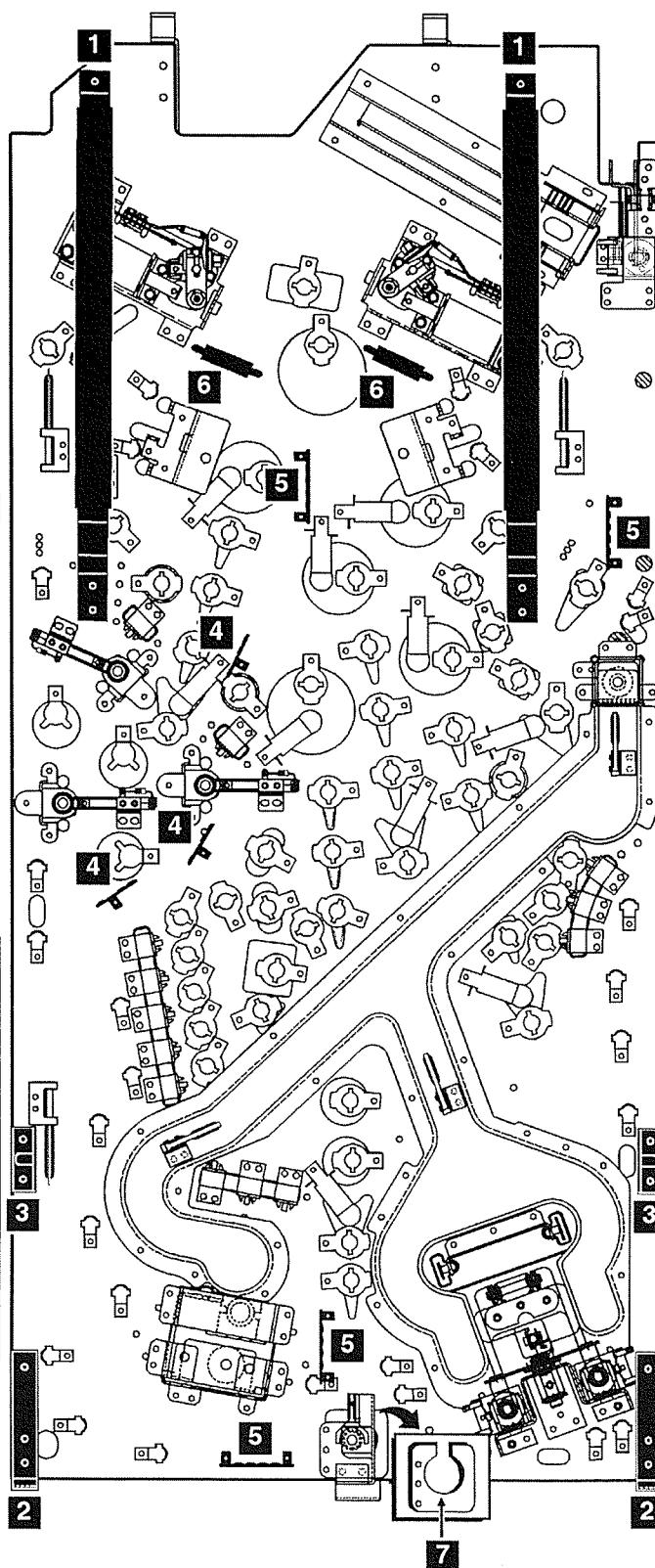
Nº	Below Playfield Part Name	QTY.	SPI Part Nº
1	Playfield Support Slide Bracket	2	535-6862-02
Item 1 is secured by: #8 X 1/2" HWH AB (Zinc) Blue (Qty. 2/per) (234-5101-05) and #8-32 X 5/8" HWH Swage (Serr) Zinc (Qty. 1/per) (237-5975-03)			
2	Edge Slide Bracket	2	535-5988-00
Item 2 is secured by: #4 X 1/2" PFH (Zinc) (Qty. 3/per) (237-5840-00)			
3	Pivot Pin Bracket Welded Assembly	2	500-5329-00
Item 3 is secured by: #8-32 X 5/8" HWH Swage (Serr) Zinc (Qty. 2/per) (237-5975-03)			
4	Diode Terminal Strip 3-Lug (813) Isolated	3	055-5204-03
5	Diode Terminal Strip 4-Lug (821) Isolated	4	055-5204-04
Items 4 & 5 are secured by: #6 X 3/8 HWH AB Zinc (Qty. 1/per) (234-5000-00). NOTE: 1N4001 Diodes (112-5001-00) are for Switches and/or Lamps. See Section 5, Chapter 2, Playfield Diode Terminal Strip Locations for Diode Usage & Wire Colors.			
6	3A 250v Slo-Blo Fuse	2	200-5000-08
	Fuse Clip Holder (Socket)		205-5000-01
Item 6, Fuse Clip Holder (Socket) 205-5000-01 is part of a set of 12 (205-5000-12). You can order them as Individuals (...-01) or a set of 12 (...-12). Items 6 is secured by: #6 X 1/2" PPH AB (Qty. 1/per) (237-5805-00)			
7	Wood VUK Spacer	1	525-5548-00

Nº	Miscellaneous Part Name	QTY.	SPI Part Nº
n/a *	3 1/2" Plastic Post (holds cables)	9	545-5253-01
n/a *	Screw Down Cable Tie	4	040-5005-00
n/a *	4" Cable Tie PLT1MXMR	230	040-5001-01
n/a *	5 1/2" Cable Tie PLT1.5I	15	040-5001-02
n/a *	5 1/2" Cable Tie PLT1.5M-XMR	142	040-5001-06
n/a *	Insulating Tubing #18 (Teflon) (12" Long)	1	605-5003-00
n/a *	Heat Shrink Tubing 1/8" Ø (BLK) (12" Lg.)	2	605-5002-00
n/a *	Heat Shrink Tubing 1/8" Ø PUI-24 (12" Lg.)	1	605-5006-00
n/a *	Heat Shrink Tubing 1/4" Ø (CLR) (12" Lg.)	3	605-5004-00
n/a *	Heat Shrink Tubing 1/4" Ø (BLK) (12" Lg.)	0	605-5004-01
n/a *	Split Flex Tubing 1 1/4" Ø (12" Long)	2	605-5008-00
n/a *	Split Flex Tubing 1/4" Ø (12" Long)	5	605-5008-01
n/a *	Split Flex Tubing 1/2" Ø (12" Long)	1	605-5008-02

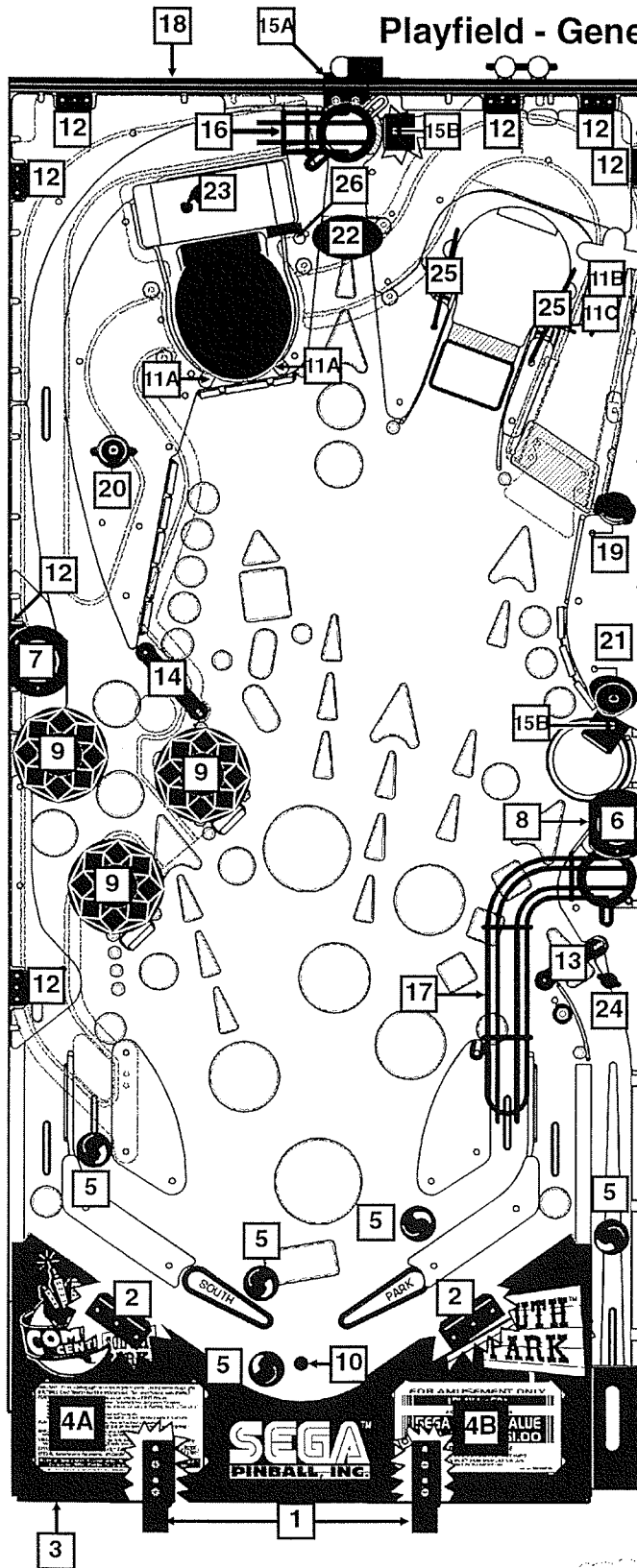
Tubular Note: Tubing is sold by the foot. The quantity shown is a multiple of that amount to cover lengths under 12" in this game. (e.g. a qty. of 6 means there is 5 feet plus up to 11" of tubing.)

Take Note:

- * An asterisk (*) indicates items are not shown on this page.
- 1. For Sockets & Bulbs (drawings & part numbers) see Pgs. 60-62.
- 2. For Major Assemblies, Ramps and/or Under Troughs, see the Blue Pages, Sec. 2, Chp. 2
- 3. For Switches see the previous page.
- 4. Tubing is used to insulate various cables/lugs. Tubing can only be ordered in 12" increments. Cut the amount required for each application. Cut sizes are variable in length. The quantities reflect total lengths required for entire game (averaged up to nearest foot). Quantities may change during production.
- 3. **Legend Note:** Items noted with a black square ■ are mounted below the playfield.



Playfield - General Parts (Above)

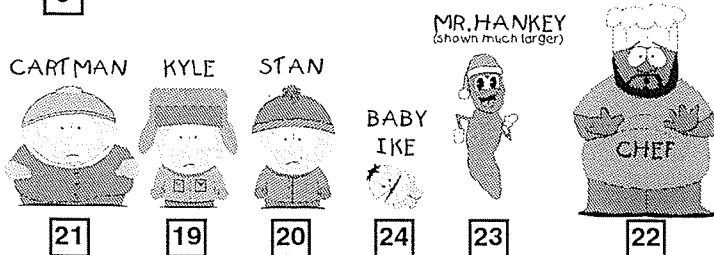


Nº	Above Playfield (P/F) Name	QTY.	SPI Part Nº
n/a *	P/F Screened w/ Inserts & NO Parts	1	830-5100-71
n/a *	P/F Complete w/ Inserts & ALL Parts		505-6004-71-71
1	Playfield Hanger Bracket	2	535-8385-00
Item 1 is secured by: #8-32 X 7/8" HWH MS Zinc (Qty. 2/per) (237-5890-00)			
2	Arch Retaining (Hold-Down) Brackets	2	535-8394-00
Item 2 is secured to the playfield by: #8 X 1/2" HWH AB (Zinc) Blue (Qty. 3/per) (234-5101-05)			
3	Arch Assembly (Metal)	1	500-6005-01
ORDERING ABOVE (ITEM 3) ASSEMBLY PART Nº WILL INCLUDE:			
3A*	Arch (Plain Black Metal) without Fork	1	535-8392-01
3B*	Nelson Protect Strip 8-9/16"	2	545-5212-02
Item 3 is secured to the playfield by: #10-32 X 5/16" PH FL U/C MS STL Zinc (Qty. 2) (237-6013-00)			
(Note: Decals are not included with the above. See Playfield - Plastic, Decals & Mylar.)			
4A	Instruction Card - South Park	1	755-5171-00
4B	Coin Card (50¢-1)	1	755-5087-50
4B	Coin Card (50¢-1 75¢-1/2 \$1-3)	1	755-5087-00
5	1-1/16" Steel Balls	5	260-5000-00
6	Mini-Mars Light Cover Snap-In (Red)	1	550-5030-02
7	Mini-Mars Light Cover Snap-In (Yellow)	1	550-5030-06
8@	Riveted Plastic Piece (Buty.) Assy.	1	515-7009-14-71
ORDERING ABOVE @ RIVETED ASSY PART Nº WILL INCLUDE:			
8A	Screened (Red) Plastic Piece -14	1	830-5967-14
8B*	2-Lug Stand-Up Short Socket	1	077-5101-00
8C*	Rivet, 1/8" ø X 3/16" Long	1	249-5001-00
9	Pop Bumper Cap Red	3	550-5057-02
10	Plug-Cap (3/16") Black Plastic	1	545-5232-01
11A	Rubber Lite Cover GREEN	2	545-5014-04
11B	Rubber Lite Cover YELLOW	1	545-5014-06
11C	Rubber Lite Cover ORANGE	1	545-5014-07
12	Ramp Mounting Welded Bracket	7	515-6508-00
Item 12 is secured to the Rails by: #6 X 3/4" HWH AB (Zinc) (Qty. 2/per) (234-5003-00)			
13	1-Way Gate Mounting Bracket (Sm.)	1	535-5269-03
	Wire Gate (for above)		535-5307-03
14	1-Way Gate Mounting Bracket (Lg.)	1	535-5269-06
	Wire Gate (for above)		535-5307-09
15A	Snubber Brkt. (Ball Stop) Weldment	1	515-6973-00
15B	Snubber Bracket (Ball Stop) Standard	2	535-8250-01
16	Wire Ramp (Top VUK)	1	515-6971-00
17	Wire Ramp (Bottom SVUK)	1	515-6972-00
18	Black Wood Back Panel (w/Inserts)	1	525-5550-00
19	South Park Kyle (Small Figurine)	1	880-5025-00
20	South Park Stan (Small Figurine)	1	880-5026-00
21	South Park Cartman (Small Figurine)	1	880-5027-00
22	South Park Chef (Small Figurine)	1	880-5028-00
23	South Park Mr. Hankey (Sm. Figurine)	1	880-5029-00
24	South Park Baby Ike (Small Figurine)	1	880-5030-00
Items 19 & 21 are supported by: 2" .0450 Music Wire (Qty. 1/per) (265-5058-00);			
Item 20 is supported by: 1" .0390 Music Wire (Qty. 1) (265-5058-01)			
Item 24 is supported by: 2" .0300 Music Wire (Qty. 1) (265-5058-02)			
Items 19, 20, 21 & 24 require: Clear Plstc. Wshr. .19 X .63 X .03 (Qty. 2/per) (545-6502-00)			
Items 19, 20, 21 & 24 are secured by: #6 X 3/4" HWH AB (Zinc) (Qty. 1/per) (234-5003-00)			
For securing hardware for Items 22 & 23 see the Blue Pages for the Assy. its associated with.			
25	Trap Spring (Prevent Ball Traps)	2	265-5051-00
26	Clear Bumper Dot (Self-Adhesive)	1	280-5012-00

Take Note:

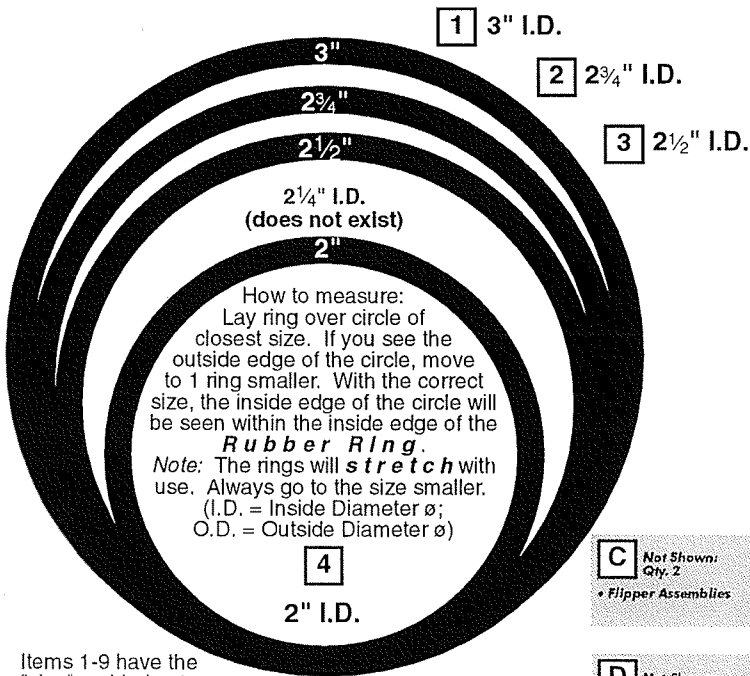
* An asterisk (*) indicates items are not noted in the pictorial.

@ "R" indicates item has a riveted-on part(s), if removing/adding rivets is not an option, order the entire @ Sub-Assembly. **Please Note:** If the @ Sub-Assembly is not available, call Tech. Support.

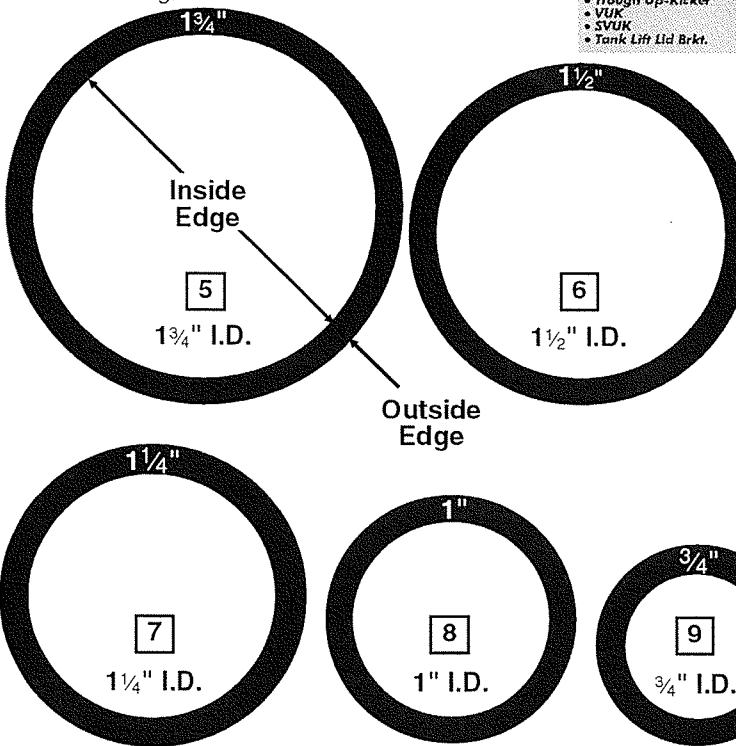


- Some unique parts may be included with or associated with a Major Assembly or Ramp Assembly; see the Blue Pages for parts required not appearing on this page. If you still cannot find the part required, call Sega Pinball Technical Support, 1-800-542-5377.
- Legend Note:** Items noted with a white square □ are mounted above the playfield.

Playfield - Rubber Parts (Rings Actual Size) †

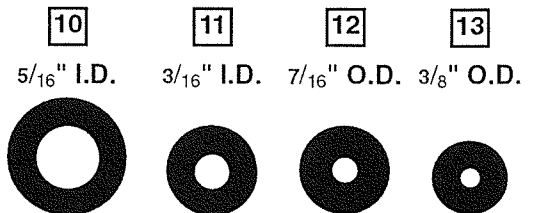
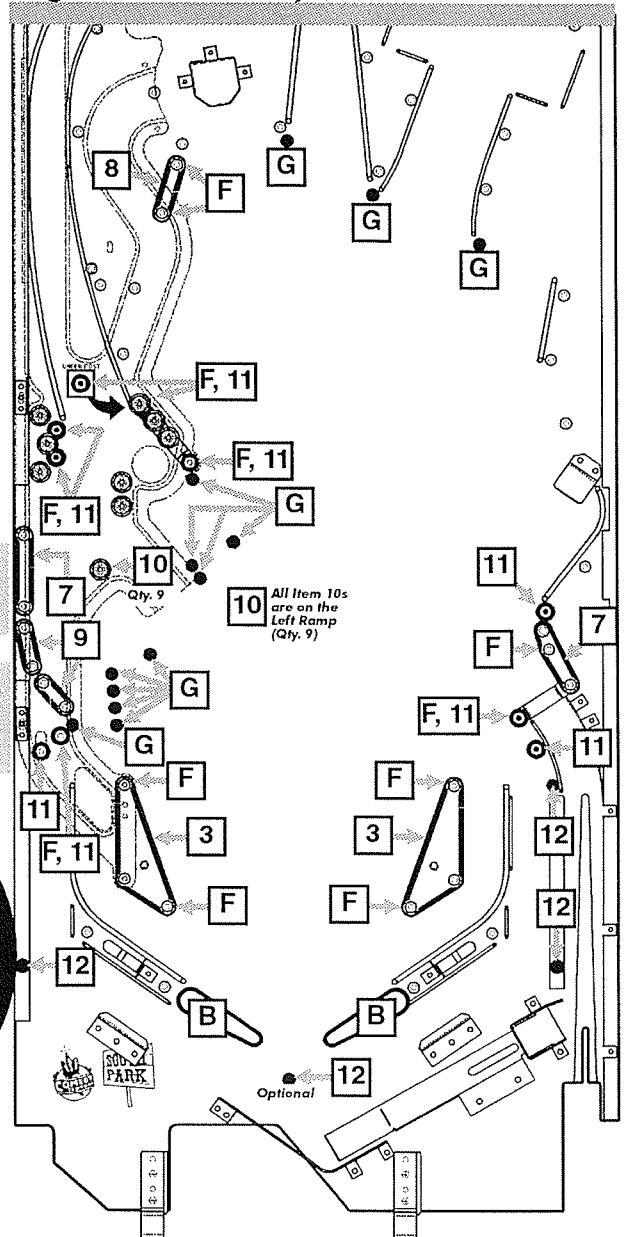


Items 1-9 have the "size" molded onto the Rubber Ring.



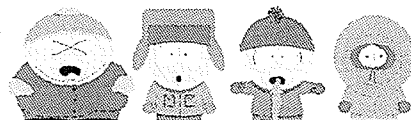
C Not Shown:
Qty. 2
• Flipper Assemblies

D Not Shown:
Qty. 4
• Trough Up-Kicker
• VUK
• SVUK
• Tank Lift Lid Brkt.

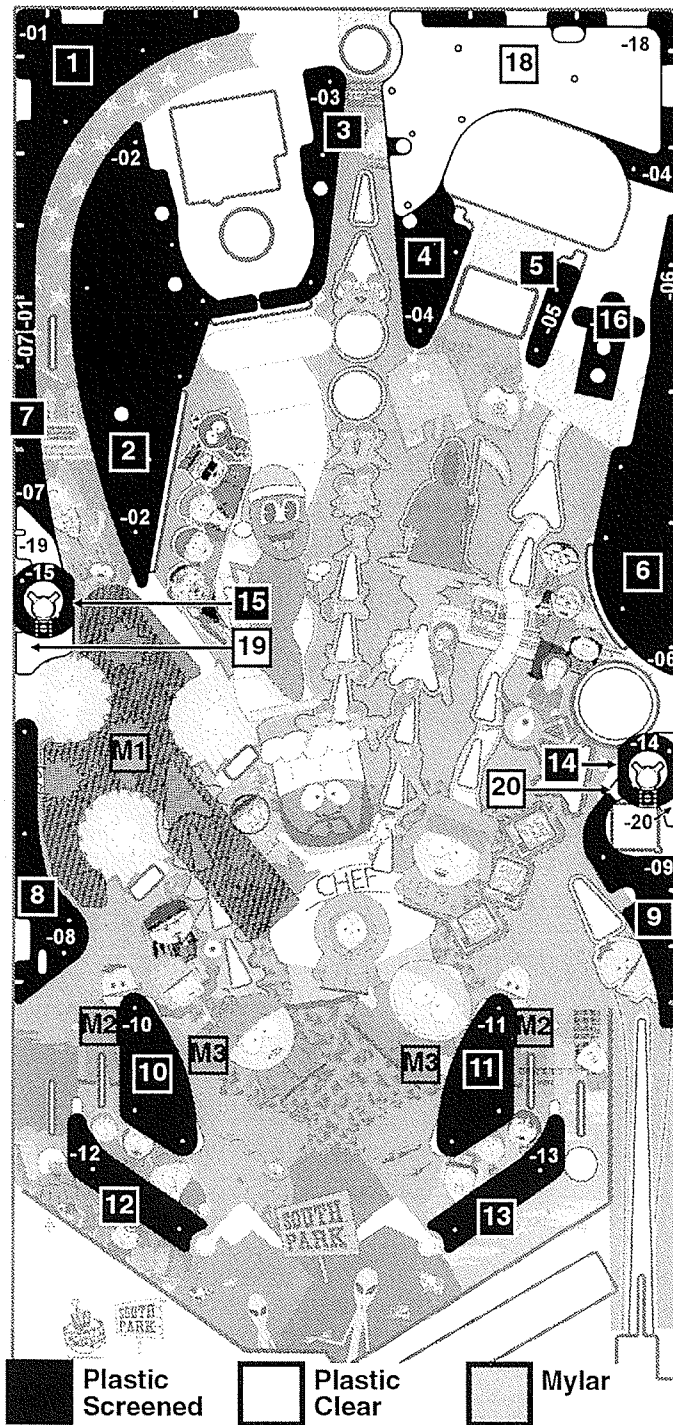


Section 4 | Parts

Nº	Rubber Part Name	QTY.	Part Nº	Nº	Rubber Part Name	QTY.	Part Nº
A	Small Flipper Rubber Ring	0	545-5207-00	4	2" I.D. Black Rubber Ring	0	545-5348-08
B	Large Flipper Black Rubber Ring	2	545-5277-00	5	1 3/4" I.D. Black Rubber Ring	0	545-5348-21
C*	Rubber Deflector Pad (Bumper)	2	545-5428-00	6	1 1/2" I.D. Black Rubber Ring	0	545-5348-07
D*	Rubber Bumper (Grommet)	4	545-5105-00	7	1 1/4" I.D. Black Rubber Ring	2	545-5348-06
E	Bumper Post Rubber	0	545-5009-00	8	1" I.D. Black Rubber Ring	1	545-5348-05
F	Post Rubber (Sleeve Short)	13	545-5151-00	9	3/4" I.D. Black Rubber Ring	2	545-5348-04
G	Post Black Rubber (Sleeve Tall)	13	545-5308-00	10	5/16" I.D. Black Rubber Ring	9	545-5348-02
1	3" I.D. BLK Rubber Ring	0	545-5348-10	11	3/16" I.D. Black Rubber Ring	9	545-5348-01
2	2 3/4" I.D. Black Rubber Ring	0	545-5348-20	12	7/16" O.D. Black Rubber Ring	4	545-5348-17
3	2 1/2" I.D. Black Rubber Ring	2	545-5348-09	13	3/8" O.D. Black Rubber Ring	0	545-5348-19



Playfield - Plastic (Butyrate), Decals and Mylar



Take Note:

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

© "R" indicates item has a riveted-on part(s), if removing/adding rivets is not an option, order the entire © Sub-Assembly.

- To order the entire Decal or Plastic (Screened or Clear) sheets, use the Part N° with the "-XX" ending. For individual pieces replace the "-XX" with appropriate last 2-Digit N°. *Attention: Individual pieces may not be available.*
- Legend Note:** Items noted with a black square ■ are Screened; ...a white square □ are © Clear; ...a gray square ▒ are Mylar.

N°	Plastic (Butyrate) Name	QTY.	SPI Part N°
Note: Some pieces are © clear OR © riveted.			
1	Top Left Corner (Screened)	1	830-5967-01
2	Left of Toilet (Screened)	1	830-5967-02
3	Right of Toilet (Screened)	1	830-5967-03
4	Top Right Corner (Screened)	1	830-5967-04
5	To Kenny Assy. Rt. Side (Screened)	1	830-5967-05
6	Right Side Playfield (Screened)	1	830-5967-06
7	Left Side Playfield (Screened)	1	830-5967-07
8	Lower Lt. Side Playfield (Screened)	1	830-5967-08
9	Lower Rt. Side Playfield (Screened)	1	830-5967-09
10	Left Slingshot (Screened)	1	830-5967-10
11	Right Slingshot (Screened)	1	830-5967-11
12	Left Return / Outlane (Screened)	1	830-5967-12
13	Right Return / Outlane (Screened)	1	830-5967-13
14©	Right Side Flash (Solid Yellow)	1	830-5967-14

Item 14 has a socket © riveted to it. If you need this Item 14 with the socket already riveted, see Sec. 4, Chp. 2, ...Major Assemblies & Ramps, Page 76 (Item A.P. 5).

15©	Left Side Flash (Solid Red)	1	830-5967-15
-----	-----------------------------	---	-------------

Item 15 has a socket © riveted to it. If you need this Item 15 with the socket already riveted, see Playfield - General Parts (Above), Page 53 (Item 8).

16	Ramp Sign [Mr. Hankey] (Screened)	1	830-5967-16
17*	Alternate Ramp Sign [Kenny] (Scrnd.)	1	830-5967-17
18©	Upper Right Corner (Clear) over -04	1	830-5967-18
19©	Left Side Playfield (Clear) over -07	1	830-5967-19
20©	Lwr. Rt. Side Playfield (Clear) over -09	1	830-5967-20
21	Back Panel Cover (Screened)	1	830-5967-21
22©	Backbox Marquee Sign (Screened)	1	830-5967-22

Item 22 has two (2) brackets © riveted to it. If you need this Item 22 with the brackets already riveted, see Backbox (Showcase II) Assy., Page 48 (Item 27).

23*	Key Fob (Kenny, Screened)	1	830-5967-23
24*	Key Fob (Mr. Hankey, Screened)	1	830-5967-24
25*	Key Fob (Stan, Screened)	1	830-5967-25
26*	Key Fob (Kyle, Screened)	1	830-5967-26
27*	Key Fob (Cartman, Screened)	1	830-5967-27
28*	Key Fob (Chef, Screened)	1	830-5967-28

N°	Mylar Name	QTY.	SPI Part N°
M1	Clear Mylar - Pop Bumper Area	1	820-5876-00
M2	Clear Mylar Square - Return Lane Ball Drop	2	820-5815-00
M3	Clear Mylar - In front of Slingshots	2	820-5821-00
M4*	Black Mylar - Cover Discs (in Cab. hiding bolts)	2	820-5041-00

N°	Game #60 Decal Name	SPI Part N°
D1*	#71 Screened Decal Sheet	820-6244-XX

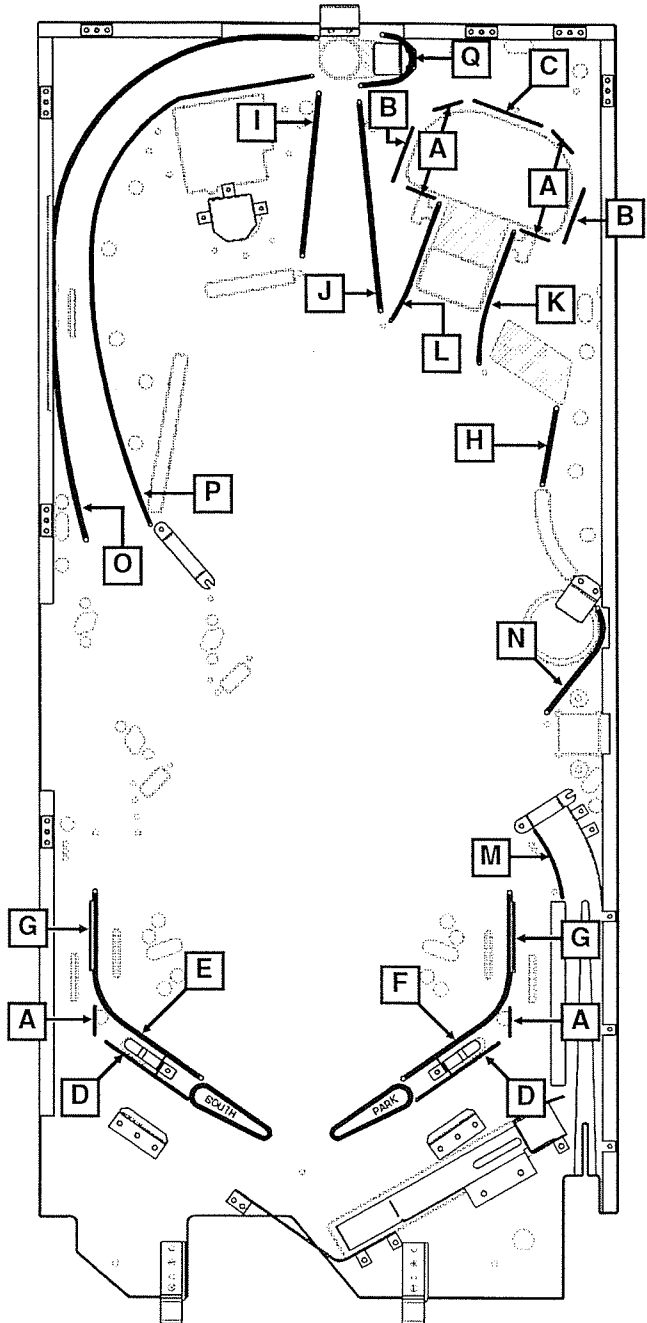
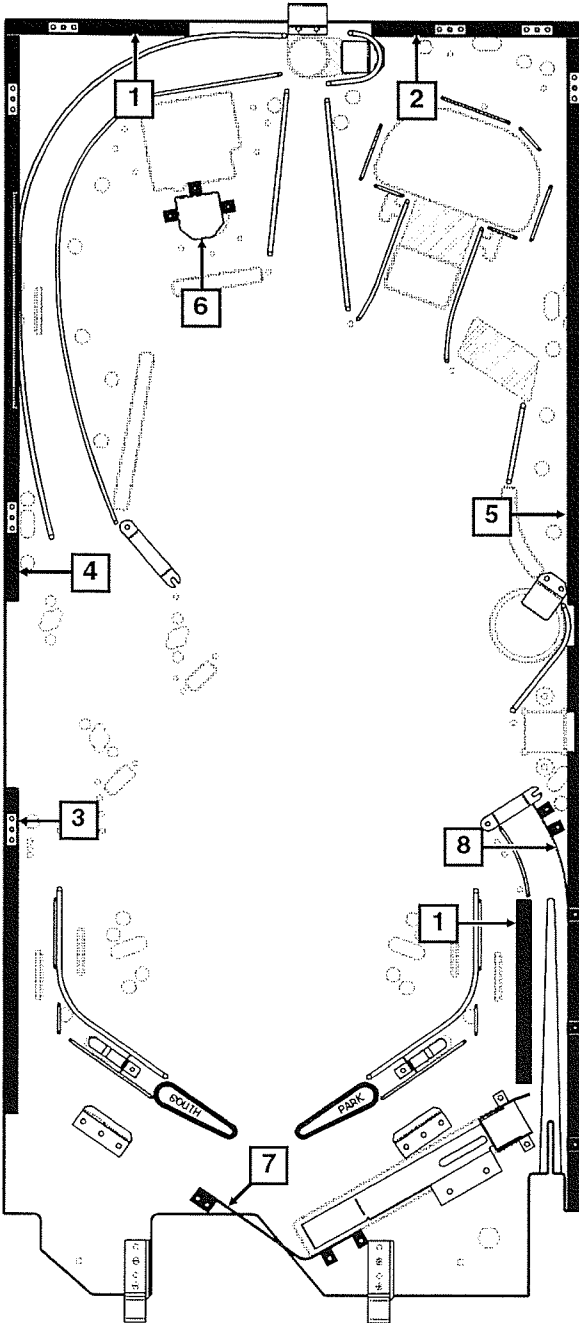
Note: View the last 2-Digit N° on decal (if applicable) for the desired individual replacement. (Individual pieces may not be available, in which case the entire sheet must be ordered.)
 -01 Arch Left (Hold Flipper...); -02 Arch Right (Pull Plunger...); -03 Arch Center (Howdy Hol...)
 -04 Arch Over Plunger; -05 Coin Door (Sega Pinball, Inc.); -06 Install 5 Balls; -07 Portals...;
 -08 Rt. Flipper Bat (Park); -09 Lt. Flipper Bat (South); -10 Left Ramp Top Cover; -11 Ramp (Under Chef, Today's Hot Lunch...); -12, -13, -14 Pop Bumper Caps (Yellow/Red Circles all identical); -20 Mr. Hankey Ramp Entrance;
 5-Bank S-U Targets (by Plastic Item 2): -21 Grandpa; -22 Cartman's Mom; -23 Mayor;
 -24 Ofc. Barbady; -25 Starvin' Marvin;
 Stand-Up Targets by Pop Bumpers: -26 Ned; -27 Mephesto;
 3-Bank S-U Targets (by Plastic Item 6): -28 Wendy; -29 Mr. Garrison; -30 Mr. Macky;
 3-Bank S-U Targets (front of Toilet): -32 Wreath; -31 Toilet Paper; -33 Xmas Bulbs;
 Not on Game-In Parts Bag: -15 Kenny; -16 Kyle; -17 Stan; -18 Cartman; -19 Arch Center Mr. Hankey Cover-Up (if desired); -34 Chef; -35 Playfield Mr. Hankey Cover-Up (if desired).

D2*	So. Park Diode Terminal Strip Desc. Decal	820-6221-71
D3*	Game Specific Backbox Fuse Locations	820-6152-71

N°	Generic Decal Names	SPI Part N°
Power (820-6223-00)	Protective Earth (820-6224-00)	
Generic Backbox Fuse Loc. (820-6152-00)	Fuse Label (UL) (820-6143-00)	
UL Listing Label (820-6141-00)	Danger Coin Door (UL) (820-6140-00)	
Power Box Decal - USA (820-6123-01)	Power Box Decal Supp. (820-6123-04)	
High Voltage Label (UL) (820-6082-01)	Suitable ...Use... (UL) (820-6001-01)	

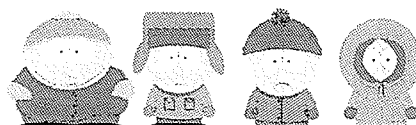


Playfield - Rails and Ball Guides †



Nº	Wood & Metal Rail (MR) Name	QTY.	SPI Part Nº	Nº	Ball Guide Rail (BGR) Name	QTY.	SPI Part Nº
1	Wood Rail - 6-1/2"	2	525-5007-14	E	Ball Guide Rail (Left Return Lane)	1	535-7560-00
2	Wood Rail - 7-3/8"	1	525-5007-40	F	Ball Guide Rail (Right Return Lane)	1	535-7560-01
3	Wood Rail - 11-1/2"	1	525-5007-27	G	Ball Guide Rail (Outlane Fence)	2	535-7595-00
4	Wood Rail (Upper Left Side Playfield)	1	525-5549-00	H	Ball Guide Rail - 2-3/4"	1	535-6492-02
5	Wood Rail (Right Side Playfield)	1	525-5547-00	I	Ball Guide Rail - 5-3/4"	1	535-6492-12
Items 1-5 are secured by: #6 X 1-1/4" PFH A (Zinc) (Qty. 18) (237-5804-00)				J	Ball Guide Rail - 7-3/8"	1	535-6492-07
6	Metal Rail Weldment (Toilet Drain)	1	515-6998-00	K	Ball Guide Rail (Kenny Right)	1	535-8514-01
7	Metal Rail (Center Drain under Arch)	1	535-8393-00	L	Ball Guide Rail (Kenny Left)	1	535-8515-01
8	Metal Rail (Shooter Lane Rt. Side)	1	535-8513-00	M	Ball Guide Rail (Shooter Lane Left)	1	535-8516-00
Items 6-8 are secured by: #8 X 1/2" HWH AB Zinc (Blue) (Qty. 12) (234-5101-05)				N	Ball Guide Rail (Large Hole Cartman)	1	535-8517-00
Nº	Wire Form (WF) Name	QTY.	SPI Part Nº	O	Ball Guide Rail (Left Orbit, Outer)	1	535-8518-00
A	Wire Form - 1"	6	535-5300-05	P	Ball Guide Rail (Left Orbit, Inner)	1	535-8519-00
B	Wire Form - 2"	2	535-5300-10	Q	Ball Guide Rail (Top VUK)	1	535-8520-00
C	Wire Form - 2-1/2"	1	535-5300-01				
D	Wire Form - 3-1/2"	2	535-5300-03				

† Items with Ø Qty. are not used in this game.
Size and/or quantities may change during production.



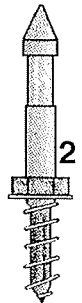
Playfield - Metal Posts (Screws) and Nuts (Actual Size) †



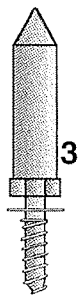
Item 1 Post can use
3/16" I.D. Rubber Ring,
545-5348-01,
or if Item 1 Post is
used in pairs, can use
3/4" — 3" Rubber Rings.

1

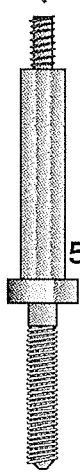
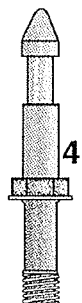
Items 2 & 4 Posts can use
7/16" O.D. Rubber Ring,
545-5348-17.



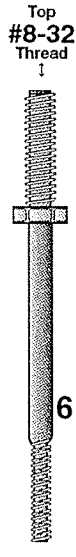
Top
#8-32
Thread



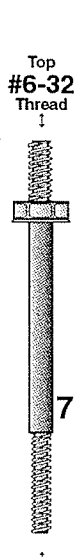
Bottom
#10-32
Thread



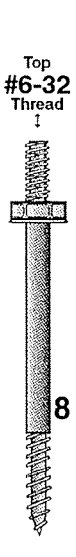
Bottom
#8-32
Thread



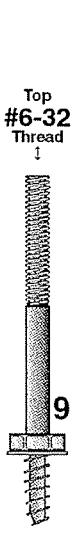
Bottom
#6-32
Thread



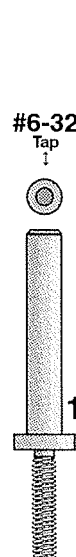
Bottom
#6-32
Thread



Bottom
#6-32
Thread



Bottom
#6-32
Thread



Bottom
#6-32
Thread



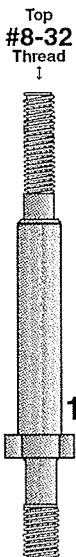
Bottom
#10-32
Thread



Bottom
#10-32
Thread



Bottom
#10-32
Thread



Bottom
#10-32
Thread



Bottom
#8-32
Thread



Bottom
#6-32
Thread



Bottom
#6-32
Thread



Bottom
#6-32
Thread

Item 16 is typically used to hold Hex
Spacers onto the Playfield Top.

Item 17 is typically used to hold the
bottom Cabinet Speaker (used with
#6-32 Nylon Stop Nut, 240-5005-00).

Item 18 is typically used to hold
Item 15 (515-5939-00) in Turbo
Bumper Assy., 515-6459-04.

Note: The "Fins" keep the screw
from turning inside the wood hole.

Nut Note: All nuts shown with a "✓" are used in this game. The quantities (not specified) vary.
The remaining items listed are not used in this game and are noted for reference only (used in prior games).

Shown Below~
• #6-32
Nylon Stop Nut:
240-5005-00 ✓

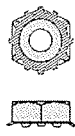


Top & Side Views

Nylon Stop Nuts
Not Shown:

- #6-32
(w/ 1/4" Hex Body):
240-5010-00
- #8-32:
240-5102-00 ✓
- #10-32:
240-5203-00 ✓
- #10-24:
240-5206-00 ✓
- #4-40:
240-5303-00 ✓
- #4-40
(18/8 Stainless):
240-5303-01
- 5/16"-18:
240-5316-00

Shown Below~
• #6-32
KEPS Nut
(with Star Washer):
240-5008-00 ✓



Bottom & Side Views

KEPS Nuts
Not Shown:

- #6-32
(w/ 1/4" Hex Body):
240-5011-00
- #8-32:
240-5104-00
- #10-32:
240-5208-00 ✓
- #10-24:
240-5207-00 ✓
- #4-40:
240-5318-00

Shown Below~
• #6-32
Hex Nut
(No Star Washer):
240-5004-00 ✓

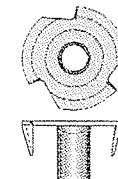


Top View

Hex Nuts
Not Shown:

- #8-32:
240-5103-00
- #10-32:
240-5201-00
- #10-24:
240-5202-00 ✓
- #10-32 X 3/8":
240-5209-00 ✓
- 3/4-16:
240-5315-00
- #2-56:
240-5301-00
- 7/8"-14:
240-5317-00

Shown Below~
• #6-32
T-Nut:
240-5002-00 ✓

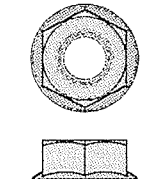


Bottom & Side Views

T-Nuts
Not Shown:

- #6-32
(w/Side Cut Off):
240-5002-01
- #8-32:
240-5101-00 ✓
- #10-32
(Black Oxide):
240-5007-00
- #10-32
(w/Side Cut Off):
240-5205-00
- #10-24:
240-5200-00

Shown Below~
• 1/4" X 20
Flange Nut:
240-5300-00 ✓



Top & Side Views

Miscellaneous Nuts
Not Shown:

- Plastic Pal Nut
(on Flipper Buttons):
240-5003-00
- Metal Pal Nut
(on Flipper Buttons):
240-5003-01 ✓
- #6-32 Wing Nut:
240-5001-00
- #8-32 Wing Nut:
240-5100-00
- 1/4"-20 Wing Nut:
240-5302-00
- 1/4"-20 Toggle Wing:
240-5324-00 ✓

† Items with Ø Qty. are not used in this game.
Size and/or quantities may change during production.

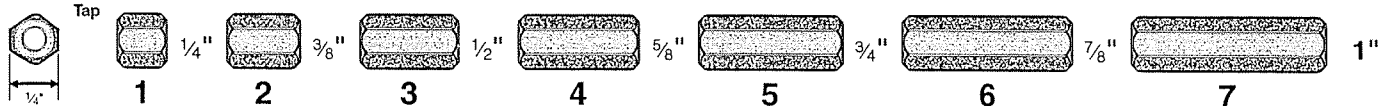
Nº	Metal Post Name	QTY.	SPI Part Nº	Nº	Metal Post Name	QTY.	SPI Part Nº
1	Stand-Off Double Groove Post 1-1/16"	0	530-5102-01	10	Post #6-32 Tap / #6-32 Bottom	0	530-5127-00
2	Mini-Post Wood Screw	6	530-5004-00	11	Post Hex Base #6-32 Tap/#10-32 Bot.	0	530-5332-01
3	Mini-Post Wood Screw (no cut-away)	0	530-5004-01	12	Post Hex Base (No Tap)/#10-32 Bot.	14	530-5332-00
4	Mini-Post Mach. Screw / #10-32 Bot.	1	530-5005-00	13	Post Hex Base #8-32 Top/#10-32 Bot.	0	530-5332-02
5	Post Fasten #6-32 Top / #8-32 Bot.	0	530-5007-00	14	Post Hex Base #6-32 Top/#10-32 Bot.	0	530-5332-03
6	Post Fasten #8-32 Top / #6-32 Bot.	3	530-5008-00	15	Playfield Support #8-32 Top/Bottom	0	530-5285-00
7	Post Fasten #6-32 Top / #6-32 Bot.	21	530-5012-02	16	#6-32 X 3/4" Fin Shank Screw	8	237-5921-02
8	Post Fstn. #6-32 Top / Wood Scr. Bot.	24	530-5010-02	17	#6-32 X 1-1/4" Fin Shank Screw	4	237-5883-00
9	Post #6-32 Top / Wood Screw Bottom	0	530-5263-01	18	#6-32 X 1-3/16" Spirol Fin Shank Scr.	9	237-5957-00



Playfield - Metal Spacers (Actual Size) †

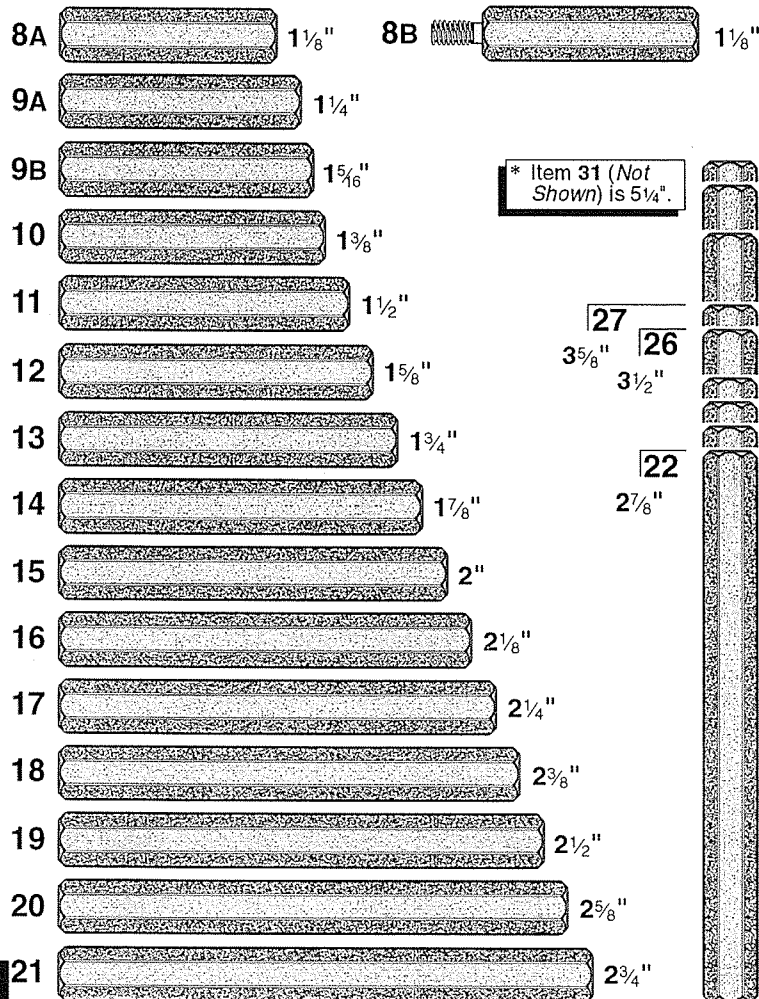
A Standard USA 9 Inch Ruler is provided on the back cover.

Hex Spacers:
#6-32
Tap

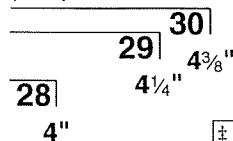


Take Note:

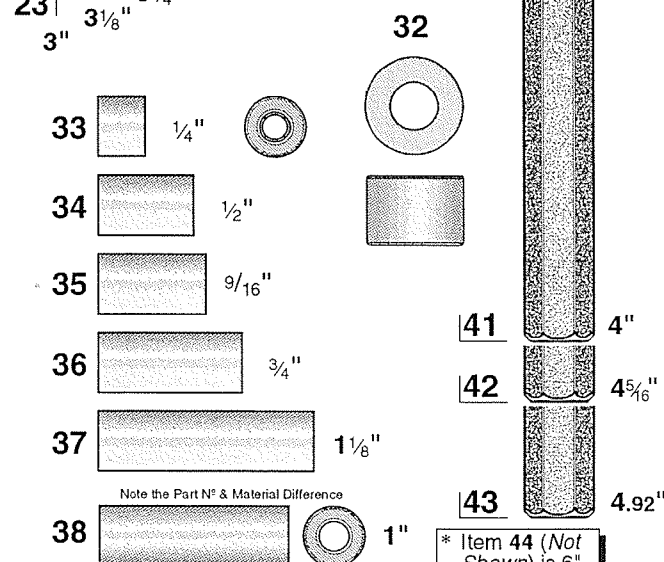
Items 1-31 are 1/4" wide. Items 39-44 are 5/16" wide. With Items 1-6, the tap goes through the length of the spacer. With Items 7-31 & Items 39-44, the tap is up to 5/8" deep on each end (exception: Item 8B has 1 Male End #6-32 Thread).



* Item 31 (Not Shown) is 5 1/4".



‡ Hex Spacers Not Used in current games may no longer be available. Choose one size up or down (+/-).

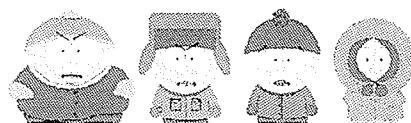


* Item 44 (Not Shown) is 6".

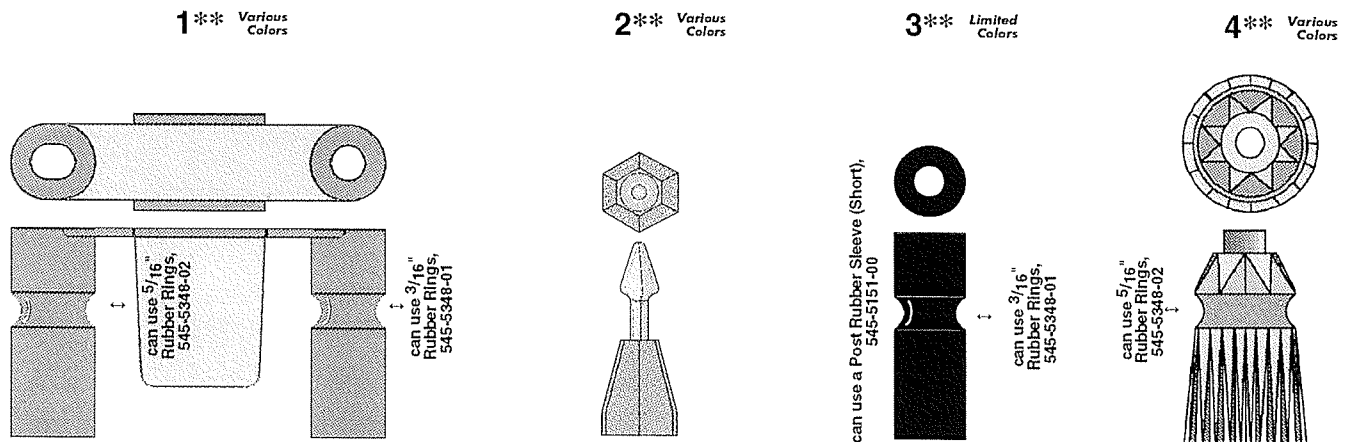
Section 4 | Parts

Nº	Metal Spacer Name	QTY.	SPI Part Nº	Nº	Metal Spacer Name	QTY.	SPI Part Nº
1	1/4" X 1/4" Hex Spacer #6-32 Tap	0	254-5008-00	22	2 7/8" X 1/4" Hex Spacer #6-32 Tap	0	254-5008-31
2	3/8" X 1/4" Hex Spacer #6-32 Tap	1	254-5008-12	23	3" X 1/4" Hex Spacer #6-32 Tap	2	254-5008-14
3	1/2" X 1/4" Hex Spacer #6-32 Tap	7	254-5008-03	24	3 1/8" X 1/4" Hex Spacer #6-32 Tap	0	254-5008-19
4	5/8" X 1/4" Hex Spacer #6-32 Tap	0	254-5008-02	25	3 1/4" X 1/4" Hex Spacer #6-32 Tap	0	254-5008-26
5	3/4" X 1/4" Hex Spacer #6-32 Tap	2	254-5008-04	26	3 1/2" X 1/4" Hex Spacer #6-32 Tap	0	254-5008-27
6	7/8" X 1/4" Hex Spacer #6-32 Tap	5	254-5008-05	27	3 5/8" X 1/4" Hex Spacer #6-32 Tap	0	254-5008-25
7	1" X 1/4" Hex Spacer #6-32 Tap	0	254-5008-06	28	4" X 1/4" Hex Spacer #6-32 Tap	5	254-5008-21
8A	1 1/8" X 1/4" Hex Spacer #6-32 Tap	0	254-5008-17	29	4 1/4" X 1/4" Hex Spacer #6-32 Tap	3	254-5008-30
8B	Same as 8A with Male End #6-32	0	254-5024-17	30	4 3/8" X 1/4" Hex Spacer #6-32 Tap	0	254-5008-29
9A	1 1/4" X 1/4" Hex Spacer #6-32 Tap	0	254-5008-11	31 *	5 1/4" X 1/4" Hex Spacer #6-32 Tap	0	254-5008-35
9B	1 5/16" X 1/4" Hex Spacer #6-32 Tap	0	254-5008-34	32	3/8" X 1/2" Spacer (Used with Backbox)	2	530-5099-00
10 ‡	1 3/8" X 1/4" Hex Spacer #6-32 Tap	0	254-5008-33	33	1/4" X 5/16" X .144" I.D. Spacer Tap.	1	254-5014-03
11 ‡	1 1/2" X 1/4" Hex Spacer #6-32 Tap	0	254-5008-09	34	1/2" X 5/16" X .144" I.D. Spacer Tap.	3	254-5014-00
12 ‡	1 5/8" X 1/4" Hex Spacer #6-32 Tap	0	254-5008-13	35	9/16" X 5/16" X .144" I.D. Spacer Tap.	0	254-5014-04
13 ‡	1 3/4" X 1/4" Hex Spacer #6-32 Tap	0	254-5008-10	36	3/4" X 5/16" X .144" I.D. Spacer Tap.	0	254-5014-01
14 ‡	1 7/8" X 1/4" Hex Spacer #6-32 Tap	0	254-5008-20	37	1 1/8" X 5/16" X .144" I.D. Spacer Tap.	0	254-5014-02
15	2" X 1/4" Hex Spacer #6-32 Tap	0	254-5008-07	38	1" X 5/16" X .144" I.D. Spacer Tap.	0	254-5001-00
16	2 1/8" X 1/4" Hex Spacer #6-32 Tap	0	254-5008-32	39	1 3/4" X 5/16" Hex Spacer #6-32 Tap	0	254-5018-06
17	2 1/4" X 1/4" Hex Spacer #6-32 Tap	3	254-5008-18	40	2" X 5/16" Hex Spacer #6-32 Tap	0	254-5018-06
18	2 3/8" X 1/4" Hex Spacer #6-32 Tap	0	254-5008-28	41	4" X 5/16" Hex Spacer #6-32 Tap	0	254-5018-03
19	2 1/2" X 1/4" Hex Spacer #6-32 Tap	1	254-5008-16	42	4 5/16" X 5/16" Hex Spacer #6-32 Tap	0	254-5018-00
20	2 5/8" X 1/4" Hex Spacer #6-32 Tap	2	254-5008-08	43	4.92" X 5/16" Hex Spacer #6-32 Tap	0	254-5018-04
21	2 3/4" X 1/4" Hex Spacer #6-32 Tap	3	254-5008-15	44 *	6" X 5/16" Hex Spacer #6-32 Tap	0	254-5018-02

† Items with Ø Qty. are not used in this game. Size and/or quantities may change during production.



Playfield - Plastic Posts and Spacers (Actual Size) †

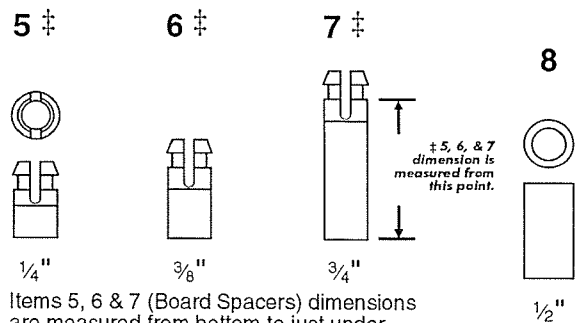


Take Note:

PLASTIC PART COLOR CHART					
Nº	Color	Nº	Color	Nº	Color
-00	Black	-06	Yellow	-12	Fluor. Blue
-01	Clear	-07	Orange	-13	Teal Green
-02	Red	-08	White	-14	Gray
-03	Amber	-09	Purple	-15	Luminescent
-04	Green	-10	Fluor. Orange	-16	Gold
-05	Blue	-11	Fluor. Green		

** Items 1, 2 and 4 come in various colors (may not be available in every color). Item 3 is currently only available in the color stated in this game manual (other colors used in prior games may no longer be available). The ".XX" in Part N°s which may come in various colors should be replaced with the desired 2-Digit N°. corresponding to the color desired. *Some colors may no longer be available for desired item.*

Items 3-4 Posts used in pairs can use 3/4" through 3" Rubber Rings, (See Rubber Parts for Part N°s).

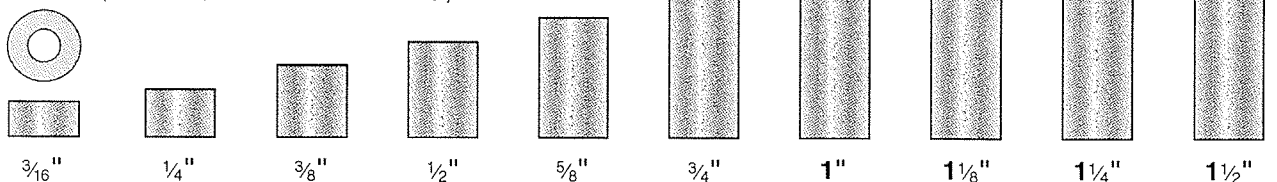


† Items 5, 6 & 7 (Board Spacers) dimensions are measured from bottom to just under cut-away (see pictorial with Item 7 above).

9 10 11 12 13 14 15 16 17 18

Take Note:

If any one of Items 9-18 Spacers is not available in the size required, order the smaller sized spacers required to stack sizes together until appropriate size is achieved. (e.g. If 1 1/8" is needed but unavailable, order a 1/2" + 5/8" and stack to = 1 1/8")



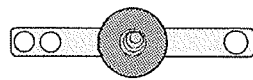
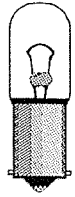
Nº	Plastic Post/Spacer Name	QTY.	SPI Part N°	Nº	Plastic Post/Spacer Name	QTY.	SPI Part N°
1**	Top Lane Mini-Light Hood	0	550-5061-XX	9	3/16" X 3/8" Spacer Gray (4 for Dot Display)	4	254-5000-18
Item 1 typically secured by: #6-32 X 1-3/4" PPH MS (Zinc) (Qty. 2/per) (237-5511-00) and Washer 9/64" X 5/16" OD X 1/32" (Qty. 2/per) (242-5017-00)				10	1/4" X 3/8" Spacer Gray	1	254-5000-02
2**	Mini-Jewel Post	0	550-5052-XX	11	3/8" X 3/8" Spacer Gray	0	254-5000-12
Item 2 typically secured by: #6 X 3/8" HWH AB (Zinc) (Qty. 1/per) (234-5000-00)				12	1/2" X 3/8" Spacer Gray	1	254-5000-01
3**	1 1/16" Single Groove Post (Black)	60	550-5059-00	13	5/8" X 3/8" Spacer Gray	0	254-5000-14
4**	Single Groove Jewel Post (Clear)	9	550-5034-01	14	3/4" X 3/8" Spacer Gray	2	254-5000-07
Items 3 & 4 typically secured by: Post Fastening Screw #6-32 Top / #6-32 Bottom (Qty. 1/per) (530-5012-02, Item 7 Page 63) and may use Washer 9/64" X 5/16" OD X 1/32" (Qty. 1/per) (242-5017-00) with a #6-32 Nylon Stop Nut (Qty. 1/per) (240-5005-00).				15	1" X 3/8" Spacer Gray	1	254-5000-04
5 †	1/4" Slf. Rtn. Spacer White	0	254-5007-02	16	1 1/8" X 3/8" Spacer Gray	0	254-5000-06
6 †	3/8" Slf. Rtn. Spacer White	0	254-5007-01	17	1 1/4" X 3/8" Spacer Gray	0	254-5000-05
7 †	3/4" Slf. Rtn. Spacer White	0	254-5007-03	18	1 1/2" X 3/8" Spacer Gray	0	254-5000-08
8	1/2" X 1/4" Spacer White (Narrow)	0	254-5000-03	Items 10-19 typically secured by: See Items 6, 7 & 8 Page 57 &/or #6-32 1 3/4" PPH MS Zinc Screw (Qty. 1/per) (237-5511-00) and #6-32 Nylon Stop Nut (Qty. 1/per) (240-5005-00).			

† Items with Ø Qty. are not used in this game. Size and/or quantities may change during production.

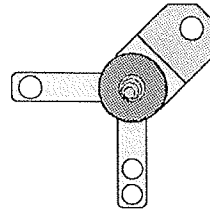
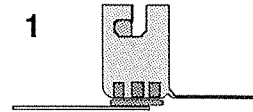
Playfield - Small Bayonet Type Bulbs and Sockets (Actual Size) †

#44 Bulb

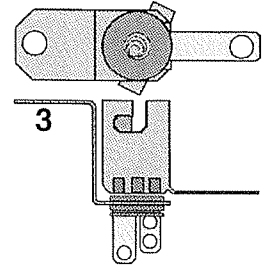
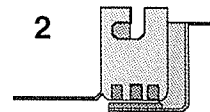
A



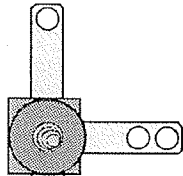
1



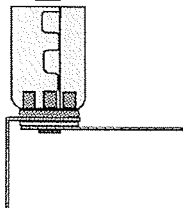
2



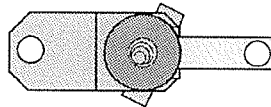
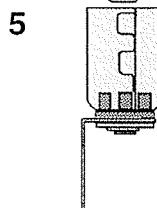
3



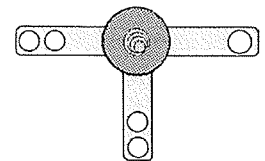
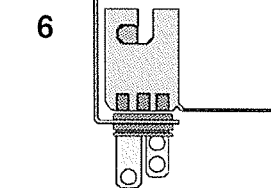
4



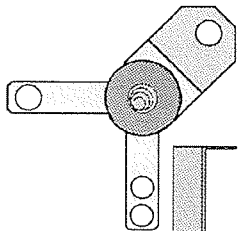
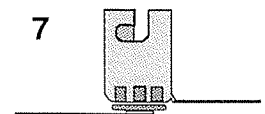
5



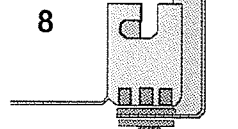
6



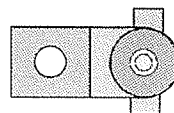
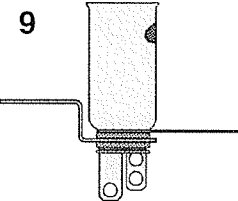
7



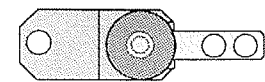
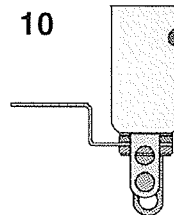
8



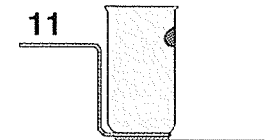
9



10



11



Section 4 | Parts

Nº	#44 Bulb & Socket Name	QTY.	SPI Part Nº
A	#44 Bulb	33	165-5000-44
1	2-Lug Staple Down Socket	0	077-5000-00
2	2-Lug Stand-Up Short Socket	0	077-5002-00
3	3-Lug Stand-Up Short Socket	0	077-5008-00
4	3-Lug Laydown Socket	0	077-5006-00
5	2-Lug Laydown Socket	2	077-5003-00
6	3-Lug Stand-Up Long Socket	0	077-5009-00
7	3-Lug Staple Down Socket	0	077-5001-00
8	2-Lug Stand-Up Long Socket	0	077-5005-00
9	3-Lug Stand-Up Long Shell Socket	0	077-5013-00
10	2-Lug Stand-Up Lg. Shell Socket (Gls)	31	077-5031-00
11	1-Lug Stand-Up Long Shell Socket	0	077-5012-00

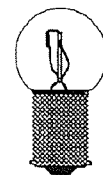
Nº	#455 Bulb	QTY.	SPI Part Nº
B	#455 Twinkle Bulb	0	165-5003-00

Take Note:

Item B Bulb (#455) is normally used in conjunction with Item 11 Socket, but **can** be used with Items 1-10 Sockets on this page.

#455 Bulb

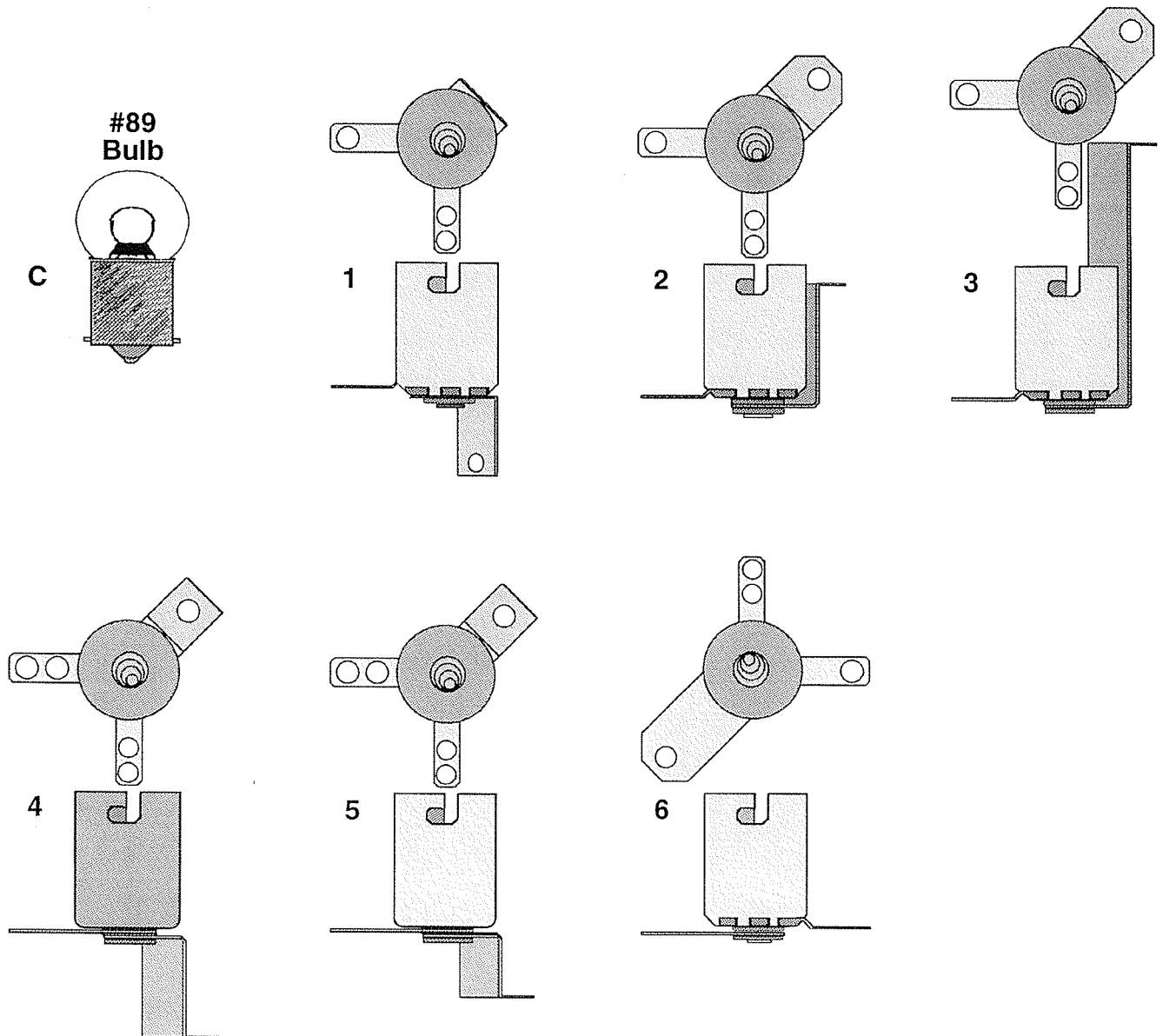
B



† Items with Ø Qty. are not used in this game.
Size and/or quantities may change during production.



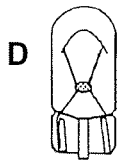
Playfield - Large Bayonet Type Bulb and Sockets (Actual Size) †



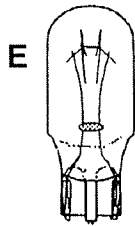
† Items with Ø Qty. are not used in this game.
Size and/or quantities may change during production.

Nº	#89 Bulb & Socket Name	QTY.	SPI Part Nº
C	#89 Bulb	18	165-5000-89
1	Laydown Standard Socket	13	077-5100-00
2	2-Lug Stand-Up Short Socket	2	077-5101-00
3	2-Lug Stand-Up Long Socket	3	077-5102-00
4	Stand-Up Socket Rev. Short	0	077-5103-00
5	2-Lug Stand-Up Small Socket	0	077-5106-00
6	Straight Leg Socket	0	077-5107-00

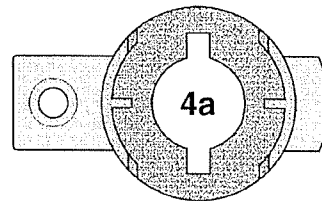
Playfield - Wedge Base Bulbs and Sockets (Actual Size) †



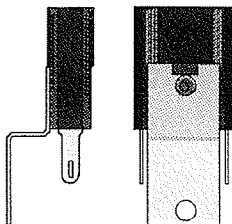
#555 Bulb



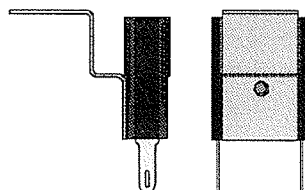
#906 Bulb



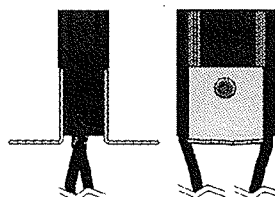
1



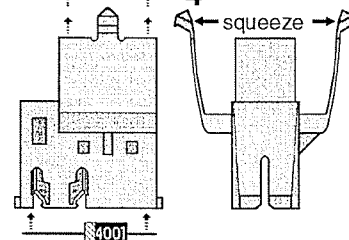
2



3



4

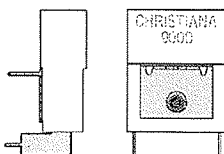


This Socket is equipped with a *built-in* Diode, 1N4003, (112-5013-00). However, replacement can be made with Diode, 1N4001, (112-5003-00).

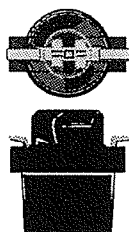
Take Special Note

Item 4 is an Insulation Displacement Connection (IDC) Style Socket. This style is solderless, and has a built-in diode. This socket is secured to the playfield or component by Items 4a and 4b Snap-On Socket Brackets, or may also be snapped into Item 4c Socket Mounting Board where sockets are positioned too close together (clear plastic piece; if used in this game, Item 4c will show a Qty. and Part N^o.). Just squeeze the "side arms" of the socket together and pull away from the bracket or mounting board for easy Bulb replacement.

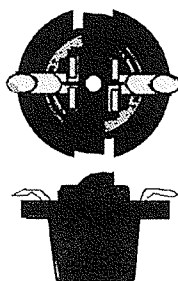
5



6



7



Take Note:

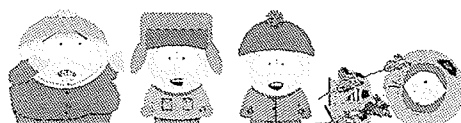
* An asterisk (*) indicates items are not shown on this page.

- Item 2 Socket has 2 Wires attached are approximately 12" ea.
- Item 5 Socket **was** used on PC Light Boards to position bulbs horizontally; Item 5 Socket is secured by soldering into place.
- Item 6 Socket **was** used on PC Light Boards to position bulbs vertically; Item 6 Socket is secured by "twisting" into place.
- Item E Bulb (#906) is normally used in conjunction with Item 7 Socket, but **can** be used with Items 1, 2, 4 or 5.

Note: Always replace with same type bulb in original application.

- See the start of this chapter for Fluor. Bulb & Associated Parts.

N ^o	#555 Bulb & Socket Name	QTY.	SPI Part N ^o	N ^o	#906 Bulb & Socket Name	QTY.	SPI Part N ^o
D	#555 Wedge Base Bulb (Clear)	60	165-5002-00	E	#906 Wedge Base Bulb (Clear)	1	165-5004-00
1	Laydown #555 Wedge Base Socket	4	077-5026-01		#906 Wedge Base Bulb (Red)	2	165-5004-02
2	#555 Wedge Base Offset Socket	4	077-5029-00		#906 Wedge Base Bulb (Amber)	0	165-5004-03
3	#555 W.B. Socket (for Pop Bumper)	3	077-5206-00		#906 Wedge Base Bulb (Blue)	0	165-5004-05
4	#555 IDC Snap-On Socket	52	077-5216-00		#906 Wedge Base Bulb (Yellow)	0	165-5004-06
4a	5/16" Ht. Snap-On Socket Bracket	52	545-5760-18	7	#906 Wedge Base Socket (Twist)	0	077-5016-00
4b *	19/32" Ht. Snap-On Socket Bracket	0	545-5760-19				
4c *	Clear Plastic (Buty.) Socket Mtg. Bd.	0	Not Used				
5	#555 W.B. Socket (Solder Type)	0	077-5207-00				
6	#555 Wedge Base Socket (Twist)	0	077-5007-00				

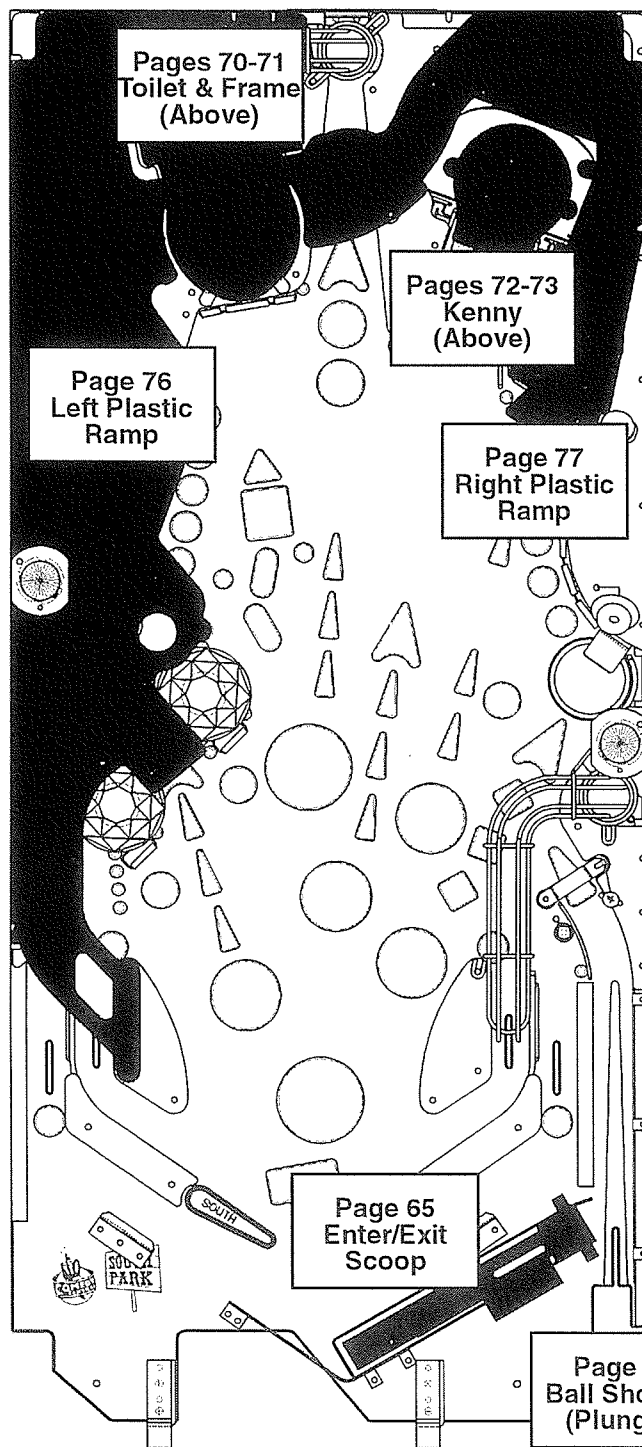


Drawings for Major Assemblies & Ramps (The Blue Pages)

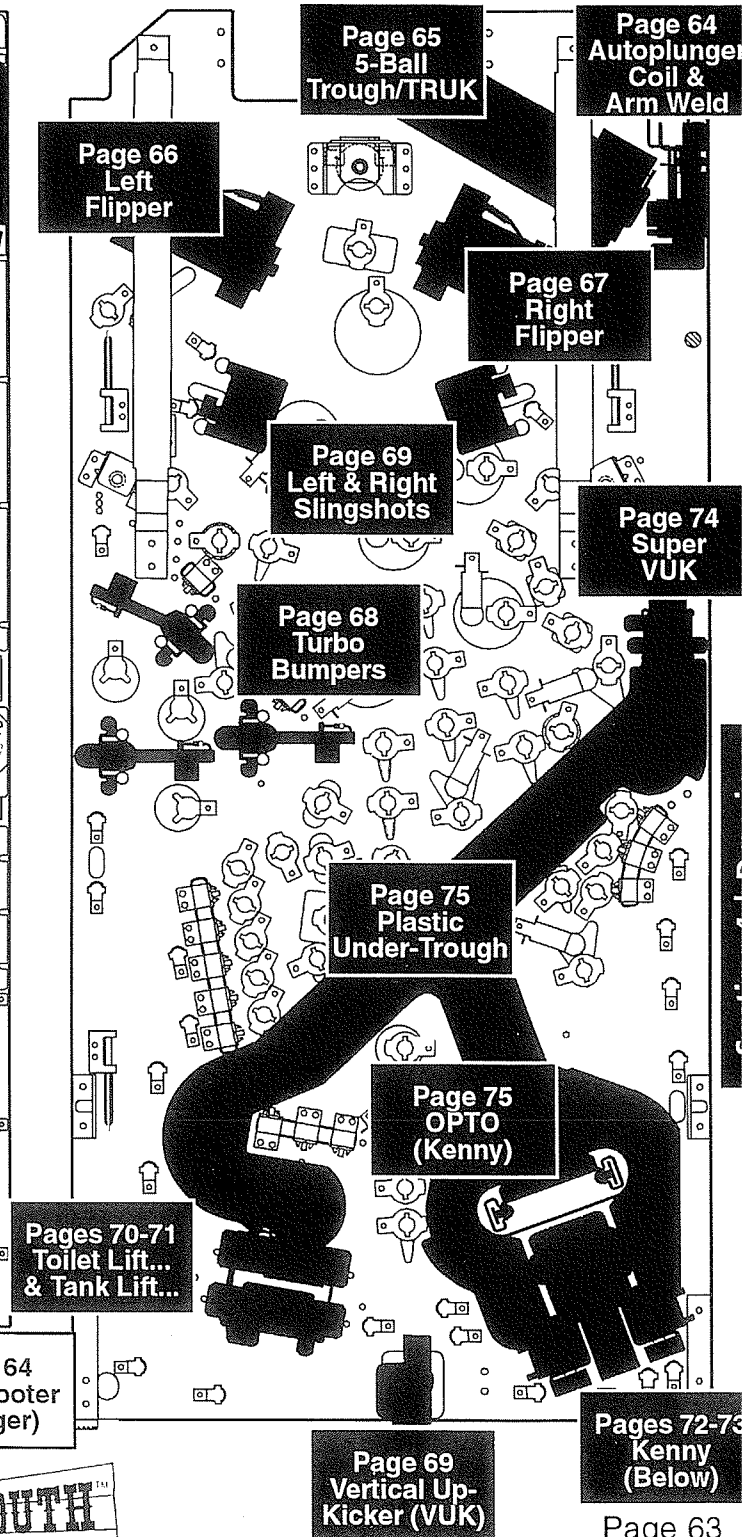
Overview

Drawings are provided for the Major Assemblies in this game with individual parts of each assembly numbered. Items noted with a white circle (①) are mounted above the playfield; items noted with a black circle (●) are mounted below. All numbered parts describe the name, quantity & Part N°. Associated Parts are noted and/or viewed with the associated Major Assembly. Parts not listed in this chapter are detailed in the Pink Pages, Chapter 1, Parts Identification & Location. Below are drawings of the Playfield (*Above & Below*) with the **Part N° & Page N° Highlighted**. **Important:** Read all "Take Note:" items.

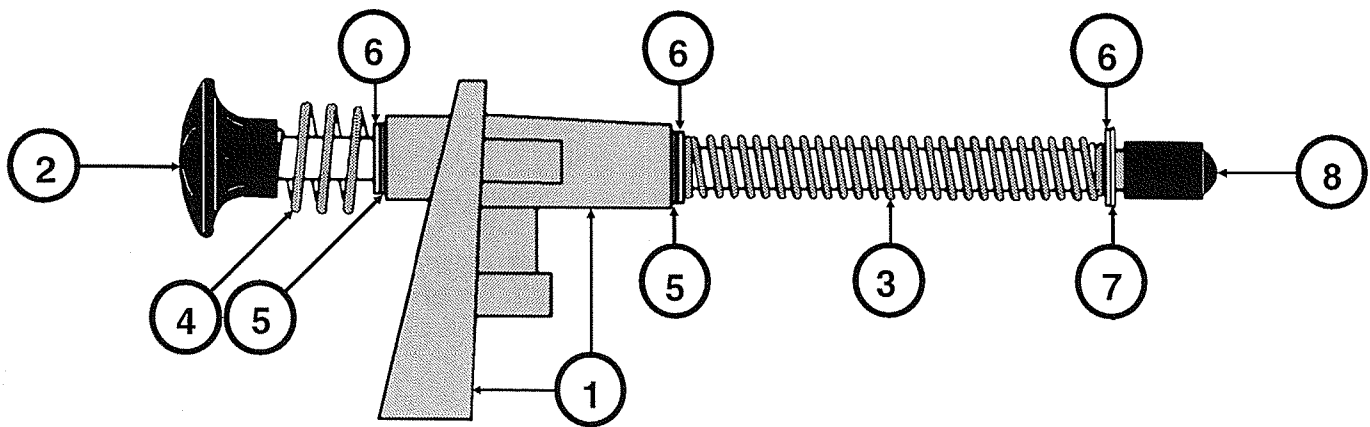
ASSEMBLIES MOUNTED ABOVE THE PLAYFIELD



ASSEMBLIES MOUNTED BELOW THE PLAYFIELD



Ball Shooter (Plunger) Assembly, 500-6146-00-04 (Items 1-8)



Nº	Individual Part Name	QTY.	SPI Part Nº	Nº	Individual Part Name	QTY.	SPI Part Nº
1	Housing (Shooter Assembly)	1	535-5067-02	6	Washer, 3/8" I.D. X 5/8" O.D. X 1/16"	3	242-5014-00
2	Rod Assembly (w/ Black Knob)	1	515-6557-00	7	Retaining Ring, 3/8" Ø Shaft	1	270-5012-00
3	Comp. Spring (Green, .035" Ø)	1	266-5001-04	8	Plunger Tip (Black 50 Duro)	1	545-5276-00
4	Compression Spring (Short Plunger)	1	266-5010-00				
5	Bushing, 3/8" I.D. (Oilite)	2	280-5010-00				

Ball Shooter (Plunger) Assembly, 500-6146-00-04, is secured to the Cabinet by:
Support Plate (Qty. 1) (535-5027-00), #10-32 X 3/8 SHWH (Serr) Swage (Qty. 3)
(237-5985-00) and #6 X 5/8" HWW AB (Zinc) (Qty. 2) (234-5002-00)

Autoplunger Coil Assembly, 500-6092-02 (Items 1-6) with Autoplunger Arm Weld Assembly, 500-6091-00 (Items 7-9)

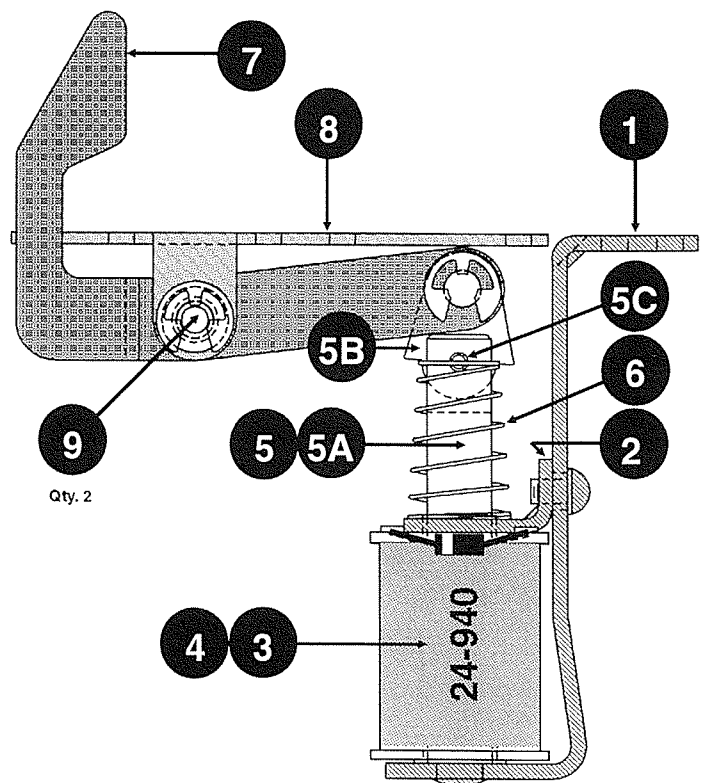
Section 4 | Drawings

Nº	Individual Part Name	QTY.	SPI Part Nº
Autoplunger Coil Assembly, 500-6092-02 (Items 1-6)			
1	Autoplunger Coil Bracket Assembly	1	515-6527-00
2	Coil Retainer Bracket	1	515-5203-03
Item 2 is secured to Item 1 by: #8-32 X 1/4" PPH MS (Serr) Zinc (Qty. 2) (232-5300-00)			
3	Coil, 24-940	1	090-5036-00T
ORDERING ABOVE (ITEM 3) COIL PART Nº WILL INCLUDE:			
—	Diode, 1N4004 (positioned at top)	1	112-5003-00
4	Coil Sleeve	1	545-5031-00
5	Plunger & Link Assembly	1	515-5338-00
ORDERING ABOVE (ITEM 5) SUB-ASSY. PART Nº WILL INCLUDE:			
5A	Plunger 2"	1	530-5025-01
5B	Plunger Link	1	545-5293-00
5C	Roll Pin, 1/8" Ø X 5/8" Lg.	1	251-5008-00

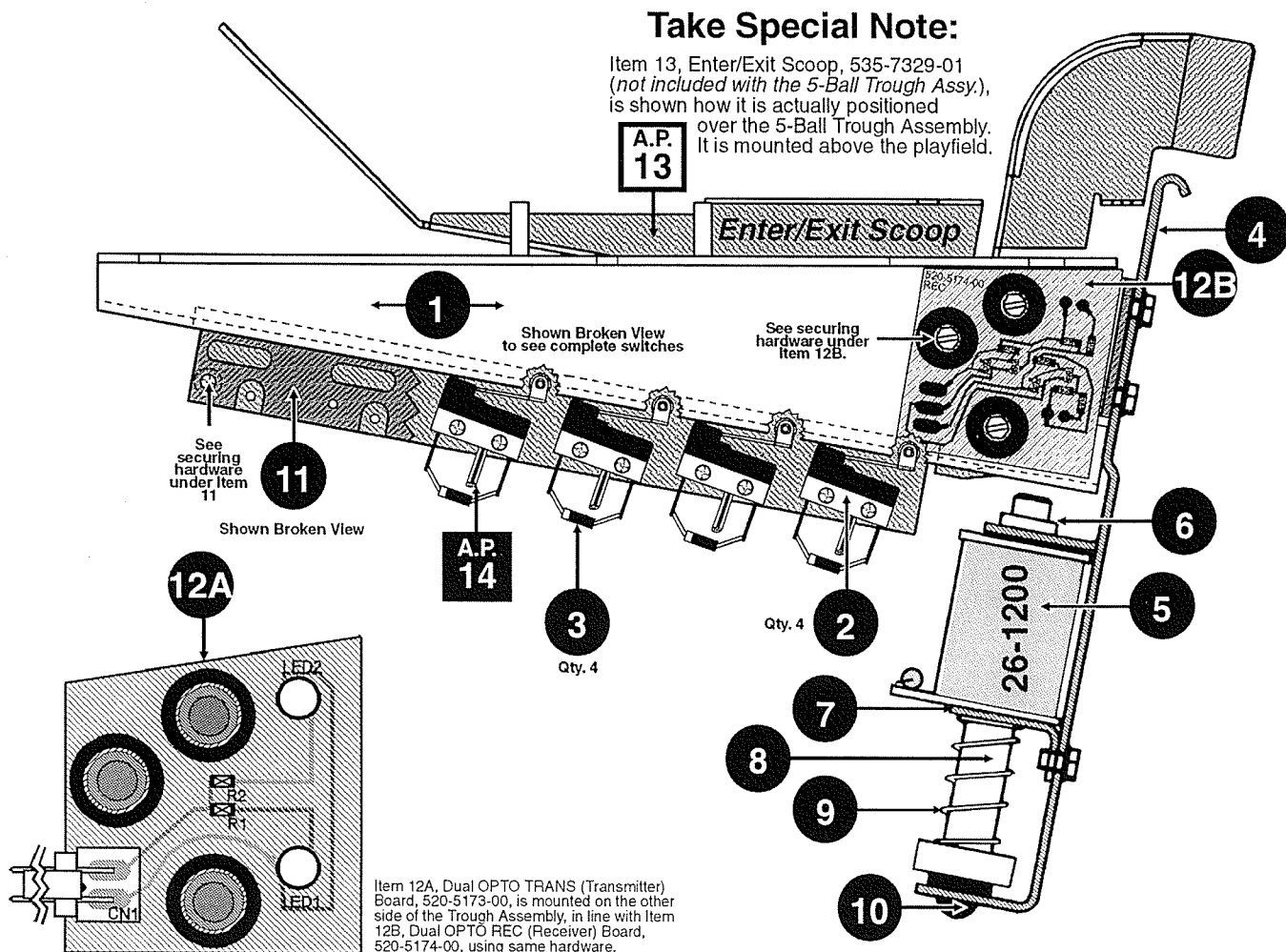
Item 5B is secured to Item 7 by: Retaining Ring, 1/4" Ø Shaft (Qty. 1) (270-5002-00)

6	Compression Return Spring	1	266-5020-00
Autoplunger Arm Weld Assy., 500-6091-00 (Items 7-9)			
7	Arm Weld Assembly	1	515-6526-00
Item 7 is secured to Item 8 by: Retaining Ring, 1/4" Ø Shaft (Qty. 1) (270-5002-00)			
8	Autoplunger Fulcrum	1	535-7697-00
9	Nyliner, 1/4" (Thomson #411-FF)	2	545-5423-00

Autoplunger Arm Weld Assy., 500-6091-00 and Autoplunger Coil Assy., 500-6092-01 are secured under the playfield by: #8 X 1/2 HWW AB (Zinc) Blue (Qty. 9) (234-5101-05)

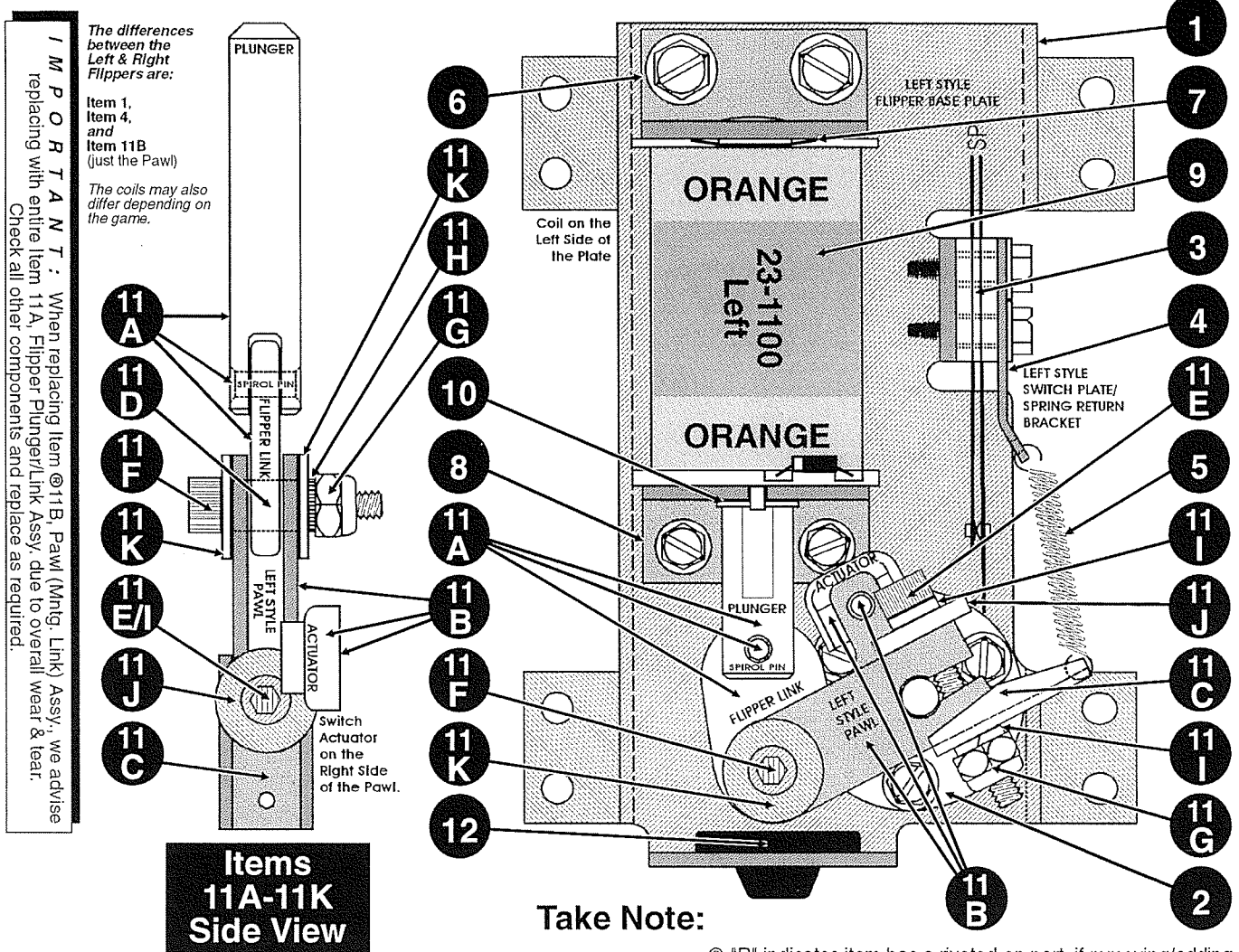


5-Ball Trough Assembly, 500-6318-25 (Items 1-12B) **and Associated Part: Ball Trough Enter/Exit Scoop, 535-7329-01 (Item 13)**



Nº	Individual Part Name	QTY.	SPI Part Nº	Nº	Individual Part Name	QTY.	SPI Part Nº
1	Ball Trough Outhole Mounting Bracket	1	515-6580-01	11	Trough Ball Guide Plate	1	535-7801-00
2	Micro-Switch (Roller Actuator, Lite-Force)	4	180-5119-02	Item 11 is secured to Item 1 by: 1/4" X 5/16" X .144" I.D. Spacer Tap. (Qty. 1) (254-5014-03) and #2-56 X 1/2" HWH (Ser) TF 3/16" Hd. (Qty. 1) (237-5937-01)			
Item 2 is secured to Item 1 by: #2-56 X 1/2" HWH (Ser) TF 3/16" Hd. (Qty. 2/per) (237-5937-01)				12A	Dual OPTO Transmitter (TRANS) Bd.	1	520-5173-00
3	Switch Diode, 1N4001	4	112-5001-00	12B	Dual OPTO Receiver (REC) Board	1	520-5174-00
4	Coil Mounting Bracket	1	535-7330-01	Items 12A & 12B are secured to Item 1 by: OPTO PCB Tube Spacer (Brass) (Qty. 3/per) (530-5308-02), OPTO PCB Rubber Grommet (Qty. 3/per) (545-5518-00) and #6-32 X 5/8" HWH Swage (Serr) Zinc (Qty. 3/per) (237-5976-04)			
Item 4 is secured to Item 1 by: #8-32 X 3/8" HWH Swage (Serr) Zinc (Qty. 4) (237-5975-00)				5-Ball Trough Assy., 500-6318-25 is secured below the playfield by: #8 X 1/2" HWH AB (Zinc) Blue (Qty. 6) (234-5101-05)			
5	Coil, 26-1200	1	090-5044-00T	ASSOCIATED PARTS ARE NOT INCLUDED WITH THE ABOVE ASSEMBLY.			
ORDERING ABOVE (ITEM 5) COIL PART Nº WILL INCLUDE:				Nº	Associated Part Name	QTY.	SPI Part Nº
— Diode, 1N4004 (positioned at top)				13	Ball Trough Enter / Exit Scoop	1	535-7329-01
6	Coil Sleeve	1	545-5076-00	Item 13 is secured to the playfield by: #8 X 1/2" HWH AB (Zinc) Blue (Qty. 4) (234-5101-05).			
7	Coil Retaining Bracket	1	535-5203-03	14	Heat Shrink Tubing 1/8" ø PUI-24	3"	605-5006-00
Item 7 is secured to Item 2 by: #8-32 X 1/4" HWH (Serr) Zinc TF (Qty. 2) (237-5964-00)				n/a*	Steel Balls (1-1/16" ø)	5	260-5000-00
8	Plunger Assembly	1	515-5941-01				
9	Compression Spring	1	266-5020-00				
10	Rubber Bumper (Grommet)	1	545-5105-00				

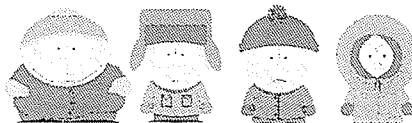
Flipper (Left) Assembly, 500-5944-14 (Items 1-12) **and Associated Part: Yellow Flipper Bat & Shaft Assy., 515-5133-06-05 (Item 13*)**



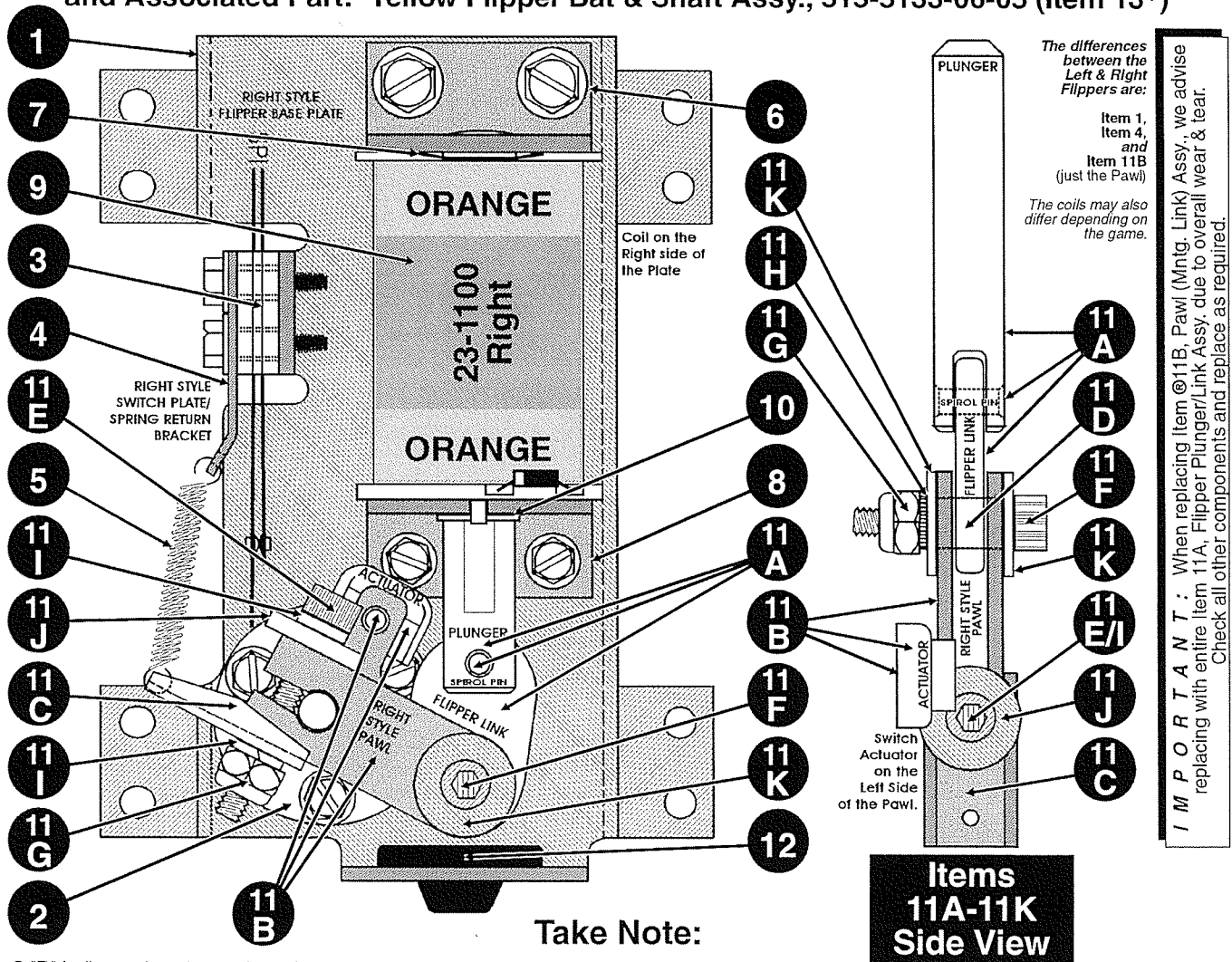
Section 4 | Drawings

* An asterisk (*) indicates item is *Not Shown* in pictorial.

<



Flipper (Right) Assembly, 500-5944-04 (Items 1-12) **and Associated Part: Yellow Flipper Bat & Shaft Assy., 515-5133-06-05 (Item 13*)**



© "R" indicates item has a riveted-on part, if removing/adding rivets is not an option, order the entire © Sub-Assembly.

* An asterisk (*) indicates item is *Not Shown* in pictorial.

Nº	Individual Part Name	QTY.	SPI Part Nº
1	Flipper Base Plate Kit (Right)	1	515-6617-00
ORDERING ABOVE (ITEM 1) SUB-ASSY. PART Nº WILL INCLUDE:			
— Flipper Base Plate (Right) comes threaded with all securing hardware (Thread Forming Screws) for Items 2, 3, 6 & 8.			
2	Flipper Bat Bushing	1	545-5594-00
Item 2 is secured to Item 1 by: #6-32 X 3/8" HWH Swage (Ser.) Zc. (Qty. 3) (237-5976-02)			
3	Power (End of Stroke) Switch	1	180-5149-00
Item 3 is secured to Item 1 by: #6-32 X 5/8" HWH Swage (Ser.) Zc. (Qty. 2) (237-5976-04)			
4	Switch Plate/Spring Return Rt. Brkt.	1	535-7354-00
5	Flipper Return Spring	1	265-5035-00
6	Coil Stop Sub-Assembly	1	515-6308-01
ORDERING ABOVE (ITEM 6) SUB-ASSY. PART Nº WILL INCLUDE:			
6A	Coil Stop with with .093" ø Hole	1	530-5350-01
6B	Shading Ring	1	530-5123-00
6C	Coil Stop Bracket	1	535-7355-00
Item 6 is secured to Item 1 by: #10-32 X 3/8" SHWH Swage (Serr) Zinc (Qty. 2) (237-5985-00) and #10 Split Lock Washer (Qty. 2) (244-5003-00)			
7	Spring Washer	1	269-5002-00
8	Coil Support Bracket	1	535-7356-00
Item 8 is secured to Item 1 by: #8-32 X 3/8" HWH Swage (Ser.) Zc. (Qty. 2) (237-5975-00)			
9	Coil, 23-1100 (ORG) (Right)	1	090-5030-00T
ORDERING ABOVE (ITEM 9) COIL PART Nº WILL INCLUDE:			
— Diode, 1N4004 (positioned at top)			
10	Coil Sleeve	1	545-5388-00

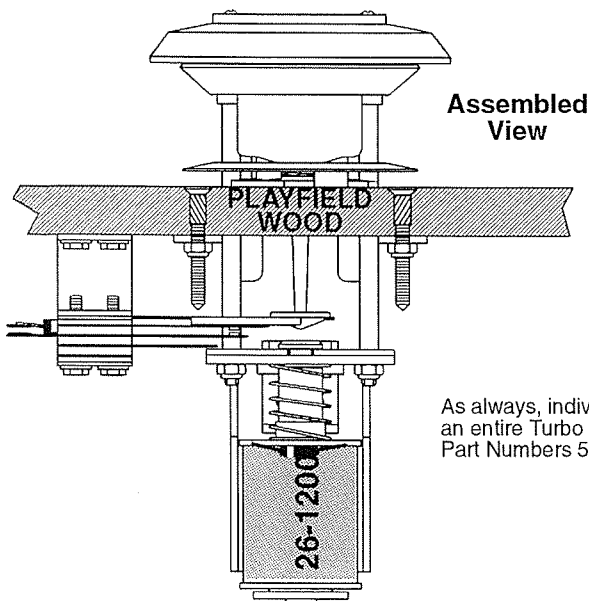
Nº	Individual Part Name	QTY.	SPI Part Nº
11	Plunger, Link & Pawl (Rt.) Sub-Assy.	1	515-6518-00
ORDERING ABOVE (ITEM 11) SUB-ASSY. PART Nº WILL INCLUDE:			
11A	Flipper Plunger/Link Sub-Assy.	1	515-6304-01
includes: Plunger "Flipper" Link			
includes: Spirol Pin ø 5/32" X 7/16" Lg.			
includes: Flipper Plunger with "Flat"			
11B	Pawl (Mntg. Link) (Rt.) Sub-Assy.	1	515-6305-00
includes: Pawl (Mounting Link) (Rt.) Plain			
includes: Switch Actuator			
includes: Rivet, 1/8" ø X 1/4" Lg.			
11C	Return Bracket	1	535-7353-00
11D	Flipper Link Bushing (Metal, Ext.) (.385" Lg. X .192" ID X .312" OD)	1	530-5139-01
11E	#10-32 X 1-1/4" Lg. Socket Head	1	237-5950-01
11F	#10-32 X 7/8" Lg. Socket Head	1	237-5966-00
11G	#10-32 Nylon Stop Nut	2	240-5203-00
11H	#10 Star Washer	1	246-5002-00
11I	#10 Split Lock Washer	2	244-5003-00
11J	Washer .203" ID X .63" OD X .105" Thk W/cut	1	242-5039-01
11K	Washer .203" ID X .63" OD X .062" Thk	2	242-5038-00
12	Deflector Pad (Bumper)	1	545-5428-00

Flipper (Right) Assembly, 500-5944-04 is secured below the playfield by:
 #10 X 1/2" HWH MS (Ser.) Zinc ST (Qty. 8) (237-5949-00)

ASSOCIATED PARTS ARE NOT INCLUDED WITH THE ABOVE ASSEMBLY.

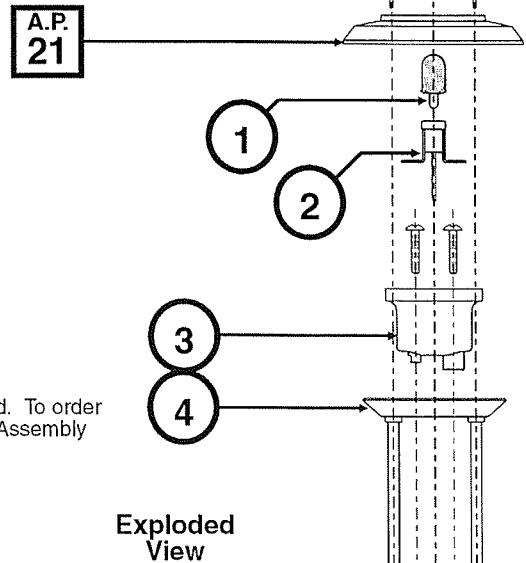
Nº	Associated Part Name	QTY.	SPI Part Nº
13*	Yellow Flipper Bat (Sega Saturn® Logo) & Shaft (Non-Knurled End) Assembly	1	515-5133-06-05
n/a*	Large Flipper BLACK Rubber Ring	1	545-5277-00

**Turbo Bumper Top Assy., 515-6459-01 (Qty. 3) (Items 1-7),
Turbo Bumper Bottom Assy., 515-6459-04 (Qty. 3) (Items 8-15),
Turbo Bumper Switch Assy., 515-6459-03 (Qty. 3) (Items 16-20)
and Associated Part: See Table Below (Item 21)**



Take Note:

As always, individual parts can be ordered. To order an entire Turbo Bumper, use all three (3) Assembly Part Numbers 515-6459-01, -04 & -03.



Nº	Individual Part Name	QTY.	SPI Part Nº
Turbo Bumper Top Assy., 515-6459-01 (Items 1-7)			
1	#555 Wedge Base Bulb	1	165-5002-00
2	#555 Wedge Base Socket	1	077-5206-00
3	Bumper Body	1	545-5197-00
Item 3 is secured by: #5 X 7/8" PRH AB (Zinc) (Qty. 2) (237-5826-00)			
4	Ring Assembly	1	515-5085-00
Item 4 is secured by: #6-32 Nylon Stop Nut (Qty. 2) (240-5005-00)			
5	Bumper Skirt	1	545-5607-00
6	Bumper Skirt Spring	1	266-5048-00
7	Bumper Base	1	545-5195-00

Turbo Bumper Bottom Assy., 515-6459-04 (Items 8-15)			
8	Plunger	1	530-5348-00
9	Coil Spring	1	266-5047-00
10	Coil, 26-1200	1	090-5044-00T
ORDERING ABOVE (ITEM 10) COIL PART Nº WILL INCLUDE:			
—	Diode, 1N4004 (positioned at top)	1	112-5003-00
11	Coil Sleeve	1	545-5031-00
12	Fiber Yoke	1	545-5609-00
13	Metal Yoke	1	535-7346-00
14	Metal Yoke Stop	1	535-7347-00

Item 14 is secured by: #6-32 X 1/4" HWH Swage (Serr.) Zinc (Qty. 2) (237-5976-01)			
15	Coil Bracket Welded Assembly	1	515-5939-00
Item 15 is secured by: #6-32 X 1-3/16" Spiral Fin Shank (Qty. 3) (237-5957-00) and #6-32 Nylon Stop Nut (Qty. 3) (240-5005-00)			

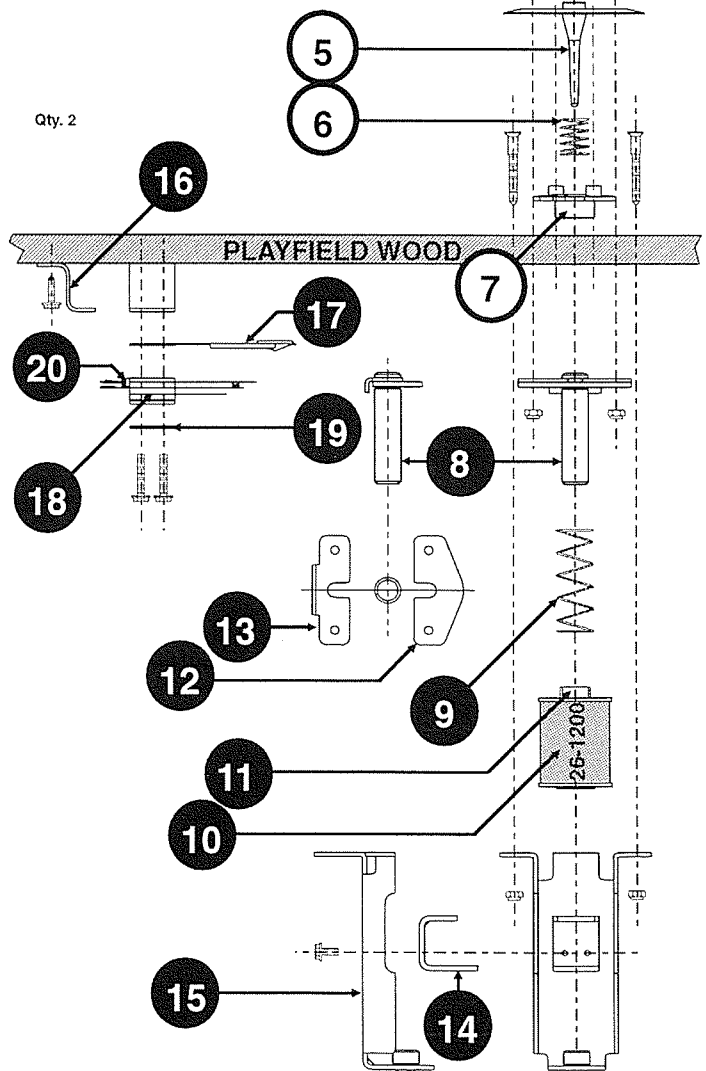
Turbo Bumper Switch Assy., 515-6459-03 (Items 16-20)			
16	Switch Bracket	1	535-7342-00
Item 16 is secured by: #8 X 1/2" HWH AB (Zinc) Blue (Qty. 2) (234-5101-05)			
17	Spoon Switch Actuator	1	545-5610-01
18	Turbo Bumper Stack (Blade) Switch	1	180-5015-03
19	Switch Body Protect Plate	1	535-7344-00
Items 18 & 19 are secured by: #6-32 X 3/4" HWH Swage (Serr.) Zc. (Qty. 2) (237-5976-05)			
20	Switch Diode, 1N4001	1	112-5001-00

The Top & Bottom Assemblies are secured together by hardware included in assemblies.

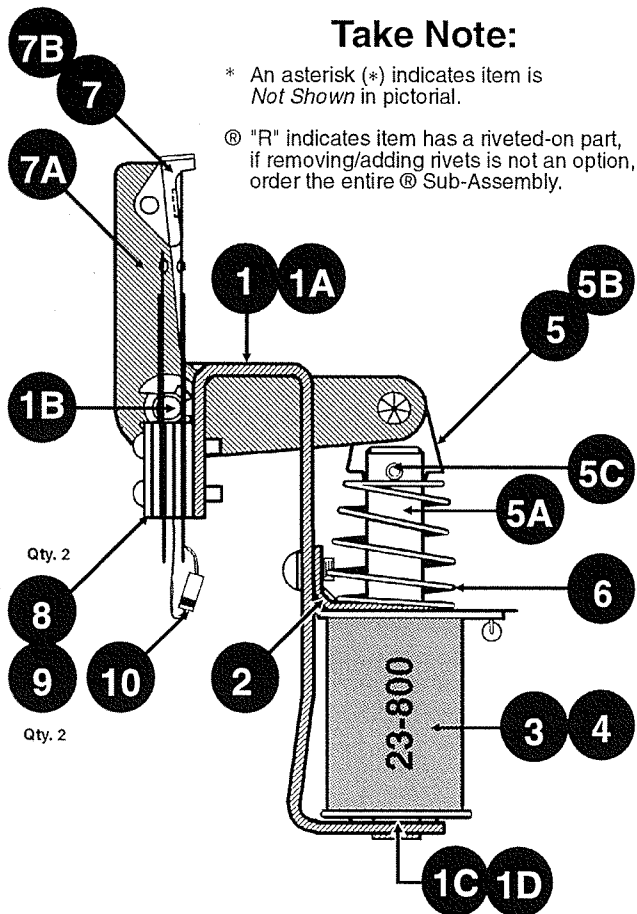
ASSOCIATED PARTS ARE NOT INCLUDED WITH THE ABOVE ASSEMBLY.

Nº	Associated Part Name	QTY.	SPI Part Nº
21	Red Pop Cap (Plastic)	3	550-5057-02

Item 21 is secured to Item 4 by: #4 X 3/4" PRH (Zinc) (Qty. 2/per) (237-5873-00)



Left & Right Slingshot Assemblies, 500-5849-00 (Qty. 2) (Items 1-10)



Take Note:

* An asterisk (*) indicates item is *Not Shown* in pictorial.

® "R" indicates item has a riveted-on part, if removing/adding rivets is not an option, order the entire ® Sub-Assembly.

Nº	Individual Part Name	QTY.	SPI Part Nº
1	Slingshot Bracket Assembly	1	515-5339-01
ORDERING ABOVE (ITEM 1) SUB-ASSY. PART Nº WILL INCLUDE:			
1A	Slingshot Bracket	1	535-5919-01
1B	Hinge Stud	1	530-5034-01
1C	Armature Stop	1	530-5017-01
1D	Shading Ring	1	530-5307-00
2	Coil Retaining Bracket	1	535-5203-03

Item 2 is secured to Item 1 by: #8-32 X 1/4" PPH MS (Sems) Zinc (Qty. 2) (232-5300-00)

3	Coil, 23-800	1	090-5001-00T
---	--------------	---	--------------

ORDERING ABOVE (ITEM 3) COIL PART Nº WILL INCLUDE:

—	Diode, 1N4004 (positioned at top)	1	112-5003-00
4	Coil Sleeve	1	545-5031-00

5	Plunger & Link Assembly	1	515-5338-00
---	-------------------------	---	-------------

ORDERING ABOVE (ITEM 5) SUB-ASSY. PART Nº WILL INCLUDE:

5A	Plunger 2" Lg.	1	530-5025-01
5B	Plunger Link	1	545-5293-00
5C	Roll Pin 1/8" ø x 5/8" Lg.	1	251-5008-00

Item 5B is secured to Item 1 by: Retaining Ring, 1/4" ø Shaft (Qty. 1) (270-5002-00)

6	Compression Return Spring	1	266-5020-00
---	---------------------------	---	-------------

7®	Riveted Arm & Tip Assembly	1	515-5340-01
----	----------------------------	---	-------------

ORDERING ABOVE ® RIVETED ASSY. PART Nº WILL INCLUDE:

7A	Arm	1	515-5341-01
7B	Kicker Tip	1	545-5216-01
7C	Rivet, 1/8" ø x 1/4" Lg.	1	249-5003-00

Item 7A is secured to Item 1B by: Retaining Ring, 1/4" ø Shaft (Qty. 1) (270-5002-00)

8	Slingshot Stack (Blade) Switch	2	180-5054-00
---	--------------------------------	---	-------------

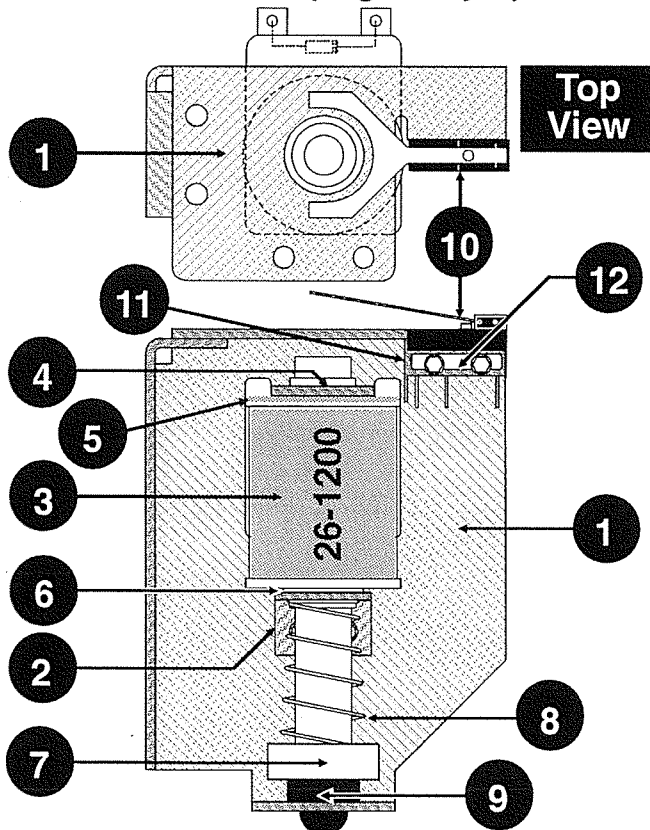
9	Switch Body Protect Plate	2	535-5045-00
---	---------------------------	---	-------------

Items 8 & 9 are secured to Item 1 by: #6-32 X 5/8" HWH Swage (Serr) Zinc (Qty. 2/per) (237-5976-04)

10	Switch Diode, 1N4001	2	112-5001-00
----	----------------------	---	-------------

Slingshot Assemblies (Qty. 2), 500-5849-01 are secured below the playfield by: #8 X 1/2" HWH AB (Zinc) Blue (Qty. 3/per) (234-5101-05)

VUK (Right Style) Assembly, 500-6290-01 (Items 1-13)



Take Note:

* An asterisk (*) indicates item is *Not Shown* in pictorial.

1. Note: The Switch Diode, 1N4001, is not located on this assembly (nor included); it's located on a *Terminal Strip* under the playfield.

Nº	Individual Part Name	QTY.	SPI Part Nº
1	VUK Coil Mounting Bracket (Right Style)	1	535-8296-01
2	Coil Retaining Bracket	1	535-5203-03

Item 2 is secured by: #8-32 X 1/4" PPH MS (Sems) Zinc (Qty. 2) (232-5300-00)

3	Coil, 26-1200	1	090-5044-00T
---	---------------	---	--------------

ORDERING ABOVE (ITEM 3) COIL PART Nº WILL INCLUDE:

—	Diode, 1N4004 (positioned at top)	1	112-5003-00
4	Coil Sleeve	1	545-5076-00

5	Coil Lug Insulator (Fiche Paper)	1	545-5431-00
---	----------------------------------	---	-------------

6	Spring Washer, 17/32" ID X 3/4" X 1"	1	269-5002-00
---	--------------------------------------	---	-------------

7	Plunger Assembly	1	515-5941-01
---	------------------	---	-------------

8	Compression (Relay) Spring	1	266-5020-00
---	----------------------------	---	-------------

9	Rubber Bumper (Grommet)	1	545-5105-00
---	-------------------------	---	-------------

10	Micro Switch ("Y" Actuator)	1	180-5116-01
----	-----------------------------	---	-------------

11	Switch Lug Insulator (Fiche Paper)	1	545-5759-00
----	------------------------------------	---	-------------

12	Switch Body Protect Plate	1	535-6539-00
----	---------------------------	---	-------------

Items 10, 11 & 12 are secured by: #2-56 X 1/2" HWH MS (Serr) Zinc Thread-Forming 3/16" (Qty. 2) (237-5937-01)

13*	Diode, 1N4001 (On Terminal Strip)	1	112-5001-00
-----	-----------------------------------	---	-------------

VUK (Right Style) Assembly, 500-6290-01 is secured under the playfield by: Wood VUK Spacer (Qty. 1) (525-5548-00) and #8 X 3/4" HWH AB (Zinc) (Qty. 3) (234-5103-00)

Toilet & Frame Assembly, 500-6360-00-71 (Items 1-16)

Take Note:

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

® "R" indicates item has a riveted-on part(s), if removing/adding rivets is not an option, order the entire ® Sub-Assembly. **Please Note:** If the ® Sub-Assembly is **not** available, call Technical Support.

Nº	Individual Part Name	QTY.	SPI Part Nº	Nº	Individual Part Name	QTY.	SPI Part Nº
1®	Riveted Toilet Frame Weldment	1	515-7007-00-71	8	Plastic Edge Protector 2"	1	545-5930-02
ORDERING ABOVE ® RIVETED ASSY. PART Nº WILL INCLUDE:				9	Laydown Wedge Base Socket	2	077-5026-01
1A	Toilet Frame Weldment	1	515-6991-00	Item 9 is secured to Item 1A by: #6-32 X 3/8" PPH MS (Sems) Zinc (Qty. 1/per) (232-5201-00) and #6-32 Nylon Stop Nut (Qty. 1/per) (240-5005-00)			
1B	Toilet Lid Hinge Weldment (Black)	1	390-5043-00	10	#906 Wedge Base Bulb (Red)	2	165-5004-02
1C*	Rivet, 1/8" ø X 5/32" Lg.	2	249-5009-00	11	Wedge Base Offset Socket	2	077-5029-00
2	Toilet (White Molded Plastic, Altered)	1	880-5033-00	Item 11 is secured to Item 1A by: #6-32 X 3/8" PPH MS (Sems) Zinc (Qty. 1/per) (232-5201-00) and #6-32 Nylon Stop Nut (Qty. 1/per) (240-5005-00)			
Item 2 is secured to Item 1A by: #6-32 X 3/8" HWH Swage (Ser) Zinc (Qty. 4) (237-5976-02) and #6 Washer (Qty. 4) (242-5001-00)				12	#555 Wedge Base Bulb	2	165-5002-00
3	Toilet Hinge Welded Assembly	1	515-7000-00	13*	Rubber Lite Cover GREEN	2	545-5014-04
4	Toilet Lid Stop Bracket	1	535-8546-00	14	Toilet Lid Seat (Black)	1	830-5968-00
Item 3 (bottom half) & Item 4 are secured to Item 1A by: #6-32 X 1/2" PPH MS (Sems) Zinc (Qty. 2) (232-5202-00) and #6-32 Nylon Stop Nut (Qty. 2) (240-5005-00).				Item 14 is secured to Item 1B by: #6-32 X 1/2" PFH MS (Zinc) (Qty. 2) (237-5918-00) and #6-32 Nylon Stop Nut (Qty. 2) (240-5005-00)			
5	Tank Lid Mounting Plate	1	515-6997-00	15	Ball Stop (Snubber) Bracket	1	515-6992-00
Item 5 is secured to Item 3 (top half) by: #6-32 X 3/8" PPH MS (Sems) (Qty. 2) (232-5201-00) and #6-32 Nylon Stop Nut (Qty. 2) (240-5005-00)				Item 15 is secured to Item 14 by: #6-32 X 3/8" PFH MS (Zinc) (Qty. 2) (237-5850-00)			
6	Tank Lid (White Molded Plastic, Altrd.)	1	880-5033-01	16	Black Sponge Rubber Pad (Self-Adh.)	1	626-5050-00
Item 6 is secured to Item 5 by: #6-32 X 3/8" PPH MS (Sems) (Qty. 2) (232-5201-00) and #6 Washer (Qty. 2) (242-5001-00)				Item 16 is secured onto Item 14 as a Ball Guide. The Dimensions: 1/8" X 1/4" X 2-1/2"			
7	Spring (used in Drop Targets)	1	265-5003-00	Toilet & Frame Assembly, 500-6360-00-71 is secured above the playfield by: #6-32 X 7/8" PFH (Zinc) (Qty. 7) (237-6021-00)			

Mr. Hankey & Tank Lid Lift Coil Assembly, 500-6391-00-71 (Items 17-30)

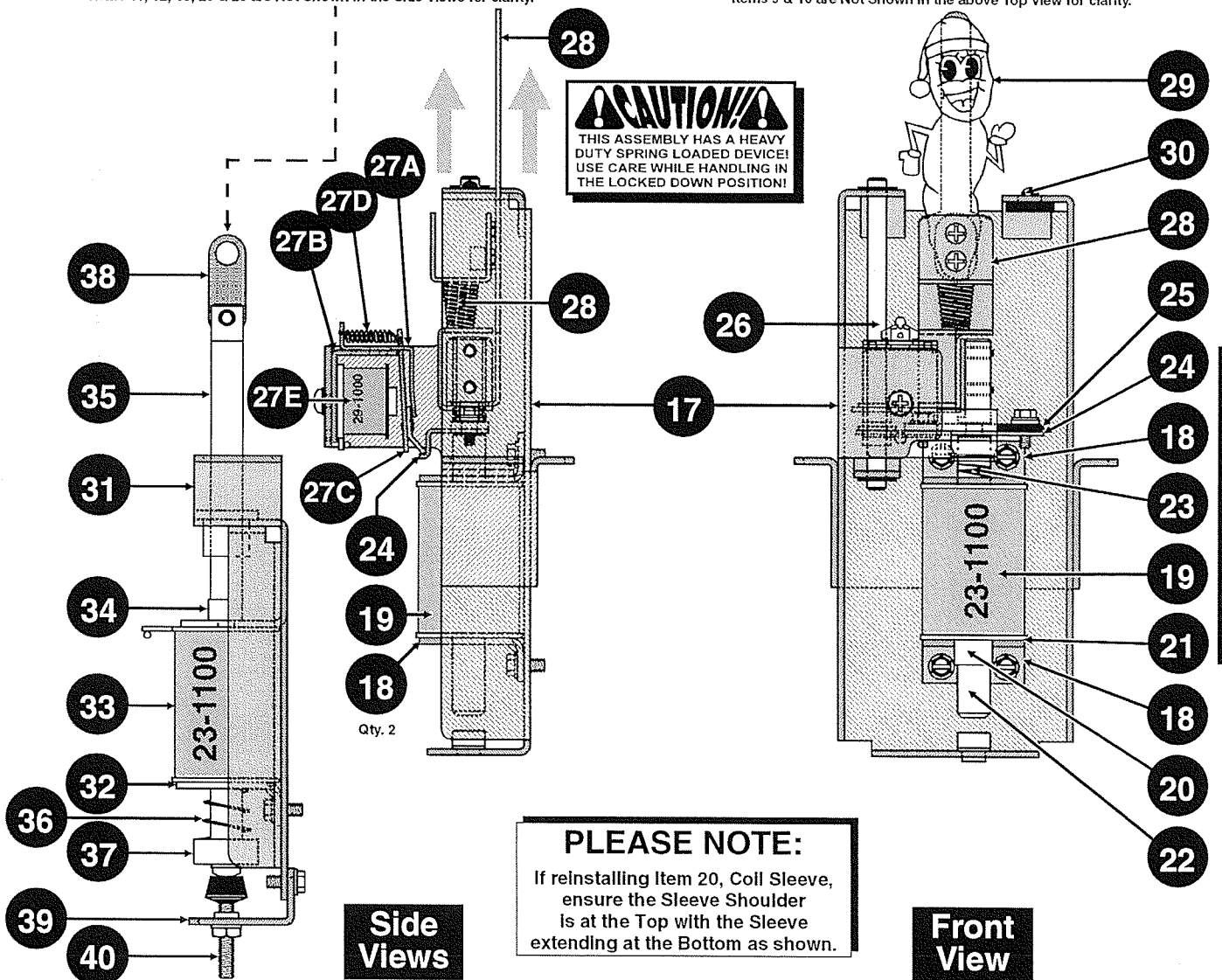
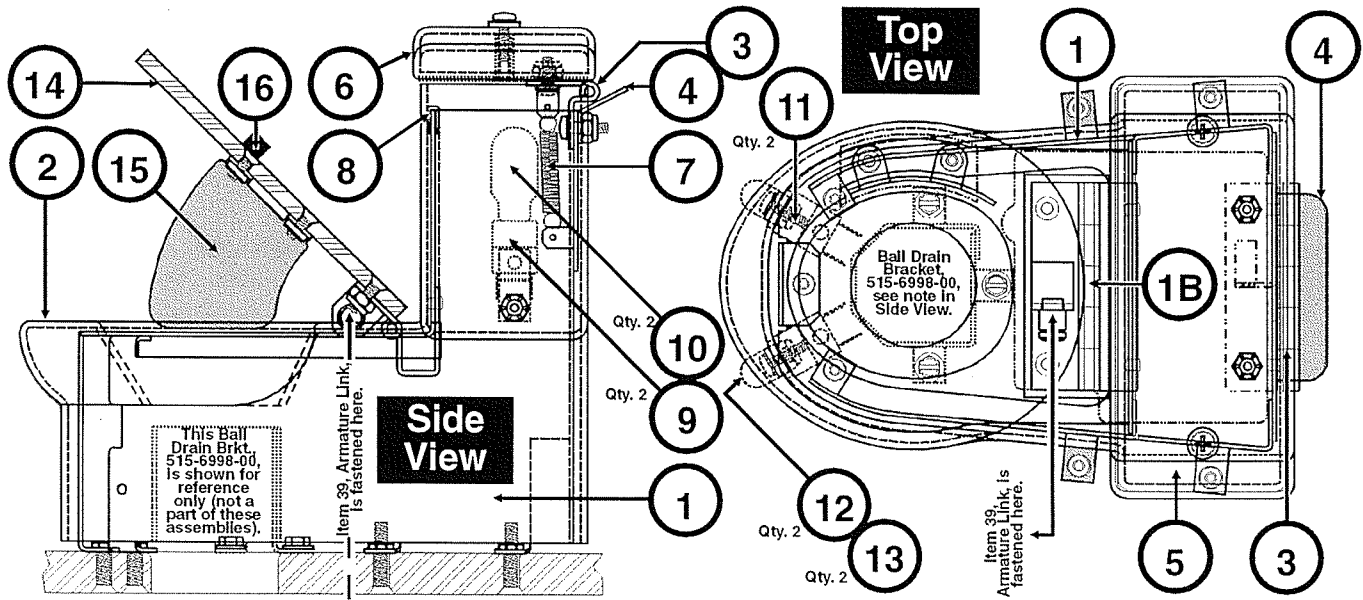
Nº	Individual Part Name	QTY.	SPI Part Nº	Nº	Individual Part Name	QTY.	SPI Part Nº
17	Coil & Trip Coil Mntg. Brkt. Weldment	1	515-6983-00	27	Trip Coil Assembly	1	515-6985-00
18	Coil Support (Retainer) Bracket (Lrg.)	2	535-7356-00	ORDERING ABOVE (ITEM 27) SUB-ASSY. PART Nº WILL INCLUDE:			
Item 18 is secured to Item 17 by: #8-32 X 3/8" HWH Swage (Serr.) Zinc (Qty. 2/per) (237-5975-00)				27A	Trip Coil Frame Top	1	535-6198-00
19	Coil, 23-1100	1	090-5030-00T	27B	Trip Coil Frame (Weldment) Bottom	1	535-6198-01
ORDERING ABOVE (ITEM 19) COIL PART Nº WILL INCLUDE:				27C®	Trip Coil Arm Riveted Assembly	1	515-6984-01
—	Diode, 1N4004 (positioned at top)	1	112-5003-00	27D	Return Spring	1	265-5024-00
20	Coil Sleeve (with Extension)	1	545-5847-00	27E	Coil, 29-1000	1	090-5059-00
21	Spring Washer	1	269-5002-00	27F*	Coil Lug Insulator (Fiche Paper)	1	545-5431-00
22	Drive Plunger (Main)	1	530-5539-01	Item 27 is secured to Item 17 by: #8-32 X 3/8" PPH MS (Sems) Zc. (Qty. 1) (232-5301-00)			
23	Plunger Spring	1	266-5063-01	28	Mr. Hankey Mntg. Brkt. Weldment	1	515-6996-00
24	Metal Yoke Weldment	1	515-6986-00	Item 28 is secured to Item 22 by: #8-32 X 1/2" PPH MS (Sems) Zc. (Qty. 2) (232-5302-00)			
25	Fiber Yoke	1	545-5609-00	29	South Park Mr. Hankey (3.5" Figurine)	1	880-5029-00
Item 25 is secured to Item 24 by: #6-32 X 3/8" HWH Swg. (Ser.) Zc. (Qty. 2) (237-5976-02)				Item 29 is secured to Item 28 by: #6-32 X 7/8" PFH Zinc (Qty. 2) (237-6021-00) and 1/4" X 3/8" Spacer Gray (Qty. 1, Bottom) (254-5000-02)			
26	Shaft (Drive Plunger Guide)	1	530-5540-00	30	Rubber Bumper (Grommet)	1	545-5105-00
Item 26 is secured to Item 17 by: Retaining Ring, 1/4" ø Shaft (Qty. 2) (270-5002-00)				Mr. Hankey & Tank ... Coil Assy., 500-6391-00-71 is secured below the playfield by: #8 X 1/2" HWH AB (Zinc) Blue (Qty. 7) (234-5101-05)			

Toilet Lid Lift Coil Assembly, 500-6392-00-71 (Items 31-40)

Nº	Individual Part Name	QTY.	SPI Part Nº	Nº	Individual Part Name	QTY.	SPI Part Nº
31	Coil Mounting Bracket Weldment	1	515-6993-00	37	Plunger Head	1	530-5511-00
32	Coil Support (Retainer) Bracket (Lrg.)	1	535-7356-00	Item 37 is secured to Item 35 by: #10-32 X 3/8" PPH MS (Sems) Zc. (Qty. 1) (232-5401-00)			
Item 32 is secured to Item 31 by: #8-32 X 3/8" HWH Swage (Sr.) Zc. (Qty. 2) (237-5975-00)				38	Armature Link	1	535-8535-00
33	Coil, 23-1100	1	090-5030-00T	Item 38 is secured to Item 35 by: Spirol Spring Pin 5/32" X 7/16" (Qty. 1) (251-5015-01) and Item 38 is secured to Item 1B (Toilet & Frame Assy.) by: Retaining Ring, 5/16" ø Shaft (Zinc) (Qty. 1) (270-5003-00)			
ORDERING ABOVE (ITEM 33) COIL PART Nº WILL INCLUDE:				39	Adjustment Spindle Stop Bracket	1	535-8303-00
—	Diode, 1N4004 (positioned at top)	1	112-5003-00	Item 39 is secured to Item 31 by: #8-32 X 3/8" HWH Swage (Sr.) Zc. (Qty. 2) (237-5975-00)			
34	Coil Sleeve (with Extension)	1	545-5847-00	40	#10-32 Adj. Spindle Stop w/Rubber Tip	1	280-5014-00
35	Toilet Lid Plunger Assembly	1	515-6994-00	Item 40 is secured to Item 39 by: #10-32 Keps Nut (Qty. 1) (240-5208-00)			
36	Compression Spring	1	266-5022-01	Toilet Lid Lift Coil Assy., 500-6392-00-71 is secured below the playfield by: #8 X 1/2" HWH AB (Zinc) Blue (Qty. 4) (234-5101-05)			



**Toilet & Frame Assembly, 500-6360-00-71 (Items 1-16),
Mr. Hankey & Tank Lid Lift Coil Assy., 500-6391-00-71 (Items 17-30) and
Toilet Lid Lift Coil Assembly, 500-6392-00-71 (Items 31-41) *Continued***



Kenny Assembly, 500-6358-00-71 (Items 1-23)

Nº	Individual Part Name	QTY.	SPI Part Nº
1	South Park Kenny (6" Figurine) Altrd.	1	880-5024-00
2	Platform Bracket Weldment	1	515-6978-00
3	Nyliner - 1/4" ø (Thomson #4L1-FF)	4	545-5423-00

Item 3 has a Qty. 2 In Item 2 & Qty. 2 In Item 15.

4	Pem Stud Plate (Inside Kenny)	1	535-8528-00
---	-------------------------------	---	-------------

Item 4 is secured to Item 2 by: #8-32 Nylon Stop Nut (Qty. 3) (240-5102-00)

5®	Riveted Lamp Bracket Assembly	1	515-7006-00-71
----	-------------------------------	---	----------------

ORDERING ABOVE ® RIVETED ASSY. PART Nº WILL INCLUDE:

5A	Lamp Assembly Bracket	1	535-8527-00
5B	Laydown Wedge Base Socket	2	077-5026-01
5C*	Rivet, 1/8" ø X 3/16" Lg.	1	249-5001-00
5E*	#6 Riveting Lock Washer	1	246-5000-00

Item 5 is secured to Item 2 by: #6-32 X 3/8" PPH MS (Sems) Zinc (Qty. 1) (232-5201-00)

6	#555 Wedge Base Bulb	1	165-5002-00
7	#906 Wedge Base Bulb	1	165-5004-00
8	Main Mntg. (Double-Coil) Brkt. Assy.	1	515-6976-00

Item 8 is secured to Item 15 (at the Top) by: Nylon Washer 25/64" ID X 3/4" OD X 1/16" (Qty. 2, 1 between Item 8 & 15, 1 with Steel Washer) (242-5049-00), Steel Washer 13/32" ID X 13/16" OD X 1/16" (Qty. 1) (242-5050-00) and Retaining Ring, 3/8" ø Shaft (Qty. 1) (270-5012-00)

Item 8 is secured to Item 15 (at the Bottom) by: Teflon Washer 1/4" ID X 1/2" OD X .062" (Qty. 2, 1 between Item 8 & 15, 1 with Steel Washer) (242-5040-01), Steel Washer 9/32" ID X 5/8" OD X 1/16" (Qty. 1) (242-5051-00) and Retaining Ring, 1/4" ø Shaft (Qty. 1) (270-5002-00)

9	Coil Retainer Bracket	2	535-5203-03
---	-----------------------	---	-------------

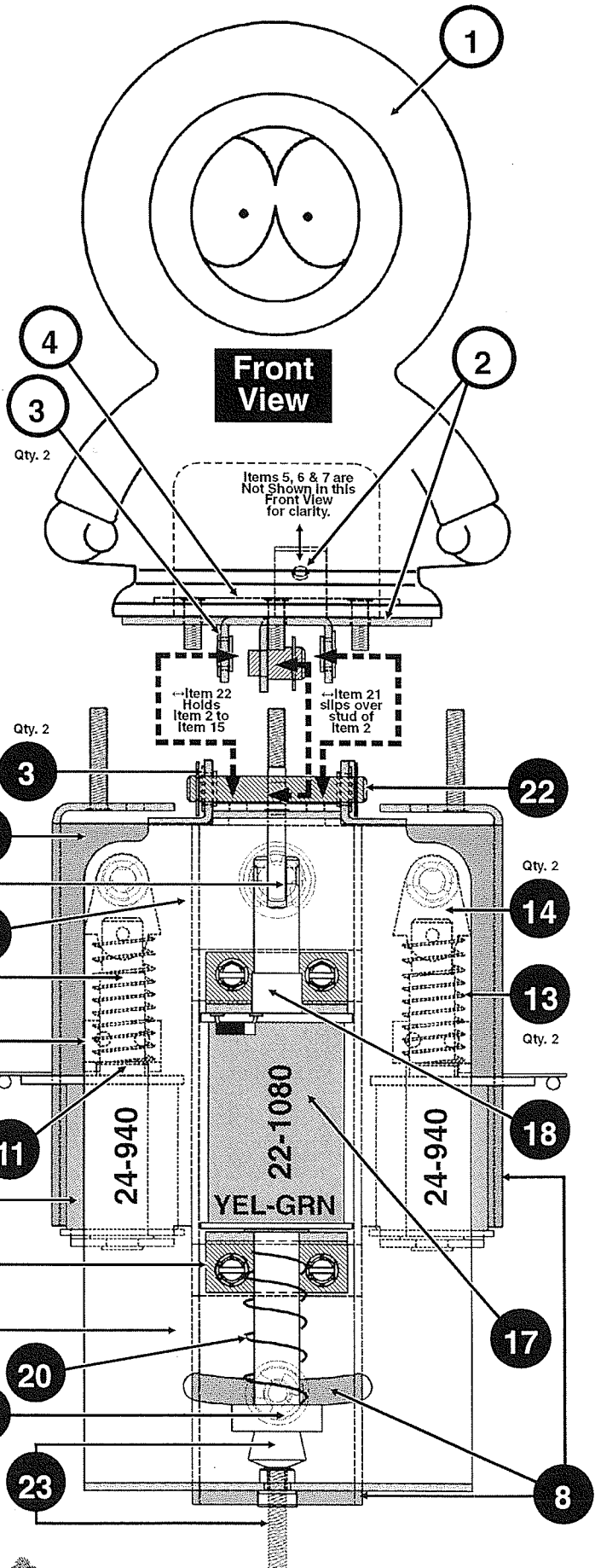
Item 9 is secured to Item 8 by: #8-32 X 1/4" PPH MS (Sems) Zc (Qty. 2/per) (237-5975-00)

10	Coil, 24-940	2	090-5036-00T
----	--------------	---	--------------

ORDERING ABOVE (ITEM 10) COIL PART Nº WILL INCLUDE:

—	Diode, 1N4004 (positioned at top)	1	112-5003-00
---	-----------------------------------	---	-------------

Parts Table continued on next page...



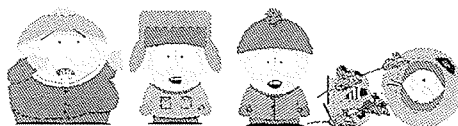
PLEASE NOTE:

If reinstalling Item 18, Coil Sleeve, ensure the Sleeve Shoulder is at the Bottom with the Sleeve extending at the Top as shown.

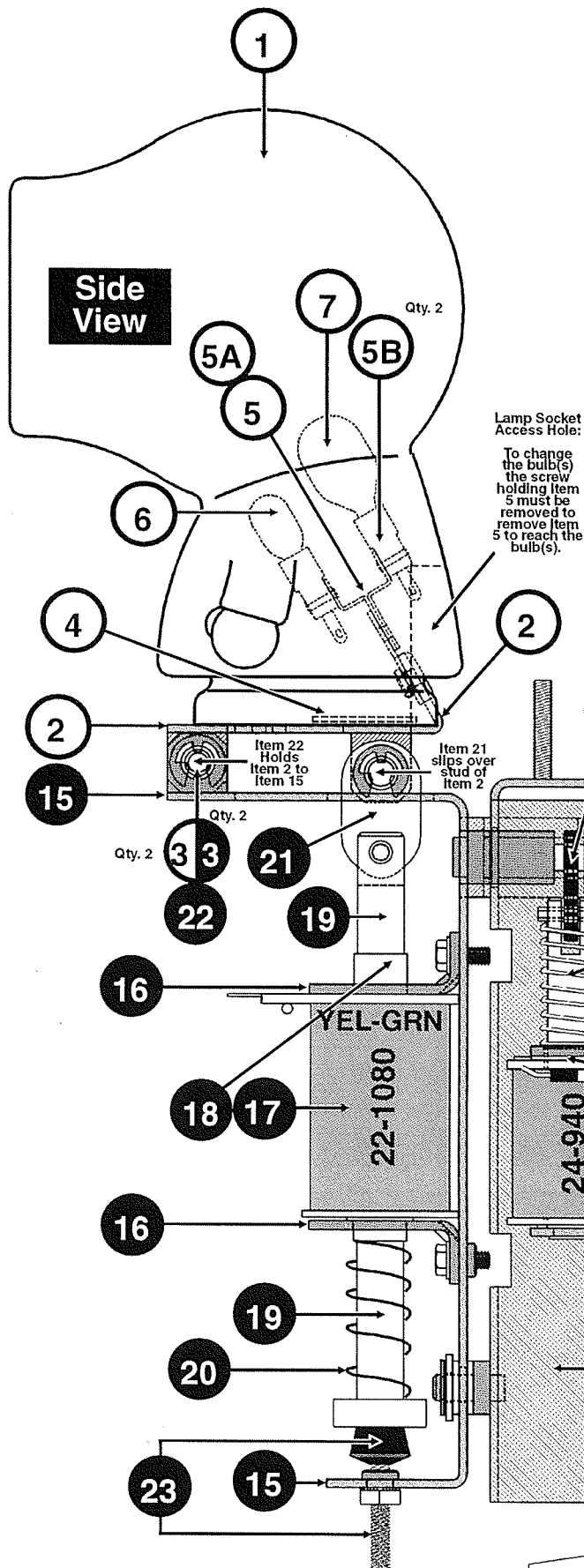
Take Note:

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

® "R" indicates item has a riveted-on part(s), if removing/adding rivets is not an option, order the entire ® Sub-Assembly. **Please Note:** If the ® Sub-Assembly is not available, call Technical Support.



Kenny Assembly, 500-6358-00-71 (Items 1-23) *Continued*



Nº	Individual Part Name	QTY.	SPI Part Nº
----	----------------------	------	-------------

Parts Table continued from previous page...

11	Coil Sleeve	2	545-5031-00
12	Plunger (2-1/2")	2	530-5025-02
13	Compression Spring (.045) (On Item 12)	2	266-5034-06
14	Plunger Link (Standard, Blue)	2	545-5293-00

Item 14 Is secured to Item 12 by: Roll Pin, 1/8" x 5/8" Lg. (Qty. 1/per) (251-5008-00)

Item 14 Is secured to Item 15 by: Retaining Ring, 1/4" x Shaft (Qty. 1/per) (270-5002-00)

15	Carriage (Swinging) Mntg. Brkt. Assy.	1	515-6977-00
16	Coil Support (Retainer) Bracket (Lrg.)	2	535-7356-00

Item 16 Is secured to Item 15 by: #8-32 X 3/8" HWH Swage (Serr.) Zinc (Qty. 2/per) (237-5975-00)

17	Coil, 22-1080 (Yel-Gm)	1	090-5032-00T
----	------------------------	---	--------------

ORDERING ABOVE (ITEM 17) COIL PART Nº WILL INCLUDE:

—	Diode, 1N4004 (positioned at top)	1	112-5003-00
18	Coil Sleeve (with Extension)	1	545-5847-00
19	Plunger Assembly (Long)	1	515-6792-01
20	Compression Spring (on Item 19)	1	266-5020-00
21	Plunger "Flipper" Link (White, Sonic Logo)	1	545-5611-00

Item 21 Is secured to Item 19 by: Spirol Spring Pin 5/32" X 1/2" (Qty. 1) (251-5015-00)

Item 21 Is secured to Item 2 by: Retaining Ring, 1/4" x Shaft (Qty. 1) (270-5002-00)

22	Platform Hinge Pin	1	530-5537-00
----	--------------------	---	-------------

Item 22 Is secured to Item 15 by: Retaining Ring, 1/4" x Shaft (Qty. 2) (270-5002-00)

23	#10-32 Adj. Spindle Stop w/Rubber Tip	1	280-5014-00
----	---------------------------------------	---	-------------

Item 23 Is secured to Item 15 by: #10-32 Keps Nut (Qty. 1) (240-5208-00)

Kenny Assembly, 500-6358-00-71 (via Item 8) Is secured under the playfield by:

#8 X 1/2" HWH AB (Zinc) Blue (Qty. 5) (234-5101-05) and above the playfield by:

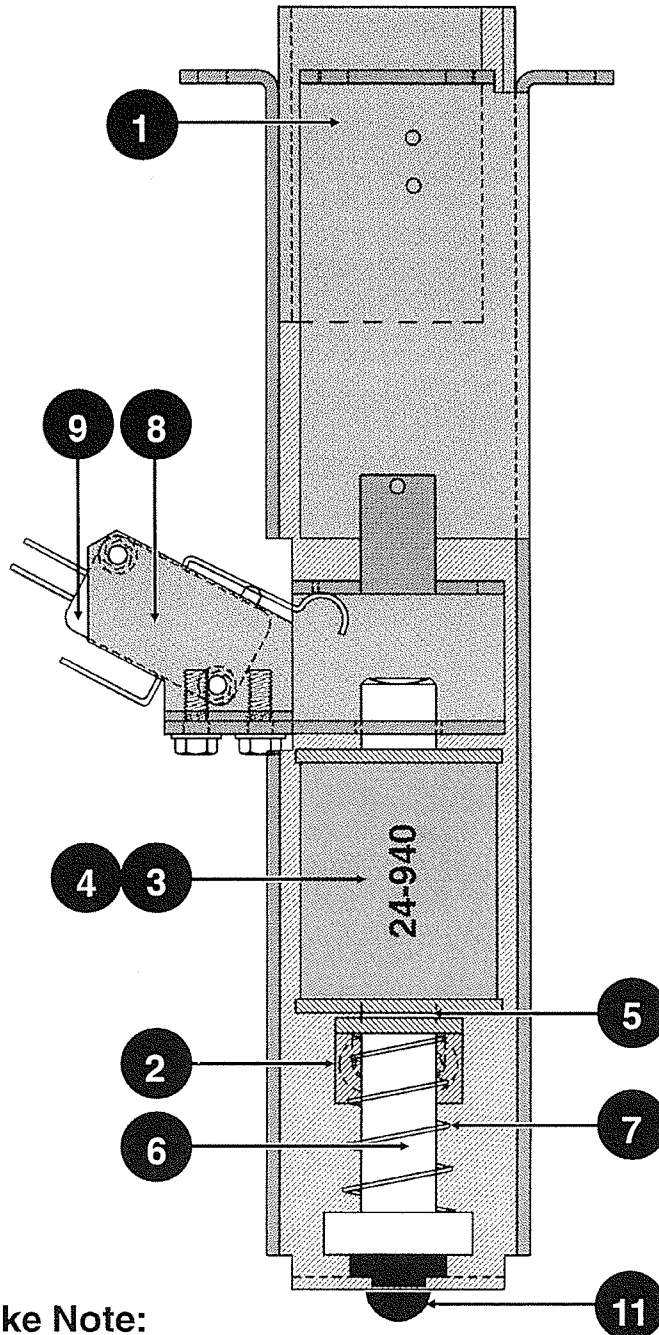
Washer 3/16" ID X 7/8" OD X .048" (Qty. 3) (242-5059-00) and

#8-32 Nylon Stop Nut (Qty. 3) (240-5102-00)

PLEASE NOTE:

If reinstalling Item 18, Coil Sleeve, ensure the Sleeve Shoulder is at the Bottom with the Sleeve extending at the Top as shown.

Super VUK Assembly, 500-6184-04-71 (Items 1-11)



Take Note:

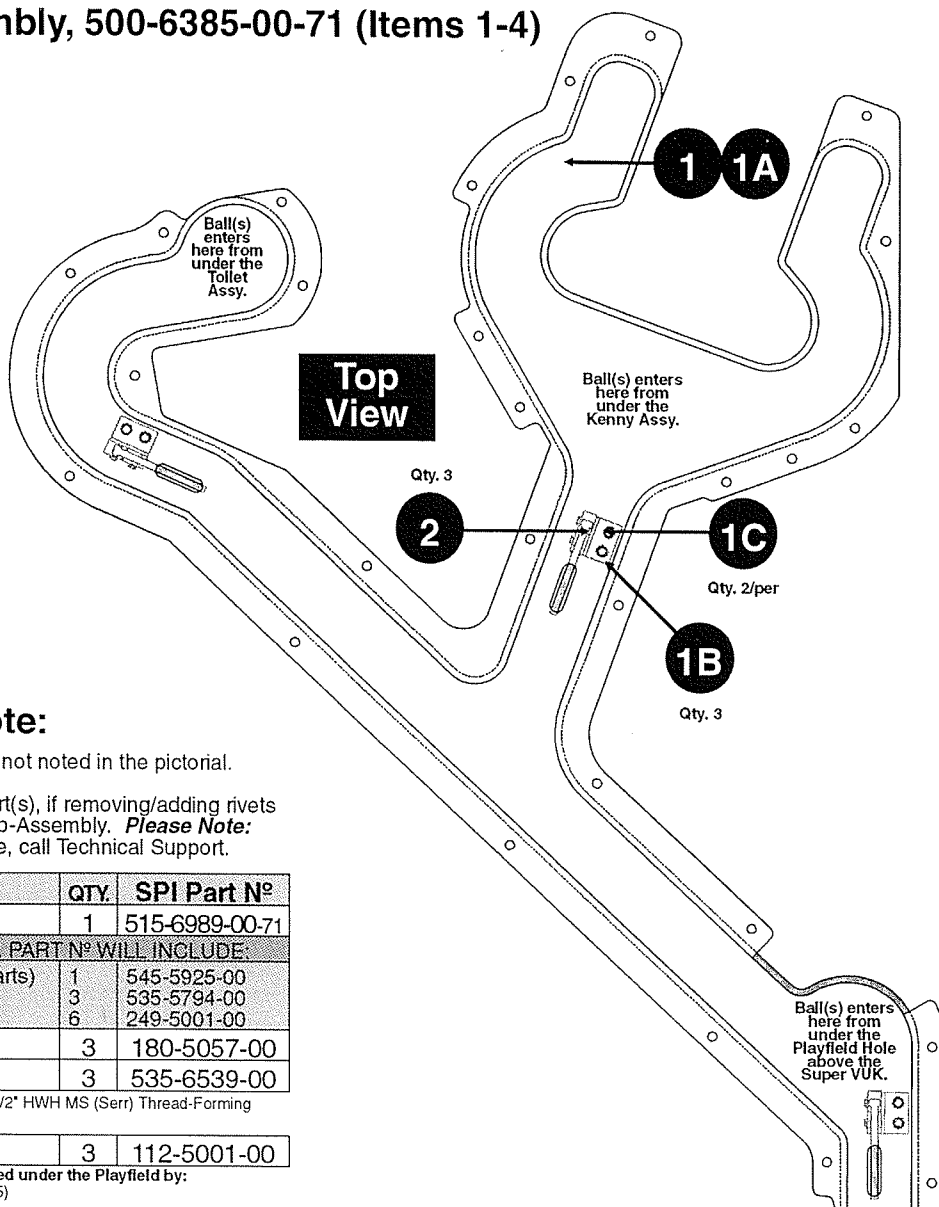
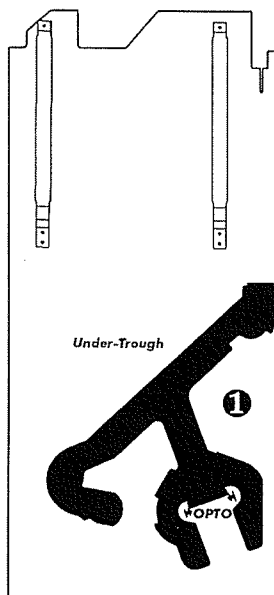
* An asterisk (*) indicates item is *Not Shown* in pictorial.

1. Note: The Switch Diode, 1N4001, is not located on this assembly (nor included); it's located on a *Terminal Strip* under the playfield.

Nº	Individual Part Name	QTY.	SPI Part Nº	Nº	Individual Part Name	QTY.	SPI Part Nº
1	SVUK Mounting Weldment Bracket	1	515-6744-04	7	Compression (Relay) Spring	1	266-5020-00
2	Coil Retaining Bracket	1	535-5203-03	8	Super VUK Switch Bracket	1	535-8144-01
Item 2 is secured by: #8-32 X 1/4" PPH MS (Sems) Zinc (Qty. 2) (232-5300-00)				Item 8 is secured by: #4-40 X 5/8" MS (Serr) Zinc (Qty. 2) (237-5945-00)			
3	Coil, 24-940	1	090-5036-00T	9	Micro Switch	1	180-5052-00
ORDERING ABOVE (ITEM 3) COIL PART Nº WILL INCLUDE:				Item 9 is secured to Item 8 by: #6-32 X 3/8" HWH Swage (Ser.) Zc. (Qty. 2) (237-5976-02)			
—	Diode, 1N4004 (positioned at top)	1	112-5003-00	10*	Diode, 1N4001 (On Terminal Strip)	1	112-5001-00
4	Coil Sleeve	1	545-5076-00	11	Rubber Bumper (Grommet)	1	545-5105-00
5	Spring Washer (17/32" ID X 3/4" X 1")	1	269-5002-00	Super VUK Assembly, 500-6184-04-71, is secured under the playfield by: #8 X 1/2" HWH AB (Zinc) Blue (Qty. 3) (234-5101-05)			
6	Plunger Assembly	1	515-5941-01				



Under-Trough Assembly, 500-6385-00-71 (Items 1-4)



Take Note:

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

© "R" indicates item has a riveted-on part(s), if removing/adding rivets is not an option, order the entire © Sub-Assembly. **Please Note:** If the © Sub-Assembly **is not** available, call Technical Support.

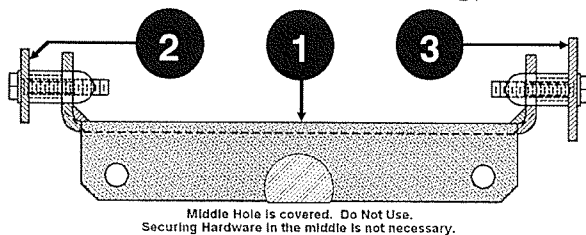
Nº	Individual Part Name	QTY.	SPI Part Nº
1©	Riveted Undertrough Sub-Assy.	1	515-6989-00-71
ORDERING ABOVE © RIVETED ASSY. PART Nº WILL INCLUDE:			
1A	Red Plastic Trough (Plain, No Parts)	1	545-5925-00
1B	Micro Switch Bracket	3	535-5794-00
1C	Rivet, 1/8" ø X 3/16" Lg. (2/per)	6	249-5001-00
2	Micro Switch (High Form)	3	180-5057-00
3*	Switch Body Protect Plate	3	535-6539-00

Items 2 & 3 are secured on Item 1B by: #2-56 X 1/2" HWH MS (Serr) Thread-Forming 3/16" Hd. (Qty. 2/per) (237-5937-01)

4*	Diode, 1N4001	3	112-5001-00
----	---------------	---	-------------

Under-Trough Assembly, 500-6385-00-71 is secured under the Playfield by: #8 X 1/2" HWH AB (Zinc) Blue (Qty. 27) (234-5101-05)

OPTO & Bracket (Long) Assembly, 500-6242-02-71 (Items 1-3)

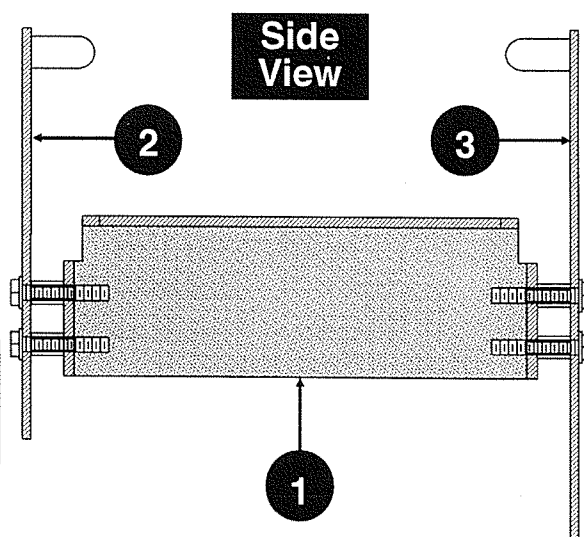


Top View

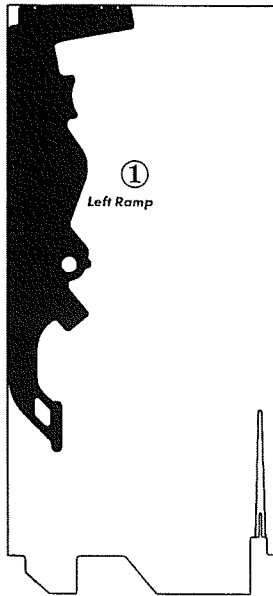
Nº	Individual Part Name	QTY.	SPI Part Nº
1	OPTO Mounting Bracket (Large)	1	515-6768-02
2	OPTO Transmitter (TRANS) Board	1	520-5082-00
3	OPTO Receiver (REC) Board	1	520-5083-01

Items 2 & 3 are secured by: #4-40 X 5/8" HWH (Serr) Zinc (Qty. 2/per) (237-5945-00)

OPTO & Bracket (Long) Assembly, 500-6242-02-71, is secured under the playfield by: #8 X 1/2" HWH AB (Zinc) Blue (Qty. 2) (234-5101-05)



Left Ramp Assembly, 500-6389-00-71 (Items 1-4) and Associated Part: (See Below Parts Table, Items 5-7)



Take Note:

- * An asterisk (*) indicates items are not noted in the pictorial.
 - ® "R" indicates item has a riveted-on part(s), if removing/adding rivets is not an option, order the entire ® Sub-Assembly.
- Please Note:**
If the ® Sub-Assembly is **not** available, call Technical Support.

Nº	Individual Part Name	QTY.	SPI Part Nº
1	Left Plastic Ramp (Plain, No Parts)	1	545-5923-01
2	Single Groove Jewel Post (Clear)	9	550-5034-01
3	5/16" I.D. Black Rubber Ring	9	545-5348-02
4	Ramp Exit Protector	1	535-8167-01

Item 2 secured onto Item 1 by: #6-32 X 1-1/2" PPH MS (Zinc) (Qty. 1/per) (237-5510-00) and #6-32 Nylon Stop Nut (Qty. 1/per) (240-5005-00)

Item 4 secured onto Item 1 by: #6-32 X 1/4" PPH MS (Sems) Zinc (Qty. 2) (232-5200-00) and #6-32 Nylon Stop Nut (Qty. 2) (240-5005-00)

Left Ramp Assembly, 500-6389-00-71 Is secured above the Playfield by:

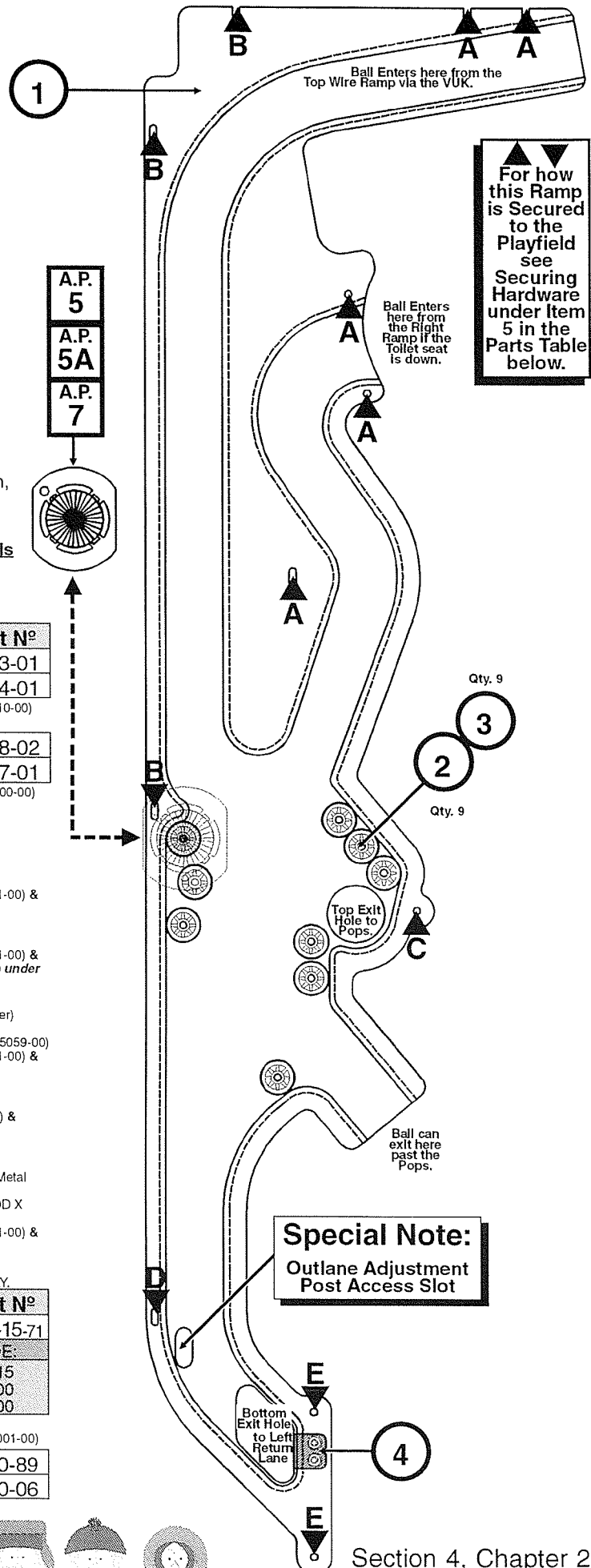
- AA 4" X 1/4" Hex Spacer #6-32 Top (Qty. 5) (254-5008-21)
at playfield with #6-32 X 3/4" Fin Shank Screw (Qty. 1/per) (237-5921-02)
and at the Ramp with #6-32 X 3/8" PPH MS Sems (Zinc) (Qty. 1/per) (232-5201-00) & #6 Washer (Qty. 1/per) (242-5001-00)
- BA 2-3/4" X 1/4" Hex Spacer #6-32 Top (Qty. 3) (254-5008-15)
at the Wood Rail with Ramp Mntg. Bracket (Qty. 1/per) (515-6508-00)
and at the Ramp with #6-32 X 3/8" PPH MS Sems (Zinc) (Qty. 1/per) (232-5201-00) & #6 Washer (Qty. 1/per) (242-5001-00); with A.P. Item 5 see securing hardware under Item 5.
- CA 2-5/8" X 1/4" Hex Spacer #6-32 Top (Qty. 1) (254-5008-08)
at the playfield above the 1-Way Gate (Right Side) with #6-32 T-Nut (Qty. 1/per) (240-5002-00), Post Fasten #6-32 Top / #6-32 Bottom (Metal Post) (Qty. 1/per) (530-5012-02) thru 1-1/16" Single Groove Post (Black Plastic) (Qty. 1/per) (550-5059-00) and at the Ramp with #6-32 X 3/8" PPH MS Sems (Zinc) (Qty. 1/per) (232-5201-00) & #6 Washer (Qty. 1/per) (242-5001-00)
- DA 2-1/2" X 1/4" Hex Spacer #6-32 Top (Qty. 1) (254-5008-16)
at the Wood Rail with Ramp Mntg. Bracket (Qty. 1) (515-6508-00)
and at the Ramp with #6-32 X 3/8" PPH MS Sems (Zinc) (Qty. 1) (232-5201-00) & #6 Washer (Qty. 1/per) (242-5001-00)
- EA 2-1/4" X 1/4" Hex Spacer #6-32 Top (Qty. 2) (254-5008-18)
at the playfield through the Left Slingshot Plastic (Butyrate) Piece with #6-32 T-Nut (Qty. 1/per) (240-5002-00), Post Fasten #6-32 Top / #6-32 Bottom (Metal Post) (Qty. 1/per) (530-5012-02) thru 1-1/16" Single Groove Post (Black Plastic) (Qty. 1/per) (550-5059-00); Slingshot Plastic Protect Washer (.187" ID X .875" OD X .048" Thk.) (Qty. 1) (242-5059-00) and at the Ramp with #6-32 X 3/8" PPH MS Sems (Zinc) (Qty. 1/per) (232-5201-00) & #6 Washer (Qty. 1/per) (242-5001-00)

ASSOCIATED PARTS ARE NOT INCLUDED WITH THE ABOVE ASSEMBLY.

Nº	Associated Part Name	QTY.	SPI Part Nº
5®	Riveted Plastic Piece (Buty.) Assy.	1	515-7009-15-71
ORDERING ABOVE ® RIVETED ASSY. PART Nº WILL INCLUDE:			
5A	Screened (Yellow) Plastic Piece -15	1	830-5967-15
5B*	2-Lug Stand-Up Short Socket	1	077-5101-00
5C*	Rivet, 1/8" ø X 3/16" Long	1	249-5001-00

A.P. Item 5 secured on Item 1 by: 1" X 3/8" Spacer Gray (Qty. 1) (254-5000-04), #6-32 X 1-1/2" PPH MS (Zinc) (Qty. 1) (237-5510-00) and #6 Washer (Qty. 1) (242-5001-00)

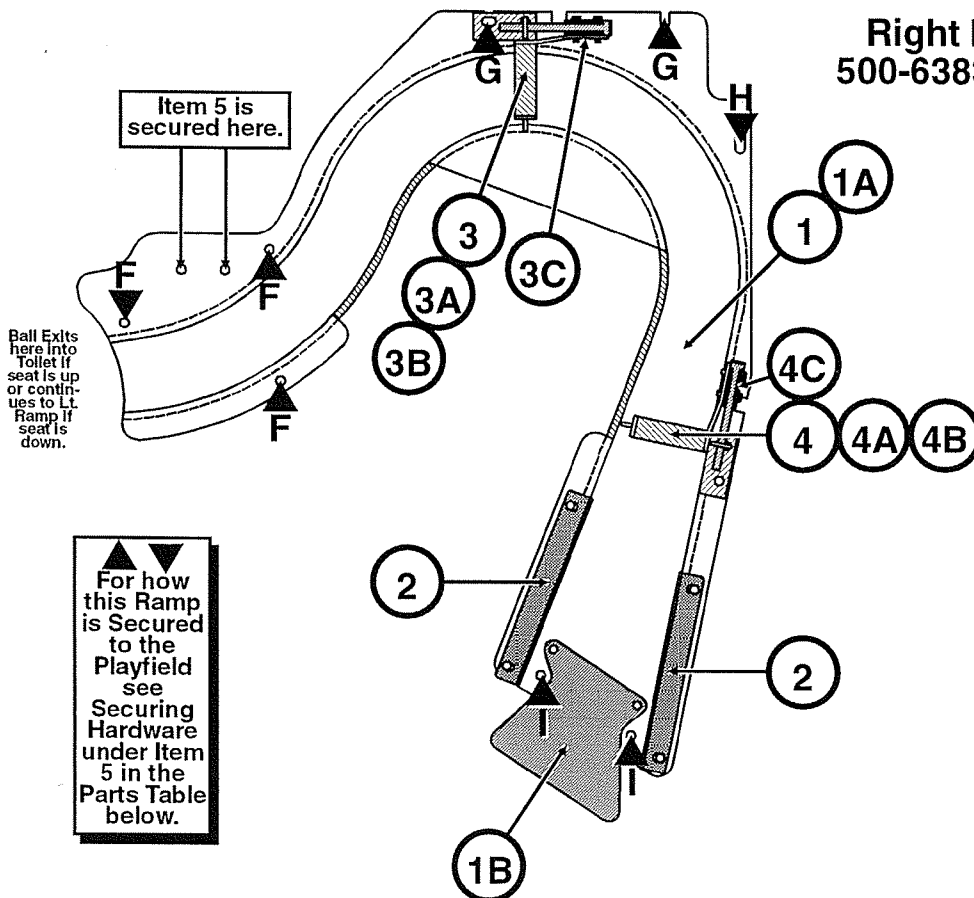
6*	#89 Bulb	1	165-5000-89
7	Mini-Mars Light Cover Snap-In Yellow	1	550-5030-06



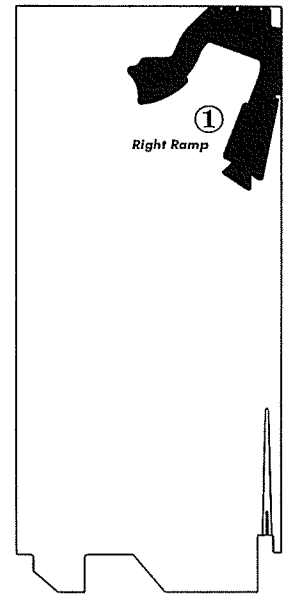
For how this Ramp is Secured to the Playfield see Securing Hardware under Item 5 in the Parts Table below.

Special Note:
Outlane Adjustment Post Access Slot





Right Ramp Assembly, 500-6383-00-71 (Items 1-5)



Take Note:

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

Ⓜ "R" indicates item has a riveted-on part(s), if removing/adding rivets is not an option, order the entire Ⓜ Sub-Assembly. **Please Note:** If the Ⓜ Sub-Assembly is **not** available, call Technical Support.

Nº	Individual Part Name	QTY.	SPI Part Nº	Nº	Individual Part Name	QTY.	SPI Part Nº
1Ⓜ	Riveted Right Ramp Sub-Assy.	1	515-6988-00-71	Item 4 continued from previous column...			
ORDERING ABOVE Ⓜ RIVETED ASSY. PART Nº WILL INCLUDE:				4H*	Rubber Lite Cover Orange	1	545-5014-07
1A	Right Plastic Ramp (Plain, No Parts)	1	545-5923-00	4I*	Plastic (Butyrate) Mr. Hankey Sign -16	1	830-5967-16
1B	Ramp Flap	1	535-8373-00	4J±*	Plastic (Butyrate) Alternate Sign -17	1	830-5967-17
1C*	Rivet, 1/8" ⌀ X 3/16" Lg.	2	249-5001-00	4K*	#2-56 X 3/8" HWH MS (Serr.) TF 3/16" Hd.	2	237-5938-01
1D*	Washer, 9/64" ID X 5/16" OD X 1/32"	2	242-5017-00	4L*	#4-40 X 3/8" PPH TF	1	237-5979-00
2	Ramp Entrance Protector	2	535-6707-01	4M*	#4-40 Nylon Stop Nut	1	240-5303-00
Item 2 secured onto Item 1 by: #6-32 X 3/8" PPH MS (Sems) Zinc (Qty. 2/per) (232-5201-00) and #6-32 Nylon Stop Nut (Qty. 2/per) (240-5005-00)				4N*	#6 X 3/8" HWH AB Zinc	2	234-5000-00
3	Gate Assembly (Exit)	1	515-6490-00	Item 4 secured onto Item 1 by: #6-32 X 1/4" PPH MS (Sems) Zinc (Qty. 2) (232-5200-00) and #6-32 Nylon Stop Nut (Qty. 2) (240-5005-00)			
ORDERING ABOVE (ITEM 3) SUB-ASSY. PART Nº WILL INCLUDE:				Item 4K secures Item 4C onto Item 4A.			
3A	Gate Mounting Bracket	1	535-7613-01	Items 4L & 4M secures Item 4E to Item 4I or 4J.			
3B	Wire Form	1	535-6304-03	Item 4N secures Item 4I or 4J to Item 4A.			
3C	Micro Switch for Wire Gate	1	180-5087-00	± Item 4J only for use if Item 4I is offensive to owner (See Parts Bag In your Game).			
3D*	Diode, 1N4001	1	112-5001-00	5*	South Park Chef (3" Figurine)	1	880-5028-00
3E*	#2-56 X 3/8" HWH MS (Serr.) TF 3/16" Hd.	2	237-5938-01	Item 5 secured onto Item 1 by: #8 X 1/2" HWH AB (Zinc) Blue (Qty. 2) (234-5101-05)			
Item 3E secures Item 3C onto 3A.				Right Ramp Assembly, 500-6383-00-71 is secured above the playfield by:			
Item 3 (closest to switch) secured onto Item 1 by: #6-32 X 1/4" PPH MS (Sems) Zinc (Qty. 1) (232-5200-00), #6-32 Nylon Stop Nut (Qty. 1) (240-5005-00) and (farthest from switch) secured by (see ▲F following Item 5)				F▲ 4-1/4" X 1/4" Hex Spacer #6-32 Top (Qty. 3) (254-5008-30)			
4	Gate & Sign Assembly (Enter)	1	515-6774-04-71	▼ at playfield with #6-32 X 3/4" Fin Shank Screw (Qty. 1/per) (237-5921-02) and at the Ramp with #6-32 X 3/8" PPH MS Sems (Zinc) (Qty. 1/per) (232-5201-00) & #6 Washer (Qty. 1/per) (242-5001-00)			
ORDERING ABOVE (ITEM 4) SUB-ASSY. PART Nº WILL INCLUDE:				G▲ 3" X 1/4" Hex Spacer #6-32 Top (Qty. 2) (254-5008-14)			
4A	Gate & Sign Mounting Bracket	1	535-6303-03	at the Wood Rail with Ramp Mntg. Bracket (Qty. 1/per) (515-6508-00) and at the Ramp with #6-32 X 3/8" PPH MS Sems (Zinc) (Qty. 1/per) (232-5201-00) & #6 Washer (Qty. 1/per) (242-5001-00)			
4B	Wire Form	1	535-6304-03	H▼ 2-5/8" X 1/4" Hex Spacer #6-32 Top (Qty. 2) (254-5008-08)			
4C	Micro Switch for Wire Gate	1	180-5087-00	at the Wood Rail with Ramp Mntg. Bracket (Qty. 1/per) (515-6508-00) and at the Ramp with #6-32 X 3/8" PPH MS Sems (Zinc) (Qty. 1/per) (232-5201-00) & #6 Washer (Qty. 1/per) (242-5001-00)			
4D	Diode, 1N4001	1	112-5001-00	I▲ #4 X 5/8" PFH (Black) Screw (Qty. 2/per) (237-5833-00) by the Ramp Flap.			
4E*	Wdg. Base Offset Socket (Step-Brkt.)	2	077-5029-00				
4F*	#555 Wedge Base Bulb	2	165-5002-00				
4G*	Rubber Lite Cover Yellow	1	545-5014-06				

Item 4 continued in the next column...



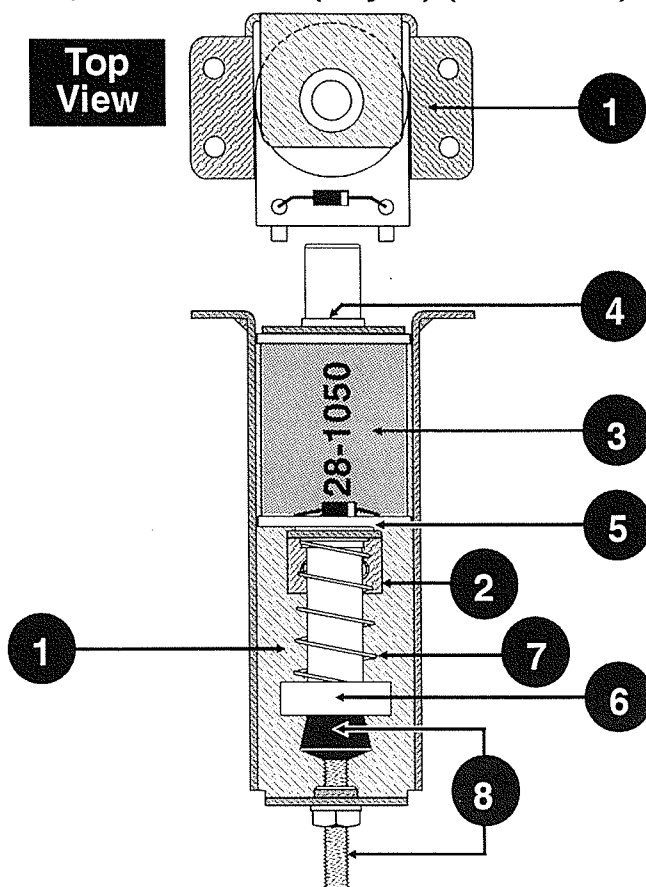
Lt. & Rt. Outlane Ball Deflector Assemblies, 500-5788-03 (Qty. 2) (Items 1-8)

**UK ONLY
OPTIONAL**

Nº	Individual Part Name	QTY.	SPI Part Nº
1	Ball Deflector Coil Mounting Bracket	1	535-6857-02
2	Coil Retaining Bracket	1	535-5203-03
Item 2 is secured by: #8-32 X 1/4" PPH MS (Sems) Zinc (Qty. 2) (232-5300-00)			
3	Coil, 28-1050	1	090-5046-00
ORDERING ABOVE (ITEM 3) COIL PART Nº WILL INCLUDE:			
—	Diode, 1N4004 (positioned at top)	1	112-5003-00
4	Coil Sleeve	1	545-5076-00
5	Spring Washer (17/32" ID X 3/4" X 1")	1	269-5002-00
6	Solid Plunger Assembly	1	515-6858-00
7	Compression (Relay) Spring	1	266-5022-01
8	#10-32 Adj. Spindle Stop w/Rubber Tip	1	280-5014-00

Item 8 is secured by: #10-32 Keps Nut (Qty. 1) (240-5208-00)

Left & Right Ball Deflector Assemblies, 500-5788-03 is secured under the playfield by:
#8-32 X 1/2" HWH AB (Zinc) Blue (Qty. 4/per) (234-5101-05)



Up / Down Post Assembly, 500-6293-00 (Items 1-9)

**UK ONLY
OPTIONAL**

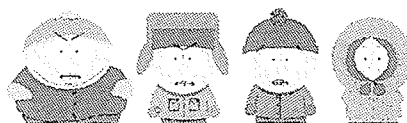
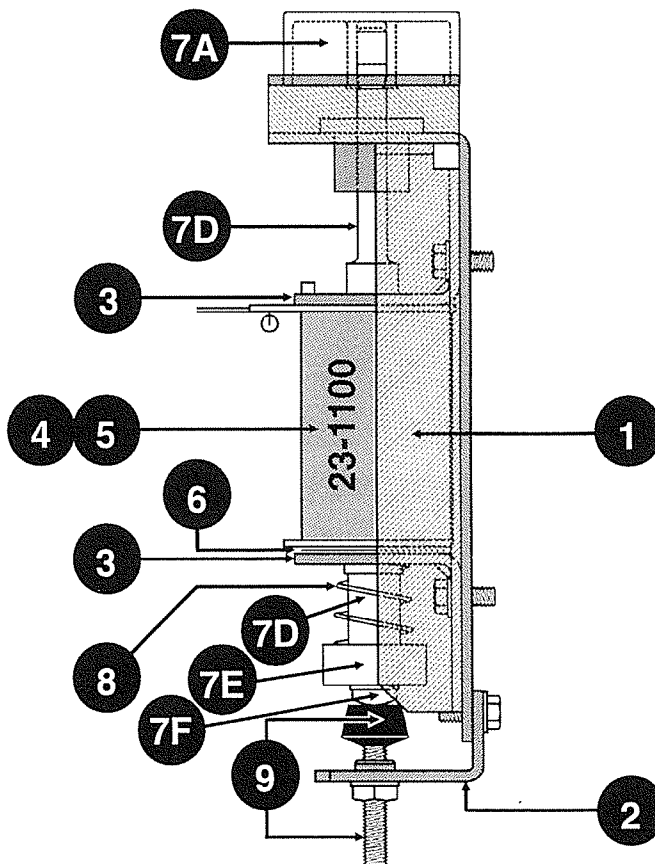
Take Note:

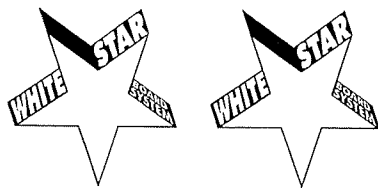
Item 5D, part of Item 5, Plunger & Shaft Sub-Assembly, is 1 piece and cannot be ordered separated.

Nº	Individual Part Name	QTY.	SPI Part Nº
1	Up/Down Post Coil Mounting Bracket	1	515-6840-00
2	Adjustment Spindle Stop Bracket	1	535-8303-00
3	Coil Retaining Bracket	2	535-7356-00
Items 2 & 3 are secured by: #8-32 X 3/8" Swage (Serr) Zinc (Qty. 2/per) (237-5975-00)			
4	Coil, 23-1100 (ORG)	1	090-5030-00T
ORDERING ABOVE (ITEM 4) COIL PART Nº WILL INCLUDE:			
—	Diode, 1N4004 (positioned at top)	1	112-5003-00
5	Coil Sleeve (with extension)	1	545-5847-00
6	Spring Washer, 17/32" ID X 3/4" X 1"	1	269-5002-00
7	Plunger & Shaft Assembly	1	515-6844-00-35
ORDERING ABOVE (ITEM 7) SUB-ASSY. PART Nº WILL INCLUDE:			
7A	Ball Bumper Plastic (Top) Red	1	550-5029-02
7B*	Roll Pin, 3/32" ø X 1/2" Long	1	251-5002-00
7C*	Retaining Ring, 1/4" ø Shaft	1	270-5002-00
7D	Plunger & Shaft Sub-Assembly	1	515-6841-00
7E	Plunger Head	1	530-5511-00
7F	#10-32 X 3/8" PPH MS (Sems) Zinc	1	232-5401-00
8	Compression (Relay) Spring	1	266-5022-01
9	#10-32 Adj. Spindle Stop w/Rubber Tip	1	280-5014-00

Item 9 is secured by: #10-32 Keps Nut (Qty. 1) (240-5208-00)

Up/Down Post Assembly, 500-6293-00 is secured under the playfield by:
#8-32 X 1/2" HWH AB (Zinc) Blue (Qty. 6) (234-5101-05)





Section 5 Schematics & Troubleshooting

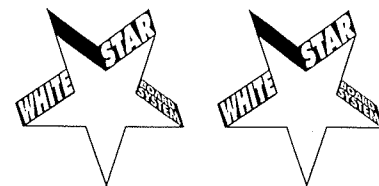


Table of Contents

<input type="checkbox"/> Coils Detailed Chart Table.....	80
• Chapter 1, Backbox Wiring.....	81
<input checked="" type="checkbox"/> Backbox Board Layout Wiring Diagram	81
<input type="checkbox"/> Backbox I/O Power Driver Board Detailed Wiring Diagram.....	82
• Chapter 2, Playfield Wiring	83
<input checked="" type="checkbox"/> General Illumination Circuit Detailed Wiring Diagram	83
<input type="checkbox"/> Playfield Switch Wiring Diagram & Playfield Lamp Wiring Diagram	84
<input checked="" type="checkbox"/> Playfield Terminal Strips, Fuses & Misc. Wiring Descriptions & Locations	85
<input type="checkbox"/> 2-Flipper Circuit Wiring Diagram.....	86
• Chapter 3, Cabinet Wiring	87
<input checked="" type="checkbox"/> Transformer Power Wiring Diagram.....	87
<input type="checkbox"/> Cabinet / Coin Door Wiring Diagram.....	88
• Chapter 4, Printed Circuit Boards (PCBs)	89
<input checked="" type="checkbox"/> Trough Up-Kicker Dual OPTO Boards Theory of Operation & Schematic	89
<input checked="" type="checkbox"/> Trough Up-Kicker Dual OPTO Boards Component Layout & Parts.....	89
<input type="checkbox"/> OPTO Troubleshooting.....	89-90
<input type="checkbox"/> Single Trough & Double-Stack OPTO Boards Alignment / Test	90
<input checked="" type="checkbox"/> Theory of Operation & Schematic (Not Available at time of Printing)	91
<input checked="" type="checkbox"/> Boards Component Layout & Parts (Not Available at time of Printing)	91
<input type="checkbox"/> Dot Matrix Display/Display Controller Bd. Combined Display Connections	92
<input checked="" type="checkbox"/> Display Power Supply Board Schematic	93
<input checked="" type="checkbox"/> Display Power Supply Board Component Layout & Parts	93
<input type="checkbox"/> Display Controller Board Schematic.....	94
<input type="checkbox"/> Display Controller Board Component Layout & Parts.....	95
<input checked="" type="checkbox"/> I/O Power Driver Board Theory of Operation	96
<input checked="" type="checkbox"/> I/O Power Driver Board Schematic (Sheet 1 of 5).....	97
<input checked="" type="checkbox"/> I/O Power Driver Board Schematic (Sheet 2 of 5).....	98
<input checked="" type="checkbox"/> I/O Power Driver Board Schematic (Sheet 3 of 5).....	99
<input checked="" type="checkbox"/> I/O Power Driver Board Schematic (Sheet 4 of 5).....	100
<input checked="" type="checkbox"/> I/O Power Driver Board Schematic (Sheet 5 of 5).....	101
<input checked="" type="checkbox"/> I/O Power Driver Board Component Layout.....	102
<input checked="" type="checkbox"/> I/O Power Driver Board Parts.....	103
<input type="checkbox"/> CPU/Sound Board Theory of Operation	104
<input type="checkbox"/> CPU/Sound Board Schematic (Sheet 1 of 3)	105
<input type="checkbox"/> CPU/Sound Board Schematic (Sheet 2 of 3)	106
<input type="checkbox"/> CPU/Sound Board Schematic (Sheet 3 of 3)	107
<input type="checkbox"/> CPU/Sound Board Component Layout.....	108
<input type="checkbox"/> CPU/Sound Board Parts.....	109



Use the below **Coils Detailed Chart Table** in conjunction with Sec. 5, Chp. 1, Backbox Board Layout Wiring Diagram and Backbox I/O Power Driver Board Detailed Wiring Diagram (I/O Board Connectors J6, J7, J8 & J9):

COILS DETAILED CHART TABLE

High Current Coils Group 1		Drive Transistor (D.T.)	Driver Output Board	D.T. Control Line Color	D.T. Control Line Connect	Power Line Color	Power Line Connection	Power Voltage	Coil GA/Turn or Bulb Type
#1	TROUGH UP-KICKER	Q1	I/O Pwr. Drvr.	BRN-BLK	J8-P1	YEL-VIO	J10-P4/5	50v DC	26-1200 090-5044-00T
#2	AUTO LAUNCH	Q2	I/O Pwr. Drvr.	BRN-RED	J8-P3	YEL-VIO	J10-P4/5	50v DC	24-940 090-5036-00T
#3	SUPER VUK	Q3	I/O Pwr. Drvr.	BRN-ORG	J8-P4	YEL-VIO	J10-P4/5	50v DC	24-940 090-5036-00T
#4	TOP VUK	Q4	I/O Pwr. Drvr.	BRY-YEL	J8-P5	YEL-VIO	J10-P4/5	50v DC	26-1200 090-5044-00T
#5	TOILET SEAT LID	Q5	I/O Pwr. Drvr.	BRN-GRN	J8-P6	BRN	J7-P1	20v DC	23-1100 090-5030-00T
#6	MR. HANKEY LATCH	Q6	I/O Pwr. Drvr.	BRN-BLU	J8-P7	YEL-VIO	J10-P4/5	50v DC	29-1000 090-5059-00
#7	FLASH POPS *4	Q7	I/O Pwr. Drvr.	BRN-VIO	J8-P8	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89
#8	EUROPEAN TOKEN DISPENSER	Q8	I/O Pwr. Drvr.	BRN-GRY	J8-P9	YEL-VIO	J10-P4/5	50v DC	DL4SS 515-6076-01
High Current Coils Group 2		Drive Transistor (D.T.)	Driver Output Board	D.T. Control Line Color	D.T. Control Line Connect	Power Line Color	Power Line Connection	Power Voltage	Coil GA/Turn
#9	LEFT TURBO BUMPER	Q9	I/O Pwr. Drvr.	BLU-BRN	J9-P1	YEL-VIO	J10-P4/5	50v DC	26-1200 090-5044-00T
#10	RIGHT TURBO BUMPER	Q10	I/O Pwr. Drvr.	BLU-RED	J9-P2	YEL-VIO	J10-P4/5	50v DC	26-1200 090-5044-00T
#11	BOTTOM TURBO BUMPER	Q11	I/O Pwr. Drvr.	BLU-ORG	J9-P4	YEL-VIO	J10-P4/5	50v DC	26-1200 090-5044-00T
#12	LEFT SLINGSHOT	Q12	I/O Pwr. Drvr.	BLU-YEL	J9-P5	BRN	J7-P1	20v DC	23-800 090-5001-00T
#13	MR. HANKEY (DOWN)	Q13	I/O Pwr. Drvr.	BLU-GRN	J9-P6	YEL-VIO	J10-P4/5	50v DC	23-1100 090-5030-00T
#14	KENNY PIVOT (DEAD)	Q14	I/O Pwr. Drvr.	BLU-BLK	J9-P7	YEL-VIO	J10-P4/5	50v DC	22-1080 090-5032-00T
#15	LEFT FLIPPER (50v RED/YEL)	Q15	I/O Pwr. Drvr.	ORG-GRY	J9-P8	RED-YEL GRY-YEL	J10-P1/2	50v DC	23-1100 090-5030-00T
#16	RIGHT FLIPPER (50v RED/YEL)	Q16	I/O Pwr. Drvr.	ORG-VIO	J9-P9	RED-YEL BLU-YEL	J10-P1/2	50v DC	23-1100 090-5030-00T
Low Current Coils Group 1		Drive Transistor (D.T.)	Driver Output Board	D.T. Control Line Color	D.T. Control Line Connect	Power Line Color	Power Line Connection	Power Voltage	Coil GA/Turn Bulb or Meter
#17	RIGHT SLINGSHOT	Q17	I/O Pwr. Drvr.	VIO-BRN	J7-P2	BRN	J7-P1	20v DC	23-800 090-5001-00T
#18	FLASH TOP VUK *1	Q18	I/O Pwr. Drvr.	VIO-RED	J7-P3	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89
#19	KENNY LT	Q19	I/O Pwr. Drvr.	VIO-ORG	J7-P4	BRN	J7-P1	20v DC	24-940 090-5036-00T
#20	KENNY RT	Q20	I/O Pwr. Drvr.	VIO-YEL	J7-P6	BRN	J7-P1	20v DC	24-940 090-5036-00T
#21	LT OUTLANE (UK ONLY)	Q21	I/O Pwr. Drvr.	VIO-GRN	J7-P7	BRN	J7-P1	20v DC	28-1050 090-5048-00
#22	RT OUTLANE (UK ONLY)	Q22	I/O Pwr. Drvr.	VIO-BLU	J7-P8	BRN	J7-P1	20v DC	28-1050 090-5049-00
#23	UP/DOWN POST (UK ONLY)	Q23	I/O Pwr. Drvr.	VIO-BLK	J7-P9	BRN	J7-P1	20v DC	23-1100 090-5030-00T
#24	OPTIONAL COIN METER	Q24	I/O Pwr. Drvr.	VIO-GRY	J7-P10	RED	J16-P7	5v DC	Meter 5v 091-5000-00
Diode On Terminal Strip (if noted)									
Flash Lamps (FLASH)		Drive Transistor (D.T.)	Driver Output Board	D.T. Control Line Color	D.T. Control Line Connect	Power Line Color	Power Line Connection	Power Voltage	Bulb Type
#F1	FLASH STAN *2	Q25	I/O Pwr. Drvr.	BLK-BRN	J6-P1	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89
#F2	FLASH CHEF *2	Q26	I/O Pwr. Drvr.	BLK-RED	J6-P2	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89
#F3	FLASH KENNY *2	Q27	I/O Pwr. Drvr.	BLK-ORG	J6-P3	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89
#F4	FLASH KYLE *2	Q28	I/O Pwr. Drvr.	BLK-YEL	J6-P4	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89
#F5	FLASH CARTMAN *2	Q29	I/O Pwr. Drvr.	BLK-GRN	J6-P5	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89
#F6	FLASH KENNY *1 BACK *2	Q30	I/O Pwr. Drvr.	BLK-BLU	J6-P6	ORG	J6-P10	20v DC	#906 Bulb 165-5004-00 #89 Bulb 165-5000-89
#F7	FLASH MR HANKEY/TOILET *2	Q31	I/O Pwr. Drvr.	BLK-VIO	J6-P7	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89
#F8	FLASH SUPER VUK *1	Q32	I/O Pwr. Drvr.	BLK-GRY	J6-P8	ORG	J6-P10	20v DC	#89 Bulb 165-5000-89
Note: In Test Flash Lamps Menu ("Flash" Icon), Flashers tested are Flash Lamps F1-F8 ONLY. Test all others in Single or Cycling Coil Tests.									

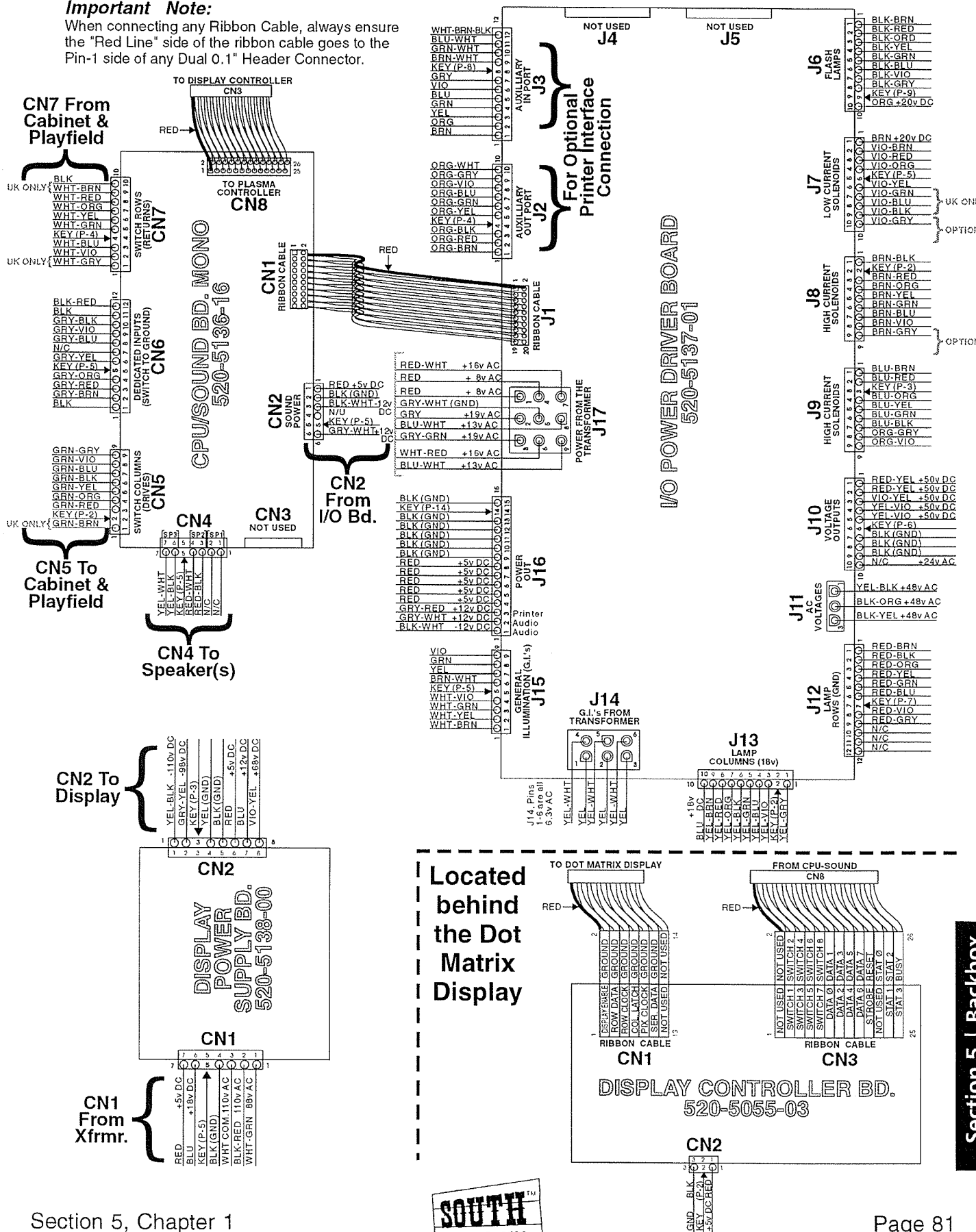


Backbox Wiring

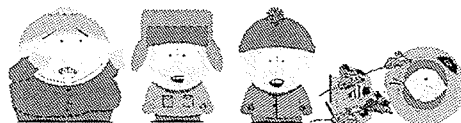
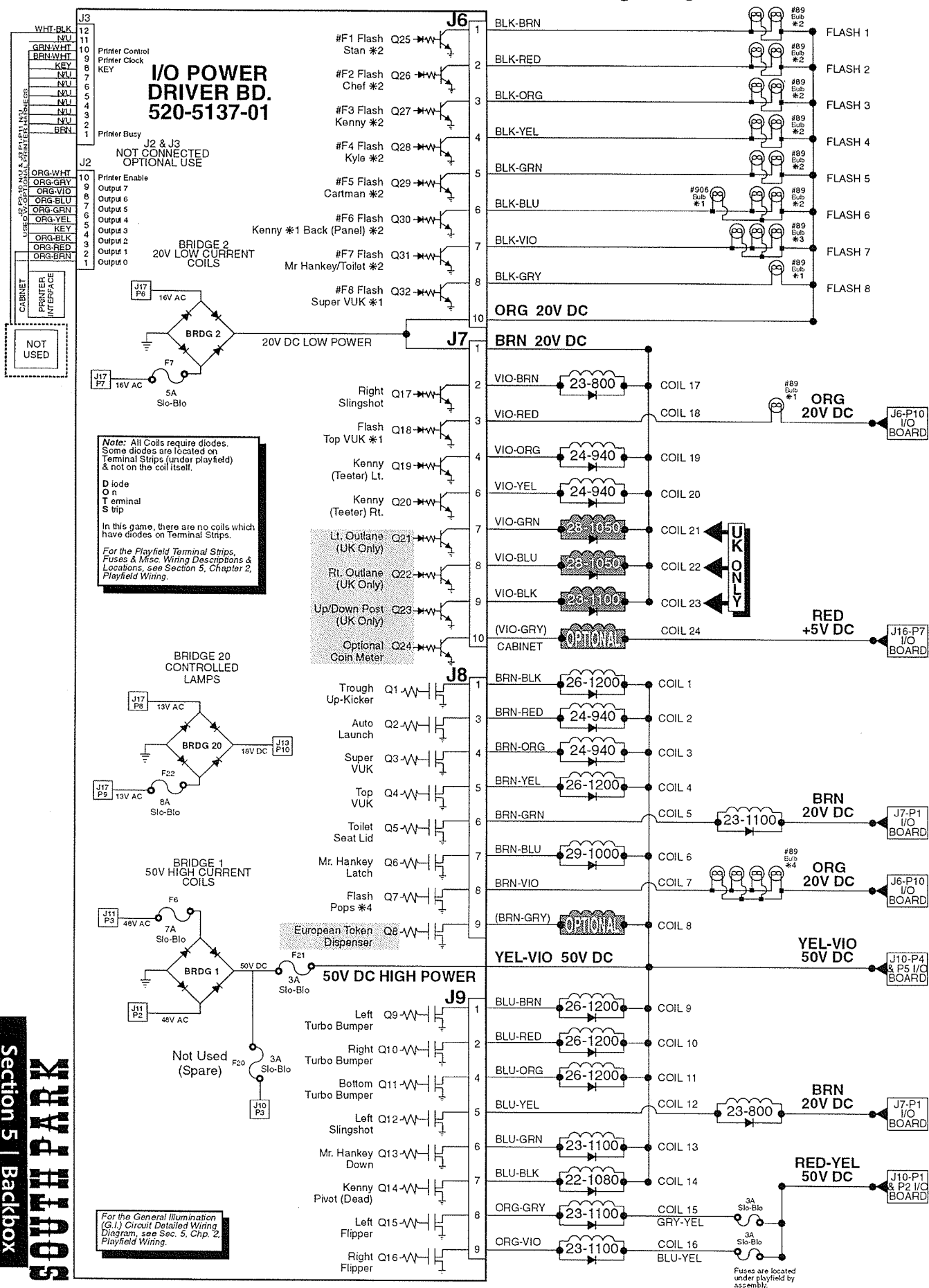
Backbox Board Layout Wiring Diagram

Important Note:

When connecting any Ribbon Cable, always ensure the "Red Line" side of the ribbon cable goes to the Pin-1 side of any Dual 0.1" Header Connector.

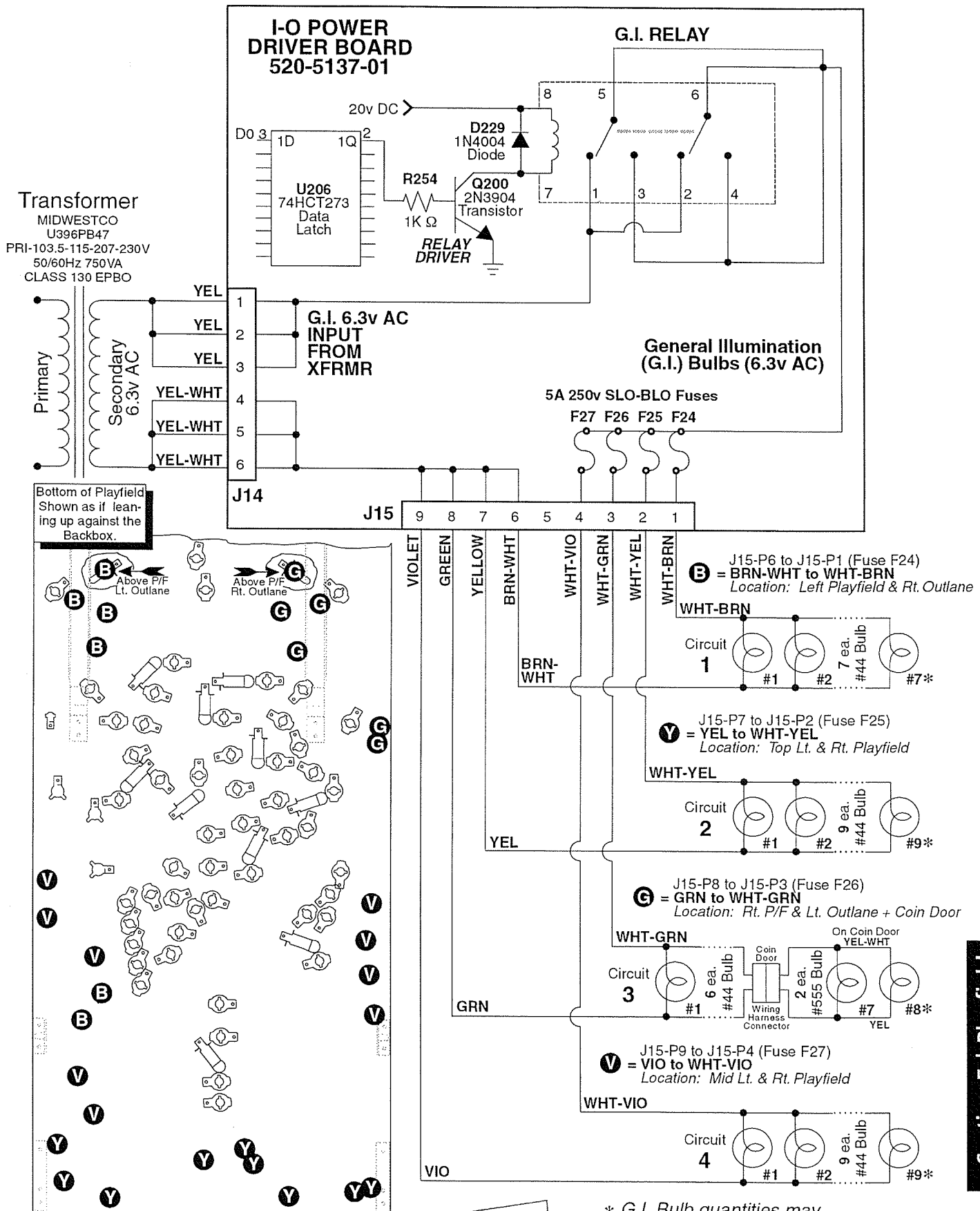


Backbox I/O Power Driver Board Detailed Wiring Diagram

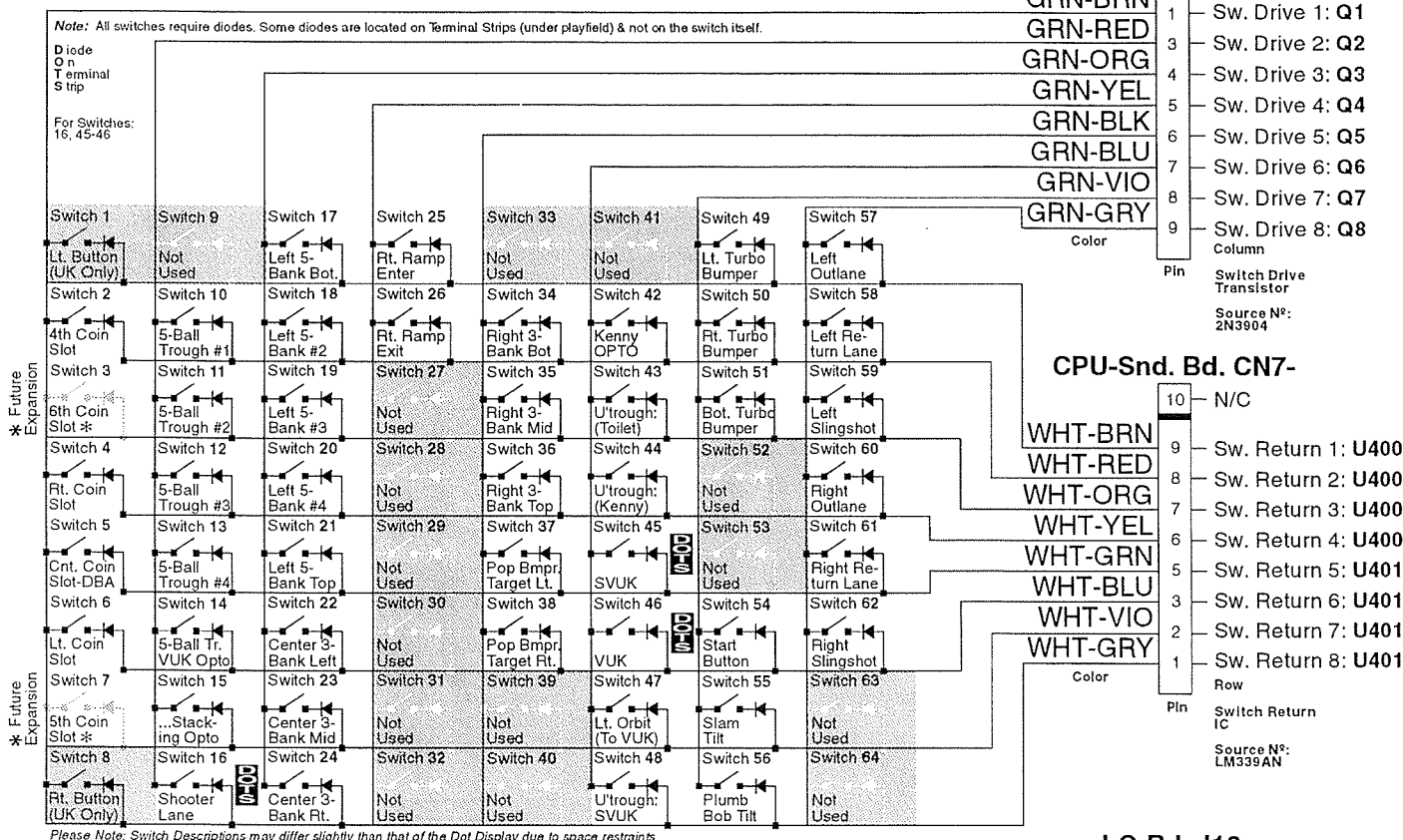


Playfield Wiring

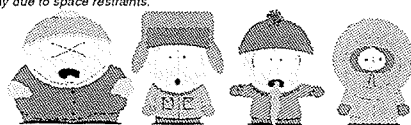
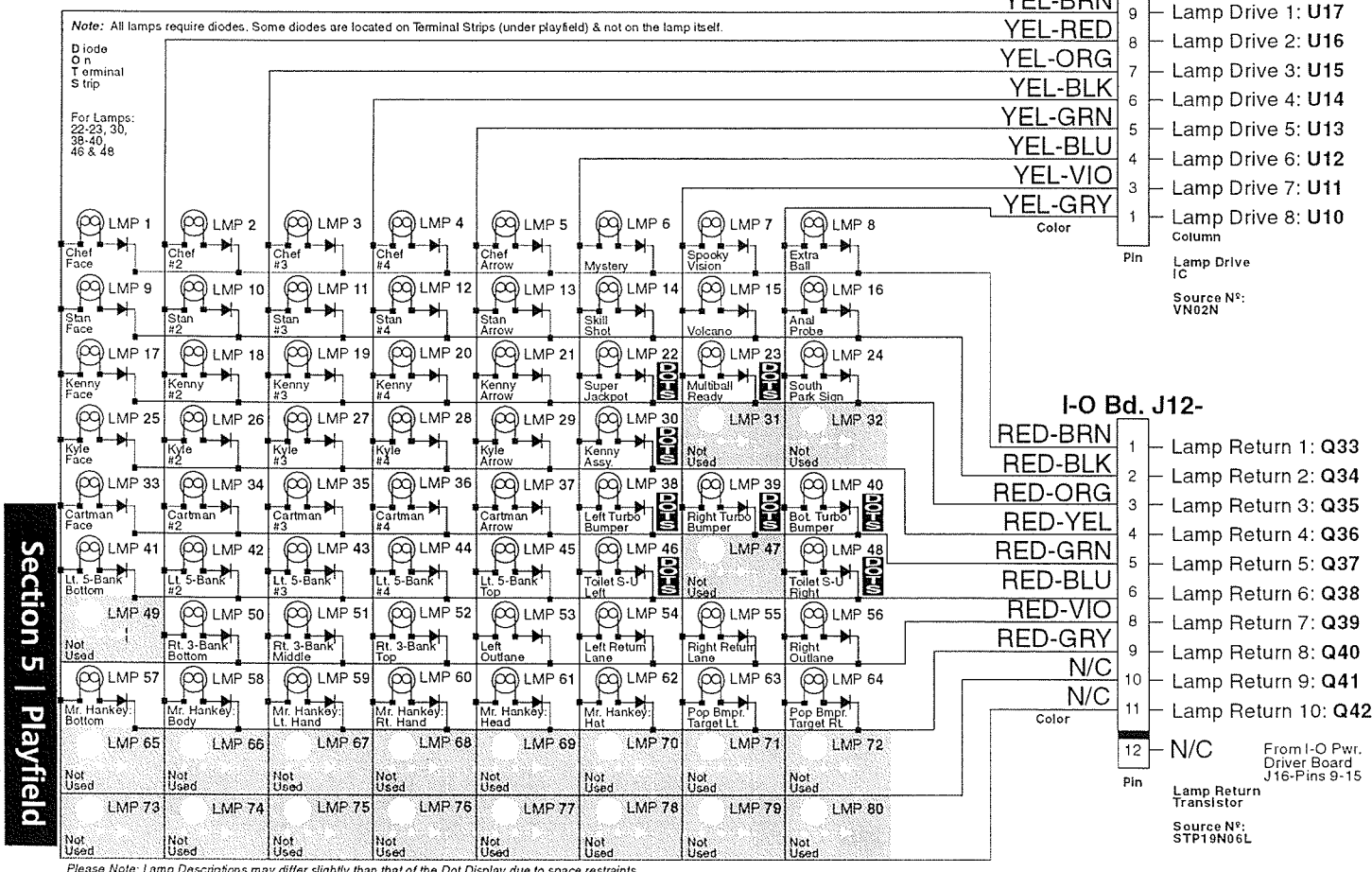
General Illumination Circuit Detailed Wiring Diagram



Playfield Switch Wiring Diagram



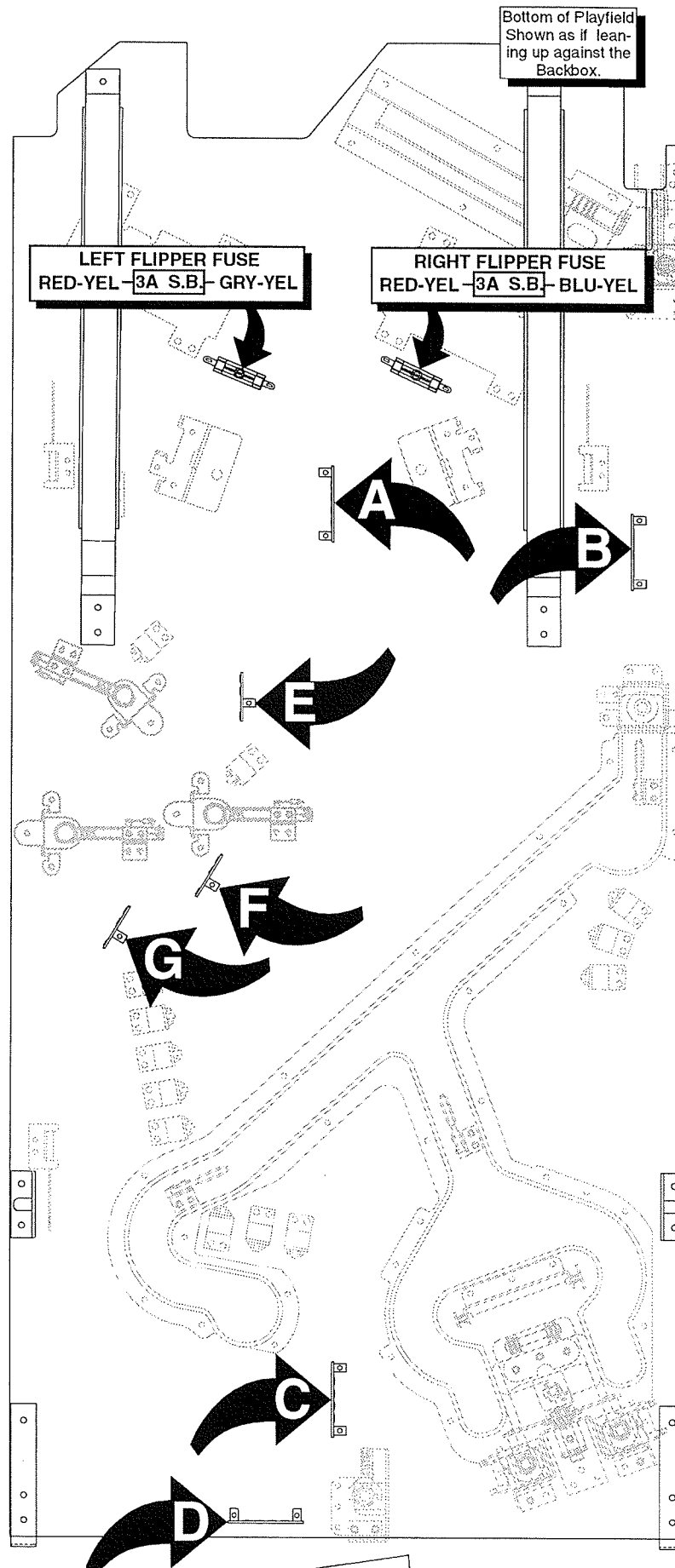
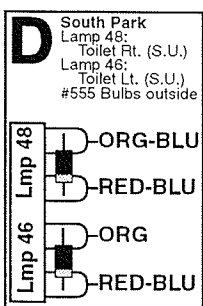
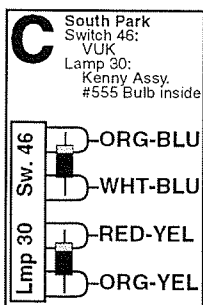
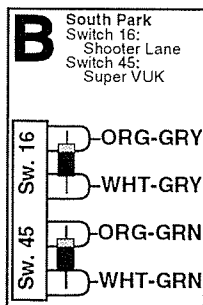
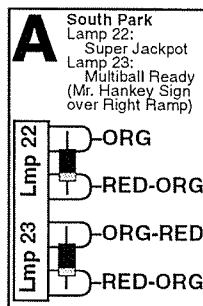
Playfield Lamp Wiring Diagram



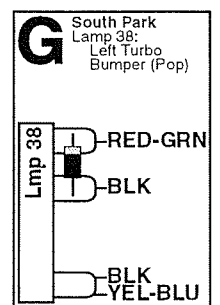
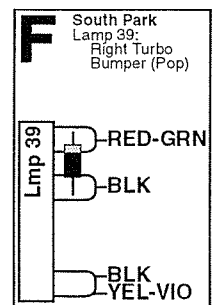
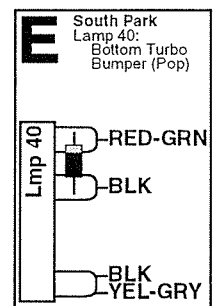
Playfield Terminal Strips, Fuses & Misc. Wiring Descriptions & Locations

See the Pink Pages, Playfield - General Parts (Below) (Page 52) for Terminal Strips, Diodes, Fuses & Holders Part N's.

Also Note: Terminal Strip & Fuse Holder locations shown represent the general location (your game may differ slightly).



All switches, lamps, coils require diodes. The diodes not physically located on the switch, lamp or coil are located on Terminal Strips under the playfield. The Switch & Lamp Matrix Grids also note which switch or lamp has a diode on a Terminal Strip (noted by "DOTS" meaning "Diode on Terminal Strip"). There are diodes located on solder lugs for the Magnet Fuses. All fuses are 3A 250v Slo-Blo, do not over-fuse.



The **White Star Board System™** has allowed us to *simplify* the flipper circuit to the point where we have *eliminated the flipper board* all together. The flipper circuit is now configured the same as any other solenoid drive circuit.

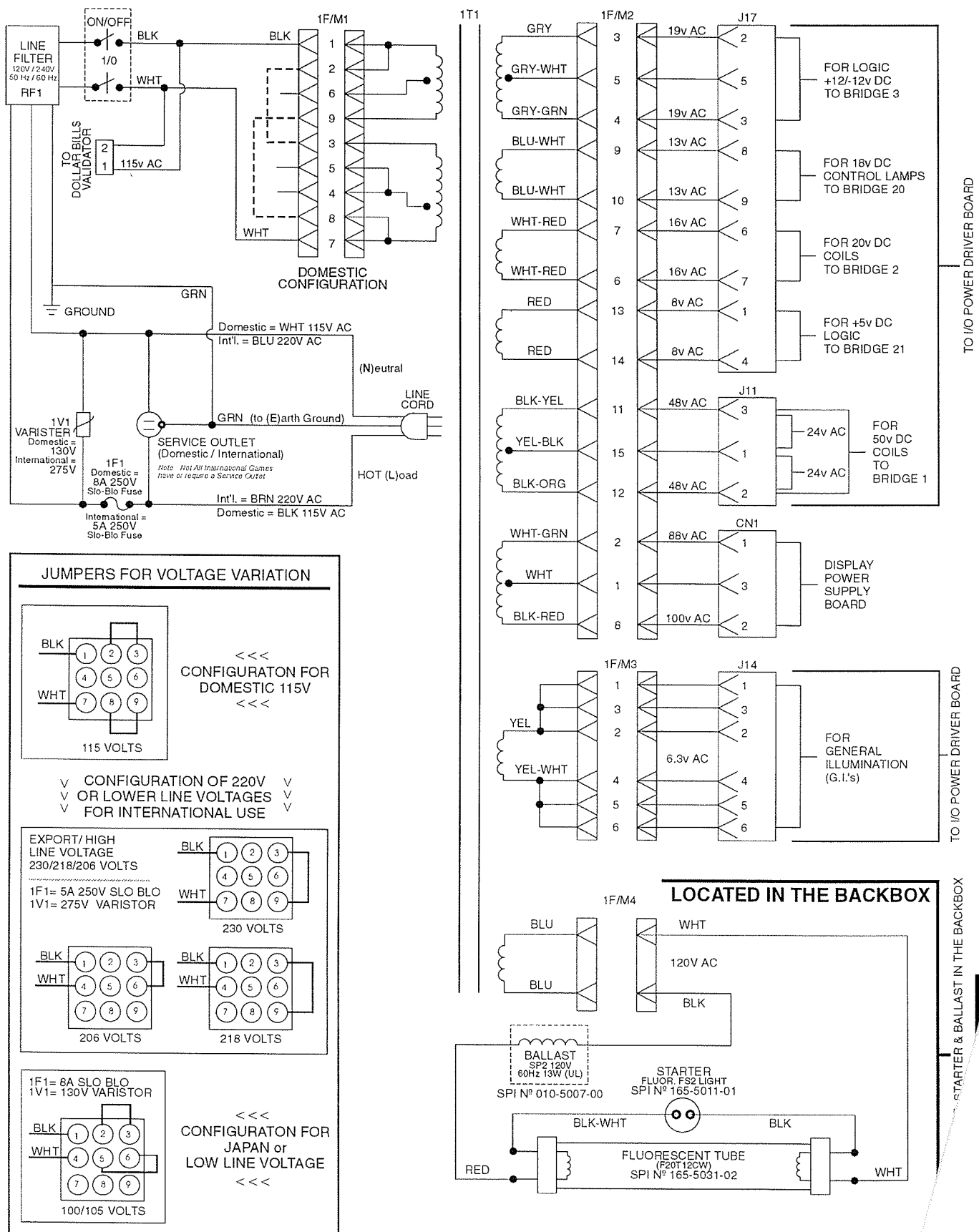


Our **New Flipper System** uses one supply voltage (50v DC) for both kick and hold. Once the **Game CPU** detects a flipper cabinet switch closure (during game play) it applies a 40 msec pulse to the gate of the flipper drive transistor (STP20N10L). If it continues to detect a flipper cabinet switch closure (the player holding the button in) it will continue to pulse the flipper drive transistor 1 msec every 12 msecs for the duration of the hold cycle.

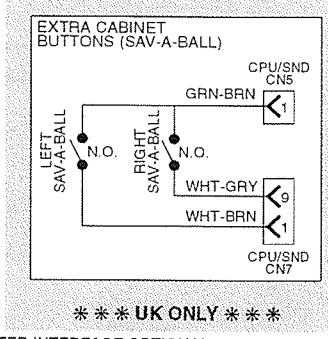
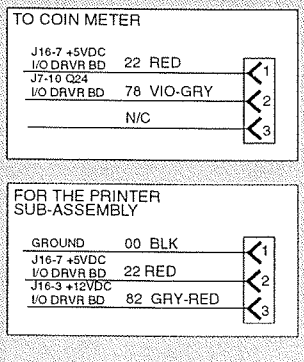
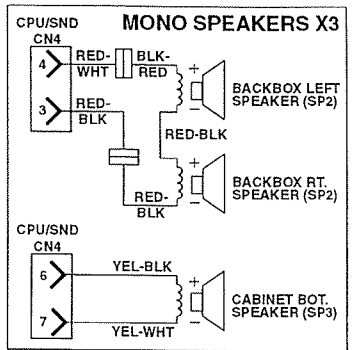
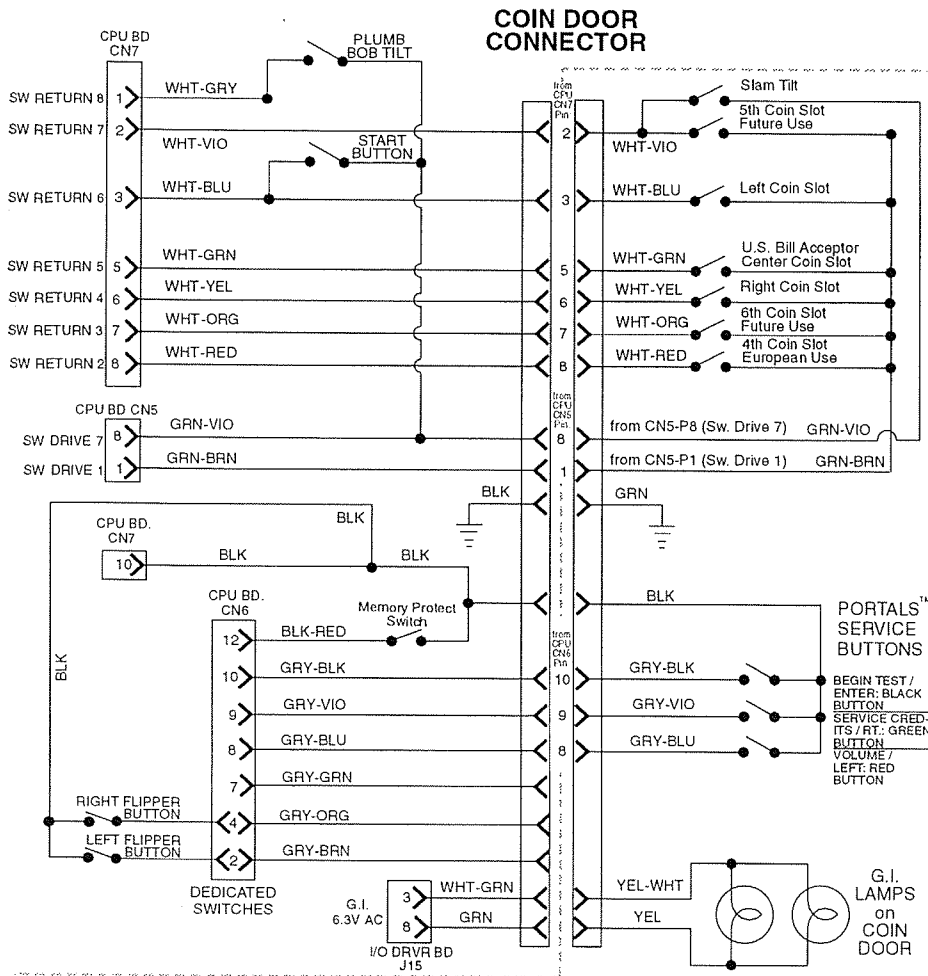
The **E.O.S. (End-Of-Stroke) Switch** serves the same function as before as it prevents foldback when the player has the flipper energized to capture balls. The **E.O.S. Switch** is a normally closed switch which opens approximately a 1/16" when the flipper is energized. The **Game CPU** will detect a switch closure if the flipper bat is forced back by a high velocity shot or rebound on the playfield and will apply another 40 msec pulse of 50v DC to the coil.

Cabinet Wiring

Transformer Power Wiring Diagram



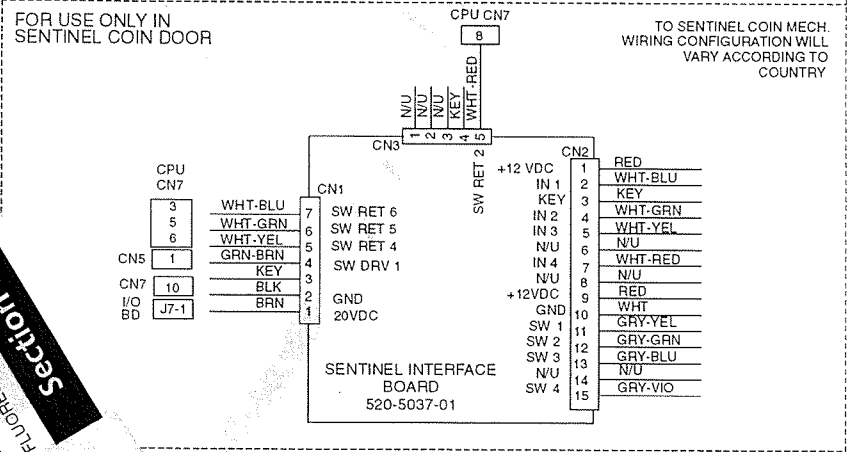
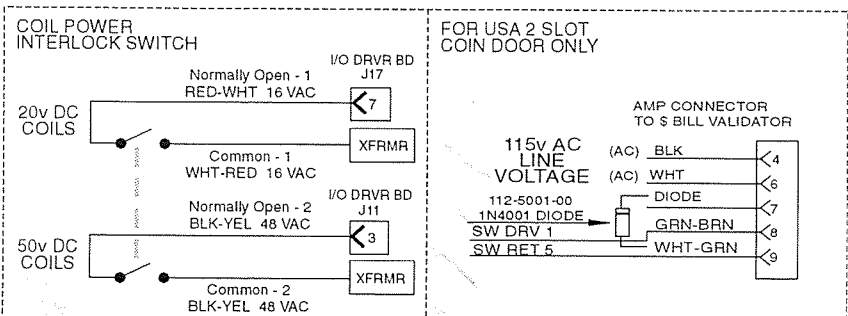
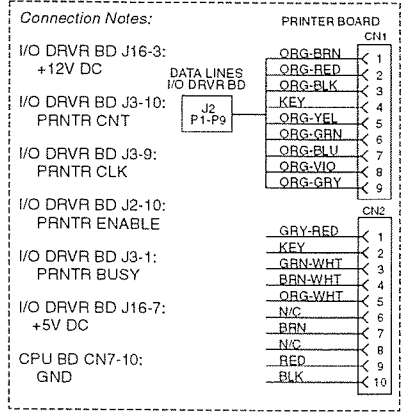
Cabinet / Coin Door Wiring Diagram



*** UK ONLY ***

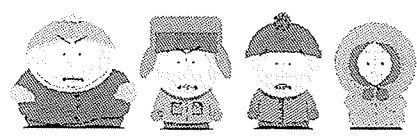
PRINTER INTERFACE OPTIONAL

Cable Wiring Harness Part N°:
036-5408-00
RS-232 Printer Interface Board Part N°:
520-5069-00










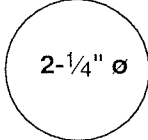
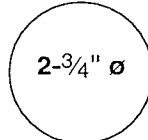




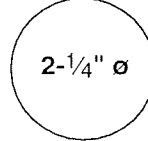
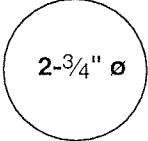




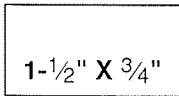
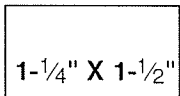
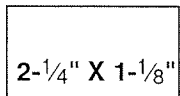
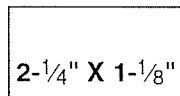
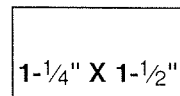
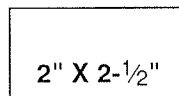

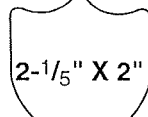
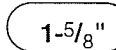
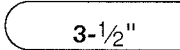
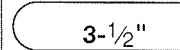




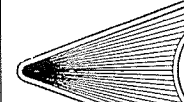


COIN DOOR

Section 5 | Cabinet
FLUORESCENT TUBE



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-SMALL  550-5013-XX	STARBURST ARROW-LARGE  550-5070-XX	STARBURST ARROW-HEAD SMALL  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 shapes may no longer be available in every color.

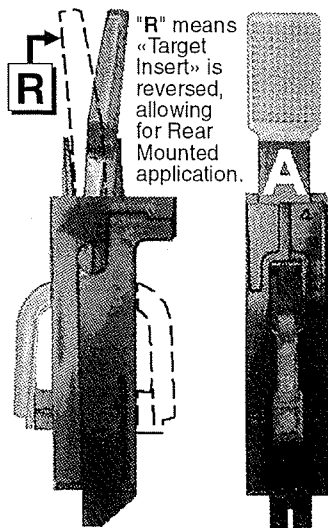
Instructions:

Parts which may come in various colors (i.e. targets, some posts, playfield inserts, etc.) end in a 2-digit N° which correspond to the color of that part. The "-XX" in Part N°s which may come in various colors should be replaced with the desired 2-Digit N°. corresponding to the color desired. *Not all colors may be available.*

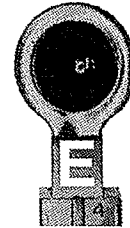
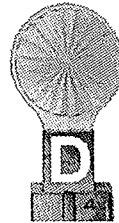
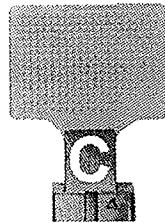
P L A S T I C P A R T C O L O R C H A R T											
N°	Color	N°	Color	N°	Color	N°	Color	N°	Color	N°	Color
-00	Black or Solid Clear	-03	Amber	-06	Yellow	-09	Purple	-12	Fluor. Blue	-15	Luminescent
-01	Clear	-04	Green	-07	Orange	-10	Fluor. Orange	-13	Teal Green	-16	Gold
-02	Red	-05	Blue	-08	White	-11	Fluor. Green	-14	Gray	-17	Trans. Brown



APPENDIX I Stand-Up Targets



"R" means
«Target
Insert» is
reversed,
allowing
for Rear
Mounted
application.



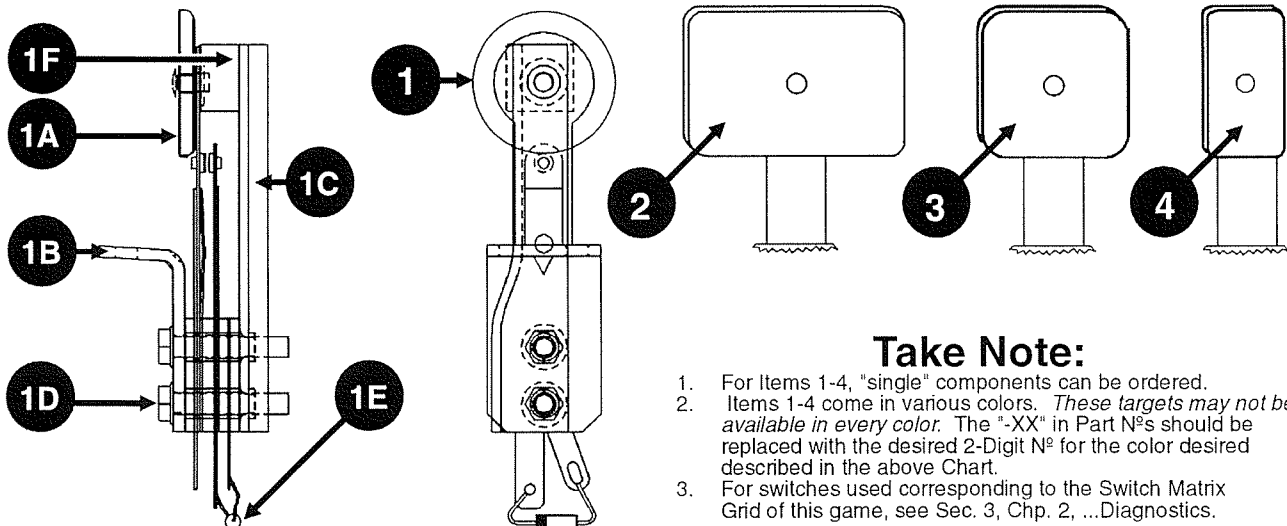
Take Note:

- For Items A-E, for the Target Assembly use the "500-" SPI N°; For the Target Assy. with Rear Mount add "R" to "500-" SPI N°; For just the «Target Insert» use the "545-" SPI N°.
 - Items A-E come in various colors. *These targets may not be available in every color.* The "-XX" in should be replaced with the desired 2-Digit N° for the color desired described in the Chart *.
- As of date of print, the following colors were used for Items A-E:**
- 01 Clear (A, D); -02 Red (A, B, C, D, E); -03 Amber (D, E); -04 Green (A, B);
 - 05 Blue (C); -06 Yellow (A, C); -09 Purple (B, D); -11 Fluorescent Green (A, B, D).
- See Section 3, Chapter 2, Go To Diagnostics Menu, for switches used corresponding to the Switch Matrix Grid of this game.

PLASTIC PART COLOR CHART

N°	Color
-00	Black
-01	Clear
-02	Red
-03	Amber
-04	Green
-05	Blue
-06	Yellow
-07	Orange
-08	White
-09	Purple
-10	Fluor. Orange
-11	Fluor. Green
-12	Fluor. Blue
-13	Teal Green
-14	Gray
-15	Luminescent
-16	Gold

N°	Stand-Up Target Name	Part N°	N°	Stand-Up Target Name	Part N°
A	Modular Stand-Up Target Narrow Assy.	500-6138-XX	D	Modular Stand-Up Target Round Assy.	500-6075-XX
	Stand-Up Target Narrow (Insert)	545-6138-XX		Stand-Up Target Round (Insert)	545-6075-XX
B	Modular Stand-Up Target Square Assy.	500-6139-XX	E	Mod. Stand-Up Target 1" Spherical Assy.	500-6189-XX
	Stand-Up Target Square (Insert)	545-6139-XX		Stand-Up Target 1" Spherical (Insert)	545-6189-XX
C	Modular Stand-Up Target Rectangle Assy.	500-6228-XX	NOTE: To receive the Target Assy. with the « Target Insert » « Reversed » simply add a "R" at the end of the Part N°. See Side View picture above to compare (dashed line shows target reversed).		
	Stand-Up Target Rectangle (Insert)	545-6228-XX			

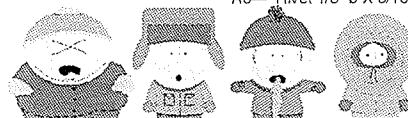


Take Note:

- For Items 1-4, "single" components can be ordered.
- Items 1-4 come in various colors. *These targets may not be available in every color.* The "-XX" in Part N°s should be replaced with the desired 2-Digit N° for the color desired described in the above Chart.
- For switches used corresponding to the Switch Matrix Grid of this game, see Sec. 3, Chp. 2, ...Diagnostics.

Nº	Stand-Up (Flat) Target Name	Part Nº	Nº	Stand-Up (Flat) Target Name	Part Nº
1	1" Round Stand-Up Target Assy.	500-5835-XX	‡ Note: Item 2A, is a riveted Sub-Assy. which includes the following items for reference: A1— Stack Switch Radius End (180-5133-00), A2— Washer 5/16" (242-5017-00), A3— Rivet 1/8" o X 3/16" (249-5001-00) and A4— Rectangular Target (545-5145-XX).		
ORDERING ABOVE (ITEM 1) ASSY. PART Nº WILL INCLUDE:			3	1" Sq. Stand-Up Target Assy.	500-5232-XX
1A‡	Switch & Target Assy. 1" Round	515-5966-XX	ORDERING ABOVE (ITEM 3) ASSY. PART Nº WILL INCLUDE:		
1B	Mounting Bracket	535-6896-00	3A‡	Sw. & Target Assy. 1" Square	515-5162-XX
1C	Switch Back Plate	535-6452-00	Items 3B-F are identical to 1B-F Same as 1B-F		
1D	6-32 X ¾ HWH Swage (Qty. 2)	237-5976-05	‡ Note: Item 3A, is a riveted Sub-Assy. which includes the following items for reference: A1— Stack Switch Radius End (180-5133-00), A2— Washer 5/16" (242-5017-00), A3— Rivet 1/8" o X 3/16" (249-5001-00) and A4— 1" Square Target (545-5470-XX).		
1E	Switch Diode, 1N4001	112-5001-00	4	Narrow Stand-Up Target Assy.	500-5835-XX
1F	Foam Pad	626-5029-00	ORDERING ABOVE (ITEM 4) ASSY. PART Nº WILL INCLUDE:		
‡ Note: Item 1A, is a riveted Sub-Assy. which includes the following items for reference: A1— Stack Switch Radius End (180-5133-00), A2— Washer 5/16" (242-5017-00), A3— Rivet 1/8" o X 3/16" (249-5001-00) and A4— 1" Round Target (545-5456-XX).			4A‡	Sw. & Target Assy. Narrow	515-5967-XX
2	1" X 1½" Stand-Up Rect. Target Assy.	500-5321-XX	Items 4B-F are identical to 1B-F Same as 1B-F		
ORDERING ABOVE (ITEM 2) ASSY. PART Nº WILL INCLUDE:			‡ Note: Item 4A, is a riveted Sub-Assy. which includes the following items for reference: A1— Stack Switch Square End (180-5132-00), A2— Washer 5/16" (242-5017-00), A3— Rivet 1/8" o X 3/16" (249-5001-00) and A4— Narrow Target (545-5210-XX).		
2A‡	Sw. & Target Assy. 1" X 1½" Rect.	515-6027-XX			
Items 2B-F are identical to 1B-F Same as 1B-F					

Item 2 Table Note continued in the next column.



GLOSSARY OF TERMS

A Followed after a number means "Amp." or Ampage in an expression relating to an electrical object. (e.g. 8A).

AC (Acronym) Alternating Current.

Adj. (Abbreviation) Adjustment(s).

Assy. (Abbreviation) Assembly.

Au. (Abbreviation) Audit(s).

Bd. (Abbreviation) Board.

BOT (Abbreviation) Bottom.

Brkt. (Abbreviation) Bracket.

Bridge Rectifier A configuration of a diode that allows current to flow in one direction producing both positive and negative pulsating DC Voltages.

Color Coding See Appendix H or I, Plastic Part Color Chart or Section 4, Chapter 1, Playfield - Plastic Posts & Spacers.

Combination (Combo) [Shot] Any variable pinball shot(s) made successively.

Conn. (Abbreviation) Connector.

CMOS Short for COSMOS (Complementary Symmetry M.O.S.); Complementary Metal-Oxide Semi-Conductor.

CN (Abbreviation) Connector (e.g. CN5-P3).

CT (Abbreviation) Center.

DC (Abbreviation) Direct Current.

DT (Abbreviation) Drop Target(s).

DOTS (Acronym) Diode On Terminal Strip.

EB (Abbreviation) Extra Ball.

Eject Playfield surface device to kick ball back into play; Saucer.

EPROM (Acronym) Erasable Programmable Read Only Memory. Can be erased using UV Light and re-programmed.

e.g. (Abbreviation) Latin- Exempli gratia. For Example.

EOS (Acronym) End-Of-Stroke (i.e. Switch for flipper).

F (Abbreviation) Fuse (i.e. F23).

GA-Turn Gauge & Turn describing the windings on a coil (e.g. 23-800, 23 is the gauge of wire and 800 is the amount of windings).

G.I. (Abbreviation) General Illumination (Lamps).

HWH (Abbreviation) Hex Washer Head.

IC (Acronym) Integrated Circuit (As in after 24-Pin IC).

ID or I.D. (Acronym) Inside Dimension.

i.e. (Abbreviation) Latin- Id est. That is.

IO or I/O (Abbreviation) Input / Output (e.g. I/O Power Driver Bd.)

LT, Lt. or L. (Abbreviation) Left.

Laser Kick A coil/plunger used above the playfield to kick pinball back into play.

LED (Acronym) 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 (Abbreviation) Magnet Board.

M-BALL or MBALL (Abbreviation) Multiball™ More than 1 ball in game play.

MID (Abbreviation) Middle.

Non-Reflexive See Reflexive.

No. or N° or # (Abbreviation) Number.

NPF (Acronym) No Problem Found.

N.C. or NC (Abbreviation) Normally Closed.

N.O. or NO (Abbreviation) Normally Open.

NS (Abbreviation) Not Stuffed. (Use in Part Listings, Sec. 5)

OD or O.D. (Abbreviation) Outside Dimension.

P (Abbreviation) Pin (e.g. CN5-P3).

PCB (Acronym) Printed Circuit Board.

P/F (Abbreviation) Playfield.

PIA LED (Acronym) Peripheral Interface Adapter Light Emitting Diode.. This is a diagnostic LED on the CPU; it should not be lit during normal operation of a pinball game.

Plumb Bob Tilt Weight on Tilt Assembly.

PPH (Abbreviation) Phillips Pan Head.

Pop(s) Another term for Turbo Bumper(s).

PPB (Acronym) Playfield Power Board ("Popcorn-Popping Bd.").

PREV (Abbreviation) Previous.

PSB (Abbreviation) Power Supply Board.

RAM (Acronym) Random Access Memory. RAM can store input instructions and supply output information.

Reflexive/Non-Reflexive Reflexive—Solenoid Drive Transistor is enabled directly by a switch closure on the (Relating to CPU Boards) solenoid assembly (Ver. 1/2).

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

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.

RMA (Abbreviation) Return Merchandise Authorization Number.

RT, Rt. or R. (Abbreviation) Right; ("R" at the end of Target Assy. Part N° signifies Target Insert is Reversed.)

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 A switch which closes when the game is slammed into or the Coin Door is slammed shut. Depending on adjustable settings, will cancel game in play when the number of closures required is achieved.

SMB (Abbreviation) Shaker Motor Board.

Solenoid A coil used for Electro Magnetic devices such as relays, flippers, slingshots, etc.

SSFB (Abbreviation) Solid State Flipper Board.

STEP Refers to the service switches on the coin door.

Sub-Assy. (Abbreviation) Sub-Assembly.

S-U or S/U (Abbreviation) Stand-Up (targets).

TM (Abbreviation) Trademark.

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.

Tri-Ball Three balls in play.

TTL (Abbreviation) Transistor-Transistor Logic.

Upr. (Abbreviation) Upper.

V or v (Abbreviation) Volt(s).

Ver. (Abbreviation) Version.

VUK (Acronym) Vertical Up-Kicker (Super or Standard).

X (Abbreviation) "Times" A multiplier; also used in dimensions.

X-Ball An undetermined number of ball(s) during game play.

Zener Diode A semi-conductor diode used for voltage regulation. Application depends on reverse break-down voltage.

"-00B" "B" at the end of Coil Part Numbers signifies that the diode is attached to the bottom of the lug.

"-00T" "T" at the end of Coil Part Numbers signifies that the diode is attached to the top of the lug (the side nearest the coil-winding).



Parts Order Checklist Notes

Date Ordered	Part N°	Qty.	Description	Date Received
	BATMAN FOREVER			
	GOLDENEYE 007			
	STARSHIP TROOPERS VHS			
	SPACE JAM INDEPENDENCE DAY			
	MARTIAN MONKEY MOVIE			
	BAYWATCH			
	APOLLO 13			
	TWISTER			
	THE GODZILLA MARY SULLIVAN FRANKENSTEIN			
	BATMAN FOREVER			
	GOLDENEYE 007			
	STARSHIP TROOPERS VHS			
	SPACE JAM INDEPENDENCE DAY			
	MARTIAN MONKEY MOVIE			
	BAYWATCH			
	APOLLO 13			
	TWISTER			
	THE GODZILLA MARY SULLIVAN FRANKENSTEIN			



SEGA PINBALL, INC. LIMITED WARRANTY

SEGA PINBALL, INC., ("SELLER") WARRANTS ONLY TO THE INITIAL PURCHASER OF ITS PRODUCTS THAT THE ITEMS LISTED BELOW ARE FREE FROM DEFECTS IN MATERIAL AND WORKMANSHIP UNDER NORMAL USE AND SERVICE FOR THE **WARRANTY PERIOD SPECIFIED**:

PRINTED CIRCUIT BOARDS (GAME LOGIC): 2 MONTHS
DOT MATRIX DISPLAY BOARDS: 9 MONTHS

NO OTHER PARTS OF SELLER'S PRODUCT ARE WARRANTED.

WARRANTY PERIODS ARE EFFECTIVE FROM THE INITIAL DATE OF SHIPMENT FROM SELLER TO ITS AUTHORIZED DISTRIBUTORS.

SELLER'S SOLE LIABILITY SHALL BE, AT ITS OPTION, TO REPAIR OR REPLACE PRODUCTS WHICH ARE RETURNED TO SELLER DURING THE WARRANTY PERIODS SPECIFIED, PROVIDED:

1. SELLER IS NOTIFIED PROMPTLY UPON DISCOVERY BY PURCHASER THAT STATED PRODUCTS ARE DEFECTIVE.
2. SUCH PRODUCTS ARE PROPERLY PACKAGED AND THEN RETURNED FREIGHT PREPAID, TO SELLER'S PLANT.


THIS WARRANTY DOES NOT APPLY TO ANY PARTS DAMAGED DURING SHIPMENT AND/OR DUE TO IMPROPER HANDLING, OR DUE TO IMPROPER INSTALLATION OR USAGE, OR ALTERATION. IN NO EVENT SHALL THE SELLER BE LIABLE FOR ANY ANTICIPATED PROFITS, LOSS OF PROFITS, LOSS OF USE, ACCIDENTAL OR CONSEQUENTIAL DAMAGES OR ANY OTHER LOSSES INCURRED BY THE CUSTOMER IN CONNECTION WITH THE PURCHASE OF A SEGA PINBALL, INC. PRODUCT.

WARRANTY DISCLAIMER

EXCEPT AS SPECIFICALLY PROVIDED IN A WRITTEN CONTRACT BETWEEN SELLER AND PURCHASER, THERE ARE NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OF FITNESS FOR A PARTICULAR PURPOSE.


CAUTIONS, WARNINGS & NOTICES

Caution

 **FOR SAFETY AND RELIABILITY**, SUBSTITUTE PARTS AND EQUIPMENT MODIFICATIONS ARE NOT RECOMMENDED (AND MAY VOID ANY WARRANTIES). USE OF NON-SEGA PINBALL INC. PARTS OR MODIFICATIONS OF GAME CIRCUITRY, MAY ADVERSELY AFFECT GAME PLAY, OR MAY CAUSE INJURIES. TRANSPORT PINBALL GAMES WITH HINGED BACKBOX DOWN ONLY! ALWAYS TAKE GREAT CARE WHEN SERVICING ANY GAME. ALWAYS DISCONNECT THE LINE VOLTAGE BEFORE SERVICING. SOME PARTS MAY STILL HOLD CURRENT WHEN UNPLUGGED. ALWAYS READ THE SERVICE MANUAL BEFORE REPLACING OR SERVICING COMPONENTS.

SUBSTITUTIONS OF PARTS OR EQUIPMENT MODIFICATIONS MAY VOID FCC TYPE ACCEPTANCE.

Warning

 THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY, AND IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTIONS MANUAL, MAY CAUSE INTERFERENCE TO RADIO COMMUNICATIONS. IT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS A COMPUTING DEVICE PURSUANT TO SUBPART J OF PART 15 OF FCC RULES, WHICH ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST SUCH INTERFERENCE WHEN OPERATED IN A COMMERCIAL ENVIRONMENT. OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE INTERFERENCE IN WHICH CASE THE USER AT HIS OWN EXPENSE WILL BE REQUIRED TO TAKE WHATEVER MEASURES MAY BE REQUIRED TO CORRECT THE INTERFERENCE.

RF INTERFERENCE NOTICE, CABLE HARNESS PLACEMENTS AND GROUND STRAP ROUTING ON THIS GAME HAVE BEEN DESIGNED TO KEEP RF RADIATION AND CONDUCTION WITHIN LEVELS ACCEPTED BY THE FCC RULES. TO MAINTAIN THESE LEVELS, REPOSITION HARNESSES AND RECONNECT GROUND STRAPS TO THEIR ORIGINAL PLACEMENTS, IF THEY BECOME DISCONNECTED DURING MAINTENANCE.

Notices

THIS DOCUMENT AND THE DATA DISCLOSED HEREIN OR HERewith IS NOT TO BE REPRODUCED (EXCEPT WHERE NOTED), USED OR OTHERWISE DISCLOSED IN WHOLE OR IN PART TO ANYONE WITHOUT WRITTEN CONSENT OF SEGA PINBALL, INC.. **WARNING:** PRODUCTS IN THIS MANUAL, THE COMPANY NAME AND DEVICES AND THE DESIGN OF THE MANUAL ITSELF, ARE PROTECTED BY FEDERAL PATENTS (AND PATENTS PENDING), DESIGN REGISTRATIONS, TRADEMARKS AND COPYRIGHTS. ACTION WILL BE TAKEN IN THE EVENT OF INFRINGEMENT OF IMITATION. THE RIGHT IS RESERVED TO CHANGE SPECIFICATIONS WITHOUT PRIOR NOTICE.



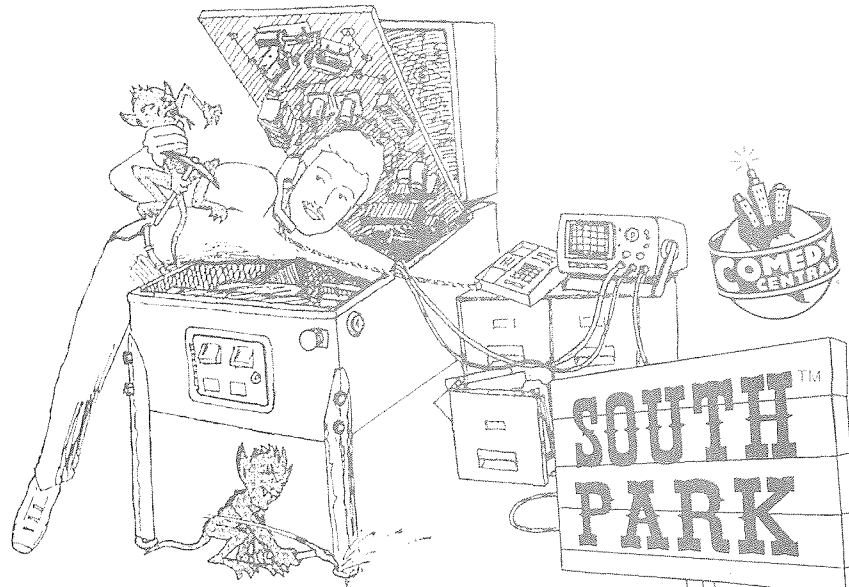
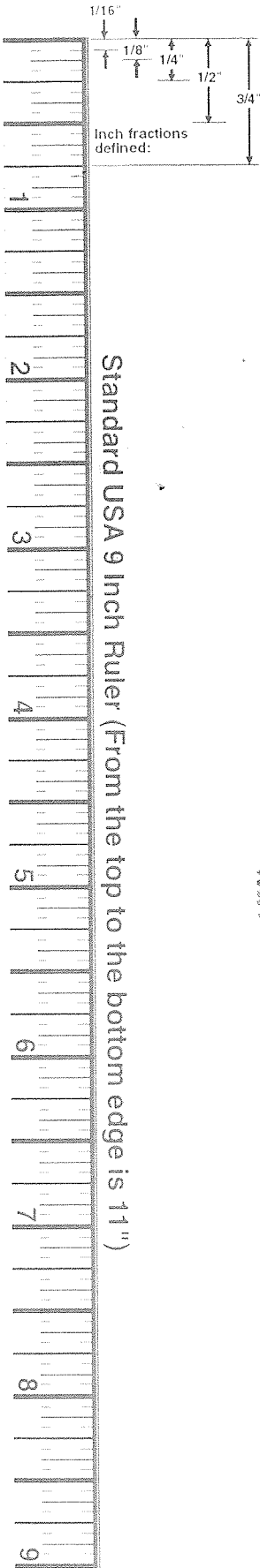
Sonic The Hedgehog™ is a TM of SEGA
©1999. Portals, Icon Designs, logos, names,
characters, & all related indicia are trade-
marks of Sega Pinball, Inc. ©1999.

All Rights Reserved. "Multiball" is a registered trademark
of Williams Electronics Games, Inc. Used by permission.
PCB Schematics (Section 5, Chapter 4) by CES,
Creative Electronics & Software, Inc. © 1995.



South Park Logo, names, characters, & all related indicia are
copyrighted trademarks of Comedy Central, TM & © 1998. All Rights Reserved.





1990 Janice Avenue
Melrose Park, IL 60160

HELP US HELP YOU! IF YOU HAVE ANY SUGGESTIONS, QUESTIONS, NEED TECHNICAL
ADVICE, FIND ERRORS OR HAVE COMMENTS, CALL US TOLL-FREE (USA or CANADA)

1-800-4-KIXERS

Tel 708-345-7700

Fax 708-345-7889



Games shipped factory
direct to Europe from
Sega Pinball, Inc. are CE
approved and will have
an "E" prefix attached to
the Serial Number

ALTHOUGH EVERY EFFORT IS PUT INTO MAKING THIS MANUAL (AND ALL
OTHER DOCUMENTS RELATING TO THIS PRODUCT) ACCURATE AND
COMPLETE, PLAYFIELD COMPONENTS, FEATURES, RULES, PROGRAMMING
AND OPERATION ARE SUBJECT TO CHANGE WITH OR WITHOUT NOTICE.