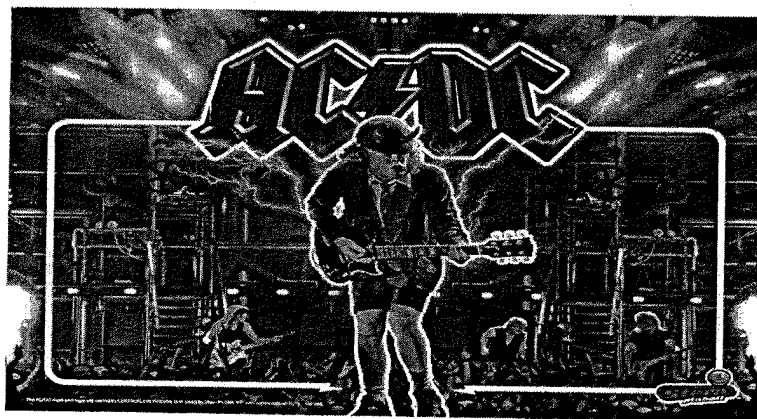
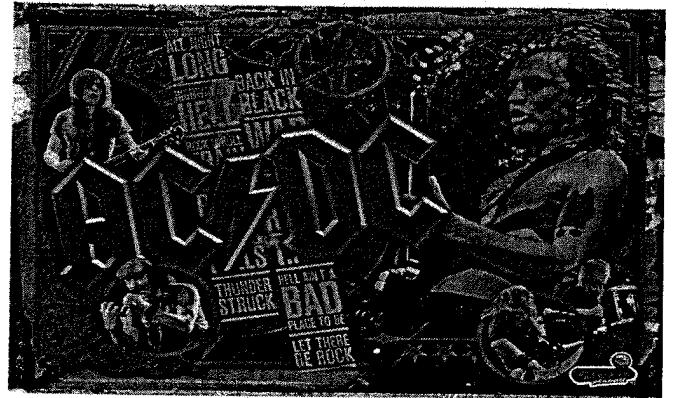
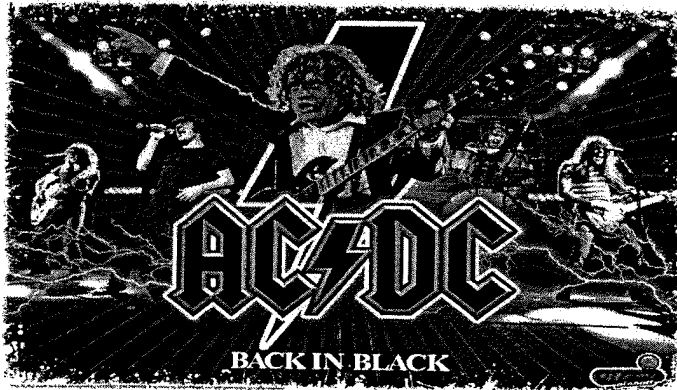




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Please visit www.sternpinball.com
For part numbers and mechanical drawings.

Stern Pinball machines are assembled in Melrose Park, Illinois, USA; each pinball machine has unique characteristics that make it a one of a kind American made product. Each machine will have variations in appearance resulting from differences in the machine's particular wood parts, individual silk screened art and mechanical assemblies. Stern Pinball has inspected each game element to insure it meets our quality standards.

Pinball Service Game Manual

Please call, eMail or visit us online for technical support, questions or comments regarding this pinball game.

Go to www.sternpinball.com and click Tech. Support & Parts Sales



Find Service Game Manual (with updates), Game Code, Appendixes, Coin Cards, Service Bulletins and much more!

* Toll-Free: 1-800-KICKERS (542-5377) or 1-708-345-7700 • eMail: parts.service@sternpinball.com •

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Printed in the U.S.A.
FEBRUARY 2012

SPI Part Number

780-5007-01 -02 & -03

HOW TO UPDATE YOUR GAME CODE FOR S.A.M. SYSTEM MACHINES

USB Compatible Data Storage Device (Thumb, Flash or Jump Drives) required to copy game code into system.
S.A.M. System compatible, tested & SPI approved USB Data Storage Devices 128MB+
available through your local distributor: Ask for **SPI Part Number 970-0128-00**

* to get the Data Storage Device with the latest **Game Code** copied to it, add "game title" to above part number.

STYLE, COLOR, SIZE AND MANUFACTURER SUBJECT TO CHANGE.

Game Code is subject to change. Update this game with the latest code downloaded from our website, from another game or order through your local distributor (use SPI PN + name above).

Upon power-up the display will describe the version of code installed in your game. When directed to do so (via Service Bulletin or website announcement) you will need to update your code ... with the **BOOT FLASH EPROM*** installed, here's how:

- STEP 1** Open the Back Box and locate the **8-Position Dip Switch (SW1 on the CPU/Sound Board)**.
- STEP 2** Switch Dip Switch #8 to 'ON'.
(***BOOT FLASH EPROM** must be installed.)
- STEP 3** Press the **White Reset Button (S1 RESET on the CPU/Sound Board)** or Power Cycle the game **OFF/ON** (ON/OFF Switch is located on the outside of the cabinet bottom, front right).

- STEP 4** Using the **4-Button Service Switch Set** (inside the Coin Door):



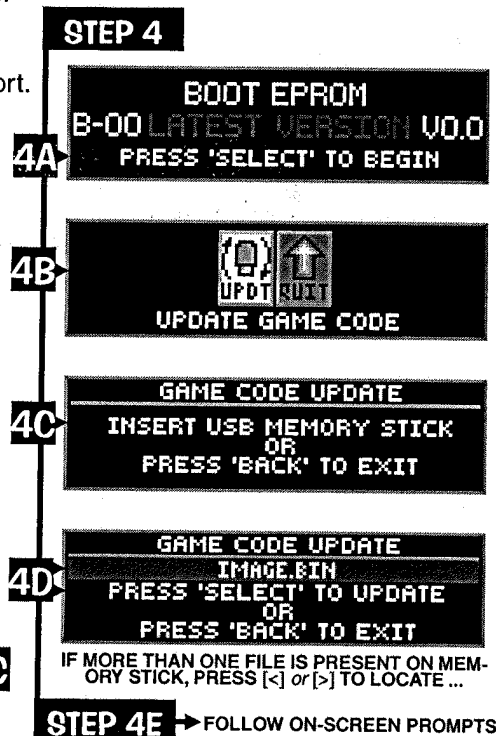
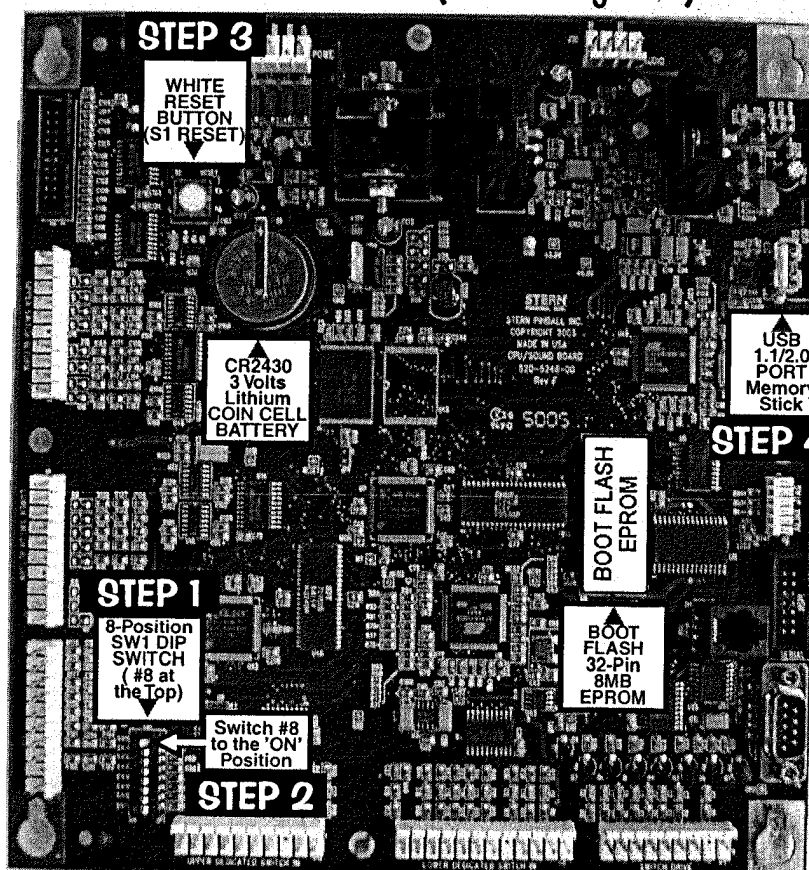
• **Green Button**
Press to
Escape
Back
(or **Exit**).

•• **Red Buttons**
Press to move
< Left , Right >.
Press to - **Decrease**
or + **Increase** values
or to change settings.

• **Black Button**
Press to
Enter
Select
(or **OK**).

- 4A } Press [SELECT] to begin.
- 4B } With the "UPDT" Icon highlighted, press [SELECT].
- 4C } Insert the Data Storage Device [w/latest file(s)] into the USB Port.
- 4D } If more than one file is present on the Data Storage Device, press [<] or [>] to locate your file. Press [SELECT] to update.
- 4E } Follow on-screen prompts.

CPU/Sound Board (S.A.M. System)

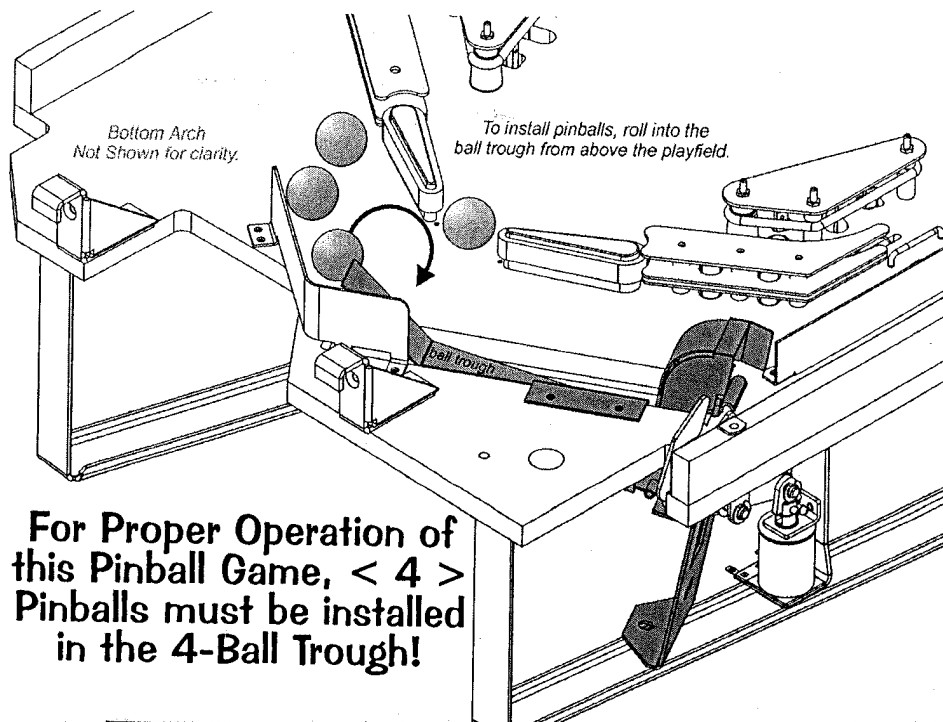


You can also retrieve your latest code from another game! From the **USB MENU** via the **UTILITIES MENU**, select the "BKUP" Icon instead and download to your Data Storage Device.



! Quick Tip ~ Try backing up your current code prior to installing your new code, just in case your Data Storage Device file was corrupted by a computer glitch while you were copying /

Got confused? Comments? Questions? Call Technical Support at 800-542-5377 or 708-345-7700 (Option 1).



For Proper Operation of this Pinball Game, < 4 > Pinballs must be installed in the 4-Ball Trough!

Backbox Fuses*, Cabinet Fuses, Playfield Fuses and Cabinet Switches

**Note: The CPU/Sound PCB does not have fuses.*

QUICK REFERENCE FUSE CHART

3/4A S.B. 200-5000-17 | 3A S.B. 200-5000-08 | 4A S.B. 200-5000-06 | 5A S.B. 200-5000-01 | 7A S.B. 200-5000-03 | 8A S.B. 200-5000-05

BACKBOX FUSES

I/O POWER DRIVER BOARD

with RED LED STATUS INDICATORS (if any RED LED is OFF, check the fuse)

F1	5A S.B.	5.7VAC~G.I. Lamps	[BROWN-WHITE↔WHT-BRN]
F2	5A S.B.	5.7VAC~G.I. Lamps	[YELLOW↔WHITE-YEL Circuit]
F3	5A S.B.	5.7VAC~G.I. Lamps	[GREEN↔WHITE-GRN Circuit]
F4	5A S.B.	5.7VAC~G.I. Lamps	[VIOLET↔WHITE-VIO Circuit]
F5	7A S.B.	50VDC Coils / Flippers	[48VAC feed to BRDG 1]
F6	3A S.B.	24VAC~ Motor or Special Application	
F7	4A S.B.	50VDC Magnet(s) or Special Application	
F8	3A S.B.	50VDC Coils	
F9	5A S.B.	5VDC Logic Power	[13VAC feed to BRDG 4]
F10	5A S.B.	20VDC Coils / Flashers	[16VAC feed to BRDG 2]
F12	5A S.B.	12VDC Audio	[19VAC feed to BRDG 3]
F13	5A S.B.	12VDC Audio	[19VAC feed to BRDG 3]

CABINET FUSES

POWER (SERVICE OUTLET) BOX

(Access through Coin Door inside cabinet, front bottom.)

8A S.B.	110-120V Main Line US / Canada / Japan
5A S.B.	220-240V Main Line International

PLAYFIELD FUSES

FLIPPER OR SPECIAL APPLICATION

(Coil Fuses are located under the playfield near assembly.)

3A S.B.	50VDC R. Flipper [BLU-YEL↔RED-YEL]
3A S.B.	50VDC L. Flipper [GRY-YEL↔RED-YEL]
3A S.B.	50VDC Additional Flipper Coil, if used.
3A S.B.	50VDC Spcl. Application Coil, if used.

For location & more details on fuses, see Sec. 5, Chp. 2.

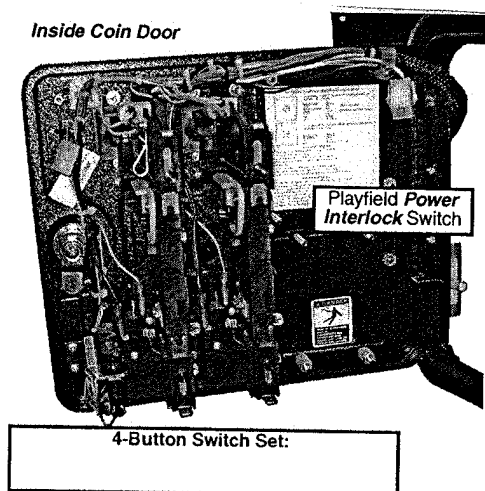
ALL FUSES ARE 250V S.B. (SLO-BLO) SEE FUSE OR TABLES FOR AMP RATING

CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ONLY WITH SAME TYPE FUSE WITH IDENTICAL ELECTRICAL RATING!

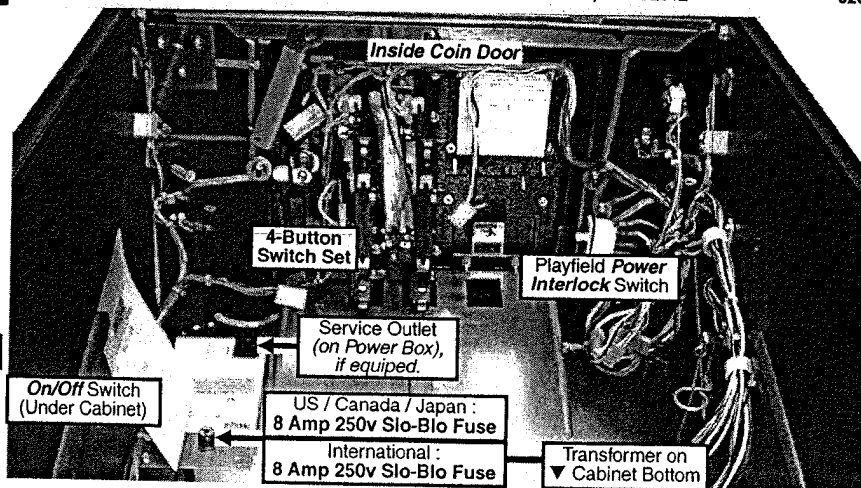
Stern Pinball®, Inc. ©2012

820-8020-00

Inside Coin Door



4-Button Switch Set:

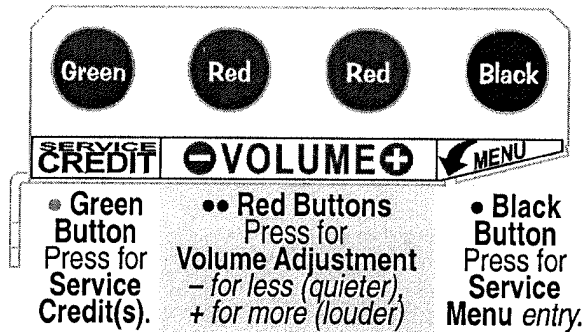


OPEN THE COIN DOOR TO ACCESS THE SERVICE SWITCH X4 SET.

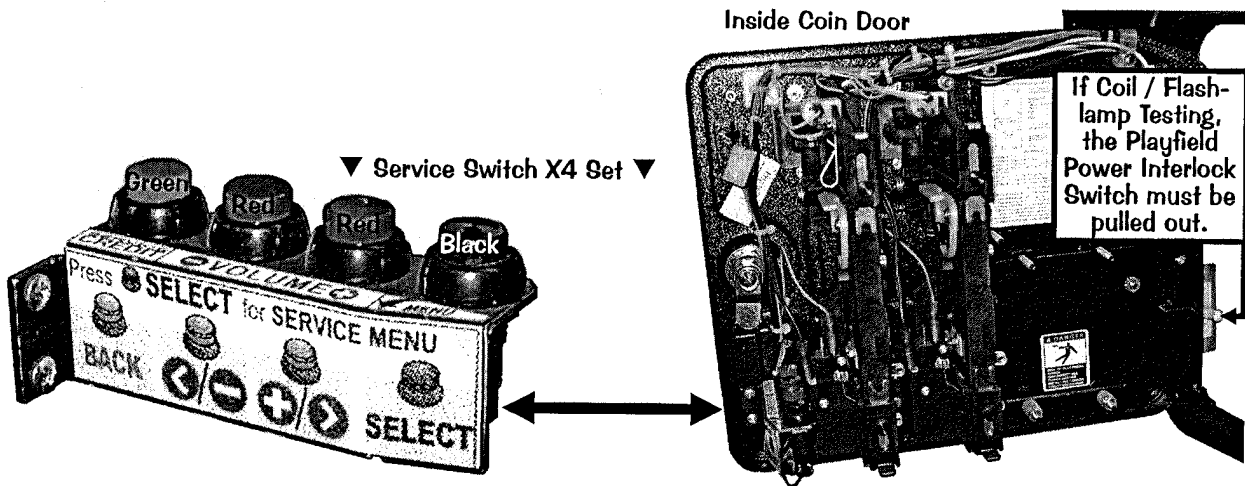
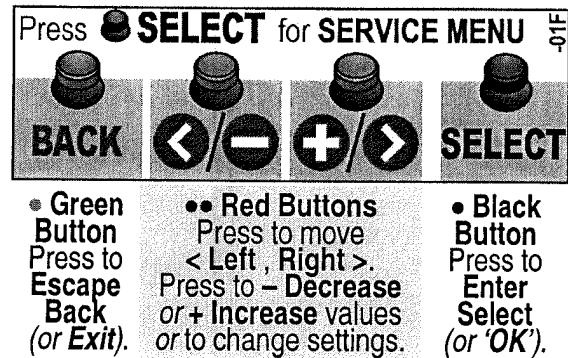
● ● ● ● Service Switch X4 Set Overview

The four buttons (*inside Coin Door*) have dual functions depending if you have entered the **Service Menu** or not.

Functions in Game or Attract Mode



Functions in the Service Menu



EXAMPLE:

To enter the **SERVICE MENU**, then enter the **SWITCH TEST MENU** via the **DIAGNOSTIC MENU**, perform the below steps.

Step 1 Press [**SELECT**].

Step 2 With the "DIAG" Icon highlighted, press [**SELECT**].

Step 3 With the "SW" Icon highlighted, press [**SELECT**].

Step 4 With the "TEST" Icon highlighted, press [**SELECT**].

Press any switch. If wired correctly, the information in the display will match the information in the Switch Matrix (see DR. 4).

Press [<] or [>] to move left or right through the menus.

Press [**BACK**] to go back a menu, exit or escape at any time.

Continue through the other menus.



The Service Menu is subject to change. Update this game with the latest code downloaded from our website with a USB Data Storage Device (64MB min., recommendation 128MB or higher). See the inside front cover for directions or in the Service Menu "Go To Utilities Menu" then "Go To USB Menu" and follow prompts.

DIAGNOSTIC AIDS

50V / 20V DISABLED
CLOSE COIN DOOR
OR PULL INTERLOCK SWITCH
TO RESTORE POWER

'escape' Green [BACK] Button will remove the alert display. Initial display presentation is accompanied by 3 audible tones (the bright display warning will go dim after approximately 30 seconds).

OPERATOR ALERT!
AUTO PLUNGER
DEVICE MALFUNCTION

This **alert display** is shown momentarily during **Game Mode** or **Power-Up** to alert the operator of a device malfunction (device or mechanism doesn't energize or is energized repeatedly). **OPERATOR ALERT!** works by monitoring any switch activated device that has the potential to trap a ball when disabled (e.g. in the Shooter Lane, Scoop or Eject Holes, etc.). This alert can also appear if a switch associated with a device (e.g. Ball Trough, Auto Plunger, etc.) is stuck closed (caused by a switch jam or stuck ball); the game will activate the device a predetermined number of times and if the problem is still detected, this device or switch will be noted in **Switch Alerts** and/or **Technician Alerts**.

VO.00 GAME NAME
SYS. 0.00 HDW. 0
SERVICE MENU *
USE -/+ TO VIEW TECH. ALERTS

and "TECH" Icon for the Technician Alerts information.

Upon entering the **SERVICE MENU**, if an asterisk " *" is displayed after the words "SERVICE MENU," the game has detected possible faulty devices, switches and/or missing pinballs. Press the either of the **Red Buttons** (short-cut to the **TECHNICIAN ALERTS MENU**) or continue into the **SERVICE MENU** (press the **Black Button** again), select the "DIAG" Icon

CPU DIP SWITCH SETTINGS

The 8-Pos. Dip Switch [SW1] is on the CPU/Sound Board (between Conn. J3 & J13, lower left corner)

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
Germany	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF								

CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
Russia	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF								

CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
Australia	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF								

CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
Greece	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF								

CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
So. Africa	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
Italy	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF								

CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
Spain	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
Japan	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
Canada 1	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF								

CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
Lithuania	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
Canada 2	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF								

CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
Middle East	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF								

CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
Taiwan	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF								

CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
Croatia	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF								

CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
Netherlands	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
Denmark	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF								

CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
New Zealand	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF								

CPU/SND PCB SETTING:	Pos.	1	2	3	4	5	6	7	8
UPDATE CODE	ON								▲
	OFF	▲	▲	▲	▲	▲	▲	▲	▲

CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
Finland	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
France	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF								

CPU COUNTRY SETTING:	Pos.	1	2	3	4	5	6	7	8
Portugal	ON	▲	▲	▲	▲	▲	▲	▲	▲
	OFF								

Note: Slide Dip Switch 8 to Position **ON** (with Dip Switches 1-7 in the **OFF** Position) only to reboot the game with the latest version **BOOT EPROM** installed at **U9** on the CPU/Sound Board (S.A.M. System only). Currently, this is also the procedure to update your game with the latest software code update file. For the latest version, visit our website. If you have questions about updating your game code, call Technical Support for assistance.

SWITCH MATRIX GRID [#1 - #64] (Switch Locations : next page)

CPU/ Sound Board	01 IC-U22A	02 IC-U22B	03 IC-U22C	04 IC-U22D	05 IC-U16A	06 IC-U16B	07 IC-U16C	08 IC-U16D	09 IC-U36A	10 IC-U36B	11 IC-U36C	12 IC-U36D	13 IC-U40A	14 IC-U40B	15 IC-U40C	16 IC-U40D
	RETURN A	RETURN A	RETURN A	RETURN A	RETURN A	RETURN A	RETURN A	RETURN A	RETURN A	RETURN A	RETURN A	RETURN A	RETURN A	RETURN A	RETURN A	RETURN A
	WH1-BRN	WH1-RED	WH1-ORG	WH1-YEL	WH1-WHT	GRN-WHT	BLU-WHT	YIO-WHT	GRN-TAN	BLK-TAN	RED-TAN	ORG-TAN	YEL-TAN	GRN-TAN	BLU-TAN	YIO-TAN
	J6-P3	J6-P2	J6-P1	J6-P5	J6-P3	J6-P2	J6-P1	J12-P3	J12-P2	J12-P1	J12-P5	J12-P4	J12-P3	J12-P2	J12-P1	J12-P5
01 DRIVE GRN-BRN J1-P1	S.W. #1 (A/C)DC	S.W. #2 A(C)DC	S.W. #3 AC(D)DC	S.W. #4 AC(D)C	S.W. #5 AC(D)C	S.W. #6 (R)OCK	S.W. #7 R(O)CK	S.W. #8 R(O)CK	S.W. #9 R(O)CK	S.W. #10 (T.)N.T.	S.W. #11 T.(N.)T.	S.W. #12 T.N.(T.)	S.W. #13 L.RAMP	S.W. #14 L.RAMP	S.W. #15 TOURN	S.W. #16 START
02 DRIVE GRN-RED J1-P3	S.W. #17 TROUGH	S.W. #18 TROUGH	S.W. #19 TROUGH	S.W. #20 TROUGH	S.W. #21 TROUGH	S.W. #22 JAM	S.W. #23 SHOOTER	S.W. #24 LEFT	S.W. #25 LEFT	S.W. #26 LEFT	S.W. #27 RIGHT	S.W. #28 RIGHT	S.W. #29 RIGHT	S.W. #30 RIGHT	S.W. #31 RIGHT	S.W. #32 BOTTOM
03 DRIVE GRN-ORG J1-P4	S.W. #33 L. LOOP	S.W. #34 L. LOOP	S.W. #35 L. LOOP	S.W. #36 EJECT	S.W. #37 EJECT	S.W. #38 LEFT	S.W. #39 CENTER	S.W. #40 RIGHT	S.W. #41 R. RAMP	S.W. #42 R. RAMP	S.W. #43 R. RAMP	S.W. #44 LEFT	S.W. #45 CANNON	S.W. #46 CANNON	S.W. #47 BELL	S.W. #48 SKILL
04 DRIVE GRN-YEL J1-P5	S.W. #49 LOWER P.F.	S.W. #50 LOWER P.F.	S.W. #51 LOWER P.F.	S.W. #52 LOWER P.F.	S.W. #53 LOWER P.F.	S.W. #54 LOWER P.F.	S.W. #55 LOWER P.F.	S.W. #56 LOWER P.F.	S.W. #57 ABOVE P.F.	S.W. #58 ABOVE P.F.	S.W. #59 ABOVE P.F.	S.W. #60 ABOVE P.F.	S.W. #61 ABOVE P.F.	S.W. #62 ABOVE P.F.	S.W. #63 ABOVE P.F.	S.W. #64 FIRE
	500-6779-01	180-5207-00	180-5207-00	180-5207-00	500-6227-04	500-6227-03	500-6227-03	500-6227-03	180-5087-00	180-5208-00	180-5087-00	180-5087-00	180-5119-02	511-7003-02	520-5292-00	180-5218-00
	500-6779-01	180-5207-00	180-5207-00	180-5207-00	500-6227-04	500-6227-03	500-6227-03	500-6227-03	180-5087-00	180-5208-00	180-5087-00	180-5087-00	180-5119-02	511-7003-02	520-5292-00	180-5218-00
	500-6779-01	180-5207-00	180-5207-00	180-5207-00	500-6227-04	500-6227-03	500-6227-03	500-6227-03	180-5087-00	180-5208-00	180-5087-00	180-5087-00	180-5119-02	511-7003-02	520-5292-00	180-5218-00
	500-6779-01	180-5207-00	180-5207-00	180-5207-00	500-6227-04	500-6227-03	500-6227-03	500-6227-03	180-5087-00	180-5208-00	180-5087-00	180-5087-00	180-5119-02	511-7003-02	520-5292-00	180-5218-00

Wire Color Abbreviations used:

- BLK Black
- BLU Blue
- BRN Brown
- GRY Gray
- GRN Green
- LGN Light Green
- ORG Orange
- PNK Pink
- RED Red
- TAN Tan
- VIO Violet
- WHT White
- YEL Yellow

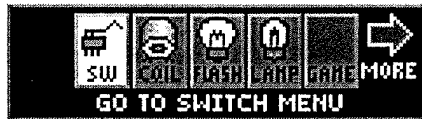
Dedicated Switches [#D-1 - #D-32] (Dedicated Switch Locations : next page)

CPU/SND Board	IC-U2 PINK-BRN J2-P2	IC-U2 PINK-RED J2-P3	IC-U2 PINK-ORG J2-P4	IC-U2 PINK-YEL J2-P5	IC-U2 PINK-BLU J2-P6	IC-U2 PINK-VIO J2-P7	IC-U2 PINK-GRY J2-P8	IC-U4 GRN-BRN J3-P1	IC-U4 GRN-RED J3-P2	IC-U4 GRN-ORG J3-P3	IC-U4 GRN-YEL J3-P4	IC-U4 GRN-BLU J3-P5	IC-U4 GRN-VIO J3-P6	IC-U4 GRN-GRY J3-P7	IC-U4 GRN-BLK J3-P8
	S.W. D-1	S.W. D-2	S.W. D-3	S.W. D-4	S.W. D-5	S.W. D-6	S.W. D-7	S.W. D-8	S.W. D-9	S.W. D-10	S.W. D-11	S.W. D-12	S.W. D-13	S.W. D-14	S.W. D-15
	LEFT	CENTER	RIGHT	FORTH	FIFTH			LEFT	LEFT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT
	COIN	COIN	COIN	COIN	COIN			FLIPPER	FLIPPER	FLIPPER	FLIPPER	FLIPPER	FLIPPER	FLIPPER	FLIPPER
	12-P1/11	12-P1/11	12-P1/11	12-P1/11	12-P1/11			500-6899-01	180-5148-00	500-6899-01	180-5148-00	500-6899-01	180-5148-00	500-6899-01	500-6899-01
	COIN DOOR	COIN DOOR	COIN DOOR	COIN DOOR	COIN DOOR			CABINET	FLIP ASSY.	CABINET	FLIP ASSY.	CABINET	FLIP ASSY.	CABINET	CABINET

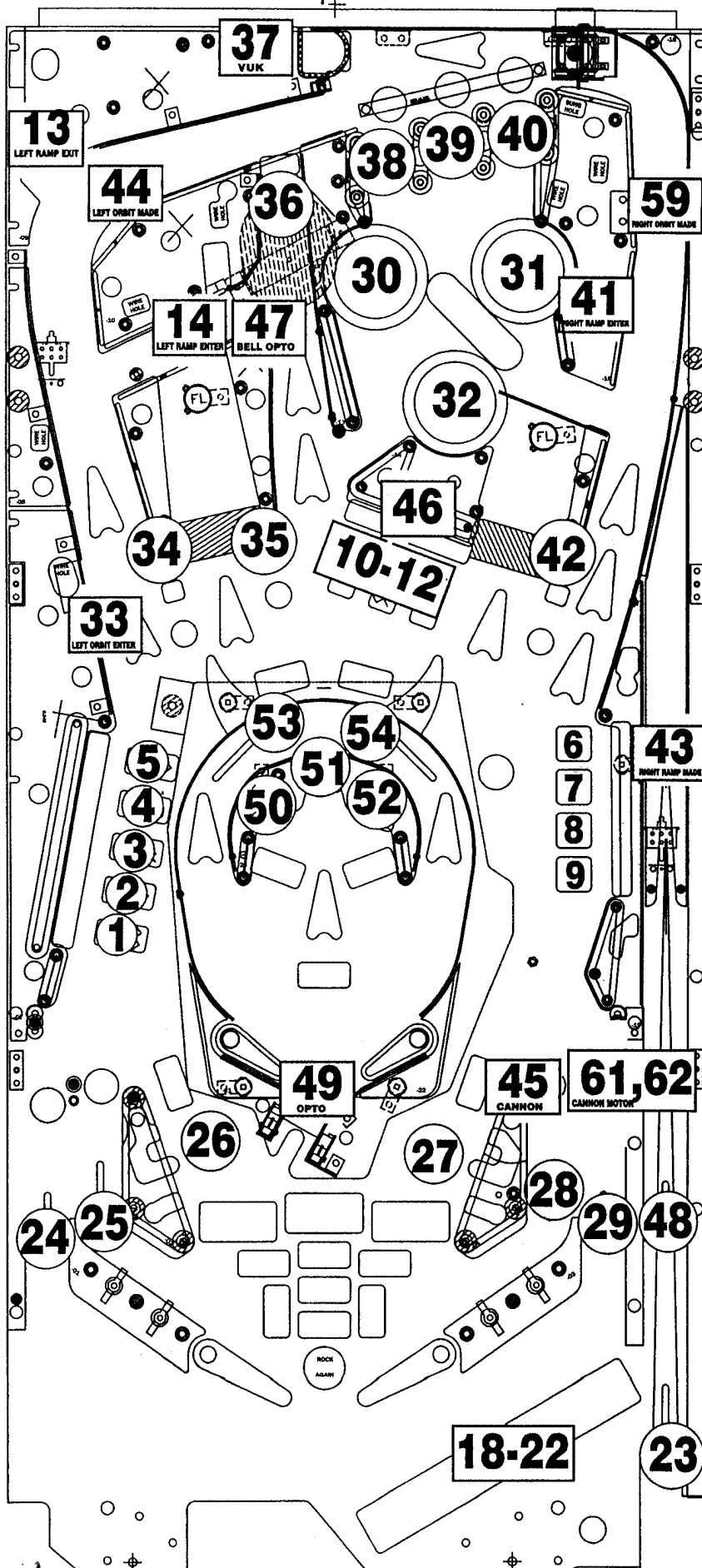
CPU/SND Board	IC-41 LGN-BRN J13-P1	IC-41 LGN-RED J13-P2	IC-41 LGN-ORG J13-P3	IC-41 LGN-YEL J13-P4	IC-41 LGN-BLU J13-P5	IC-41 LGN-VIO J13-P6	IC-41 LGN-GRY J13-P7	IC-41 LGN-BLK J13-P8
	S.W. D-17	S.W. D-18	S.W. D-19	S.W. D-20	S.W. D-21	S.W. D-22	S.W. D-23	S.W. D-24
	TILT	SLAM	TICKET		BACK	MINUS	PLUS	SELECT
	PENDULUM	TILT	NOTCH		(GREEN)	(RED)	(RED)	(BLACK)
	J13-P10	J13-P10	J13-P10	J13-P10	180-5182-04	180-5182-02	180-5182-02	180-5182-00
	CABINET				COIN DOOR	COIN DOOR	COIN DOOR	COIN DOOR

CPU/SOUND BD. SW1 DIP SWITCH (located between Connectors J3/J13)

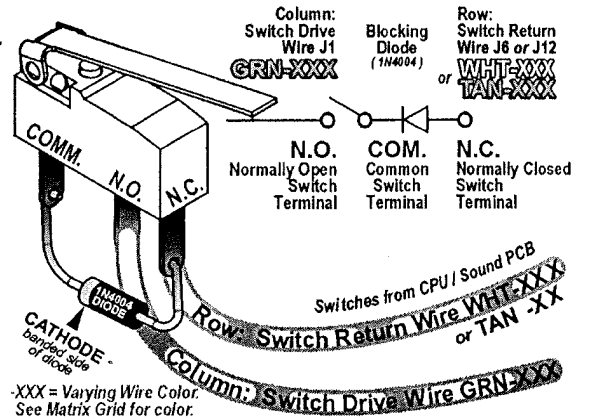
DIP	DIP	DIP	DIP	DIP	DIP	DIP	DIP	DIP
S.W. POS. #1 ON	S.W. POS. #2 ON	S.W. POS. #3 ON	S.W. POS. #4 ON	S.W. POS. #5 ON	S.W. POS. #6 ON	S.W. POS. #7 ON	S.W. POS. #8 ON	S.W. POS. #9 ON



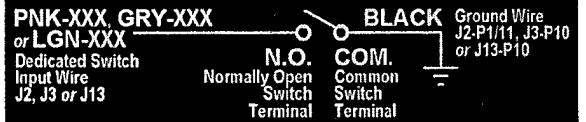
SWITCH MENU: SWITCH, ACTIVE, SINGLE & SERVICE



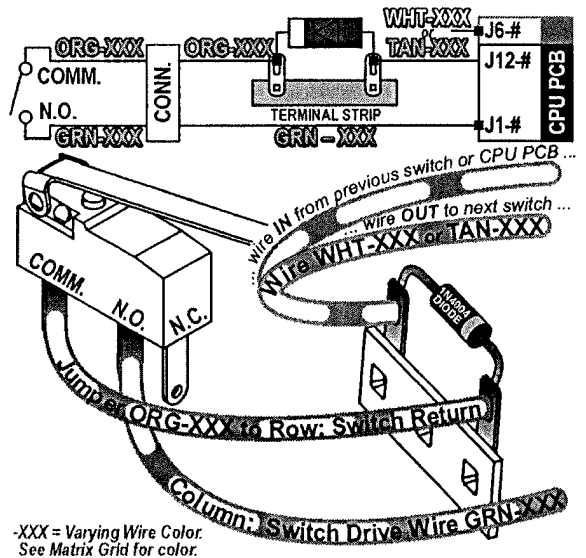
Typical Switch Wiring & Schematic



Dedicated Switch Schematic



Typical Switch Wiring & Schematic ... with Switch Diode on a Terminal Strip (DOTS)



For more about Diode on Terminal Strips (DOTS), see the Yellow Pages (Schematics & Wiring).

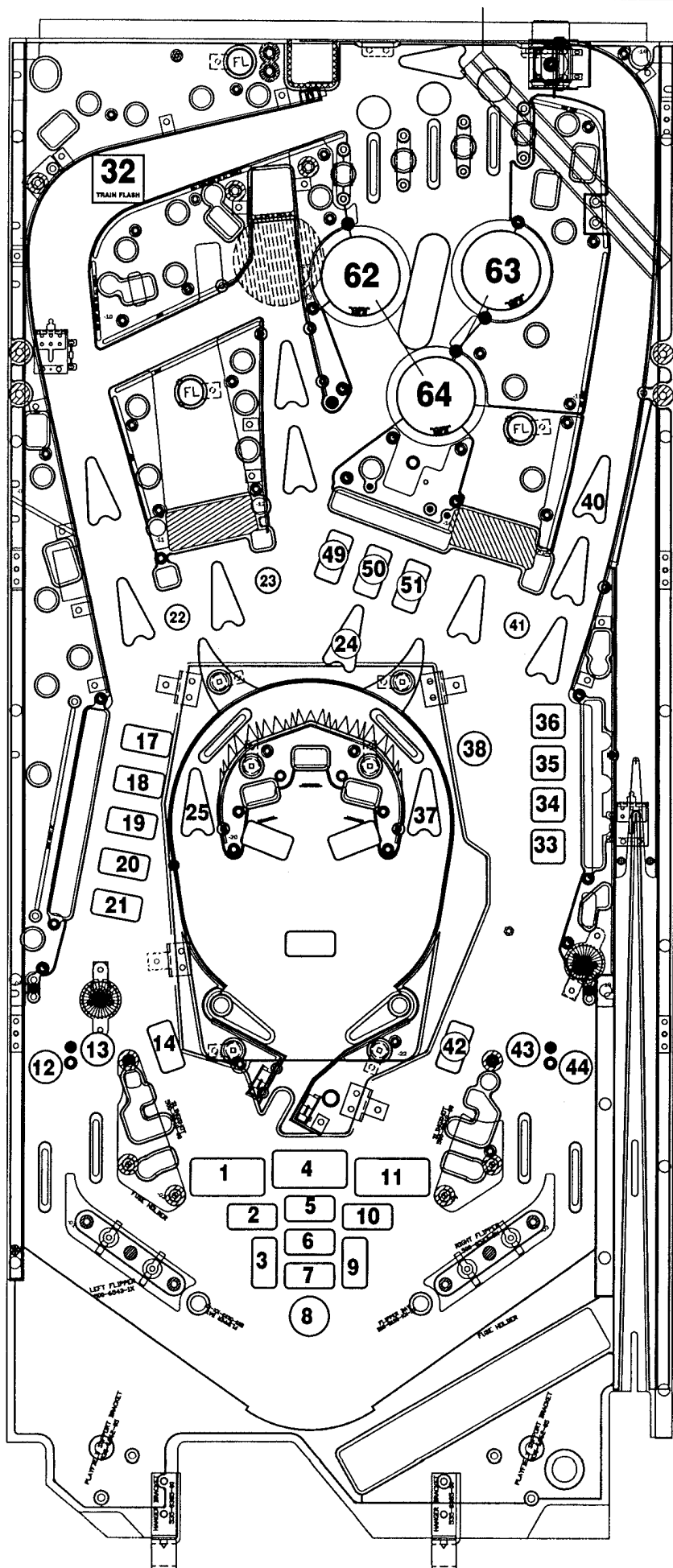
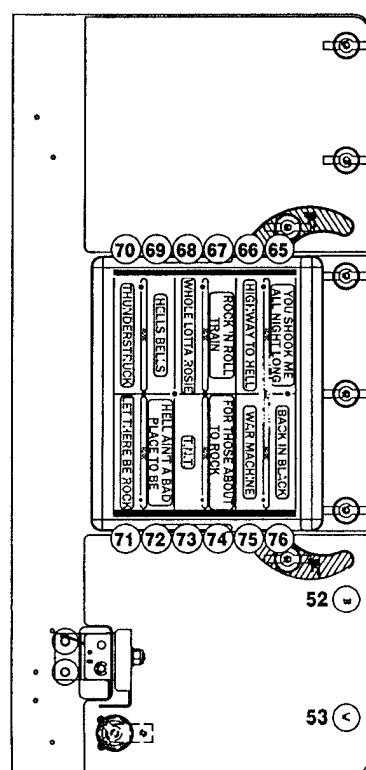
LAMP MATRIX GRID I #1 - #80} {Lamp Locations : next page}

LED BD. L.P. #1	LED BD. L.P. #2	LED BD. L.P. #3	LED BD. L.P. #4	LED BD. L.P. #5	LED BD. L.P. #6	LED BD. L.P. #7	LED BD. L.P. #8
JAM MULTIBALL	SUPER TARGETS	SUPER LANES	ALBUM MULTIBALL	CANNON FODDER	CANNON VOLLEY	CANNON CHAOS	ROCK AGAIN
LED BD. L.P. #9	LED BD. L.P. #10	LED BD. L.P. #11	LED BD. L.P. #12	LED BD. L.P. #13	LED BD. L.P. #14	L.P. #15	L.P. #16
SUPER LOOPS	SUPER COMBO	TOUR MULTIBALL	LEFT OUTLANE	LEFT RETURN LANE	2X		
LED BD. L.P. #17	LED BD. L.P. #18	LED BD. L.P. #19	LED BD. L.P. #20	LED BD. L.P. #21	LED BD. L.P. #22	LED BD. L.P. #23	LED BD. L.P. #24
AC/D(C) AC/(D)C AC/(/)DC A(C)/DC (A)C/DC					L. RAMP STANDUP (L.)	L. RAMP STANDUP (R.)	T.N.T. ARROW (WHT./NOTE)
LED BD. L.P. #25	L.P. #26	L.P. #27	L.P. #28	L.P. #29	L.P. #30	L.P. #31	L.P. #32
LOWER PLFD. L. LOOP ARROW							TRAIN
LED BD. L.P. #33	LED BD. L.P. #34	LED BD. L.P. #35	LED BD. L.P. #36	LED BD. L.P. #37	LED BD. L.P. #38	L.P. #39	LED BD. L.P. #40
ROCK(K) RO(C)K R(O)CK (R)OCK				LOWER PLFD. R. LOOP ARROW	SPECIAL		EXTRA BALL
LED BD. L.P. #41	LED BD. L.P. #42	LED BD. L.P. #43	LED BD. L.P. #44	L.P. #45	L.P. #46	L.P. #47	L.P. #48
R. RAMP STANDUP	3X	RIGHT RETURN LANE	RIGHT OUTLANE				
LED BD. L.P. #49	LED BD. L.P. #50	LED BD. L.P. #51	L.P. #52	LED L.P. #53	LED L.P. #54	L.P. #55	L.P. #56
(T.)N.T. T.(N.)T. T.N.(T.)				JUKE BOX HORN R.	JUKE BOX HORN L.		
LED L.P. #57	LED L.P. #58	LED BD. L.P. #59	LED BD. L.P. #60	LED BD. L.P. #61	LED L.P. #62	LED L.P. #63	LED L.P. #64
START	TOURNEY START	FIRE BUTTON (RED)	FIRE BUTTON (GREEN)	FIRE BUTTON (BLUE)	LEFT BUMPER	RIGHT BUMPER	BOTTOM BUMPER
LED BD. L.P. #65	LED BD. L.P. #66	LED BD. L.P. #67	LED BD. L.P. #68	LED BD. L.P. #69	LED BD. L.P. #70	LED BD. L.P. #71	LED BD. L.P. #72
YOU SHOOK ME ALL NIGHT	HIGHWAY TO HELL	ROCK N ROLL TRAIN	WHOLE LOTTA ROSIE	HELLS BELLS	THUNDERSTRUCK	LET THERE BE ROCK	HELL AINT A BAD PLACE
LED BD. L.P. #73	LED BD. L.P. #74	LED BD. L.P. #75	LED BD. L.P. #76	L.P. #77	L.P. #78	L.P. #79	L.P. #80
T.N.T. FOR THOSE ABOUT TO ROCK		WAR MACHINE	BACK IN BLACK				

AC-DC PREMIUM SINGLE LED MAP

57 = Start
56 = Tournament

59 = Fire: RED
60 = Fire: GRN
61 = Fire: BLU

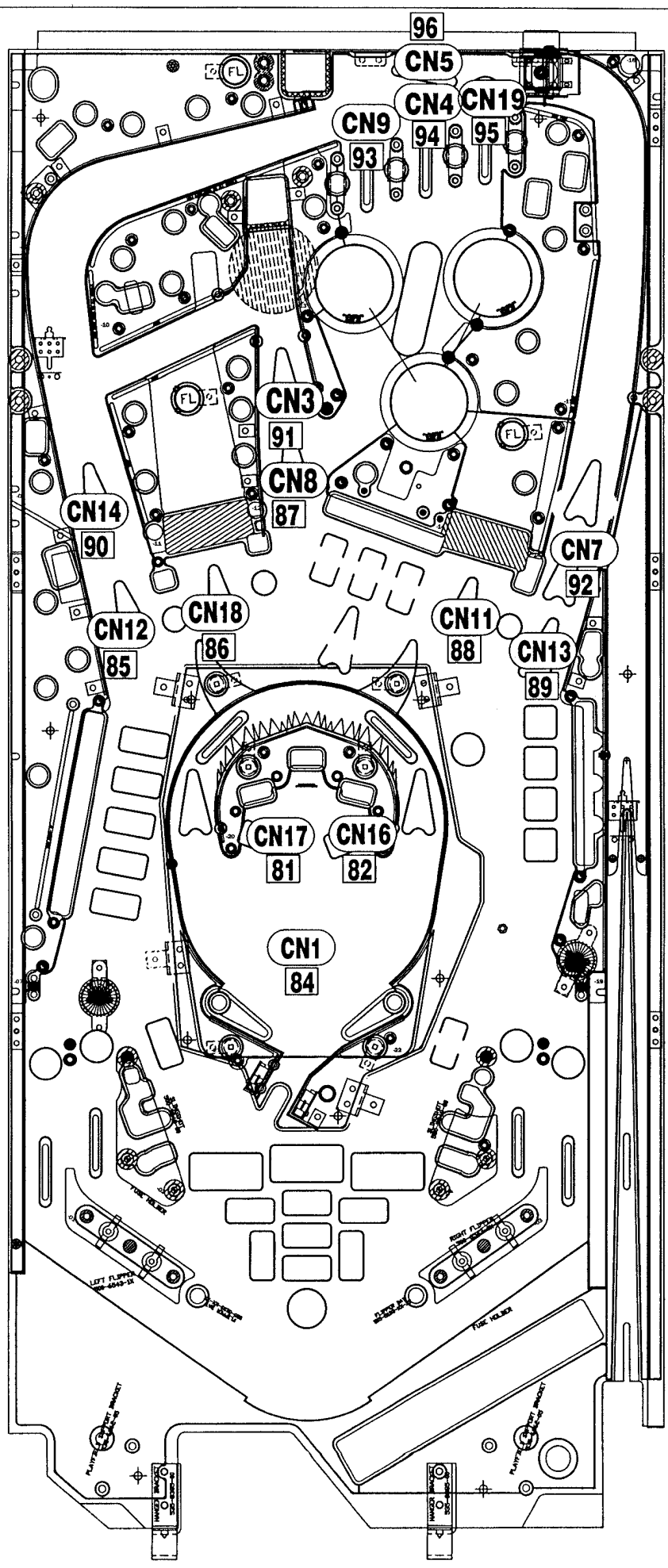
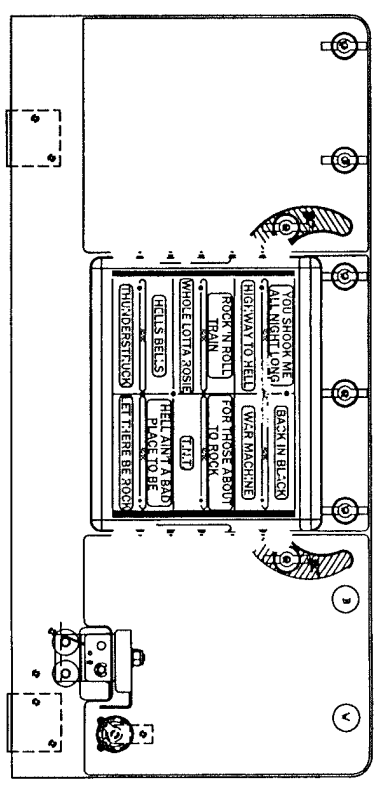


LAMP NUMBER	LAMP NAME	CONNECTOR NUMBER ON DRIVER BD. 520-5331-00
-------------	-----------	--

81	FACE LEFT EYE	CN17
82	FACE RIGHT EYE	CN16
84	FACE MOUTH	CN1
85	L. LOOP ARROW (BOT.)	CN12
86	L. RAMP ARROW	CN18
87	BELL ARROW (BOT.)	CN8
88	R. RAMP ARROW	CN11
89	R. LOOP ARROW (BOT.)	CN13
90	L. LOOP ARROW (TOP.)	CN14
91	BELL ARROW (TOP.)	CN3
92	RIGHT LOOP ARROW (MID.)	CN7
93	LEFT TOP LANE	CN9
94	CENTER TOP LANE	CN4
95	RIGHT TOP LANE	CN19
96	TUNES - N - STUFF	CN5

AC-DC PREMIUM TRI-COLOR LED MAP

CN1 = Connector number on driver board 520-5331-00
84 = Matrix number on Dot Matrix display

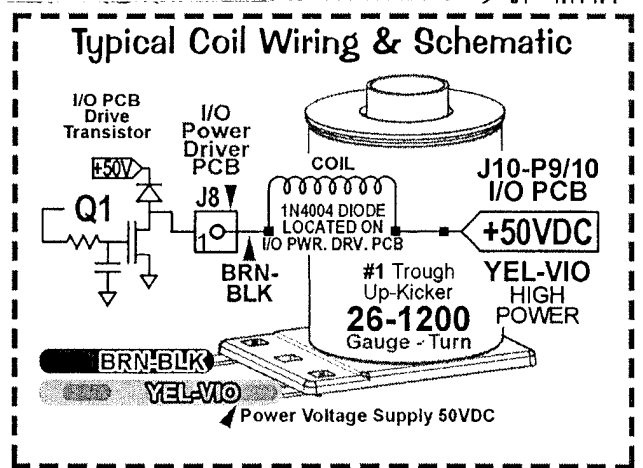
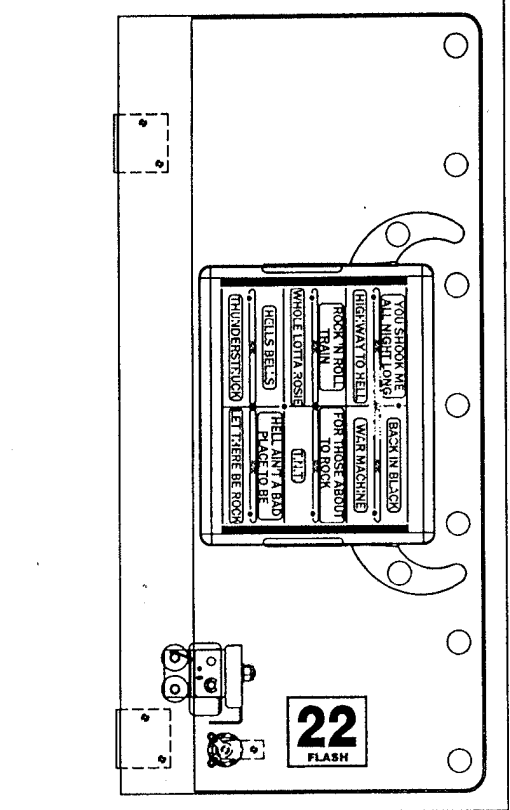
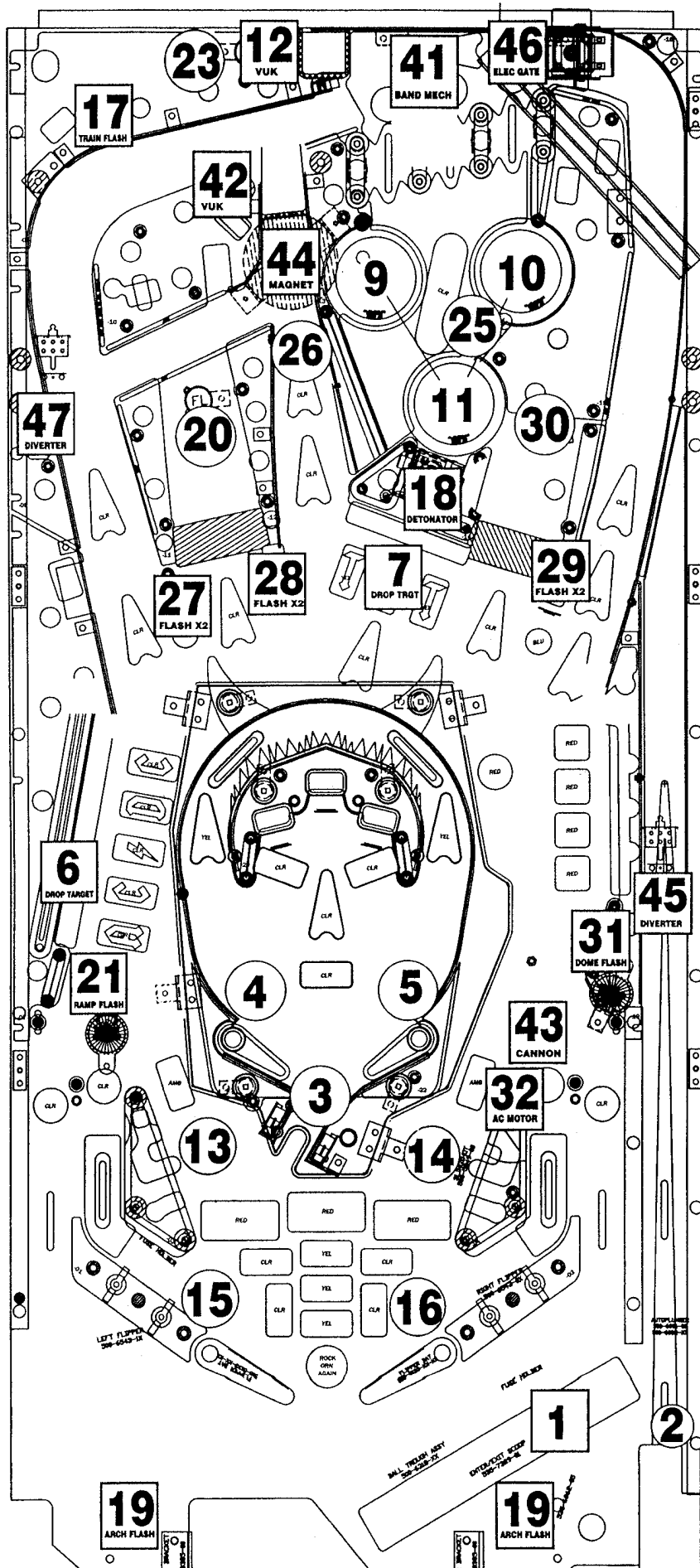


COILS DETAILED CHART TABLE

High Current Coils Group 1			Drive Transistor	Driver Output PCB	Power Line Color	Power Line Connection	Power Voltage	Drive Transistor Control Line Color	D.T. Control Line Connect	Coil GA-Turn or Bulb Type
#1	TROUGH UP-KICKER	Q1	I/O Power Driver	▲	YEL-VIO	J10-P9/10	50VDC	BRN-BLK	J8-P1	28-1200 090-5044-NB
#2	AUTO LAUNCH	Q2			YEL-VIO	J10-P9/10	50VDC	BRN-RED	J8-P3	24-940 090-5038-NB
#3	LOWER PLAYFIELD EJECT	Q3			YEL-VIO	J10-P9/10	50VDC	BRN-ORG	J8-P4	28-1200 090-5044-NB
#4	LOWER PLAYFIELD LEFT FLIPPER	Q4			GRY-YEL	J10-P9/10	50VDC	BRN-YEL	J8-P5	22-1080 090-5032-NB
#5	LOWER PLAYFIELD RIGHT FLIPPER	Q5			BLU-YEL	J10-P9/10	50VDC	BRN-GRN	J8-P6	22-1080 090-5032-NB
#6	LEFT 5- BANK DROP RESET (X2)	Q6			YEL-VIO	J10-P9/10	50VDC	BRN-BLU	J8-P7	25-1240 090-5034-NB
#7	CENTER 3- BANK DROP RESET	Q7			YEL-VIO	J10-P9/10	50VDC	BRN-VIO	J8-P8	25-1240 090-5034-NB
#8	SHAKER MOTOR (OPTIONAL)	Q8			RED-WHT	J17-P7	16VAC	BRN-GRY	J8-P9	502-5027-00
High Current Coils Group 2			Drive Transistor	Driver Output PCB	Power Line Color	Power Line Connection	Power Voltage	Drive Transistor Control Line Color	D.T. Control Line Connect	Coil GA-Turn or Bulb Type
#9	LEFT POP BUMPER	Q9	I/O Power Driver	▲	YEL-VIO	J10-P9/10	50VDC	BLU-BRN	J8-P1	28-1200 090-5044-NB
#10	RIGHT POP BUMPER	Q10			YEL-VIO	J10-P9/10	50VDC	BLU-RED	J8-P2	28-1200 090-5044-NB
#11	BOTTOM POP BUMPER	Q11			YEL-VIO	J10-P9/10	50VDC	BLU-ORG	J8-P4	28-1200 090-5044-NB
#12	TOP EJECT	Q12			YEL-VIO	J10-P9/10	50VDC	BLU-YEL	J8-P5	23-800 090-5001-NB
#13	LEFT SLINGSHOT	Q13			YEL-VIO	J10-P9/10	50VDC	BLU-GRN	J8-P6	28-1200 090-5044-NB
#14	RIGHT SLINGSHOT	Q14			YEL-VIO	J10-P9/10	50VDC	BLU-BLU	J8-P7	28-1200 090-5044-NB
#15	LEFT FLIPPER (50V RED/YEL)	Q15			GRY-YEL-3A Fuse-RED-YEL	J10-P6/7	50VDC	ORG-GRY	J8-P8	22-1080 090-5032-NB
#16	RIGHT FLIPPER (50V RED/YEL)	Q16			GRY-YEL-3A Fuse-RED-YEL	J10-P6/7	50VDC	ORG-VIO	J8-P9	22-1080 090-5032-NB
Low Current Coils Group 1			Drive Transistor	Driver Output PCB	Power Line Color	Power Line Connection	Power Voltage	Drive Transistor Control Line Color	D.T. Control Line Connect	Coil GA-Turn or Bulb Type
#17	TRAIN FLASHER	Q17	I/O Power Driver	▲	ORG	J6-P10	20VDC	VIO-BRN	J7-P2	# 89 BULB 165-5000-89
#18	DETONATOR	Q18			BRN	J7-P1	20VDC	VIO-RED	J7-P3	29-1400 090-5072-03
#19	BOTTOM ARCH FLASHER (X2)	Q19			ORG	J6-P10	20VDC	VIO-ORG	J7-P4	LED BD. 520-5328-00
#20	LEFT RAMP FLASHER	Q20			ORG	J6-P10	20VDC	VIO-YEL	J7-P6	# 89 BULB 165-5000-89
#21	LEFT SIDE FLASHER	Q21			ORG	J6-P10	20VDC	VIO-GRN	J7-P7	# 89 BULB 165-5000-89
#22	BACK PANEL FLASHER	Q22			ORG	J6-P10	20VDC	VIO-BLU	J7-P8	# 89 BULB 165-5000-89
#23	TOP EJECT FLASHER	Q23			ORG	J6-P10	20VDC	VIO-BLK	J7-P9	# 89 BULB 165-5000-89
#24	OPTIONAL (e.g. COIN METER)	Q24			RED	J16-P4-8	5VDC	VIO-GRY	J7-P10	COIN METER
Low Current Coils Group 2			Drive Transistor	Driver Output PCB	Power Line Color	Power Line Connection	Power Voltage	Drive Transistor Control Line Color	D.T. Control Line Connect	Coil GA-Turn or Bulb Type
#25	POP BUMPERS FLASH (X3)	Q25	I/O Power Driver	▲	ORG	J6-P10	20VDC	BLK-BRN	J6-P1	# 89 BULB 165-5000-89
#26	BELL ARROW FLASHER	Q26			ORG	J6-P10	20VDC	BLK-RED	J6-P2	# 89 BULB 165-5000-89
#27	LEFT RAMP LEFT SIDE FLASHER	Q27			ORG	J6-P10	20VDC	BLK-ORG	J6-P3	# 181 BULB 165-5032-00
#28	LEFT RAMP RIGHT SIDE FLASHER	Q28			ORG	J6-P10	20VDC	BLK-YEL	J6-P4	# 181 BULB 165-5032-00
#29	RIGHT RAMP RIGHT SIDE FLASHER	Q29			ORG	J6-P10	20VDC	BLK-GRN	J6-P5	# 181 BULB 165-5032-00
#30	RIGHT RAMP FLASHER	Q30			ORG	J6-P10	20VDC	BLK-BLU	J6-P6	# 89 BULB 165-5000-89
#31	RIGHT SIDE FLASHER	Q31			ORG	J6-P10	20VDC	BLK-VIO	J6-P7	# 89 BULB 165-5000-89
#32	CANNON MOTOR	Q32			BRN	J7-P1	20VDC	BLK-GRY	J6-P8	MOTOR 041-5111-00



COIL MENU: SINGLE COIL & CYCLING COIL



48
TOP MECH

27-29
3 TARGET FLASHERS

**FOR FUTURE
OPTIONAL
TOP BOX**

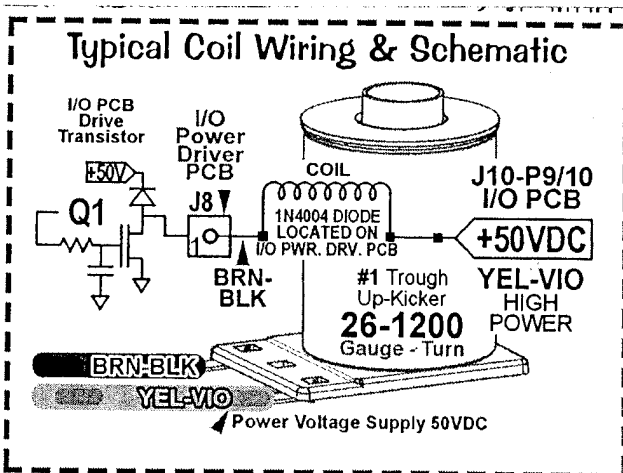
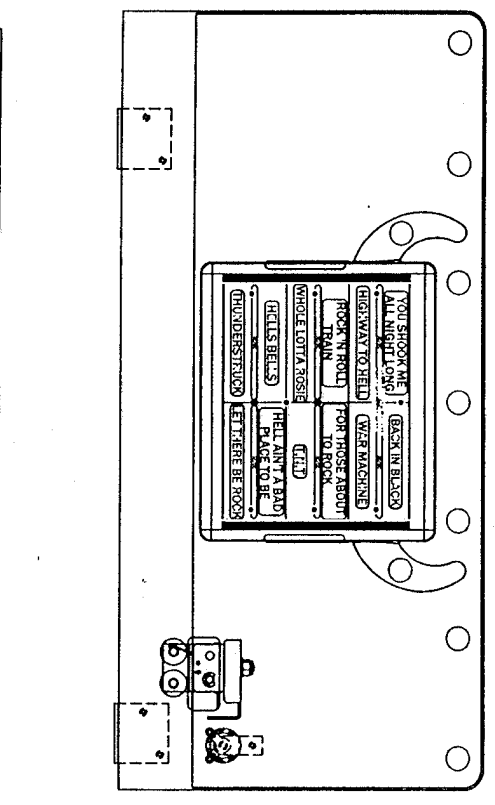
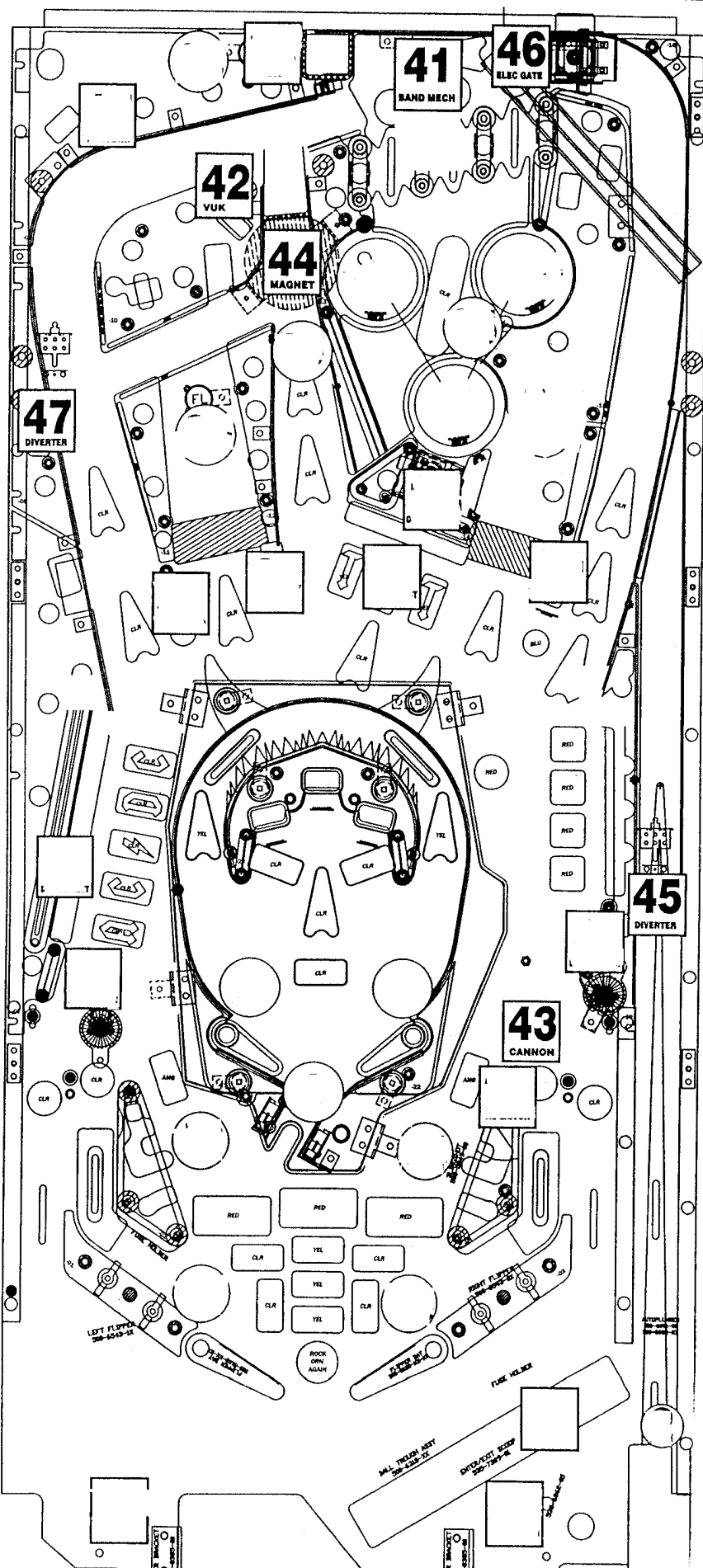
Coil Q24 is Optional.
If either a Coin Meter, Token
Dispenser or Kicker (all
optional equipment) is
required, call Technical
Support for more informa-
tion, 1-800-542-5377 or
1-708-345-7700.

AUX. COILS 41-43

COILS DETAILED CHART TABLE							
HIGH CURRENT COILS GROUP 1	Drive	Power Line	Power Line	Power	Driver Transistor	D.T CNTL	Coil GA-Turn
	Transistor	Color	Connection	Voltage	Control Line Color	LINE CON.	or Bulb Type
BAND MEMBER MECH AUX D/D0	Q1 AUX BD.	YEL-VIO	J2-P10	50VDC	BLU-BRN	J2-P8	29-1400 COIL
							090-5073-03
BELL EJECT	Q2 AUX BD.	YEL-VIO	J2-P10	50VDC	BRN-BLK	J2-P7	23-800 COIL
							090-5001-ND
CANNON EJECT	Q3 AUX BD.	YEL-VIO	J2-P10	50VDC	VIO-BRN	J2-P6	23-800 COIL
							090-5001-ND
BELL MAGNET	Q4 AUX BD.	VIO-YEL	J2-P10	50VDC	BLU-RED	J2-P5	22-600 COIL
							090-5076-00
RIGHT RAMP DIVERter	Q5 AUX BD.	YEL-VIO	J2-P10	50VDC	BRN-RED	J2-P4	32-1800 COIL
							515-6595-01-ND
RIGHT CONTROL GATE	Q6 AUX BD.	YEL-VIO	J2-P10	50VDC	VIO-RED	J2-P3	32-1250
							090-5060-01-ND
LEFT RAMP DIVERter	Q7 AUX BD.	YEL-VIO	J2-P10	50VDC	BLU-ORG	J2-P2	32-1800 COIL
							515-6595-01-ND



COIL MENU: SINGLE COIL & CYCLING COIL



48
TOP MECH

**FOR FUTURE
OPTIONAL
TOP BOX**

Coil Q24 is Optional.
If either a Coin Meter, Token
Dispenser or Knocker (all
optional equipment) is
required, call Technical
Support for more informa-
tion, 1-800-542-5377 or
1-708-345-7700.



CHOOSE EARNINGS or STANDARD AUDITS

GO TO AUDITS MENU: EARNINGS AUDITS [#1 – #13] / STANDARD AUDITS [#1 – #59]

Perform the below steps to review the audits. Enter the **SERVICE MENU**, then enter the **EARNINGS AUDITS** or **STANDARD AUDITS** MENUS. For audit definitions or summary, review the Audits Section (**GO TO AUDITS MENU**). Try the **"DUMP AUDITS TO USB"** Feature to create a text file of your audits. Don't forget to set the **DATE & TIME** in the **UTILITIES MENU**. See the Utilities Section (**GO TO UTILITIES MENU**).

Step 1 Press [**SELECT**].

Press [**BACK**] to exit for escape at any time.

Step 2 Press [**>**]. Go to the

"AUD" Icon.

Press [**SELECT**].

Step 3 Press [**>**]. Go to the

"EARN" or "S.P.I." Icon.

Press [**SELECT**].

Step 4 Press [**<**] [**>**] to

move between audits.

Audit Number

Audit Name

Audit Result

EARNINGS AUDIT #1

TOTAL PAID CREDITS

0

EARNINGS AUDITS [#1 – #13] ▼

Nr.	EARNINGS AUDIT NAME	YOUR RESULT
1	TOTAL PAID CREDITS	
2	FREE GAME PERCENTAGE	
3	AVERAGE BALL TIME	
4	AVERAGE GAME TIME	
5	COINS THROUGH LEFT SLOT	
6	COINS THROUGH RIGHT SLOT	
7	COINS THROUGH CENTER SLOT	

Nr.	EARNINGS AUDIT NAME	YOUR RESULT
8	COINS THROUGH FOURTH SLOT	
9	COINS THROUGH FIFTH SLOT	
10	TOTAL COINS	
11	TOTAL EARNINGS	
12	METER CLICKS	
13	SOFTWARE METER	

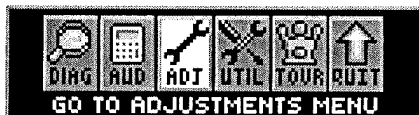
STANDARD AUDITS [#1 – #59] ▼

Nr.	STANDARD AUDIT NAME	YOUR RESULT
1	TOTAL BALLS PLAYED	
2	TOTAL EXTRA BALLS	
3	EXTRA BALL PERCENTAGE	
4	REPLAY 1 AWARDS	
5	REPLAY 2 AWARDS	
6	REPLAY 3 AWARDS	
7	REPLAY 4 AWARDS	
8	TOTAL REPLAYS	
9	REPLAY PERCENTAGE	
10	TOTAL SPECIALS	
11	SPECIAL PERCENTAGE	
12	TOTAL MATCHES	
13	HIGH SCORE AWARDS	
14	HIGH SCORE PERCENT	
15	TOTAL FREE PLAYS	
16	TOTAL PLAYS	
17	0.0M – 1.99M SCORES	
18	2.0M – 3.99M SCORES	
19	4.0M – 5.99M SCORES	
20	6.0M – 7.99M SCORES	

Nr.	STANDARD AUDIT NAME	YOUR RESULT
21	8.0M – 9.99M SCORES	
22	10.0M – 12.49M SCORES	
23	12.5M – 14.99M SCORES	
24	15.0M – 17.49M SCORES	
25	17.5M – 19.99M SCORES	
26	20.0M – 24.99M SCORES	
27	25.0M – 29.99M SCORES	
28	30.0M – 39.99M SCORES	
29	40.0M – 49.99M SCORES	
30	50.0M – 74.99M SCORES	
31	75.0M – 99.99M SCORES	
32	100.0M – 149.99M SCORES	
33	150.0M+ SCORES	
34	AVERAGE SCORES	
35	SERVICE CREDITS	
36	BALL SEARCH STARTED	
37	LOST BALL FEEDS	
38	LOST BALL GAME STARTS	
39	LEFT DRAINS	
40	CENTER DRAINS	

Nr.	STANDARD AUDIT NAME	YOUR RESULT
41	RIGHT DRAINS	
42	TILTS	
43	TOTAL BALLS SAVED	
44	LEFT FLIPPER USED	
45	RIGHT FLIPPER USED	
46	0 – 1 MINUTE GAMES	
47	1 – 1.5 MINUTE GAMES	
48	1.5 – 2 MINUTE GAMES	
49	2 – 2.5 MINUTE GAMES	
50	2.5 – 3 MINUTE GAMES	
51	3 – 3.5 MINUTE GAMES	
52	3.5 – 4 MINUTE GAMES	
53	4 – 5 MINUTE GAMES	
54	5 – 6 MINUTE GAMES	
55	6 – 8 MINUTE GAMES	
56	8 – 10 MINUTE GAMES	
57	10 – 15 MINUTE GAMES	
58	15+ MINUTE GAMES	
59	RECENT REPLAY PERCENT	

Note: Audits are subject to change (with or without notice).



STANDARD ADJUSTMENT 1

GO TO ADJUSTMENTS MENU: STANDARD ADJUSTMENTS [#1 – #63]

Perform the below steps to review the adjustments. Enter the **ADJUSTMENTS MENU**, then enter the **STANDARD ADJUSTMENTS MENU**. For adjustment definitions or summary, review the *Adjustments Section (GO TO ADJUSTMENTS MENU)*. See *Utilities Section (GO TO INSTALLS MENU)*, to easily change all adjustments required depending on the Install Type (Easy, Hard, 5-Ball, Home Play, etc.) desired.

Step 1 Press [**SELECT**]. Press [**BACK**] to exit or escape at any time.

Step 2 Press [>]. Go to the "ADJ" Icon.
Press [**SELECT**].

Step 3 ... "S.P.I." Icon. Press [**SELECT**].

Adjustment Number
Adjustment Name
Adjustment Setting
Adjustment Comment

STANDARD ADJUSTMENT #1
REPLAY TYPE
AUTO
(INSTALLED/FACTORY DEFAULT)

Step 4 **STANDARD ADJUSTMENT #1** appears with the Adjustment Name [**REPLAY TYPE**] flashing. With the Adjustment Name flashing, press [<] [>] to move between adjustments.

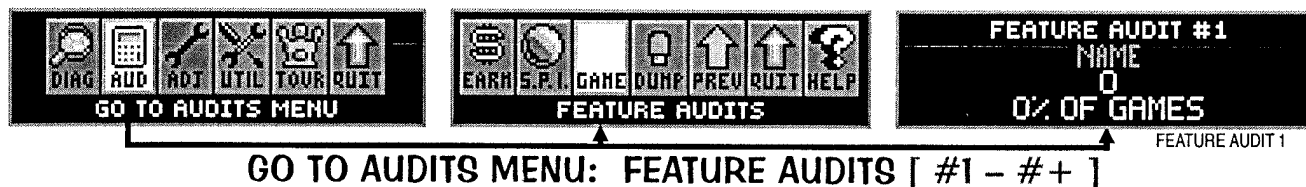
Step 5 To change the Adjustment Setting, press [**SELECT**]. With the Adjustment Setting flashing, press [<] [>] repeatedly until the desired setting appears. Press the [**SELECT**] to "install" the change. The Adjustment Comment (bottom text line) will indicate [**INSTALLED/FACTORY DEFAULT**], if the Factory Default Setting is selected or [**INSTALLED**] if the change is not the Factory Default Setting.

STANDARD ADJUSTMENTS [#1 – #63] ▼

Nr.	STANDARD ADJUSTMENT NAME	USA DEFAULT	YOUR SETTING
1	REPLAY TYPE	AUTO	
2	‡ REPLAY PERCENTAGE	10%	
3	‡ REPLAY AWARD	CREDIT	
4	‡ REPLAY LEVELS	1	
5	‡ AUTO REPLAY START	___,000,000	
6	‡ DYNAMIC REPLAY START	60,000,000	
7	‡ REPLAY LEVEL #1	15,000,000	
8	‡ REPLAY LEVEL #2	30,000,000	
9	‡ REPLAY LEVEL #3	45,000,000	
10	‡ REPLAY LEVEL #4	60,000,000	
11	‡ REPLAY BOOST	YES	
12	SPECIAL LIMIT	1	
13	‡ SPECIAL PERCENTAGE	10%	
14	SPECIAL AWARD	CREDIT	
15	FREE GAME LIMIT	5	
16	EXTRA BALL LIMIT	5	
17	‡ EXTRA BALL PERCENTAGE	25%	
18	GAME PRICING	USA 10	
19	MATCH PERCENTAGE	9%	
20	MATCH AWARD	CREDIT	
21	BALLS PER GAME	3	
22	TILT WARNINGS	2	
23	CREDIT LIMIT	30	
24	ALLOW HIGH SCORES	YES	
25	HIGH SCORE AWARD	CREDIT	
26	GRAND CHAMPION AWARDS	1	
27	HIGH SCORE #1 AWARDS	1	
28	HIGH SCORE #2 AWARDS	0	
29	HIGH SCORE #3 AWARDS	0	
30	HIGH SCORE #4 AWARDS	0	
31	GRAND CHAMPION SCORE	___,000,000	

Nr.	STANDARD ADJUSTMENT NAME	USA DEFAULT	YOUR SETTING
32	HIGH SCORE #1	___,000,000	
33	HIGH SCORE #2	___,000,000	
34	HIGH SCORE #3	___,000,000	
35	HIGH SCORE #4	___,000,000	
36	HSTD INITIALS	3 INITIALS	
37	HSTD RESET COUNT	2000	
38	FREE PLAY	NO	
39	LANGUAGE	ENGLISH	
40	PLAYER LANGUAGE SELECT	YES	
41	CUSTOM MESSAGE	ON	
42	FLASH LAMP POWER	NORMAL	
43	COIL PULSE POWER	NORMAL	
44	KNOCKER VOLUME	NORMAL	
45	GAME RESTART	YES	
46	BILL VALIDATOR	NO	
47	MUSIC VOLUME	1	
48	BALL SAVE TIME	0:05	
49	TIMED PLUNGER	OFF	
50	FLIPPER BALL LAUNCH	OFF	
51	COINDOOR BALL SAVER	NO	
52	COMPETITION MODE	NO	
53	CONSOLATION BALL	YES	
54	FAST BOOT	YES	
55	Q24 OPTION	COIN METER	
56	TICKET DISPENSER	NO	
57	PLAYER COMPETITION	YES	
58	TEAM SCORES	NO	
59	LOCATION ID	0	
60	GAME ID	0	
61	TIME FORMAT	12-HOUR	
62	COIN INPUT DELAY	30	
63	LOST BALL RECOVERY	YES	

Factory Defaults Settings are subject to change during production (especially Standard Adjustments 2, 4, 5, 13, 16-17, 19, 31-35 & 47).
‡ Not all Standard Adjustments are shown. Depending on the setting (whether Factory Default or if changed by the operator), associated adjustments do not appear, if not required. **Note:** If **Game Dip Switch** other than USA is installed, different Defaults will appear.



Perform the below steps to review the audits. Enter the **AUDITS MENU**, then enter the **FEATURE AUDITS MENU**. Try the **"DUMP AUDITS TO USB"** Feature to create a text file of your audits. *Don't forget to set the **DATE & TIME** in the **UTILITIES MENU**. See *Utilities Section (GO TO UTILITIES MENU)*, for more information.

Step 1 Press [**SELECT**]. Press [**BACK**] to exit or escape at any time.

Step 2 Press [**>**]. Go to the "AUD" Icon.
Press [**SELECT**].

Step 3 Press [**>**]. Go to the "GAME" Icon. Press [**SELECT**].

Step 4 Press [**<**] [**>**] to move between audits.



% = AUDIT RESULT DIVIDED BY STANDARD AUDIT 16 (TOTAL PLAYS).

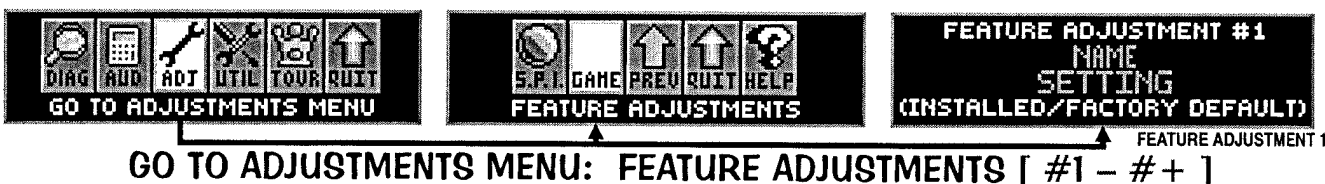
Feature Audits are subject to change (with or without notice). View **Feature Audits on the Dot Display only**. To export all audits to your memory stick (creating a text file), perform the following. Enter the **AUDITS MENU**, then enter the **DUMP AUDITS TO USB**. **Note:** The "DUMP" Icon can also be accessed in the **USB MENU** via the **UTILITIES MENU** (see the *Utilities Section (GO TO USB MENU)* for details).



Step 1 Insert your **USB Compatible Memory Stick** into the USB port on the CPU/Sound Board (S.A.M. System). If the Memory Stick has space available and is free of errors, a dated file* is generated (* ensure your Date & Time is set prior to selecting or the dated file will have the default date of 20XX_01_01; see *Section 3, Chapter 5, SET DATE / TIME via the UTILITIES MENU* for details).

Step 2 Press [**SELECT**] to save the file to your Memory Stick. Press [**SELECT**] again to continue or [**BACK**] to exit or escape at any time.

Step 3 Remove the Memory Stick and insert into your PC or Mac to save the file (which can then be copied, printed or emailed). The audits are numbered sequentially *without* a number restart between the three types of audits (Earnings, Standard and Feature).



Perform the below steps to review the adjustments. Enter the **SERVICE MENU**, then enter the **FEATURE ADJUSTMENTS MENU**. For adjustment definitions or summary, review the *Adjustments Section (GO TO ADJUSTMENTS MENU)*. See *Utilities Section (GO TO INSTALLS MENU)*, to easily change all adjustments required depending on the Install Type (Easy, Hard, 5-Ball, Home Play, etc.) desired.

Step 1 Press [**SELECT**]. Press [**BACK**] to exit or escape at any time.

Step 2 Press [**>**]. Go to the "ADJ" Icon.
Press [**SELECT**].

Step 3 Press [**>**]. Go to the "GAME" Icon.
Press [**SELECT**].

Step 4 **FEATURE ADJUSTMENT #1** appears with the Adjustment Name [**FEATURE ADJ. NAME**] flashing. With the Adjustment Name flashing, press [**<**] [**>**] to move between adjustments.

Step 5 To change the Adjustment Setting, press [**SELECT**]. With the Adjustment Setting flashing, press [**<**] [**>**] repeatedly until the desired setting appears. Press the [**SELECT**] to "install" the change. The Adjustment Comment (bottom text line) will indicate [**INSTALLED/FACTORY DEFAULT**], if the Factory Default Setting is selected or [**INSTALLED**] if the change is not the Factory Default Setting.

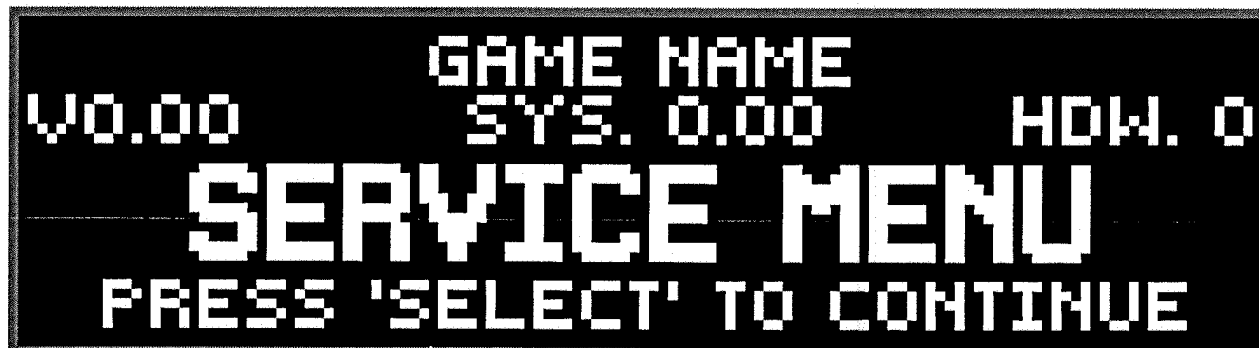


Feature Adjustments are subject to change (with or without notice). View **Feature Adjustments on the Dot Display only**. Use the **Installs Menu** (via the **UTILITIES MENU**) to automatically change a select group of Feature Adjustments (see the *Utilities Section*) or adjust them one-by-one.

Service Menu Introduction

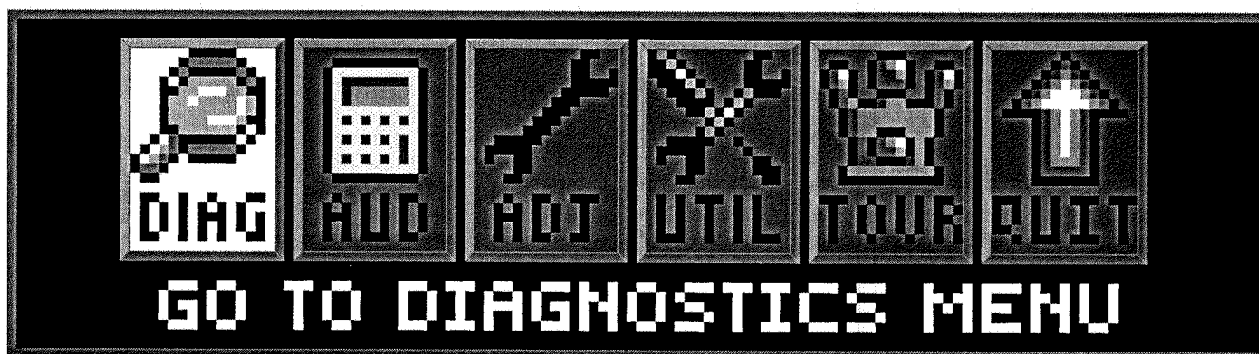
Important: The **Switch Bracket** holds the **Playfield Power Interlock**. It is located just inside the **Coin Door** frame (see pictorial of the **Coin Door** on the previous page). The **Button Switch** for the **Playfield Power Interlock Switch** must be pulled out for electro-mechanical device testing or diagnostic purposes (this is required). If this button is pushed in, the **Playfield Power** is disabled while the **Coin Door** is **OPEN**.

To get into the **SERVICE MENU MODE** review "Function 3: SERVICE MENU" on the next page. After Power-Up, push down the **Black [SELECT] Button** to begin. Looking at the display you will momentarily see "SERVICE MENU" followed by the **MAIN MENU**:



Use the **Red [</-] / [+/>] Buttons** to move the selected **Icon** left or right, and the **Black [SELECT] Button** to activate the selected **Icon**.

The **MAIN MENU** now appears with the "DIAG" **Icon** (**GO TO DIAGNOSTICS MENU**) highlighted:



Service Menu Intro.

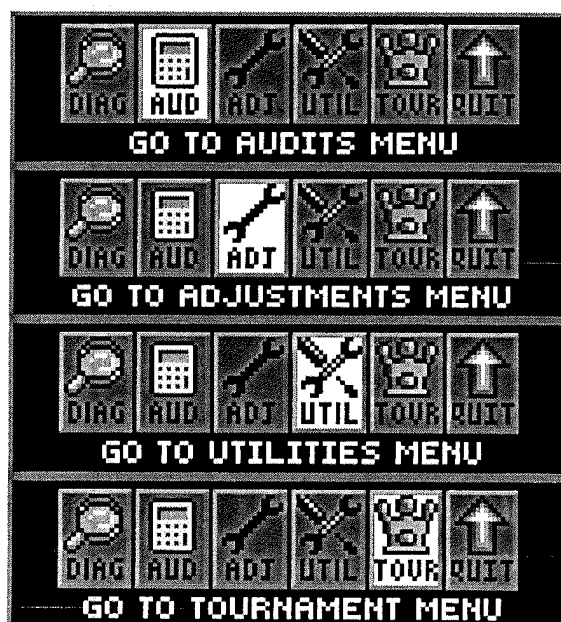
As the operator views the Menu Screen(s), the **MORE MORE** symbols indicates that there are more **Icons** to select in each direction. The **Icon** selected will blink. Pushing the **Black [SELECT] Button** will select the **Icon** and the Menu Screen will change to the menu selected. Select the **Green [BACK] Button** to move backwards through the menu levels. Press the **Green [BACK] Button** repeatedly or select the "QUIT" **Icon** to completely exit the **SERVICE MENU Mode**.

View the **SERVICE MENU Icon Tree** on the next pages for a complete overview of all menus used in this system. The "HELP" **Icon** provides an explanation of **ICON** usage or any other information in the Menu where the "HELP" **Icon** was selected (when available).

DIAG: GO TO DIAGNOSTICS MENU
AUD: GO TO AUDITS MENU
ADJ: GO TO ADJUSTMENTS MENU
UTIL: GO TO UTILITIES MENU
 (INSTALLS, CUSTOM MSG., CUSTOM PRICING, SET TIME, RESET & USB)
TOUR: GO TO TOURNAMENT MENU (START TOURNAMENT, VIEW TOURNAMENT DATA, SIGN MESSAGES)

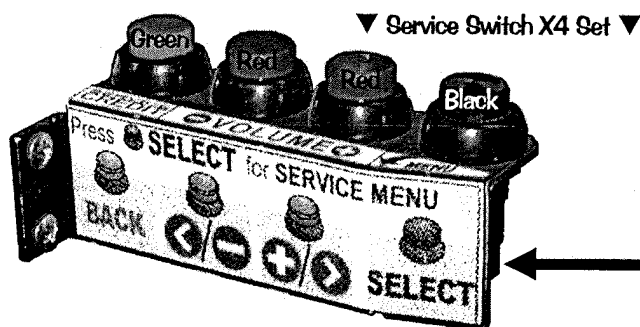
>> TO UPDATE THE GAME CODE, REVIEW THE STEPS ON THE INSIDE FRONT COVER OF THIS MANUAL.

Use both the manual and the display to help customize, troubleshoot and/or diagnose faults, if any.

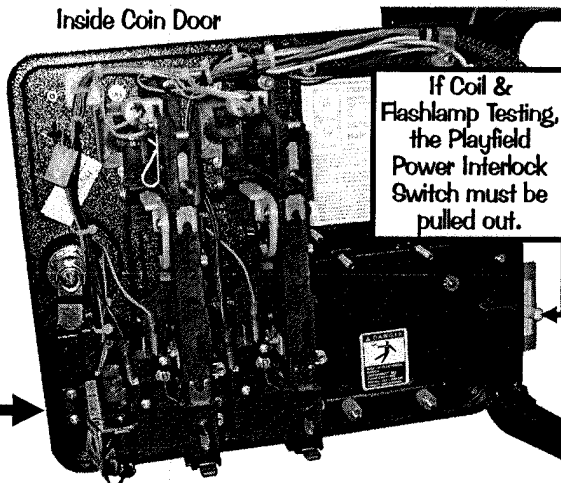


Service Switch X4 Set Access & Use

The 4-Button Service Switch Set provides access for **three (3) functions** available for your use: 1: **SERVICE CREDIT**, 2: **VOLUME [-] / [+]** and 3: **SERVICE MENU**.



Inside Coin Door



To access any of these **three (3) functions** you must first open the **Coin Door** (see pictorial above) with the Game in the **Attract Mode** (not already in any Function or Menu stated below) and then follow below.

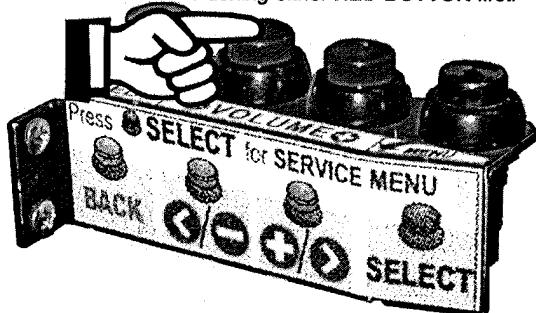
Pushing the GREEN BUTTON first.

◀ Function 1: SERVICE CREDITS MENU

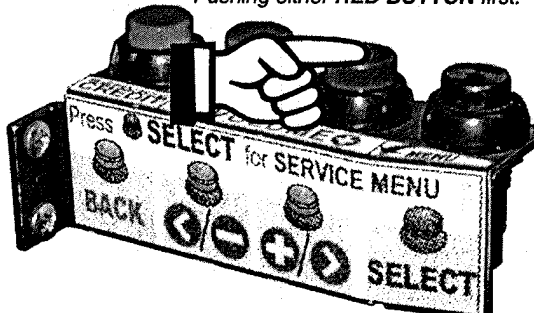
Pushing the Green [**SERVICE CREDIT**] Button first, adds a **Service Credit** per push (will not affect your audits as "paid" credits). This is useful for the technician to test games in regular play without affecting the game audits. Each depression adds 1 credit; up to 50 credits can be applied. **Standard Adjustment 23, Credit Limit**, determines this, however, it can be changed from 04-50; for details see the **Adjustments Section**.

Note: Once your credits are added, this menu will **automatically exit** a few seconds after the last button depression or when the Green [**BACK**] or Black [**SELECT**] Button is pushed. This function is disabled if **Standard Adjustment 38, Free Play**, is set to **YES**. The Service Credits are limited to the Credit Limit in addition to any paid credits present in the game (e.g. If the Credit Limit is 30, with 8 paid credits present, only 22 Credits can be applied.).

Pushing either RED BUTTON first.



Pushing either RED BUTTON first.

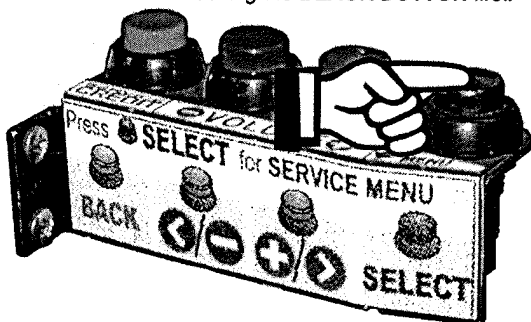


▲ Function 2: VOLUME MENU ▲

Pushing either of the Red [**VOLUME**] Buttons first, enters the **VOLUME MENU**. While in this Mode, to **DECREASE** the volume, hold down or depress the 1st Red [**< / -**] Button until desired the volume is achieved; to **INCREASE** the volume, hold down or depress the 2nd Red [**+ / >**] Button until the desired volume is achieved.

Note: The volume can be set between 0-63; Once your adjustments are made, this menu will **automatically exit** a few seconds after the last button depression or when the Green [**BACK**] or Black [**SELECT**] Button is pushed.

Pushing the BLACK BUTTON first.



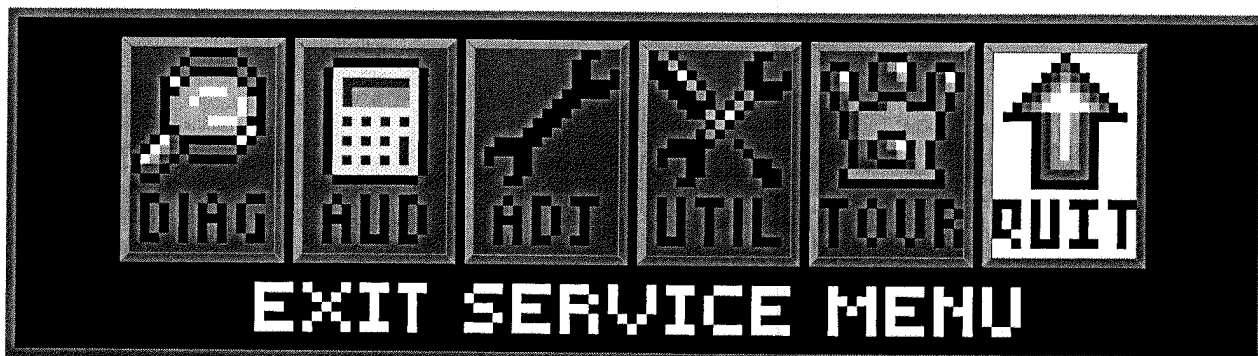
◀ Function 3: SERVICE MENU

Pushing the Black [**SELECT**] Button first, enters the **SERVICE MENU**. Once in, navigate through all menus by depressing the **Service Menu Buttons**. Use the Red [**< / -**] or [**+ / >**] Buttons to move **LEFT / RIGHT, NEXT/PREVIOUS** (audits/adjustments) or to **INCREASE / DECREASE** an adjustment (setting). Use the Black [**SELECT**] Button to select a highlighted **Icon**, move to the next line of text or to answer "OK" where applicable. Use the Green [**BACK**] Button to exit or escape back.



Exit Service Menu

In the **MAIN MENU** and in all **SUB-MENUS** (where the "QUIT" Icon is present), if the "QUIT" Icon is selected and activated, or the **Green [BACK] Button** is selected repeatedly (depending on which sub-menu you're in...), the **SERVICE MENU Session** will be exited and returned to the **Attract Mode**.



Turning the game on/off will start the *Power-Up Routine*. Upon **Power-Up**, the **DISPLAY** will indicate the **COUNTRY**, **FILE VERSION** and **LANGUAGE(S)** installed. **LANGUAGE/COUNTRY**: change via Dip Switch.



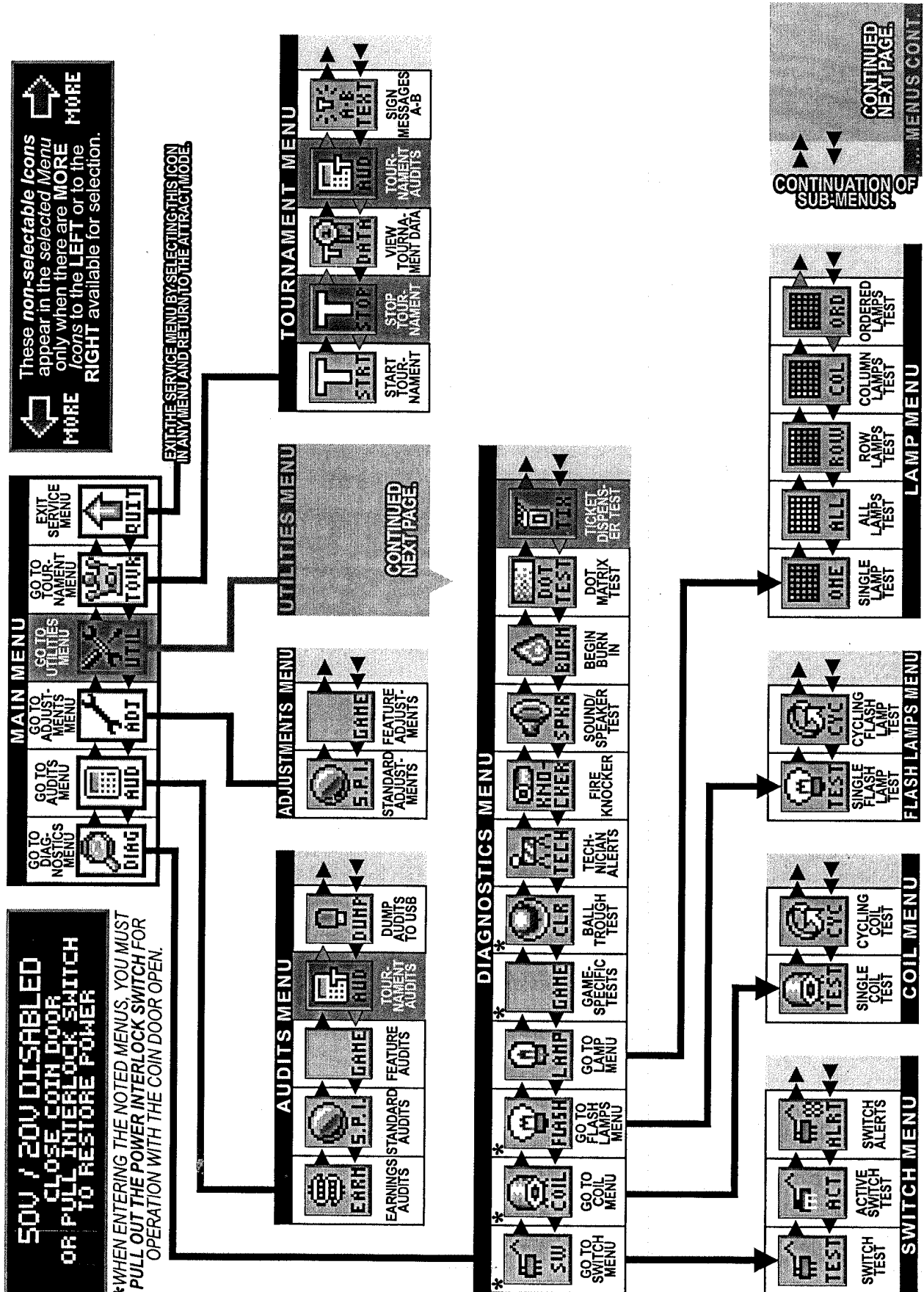
The below **Problem / Solution Table** was designed to answer some common problems frequently asked.

Problem / Solution Table

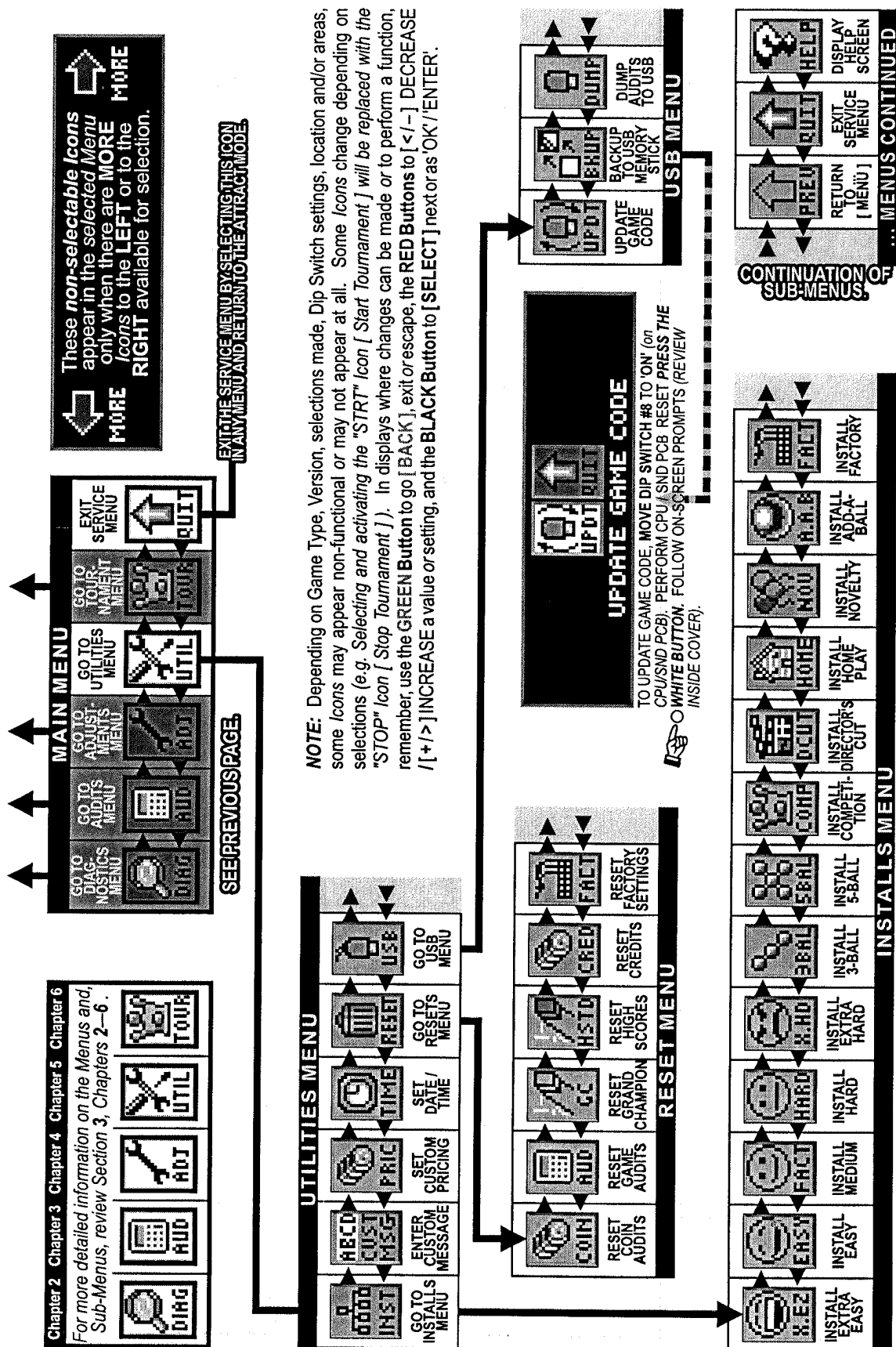
PROBLEM	SOLUTION
Will not enter the SERVICE MENU after depressing the Black [SELECT] Button .	- Check the Service Switches [GREEN, RED (x2) & BLACK Buttons] for loose connections or bad ground. - Check the associated wiring harness to/from the CPU/Sound Board, Connector J13. - Check CPU/Sound Board for possible failure.
All Service Buttons [•••• Buttons] appear nonfunctional.	Check the Service Switches wiring harness for poor or no connection and/or broken wires.
The Green Button in the Attract Mode will not enter the SERVICE CREDITS MENU to add Service Credits.	- Check to make sure the Game is not in "Free Play." If the game is set to Free Play, adding Service Credits is not required. - Check the Service Switches wiring harness for poor or no connection and/or broken wires.
The Display "blanks out."	- Check the Dot Matrix Display for loose wiring harness for poor or no connection and/or broken wires. - Check F1 (3/4A Fuse) on the Display Power Supply Board. Refer to the Yellow Pages (SCHEMATICS & TROUBLESHOOTING).
Icons "scroll" along continuously in the MAIN MENU .	Check for a stuck switch on either of the Red Buttons.
The Start and Flipper Buttons do not select or activate Icons in the SWITCH TEST MENU .	This is normal. These switches are deactivated, as they are a part of the Switch Test. Refer to the Diagnostics Section (GO TO DIAGNOSTICS MENU, Switch Test).
Can't move selection of Icon with the Left and/or Right Flipper Buttons .	- Check the Flipper Buttons for loose connections or bad Ground and refer to Section 5, Chapter 2, Playfield Wiring, #-Flipper Circuit Wiring Diagram. - This is normal <i>only</i> in Diagnostic's Switch & Active Switch Tests (see previous Problem).
Some Icons appear non-functional in the MENU or missing.	Some functionality of the Service Menu may not have been completed during development. If exists, it should only be a non-critical function, such as the "HELP" Icon, which will explain the usage of icons. When completed, a software update will correct the problem. Software updates are announced via Service Bulletins (if critical) and on our website http://www.sternpinball.com/GAME-code.shtml; view the Game Code Library Message Board Marquee or click Previous Messages for past announcements.
In COIL TEST MENU , the coils and flashlamps <i>do not</i> fire after pressing the Black [SELECT] Button .	Ensure the POWER INTERLOCK SWITCH is pulled out (see the start of this Chapter).
In the SERVICE MENU , the volume cannot be adjusted with either of the Red Buttons .	The Volume adjustment can only be made when in the Attract Mode (see the start of this Chapter).
In the SERVICE MENU , the display seems to lock up, or the Help Display appears to be non-functional.	If you cannot clear the situation by exiting back one Menu, exit completely out of the SERVICE MENU, and re-enter. If the problem persists, call Technical Support for additional help.

IF YOU NOTE ANY OTHER PROBLEMS or HAVE ANY SYMPTOMS NOT DESCRIBED ABOVE, PLEASE CALL TECHNICAL SUPPORT 800-542-5377 (708-345-7700 OPTION #1), SO WE MAY ASSIST YOU.

Pinball Service Menu Icon Tree



Pinball Service Menu Icon Tree Continued



Note: Press [SELECT] to Install; Press [BACK] to cancel. After selection of any of the Install Icons, the request is installed and returns to the Install Menu. The last icon activated before exiting this menu will supersede any previous icon selected in the group.



To initiate, from the **MAIN MENU**, select the "DIAG" *Icon*. The **DIAGNOSTICS MENU** provides tests for switches, coils, flash lamps, lamps, sounds and dots in the Dot Matrix Display. Each feature may be tested manually or automatically after entering the **SERVICE MENU** (see *Service Menu Introduction Section*).

The [**CYCLING COIL TEST**] / [**FLASH LAMP TEST**] may be used for a quick verification of automatic test functions. The [**SWITCH TEST**] / [**SINGLE COIL TEST**] / [**SINGLE LAMP TEST**] / [**ALL LAMPS TEST**] / [**ROW LAMPS TEST**] / [**COLUMN LAMPS TEST**] / [**FLASH LAMP TEST**] may be used for troubleshooting.

All **DIAGNOSTICS MENU** *Icons* and there usages are explained throughout this chapter in the same order as seen in the Dot Matrix Display. **NOTE:** Depending on Game Type, Version, selections made, Dip Switch settings, location and/or areas, some *Icons* may appear non-functional or may not appear at all. Some *Icons* change depending on selections (e.g. Selecting and activating the "STRT" *Icon* [Start Tournament] will be replaced with the "STOP" *Icon* [Stop Tournament]). *Icons* and/or *functions*, *order* and *operation* are **subject to change**.

In displays where changes can be made or to perform a function, use the **GREEN Button** to go [**BACK**], exit or escape, the **RED Buttons** to [< / -] **MOVE BACK / LEFT / DECREASE** / [+ / >] **MOVE FORWARD / RIGHT / INCREASE** a value or setting, and the **BLACK Button** to [**SELECT**] next or as "OK / ENTER / ENERGIZE."

Important: Upon **Power-Up** (Game CPU Reset) or opening the **Coin Door** watch the **Display** for any **Alerts**.*

50V / 20V DISABLED
CLOSE COIN DOOR
OR PULL INTERLOCK SWITCH
TO RESTORE POWER

This **audible / visual alert display** is shown when the 50V / 20V Power is disabled (by opening the Coin Door). **PULL OUT THE INTERLOCK SWITCH ONLY WHILE IN THE SERVICE MENU FOR COIL OR SWITCH TESTING & BURN-IN WHEN THE COIN DOOR IS REQUIRED TO STAY OPEN FOR SERVICE BUTTON USE!** Pulling out the Power Interlock Switch or

pressing the 'escape' Green [**BACK**] Button will remove the alert display. Initial display presentation is accompanied by 3 audible tones (the bright display warning will go dim after approximately 30 seconds).

OPERATOR ALERT!
AUTO PLUNGER
DEVICE MALFUNCTION

This **alert display** is shown momentarily during **Game Mode** or **Power-Up** to alert the operator of a device malfunction (device or mechanism doesn't energize or is energized repeatedly).

OPERATOR ALERT! works by monitoring any switch activated device that has the potential to trap a ball when disabled (e.g. in the Shooter Lane, Scoop or Eject Holes, etc.). This alert can

also appear if a switch associated with a device (e.g. Ball Trough, Auto Plunger, etc.) is stuck closed (caused by a switch jam or stuck ball); the game will activate the device a predetermined number of times and if the problem is still detected, this device or switch will be noted in **Switch Alerts** (next page) and/or **Technician Alerts**.

VO.00 GAME NAME
SYS. 0.00 | HDW. 0
SERVICE MENU *
USE -/+ TO VIEW TECH. ALERTS

Upon entering the **SERVICE MENU**, if an asterisk " * " is displayed after the words "SERVICE MENU," the game has detected possible faulty devices, switches and/or missing pinballs. Press the either of the **Red Buttons** (short-cut to the **TECHNICIAN ALERTS MENU**) or continue into the **SERVICE MENU** (press the **Black Button** again), select the "DIAG" *Icon*

and "TECH" *Icon* for the **Technician Alerts** information.



CAUTION! Remove all pinballs from the Ball Trough prior to lifting the playfield to it's full upright position for servicing. **PULL OUT** the **Power Interlock Switch** for operation. To eject pinballs, select the "DIAG" *Icon* from the **MAIN MENU** to enter the **DIAGNOSTICS MENU**. Select the "CLR" *Icon* to enter the **BALL TROUGH TEST MENU**. Press the **Black [SELECT] Button**. To return to the **DIAGNOSTICS MENU**, press the **Green [BACK] Button**. This feature also useful to retrieve a pinball for game testing in **Switch** or **Coil Tests**.



Go To Switch Menu

To initiate, from the **DIAGNOSTICS MENU**, select the "SW" *Icon*. Switches are configured in an 4 X 16 Matrix of Rows [Switch Drives] and Columns [Sw. Returns] with up to **64** possible switches. Dedicated Switches are configured in a 2 X 16 Matrix of Rows [Dedicated Sw. Drives / Ground] and Column [Ded. Switch Returns] with up to **32** possible dedicated switches (*includes the 8 dip switch positions*). The **SWITCH TEST MENU** consists of three (3) parts: **Switch & Active Switch Tests** and **Switch Alerts** to test *all* switches.

Reminder: The **Flipper & Start Buttons** (part of Switch Tests) are temporarily disabled as **Service Menu Navigation Buttons** during these test(s) so they can be tested and shown on-screen. Pressing the **Green [BACK] Button** (Dedicated Switch D-21), Light Green-Black / Black (GND), will exit **Switch Test** or **Active Switch Test**.



Switch Test

To initiate, from the **SWITCH MENU**, select the "TEST" *Icon*. Ensure the **Power Interlock Switch** is pulled out if testing with the Coin Door open and the activation of coils is required. Upon entering **Switch Test**, you will notice that some switches are already indicated as closed. In the examples, the 4-Ball Trough Switches #18, #19, #20 & #21 are shown closed (*pinballs at rest in the ball trough*), along with the Flipper E.O.S. Dedicated Switches D-10 & D-12 (End-of-Stroke Switches are 'normally closed'). If the game has more flippers with E.O.S. Dedicated Switches, CPU Dip Switch Setting *other* than 1-8 OFF or switches stuck closed, more dots will be indicated (*enter Active Switch Test to reveal the names*).

In **Switch Test**, close each switch and observe the display (*switch closure is accompanied by a short audible tone*). In the example, the **Black [SELECT] Button** Dedicated Switch D-24 is pressed. The Dot Matrix Display will light up (*highlight*) the corresponding dot in the on-screen matrix, display the switch name, switch number and the Switch Drive / Return wire colors. When not closing a switch, the display indicates **NONE** and the last switch number closure. For the Switch Matrix Grid and Dedicated Switch Grid, see **Find-It-In-Front: Dr. Pinball, DR. 4** or escape out of this test and enter **Active Switch Test** (*described below*) to view the names of the switches closed. **Note:** Pressing the **Green [BACK] Button** (Ded. Switch D-21), Lt. Green-Black / Black (GND), will exit the **Switch Test**.



CAUTION! COIL MECHANISMS WHEN ACTIVATED HAVE FAST MOVING PARTS! While performing **Switch Test** with the Coin Door closed or open (*with the Power Interlock Switch is pulled out*), **DO NOT USE YOUR FINGER** to test switches which are associated with a coil mechanism such as a Vertical Up-Kicker (*hole with a switch*), Slingshots, Bumpers, etc..



Active Switch Test

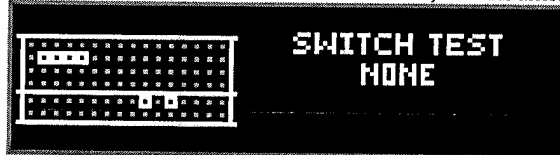
To initiate, from the **SWITCH MENU**, select the "ACT" *Icon*. In **Active Switch Test**, if any switches are stuck closed (*or normally closed from the presence of pinball(s) as in the Ball Trough*), the display will flash the corresponding dot(s) in the on-screen matrix, display the name and the Switch Drive / Return wire colors. If more than one switch is closed, the switch information will change with each switch. This cycle continues until all switches are cleared or until **Active Switch Test** is exited. In the example, the **Black [SELECT] Button** Dedicated Switch D-24 is pressed and held down. The display will cycle and flash each dot, naming each switch which is closed. To determine the *switch number*, compare the highlighted dot to the same position in the Switch Matrix Grid at the beginning of this manual.



Switch Alerts

To initiate, from the **SWITCH MENU**, select the "ALRT" *Icon*. In **Switch Alerts Menu**, possible inoperable switches are marked with an "X" (**OUT OF SERVICE**). Mark switches **IN** or **OUT OF SERVICE** by pressing the **Black Button** while the intended switch is highlighted and change with either of the **Red Buttons**. Switches which are determined as "OUT OF SERVICE" by the game or manually, will be automatically marked as "IN SERVICE" as soon as the game determines a valid switch closure (*after adjusting, fixing or replacing the switch, then testing/actuating the switch*). **Note:** A **Factory Reset** will also put the switch back "IN SERVICE" in which the game will need to redetermine if the switch should be marked **OUT OF SERVICE**.

Upon entering Switch Test, you will notice that some switches are already indicated as 'closed'.



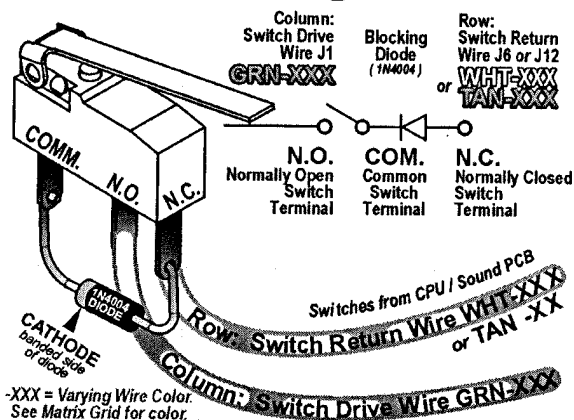
D-24 position is highlighted and accompanied by a short audible tone when pressed.



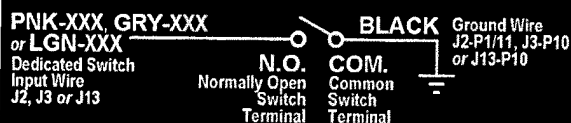
After pressing the switch (to make it close), the display will indicate the last switch number.



Typical Switch Wiring & Schematic



Dedicated Switch Schematic



D-24 is held down. The display will cycle and flash each dot, naming each switch ... closed.





Go To Coil Menu

To initiate, from the **DIAGNOSTICS MENU**, select the "COIL" *Icon*. Coils #01 – #16 are typically High Current Coils (*although Low Current Coils may be used in these positions & will be noted*). Coils #17 – #32 are typically Low Current Coils. Flash Lamps are typically used in positions #25 – #32 (*although Flash Lamps may be used in any position and will be noted*). Auxiliary Coils may be used in positions #33 – #35.

Remember, use the **GREEN Button** to go [**BACK**], exit or escape, the **RED Buttons** to [**< / -**] GO BACK [**+ / >**] GO FORWARD, and the **BLACK Button** to [**SELECT**] ENERGIZE the coil (*solenoid*) or flash lamp.



Single Coil Test

To initiate, from the **COIL MENU**, select the "TEST" *Icon*. Ensure the **Power Interlock Switch** is pulled out if testing with the Coin Door open. Upon entering **Single Coil Test**, you will notice the #1 coil is shown. The Dot Matrix Display will indicate the *coil or flash lamp name, coil (solenoid) or flash lamp number and the Coil or Flash Lamp Power Line / Drive Transistor Control Line wire colors*. To determine the "Pin-Outs" from the I/O Power Driver Board, the Coil Voltage Gauge-Turns (e.g. 23-800) or lamp type (e.g. #89 or #906 Bulb), view the Coils Detailed Chart Table at the beginning of this manual or for more on troubleshooting and diagnosing, see the Yellow Pages (*Schematics & Wiring*).



Cycling Coil Test

To initiate, from the **COIL MENU**, select the "CYC" *Icon*. Ensure the **Power Interlock Switch** is pulled out if testing with the Coin Door open. The test pulses each regular coil or flash lamp sequentially (*cycling*) on the Playfield and in the Backbox (*if coils or flash lamps are used*). The Dot Matrix Display indicates the same information you will find in **Single Coil Test**.



Go To Flash Lamps Menu

To initiate, from the **DIAGNOSTICS MENU**, select the "FLASH" *Icon*. The two tests allows the technician to easily spot any burned-out flash lamps and replace them. Unlike **Single Coil Test**, which tests *all* coil (*solenoids*), including flash lamps, **Single and Cycling Flash Lamp Tests**, test only the flash lamps used in the game. Flash Lamps are typically used in positions #25 – #32 (*although Flash Lamps may be used in any position and will be noted*).

Remember, use the **GREEN Button** to go [**BACK**], exit or escape, the **RED Buttons** to [**< / -**] GO BACK [**+ / >**] GO FORWARD, and the **BLACK Button** to [**SELECT**] ENERGIZE the flash lamp.



Single Flash Lamp Test

To initiate, from the **FLASH LAMPS MENU**, select the "TEST" *Icon*. Ensure the **Power Interlock Switch** is pulled out if testing with the Coin Door open. Upon entering **Single Flash Lamp Test**, you will notice the first Flash Lamp is shown. The Dot Matrix Display will indicate the *flash lamp name, flash lamp number and the Flash Lamp Power Line / Drive Transistor Control Line wire colors*. To determine the "Pin-Outs" from the I/O Power Driver Board or lamp type (e.g. #89 or #906 Bulb), view the Coils Detailed Chart Table at the beginning of this manual or for more on troubleshooting and diagnosing, see the Yellow Pages (*Schematics & Wiring*).

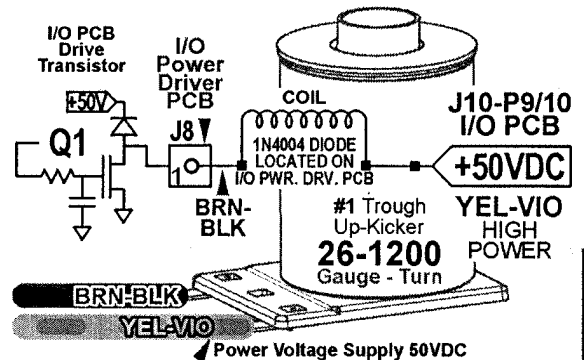


Cycling Flash Lamp Test

To initiate, from the **FLASH LAMPS MENU**, select the "CYC" *Icon*. Ensure the **Power Interlock Switch** is pulled out if testing with the Coin Door open. The test pulses each flash lamp sequentially (*cycling*) on the Playfield and in the Backbox (*if flash lamps are used*). The Dot Matrix Display indicates the same information you will find in **Single Flash Lamp Test**.

COIL TEST
TROUGH UP-KICKER
#1
YEL-VIO BRN-BLK

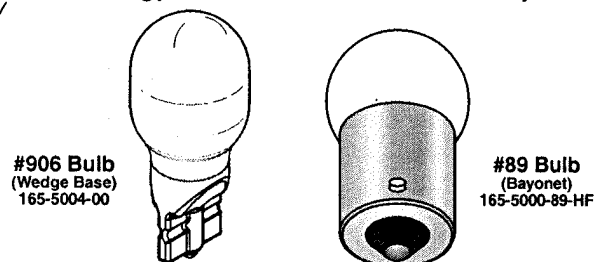
Typical Coil Wiring & Schematic



Diagnostics

FLASH LAMP TEST
FLASH: NAME OF FLASHER
#25
ORG BLK-BRN

Bulb Types used for Flash Lamps



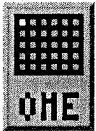


Go To Lamp Menu

To initiate, from the **DIAGNOSTICS MENU**, select the "LAMP" *Icon*. Controlled lamps are configured in and 8 X 10 Matrix of Rows [Lamp Returns / Ground] and Columns [Lamp Drives / 18VDC] with up to 80 lamps possible. The **LAMP TEST MENU** consists of five (5) parts: **Single Lamp Test**, **Test All Lamps**, **Row Lamps Test**, **Column Lamps Test** and **Ordered Lamps Test*** to test *all* lamps.

Remember, use the **GREEN Button** to go [**BACK**], exit or escape, the **RED Buttons** to [**< / -**] GO BACK / LEFT / [**+ / >**] GO FORWARD / RIGHT, and the **BLACK Button** to [**SELECT**] next or as "OK / ENTER."

Upon entering **Single Lamp Test**, ... the #1 lamp is shown. Display will light up ... the dot ... ▶

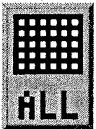


Single Lamp Test

To initiate, from the **LAMP MENU**, select the "ONE" *Icon*. As each lamp is selected, the lamp will light at it's location on the playfield as well as the Dot Matrix

Display. Upon entering **Single Lamp Test**, you will notice the #1 lamp is shown. The Dot Matrix Display will light up (*highlight*) the corresponding *dot* in the on-screen matrix, display the *lamp name*, *lamp number* and the *Lamp Return / Drive wire colors*. For the Lamp Matrix Grid, see the beginning section of this Service Game Manual.

Upon entering **All Lamps Test**, ... the Dot Matrix Display is flashing "ALL LAMPS ON" ... ▶



All Lamps Test

To initiate, from the **LAMP MENU**, select the "ALL" *Icon*. Upon entering **All Lamps Test**, you will notice the Dot Matrix Display is flashing **ALL LAMPS ON** and the

lamps on the playfield will be lit, alternating between the rows in the Lamp Matrix Grid. The Dot Matrix Display will light up (*highlight*) all of the *dots* in the on-screen matrix.

Upon entering **Row Lamps Test**, you will notice the #1 lamp row is shown. ▶

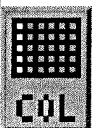


Row Lamps Test

To initiate, from the **LAMP MENU**, select the "ROW" *Icon*. As each lamp row is selected, the lamps in the row will light on the playfield as well as the Dot Matrix

Display. Upon entering **Row Lamps Test**, you will notice the #1 lamp row is shown. The Dot Matrix Display will light up (*highlight*) the corresponding row of *dots* in the on-screen matrix, display the *lamp row number*, the *Lamp Return wire colors*, the *I/O PCB Connector* and *transistor number*.

Upon entering **Column Lamps Test**, you will notice the #1 lamp column is shown. ▶



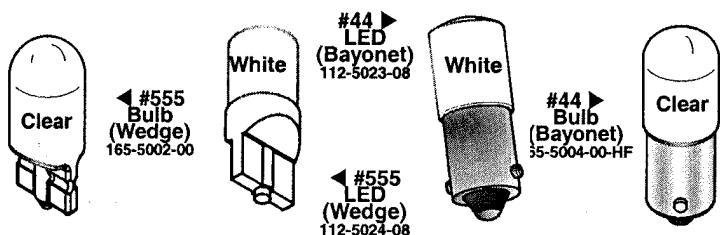
Column Lamps Test

To initiate, from the **LAMP MENU**, select the "COL" *Icon*. As each lamp column is selected, the lamps in the column will light on the playfield as well as the Dot

Matrix Display. Upon entering **Column Lamps Test**, you will notice the #1 lamp column is shown. The Dot Matrix Display will light up (*highlight*) the corresponding row of *dots* in the on-screen matrix, display the *lamp column number*, the *Lamp Drive (18VDC) wire colors*, the *I/O PCB Connector* and *IC number*.



Bulb Types used for Control Lamps



* If not required in this game, *Icon* will not be shown.

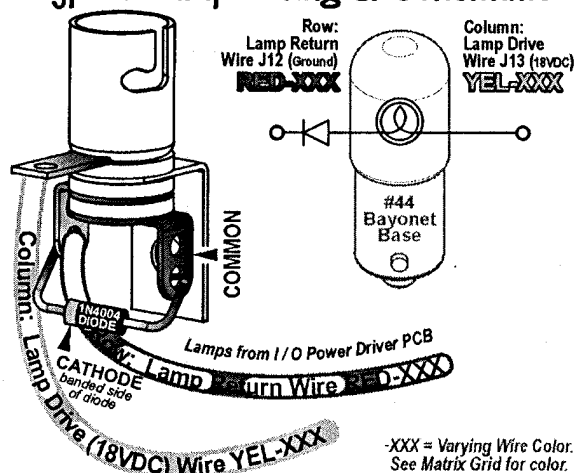


Ordered Lamps Test

To initiate, from the **LAMP MENU**, select the "ORD" *Icon*.

If required, this *Icon* will appear in the **LAMP MENU**. Identical to **Single Lamp Test**, however, the lamps lit are not in the Lamp Matrix numeric order, but ordered or arranged in separate localized grouping(s) for easier lamp checking.

Typical Lamp Wiring & Schematic



-XXX = Varying Wire Color.
See Matrix Grid for color.



Game-Specific Tests

To initiate, from the **DIAGNOSTICS MENU**, select the "GAME" *Icon*. Ensure the **Power Interlock Switch** is pulled out when testing with the Coin Door open. This Menu is provided to allow the technician a simple method of testing game specific coils and/or switches, if required. If used, select the *Icon* (and Sub-Menu *Icons*, if any) and follow on-screen prompts.



Ball Trough Test

To initiate, from the **DIAGNOSTICS MENU**, select the "CLR" *Icon*. Ensure the **Power Interlock Switch** is pulled out if testing with the Coin Door open. This Menu 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. Upon entering **Ball Trough Test**, you will notice that four switches are already indicated as closed. In the example, the 4-Ball Trough Switches #18, #19, #20 & #21 are shown closed (pinballs at rest in the ball trough). To return to the **DIAGNOSTICS MENU**, press the **Green [BACK] Button**.



Press the **Black [SELECT] Button** to eject the ball in the first position Switch #21 (VUK OPTO Trough #1 (R)). Simultaneously, the Dot Matrix Display and the playfield will eject the ball to the Trough Up-Kicker, eject from the Trough Up-Kicker into the Shooter Lane, momentarily closing Switch #23 (Shooter Lane), and is ejected onto the playfield where the technician can easily

retrieve the pinball or allow the ball(s) to re-enter the trough to continue **Ball Trough Test**. The Dot Matrix Display indicates Switch #18 (4-Ball Trough #4 (L)) as open as the remaining three (3) pinballs shift over one (1) position to the right. If the technician allows the ejected pinball to reenter the ball trough, the Dot Matrix Display will indicate Switch #18 as closed. **REMINDER:** Switch #22 is the stacking OPTO switch; If more than five (5) pinballs are used, the additional switches will be noted. Typically, four (4) pinballs are used and required for proper operation; if this amounts differs, it will be noted on the front page of this Service Game Manual.



CAUTION! Continuous use off the above test may overheat the Trough Up-Kicker Coil.



Technician Alerts

To initiate, from the **DIAGNOSTICS MENU**, select the "TECH" *Icon*. This Menu is provided to show any switch or solenoid problems and/or missing pinballs. If upon entering the **SERVICE MENU** the display indicated an asterisk (*) and "USE -/+ TO VIEW TECH. ALERTS", alerts are present.



present. Refer to the start of this chapter regarding "Upon entering the **SERVICE MENU ***" indication and to **SWITCH ALERTS**. To return to the **DIAGNOSTICS MENU**, press the **Green [BACK] Button**. **Note:** While in this menu, an option may be present to jump (short-cut) to the appropriate Testing Menu (e.g. Coil Test, Switch Test, Game Specific Test or Ticket Dispenser Test, if installed).

NOTE ON SWITCH DETECTION : During game play, activation of switches are continuously monitored. For a switch to be determined as inoperable or **OUT OF SERVICE**, up to twenty games or so must be played for a switch to be automatically marked as **OUT OF SERVICE**. In programming, if a switch is determined to be faulty, game play is compensated. Switches noted as **OUT OF SERVICE** are determined to be stuck closed or open depending on switch usage. Free up the switch actuator, adjust or replace, if necessary. Performing a valid switch closure will put the switch back "IN SERVICE."

Determination of switch usage can be checked in **Audits** (review the *Audits Section*). Find the associated Audit with the switch in question and check usage; compare the numbers to commonly used switches. After any switch is checked and repaired or replaced, it's suggested to test the switch in the **Switch Test** or **Single Coil Test** (reviewed earlier in this section) where the associated coil to the switch can be tested as well. After correcting the problem, the switch will marked "IN SERVICE" and the switch is again monitored as specified above. Only you can determine if a switch marked **OUT OF SERVICE** is actually inoperable, or if it is just not getting actuated during game play.

NOTE ON PINBALL DETECTION :

While in **TECHNICIAN ALERTS MENU**, if the following is displayed, the game has detected one (1) or more pinball(s) missing and has compensated for the lost pinball(s) to provide normal game play.

Technician Alerts continued on the next page.

TECHNICIAN ALERT - (0/0)

NO TECHNICIAN ALERTS

PRESS 'BACK' TO EXIT



Technician Alerts continued from previous page.

During game play, a pinball can get trapped or stuck. If after approximately 15 seconds of inactivity or "no scoring," **Ball Search** is started. **Note:** If the pinball is in the Plunger Lane or "held" on the flipper, no **Ball Search** will be performed. The game will perform one **Ball Search** in an attempt to "find" or free-up the pinball.

If the game does not see a switch closure (indicating the pinball has not been found), the Dot Matrix Display may indicate [**LOCATING PINBALLS PLEASE WAIT ...**], during which **Ball Search** will continue until the timer runs out (this feature will not happen if the game is in Competition Mode; **Ball Search** will continue until the pinball is found, unstuck and/or replaced manually). The display will momentarily acknowledge the missing pinball(s). The game will provide another pinball into play and will compensate for the lost pinball. Game play will appear normal.

Note: This detection and compensation will happen with every pinball, if each suffers the same fate of a ball trap. If all balls get trapped, the game cannot be played or started until the situation is rectified.

Important: Determine where the pinball is! **Do not add pinball(s)** until it is determined the pinball(s) are indeed missing and not just stuck. The most common places for a pinball to be stuck is in device holes (ejects and VUKs) or ball troughs. Determine that all devices are functionally properly. Check around plastic pieces and ramps to see if the pinball got jammed or stuck.

When the found pinball or a replacement pinball is added to the Ball Trough, the **Technician Alert** will immediately clear and will then indicate any remaining alerts (if present) or **NO TECHNICIAN ALERTS**.

Enter the **BALL TROUGH TEST** (review the previous page) to cycle the pinballs and to check proper switch and coil operation. If a pinball was added, and the originally stuck pinball has freed itself at a later time, the game will not operate correctly.

NOTE ON DEVICE MALFUNCTION : While in **TECHNICIAN ALERTS MENU**, if the following is displayed, the game has detected a "device malfunction." Check the device indicated (coil and/or switch).

TECHNICIAN ALERT - (2/2)
DEVICE MALFUNCTION
AUTO PLUNGER
USE -/+ TO VIEW OTHER ALERTS



Knocker Test

To initiate, from the **DIAGNOSTICS MENU**, select the "KNO-CKER" Icon. The digitally mastered "Knocker" is sounded. The *knocker sound* is used to alert the player if he/she has received a special, replay or a credit from the Match Award feature. Press the **Black [SELECT] Button** to activate the knocker. To return to the **DIAGNOSTICS MENU**, press the **Green [BACK] Button**.

FACTOID: The knocker got it's name from the 'original knocker' (20th century pinball games), which used a coil and when energized (fired), the plunger would strike a wood panel inside the cabinet.



Sound / Speaker Test

To initiate, from the **DIAGNOSTICS MENU**, select the "SPKR" Icon. This system produces true digital stereo sound from Backbox & Cabinet Speakers or "Mono" on the Cabinet Speaker (when used by itself). This Menu is provided to allow the technician a simple method of testing the speakers if rewired or replaced.

Upon entering **Sound / Speaker Test**, you will notice the Dot Matrix Display indicating the first option of available music and/or sound(s) in this test. Press the **Red [+ / >] Button** to cycle through the available music and/or sounds, and press the **Black [SELECT] Button** to play the option shown in the Dot Matrix Display. Press the **Green [BACK] Button** to exit.

SOUND / SPEAKER TEST
MUSIC: MAIN PLAY
#1
PRESS 'SELECT' TO PLAY

SOUND / SPEAKER TEST
MUSIC: MAIN PLAY
#1
PLAYING SOUND #1

Speaker Phase Testing

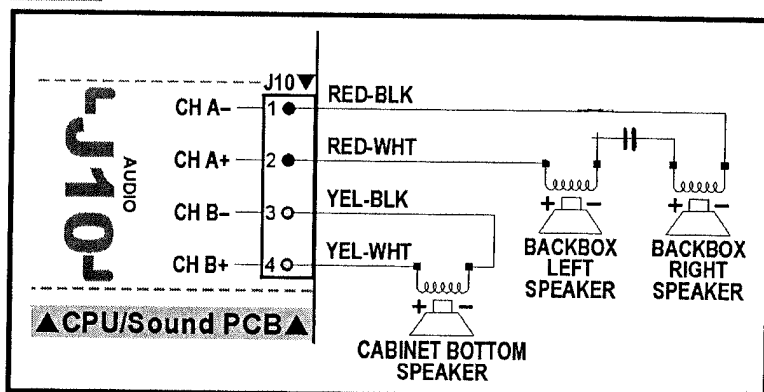
Connections to each of speakers are polarized and each must be connected appropriately for the best quality sound. If one speaker has the positive and negative connections reversed with respect to the other one, bass frequencies will not be produced properly and the overall sound quality will be poor. To test for proper speaker phasing, use the **Sound / Speaker Test** to cycle through the available music and sound.

Speaker Phase Testing cont. next page.



Speaker Phase Testing continued from previous page.

If the sound is not balanced or doesn't sound correct, check the speaker wiring.



1. Check each speaker for polarity markings. If the speakers have polarity markings, verify that the Backbox Speaker's **RED-BLK** Wires and the Cabinet Speaker **YEL-BLK** Wire(s) are connected to the negative (-) terminal.

2. Disconnect the speaker output **Connector J10 (AUDIO)** from the CPU / Sound PCB (in the Backbox) and connect a 1.5-volt battery across each speaker pair one at a time while observing the speakers.

3. Make sure the positive (+) battery terminal is connected to the positive lead [J10, Pin-2, CH A+] (**RED-WHT**) or [J10, Pin-4, CH B+]

(**YEL-WHT**) each time. As the connection is made, check speaker cone movement; proper connections are indicated by outward movement.



Begin Burn-In

To initiate, from the **DIAGNOSTICS MENU**, select the "BURN" Icon. After selecting this Icon, press the **Black [SELECT] Button** to begin (initiate) the **Burn-In Test**. Ensure the **Power Interlock Switch** is pulled out if testing with the Coin Door open (required for coil function). Upon entering **Burn-In Test**, the game will exercise all CPU I/O Functions: **Dot Matrix Display Test**, **Coil Cycling Testing**, **All Lamps Test** and **Sound / Speaker Test**. Press the **Green [BACK] Button**, to pause and to view the cumulative Burn-In minutes. Press the **Green [BACK] Button** again to return to the **DIAGNOSTICS MENU**.

Note: To reset Burn-In minutes back to 0:00, see Section 3, Chapter 5, **GO TO RESET MENU** (via the **UTILITIES MENU**), **Reset Factory Settings**. **CAUTION:** Performing a **FACTORY RESET** will reset all other information as well (read the Utilities Section (**GO TO RESET MENU**), for more information).



Dot Matrix Test

To initiate, from the **DIAGNOSTICS MENU**, select the "DOT TEST" Icon. After selecting this Icon the **Dot Matrix Test** immediately begins. The Dot Matrix Display will immediately and continuously illuminate and cycle each of the **5 Tests for 1 pass each**. To return to the **DIAGNOSTICS MENU**, press the **Green [BACK] Button**.

Diagnostics

Test 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.

Test 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.

Test 3

Illuminates **all the dots, except for one column** from left to right.

Test 4

Illuminates **all the dots, except for one row** from top to bottom.

Test 5

Illuminates **all the dots alternating even & odd**, in both the rows and columns.

Test 1

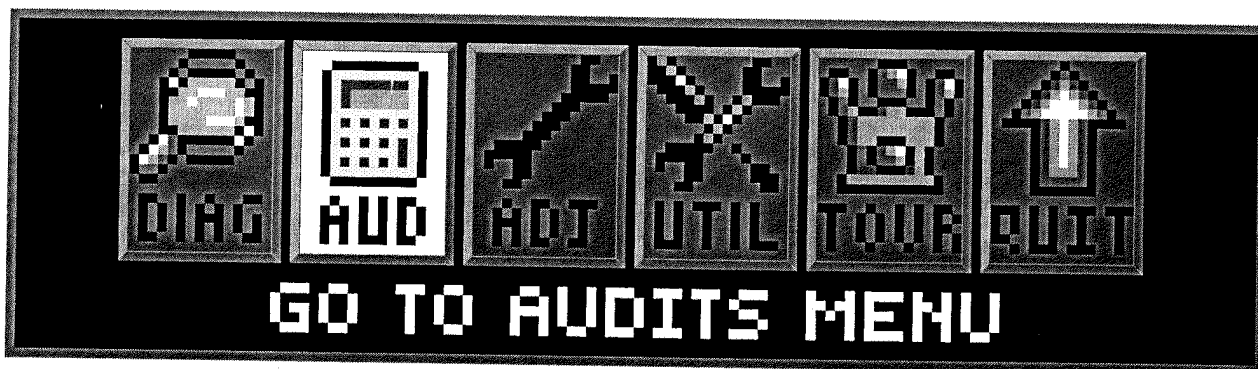
Illuminates **1 vertical column of dots**, turning it off & illuminating the next column, until each column has been individually lit, while the other columns are off.



Ticket Dispenser Test

To initiate, from the **DIAGNOSTICS MENU**, select the "TIX" *Icon*. This Menu (*Icon*) will only appear if Standard Adjustment 56, Ticket Dispenser, is set to **YES** (Default = **NO***). ***Note:** Some games shipped from the factory with a unique Dip Switch Setting will default to **YES**. To view and/or change your setting, see Adjustments Section (**GO TO ADJUSTMENTS MENU**). Please remember, if you install an optional Ticket Dispenser, and your default setting is "NO," you will have to reset it back to "YES" if a **Factory Reset** is performed.

After selecting this *Icon*, the **Ticket Dispenser Test** will start. With the Ticket Dispenser properly installed, manually feed your tickets into the dispenser. The dispenser will activate and pull in the first ticket. Press the **Black [SELECT] Button** (which energizes Coil #35, Aux 3: Switched Ground) to advance a ticket. Feeding your Tickets into the dispenser works because Coil #33, Aux 1: Ticket Advance (Enable) is always 'energized'. With a Ticket Meter installed, as one Ticket Passes through the Ticket Dispenser, one 'click' is fired to the Meter (Coil #34, Aux 2: Ticket Meter) for each ticket passing through. Dedicated Switch **D-19, Ticket Notch**, will also be indicated on-screen (*in combination with a audible sound*) as "closing" as the notch between the tickets passes through. In this test you can clear ticket jams and check and/or clear tickets in Escrow, if necessary. To return to the **DIAGNOSTICS MENU**, press the **Green [BACK] Button**.



To initiate, from the **MAIN MENU**, select the "AUD" *Icon*. The **AUDITS MENU** provides 99* Audits for accounting purposes and for evaluation of *Game Programming*. The Audits are divided into 4 groups: • **Earnings Audits** [#1 – #13], • **Standard Audits** [#1 – #59], • **Feature Audits (Programming Use Only)** [#1 – #+] and • **Tournament Audits** [#1 – #14], "T AUD" *Icon* provided as an alternate access to Tournament Audits (*if data is available). For more information on the **TOURNAMENT MENU**, review the *Tournament Section (GO TO TOURNAMENT MENU)*. Try the "DUMP AUDITS TO USB" feature to create a text file of your audits. Don't forget to set the **DATE & TIME** in the **UTILITIES MENU**. See the *Utilities Section (GO TO UTILITIES MENU)*, for more information.

Audits which are named **Proprietary** are also for **Future Expansion** or **Programming**. Game code may get upgraded during production; compare all Audits in the Dot Matrix Display with the manual and make any corrections, as necessary. Audits are subject to change (*with or without notice*).

All **AUDITS MENU** *Icons* and there usages are explained throughout this chapter in the same order as seen in the Dot Matrix Display. **NOTE:** Depending on Game Type, Version, selections made, Dip Switch settings, location and/or areas, some *Icons* may appear non-functional or may not appear at all. **Icons and/or functions, order and operation are subject to change.**

In displays where changes can be made or to perform a function, use the **GREEN Button** to go [**BACK**], exit or escape, the **RED Buttons** to [< / -] **MOVE BACK / LEFT** / [+ / >] **MOVE FORWARD / RIGHT** to view the next audit in the group, and the **BLACK Button** to [**SELECT**] the sub-menus.



Earnings Audits [#1 – #13]

To initiate, from the **AUDITS MENU**, select the "EARN" *Icon*. The Dot Matrix Display will indicate the *audit number (in this group)*, *audit name* and the *audit total or value*. The current audit will remain on the display until the next audit is viewed or when this sub-menu is exited.

- #1 **TOTAL PAID CREDITS [0]**: Total number of *Paid Credits*.
- #2 **FREE GAME PERCENTAGE [0%]**: Percentage value is 'Total Free Plays' (Standard Audit 15) divided by 'Total Plays' (Standard Audit 16).
- #3 **AVERAGE BALL TIME [0:00]**: In seconds, the average ball time is derived from the total play time divided by Standard Audit 1, Total Balls Played.
- #4 **AVERAGE GAME TIME [0:00]**: The average game time is expressed in minutes and seconds.
- #5 **COINS THROUGH LEFT SLOT [0]**: Total 'Left Coin Slot' Dedicated Switch (D-1) closures.
- #6 **COINS THROUGH RIGHT SLOT [0]**: Total 'Right Coin Slot' Dedicated Switch (D-3) closures.
- #7 **COINS THROUGH CENTER SLOT [0]**: Total 'Center Coin Slot' Dedicated Switch (D-2) closures.
- #8 **COINS THROUGH FOURTH SLOT [0]**: Total '4th Coin Slot' Dedicated Switch (D-4) closures.
- #9 **COINS THROUGH FIFTH SLOT [0]**: Total '5th Coin Slot' Dedicated Switch (D-5) closures.
- #10 **TOTAL COINS [0]**: Total amount of coins registered through all the *Coin Slots*.
- #11 **TOTAL EARNINGS [USD 0.00]**: Total cash value accumulated since the last Factory Reset occurred (*review the Utilities Section (GO TO RESET MENU), Reset Coin Audits*).
- #12 **METER CLICKS [0]**: Total number of money clicks accumulated.
Based on the country's lowest coin denomination used for the game credit.
- #13 **SOFTWARE METER [0]**: Continuing total of Meter Clicks.
This audit cannot be reset; the display shows the constant addition of Meter Clicks.



Feature Audits [#1 - #+]

To initiate, from the **AUDITS MENU**, select the "GAME" *Icon*. The Dot Matrix Display will indicate the *audit number (in this group)*, *audit name* and the *audit total or value*. The current audit will remain on the display until the next audit is viewed or when this sub-menu is exited.

Feature Audits Definition: Programming Use Only. *The proprietary information Total number of times a feature was started, awarded, lit, played and/or completed (awarded); also, the total number of Switch Closures during certain modes or features are tracked (a predetermined single/multiple variations of switch closures are used to determine the lighting and/or completion of the feature stated).* **SEE THE DOT MATRIX DISPLAY FOR CURRENT FEATURE AUDITS.**

Feature Audits are subject to change (with or without notice). View Feature Audits on the Dot Display only. To export all audits to your memory stick (creating a text file), perform the following. Enter the **AUDITS MENU**, then enter the **DUMP AUDITS TO USB**. **Note:** The "DUMP" *Icon* can also be accessed in the **USB MENU** via the **UTILITIES MENU** (see the Utilities Section (GO TO USB MENU) for details).



Tournament Audits [#1 - #14] subject to change

"T AUD" *Icon* provided as an alternate access to Tournament Audits (if data is available). For more information on the **TOURNAMENT MENU**, review the *Tournament Section (GO TO TOURNAMENT MENU)*.



Dump Audits To USB (Memory Stick)

To initiate, from the **USB MENU**, select the "DUMP" *Icon*. Follow the on-screen prompts to perform a **Data Dump (download)**. A dated text file will be created on your USB Memory Stick.

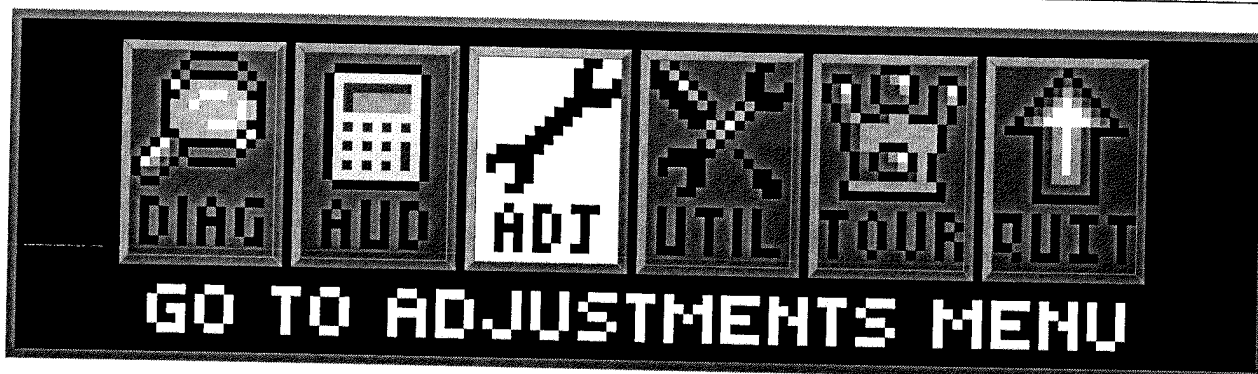


Step 1 Insert your **USB Compatible Memory Stick** into the USB port on the CPU/Sound Board (S.A.M. System). If the Memory Stick has space available and is free of errors, a dated file* is generated (* ensure your Date & Time is set prior to selecting or the dated file will have the default date of 20XX_01_01; see the Utilities Section (**SET DATE / TIME**) for details).

Step 2 Press [**SELECT**] to save the file to your Memory Stick. Press [**SELECT**] again to continue or [**BACK**] to exit or escape at any time.

Step 3 Remove the Memory Stick and insert into your PC or Mac to save the file (which can then be copied, printed or emailed). The audits are numbered sequentially **without** a number restart between the three types of audits (Earnings, Standard and Feature).

Note: The "DUMP" *Icon* can also be accessed in the **USB MENU** via the **UTILITIES MENU** (see the Utilities Section (GO TO USB MENU) for details).



To initiate, from the **MAIN MENU**, select the "ADJ" Icon. The **ADJUSTMENTS MENU** provides 64+/- Adjustments to vary Game Functions to customize for your particular needs. The Adjustments are divided into 2 groups:
 • **Standard Adjustments** [#1 – #63] and • **Feature Adjustments (Programming Use Only)** [#1 – #+].
 For quick and easy customization of **Game Play Difficulty** or **Game Play Type** or how to **RESET ONLY** the Adjustments, review the Utilities Section (**GO TO INSTALLS MENU**). **Shortcut: Enter Custom Message** (Standard Adj. 41) and **Set Custom Pricing** (via Standard Adjustment 18, Game Pricing) can be quickly accessed via the **UTILITIES MENU**. See the Utilities Section (**GO TO UTILITIES MENU**), for more information.

Adjustments which are named **Proprietary** are also for **Future Expansion** or **Programming**. Game code may get upgraded during production; compare all Adjustments in the Dot Matrix Display with the manual and make any corrections, as necessary. Adjustments are subject to change (with or without notice).

All **ADJUSTMENTS MENU** Icons and there usages are explained throughout this chapter in the same order as seen in the Dot Matrix Display. **NOTE:** Depending on Game Type, Version, selections made, Dip Switch settings, location and/or areas, some Adjustments may appear non-functional or may not appear at all. **Adjustments and/or functions, order and operation are subject to change. If in doubt use the Factory Default Settings.**

In displays where changes can be made or to perform a function, use the **GREEN** Button to go [**BACK**], exit or escape, the **RED** Buttons to [< / -] **SELECT PREVIOUS** [+ / >] **SELECT NEXT** when the adjustment name or setting is flashing and the **BLACK** Button to [**SELECT**] toggle between the **ADJUSTMENT** and **SETTING**.



Standard Adjustments [#1 – #63]

To initiate, from the **ADJUSTMENTS MENU**, select the "S.P.I." Icon. The Dot Matrix Display will indicate the *adjustment number (in this group), adjust. name, adjust. setting and comment line*. The current adjustment will remain on the display until the next adjustment is viewed or when this sub-menu is exited.

- #1 **REPLAY TYPE:** Set to **AUTO**, **NONE**, **FIXED** or **DYNAMIC**. Factory Default = **AUTO**. **AUTO** & **DYNAMIC** are based on the **Replay Percentage** (Standard Adjustment 2). • Select **FIXED** to give the player a **Replay Award** (Standard Adjustment 3) as the **Replay Levels** (Standard Adjustments 7-10) are reached. The **Replay Level(s)** (Standard Adjustments 7-10) will not adjust up or down. • Select **AUTO** to give the player a **Replay Award** (Standard Adjustment 3) as the **Auto Replay Start** (Standard Adjustment 5) score level is reached. This *score threshold* will automatically adjust up or down based on the **Replay Percentage** chosen (Standard Adjustment 2). The game periodically adjusts based upon the Player Base Skill Level. • Select **DYNAMIC** to give the player a **Replay Award** (Standard Adjustment 3) as the **Dynamic Replay Start** (Standard Adjustment 6) score level is reached. This *score threshold* will go down every game based on the **Replay Percentage** (Standard Adjustment 2) selected. • Select **NONE** to turn off Standard Adjustments 2-11.
- #2 **REPLAY PERCENTAGE:** Set between 1% – 50%. Factory Default = 10%. Adjustable only if **AUTO** or **DYNAMIC** is installed in Replay Type, Standard Adjustment 1. For [**DYNAMIC**] example, if the *score threshold* is 50,000,00 and the **Replay Percentage** selected is 10%, every game a player does not reach the *score threshold*, the score to reach will drop by 5,000,000 (10% of 50M). This will continue every game until the *threshold score* is reached. Thus, if the score then drops to 15,000,000 after 7 games and is then achieved, the **Replay Award** (Standard Adjustment 3) is given. The original *score threshold* is added to 15,000,000 and is now 65,000,000. It will then take the same player 10 games to reach 15,000,000. This adjustment is shown only if **AUTO** or **DYNAMIC** is installed in **Replay Type** (Standard Adjustment 1).

Standard Adjustments 3-18 continued on the next page.



Standard Adjustments continued.

- #3 **REPLAY AWARD:** Set to **CREDIT**, **TICKET***, **TOKEN*** or **EXTRA BALL**. Factory Default = **CREDIT**. Set the type of award to be given to the player when the appropriate Replay Score threshold or level is achieved. If awarding a **CREDIT**, **TICKET** or **TOKEN** is prohibited in your area, select **EXTRA BALL**. *This adjustment is not shown if NONE is installed in Replay Type (Standard Adjustment 1).*

**Note: If TICKET or TOKEN is selected, the game will require an optional Ticket or Token Dispenser and then Q24 Option (Standard Adj. 55) must be changed accordingly.*

- #4 **REPLAY LEVELS:** Set between 1 – 4 for the number of Replay Levels to be active. Factory Default = 1. *This adjustment is not shown if NONE is installed in Replay Type (Standard Adjustment 1).*
- #5 **AUTO REPLAY START:** Set between 5,000,000 – 150,000,000 (increments of 1,000,000) for the Auto Replay Start threshold. Factory Default = __,000,000. *This adjustment is shown only if AUTO is installed in Replay Type (Standard Adjustment 1).*
- #6 **DYNAMIC REPLAY START:** Set between 5,000,000 – 150,000,000 (increments of 1,000,000) for the Dynamic Replay Start threshold. Factory Default = __,000,000. *This adjustment is shown only if DYNAMIC is installed in Replay Type (Standard Adjustment 1).*
- #7 **REPLAY LEVEL #1:** Set between 5,000,000 – 150,000,000 (increments of 1,000,000). Factory Default = __,000,000. Set the first or only Replay Level. *This adjustment is shown only if FIXED is installed in Replay Type (Standard Adjustment 1).*
- #8 **REPLAY LEVEL #2:** Set between 5,000,000 – 150,000,000 (increments of 1,000,000). Factory Default = __,000,000. Set the second Replay Level. *This adjustment is shown only if FIXED is installed in Replay Type (Standard Adjustment 1) and 2 is installed in Replay Levels (Standard Adjustment 4).*
- #9 **REPLAY LEVEL #3:** Set between 5,000,000 – 150,000,000 (increments of 1,000,000). Factory Default = __,000,000. Set the third Replay Level. *This adjustment is shown only if FIXED is installed in Replay Type (Standard Adjustment 1) and 3 is installed in Replay Levels (Standard Adjustment 4).*
- #10 **REPLAY LEVEL #4:** Set between 5,000,000 – 150,000,000 (increments of 1,000,000). Factory Default = __,000,000. Set the fourth Replay Level. *This adjustment is shown only if FIXED is installed in Replay Type (Standard Adjustment 1) and 4 is installed in Replay Levels (Standard Adjustment 4).*
- #11 **REPLAY BOOST:** Set to **YES** or **NO**. Factory Default = **YES**. When set to **YES**, while **FIXED** or **AUTO** maintains the Replay Levels, Replay Boost works as follows: If the Replay Level is 7,000,000 (regardless of the Replay Percentage), and the Player scores 20M, and receives the Replay Award, the next game the Current Replay Level is added to this base. Thus the next game, the Replay Level is 14,000,000. The Player again scores 20M. The next game the Player will need to achieve 21,000,000 to earn the Replay Award. If the Player does not achieve 21,000,000, the next game reverts back to the original 7,000,000 or the new adjusted level maintained by the Fixed or Autopercentaging Feature. *This adjustment is shown only if AUTO or FIXED is installed in Replay Type (Standard Adjustment 1).*
- #12 **SPECIAL LIMIT:** Set between 1 – 5, **UNLIMITED** or **NO SPECIALS**. Factory Default = 1. Set the maximum number of Specials that may be accumulated per game.
- #13 **SPECIAL PERCENTAGE:** Set between 1% – 50%. Factory Default = 10%. This adjustment allows the operator to adjust how frequently the **Special Feature** is made available to the player. *This adjustment is not shown if NO SPECIALS is installed in Special Limit (Standard Adjustment 12).*
- #14 **SPECIAL AWARD:** Set to **CREDIT**, **TICKET***, **TOKEN***, **POINTS** or **EXTRA BALL**. Factory Default = **CREDIT**. Select **EX. BALL** or **POINTS** if awarding a **CREDIT** or **TICKET / TOKEN** is prohibited in your area. *This adjustment is not shown if NO SPECIALS is installed in Special Limit (Standard Adjustment 12).*
- *Note: If TICKET or TOKEN is selected, the game will require an optional Ticket or Token Dispenser and then Q24 Option (Standard Adj. 55) must be changed accordingly.*
- #15 **FREE GAME LIMIT:** Set between 1 – 9, **UNLIMITED** or **NO FREE GAMES**. Factory Default = 5. Set the maximum number of Free Games that may be accumulated per game.
- #16 **EXTRA BALL LIMIT:** Set between 1 – 9, **UNLIMITED** or **NO EXTRA BALLS**. Factory Default = 5. Set the number of Extra Balls that may be accumulated per game.
- #17 **EXTRA BALL PERCENTAGE:** Set between 1% – 50%. Factory Default = 25%. This adjustment allows the operator to adjust how frequently the **Extra Ball Feature** is made available to the player. *This adjustment is not shown if NO EXTRA BALLS is installed in Extra Ball Limit (Standard Adjustment 16).*
- #18 **GAME PRICING:** There are two (2) methods available for Coin Switch Programming: **Standard & Custom**. Set between **AUSTRALIA 1 – UK 6** or **CUSTOM**. Factory Default = **USA 10**. **Shortcut: Set Custom Pricing and instructions, review the Utilities Section, Set Custom Pricing.** The appropriate Dip Switch Setting (Dip Sw. 1-8 location CPU/Sound PCB SW1) in relationship to the Pricing Scheme selected is important (view the tables on the following pages for more information).

Standard Adjustment 18, Game Pricing, continued on the next page.



Standard Adjustment 18, Game Pricing, continued.

USA & International (non-Euro) Standard Pricing Select Table

CPU/SOUND PCB DIP SWITCH SW1 SETTING									COUNTRY SETTING OPTION(S)		COIN MECHANISMS (SWITCHES) COINS THRU ... SLOT: LEFT CENTER RIGHT 4TH					PRICING SCHEME Number of Plays (Credits) for Price Amount Shown See "Appendix J" for Coin Cards Examples & Info!					Requires SPI Coin Card(s) Part Number					
Pos.	1	2	3	4	5	6	7	8	Default Highlighted							USD // UNITED STATES DOLLAR // [\$]										
ON									USA 1		0.25 1.00 0.25					1/0.25			755-5400-01-Y							
OFF	▼	▼	▼	▼	▼	▼	▼	▼	USA 2							1/0.50			2/0.75		3/1.00	755-5400-09-Y				
HIGHLIGHTED									USA 3							For USA 6 and USA 7 use: 755-5400-02-Y USA 6 Note: If player uses X4 25c quarters = 2 plays. However, \$1 bill = 3 plays!					1/0.50			755-5400-02-Y		
= Factory Default									USA 4							1/0.50					1/0.50	2/1.00	3/1.50	5/2.00	755-5400-02-Y	
HIGHLIGHTED									USA 5							1/0.50					1/0.50	2/1.00	3/1.50	5/2.00	755-5400-08-Y	
= Not Shown on Coin Card									USA 6							1/0.50					1/0.50	2/1.00	4/1.50	6/2.00	755-5400-00-Y	
									USA 7							1/0.50					1/0.50	3/1.00		755-5400-07-Y		
									USA 8							1/1.00								755-5400-11-Y		
									USA 9							1/0.75					2/1.50	3/2.00				
									USA 10																	
Pos.	1	2	3	4	5	6	7	8	Default Highlighted		0.20 1.00 2.00					AUD // AUSTRALIAN DOLLARS // [\$AUS]										
ON	▲	▲	▲						AUSTRALIA 1		0.25 0.25 1.00 2.00					1/1.00	3/2.00		755-5406-00-Y							
OFF	▼	▼	▼	▼	▼	▼	▼	▼	AUSTRALIA 2							1/1.00					(1 Side)					
Pos.	1	2	3	4	5	6	7	8	Default Highlighted		0.25 0.25 1.00 2.00					CAD // CANADIAN DOLLARS // [\$CAN]										
ON	▲	▲							CANADA 1 [25c door]		1.00 2.00					1/0.50	2/0.75	3/1.00	755-5400-00-Y							
OFF	▼	▼	▼	▼	▼	▼	▼	▼	CANADA 2 [dollar door]							1/1.00			3/2.00		755-5400-10-Y					
Pos.	1	2	3	4	5	6	7	8	Default Highlighted		1 2 5					HRK // CROATIAN KUNA // [kuna]										
ON	▲	▲	▲						CROATIA		100 100					1/3	2/5		755-5410-00-Y							
OFF	▼	▼	▼	▼	▼	▼	▼	▼								1/2	2/4	3/5	4/7	5/9	7/10	(2-Sided)				
Pos.	1	2	3	4	5	6	7	8	Default Highlighted		1 5 10 20					DKK // DANISH KRONER // [Kr]										
ON	▲	▲	▲						DENMARK 1		100 100					1/3	2/5		755-5402-00-Y							
OFF	▼	▼	▼	▼	▼	▼	▼	▼	DENMARK 2							1/2	2/4	3/5	4/7	5/9	7/10	(2-Sided)				
Pos.	1	2	3	4	5	6	7	8	Default Highlighted		100 100					JPY // JAPANESE YEN // [¥]										
ON	▲	▲	▲						JAPAN 1		1 2 5					1/100			755-5408-01-Y							
OFF	▼	▼	▼	▼	▼	▼	▼	▼	JAPAN 2							1/100	3/200				(2-Sided)					
Pos.	1	2	3	4	5	6	7	8	Default Highlighted		1 2 5					LTL // LITHUANIA LITAI // [Lt]										
ON	▲	▲	▲						LITHUANIA		token token					1/2			755-5416-00-Y							
OFF	▼	▼	▼	▼	▼	▼	▼	▼								1/2					(1 Side)					
Pos.	1	2	3	4	5	6	7	8	Default Highlighted		token token					TOKEN // Middle East currency used to buy token // [TOKEN]										
ON	▲	▲	▲						MIDDLE EAST		1 2					1/1			755-5416-00-Y							
OFF	▼	▼	▼	▼	▼	▼	▼	▼								1/1					(use Side 1)					
Pos.	1	2	3	4	5	6	7	8	Default Highlighted		1 2					NZD // NEW ZEALAND DOLLAR // [\$NZD]										
ON	▲	▲	▲						NEW ZEALAND 1		10 5 20					1/1			755-5406-00-Y							
OFF	▼	▼	▼	▼	▼	▼	▼	▼	NEW ZEALAND 2							1/1	3/2				(Side 2)					
Pos.	1	2	3	4	5	6	7	8	Default Highlighted		10 5 20					NOK // NORWEGIAN KRONE // [Kr]										
ON	▲	▲	▲						NORWAY 1		10 5 20					1/10			755-5403-01-Y or							
OFF	▼	▼	▼	▼	▼	▼	▼	▼	NORWAY 2							1/10	3/20				-02-Y / (2-Sided)					
									NORWAY 3							1/20						755-5403-03-Y				
									NORWAY 4							1/20	3/40					(2-Sided)				
Pos.	1	2	3	4	5	6	7	8	Default Highlighted		10 5 1					RUB // RUSSIAN RUBLE // [Ruble]										
ON	▲	▲	▲						RUSSIA		0.50 1.00 2.00 5.00					1/5			755-5411-00-Y							
OFF	▼	▼	▼	▼	▼	▼	▼	▼								1/5					(2-Sided)					
Pos.	1	2	3	4	5	6	7	8	Default Highlighted		0.50 1.00 2.00 5.00					ZAR // SOUTH AFRICAN RAND // [R]										
ON	▲	▲	▲						SO. AFRICA 1		1 5 10					1/2.00			755-5409-01-Y							
OFF	▼	▼	▼	▼	▼	▼	▼	▼	SO. AFRICA 2							1/3.00	2/5.00				(2-Sided)					
Pos.	1	2	3	4	5	6	7	8	Default Highlighted		1 5 10					SEK // SWEDISH KRONOR // [kr]										
ON	▲	▲	▲						SWEDEN 1		1 2 5					1/10	2/15	3/20	755-5404-00-Y							
OFF	▼	▼	▼	▼	▼	▼	▼	▼	SWEDEN 2							1/5					(2-Sided)					
Pos.	1	2	3	4	5	6	7	8	Default Highlighted		1 2 5					CHF // SWISS FRANCS // [\$f]										
ON	▲	▲	▲						SWITZERLAND 1		10 10					1/1	2/2	3/3	4/4	6/5	755-5405-00-Y					
OFF	▼	▼	▼	▼	▼	▼	▼	▼	SWITZERLAND 2							1/1	3/2	5/3	7/4	9/5		(2-Sided)				
Pos.	1	2	3	4	5	6	7	8	Default Highlighted		10 10					TWD // TAIWANESE DOLLAR // [TWD]										
ON	▲	▲	▲						TAIWAN		0.10 0.50 1.00 0.20 2£					1/10			755-5412-00-Y							
OFF	▼	▼	▼	▼	▼	▼	▼	▼								1/10					(use Side 1)					
Pos.	1	2	3	4	5	6	7	8	Default Highlighted		0.10 0.50 1.00 0.20 2£					GBP // UNITED KINGDOM POUNDS // [£]										
ON	▲	▲	▲						UK 1		0.10 0.50 1.00 0.20 2£ ▲ Coin Only					3/1.00	7/2.00		755-5407-00-Y							
OFF	▼	▼	▼	▼	▼	▼	▼	▼	UK 2							1/0.50	2/1.00	3/1.50	5/2.00		755-5407-01-Y*					
ATTENTION: UK 5TH COIN SLOT TIED TO 6TH CHANNEL ON ELEC. COIN MECH									UK 3							1/0.30	2/0.60	3/0.90	4/1.00		755-5407-01-Y*					
									UK 4							1/1.00	3/2.00					755-5407-01				
									UK 5							3/2.00						*use blank side	755-5407-01-Y*			
									UK 6																	

HIGHLIGHTED

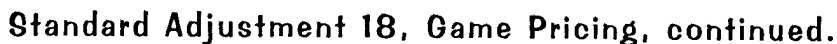
= Factory Default

HIGHLIGHTED

= Not Shown on Coin Card

Adjustments

Standard Adjustment 18, Game Pricing, continued on the next page.



Euro 1-12 Summary & International (Euro) Standard Pricing Select Table

HIGHLIGHTED
= Factory Default

HIGHLIGHTED
= Not Shown on Coin Card

[illegible]

HIGHLIGHTED = Factory Default **HIGHLIGHTED** = Not Shown on Coin Card

For the associated **Coinage Card** required *if the Factory Default Setting was changed*, view on-line at:
<http://www.sternpinball.com/coinagecards.shtml>

ASTROBRIGHTS® SOLAR YELLOW #65 FROM WAUSAU PAPER PRODUCTS (Stock #22731)

- #19 MATCH PERCENTAGE:** Set between 0% – 10% or OFF. Factory Default = 9%. At 0% the *Match Animation Feature* occurs at the end of the game but never awards the **Match Award** (Standard Adjustment 20). Set to OFF, no **Match Animation Feature** is shown.
- #20 MATCH AWARD:** Set to CREDIT, TICKET* or TOKEN*. Factory Default = CREDIT. *This adjustment is not shown if OFF is installed in Match Percentage (Standard Adjustment 19).*
- *Note: If TICKET or TOKEN is selected, the game will require an optional Ticket or Token Dispenser and then Q24 Option (Standard Adj. 55) must be changed accordingly.*
- #21 BALLS PER GAME:** Set between 1 – 10. Factory Default = 3. Set the number of balls per game.

Standard Adjustments 22-36 continued on the next page. Standard Adjustments continued.



- #22 **TILT WARNINGS:** Set between 0 – 3. Factory Default = 2. Set the number of Plumb Bob Tilt Switch closures before the ball in play is tilted. *Each closure generates an audible alert and/or display alert.*
- #23 **CREDIT LIMIT:** Set between 4 – 50. Factory Default = 30. Set the maximum credits allowed.
- #24 **ALLOW HIGH SCORES:** Set to **YES** or **NO**. Factory Default = **YES**. When set to **YES**, if a player exceeds the Default Grand Champion or 1-4 High Scores, the player may receive a **High Score Award** (Standard Adjustment 25) and enter their **3 Initials** or **10-Letter Name** (Standard Adjustment 36). Set to **NO** to disable this feature. *The following Standard Adjustments 25-37 are not shown if **NO** is installed.*
- #25 **HIGH SCORE AWARD:** Set to **CREDIT**, **TICKET*** or **TOKEN***. Factory Default = **CREDIT**. Set the type of award to be given to the player when the appropriate **Grand Champion Score** or **High Score #1 – #4** threshold or level is achieved. If awarding a **CREDIT**, **TICKET** or **TOKEN** is prohibited in your area, install **NO** in **Allow High Scores** (Standard Adjustment 24). *This adjustment is not shown if **NO** is installed in **Allow High Scores** (Standard Adjustment 24).*
- *Note: If **TICKET** or **TOKEN** is selected, the game will require an optional Ticket or Token Dispenser and then **Q24 Option** (Standard Adj. 55) must be changed accordingly.*
- #26 **GRAND CHAMPION AWARDS:** Set between 0 – 5. Factory Default = 1. Set the number of **High Score Award(s)** (Std. Adj. 25), awarded for exceeding the Grand Champion Score (Standard Adjustment 31). *This adjustment is not shown if **NO** is installed in **Allow High Scores** (Standard Adjustment 24).*
- #27 **HIGH SCORE #1 AWARDS:** Set between 0 – 3. Factory Default = 1. Set the number of **High Score Award(s)** (Std. Adj. 25), awarded for exceeding the High Score #1 (Standard Adjustment 32). *This adjustment is not shown if **NO** is installed in **Allow High Scores** (Standard Adjustment 24).*
- #28 **HIGH SCORE #2 AWARDS:** Set between 0 – 2. Factory Default = 0. Set the number of **High Score Award(s)** (Std. Adj. 25), awarded for exceeding the High Score #2 (Standard Adjustment 33). *This adjustment is not shown if **NO** is installed in **Allow High Scores** (Standard Adjustment 24).*
- #29 **HIGH SCORE #3 AWARDS:** Set between 0 – 1. Factory Default = 0. Set the number of **High Score Award(s)** (Std. Adj. 25), awarded for exceeding the High Score #3 (Standard Adjustment 34). *This adjustment is not shown if **NO** is installed in **Allow High Scores** (Standard Adjustment 24).*
- #30 **HIGH SCORE #4 AWARDS:** Set between 0 – 1. Factory Default = 0. Set the number of **High Score Award(s)** (Std. Adj. 25), awarded for exceeding the High Score #4 (Standard Adjustment 35). *This adjustment is not shown if **NO** is installed in **Allow High Scores** (Standard Adjustment 24).*
- #31 **GRAND CHAMPION SCORE:** Set between 1,000,000 – 1,000,000,000 (increments of 1,000,000). Factory Default = __,000,000. Set the desired **Grand Champion Score** level a player needs to exceed to earn the **High Score Award** (Standard Adjustment 25). A score higher than the default, cannot be reset by Standard Adjustment 37, **HSTD Reset Count**. *The Grand Champion Score will revert to the Factory Default Score **ONLY** if a **Reset Grand Champion** is performed in the **RESET MENU** (via the **UTILITIES MENU**) or if the game is without power for more than 12 hours after the CPU/Sound PCB Coin Cell Battery is expired or removed. This adjustment is not shown if **NO** is installed in **Allow High Scores** (Standard Adjustment 24).*
- #32 **HIGH SCORE #1:** Set between 1,000,000 – 1,000,000,000. Factory Default = __,000,000. Set the desired **High Score #1** level a player needs to exceed to earn the **High Score Award** (Standard Adjustment 25). A score higher than the default, will be reset by Standard Adjustment 37, **HSTD Reset Count**. *The High Score will revert to the Factory Default Score **ONLY** if a **Reset High Scores** is performed in the **RESET MENU** (via the **UTILITIES MENU**) or if the game is without power for more than 12 hours after the CPU/Sound PCB Coin Cell Battery is expired or removed. This adjustment is not shown if **NO** is installed in **Allow High Scores** (Standard Adjustment 24).*
- #33 **HIGH SCORE #2:** Set between 1,000,000 – 1,000,000,000. Factory Default = __,000,000. Set the desired **High Score #2** level a player needs to exceed ... (continued in Standard Adjustment 32 definition above).
- #34 **HIGH SCORE #3:** Set between 1,000,000 – 1,000,000,000. Factory Default = __,000,000. Set the desired **High Score #3** level a player needs to exceed ... (continued in Standard Adjustment 32 definition above).
- #35 **HIGH SCORE #4:** Set between 1,000,000 – 1,000,000,000. Factory Default = __,000,000. Set the desired **High Score #4** level a player needs to exceed ... (continued in Standard Adjustment 32 definition above).
- #36 **HSTD (HIGH SCORE TO DATE) INITIALS:** Set to **3 INITIALS** or **10 LETTER NAME**. Factory Default = **3 INITIALS**. When set to **3 INITIALS**, the player is allowed only 3 initials to input. When set to **10 LETTER NAME**, the player is allowed to enter 10 initials to input. *This adjustment is not shown if **NO** is installed in **Allow High Scores** (Standard Adjustment 24).*

Standard Adjustments 37-50 continued on the next page.



Standard Adjustments continued.

- #37 HSTD (HIGH SCORE TO DATE) RESET COUNT:** Set between **100 – 9900** or **OFF** (increments of 100). Factory Default = **2000**. Set the number of games between "automatic resets" of High Scores back to the Factory Defaults for **ONLY** Standard Adj. **32 – 35, High Score #1 – #4**. The High Score will revert to the Factory Default Scores when the number of games stated is reached. **Reset High Scores** can be performed in the **RESET MENU** (via the **UTILITIES MENU**) anytime or if the game is without power for more than 12 hours after the CPU/Sound PCB Coin Cell Battery is expired or removed. This adjustment is not shown if **NO** is installed in **Allow High Scores** (Standard Adj. 24).
- #38 FREE PLAY:** Set to **YES** or **NO**. Factory Default = **NO**. When set to **YES**, no coins are required for Game Play.
- #39 LANGUAGE:** Set to **ENGLISH, GERMAN, FRENCH, SPANISH** or **ITALIAN**. Factory Default = **ENGLISH**. Set the language for the game. Language of game is also shown in the Dot Display (along with the Game Title and code version) at the start-up routine which follows a game reset or power-up.
- #40 PLAYER LANGUAGE SELECT:** Set to **YES** or **NO**. Factory Default = **YES**. When set to **YES**, after the player presses the **Start Button** (to start a game with adequate credit), the player has the option to choose a language by pressing either **Flipper Button** before game start (options of languages installed are shown on the Dot Display). **Note:** If set to **NO** or if only one language is installed and the setting is set to **YES**, the game will start immediately after the **Start Button** press. Language(s) available are dependent on game destination from the factory. Other languages may be available on-line for download and installed on your game. With the proper dip switch installed, the language option(s) can be changed. For more information or help, call Technical Support at 800-542-5377 (708-345-7700).
- #41 CUSTOM MESSAGE:** Set to **ON, CHANGE** or **OFF**. Factory Default = **ON**. Shortcut: **Enter Custom Message** and instructions, review the Utilities Section, **Enter Custom Message**.
- #42 FLASH LAMP POWER:** Set to **NORMAL, OFF** or **DIM**. Factory Default = **NORMAL**. When set to **DIM**, the Flash Lamps impulse power is reduced by 25% and when set to **OFF** the Flash Lamps will not flash. For Flash Lamps used in this game, **Go To Flash Lamps Menu** via the **DIAGNOSTICS MENU** (see the Diagnostics Section).
- #43 COIL PULSE POWER:** Set to **NORMAL, HARD** or **SOFT**. Factory Default = **NORMAL**. When set to **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. This adjustment is provided to compensate for **Low Line** or **High Line** voltage conditions where the solenoids (coils) appear to *kicking too weak* or *too hard*. Adjust as required.
- #44 KNOCKER VOLUME:** Set to **NORMAL, OFF** or **LOW**. Factory Default = **NORMAL**. When set to **LOW**, the volume is decreased 50%. When set to **OFF**, no sound is heard when the "knocker" is sounded. Test the knocker sound in the **Fire Knocker Test** via the **DIAGNOSTICS MENU** (see Section 3, Chapter 2, **GO TO DIAGNOSTICS MENU**, Page 19).
- #45 GAME RESTART:** Set to **YES** or **NO**. Factory Default = **YES**. When set to **YES**, a new game may be started during any ball after the first ball is completed (if credits allow). Pressing the **Start Button** during the first ball will add additional players (up to 4, if credits allow). When set to **NO**, the game disables the **Start Button** after the first ball until the final ball is in play.
- #46 BILL VALIDATOR:** Set to **YES** or **NO**. Factory Default = **NO**. When set to **YES**, in **Game Attract Mode** an "Insert Bill Animation" is shown in the display (or just the absence of the Coin Animation). When set to **NO**, an "Insert Coin Animation" is shown. (This adjustment will appear when implemented).
- #47 MUSIC VOLUME:** Set between **1 – 15**. Factory Default = **1**. After volume is set via Service Buttons 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 Effects at the same level.
- #48 BALL SAVE TIME:** Set between **0:01 – 0:15, AUTO** or **NO BALL SAVES**. Factory Default = **0:05**. When set to **NO BALL SAVES** this feature is unavailable. Set between **0:01** through **0:15** (single increments) for the ball to be sent back into play if the time set is not met (per ball). Set to **AUTO** to automatically adjust the Ball Save Timer based on the average ball time.
- #49 TIMED PLUNGER:** Set to **OFF** or **0:01 – 1:00**. Factory Default = **OFF**. The plunger will "Autoplunge" the ball (at the time set) when the ball is at the beginning of play, waiting for the player.
- #50 FLIPPER BALL LAUNCH:** Set to **OFF, LEFT FLIPPER, RIGHT FLIPPER, EITHER FLIPPER** or **BOTH FLIPPERS**. Default is **OFF**. This feature allows the player to operate the Auto Ball Launch with the Flipper Button(s) depending on which setting is chosen.

Standard Adjustments 51-63 continued on the next page.



Standard Adjustments continued.

- #51 **COINDOOR BALL SAVER:** Set to **YES** or **NO**. Factory Default = **NO**. When set to **NO**, this feature is not available. When set to **YES**, this feature allows the Coin Door to be opened during game play; the ball will drain but the game will be placed "on hold". When the Coin Door is closed, the pinball will return to the Shooter Lane, and the game will resume. *Useful at locations where technicians change the cash box regularly at exact times of the day where players can be on the game.*
- #52 **COMPETITION MODE:** Set to **YES** or **NO**. Factory Default = **NO**. When set to **NO**, this feature is not available. Set to **YES**, this feature will equalize random game features and global score values during multi-player games by predetermined competition rules set by programming. If an **Install Competition** was made via the **INSTALLS MENU** (which automatically changes this setting to **YES**), and this setting was changed back to **NO**, the **Competition Mode** will be turned **OFF** (cancelled).
- #53 **CONSOLATION BALL:** Set to **YES** or **NO**. Factory Default = **YES**. When set to **YES**, the **EXTRA BALL** (lamp insert, location varies) will be lit on the last ball in play, if certain programming criteria is met.
- #54 **FAST BOOT:** Set to **YES** or **NO**. Factory Default = **YES**. When set to **NO** or if you hold both **Flipper Buttons** during Power-Up, this feature is not available and will display all normal Power-Up screens. When set to **YES**, the game will not display the normal informative Power-Up screens, specifically the CPU Version screen and the Location/Game ID screen. Regardless of the setting, normal Power-Up safety checks are still performed. *(This adjustment will appear when implemented).*
- #55 **Q24 OPTION:** Set to **COIN METER**, **TOKEN DISPENSER** or **KNOCKER**. Factory Default = **COIN METER**. This Coil (Solenoid) Location is left "open" at the Factory to allow for these optional Mechanisms to be added to the game. If selecting **TOKEN DISPENSER**, Standard Adjustments 3, 14, 20 & 25 should be changed to **TOKEN**. *Call Tech. Support at 1-800-542-5377 if more information is required on this option.*
- #56 **TICKET DISPENSER:** Set to **YES** or **NO**. Factory Default = **NO**. *This adjustment is required only for games which have an optional Deltronics (DL-1275-2 PCB Style, SPI Part Nr. 515-7275-00) Ticket Dispenser installed. Unique CPU Sound Bd. Dip Switch Setting required, changes the Default to YES.*
- #57 **PLAYER COMPETITION:** Set to **YES** or **NO**. Factory Default = **YES**. **Competition Mode** unrandomizes feature events, and standardizes game play and rule sets (varies from game to game) for fair competitions. With at least one credit posted, or with the game set for 'FREE PLAY', during the game-over Attract Mode, press the **Left Flipper Button** and hold it in for approximately one second. The following message will appear on the display for approximately 10 seconds: '**COMPETITION MODE READY ... PRESS START NOW**'. If a game is started (either by pressing the 'START' button for a regular game, or by pressing the 'TOURNAMENT START' button for a tournament game) while this message appears on the display, then competition mode will be enabled for all players during the game. General rules are covered in the Instruction Card. Other *Hints and/or Rules* can be made known on this game either visually (the Dot Display or Flashing Light Inserts) or can be audible.
- #58 **TEAM SCORES:** Set to **YES** or **NO**. Factory Default = **NO**. Set to **YES**, then Team Play will be made available. **Team Play only works in a 4-Player Game**. The totals for Players 1 / 3 (Team 1) & Players 2 / 4 (Team 2) are then displayed individually **as well as** the combined score for **BOTH TEAMS** to enable **Team Play (Doubles)**. *(This adjustment will appear when implemented).*
- #59 **LOCATION ID:** Set between **0** to **9999**. Factory Default = **0**. This adjustment allows the operator to assign a location identification number to the audit print-out sheet. *(Will not be affected by a Factory Reset.)*
- #60 **GAME ID:** Set between **0** to **9999**. Factory Default = **0**. This adjustment allows the operator to assign a game identification number to the audit print-out sheet. *(Will not be affected by a Factory Reset.)*
- #61 **TIME FORMAT:** Set to **12-HOUR** or **24-HOUR**. Factory Default = **12-HOUR**. This adjustments determines how the time is displayed. *Time used for Tournament and Data Dumps where a time stamp is required.*
- #62 **COIN INPUT DELAY:** Set between **30** to **60** or **OFF**. Factory Default = **30**. This adjustment creates a short time delay between the moment the coin is inserted into the **Coin Slot** to the moment the CPU/Sound PCB registers the coin (**30** = approximately 1/2 second).
- #63 **LOST BALL RECOVERY:** Set to **YES** or **NO**. Factory Default = **NO**. Set to **YES**, at the start of the 5th consecutive ball search (with no scoring between searches), the game will consider any balls in play to be permanently lost and will attempt to recover from this situation by serving a new ball into play from the ball trough. Set to **NO** (to suppress this adjustment behavior) for the game to perform the "ball search" indefinitely until the lost balls are found or replaced.

STANDARD ADJUSTMENTS [#1 – #63] ▼

Nr.	STANDARD ADJUSTMENT NAME	USA DEFAULT	YOUR SETTING	Nr.	STANDARD ADJUSTMENT NAME	USA DEFAULT	YOUR SETTING
1	REPLAY TYPE	AUTO		32	HIGH SCORE #1	____,000,000	
2	‡ REPLAY PERCENTAGE	10%		33	HIGH SCORE #2	____,000,000	
3	‡ REPLAY AWARD	CREDIT		34	HIGH SCORE #3	____,000,000	
4	‡ REPLAY LEVELS	1		35	HIGH SCORE #4	____,000,000	
5	‡ AUTO REPLAY START	____,000,000		36	HSTD INITIALS	3 INITIALS	
6	‡ DYNAMIC REPLAY START	____,000,000		37	HSTD RESET COUNT	2000	
7	‡ REPLAY LEVEL #1	____,000,000		38	FREE PLAY	NO	
8	‡ REPLAY LEVEL #2	____,000,000		39	LANGUAGE	ENGLISH	
9	‡ REPLAY LEVEL #3	____,000,000		40	PLAYER LANGUAGE SELECT	YES	
10	‡ REPLAY LEVEL #4	____,000,000		41	CUSTOM MESSAGE	ON	
11	‡ REPLAY BOOST	YES		42	FLASH LAMP POWER	NORMAL	
12	SPECIAL LIMIT	1		43	COIL PULSE POWER	NORMAL	
13	‡ SPECIAL PERCENTAGE	10%		44	KNOCKER VOLUME	NORMAL	
14	SPECIAL AWARD	CREDIT		45	GAME RESTART	YES	
15	FREE GAME LIMIT	5		46	BILL VALIDATOR	NO	
16	EXTRA BALL LIMIT	5		47	MUSIC VOLUME	1	
17	‡ EXTRA BALL PERCENTAGE	25%		48	BALL SAVE TIME	0:05	
18	GAME PRICING	USA 10		49	TIMED PLUNGER	OFF	
19	MATCH PERCENTAGE	9%		50	FLIPPER BALL LAUNCH	OFF	
20	MATCH AWARD	CREDIT		51	COINDOOR BALL SAVER	NO	
21	BALLS PER GAME	3		52	COMPETITION MODE	NO	
22	TILT WARNINGS	2		53	CONSOLATION BALL	YES	
23	CREDIT LIMIT	30		54	FAST BOOT	YES	
24	ALLOW HIGH SCORES	YES		55	Q24 OPTION	COIN METER	
25	HIGH SCORE AWARD	CREDIT		56	TICKET DISPENSER	NO	
26	GRAND CHAMPION AWARDS	1		57	PLAYER COMPETITION	YES	
27	HIGH SCORE #1 AWARDS	1		58	TEAM SCORES	NO	
28	HIGH SCORE #2 AWARDS	0		59	LOCATION ID	0	
29	HIGH SCORE #3 AWARDS	0		60	GAME ID	0	
30	HIGH SCORE #4 AWARDS	0		61	TIME FORMAT	12-HOUR	
31	GRAND CHAMPION SCORE	____,000,000		62	COIN INPUT DELAY	30	
				63	LOST BALL RECOVERY	YES	

Factory Defaults Settings are subject to change during production (especially Standard Adjustments 2, 4, 5, 13, 16-17, 19, 31-35 & 47).
 ‡ Not all Standard Adjustments are shown. Depending on the setting (whether Factory Default or if changed by the operator), associated adjustments do not appear, if not required. **Note:** If Game Dip Switch other than USA is installed, different Defaults will appear.

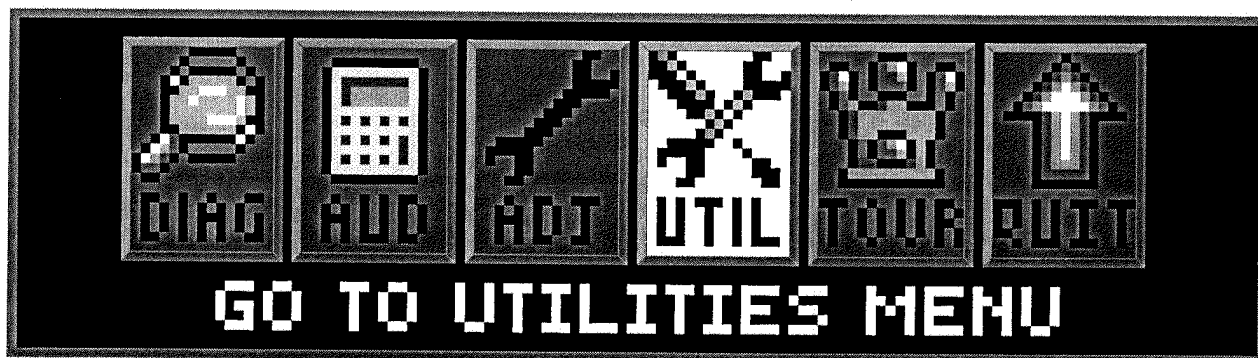
Feature Adjustments [#1 – #+]

To initiate, from the **ADJUSTMENTS MENU**, select the "GAME" Icon. The Dot Matrix Display will indicate the adjustment number (in this group), adjust. name, adjust. setting and comment line. The current adjustment will remain on the display until the next adjustment is viewed or when this sub-menu is exited.

>>> **FACTORY RESET or CODE UPDATE NOTE:** Don't forget, any changes you make to your adjustments will revert back to the Factory Default settings if you perform a Factory Reset or update your Game Code. See Utilities Section (**GO TO RESETS MENU** and **GO TO USB MENU**).

View the Coils Detailed Chart Menu to see if this game is Shaker Motor Enabled. If it is, set the options in the Feature Adjustment as seen below. (typically the last one).

SHAKER MOTOR (OPTIONAL) : Set to **NONE, MINIMAL USE, MODERATE USE** or **MAXIMAL USE**.
 Factory Default = **MODERATE USE**. Set to any of the varying "... USES" if an Optional Shaker Motor Kit (SPI Part Number 502-5027-00) was installed correctly in this pinball machine. See the assembly (kit) on the last page of Blue Pages (Major Assemblies). Also see Shaker Motor Coil (Q8) in the Coils Detailed Chart Table at the beginning of this Service Game Manual or the beginning of the Yellow Pages.



To initiate, from the **MAIN MENU**, select the "UTIL" *Icon*. The **UTILITIES MENU** provides ways to quickly and easily customize your game with **Installs** (pre-sets for game *Standard & Feature Adjustments*), set-up a **Custom Message** (short-cut to *Standard Adjustment 41, Custom Message*), set-up **Custom Pricing** (short-cut to *Standard Adjustment 18, to the Custom Pricing Sub-Menu*), set-up the **Date and Time** (required if the date and time is needed to be accurate for data dumps and for tournaments), reset certain particular game data or perform a complete **Factory Reset** and to download game data, update or backup game code in the **USB MENU**.

All **UTILITIES, INSTALLS, RESETS MENU** and **USB MENU** *Icons* and there usages are explained throughout this chapter in the same order as seen in the Dot Matrix Display. **NOTE:** Depending on Game Type, Version, selections made, Dip Switch settings, location and/or areas, some *Icons* may appear non-functional or may not appear at all. **Installs (Adjustments), Icons and/or functions, order and operation are subject to change. If in doubt use the Factory Default Settings (review Install Factory on the next page).**

In displays where changes can be made or to perform a function, use the **GREEN Button** to go [**BACK**], exit or escape, the **RED Buttons** to [< / -] MOVE BACK / LEFT / [+ / >] MOVE FORWARD / RIGHT to view the next audit in the group, and the **BLACK Button** to [**SELECT**] the sub-menus.



Go To Installs Menu

To initiate, from the **UTILITIES MENU**, select the "INST" *Icon*. The **INSTALLS MENU** provides 13 **Installs** to vary **Game Play Difficulty** (set with *Feature Adjustments*) or **Game Play Type** and **Install Factory** (restores all adjustments to *Factory Defaults*).

For **detailed customization** or to check current **Adjustments Defaults** (either changed by *YOU* in the *Adjustments Menu* or by this **INSTALLS MENU** or for *Factory Default Settings*), see *Section 3, Chapter 4, GO TO ADJUSTMENTS MENU*. After completing one or more of the **Installs** in this chapter, go back to the **ADJUSTMENTS MENU** to see which **Standard and/or Feature Adjustments** have changed (*Feature Adjustments and/or settings are subject to change during production, and may differ than what is described in the tables at the end of this chapter*). The Dot Display will indicate if a setting is a *Factory Default* or not. If the settings are not to your liking, perform **one** of the following:

- 1.: **Manually change the Standard & Feature Adjustments Settings** (perform this task in the **ADJUSTMENTS MENU**, see the *Adjustments Section*).
- 2.: **Install Factory** (see the last install) on how to reset all of the **Standard & Feature Adjustments** back to the *Factory Default Settings*.

Multiple **Installs** can be set to vary game play; however, for **Installs** that have *one or more* **Adjustments** in common, the **last** "Install" selected & *activated*, will **supersede** any previously changed **Adjustment(s)** from any prior **Installs**. Any adjustments which you changed and are not affected by the **Install** will remain as set.

For example, if you want a **5-BALL Game** set to **EXTRA EASY**: Select and *activate* the "5BAL" *Icon* first (which will typically change any **Feature** Difficulty Adjustments to **HARD**), then select & *activate* the "X.EZ" *Icon* to **change back** the Difficulty Adjustments to **EXTRA EASY**. However, if the "X.EZ" *Icon* was selected & *activated* first, then the "5BAL" *Icon* was selected & *activated*, the game will be set to a **5-BALL Game** set to **HARD**.

Remember, use the **GREEN Button** to go [**BACK**], exit or escape and the **BLACK Button** to [**SELECT**] to **INSTALL** your new setting(s).



Install Extra Easy

To initiate, from the **INSTALLS MENU**, select the "X.EZ" *Icon*. The Dot Matrix Display will indicate the **INSTALL EXTRA EASY**. Follow the on-screen prompts to perform the **Install**. Set the **Game Play** Difficulty level.

Installs Menu continued on the next page.

Installs Menu continued from previous page.



Install Easy

To initiate, from the **INSTALLS MENU**, select the "EASY" *Icon*. The Dot Matrix Display will indicate the **INSTALL EASY**. Follow the on-screen prompts to perform the **Install**. Set the **Game Play Difficulty** level.



Install Medium (Normal or Factory Settings)

To initiate, from the **INSTALLS MENU**, select the "FACT" *Icon*. The Dot Matrix Display will indicate the **INSTALL MEDIUM**. Follow the on-screen prompts to perform the **Install**. Set the **Game Play Difficulty** level.



Install Hard

To initiate, from the **INSTALLS MENU**, select the "HARD" *Icon*. The Dot Matrix Display will indicate the **INSTALL HARD**. Follow the on-screen prompts to perform the **Install**. Set the **Game Play Difficulty** level.



Install Extra Hard

To initiate, from the **INSTALLS MENU**, select the "X.HD" *Icon*. The Dot Matrix Display will indicate the **INSTALL EXTRA HARD**. Follow the on-screen prompts to perform the **Install**. Set the **Game Play Difficulty** level.



Install 3-Ball or 5-Ball

To initiate, from the **INSTALLS MENU**, select either the "3BAL" or "5BAL" *Icons*. The Dot Matrix Display will indicate the **INSTALL 3-BALL** or **5-BALL** depending on choice. Follow the on-screen prompts to perform the **Install**. Set the **Game Play Type** to 3 Balls per game

(Factory Default is 3 Balls per game, not including extra balls earned by the player, if any).



Install Competition

To initiate, from the **INSTALLS MENU**, select the "COMP" *Icon*. The Dot Matrix Display will indicate the **INSTALL COMPETITION**. Follow the on-screen prompts to perform the **Install**. Set the **Game Play Type** to "Tournament" Rules. *Programming varies and is subject to change.*



Install Director's Cut

To initiate, from the **INSTALLS MENU**, select the "DCUT" *Icon*. The Dot Matrix Display will indicate the **INSTALL DIRECTOR'S CUT**. Follow the on-screen prompts to perform the **Install**. Set the **Game Play Type** to programmer's choice. *Programming varies and is subject to change.*



Install Home Play

To initiate, from the **INSTALLS MENU**, select the "HOME" *Icon*. The Dot Matrix Display will indicate the **INSTALL HOME PLAY**. Follow the on-screen prompts to perform the **Install**. Set the **Game Play Type** to "Home" Rules. *Programming varies and is subject to change.*



Install Novelty

To initiate, from the **INSTALLS MENU**, select the "NOV" *Icon*. The Dot Matrix Display will indicate the **INSTALL NOVELTY**. Follow the on-screen prompts to perform the **Install**.

***** This setting is recommended where local laws restrict certain game features. *****

Set the **Game Play Type** to "Restricted" Rules. *Programming varies and is subject to change.*



Install Add-A-Ball

To initiate, from the **INSTALLS MENU**, select the "A.A.B." *Icon*. The Dot Matrix Display will indicate the **INSTALL ADD-A-BALL**. Follow the on-screen prompts to perform the **Install**.

***** This setting is recommended where local laws restrict certain game features. *****

Set the **Game Play Type** to "Restricted" Rules. *Programming varies and is subject to change.*



Install Factory

To initiate, from the **INSTALLS MENU**, select the "FACT" *Icon*. The Dot Matrix Display will indicate the **INSTALL FACTORY**. Follow the on-screen prompts to perform the **Install**. **CAUTION!** All **Standard** and **Feature Adjustments** which were changed in the **INSTALLS MENU** or **ADJUSTMENTS MENU** are returned to the **Factory Defaults** (as indicated in the Dot Display in the **ADJUSTMENTS MENU**). *Note: To perform a complete Factory Reset, GO TO THE RESETS MENU. Escape back to the UTILITIES MENU, select the "RESET" Icon, then select the "FACT" Icon in the RESETS MENU (review the end of this section, Reset Factory Settings).*



Enter Custom Message

To initiate, from the **UTILITIES MENU**, select the "ABCD CUST MSG" *Icon*. The **SET CUSTOM MESSAGE** (a short-cut for Standard Adjustment 41, **Custom Message**) provides an opportunity to have a text message appear in the the **Attract Mode**. Follow the on-screen prompts to complete [END].

Remember, use the **GREEN Button** to go [BACK], exit or escape, the **RED Buttons** to [< / -] MOVE LEFT / CHOOSE NEXT [+ / >] MOVE RIGHT / CHOOSE PREVIOUS, and the **BLACK Button** to [SELECT] as 'OK'.



Set Custom Pricing

To initiate, from the **UTILITIES MENU**, select the "PRIC" *Icon*. The **CUSTOM PRICING MENU** (a short-cut for Standard Adjustment 18, **Game Pricing**, and setting selected is **CUSTOM**) provides an opportunity to set **Custom Pricing**.

Note ! MONETARY AMOUNT MUST BE SELECTED FIRST! Press [BACK] to - DECREASE or [SELECT] to + INCREASE the [< \$ >] monetary amount (e.g. look at the right side of the display from \$0.25 to \$0.50). Press [< / -] to - DECREASE or [+ / >] to + INCREASE the credit quantity (e.g. look at the left side of the display from 0 CREDITS AT: to 1 CREDIT AT:).

IF EXAMPLE CUSTOM PRICING SETTING DESIRED IS :

1 Play for \$0.50, 3 Plays for \$1.00 and 7 Plays for \$2.00

THEN YOU WILL NEED TO PERFORM THE FOLLOWING :

REMINDER In these menus:

Press [BACK] to - DECREASE [< \$]

Press [SELECT] to + INCREASE [\$ >]

Step 1 The starting display appears as below if no prior **Custom Pricing** was installed.

```

CUSTOM PRICING
0 CREDITS AT:          $0.25
USE - / + TO CHANGE CREDITS
  
```

Step 2 Press [SELECT] to + INCREASE to \$0.50.
Press [+ / >] to + INCREASE to 1 CREDIT AT:

```

CUSTOM PRICING
1 CREDIT AT:          $0.50
1/0.50
USE - / + TO 'INSTALL'
  
```

Step 3 Press [SELECT] to + INCREASE to \$1.00.
Press [+ / >] to + INCREASE to 2 CREDITS AT:

```

CUSTOM PRICING
2 CREDITS AT:          $1.00
1/0.50 3/1.00
USE - / + TO CHANGE CREDITS
  
```

Step 4 Press [SELECT] to + INCREASE to \$2.00.
Press [+ / >] to + INCREASE to 4 CREDITS AT:

```

CUSTOM PRICING
4 CREDITS AT:          $2.00
1/0.50 3/1.00 7/2.00
USE - / + TO CHANGE CREDITS
  
```

Step 5 Press [SELECT] to + INCREASE the amount once (example = \$2.25).

```

CUSTOM PRICING
0 CREDITS AT:          $2.25
1/0.50 3/1.00 7/2.00
USE - / + TO 'INSTALL'
  
```

Press [< / -] once or press [+ / >] eleven times until **INSTALL** appears.

Step 6 Press [SELECT] to **INSTALL**.
Press [< / -] / [+ / >] or [BACK] to edit.

```

CUSTOM PRICING
INSTALL
1/0.50 3/1.00 7/2.00
PRESS 'SELECT' TO INSTALL
  
```

Step 7 Press [SELECT], press [BACK] twice to exit the **SERVICE MENU** with your **Custom Pricing** installed.

```

CUSTOM PRICING
INSTALLED
PRESS 'SELECT' TO CONTINUE
  
```

To correct or make new changes, reenter, which brings you to **Step 6**. Press [BACK] repeatedly until the monetary amount shown is the desired amount and then continue following the above steps with your new or corrected settings. If you are still having difficulty or if you have any questions, please call Technical Support 800-542-5377 or 708-345-7700, option 1.



Set Date / Time

To initiate, from the **UTILITIES MENU**, select the "TIME" *Icon*. The **SET TIME MENU** appears with the **MONTH** flashing. Setting the date and time is required for 'Data Dumps' and Tournament Start and End Dates. If the setting of Standard Adjustment 61, **Time Format**, is set to **12-HOUR** (*Factory Default*) the time will be expressed in the **AM / PM format**. If Standard Adjustment 61, **Time Format**, is set to **24-HOUR** the time will be expressed in the **24-hour format**.



Go To Resets Menu

To initiate, from the **UTILITIES MENU**, select the "RESET" *Icon*. The **RESETS MENU** provides six (6) functions to reset *only the Coin Audits*, reset *only the Game Audits*, reset *only the Grand Champion Score*, reset *only the High Score(s)*, reset *only the paid Credits* (includes *Service Credits*) or to reset **ALL DATA** back to the **Factory Default Settings**.



Reset Coin Audits

To initiate, from the **RESET MENU**, select the "COIN" *Icon*. ⚠ **ONLY the Coin Audits** [Earnings Audits 5–12], will be reset to zero (0), *Factory Default Settings*. Follow the on-screen prompts to perform the **Reset**.



Reset Game Audits

To initiate, from the **RESET MENU**, select the "AUD" *Icon*. ⚠ **ONLY the Game Audits** [Earnings Audits 1–4, Standard Audits 1–59 and Feature Audits 1–XX*], will be reset to zero (0), *Factory Default Settings*. Follow the on-screen prompts to perform the **Reset**. *varies per game title.



Reset Grand Champion (Score)

To initiate, from the **RESET MENU**, select the "GC" *Icon*. ⚠ **ONLY the Grand Champion Score** [adjustable via Standard Adjustment 31], will be reset to *Factory Default Setting*. Follow the on-screen prompts to perform the **Reset**.



Reset High Scores

To initiate, from the **RESET MENU**, select the "HSTD" *Icon*. ⚠ **ONLY the High Score(s)** [adjustable via Standard Adjustments 32–35], will be reset to *Factory Default Setting(s)*. Follow the on-screen prompts to perform the **Reset**. **Note:** *High Scores (but not Grand Champion Score) are reset automatically every 2,000 games (Factory Default Setting) [adjustable via Standard Adjustment 37, HSTD Reset Count]*.



Reset Credits

To initiate, from the **RESET MENU**, select the "CRED" *Icon*. ⚠ **ONLY the Credits** (includes *Service Credits*) [adjustable via Standard Adjustment 23, **Credit Limit**], will be reset to zero (0), *Factory Default Settings*. Follow the on-screen prompts to perform the **Reset**.



Reset Factory Settings

To initiate, from the **RESET MENU**, select the "FACT" *Icon*. ⚠ **ALL GAME DATA IS RESET!** (with the exception of *Earnings Audit 13, Software Meter*). **NOTE: IF YOU HAD SET-UP CUSTOM PRICING OR HAD CHANGED ANY ADJUSTMENTS OR PERFORMED INSTALLS, IT IS SUGGESTED TO WRITE DOWN YOUR CHANGES PRIOR TO THE FACTORY RESET.** Follow the on-screen prompts to perform the **Reset**.



Go To USB Menu

To initiate, from the **UTILITIES MENU**, select the "USB" *Icon*. The **USB MENU** provides three (3) functions to download game data, update your game code or backup your code onto a USB Memory Stick. *Review the inside cover for information on how to update your game code.*



Update Game Code

To initiate, from the **USB MENU**, select the "UPDT" *Icon*. Follow the on-screen prompts or review the inside cover for more information.



Backup to USB Memory Stick

To initiate, from the **USB MENU**, select the "BKUP" *Icon*. Follow the on-screen prompts to perform a **Backup** (game code only). This backup feature does not retain adjustments and/or settings changes made.



Dump Audits to USB

To initiate, from the **USB MENU**, select the "DUMP" *Icon*. Follow the on-screen prompts to perform a **Data Dump** (download).

Note: *If Icon is not present, access via the Audits Menu, see the Audits Section.*

Optional Kits available through your Distributor:

Pinball Location Maintenance Standard Kit (for AC/DC Premium Pinball) 502-6002-C7

Standard Kit includes : 8 oz. Novus Wax #2 Fine (Red) (675-0003-01), Cloth, Rubber Rings (used above playfield), Bulbs (Bulb quantities vary and is limited to 25 per type), Fuses (1/per type) and 4 Pinballs. **Note:** Quantities, sizes and contents subject to change without notice.

Pinball Location Maintenance Deluxe Kit (for AC/DC Premium Pinball) 502-6003-C7

Deluxe Kit includes : Pinball Location Maintenance Standard Kit as described above plus a quantity of Flipper Rebuild Kits. **Note:** Quantity varies which equals the same quantity of flippers used in this game.

▲ THIS GAME KIT INCLUDES (2) FLIPPER REBUILD KITS ▲

Plastics*Kit (for AC/DC Premium Pinball) 803-5000-C7

Plastics Kit includes: Plastic Sets (830-6125-XX)

Decals*Kit (for AC/DC Premium Pinball) 802-5000-C7

Decals Kit includes: Decal Set (820-7000-XX)

*Attention: No individual Plastic or Decal can be ordered separately, unless noted otherwise. Plastics & Decals are subject to change without notice during and / or after production. Key Fobs subject to availability and may or may not be included in the plastic set. All designs, shapes & pieces used subject to change without notice. Kit contents subject to change. Service Bulletin(s) will announce any critical changes, if warranted. The last 2-digits shown on plastics or decals are for reference only.

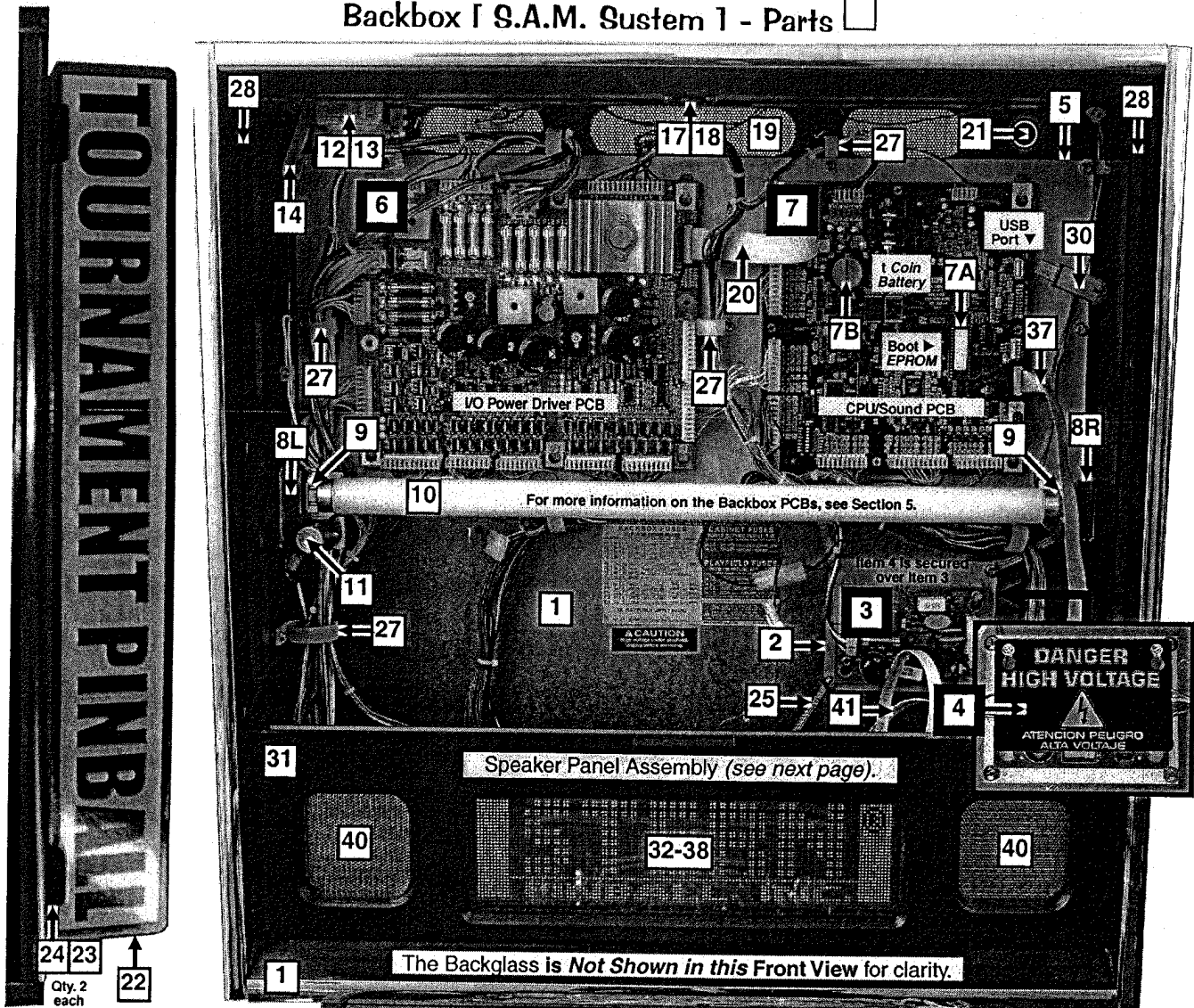
AC/DC L.T.B.R Parts available through your Distributor:

Leg Assy Gloss Red.....	500-5921-23
Start Button Assy.....	515-7791-00
Front Molding Weldment Glossy Red.....	515-8646-23
Glossy Red Left Side Armor.....	535-0530-20
Glossy Red Right Side Armor.....	535-0530-21
Pivot Pin Right Arm.....	530-7799-00
Pivot Pin Left Arm.....	530-7800-00
Pivot Hinge Left Glossy Red.....	535-7999-20-C7
Pivot Hinge Right Glossy Red.....	535-7999-21-C7
Mirrored Back Glass.....	830-52C7-03
Left Yellow Back Plate.....	535-0584-60
Right Yellow Back Plate.....	535-0584-61
Bottom Arch Plastic Red.....	545-5995-118

AC/DC Back In Black Parts available through your Distributor:

Leg Assy Glossy Black.....	500-5921-23
Start Button Assy.....	515-7791-00
Front Molding Weldment Glossy Black.....	515-8646-25
Glossy Black Left Side Armor.....	535-0530-00
Glossy Black Right Side Armor.....	535-0530-01
Pivot Hinge Left Glossy Black.....	535-7999-00-C7
Pivot Hinge Right Glossy Black.....	535-7999-01-C7
Mirrored Back Glass Back & Black.....	830-5207-02
Left Backing Plate.....	535-0528-00
Right Backing Plate.....	535-0528-01
Bottom Arch Plastic Red.....	545-5995-118

Backbox I S.A.M. Systeem 1 - Parts

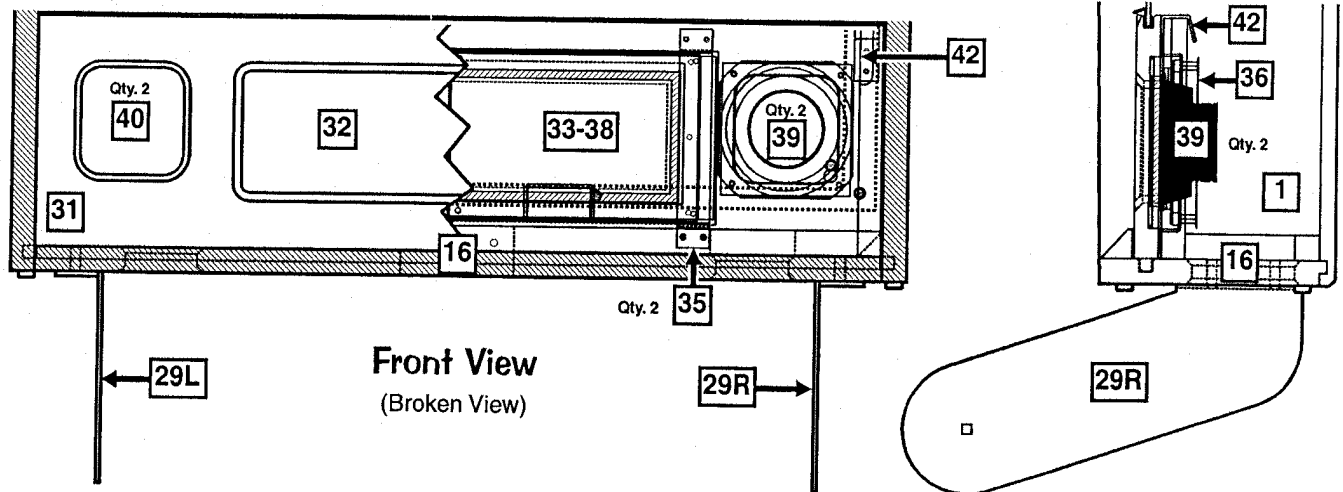


Parts Identification

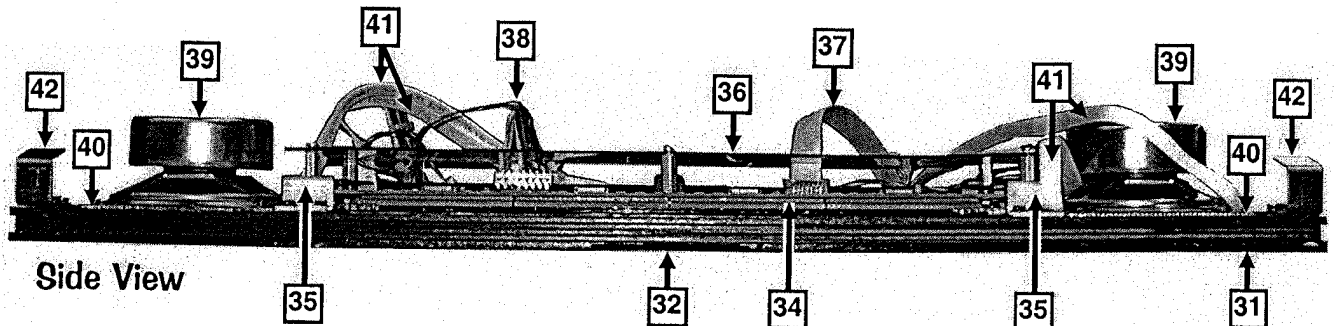
Nr.	BACKBOX PARTS	QTY.	SPI PART Nr.	Nr.	BACKBOX PARTS	QTY.	SPI PART Nr.
1	Backbox ACDC™ (No Parts)	1	525-5631-17-C7	11	Starter - Fluorescent (FS2 Light)	1	165-5011-01
Item 1 Note: Chrome T-Molding is installed and cannot be ordered separately. Fuse Description (820-6384-00) and High Voltage Caution (uL) (820-6082-01 & -02) Decals.				Starter Base (with leads) (on Item 8L) 1 077-5213-00			
2	PCB Metal Mounting Plate (Display)	1	535-9769-00	Item 11 is secured to Item 8L by: #4-40 X 1/2" PPH MS (Sems) Zc. (Qty. 2) (237-5813-00)			
3	Display Power Supply PCB	1	520-5138-00	12	Ballast Mounting Plate	1	535-8657-00
Item 3 is secured to @ bottom by: #8-32 X 3/8" SHWH Swg. (Zinc) (Qty. 2) (237-5975-00)				13	Ballast CU452-W 1/2" Core 120v 60 Hz 13W	1	010-5015-00
4	Plastic Cover (DANGER HIGH VOLTAGE)	1	830-6053-00	Items 12 & 13 are secured to Item 1 by: #8 X 1/2" SHWH AB (Zinc) (Qty. 2) (234-5101-00) >>> CAUTION - VERY HOT! Decal (820-6266-00) EU / UK Only : Ballast 5/8" Core 50/60 Hz (010-5015-01)			
Items 3 & 4 are secured to @ top by: 1-1/4" X 3/8" Plastic Spacer Gray (Qty. 2) (254-5000-05) and #8-32 X 1-3/4" SHWH Ser. (Zinc) (Qty. 2) (237-5975-28)				14	Ground Strap (5')	1	600-5006-05
5	PCB Metal Mounting Plate [I/O+CPU]	1	535-9664-00	15*	Roto Lock Male (on Cabinet)	1	355-5006-01
Items 2 & 5 are secured to Item 1 by: #8 X 1/2" SHWH AB (Zinc) (Qty. 1/hole) (234-5101-00) and #10 Washer 7/32" I.D. X .5" O.D. X 1/16" Thick (Qty. 1/hole) (242-5003-00) Note: Where a Wire Clamp (Item 27) is mounted, a #10 Washer is not required.				16	Roto Lock Female (R2-0002-02)	1	355-5006-02
6	I/O Power Driver LED	1	520-5317-00	Item 16 is secured by: #10-24 X 1-3/4" CBSN (231-5022-00), #10-24 Keps Nut (Qty. 2) (240-5207-00), #10-24 X 2" CBSN (231-5045-00) and #10 Washer 7/32" I.D. X .5" O.D. X 1/16" (Qty. 5) (242-5003-00). See opposite next page.			
7	CPU/Sound PCB LE GAMES NEW USB	1	520-5337-00	17	Lock Mounting Plate	1	535-0072-00
7A: 8MB EPROM #M27C801-100F1 (960-5016-00) Ordering Note: Programmed EPROM (965-B00T-SAM) 7B: Coin Cell Battery (CR2430 3V) (000-0644-01) For USB Memory Stick Information, see Item 30 on the next page.				18	Lock 5/8" Barrel, 3/4"ø, 1.5" Flat Cam	1	355-5055-00
Items 6 & 7 are secured to Item 5 by: #8-32 X 3/8" SHWH Swage (Zinc) (Qty. 10) (237-5975-00) and 1/4" Sil. Rtn. Spacer White (Qty. 5 [I/O] / Qty. 4 [CPU]) (254-5007-05)				Items 17 & 18 are secured by: #8 X 1/2" TP Torx T20 Black (Qty. 2) (237-6173-05)			
8L	Fluorescent Light Bracket (Left Style)	1	535-7739-00	19	Back Vent Grill 2-1/2" X 18"	3	545-5072-02
8R	Fluorescent Light Brckt. (Right Style)	1	535-7739-01	20	Ribbon Cable, 20-Pin (3.5")	1	036-5000-350
Items 8L & 8R are secured to Item 1 by: #10-24 X 1-1/4" Carriage Bolt Square Neck (Qty. 2/per) (231-5012-00), #10-24 Keps Nut (Qty. 2/per) (240-5207-00) and 3/4" X 3" Reinforced Strapping Tape (Qty. 1, sold in 12' length only) (626-5040-00)				Item 20 connects the I/O Pwr. Dvr. PCB to the CPU/Sound PCB. For 14-Pin see next page.			
9	Fluorescent Lamp Holder (Socket)	2	077-5214-01	21	Button Hole Plug (Blk) (Happ #52-6214-00)	1	500-6566-00
Item 9 is secured to Items 8L and 8R by: #6-32 X 5/8" PPH MS (Sems) Zinc (Qty. 1/per) (232-5203-00) Lock-In Fluor. Bulb with Yellow Socket Clip (Qty. 1/per) (545-6271-00)				Item 21 plugs the Access Hole required if using optional BETArite Sign or Data cables.			
10	Fluorescent Tube 24" (F18T8CW)	1	165-5061-00	22	Header Sign TOURNAMENT PINBALL	1	545-6133-00
				23	Bracket, Tournament Sign (Black)	2	535-0081-02
				Item 22 is mounted to Item 23 with #8-32 X 3/8" PPA screw (Qty. 2/per) (232-5303-01) & #8-32 Nylock Nut (Qty. 2/per) (240-5102-00). Item 23 is secured to Item 1 by: #8 X 5/8" PPH (Qty. 2/per) (232-5101-01)			

PARTS TABLE & VIEWS CONTINUED ON THE NEXT PAGE. ▶

Backbox [S.A.M. System] - Parts ☐



Speaker Panel [S.A.M. System] - Parts ☐



Nr.	BACKBOX PARTS	QTY.	SPI PART Nr.	Nr.	SPEAKER PANEL PARTS	QTY.	SPI PART Nr.
1 PARTS TABLE & VIEWS CONTINUED FROM THE PREVIOUS PAGE.							
25	Braided Wire (1-1/2 Feet)	1	600-5001-00	31	Speaker Panel (Black Wood)	1	525-5515-00
Item 25 is secured by: Staple 5/16" (Qty. 23) (631-5000-00)				32	Plastic Shield (Display Front Cover)	1	545-5884-00
26*	Zip Cable Tie (Screw Down Style)	4	040-5005-00	Item 33 is secured to inside Item 31 by: #6 X 3/8" SHWH AB (Zinc) (Qty. 8) (234-5000-00)			
Item 26 is secured @ inside bot. by: #8 X 1/2" SHWH AB (Zinc) (Qty. 1/per) (234-5101-00)				33*	Foam 3/16" Thick X 1/4" Wide X 12"	6	626-5026-00
27	Clamps [Multiple Sizes]	31	040-5000-XX	Above Item 33 is self-adhesive. Located between Items 32-34. Sold in 12" Lengths only.			
Item 27 secured by: #8 X 1/2" SHWH AB (Zinc) (Qty. 1/per) (234-5101-00) For the following sizes, replace -XX with: 1/4" Double = -23 (Qty. 5); 1/2" Single = -06 (Qty. 3); 3/4" Single = -08 (Qty. 4); 1" Single = -09 (Qty. 1); 1-1/4" Double = -30 (Qty. 1)				34	128 X 32 Dot Matrix Display PCB	1	520-5052-15
28	Foam 3/16" Thick X 1/4" Wide X 12"	6	626-5026-00	// EURO ONLY RoHS // 128 X 32 DM PCB			
Above Item 28 is self-adhesive. 17.5" strip on each side. Sold in 12" Lengths only.				// EURO ONLY RoHS // Dot Matrix Bezel			
29L	Pivot Hinge Red (Left Style)	1	535-7999-22	Item 34 is secured to Item 35 by (at corners): 3/16" X 3/8" Spacer Gray (Qty. 4) (254-5000-18) and #6-32 X 1/2" SHWH Swags (Serr) Zinc (Qty. 4) (237-5976-03)			
29R	Pivot Hinge Red (Right Style)	1	535-7999-23	35	Dot Matrix Display Mounting Bracket	2	535-8368-01
Items 29L-29R are 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)				Item 35 is secured to Item 31 by: #8 X 1/2" SHWH AB (Zinc) (Qty. 4/per) (234-5101-00)			
Items 29L-29R are secured to Cabinet by: Spacer Hex Nut 1/2" O.D. - 1/4-20 X 1/2" TD (Black) (Qty. 1/per) (254-5042-00), Nylon Spacer (Black) (Qty. 1/per) (242-5084-00), 1/4-20 X 1/2" Carriage Bolt Square Neck (Black) (Qty. 1/per) (231-5072-00) and Washer 1" O.D. X 1/2" I.D. X 1/16" (Black) (Qty. 1/per side, only if required) (242-5087-00)				36	Plastic Shield (Display Back Cover)	1	830-6040-00
30*	Memory Stick USB 1.1+ [Generic] 64MB	970-0064-00		Item 36 is secured to Item 34 by: 1/2" X 1/4" Hex Spacer #6-32 Tap (Qty. 4) (254-5008-03), 3/4" X 1/4" Hex Spacer #6-32 Tap (Qty. 2) (254-5008-04), #6-32 X 1/4" PPH MS (Serr) Zinc (Qty. 2) (232-5200-00) and #6-32 X 3/8" PPH (Qty. 6) (232-5201-00)			
	Memory Stick USB 1.1+ [Generic] 128MB	970-0128-00		37	Ribbon Cable, 14-Pin (33")	1	036-5260-33
Item 30 was not included with your game. Read the inside cover or go on-line for more info. To order with the latest game code copied onto it, add: A3 to the Part Nr. (970-0128-00-A3). File(s) can be downloaded from our website (Files are 25MB or larger, DSL or Fast Modem recommended). Not all manufacturers of Memory Sticks are compatible with our system. Test it out, if it doesn't work properly, return your purchase and order the memory stick through you local pinball distributor (Stern Pinball Memory Sticks guaranteed compatible).				// EURO ONLY RoHS // LED Ribbon Cable Filter PCB			
(ASM. REF. 505-6002-A3-A3, Items 1-42 Only; [29-30 not included in assembly])				Item 37 (14-Pin) connects the 128 X 32 Dot Matrix Display PCB to the CPU/Sound PCB.			
				38	Display Cable (Wiring Harness)	1	036-5454-01
				// EURO ONLY RoHS // LED Display Adapter Harness			
				39	Speaker (Shld.) 4 x 4" 8Ω OHM MG	2	031-5004-02
				40	Speaker Grill (Chrome w/Artwork)	2	535-8081-04
				Items 39-40 are secured by: #8 X 1/2" SHWH AB (Black) (Qty. 4/per) (234-5101-01)			
				41	Ground Strap (25") [2 per : Items 35 & 39]	4	600-5006-25
				42	Speaker Panel Hook Bracket	2	535-7009-02
				Item 42 is secured by: #8 X 1/2" SHWH AB (Zinc) (Qty. 2/per) (234-5101-00)			

Take Note:

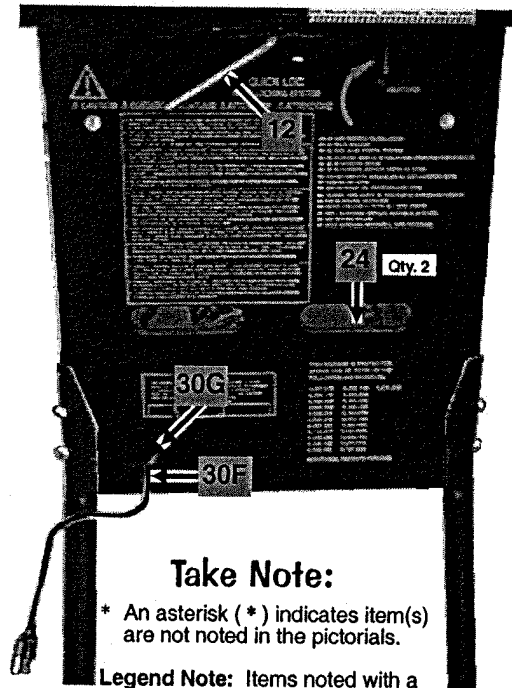
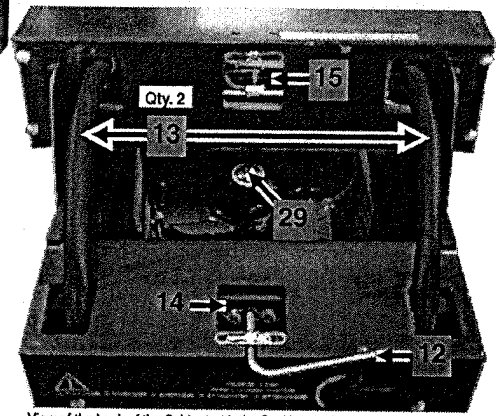
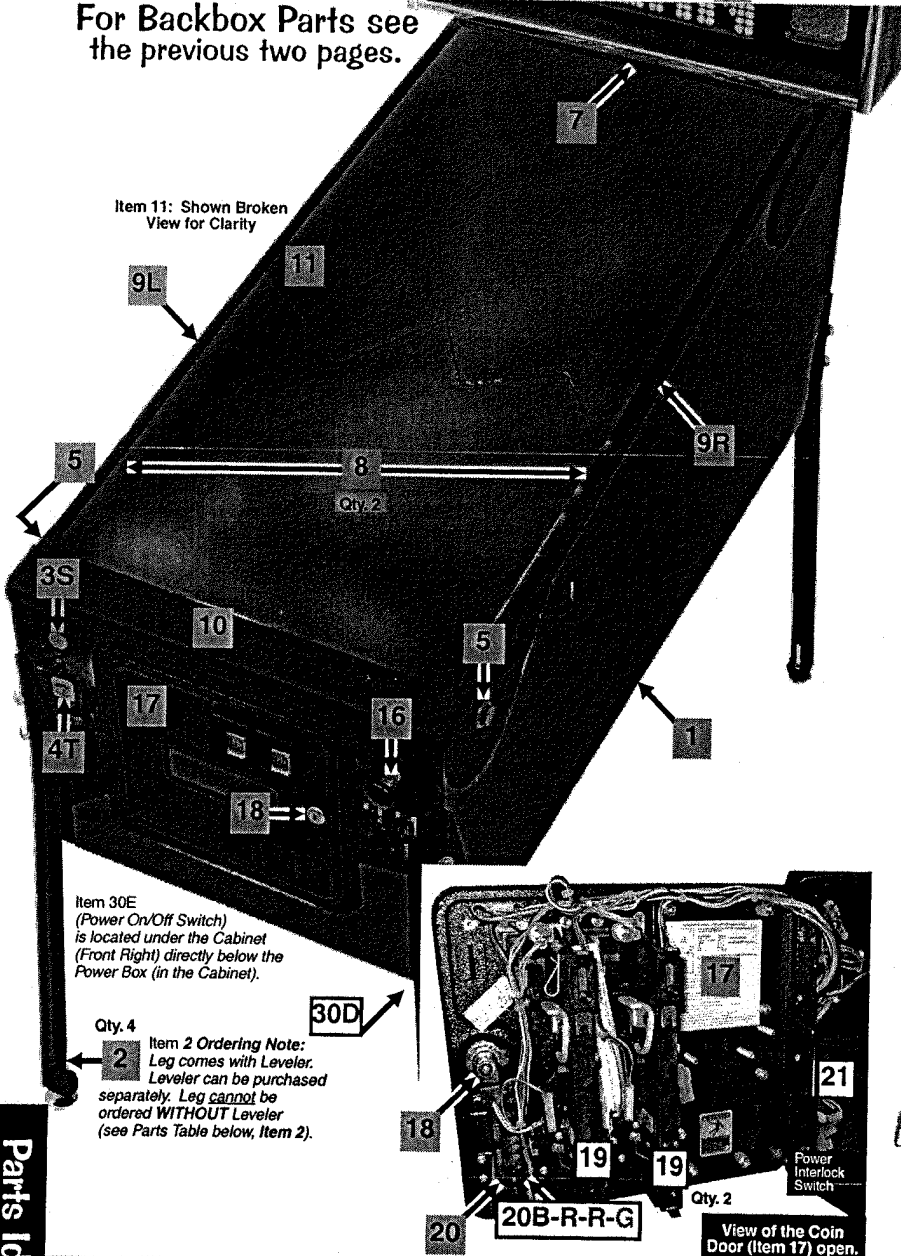
* An asterisk (*) indicates item(s) are not noted in the pictorials.

Nr.	BACKGLASS PARTS	QTY.	SPI PART Nr.	Nr.	BACKGLASS PARTS	QTY.	SPI PART Nr.
i*	Glass (Tempered) 25.906" X 19.187" X .125"	1	660-5038-02	iv*	Bottom Plastic Lift Channel - 26"	1	545-6313-01
ii*	ACDC™ Film Art (#C7) (PRE)	1	830-52C7-00	v*	Plastic Edging (Left/Right) - 18-1/8"	2	545-5018-14
iii*	Top Plastic Channel - 26"	1	545-5018-15	Items i-v are secured to Item 1 by: 3M Tape (Double-Sided), 12" (Qty. 1) (626-5080-00)			
				Note: Only 6" required, sold in 12" lengths only.			

(ASM. REF. 515-5450-00-A9, Items i-v)

Cabinet - Parts ■ & Switches □

For Backbox Parts see the previous two pages.



Parts Identification

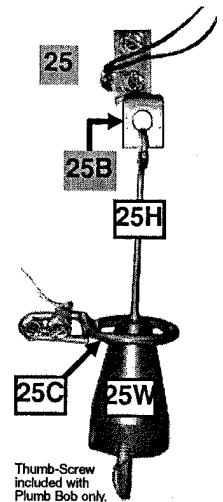
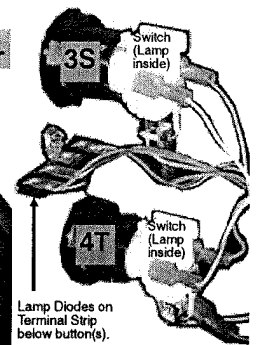
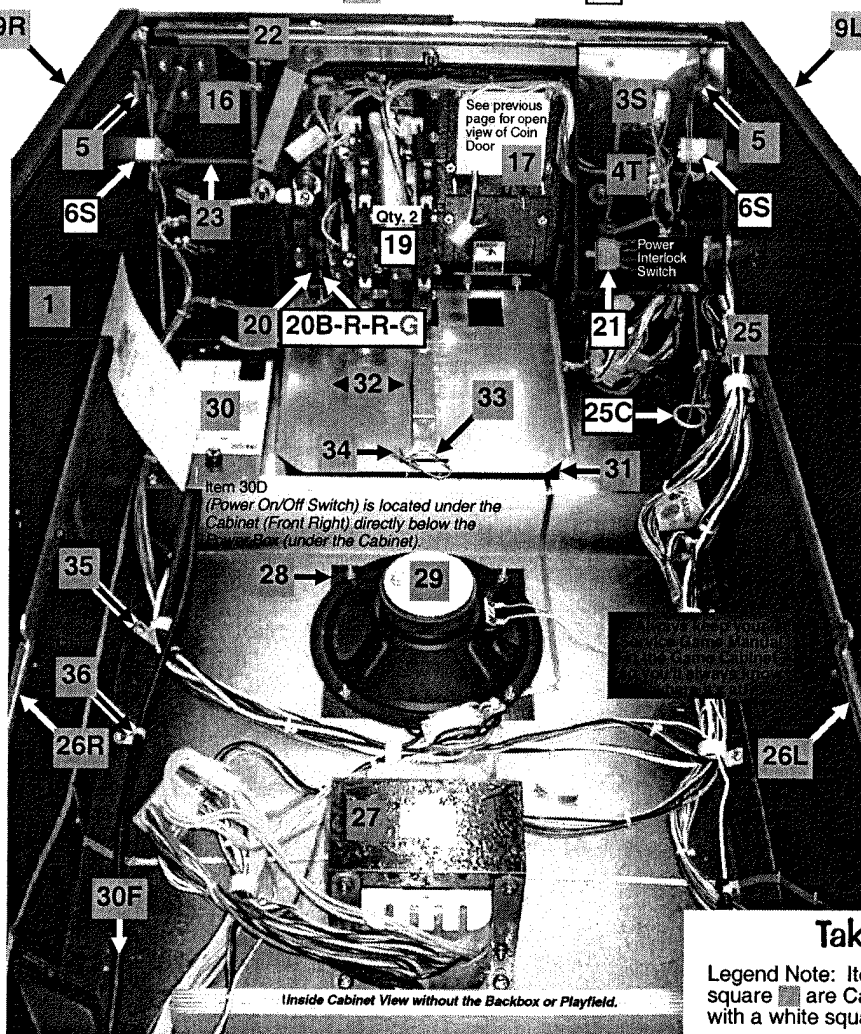
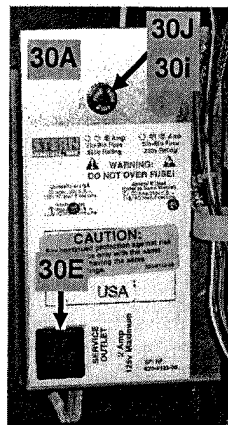
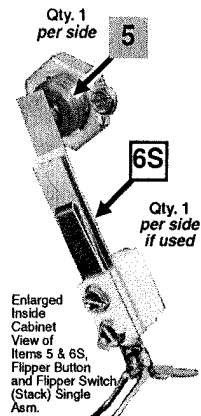
Nr.	CAB. PARTS & SWITCHES	QTY.	SPI PART Nr.
1	Screened Cabinet AGDC™ (No Parts)		525-5395-15P-C7
2	Red Glossy Leg with Leveler Asm	4	500-5921-23
Item 2 is secured by: Leg Bolt Back Plate (535-5703-00) and Leg Bolt 3/8" X 16 X 2-1/2" Hex 5/8" Hd. (2/per) (231-5001-01) Leg Leveler ONLY (3/8"-16 X 3") (500-5017-00).			
3S	Start Button (Green Round) with Sw. + Led	1	500-6388-44-LED
4T	Tournament Button (Yel. Sq.), w/Sw. + Led		500-6587-06-LED
Item 3S & 4T includes the Switch & Lamp (No Wiring; desolder old wiring where required). Switch or Bulb replacement: ⚠ TWIST ⚠ LOCK (-TL) >> not snap-in << Assembly Parts Included: Microswitch (180-5174-00); Led Hi Int White 106W-WB (112-5024-08); If 4T is not desired, use optional Button Plug Black (500-6566-00). Requires 3-Lug Terminal Strip (055-5204-03) and Diodes, 1N4004 (Qty. 2) (112-5003-00) inside cabinet under button(s) for Lamp Operation (Diode for Switch, located on Switch).			
5	Flipper Button (Yellow) Assy (No Sw.)	2	500-5026-36
Item 5 is secured by: Pal Nut for Flipper Button (Metal) (Qty. 2/per) (240-5003-01) Pal Nut inside cabinet secured by: #8 X 1/2" SHWH AB (Zinc) (Qty. 1/per) (234-5101-00) and Washer (Zinc) .187" ID X .875" OD X .048" Thick (Qty. 1/per) (242-5059-00)			
6S	Flipper Switch Single Assembly		500-6889-01
Assembly Parts Included: Flipper Switch Stack Single (Paliney Contact) (180-5160-01) and Capacitor - Ceramic .05 Mfd 25 volt (130-5001-00)			
Item 6S/6D are secured to Cab. by: #6 X 1-1/4 SHWH AB (Zinc) (Qty. 2/per) (237-5959-00)			
6D	Flipper Switch Double Assembly	2	500-6890-01

Assembly Parts Included: Flipper Switch Stack Double (Paliney Contact) (180-5164-01) and Capacitor - Ceramic .05 Mfd 25 volt (130-5001-00)

Item 6S/6D are secured to Cab. by: #6 X 1-1/4 SHWH AB (Zinc) (Qty. 2/per) (237-5959-00)

Nr.	CAB. PARTS & SWITCHES	QTY.	SPI PART Nr.
7	Rear Glass Channel 20-3/8" Length	1	545-5038-00
8	Plastic Channel 42-5/8" Lg. (Left/Rt.)	2	545-5017-00
9L	Side Armor (Left) Glossy Red	1	535-0585-20
9R	Side Armor (Right) Glossy Red	1	535-0585-21
Items 9L & 9R are secured @ front & side by: Perm Stud 1/4 X 1" Flange Head Black (Qty. 1/per) (237-6116-01); 1/4-20 Flange Nut (Qty. 1/per) (240-5300-00) and #8 X 1/2" T20 Tamper Proof Black (Qty. 5/per) (237-6173-05); @ rear (backbox) by: #10-24 X 1" Sq. Neck Carrg. Bolt Black (Qty. 1/per) (231-5021-00) and #10-24 Hex Nut (Qty. 1/per) (240-5202-00)			
10	Front Molding (Glossy Red) < BUTTON HOLE >	1	515-8646-23
Item 10 includes: Self-Adhesive Foam Rubber 3/8" X 3/16" X 20-3/8" (3") (626-5001-00) Items 10 works with Item 22 (next page) ONLY.			
11	Playfield Glass (Tempered) 21" X 43" X 3/16"	1	660-5001-00
12	Hex Key Allen Wrench 5/16"	1	777-0001-00
13	Corrugated Tubing Black 1" x 2.6' Lg.	1	605-5008-03
Above Item 13 covers the Cable Wiring Harnesses going into the Backbox from the Cabinet.			
14	Roto Lock Male (R2-0055-02)	1	355-5006-01
Item 14 is secured by: #10-24 X 1-3/4" Carriage Bolt Square Neck (Qty. 2) (231-5022-00), #10-24 Nylon Stop Nut (Qty. 2) (240-5206-00) and #10 Washer 7/32" ID X 1/2" OD X 1/16" Thick (Qty. 2) (242-5003-00)			

Cabinet - Parts & Switches Continued



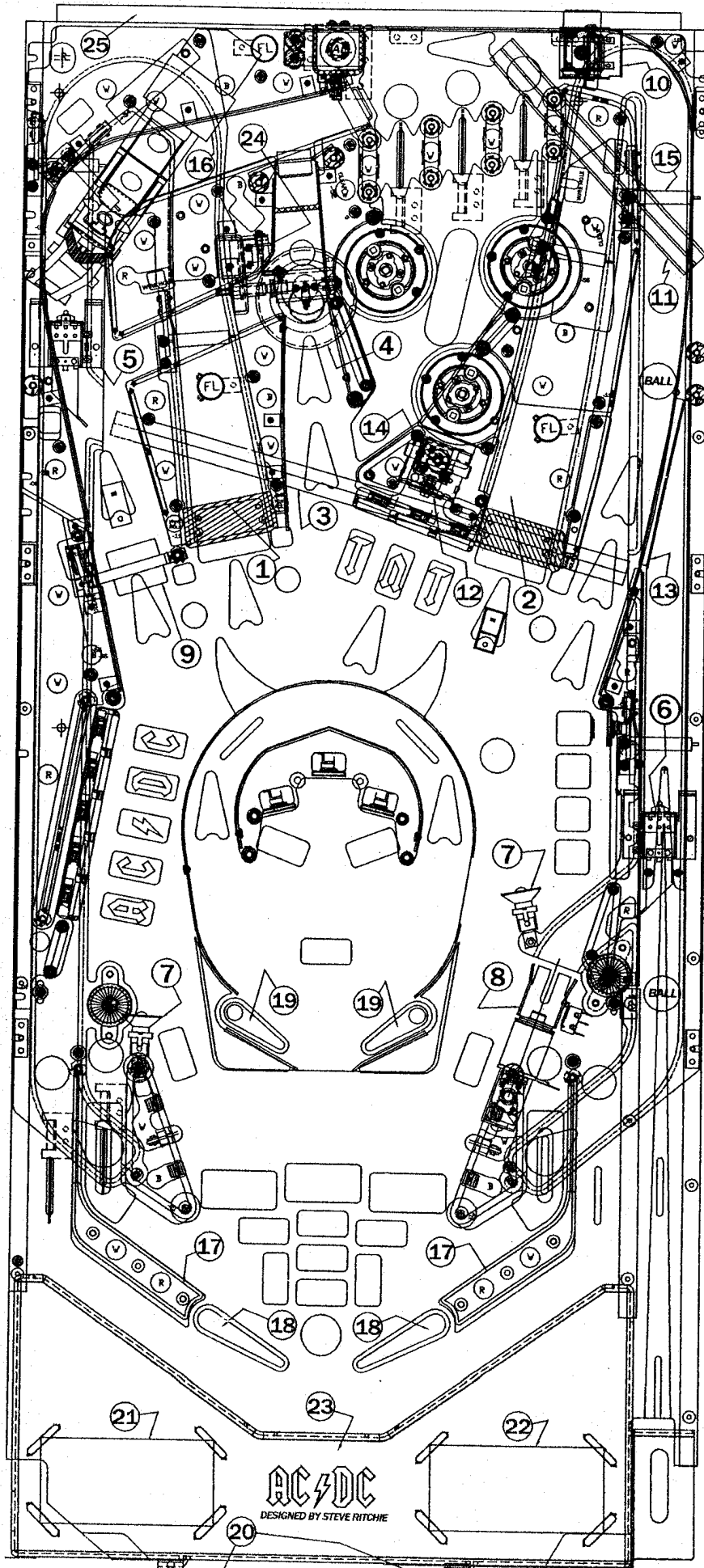
Take Note:

Legend Note: Items noted with a cyan square ■ are Cabinet Parts. Items noted with a white square □ are Switches.

Nr.	CAB. PARTS & SWITCHES	QTY.	SPI PART Nr.
† PARTS TABLE & VIEWS CONTINUED FROM THE PREVIOUS PAGE.			
17	Coin Door 2-Cht \$V Up-Stk. 4-Button Bracket	1	501-5018-172
Item 17 is secured by: 1/4"-20 X 1-1/4" Carriage Bolt Square Neck (Qty. 4) (231-5003-00) 1/4"-20 Flange Nut (Qty. 4) (240-5300-00) and Fend Washer 1/4" I.D. X 1" O.D. (Qty. 3) (242-5009-00) Note: For Coin Door other than USA call Technical Support for SPI Part Nr.			
18	Lock 5/8" Barrel, 3/4, Flt. Cam	1	355-5055-00
19	Coin Door Switch (USA) (Happ)	2	180-5024-01
ALT. SW.: 19C: Coin Door Switch (USA) (Coin Control) (180-5024-00) ALT. SW.: 19J: Coin Door Switch (Japan) (180-5091-00)			
20	4-Button Bracket (for Service Menu Buttons)	1	535-6860-04
SWITCH: 20B: Push-Button Service Switch (Black) (180-5192-00) SWITCH: 20R: Push-Button Service Switch (Red) (Qty. 2) (180-5192-02) SWITCH: 20G: Push-Button Service Switch (Green) (180-5192-04)			
Ordering Note: Securing hardware for switches included. Decal in kit sold separately.			
21	Power Interlock-Memory Protect Switch Asm.	1	500-5808-05
Assembly Parts Included: Mounting Bracket (535-9794-00), Power Interlock (Playfield) Switch (180-5136-00) and secured by: #8 X 1/2" SHWH AB (Zinc) (Qty. 2) (234-5101-00)			
22	Front Molding Lockdown Asm.	1	500-7237-00
Item 22 is secured by: #10-24 X 1-1/4" Carr. Bolt (Qty. 2) (231-5012-00) and #10-24 Keps Nut (Qty. 2) (240-5207-00)			
23	Lockdown Spring (connected to handle)	1	265-5008-00
Item 23 is secured by: #8 X 1/2" SHWH AB (Zinc) (Qty. 1) (234-5101-00) and #10 Washer, 7/32" ID X 1/2" OD X 1/16" Thick (Qty. 1) (242-5003-00)			
24	Grills 2-1/2" X 18" (on Back & Bottom)	3	545-5072-02
Plumb Bob Tilt Switch Individual Parts Only Ind. Parts Only			
25	SWITCH: 25B: Bracket for Hanger Wire (535-5221-00) 25C: Contact Wire Form (535-7563-01) 25H: Hanger Wire (535-5319-02) 25W: Plumb Bob Weight (535-5029-00) (includes Thumb-Screw)		
Item 25B is secured to Cabinet by: #6 X 5/8" SHWH AB (Zinc) (Qty. 4) (234-5002-00)			
26L	Slide & Pivot Support Bracket (Left)	1	535-5989-00
26R	Slide & Pivot Support Bracket (Right)	1	535-5990-00
Items 26L & 26R are secured by: #10-24 X 1-1/4" Carriage Bolt Square Neck Black (3/per) (231-5012-00) and #10-24 KEPS Nut (3/per) (240-5207-00)			

Nr.	CAB. PARTS & SWITCHES	QTY.	SPI PART Nr.
27	Transformer 5.7VAC (with Ballast Winding)	1	010-5012-01
Item 27 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)			
28	Woofers (Speaker) Grill 12" X 12"		535-0547-00
29	Woofers 12" ø Round 8Ω	1	031-5009-00
Items 28 & 29 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)			
Power Input Box Asm. + Univ. Cable			
30A: Power Box (No Parts) Mounting Frame (535-5932-00) 30B*: Line Filter (150-5000-00) 30C*: Varistor TNR159211KM (Domestic) (150-5001-00) or Varistor TRM15G431KM (Euro) (150-5002-00) SWITCH: 30D: On/Off Rocker Switch + Bracket Assembly (515-7085-00) 30D incl.: Switch, APEM R2101C5NBB (180-5001-03) + Bracket (535-8318-00) 30E: Service Outlet (3-Prong / US) (180-5008-01) / International N/A 30F: Line Cord 10' ROJ 3" + Ring Terminal Asm. (515-6566-00) 30G: Recessed (Black) Cup (rear of Cabinet) (545-5122-00) 30H*: Snap Bushing 9/16" (White) (280-5001-01) 30I: Fuse 8 Amp 250V Slo-Blo (Domestic) (200-5000-05) or Fuse 5 Amp 250V Slo-Blo (International) (Qty. 2) (200-5003-00) 30J: Fuse Holder (205-5001-00)			
Universal Cable & Jumper Caps (all voltage variations): See the Yellow Pages, Page y 10.			
31	Cash Box Plastic Bottom	1	545-5090-00
32	Cash Box Cover (Validator)	1	535-5013-03
33	Cash Box Lock Bracket (U-Wire)	1	535-7562-00
Item 33 is secured by: #8 X 5/8" HWH AB (Green) (Qty. 2) (234-5102-04)			
34	Large Hair-Pin Clip	1	535-7772-00
35	Clamps (Multiple Sizes)	31	040-5000-XX
Item 35 is secured to Item 1 by: #8 X 1/2" SHWH AB (Zinc) (Qty. 1/per) (234-5101-00) For following sizes, replace XX with: 3/4" Single = -08 (Qty. 9); 1-1/2" Single = -10 (Qty. 3)			
36	Zip Cable Tie (Screw Down Style)	4	040-5005-00
Item 36 is secured by: #8 X 1/2" SHWH AB (Zinc) (Qty. 1/per) (234-5101-00)			
37†	Meter +12VDC with Bracket Optional	opt.	G-0053-013-102
† Meters (Diode included) are optional and were not included in this Pinball Machine. Order without the bracket use G-0053-013-102A. More information or Qs? Call Technical Support.			

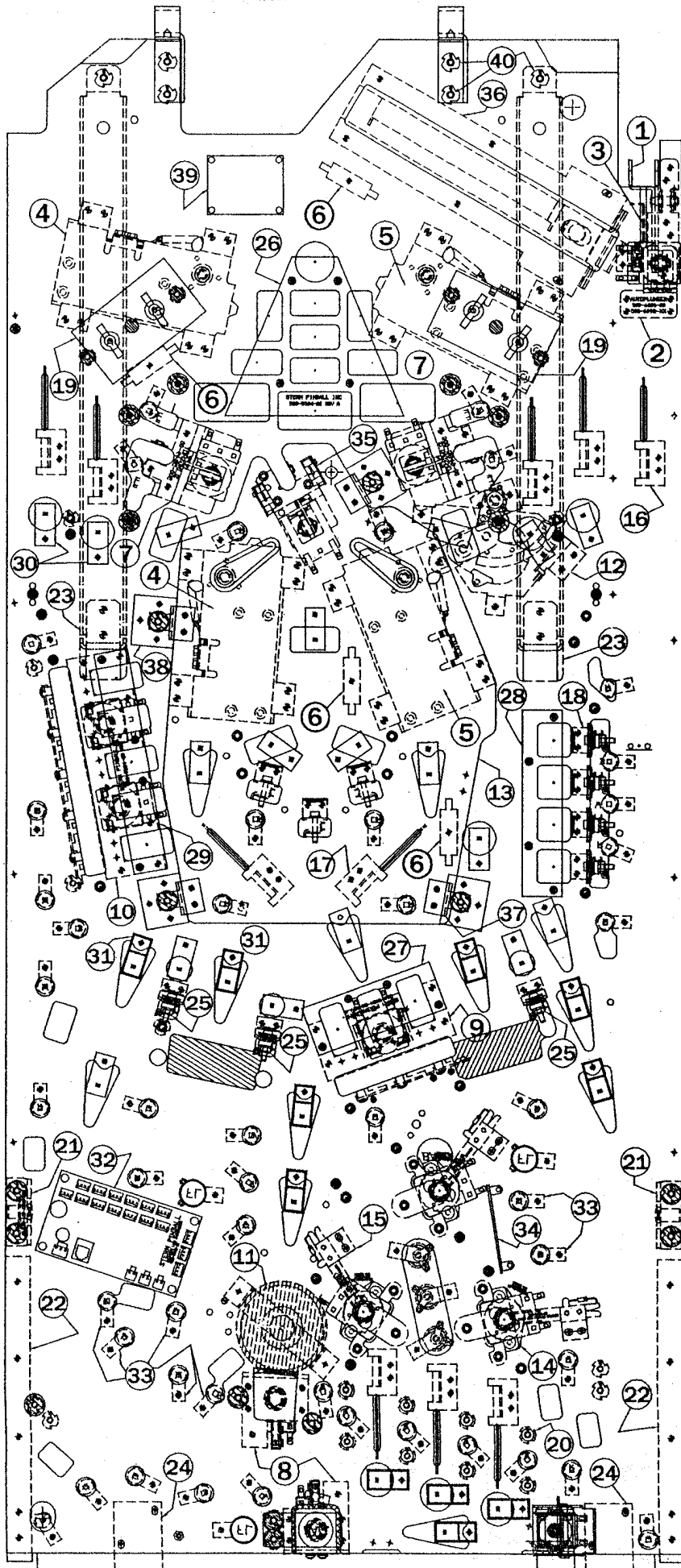
Main Playfield Top Parts



Main Playfield Top Parts

PART NAME	QTY	PART NUMBER
1.) LEFT RAMP ASSEMBLY	1	511-7208-00
2.) RIGHT RAMP ASSEMBLY	1	511-7209-00
3.) CROSSOVER TRACK	1	535-0509-00
4.) HELLS BELL ASSEMBLY	1	500-7218-00
5.) LEFT DIVERTER ASSEMBLY	1	515-6596-00-GE
6.) RIGHT DIVERTER ASSEMBLY	1	515-6596-01-GE
7.) SPOTLIGHT REFLECTOR	2	511-6949-02
8.) ROTATING CANNON ASSEMBLY	1	500-7214-00
9.) SPINNING TARGET	1	500-7242-C7
10.) ELECTRIC BALL GATE	1	511-5096-01
11.) ANIMATED BAND ASSEMBLY	1	500-7240-00
12.) DETONATOR SLAM TARGET	1	511-7003-02
13.) SHOOTER RAMP	1	535-9051-00
14.) ANIMATED DETONATOR	1	500-7225-00
15.) ROLLUNDER SWITCH	6	515-6556-03A
16.) MOLDED TRAIN TOY	1	511-6987-00
17.) RETURN GUIDE CLEAR	2	550-5037-01
18.) FLIPPER BAT YELLOW	2	515-5133-06-06
19.) SMALL FLIPPER BAT YELLOW	2	515-6275-06
20.) PLAYFIELD HANGER BRACKET	2	535-8385-00
21.) INSTRUCTION CARD	1	755-51C7-12-Y
22.) COIN CARD	1	755-5400-02-Y
23.) PLASTIC ARCH RED	1	545-7307-02
24.) BELL OPTO SWITCH	1	520-5292-00
25.) BACK PANEL ASSEMBLY	1	500-7207-00

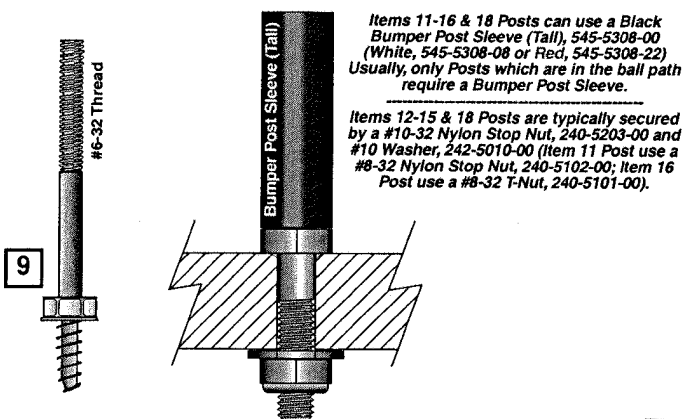
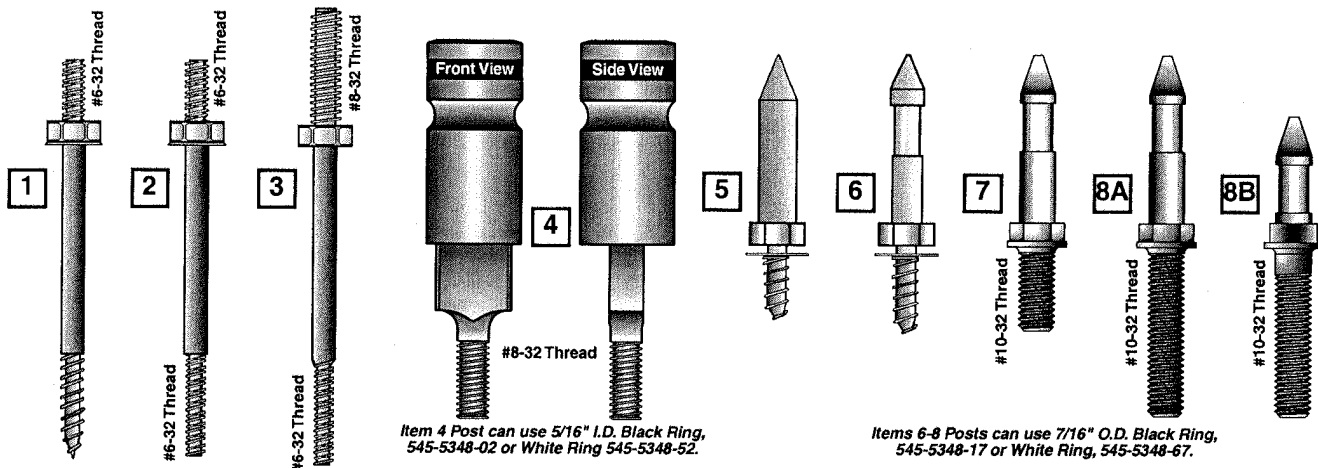
Main Playfield Bottom Parts



Main Playfield Bottom Parts

1.) AUTOPLUNGER ARM WELD ASSEMBLY	1	500-6091-00
2.) AUTOPLUNGER COIL ASSEMBLY	1	500-6092-02-ND
3.) SHOOTER LANE SWITCH ASSEMBLY	1	500-6096-00
4.) FLIPPER ASSEMBLY (LEFT)	2	500-6543-12-ND
5.) FLIPPER ASSEMBLY (RIGHT)	2	500-6543-XX-ND
6.) FUSE CLIP HOLDER SOCKET	4	205-5000-01
USE 200-5000-08 3AMP SLO BLOW FUSE	4	
7.) SLINGSHOT ASSEMBLY	2	500-5849-01-ND
8.) VUK/POSI-LOCK ASSEMBLY	2	500-7078-01
9.) 3-BANK DROP TARGET ASSEMBLY	1	500-7216-03
10.) 5-BANK DROP TARGET ASSEMBLY	1	500-7216-05
11.) BELL MAGNET ASSEMBLY	1	516-0059-00
12.) CANNON MOTOR ASSEMBLY	1	500-7213-00
13.) LOWER PLAYFIELD	1	500-5022-00
14.) POP BUMPER BOTTOM ASSEMBLY	3	515-6459-04-ND
15.) POP BUMPER SWITCH ASSEMBLY	3	515-6459-09
16.) ROLLOVER SWITCH ASSEMBLY (LEFT)	4	500-6227-03
17.) ROLLOVER SWITCH ASSEMBLY (RIGHT)	6	500-6227-04
18.) STAND UP TARGET ASSEMBLY 1" SQUARE	4	500-6984-06
19.) FLIPPER BASE INSULATOR	2	545-5721-00
20.) 6-32 T-NUT	30	240-5002-00
21.) PIVOT SLIDE BRACKET ASSEMBLY	2	500-5329-03
22.) EDGE SLIDE BRACKET	2	535-5988-01
23.) PLAYFIELD SUPPORT SLIDE BRACKET	2	535-6862-05
24.) BACK PANEL MOUNTING BRACKET	2	535-8964-00
25.) STAND UP TARGET ASSEMBLY 1/2"	3	500-6985-05
26.) LED LAMP PCB LOWER CENTER AREA	1	520-5324-01
27.) LED LAMP PCB 3-BANK	1	520-5324-03
28.) LED LAMP PCB "ROCK" TRAGETS	1	520-5324-04
29.) LED LAMP PCB 5-BANK	1	520-5324-05
30.) LED LAMP PCB SINGLE	14	520-5307-00
31.) LED LAMP PCB MULTICOLOR	16	520-5333-00
32.) LED GI DRIVER PCB	1	520-5331-00
33.) SOCKET WEDGE BASE GI	52	077-5030-00
34.) TERMINAL STRIP 5 POSITION	1	055-5204-05
35.) LOWER PLAYFIELD KICKER ARM ASSEMBLY	1	500-7217-00
36.) 4 BALL TROUGH ASSEMBLY	1	500-6318-14-ND
37.) LOWER PLAYFIELD HANGER BRACKET	4	535-0527-00
38.) LOWER PLAYFIELD MOUNTING BLOCK	4	511-6976-00
39.) OPTO SWITCH PCB	1	520-5239-01
40.) 8-32 T-NUT	24	240-5101-00

Playfield - Metal Posts & Fin Shank Screws (Actual Size) †

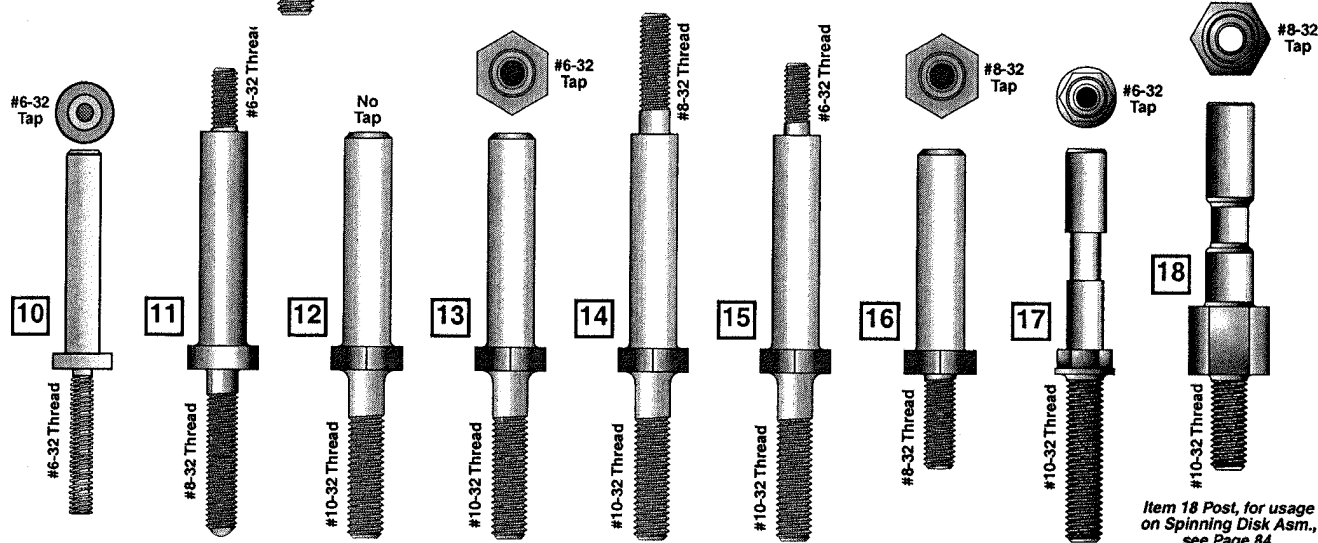
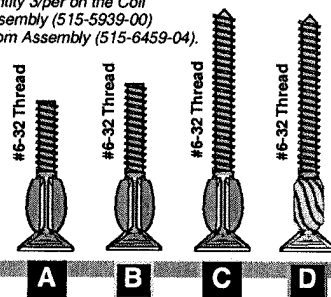


A & B Items A & B Note: Typically used to secure Hex Spacers onto the Playfield Wood or Back Panel.

C Item C Note: Quantity 4 on bottom Cabinet Speaker Grill (Qty. 4) (also requires #6-32 Nylon Stop Nut, 240-5005-00).

D Item D Note: Quantity 3/per on the Coil Bracket Welded Assembly (515-5939-00) in the Bumper Bottom Assembly (515-6459-04).

A-D Items A-D Note: The "Fins" keep the screw from turning inside the wood hole.



Parts Identification

Nr.	METAL POSTS	SPI PART Nr.	Nr.	METAL POSTS	SPI PART Nr.
1	Post [Fasten] #6-32 Thread // Wood Screw	530-5010-02	12	Post [Hex Base] NO TAP // 10-32 Thread	530-5332-00
2	Post [Fasten] #6-32 Thread // #6-32 Thread	530-5012-02	13	Post [Hex Bs.] #6-32 TAP // #10-32 Thread	530-5332-01
3	Post [Fasten] #8-32 Thread // #6-32 Thread	530-5008-00	14	Post [Hex Bs.] #8-32 Thread // #10-32 Thr.	530-5332-02
4	Post Brass [Adjustable, Sliding] #8-32 Thread	530-5621-00	15	Post [Hex Bs.] #6-32 Thread // #10-32 Thr.	530-5332-03
5	Mini-Post Wood Screw (no cut-away)	530-5004-01	16	Post [Hex Bs.] #8-32 TAP // #8-32 Thread	530-5332-04
6	Mini-Post Wood Screw	530-5004-00	17	Post [Hex Bs.+Groove] #6-32 TAP // #10-32 Thr.	530-5679-00
7	Mini-Post Machine Scr. // #10-32 .4" Thread	530-5005-01	18	Post [Hex Bs.+Groove] #8-32 TAP // #10-32 Thr.	530-5753-00
8A	Mini-Post MS // #10-32 .875" Thread	530-5005-00			
8B	Mini-Post Short MS // #10-32 .875" Thread	530-5749-00			
9	Post [Fasten] #6-32 Thread // Wood Screw	530-5263-01			
10	Post #6-32 Tap // #6-32 Thread	530-5127-00			
11	Post [Fasten] #6-32 Thread // #8-32 Thread	530-5007-00			
Nr.	FIN SHANK SCREWS	SPI PART Nr.			
A	#6-32 X 3/4" Fin Shank Screw	237-5921-02			
B	#6-32 X 7/8" Fin Shank Screw	237-5921-04			
C	#6-32 X 1 1/4" Fin Shank Screw	237-5883-00			
D	#6-32 X 1 3/16" Spiral Fin Shank Screw	237-5957-00			

NOT ALL PARTS LISTED ABOVE ARE USED ON THIS GAME (QUANTITIES PER GAME WILL DIFFER).
COMPARE ACTUAL PART ON GAME TO ABOVE DRAWINGS TO IDENTIFY THE PART NUMBER REQUIRED.

Playfield - Nylon Stop, KEPS, Hex, T-, Flange, Pal* & Wing Nuts* (Actual Size) †

Nr.	NYLON STOP NUTS*	SPI PART Nr.
N1	#6-32 Nylon Stop Nut	240-5005-00
N2	#6-32 N.S. Nut (with 1/4" Hex Body)	240-5010-00
N3	#8-32 Nylon Stop Nut	240-5102-00
N4	#10-32 Nylon Stop Nut	240-5203-00
N5	#10-24 Nylon Stop Nut	240-5206-00
<i>Item N5 used with #10-24 X 1-3/4" Carriage Bolt Square Neck Black (231-5022-00) located in the Cabinet for the Foto Lock (Male) (355-5006-01).</i>		
N6	#4-40 Nylon Stop Nut	240-5303-00
N7	#4-40 (18/8 Stainless) Nylon Stop Nut	240-5303-01
N8	5/16"-18 Nylon Stop Nut	240-5316-00



Nr.	KEPS NUTS*	SPI PART Nr.
K1	#6-32 Keps Nut (with Star Washer)	240-5008-00
K2	#6-32 Keps Nut (with 1/4" Hex Body)	240-5011-00
K3	#8-32 Keps Nut	240-5104-00
K4	#10-32 Keps Nut	240-5208-00
K5	#10-24 Keps Nut	240-5207-00
K6	#4-40 Keps Nut	240-5318-00



Nr.	HEX NUTS*	SPI PART Nr.
H1	#6-32 Hex Nut (No Star Washer)	240-5004-00
H2	#8-32 Hex Nut	240-5103-00
H3	#10-32 Hex Nut	240-5201-00
H4	#10-24 Hex Nut	240-5202-00
<i>Item H4 used with #10-24 X 1" Carriage Bolt Square Neck Black (231-5021-00) located in the Cabinet for the Side Armor Rear (towards Backbox).</i>		
H5	#10-32 X 3/8" Hex Nut	240-5209-00
H6	3/4"-16 Hex Nut	240-5315-00
H7	#2-56 Hex Nut	240-5301-00
H8	7/8"-14 Hex Nut	240-5317-00



Nr.	T-NUTS*	SPI PART Nr.
T1	#6-32 T-Nut	240-5002-00
T2	#6-32 T-Nut (with Side Cut Off)	240-5002-01
T3	#8-32 T-Nut	240-5101-00
T4	#10-32 (Black Oxide) T-Nut	240-5007-00
T5	#10-32 T-Nut (with Side Cut Off)	240-5205-00
T6	#10-32 X 5/16" 3-Prong T-Nut	240-5204-00
T7	#10-24 T-Nut	240-5200-00



Nr.	FLANGE NUT*	SPI PART Nr.
F1	1/4" X 20 Flange Nut	240-5300-00
<i>Item F1 used with 1/4-20 X 1-1/4 Sq. Neck Carriage Bolt Black (231-5003-00) located in the Cabinet for the Slide Armor (Front) and Pivot Hinges.</i>		



Nr.	PAL NUTS*	SPI PART Nr.
P1	Plastic Pal Nut (on Flipper Buttons)	240-5003-00
P2	Metal Pal Nut (on Flipper Buttons)	240-5003-01

* Not Shown

Nr.	WING NUTS*	SPI PART Nr.
W1	#6-32 Wing Nut	240-5001-00
W2	#8-32 Wing Nut	240-5100-00
W3	#10-24 Wing Nut	240-5211-00
W4	1/4"-20 Wing Nut	240-5302-00
W5	1/4"-20 Toggle Wing	240-5324-00

* Not Shown

NOT ALL PARTS LISTED ABOVE ARE USED ON THIS GAME (QUANTITIES PER GAME WILL DIFFER).
COMPARE ACTUAL PART ON GAME TO ABOVE DRAWINGS TO IDENTIFY THE PART NUMBER REQUIRED.

Playfield Top - Hex Spacers (Actual Size) †

Hex Spacers:

#6-32

Tap



1

2

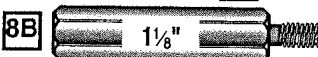
3A

4A

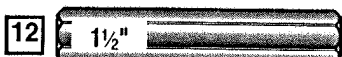
5

6A

7



example of "Bs"
with Male #6-32 Thread
1-end, #6-32 Tap on other.



Take Note:

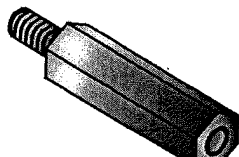
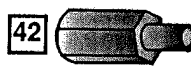
Items 1-33 are 1/4" wide. Items 34-39 are 5/16" wide. With Items 1-3A, 4A, 5 & 6A (the tap goes thru the length of spacer). With Items 7, 8A, 9-33 & 34-39, the tap is up to 5/8" deep on each end. **Note:** Items 3B, 4B, 6B (Not Shown) & 8B (Shown as example of all "B" Styles) all have a #6-32 Threaded end, the other end Tapped (same as Items 7-33).

‡ Hex Spacers Not Used in current games may no longer be available. Choose an available size (+/-) and compensate with washers or other spacers.

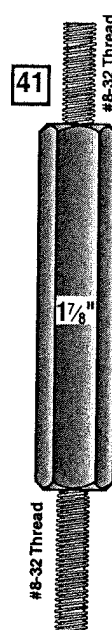
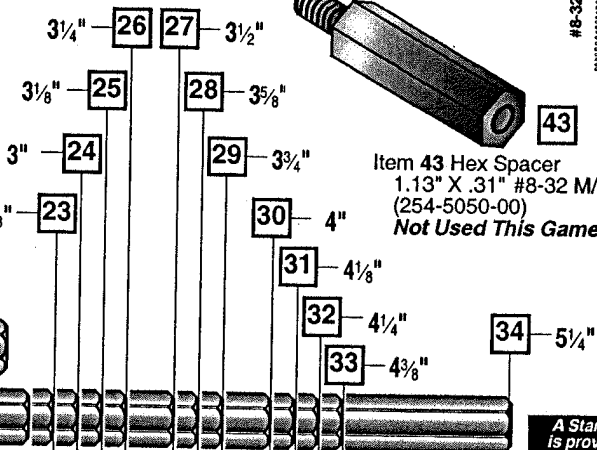
☒ Hex Spacer Nut 1/5" O.D. X 1/4"-20 BO (254-5042-00) (Qty. 2)
(with Pivot Hinges Item 29L/R, Page 43, Backbox Parts).

☒ Hex Spacer (254-5052-00) (Qty. 4)

Item 42 Hex Spacer 1/2" X 1/4" #6-32 M/F
(254-5049-03) **Not Used This Game**



Item 43 Hex Spacer
1.13" X .31" #8-32 M/F
(254-5050-00)
Not Used This Game

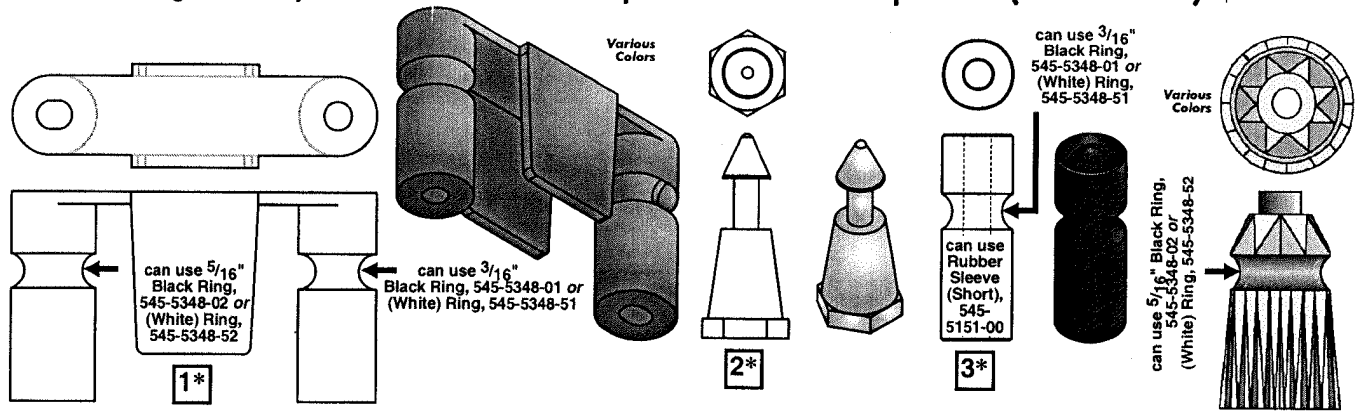


A Standard USA 9 Inch Ruler
is provided on the back cover.

Nr.	HEX SPACERS	QTY.	SPI PART Nr.	Nr.	HEX SPACERS	QTY.	SPI PART Nr.
1	1/4" X 1/4" #6-32 Tap (both ends)		254-5008-00	19	2 3/8" X 1/4" #6-32 Tap (both ends)		254-5008-28
2	3/8" X 1/4" #6-32 Tap (both ends)		254-5008-12	20	2 1/2" X 1/4" #6-32 Tap (both ends)	1	254-5008-16
3A	1/2" X 1/4" #6-32 Tap (both ends)	4	254-5008-03	21	2 5/8" X 1/4" #6-32 Tap (both ends)		254-5008-08
3B*	Identical to 3A with #6-32 Thread end		254-5024-03	22	2 3/4" X 1/4" #6-32 Tap (both ends)	2	254-5008-15
4A	5/8" X 1/4" #6-32 Tap (both ends)		254-5008-02	23	2 1/8" X 1/4" #6-32 Tap (both ends)		254-5008-31
4B*	Identical to 4A with #6-32 Thread end	2	254-5024-02	24	3" X 1/4" #6-32 Tap (both ends)		254-5008-14
5	3/4" X 1/4" #6-32 Tap (both ends)	2	254-5008-04	25	3 1/8" X 1/4" #6-32 Tap (both ends)		254-5008-19
6A	7/8" X 1/4" #6-32 Tap (both ends)		254-5008-05	26	3 1/4" X 1/4" #6-32 Tap (both ends)		254-5008-26
6B*	Identical to 6A with #6-32 Thread end		254-5024-05	27	3 1/2" X 1/4" #6-32 Tap (both ends)		254-5008-27
7	1" X 1/4" #6-32 Tap (both ends)		254-5008-06	28	3 3/8" X 1/4" #6-32 Tap (both ends)		254-5008-25
8A	1 1/8" X 1/4" #6-32 Tap (both ends)		254-5008-17	29	3 3/4" X 1/4" #6-32 Tap (both ends)		254-5008-36
8B	Identical to 8A with #6-32 Thread end		254-5024-17	30	4" X 1/4" #6-32 Tap (both ends)	3	254-5008-21
9	1 1/4" X 1/4" #6-32 Tap (both ends)	4	254-5008-11	31	4 1/8" X 1/4" #6-32 Tap (both ends)	1	254-5008-23
10	1 5/16" X 1/4" #6-32 Tap (both ends)	2	254-5008-34	32	4 1/4" X 1/4" #6-32 Tap (both ends)		254-5008-30
11 ‡	1 3/8" X 1/4" #6-32 Tap (both ends)	3	254-5008-33	33	4 3/8" X 1/4" #6-32 Tap (both ends)		254-5008-29
12	1 1/2" X 1/4" #6-32 Tap (both ends)	3	254-5008-09	34	5 1/4" X 1/4" #6-32 Tap (both ends)		254-5008-35
13 ‡	1 5/8" X 1/4" #6-32 Tap (both ends)		254-5008-13	35	1 1/4" X 5/16" #6-32 Tap (both ends)		254-5018-09
14	1 3/4" X 1/4" #6-32 Tap (both ends)	1	254-5008-10	36	1 3/4" X 5/16" #6-32 Tap (both ends)		254-5018-06
15 ‡	1 7/8" X 1/4" #6-32 Tap (both ends)	2	254-5008-20	37	2" X 5/16" #6-32 Tap (both ends)		254-5018-07
16	2" X 1/4" #6-32 Tap (both ends)	1	254-5008-07	38	4" X 5/16" #6-32 Tap (both ends)		254-5018-03
17	2 1/8" X 1/4" #6-32 Tap (both ends)		254-5008-32	39	4 5/16" X 5/16" #6-32 Tap (both ends)		254-5018-00
18	2 1/4" X 1/4" #6-32 Tap (both ends)		254-5008-18	40	4.92" X 5/16" #6-32 Tap (both ends)		254-5018-04
				41	1 7/8" X 3/8" #8-32 Thread (both ends)		530-5285-00

† The item type (size / description), the quantity and/or location used, are subject to change without notice. Service Bulletins will announce any changes, if warranted.

Playfield Top - Plastic Posts & Spacers & Metal Spacers (Actual Size) †



PLASTIC PART COLOR CHART

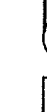
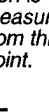
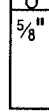
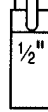
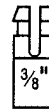
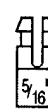
Nr.	Color	Nr.	Color	Nr.	Color
-00	Black	-06	Yellow	-12	Fluor. Blue
-01	Clear	-07	Orange	-13	Teal Green
-02	Red	-08	(White)	-14	(Gray)
-03	Amber	-09	Purple	-15	Luminescent
-04	Green	-10	Fluor. Org.	-16	Gold
-05	Blue	-11	Fluor. Green		

* Items 1 & 5 come in various colors. The "-XX" (the last 2-Digits in the Part Number), should be replaced with the desired 2-Digit number from the above Color Chart (may not be available in every color; other colors used in prior games may no longer be available.) Call for availability.

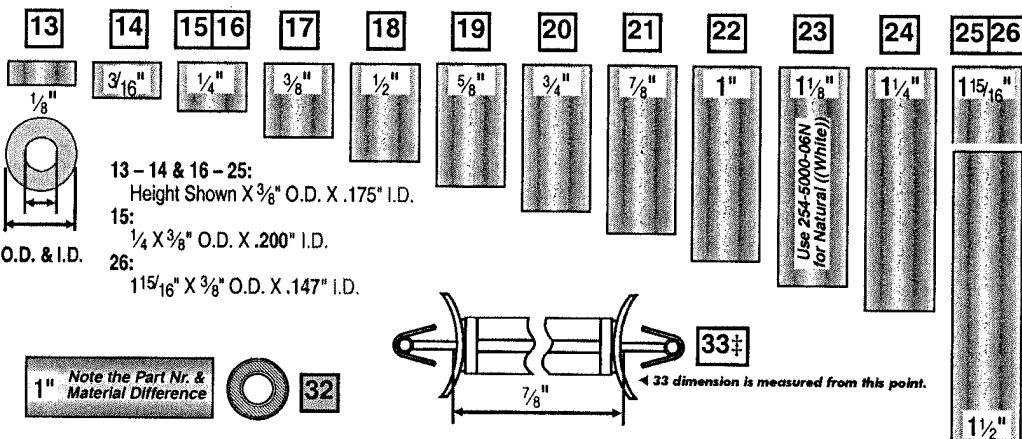
O.D. & I.D.



5-11:
Height Shown X 9/32" O.D.
X .153" I.D.



† Items 5 through 11 dimensions are measured from bottom to just under the cut-away. Item 33 dimension is measured from top-to-top of curve. See pictorials with Items 11 & 33.



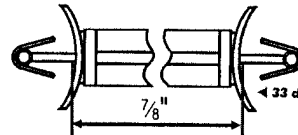
O.D. & I.D.

13-14 & 16-25:
Height Shown X 3/8" O.D. X .175" I.D.

15:
1/4 X 3/8" O.D. X .200" I.D.

26:
115/16" X 3/8" O.D. X .147" I.D.

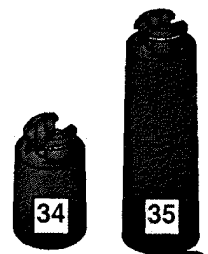
1" Note the Part Nr. & Material Difference



† 33 dimension is measured from this point.

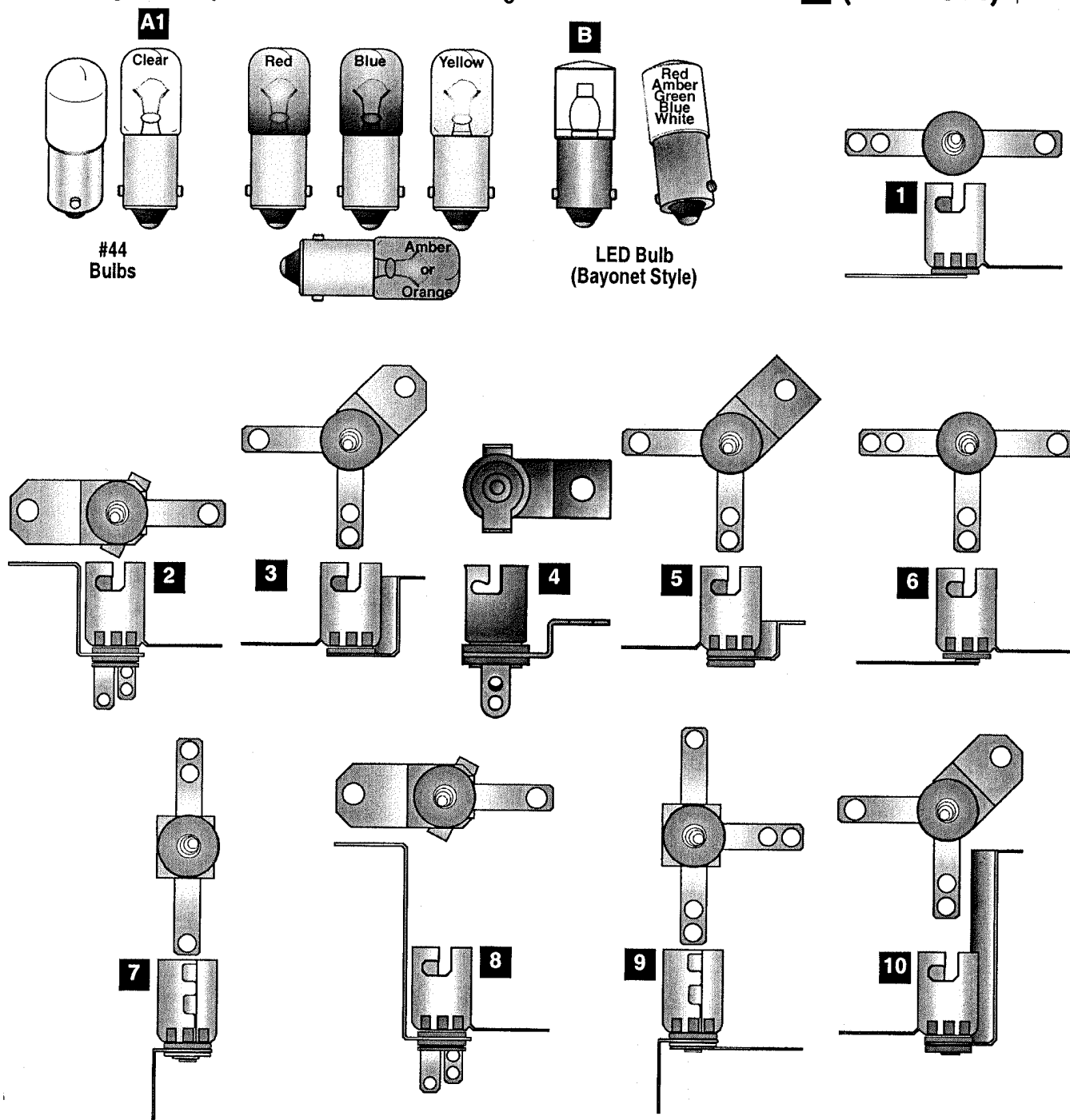
Nr.	PLASTIC POSTS & SPACERS	SPI PART Nr.	Nr.	PLASTIC POSTS & SPACERS	SPI PART Nr.
1**	Top Lane Plastic Mini-Lite Hood (XX-Color)	550-5061-XX	21	7/8" X 3/8" O.D. X .175" I.D. Pls. Spacer (Gray)	254-5000-11
2**	Mini-Jewel Plastic Post (XX-Color)	550-5052-XX	22	1" X 3/8" O.D. X .175" I.D. Pls. Spacer (Gray)	254-5000-04
3**	1 1/16" 1-Groove Plastic Post (XX-Color)	550-5059-XX	23	1 1/8" X 3/8" O.D. X .175" I.D. Pls. Spcr. (Gray)	254-5000-06
Item 3 Only : Use Part Number (550-5059-00) for color Black.					
4**	1-Groove Jewel Plastic Post (XX-Color)	550-5034-XX	24	1 1/4" X 3/8" O.D. X .175" I.D. Pls. Spcr. (Gray)	254-5000-05
Items 3 & 4 typically sec'd by: Post Fastening Scr. #6-32 Top / #6-32 Bot. (530-5012-02). Use Color Chart above for last 2-digits. Not all colors are available.					
Items 1-4 Note: Use Color Chart above for last 2-digits. Not all colors are available.					
5 †	1/4" Self Retain. Plastic Spacer (White)	254-5007-02	25	1 1/2" X 3/8" O.D. X .175" I.D. Pls. Spcr. (Gray)	254-5000-08
6 †	9/16" Self Retain. Plastic Spacer (White)	254-5007-05	26	1 15/16" X 3/8" O.D. X .147" I.D. Plastic Spacer (Gray)	254-5000-15
7 †	3/8" Self Retain. Plastic Spacer (White)	254-5007-01	Items 13-26 Only : Spacers may also be Black in color (random from vendor).		
8 †	1/2" Self Retain. Plastic Spacer (White)	254-5007-04	Not Shown and listed for reference only : 254-5000-10: 2 1/2" X 3/8" O.D. X .175" I.D.		
9 †	5/8" Self Retain. Plastic Spacer (White)	254-5007-00	-13: 5/16" X 1/4" X .147"; -16: 5/16" X 5/16" X .190"; -17: 1 3/4" X 3/8" O.D. X .175" I.D.		
10 †	3/4" Self Retain. Plastic Spacer (White)	254-5007-03	27	1/4" X 5/16" O.D. X .144" I.D. Metal Spacer	254-5014-03
11 †	1" Self Retain. Plastic Spacer (White)	254-5007-06	28	1/2" X 5/16" O.D. X .144" I.D. Metal Spacer	254-5014-00
12	1/2" X 1/4" O.D. X .147" I.D. Pls. Spacer (White)	254-5000-03	29	9/16" X 5/16" O.D. X .144" I.D. Metal Spacer	254-5014-04
13	1/8" X 3/8" O.D. X .175" I.D. Pls. Spacer (Gray)	254-5000-19	30	3/4" X 5/16" O.D. X .144" I.D. Metal Spacer	254-5014-01
14	3/16" X 3/8" O.D. X .175" I.D. Pls. Spcr. (Gray)	254-5000-18	31	1 1/8" X 5/16" O.D. X .144" I.D. Metal Spacer	254-5014-02
15	1/4" X 3/8" O.D. X .200" I.D. Pls. Spcr. (Gray)	254-5000-02	32	1" X 5/16" O.D. X .144" I.D. Metal Spacer	254-5001-00
16	1/4" X 3/8" O.D. X .175" I.D. Pls. Spacer (Gray)	254-5000-09	33 †	7/8" Plastic Spacer Support (Dual-Locking)	254-5039-14
17	3/8" X 3/8" O.D. X .175" I.D. Pls. Spacer (Gray)	254-5000-12	34	Plastic Spacer, .5"	254-5054-00
18	1/2" X 3/8" O.D. X .175" I.D. Pls. Spacer (Gray)	254-5000-01	35	Plastic Spacer, 1.13"	254-5054-01
19	3/8" X 3/8" O.D. X .175" I.D. Pls. Spacer (Gray)	254-5000-14			
20	3/4" X 3/8" O.D. X .175" I.D. Pls. Spacer (Gray)	254-5000-07			

NOT ALL PARTS LISTED ABOVE ARE USED ON THIS GAME (QUANTITIES PER GAME WILL DIFFER).
COMPARE ACTUAL PART ON GAME TO ABOVE DRAWINGS TO IDENTIFY THE P/N REQUIRED.



Parts Identification

Playfield Top & Bottom - Small Bayonet Sockets & Bulbs ■ (Actual Size) †

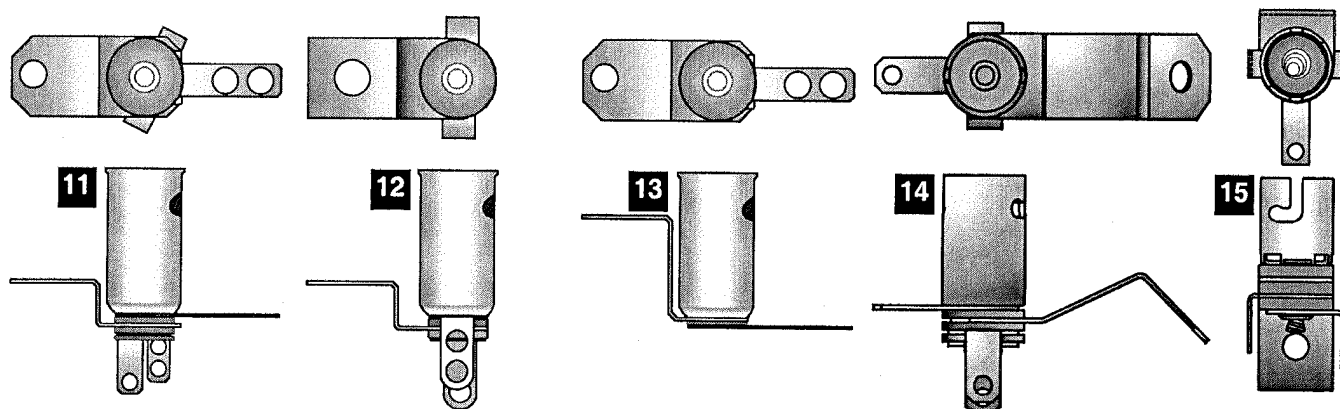


Nr.	BULBS (#44)	SPI PART Nr.	Nr.	BULBS (LED & #455)	SPI PART Nr.
A	#44 Bulb (Clear) Heavy Filament	165-5000-44-HF	B	LED Module (WHT) (12.8v 20-25mA) Bynt.	112-5023-08
	#44 Bulb (replace -XX w/color below)	165-5053-XX-HF			
Item A Note: Amber (165-5053-03-HF); Green (165-5053-04-HF); Yellow (165-5053-06-HF); Red (165-5053-02-HF); Blue (165-5053-05-HF); Orange (165-5053-07-HF)					
Item B Note: Different Colors may be available - Red (112-5023-02); Amber (112-5023-03); Green (112-5023-04); Blue (112-5023-05);					

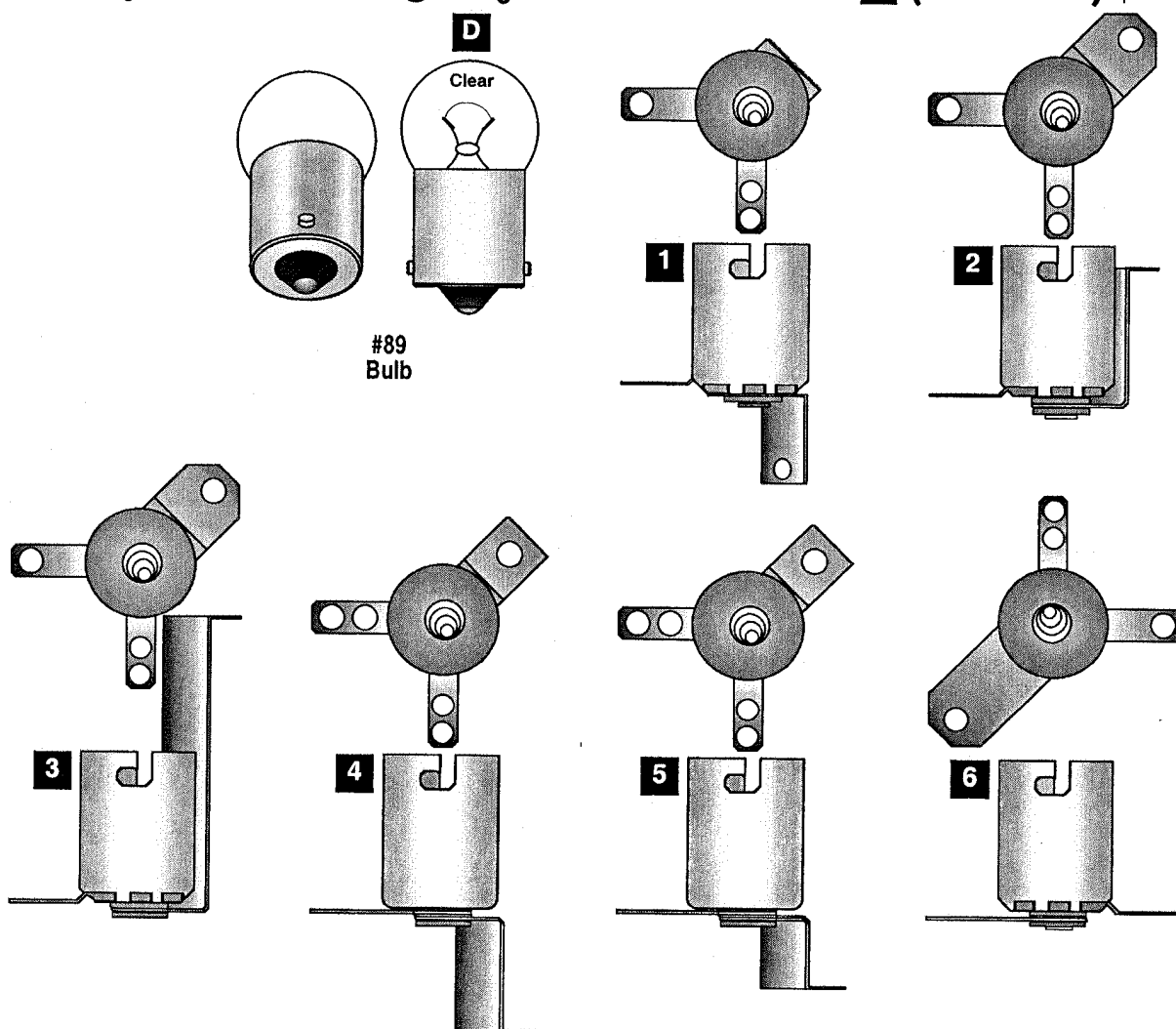
Nr.	SMALL BAYONET SOCKETS	SPI PART Nr.	Nr.	SMALL BAYONET SOCKETS	SPI PART Nr.
1	2-Lug Staple Down Socket	077-5000-00	10	2-Lug Stand-Up Socket (Tall Bracket)	077-5005-00
2	3-Lug Stand-Up Socket (Med. Brkt.)	077-5008-00	11	3-Lug Stand-Up Long Shell Socket	077-5013-00
3	2-Lug Stand-Up Socket (Med. Brkt.)	077-5002-00	12	2-Lug Stand-Up Lg. Shell Socket (Gls)	077-5031-00
4	2-Lug Stand-Up Socket (Short Brkt.)	077-5223-00	13	1-Lug S-U Lg. Shell Sckt. (Med. Brkt.)	077-5012-00
5	2-Lug Stand-Up Sckt. (Short Bracket)	077-5002-31	14	3-Lug S-U Lg. Shell Sckt. (45° Brkt.)	077-5035-00
6	3-Lug Staple Down Socket	077-5001-00	15	3-Lug Laydown Socket (2 Lugs Bent)	077-5032-00
7	2-Lug Laydown Socket	077-5003-00			
8	3-Lug Stand-Up Socket (Tall Bracket)	077-5009-00			
Nr.	SMALL BAYONET SOCKETS	SPI PART Nr.			
9	3-Lug Laydown Socket (3 Lugs Flat)	077-5006-00			

NOT ALL PARTS LISTED ABOVE ARE USED ON THIS GAME (QUANTITIES PER GAME WILL DIFFER).
COMPARE ACTUAL PART ON GAME TO ABOVE DRAWINGS TO IDENTIFY THE PART NUMBER REQUIRED.

Playfield Top & Bot. - Small Bayonet Sockets & Bulbs ■ (Actual Size) † Continued



Playfield Bottom - Large Bayonet Sockets & Bulbs ■ (Actual Size) †

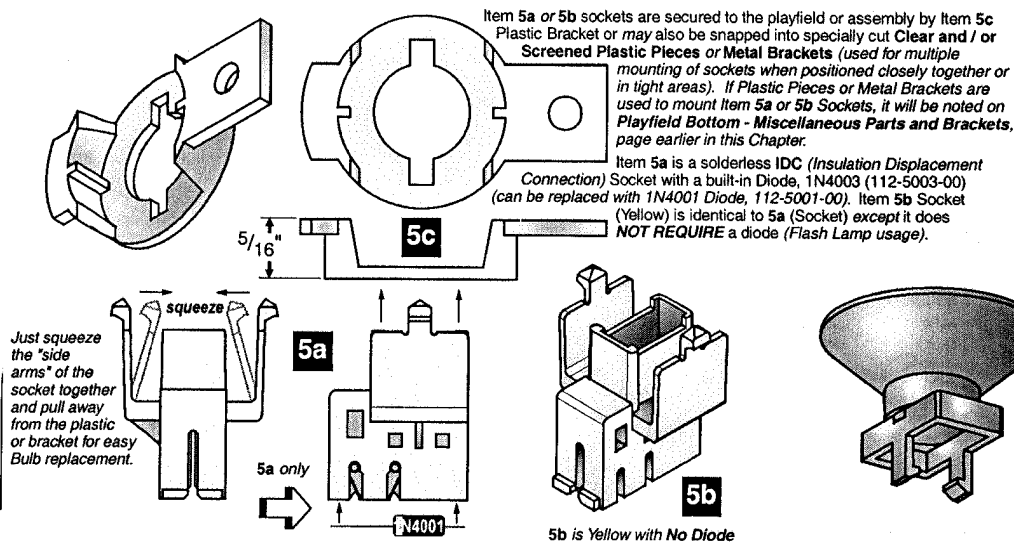
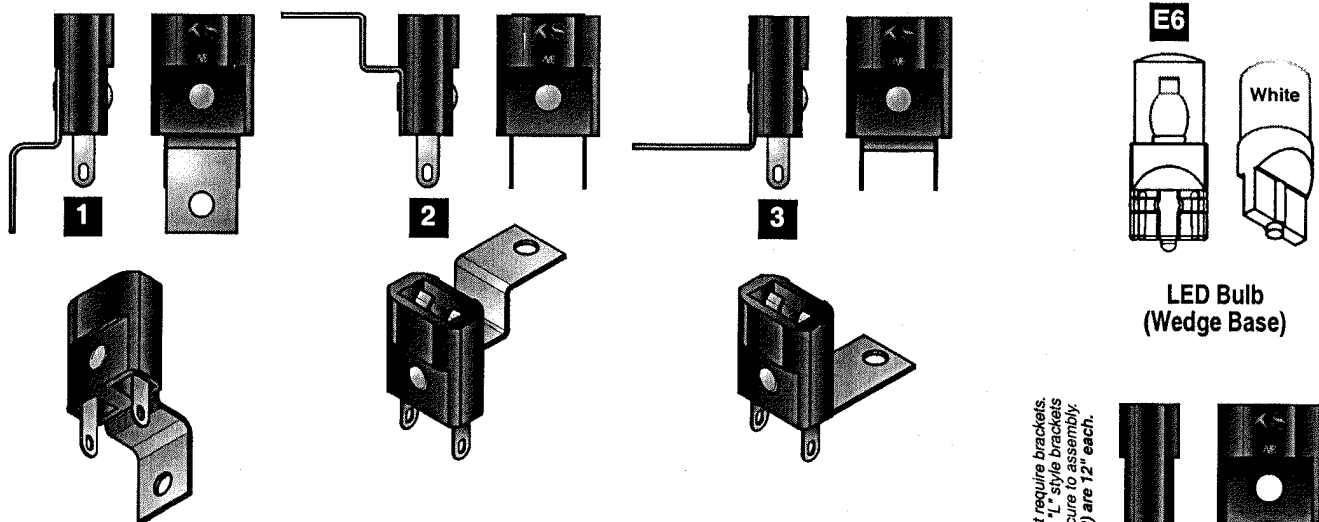
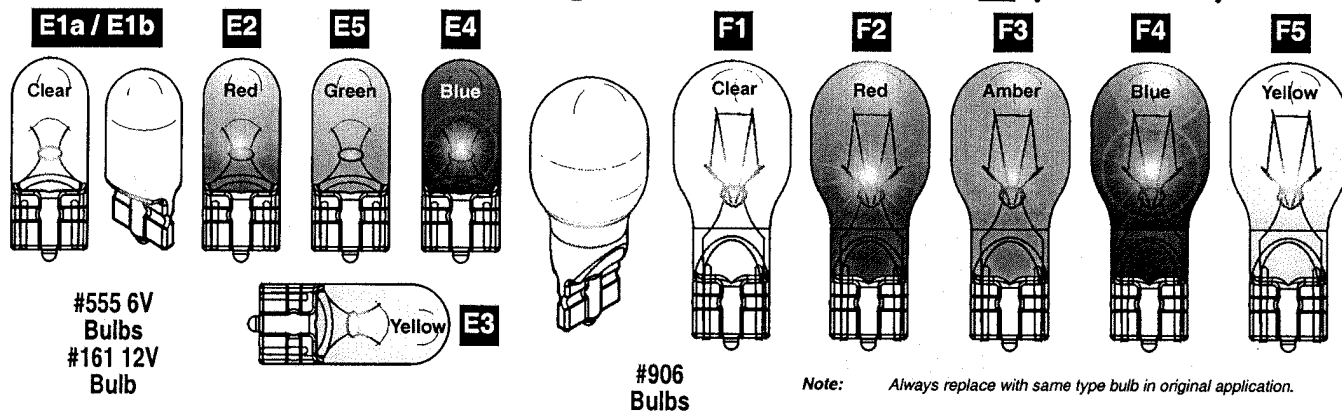


Nr.	BULBS (#89)	SPI PART Nr.		
D	#89 Bulb Heavy Filament	165-5000-89-HF	1	2-Lug Laydown Standard Socket 077-5100-00
			2	2-Lug Stand-Up Short Socket 077-5101-00
			3	2-Lug Stand-Up Long Socket 077-5102-00
			4	2-Lug Stand-Up Rev. Mount Socket 077-5103-00
			5	2-Lug Stand-Up Rv. Mnt. Short Socket 077-5106-00
			6	2-Lug Straight Leg Socket 077-5107-00

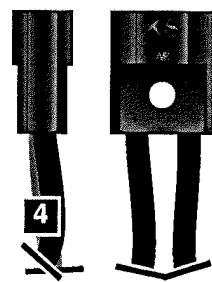
Nr.	LARGE BAYONET SOCKETS	SPI PART Nr.
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NOT ALL PARTS LISTED ABOVE ARE USED ON THIS GAME (QUANTITIES PER GAME WILL DIFFER).
COMPARE ACTUAL PART ON GAME TO ABOVE DRAWINGS TO IDENTIFY THE PART NUMBER REQUIRED.

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



Item 4 Socket does not require brackets. Old stock may include "1" style brackets (each side); do not secure to assembly. Black Wires (Qty. 2) are 12" each.



Nr.	BULBS (#555)	SPI PART Nr.	Nr.	BULBS (LED & #906)	SPI PART Nr.
E1a	#555 Wedge Base Bulb (Clear)	165-5002-00	E6	LED Module (WHT) (5v - 6.3v) Wedge Base	112-5024-08
E2-E5	#555 Wedge Base Bulb (Multi-Color)	165-5054-XX	Item E6 Bulb Note: Typically used with Item 4 Socket in Pop Bumpers.		
Item E2-E5 Bulb Note: Different Colors available (not used in this game) - Red (165-5054-02); Green (165-5054-04); Blue (165-5054-05); Yellow (165-5054-06);			F	#906 Wedge Base Bulb (Clear)	165-5004-00
E1b	#161 12V Wedge Base Bulb (Clear)	165-5032-00	Item F Note: Different Colors available (not used in this game) - Red (165-5004-02); Amber (165-5004-03); Blue (165-5004-05); Yellow (165-5004-06)		

Nr.	WEDGE BASE SOCKETS	SPI PART Nr.	Nr.	WEDGE BASE SOCKETS	SPI PART Nr.
1	Wedge Base Socket (Laydown)	077-5026-01	5a	IDC Snap-On Socket (Biege)	077-5216-00
2	Wedge Base Socket (Offset)	077-5029-00	5b	IDC Snap-On Socket No Diode (Yel.)	077-5216-01
3	Wedge Base Socket (Laydown GI)	077-5030-00	5c	5/16" Ht. Bracket (White)	545-5760-18
4	W.B. Socket (Bumpers/Special App.)	077-5206-00	6	Light Reflector (Silver Plst.) REF540N	545-5409-01
			Note Item 6: Typically used with Item 1 (but will fit on any similar Wedge Base Socket).		

**NOT ALL PARTS LISTED ABOVE ARE USED ON THIS GAME (QUANTITIES PER GAME WILL DIFFER).
COMPARE ACTUAL PART ON GAME TO ABOVE DRAWINGS TO IDENTIFY THE PART NUMBER REQUIRED.**

Optional Kits available through your Distributor:

Flipper Rebuild Kit (Left) 500-6307-10

Flipper Base Plate Kit (Left) 515-6617-01

Kit includes: Flipper Base Plate (Left) pre-threaded with securing hardware; see the Flipper Drawing for view.

Flipper Rebuild Kit (Right) 500-6307-00

Flipper Base Plate Kit (Right) 515-6617-00

*Kit includes: Flipper Base Plate (Left) pre-threaded with securing hardware; see the Flipper Drawing for view.*Pinball Location Maintenance Standard Kit (for AC/DC Premium Pinball) 502-6002-C7*Standard Kit includes : 8 oz. Novus Wax #2 Fine (Red) (675-0003-01), Cloth, Rubber Rings (used above playfield), Bulbs (Bulb quantities vary and is limited to 25 per type), Fuses (1/per type) and 4 Pinballs. Note: Quanties, sizes and contents subject to change without notice.*Pinball Location Maintenance Deluxe Kit (for AC/DC Premium Pinball) 502-6003-C7*Deluxe Kit includes : Pinball Location Maintenance Standard Kit as described above plus a quantity of Flipper Rebuild Kits. Note: Quantity varies which equals the same quantity of flippers used in this game.***▲ THIS GAME KIT INCLUDES (2) FLIPPER REBUILD KITS ▲**

Plastics*Kit (for AC/DC Premium Pinball) 803-5000-C7

Plastics Kit includes: Plastic Sets (830-6125-XX)

Decals*Kit (for AC/DC Premium Pinball) 802-5000-C4

Decals Kit includes: Decal Set (820-7000-XX)

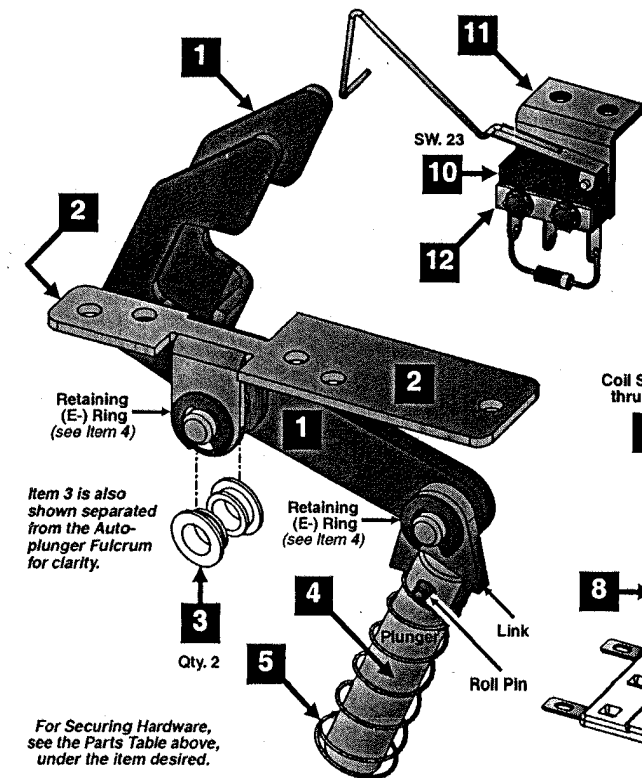
***Attention:** No individual Plastic or Decal can be ordered separately, unless noted otherwise. Plastics & Decals are subject to change without notice during and / or after production. Key Fobs subject to availability and may or may not be included in the plastic set. All designs, shapes & pieces used subject to change without notice. Kit contents subject to change. Service Bulletin(s) will announce any critical changes, if warranted. The last 2-digits shown on plastics or decals are for reference only.

Ball Shooter (Plunger) Assembly, 500-6146-00-04 (Items 1-6)



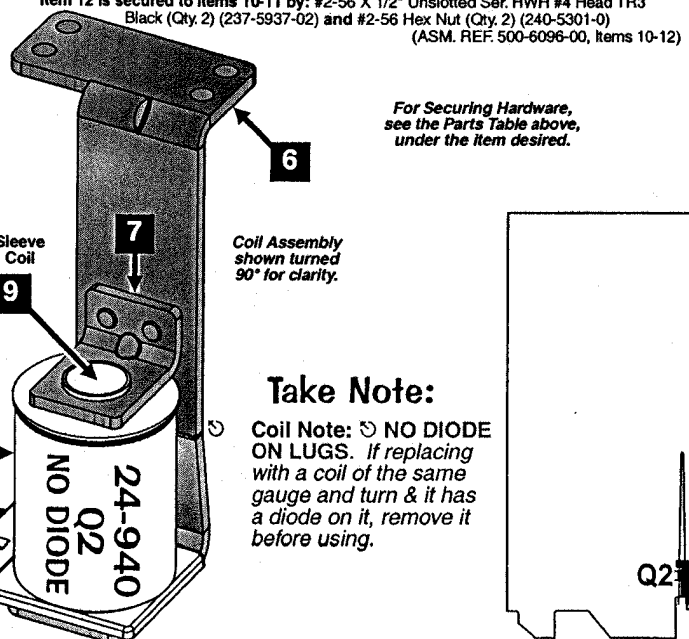
Autoplunger Arm Weld Asm., 500-6091-00 (Items 1-5), Autoplunger Coil Assembly, 500-6092-02-ND (Items 6-9) and Shooter Lane Switch Assembly, 500-6096-00 (Items 10-12)

Nr.	AUTOPL. ARM WELD PARTS	QTY.	SPI PART Nr.
1	Arm Weld Assembly	1	515-6526-00
Item 1 is secured to Item 2 by: Retaining Ring, 1/4" ø Shaft (Qty. 1) (270-5002-00)			
2	Autoplunger Fulcrum	1	535-7697-00
3	Nyliner, 1/4" (Thomson #411-FF)	2	545-5423-00
4	Plunger & Link Assembly	1	511-5183-00
Item 4 is secured to Item 1 by: Retaining Ring, 1/4" ø Shaft (Qty. 1) (270-5002-00) For Individual Items use: Plunger 1.81" Lg. (530-5025-05), Plunger Link (545-5293-00) and Roll Pin 1/8" ø x 5/8" Lg. (251-5008-00)			
5	Compression (Return) Spring	1	266-5020-00
(ASM. REF 500-6091-00, Items 1-5)			



Nr.	AUTOPLNGR. COIL PARTS	QTY.	SPI PART Nr.
6	Autoplunger Coil Bracket Assembly	1	515-6527-00
Items 1 & 6 are secured below the P/F by: #8 X 1/2" SHWH AB (Zc.) (Qty. 9) (234-5101-00)			
7	Coil Retainer Bracket	1	535-5203-03
Item 7 is secured to Item 6 by: #8-32 X 1/4" PPH MS (Sems) Zinc (Qty. 2) (232-5300-00)			
8	Coil, 24-940 [NO DIODE]	1	090-5036-ND
COIL DOES NOT REQUIRE A DIODE. SEE COIL NOTE BELOW FOR DETAILS.			
9	Coil Sleeve	1	545-5031-00
(ASM. REF 500-6092-02-ND, Items 6-9)			

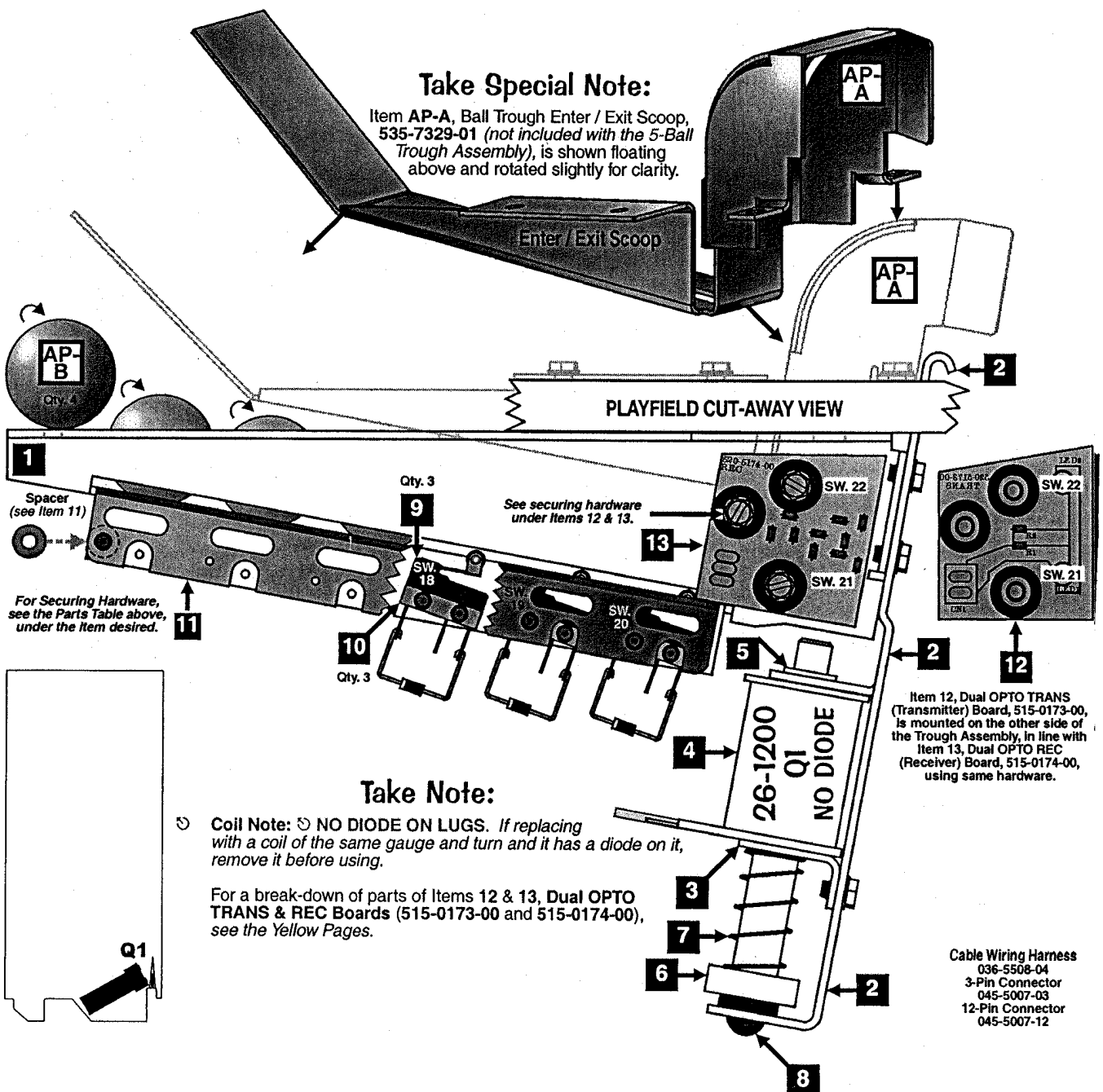
Nr.	SWITCH PARTS	QTY.	SPI PART Nr.
10	Switch (for Shooter Lane)	1	180-5157-00
Switch has a Diode (1N4004) (112-5003-00). Can be replaced with (1N4001) (112-5001-00).			
11	Switch Mounting Bracket	1	535-6173-00
Item 11 is secured to Playfield by: #6 X 1/2" SLT HWH AB (Zinc) (Qty. 2) (234-5001-02)			
12	Switch Body Protect Plate	1	535-6539-00
Item 12 is secured to Items 10-11 by: #2-56 X 1/2" Unslotted Ser. HWH #4 Head TR3 Black (Qty. 2) (237-5937-02) and #2-56 Hex Nut (Qty. 2) (240-5301-0) (ASM. REF 500-6096-00, Items 10-12)			



4-Ball Trough Assembly, 500-6318-24-ND (Items 1-13) and Associated Parts: See Parts Table Below.

Ordering Note: Identical to 500-6318-14 with exceptions, see note below Item 13 (Parts Table).

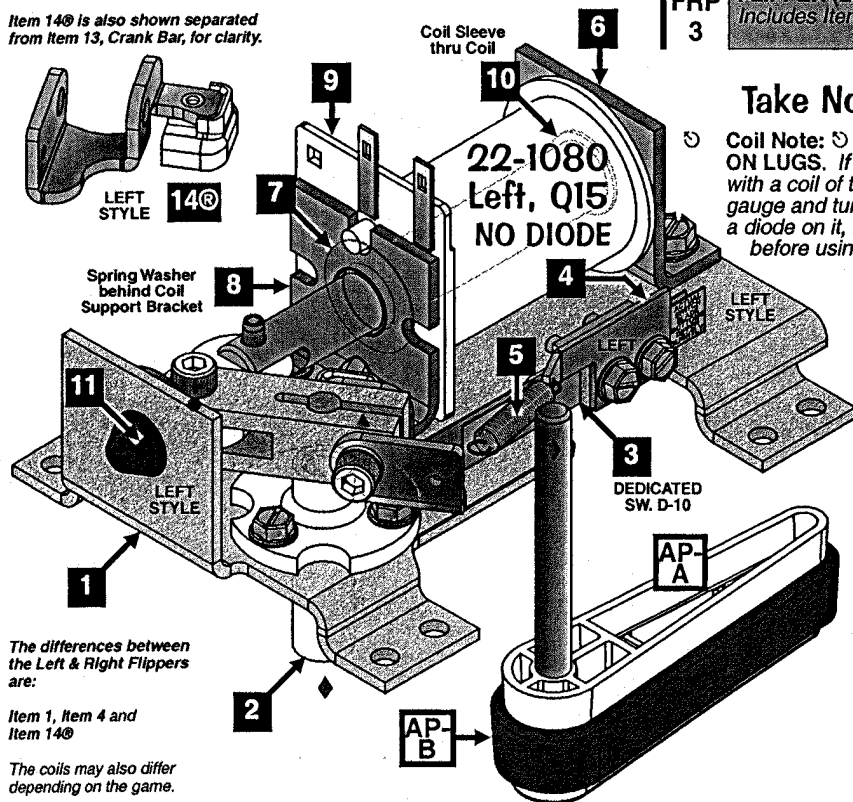
Nr.	4-BALL TROUGH PARTS	QTY.	SPI PART Nr.	Nr.	4-BALL TROUGH PARTS	QTY.	SPI PART Nr.
1	Ball Trough Outhole Mounting Bracket Item 1 is secured below the playfield by: #8 X 1/2" SHWH AB (Zc) (Qty. 4) (234-5101-00)	1	515-6580-01	11	Trough Ball Guide Plate Item 11 is secured to Item 1 by: 1/4" X 5/16" X .144" I.D. Spacer Tap (Qty. 1) (254-5014-03) and #2-58 X 1/2" HWH (Ser) UNS #4HD TR3 BO (Qty. 4) (237-5937-02)	1	535-7801-00
2	Coil Mounting Bracket Item 2 is secured to Item 1 by: #8-32 X 3/8" HWH Swage (Sr) Zinc (Qty. 4) (237-5975-00)	1	535-7330-01	12	Dual OPTO TRANS Board Assembly	1	515-0173-00
3	Coil Retaining Bracket Item 3 is secured to Item 2 by: #8-32 X 1/4" SHWH (Ser) Zinc (Qty. 2) (237-5975-04)	1	535-5203-03	13	Dual OPTO REC Board Assembly Items 12 & 13 are secured by: #6-32 X 5/8" HWH Swg (Ser) Zc (Qty. 3/per) (237-5976-04) For Individual Items use: Dual OPTO Transmitter Board (Qty. 1) (520-5173-00), Dual OPTO Receiver Board (Qty. 1) (520-5174-00), OPTO PCB Tube Spacer (Brass) (Qty. 3/per) (530-5308-02) and OPTO PCB Rubber Grommet (Qty. 3/per) (545-5518-00)	1	515-0174-00
4	Coil, 26-1200 [NO DIODE] COIL DOES NOT REQUIRE A DIODE. SEE COIL NOTE BELOW FOR DETAILS.	1	090-5044-ND	Ordering Note: If 500-6318-24-ND is unavailable, order the individual part(s) actually required. This assembly is identical to 500-6318-14-ND, -15 or -25 except for the quantity of Items 9 & 10 (Qty. 4/per on 5-Ball Trough) and Item 11, required when a Magnet Mech. is used in the game. -ND means no diode on Item 4, Coil, 26-1200.			
5	Coil Sleeve (Short) (Formost #10-7077)	1	545-5076-01	ASSOCIATED PARTS ARE NOT INCLUDED WITH THE ABOVE ASSEMBLY.			
6	Steel & Nylon Plunger Asm. (3.57")	1	515-7309-01	Nr.	ASSOCIATED PART(S)	QTY.	SPI PART Nr.
7	Compression (Return) Spring	1	266-5020-00	AP-A	Ball Trough Enter / Exit Scoop Item AP-A secured to the playfield by: #8 X 1/2" SHWH AB (Zinc) (Qty. 4) (234-5101-00)	1	535-7329-01
8	Rubber Bumper (Grommet)	1	545-5105-00	AP-B	Steel Balls (1-1/16" ø)	4	260-5000-00
9	Micro Switch (Roller Actuator, Lite-Force) Item 9 requires: Heat Shrink Tubing 1/8" ø PUL-24 (Qty. 1/per) (605-5005-00) Switch has a Diode (1N4004) (112-5003-00). Can be replaced with (1N4001) (112-5001-00).	3	180-5119-02				
10	Switch Body Protect Plate	3	535-6539-00				



Flipper (Left) Assembly, 500-6543-12-ND (Items 1-15) **and Associated Parts: Yellow Flipper Bat & Shaft Asm., 515-5133-06-06 (Items AP-A / AP-B)**

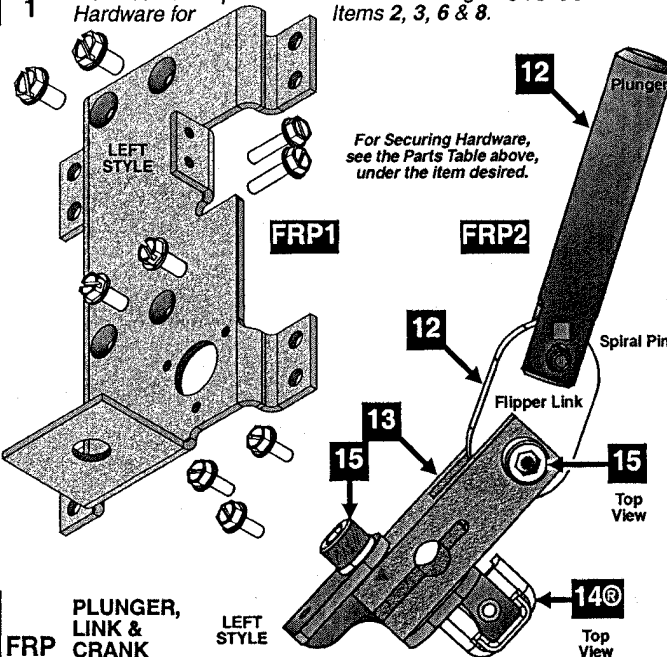
Nr.	FLIPPER (LEFT) PARTS	QTY.	SPI PART Nr.
1	Flipper Base Plate (LEFT)	1	See FRP1
Item 1 is secured below by: #8 X 1/2" SHWH AB (Zinc) (Qty. 8) (234-5101-00) Ordering Note: Individual Part (535-7275-01) is not prethreaded, see Item FRP1.			
2	Flipper Bat Bushing (White Plastic) 25" ID	1	545-5070-00
Item 2 is secured to Item 1 by: #6-32 X 3/8" HWH Swage (Ser.) Zc. (Qty. 3) (237-5976-02)			
3	Power (EOS / 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	Sw. Plate/Spring Return Brkt. (LEFT)	1	535-7354-01
5	Flipper Return Spring	1	265-5035-00
6	Coil Stop Bracket Sub-Assembly	1	515-6308-01
Item 6 is secured to Item 1 by: #10-32 X 3/8" SHWH Swage (Ser.) Zinc (Qty. 2) (237-5985-00) and #10 Split Lock Washer (Qty. 2) (244-5003-00)			
7	Spring Washer (17/32" ID X 3/4" X 1")	1	269-5002-00
8	Coil Support Bracket	1	535-7356-00
Item 8 is secured to Item 1 by: #6-32 X 3/8" HWH Swage (Ser.) Zc. (Qty. 2) (237-5976-04)			
9	Coil, 22-1080 [NO DIODE] YEL-GRN	1	090-5032-ND
COIL DOES NOT REQUIRE A DIODE. SEE COIL NOTE BELOW FOR DETAILS.			
10	Coil Sleeve	1	545-5388-00
11	Deflector Pad (Bumper)	1	545-5428-00
12	Flipper Plunger & Link Sub-Assy	1	515-6304-03
For Individual Items use: Flipper Plunger (530-5349-01) and Plunger "Flipper" Link (545-5611-01) and is secured to the Plunger by: Bushing, 16" ID X 281" OD X 167" (Qty. 1) (530-5532-00) and Spiral Pin (532" X 3/4" Lg. (Qty. 1) (251-5015-02)			
13	Crank Bar (Pawl)	1	530-5070-02
Item 13 requires: Bushing, .192" ID X .312" OD X .195" (Qty. 1) (530-5139-00)			
14®	Switch Actuator (LEFT) Sub-Assy	1	515-7257-01
For Individual Items use: Actuator & Spring Bracket (LEFT) (535-9038-01) and Switch Actuator (White Plastic) (545-5612-00) and is secured to the Bracket by: Rivet, 1/8" X 1/4" Lg. (Qty. 1) (249-5003-00)			
15	Set Screw: #10-32 X 3/4" Socket Hd.	2	237-6144-00
Item 15 requires: #10-32 Nylon Stop Nut (Qty. 1) Flipper Link Side Only (240-5203-00) and #10 Split Lock Washer (Qty. 1) Switch Actuator Side Only (244-5003-00) Tool required for Item 15: 5/32" or 4mm Allen Wrench			

Item 14® is also shown separated from Item 13, Crank Bar, for clarity.



Flipper Rebuild Parts for Easier Installation, Save \$:

FRP 1 FLIPPER BASE PLATE KIT (LEFT):
Includes Item 1 pre-threaded >+< Securing Hardware for Items 2, 3, 6 & 8. **515-6617-01**

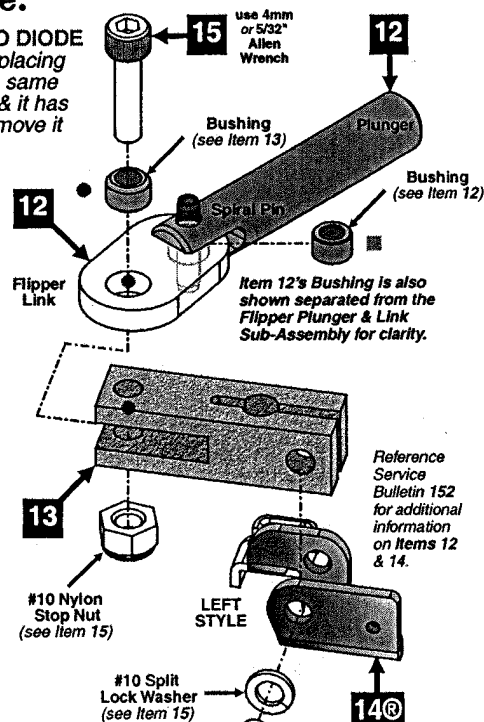


FRP 2 PLUNGER, LINK & CRANK (LEFT STYLE) ASSEMBLY: Includes Items 12, 13, 14 & 15 (comes assembled). **515-7203-01**

FRP 3 FLIPPER (LEFT) REBUILD KIT:
Includes Items 6, 10 AND above FRP2 **500-6307-10**

Take Note:

⊙ **Coil Note:** ⊙ NO DIODE ON LUGS. If replacing with a coil of the same gauge and turn & it has a diode on it, remove it before using.



Take Note:

® "R" indicates Item noted is secured with rivet(s) as listed.

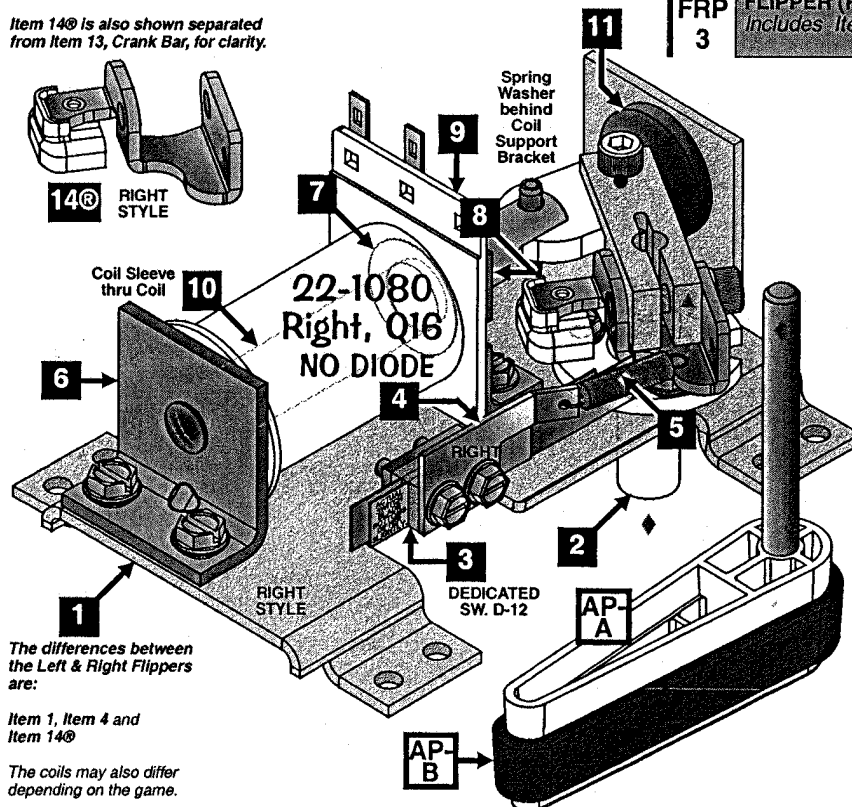
ASSOCIATED PARTS ARE NOT INCLUDED WITH THE ABOVE ASSEMBLY.

Nr.	ASSOCIATED PART(S)	QTY.	SPI PART Nr.
AP-A	Yellow Flipper Bat & Shaft Assembly (Non-Knurled End) without Rubber Ring	1	515-5133-06-06
AP-B	Large Flipper RED Rubber Ring	1	545-5277-22

Flipper (Right) Assembly, 500-6543-02-ND (Items 1-15) and Associated Parts: Yellow Flipper Bat & Shaft Asm., 515-5133-06-06 (Items AP-A / AP-B)

Nr.	FLIPPER (RIGHT) PARTS	QTY.	SPI PART Nr.
1	Flipper Base Plate (RIGHT)	1	See FRP1
Item 1 is secured below by: #8 X 1/2" SHWH AB (Zinc) (Qty. 8) (234-5101-00) Ordering Note: Individual Part (535-7275-00) is not prethreaded, see Item FRP1.			
2	Flipper Bat Bushing (White Plastic) .25" I.D.	1	545-5070-00
Item 2 is secured to Item 1 by: #6-32 X 3/8" HWH Swage (Ser.) Zc. (Qty. 3) (237-5976-02)			
3	Power (EOS / 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	Sw. Plate/Spring Return Brkt. (RIGHT)	1	535-7354-00
5	Flipper Return Spring	1	265-5035-00
6	Coil Stop Bracket Sub-Assembly	1	515-6308-01
Item 6 is secured to Item 1 by: #10-32 X 3/8" SHWH Swage (Ser.) Zinc (Qty. 2) (237-5985-00) and #10 Split Lock Washer (Qty. 2) (244-5003-00)			
7	Spring Washer (17/32" ID X 3/4" X 1")	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, 22-1080 [NO DIODE] YEL-GRN	1	090-5032-ND
COIL DOES NOT REQUIRE A DIODE. SEE COIL NOTE PREV. PAGE FOR DETAILS.			
10	Coil Sleeve	1	545-5388-00
11	Deflector Pad (Bumper)	1	545-5428-00
12	Flipper Plunger & Link Sub-Assy	1	515-6304-03
For Individual Items use: Flipper Plunger (530-5349-01) and Plunger Flipper Link (545-5611-01) and is secured to the Plunger by: Bushing, 16" ID X .281" OD X .187" (Qty. 1) (530-5532-00) and Spiral Pin (Qty. 1) (251-5015-02)			
13	Crank Bar (Paw)	1	530-5070-02
Item 13 requires: Bushing, .192" ID X .312" OD X .195" (Qty. 1) (530-5139-00)			
14®	Switch Actuator (RIGHT) Sub-Assy.	1	515-7257-00
For Individual Items use: Actuator & Spring Bracket (LEFT) (535-9038-01) and ® Switch Actuator (White Plastic) (545-5612-00) and is secured to the Bracket by: Rivet, 1/8" ID X 1/4" Lg. (Qty. 1) (249-5003-00)			
15	Set Screw: #10-32 X 3/4" Socket Hd.	2	237-6144-00
Item 15 requires: #10-32 Nylon Stop Nut (Qty. 1) Flipper Link Side Only (240-5203-00) and #10 Split Lock Washer (Qty. 1) Switch Actuator Side Only (244-5003-00) Tool required for Item 15: 5/32" or 4mm Allen Wrench			

Item 14® is also shown separated from Item 13, Crank Bar, for clarity.

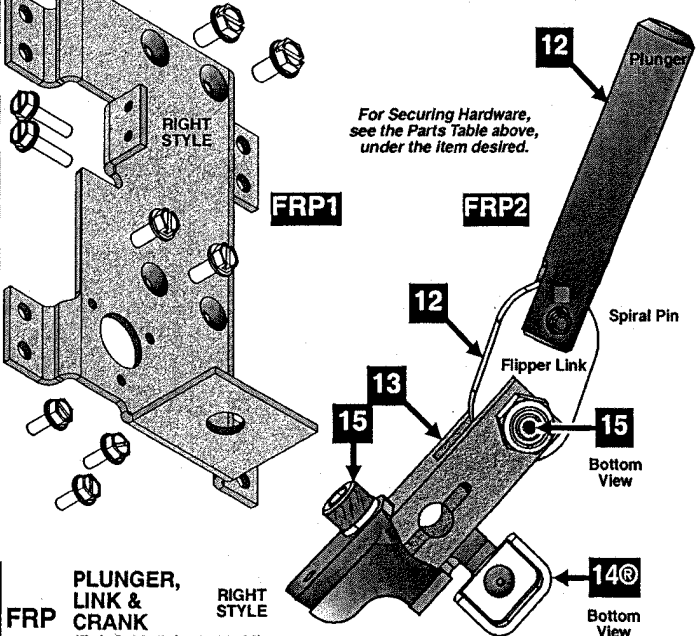


ASSOCIATED PARTS ARE NOT INCLUDED WITH THE ABOVE ASSEMBLY.

Nr.	ASSOCIATED PART(S)	QTY.	SPI PART Nr.
AP-A	Yellow Flipper Bat & Shaft Assembly (Non-Knurled End) <i>without Rubber Ring</i>	1	515-5133-06-06
AP-B	Large Flipper Red Rubber Ring	1	545-5277-22

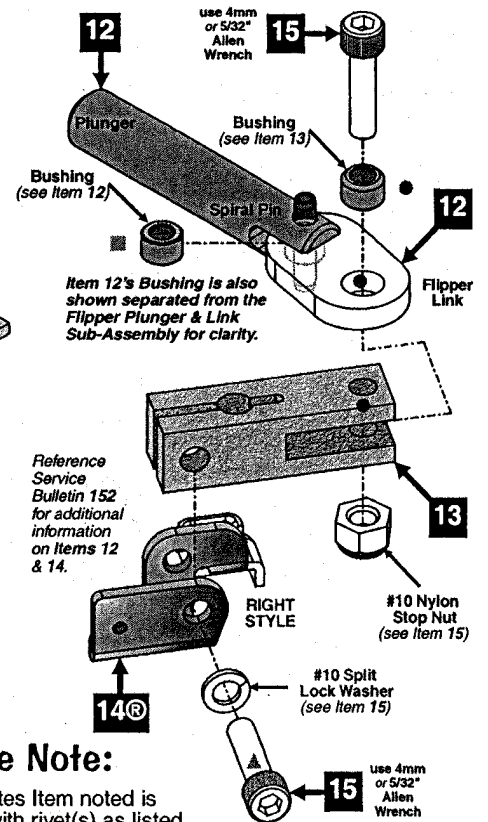
Flipper Rebuild Parts for Easier Installation, Save \$:

FRP FLIPPER BASE PLATE KIT (RIGHT):
Includes Item 1 pre-threaded >+< Securing Hardware for Items 2, 3, 6 & 8. 515-6617-00



FRP PLUNGER, LINK & CRANK (RIGHT STYLE) ASSEMBLY: Includes Items 12, 13, 14 & 15 (comes assembled). 515-7203-00

FRP FLIPPER (RIGHT) REBUILD KIT:
Includes Items 6, 10 AND above FRP2 500-6307-00



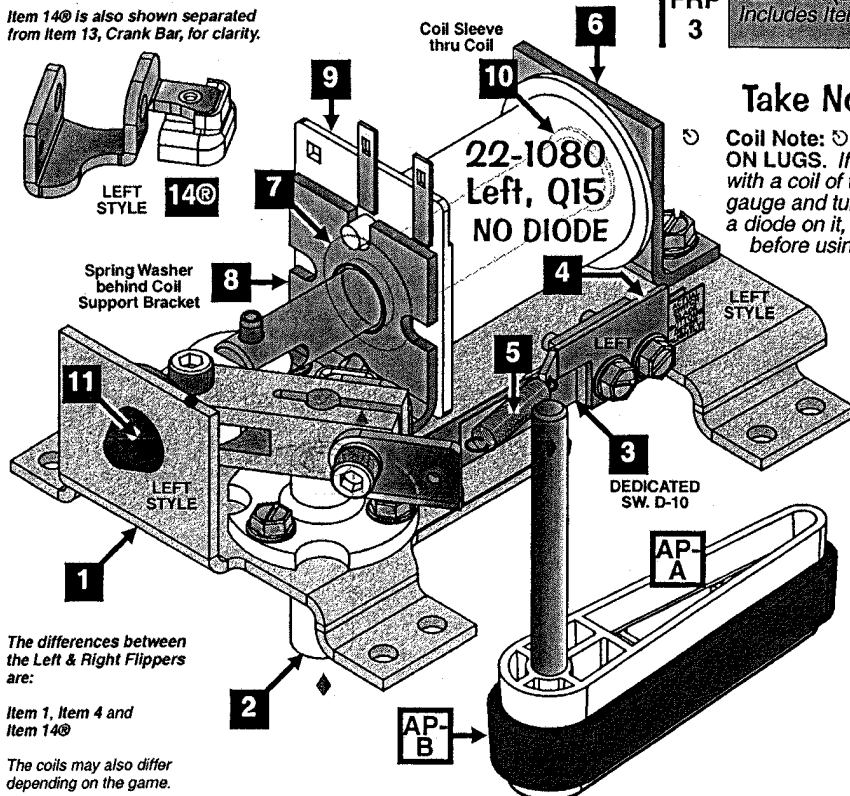
Take Note:

® "R" indicates Item noted is secured with rivet(s) as listed.

Flipper (Left) Assembly, 500-6543-12-ND (Items 1-15) and Associated Parts: Yellow Flipper Bat & Shaft Asm., 515-6275-06 (Items AP-A / AP-B)

Nr.	FLIPPER (LEFT) PARTS	QTY.	SPI PART Nr.
1	Flipper Base Plate (LEFT)	1	See FRP1
Item 1 is secured below by: #8 X 1/2" SHWH AB (Zinc) (Qty. 8) (234-5101-00) Ordering Note: Individual Part (535-7275-01) is not prethreaded, see Item FRP1.			
2	Flipper Bat Bushing (White Plastic) .25" ID.	1	545-5070-00
Item 2 is secured to item 1 by: #6-32 X 3/8" HWH Swage (Ser.) Zc. (Qty. 3) (237-5976-02)			
3	Power (EOS / 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	Sw. Plate/Spring Return Brkt. (LEFT)	1	535-7354-01
5	Flipper Return Spring	1	265-5035-00
6	Coil Stop Bracket Sub-Assembly	1	515-6308-01
Item 6 is secured to item 1 by: #10-32 X 3/8" SHWH Swage (Ser.) Zinc (Qty. 2) (237-5985-00) and #10 Split Lock Washer (Qty. 2) (244-5003-00)			
7	Spring Washer (17/32" ID X 3/4" X 1")	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, 22-1080 [NO DIODE] YEL-GRN	1	090-5032-ND
COIL DOES NOT REQUIRE A DIODE. SEE COIL NOTE BELOW FOR DETAILS.			
10	Coil Sleeve	1	545-5388-00
11	Deflector Pad (Bumper)	1	545-5428-00
12	Flipper Plunger & Link Sub-Assy.	1	515-6304-03
For Individual Items use: Flipper Plunger (530-5349-01) and Plunger Flipper Link (545-5611-01) and is secured to the Plunger by: Bushing, 16" ID X .281" OD X .187" (Qty. 1) (530-5532-00) and Spiral Pin a 5/32" X 3/4" Lg. (Qty. 1) (251-5015-02)			
13	Crank Bar (Pawl)	1	530-5070-02
Item 13 requires: Bushing, .192" ID X .312" OD X .195" (Qty. 1) (530-5139-00)			
14	Switch Actuator (LEFT) Sub-Assy.	1	515-7257-01
For Individual Items use: Actuator & Spring Bracket (LEFT) (535-9038-01) and Switch Actuator (White Plastic) (545-5612-00) and is secured to the Bracket by: Rivet, 1/8" X 1/4" Lg. (Qty. 1) (249-5003-00)			
15	Set Screw: #10-32 X 3/4" Socket Hd.	2	237-6144-00
Item 15 requires: #10-32 Nylon Stop Nut (Qty. 1) Flipper Link Side Only (240-5203-00) and #10 Split Lock Washer (Qty. 1) Switch Actuator Side Only (244-5003-00) Tool required for Item 15: 5/32" or 4mm Allen Wrench			

Item 14 is also shown separated from Item 13, Crank Bar, for clarity.



The differences between the Left & Right Flippers are:

Item 1, Item 4 and Item 14

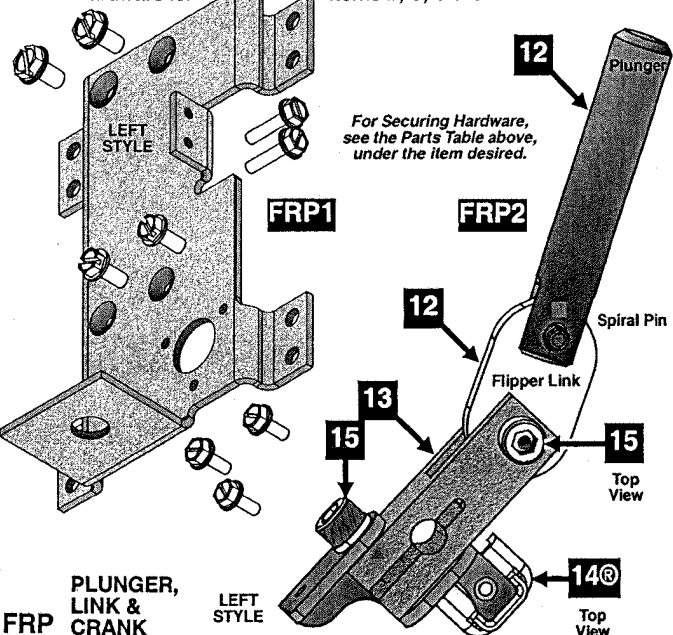
The coils may also differ depending on the game.

ASSOCIATED PARTS ARE NOT INCLUDED WITH THE ABOVE ASSEMBLY.

Nr.	ASSOCIATED PART(S)	QTY.	SPI PART Nr.
AP-A	Yellow Mini Flip Bat & Shaft Assembly (Non-Knurled End) without Rubber Ring	1	515-6275-06
AP-B	Small Flip RED Rubber Ring	1	545-5207-22

Flipper Rebuild Parts for Easier Installation, Save \$:

FRP 1 FLIPPER BASE PLATE KIT (LEFT): Includes Item 1 pre-threaded >+< Securing Hardware for 515-6617-01

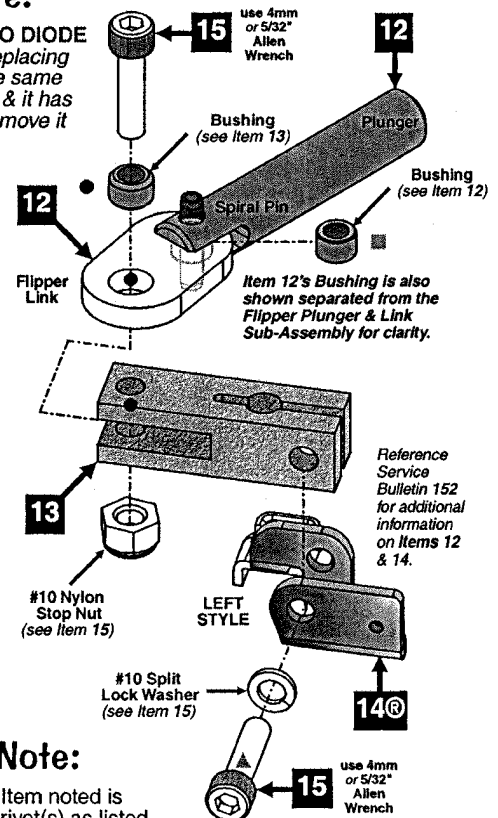


FRP 2 PLUNGER, LINK & CRANK (LEFT STYLE) ASSEMBLY: Includes Items 12, 13, 14 & 15 (comes assembled). 515-7203-01

FRP 3 FLIPPER (LEFT) REBUILD KIT: Includes Items 6, 10 AND above FRP2 500-6307-10

Take Note:

Coil Note: NO DIODE ON LUGS. If replacing with a coil of the same gauge and turn & it has a diode on it, remove it before using.



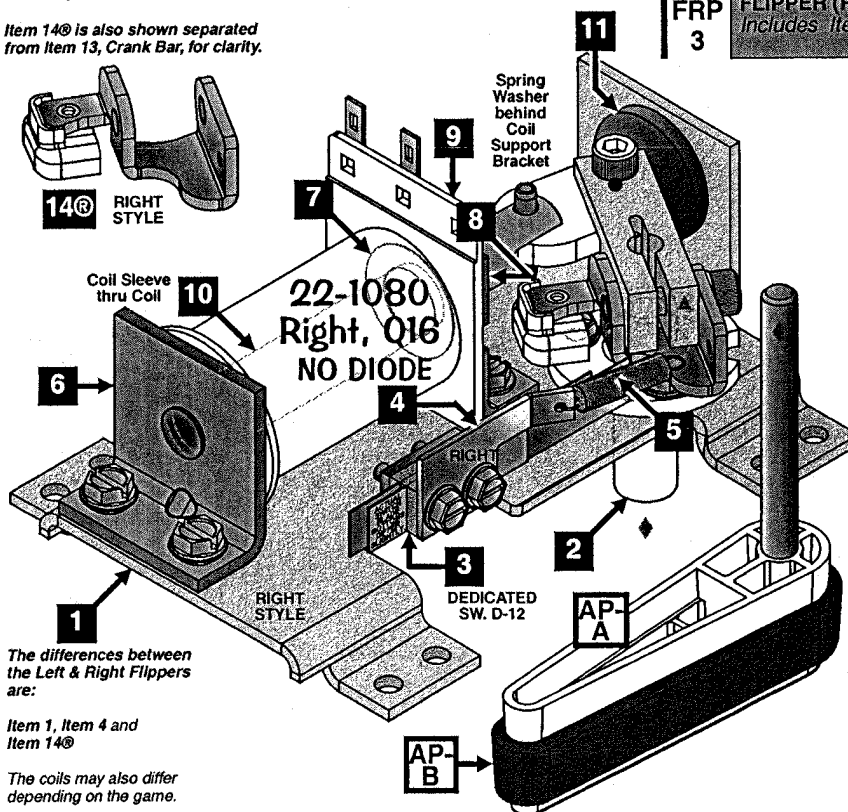
Take Note:

® "R" indicates Item noted is secured with rivet(s) as listed.

Flipper (Right) Assembly, 500-6543-02-ND (Items 1-15) **and Associated Parts: Yellow Mini Flipper Bat & Shaft Asm., 515-6275-06 (Items AP-A / AP-B)**

Nr.	FLIPPER (RIGHT) PARTS	QTY.	SPI PART Nr.
1	Flipper Base Plate (RIGHT)	1	See FRP1
Item 1 is secured below by: #8 X 1/2" SHWH AB (Zinc) (Qty. 8) (234-5101-00) Ordering Note: Individual Part (535-7275-00) is not prethreaded, see Item FRP1.			
2	Flipper Bat Bushing (White Plastic) .25" ID	1	545-5070-00
Item 2 is secured to Item 1 by: #6-32 X 3/8" HWH Swage (Ser.) Zc. (Qty. 3) (237-5976-02)			
3	Power (EOS / 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	Sw Plate/Spring Return Brkt. (RIGHT)	1	535-7354-00
5	Flipper Return Spring	1	265-5035-00
6	Coil Stop Bracket Sub-Assembly	1	515-6308-01
Item 6 is secured to Item 1 by: #10-32 X 3/8" SHWH Swage (Ser.) Zinc (Qty. 2) (237-5985-00) and #10 Split Lock Washer (Qty. 2) (244-5003-00)			
7	Spring Washer (17/32" ID X 3/4" X 1")	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, 22-1080 [NO DIODE] YEL-GRN	1	090-5032-ND
COIL DOES NOT REQUIRE A DIODE. SEE COIL NOTE PREV. PAGE FOR DETAILS.			
10	Coil Sleeve	1	545-5388-00
11	Deflector Pad (Bumper)	1	545-5428-00
12	Flipper Plunger & Link Sub-Assy	1	515-6304-03
For Individual Items use: Flipper Plunger (530-5349-01) and Plunger, Flipper Link (545-5611-01) and is secured to the Plunger by: Bushing, 16" ID X .281" OD X .187" (Qty. 1) (530-5532-00) and Spiral Pin (532" X 3/4" Lg. (Qty. 1) (251-5015-02)			
13	Crank Bar (Pawl)	1	530-5070-02
Item 13 requires: Bushing, .192" ID X .312" OD X .195" (Qty. 1) (530-5139-00)			
14®	Switch Actuator (RIGHT) Sub-Assy	1	515-7257-00
For Individual Items use: Actuator & Spring Bracket (LEFT) (535-9038-01) and © Switch Actuator (White Plastic) (545-5612-00) and is secured to the Bracket by: Rivet, 1/8" ID X 1/4" Lg. (Qty. 1) (249-5003-00)			
15	Set Screw: #10-32 X 3/4" Socket Hd.	2	237-6144-00
Item 15 requires: #10-32 Nylon Stop Nut (Qty. 1) Flipper Link Side Only (240-5203-00) and #10 Split Lock Washer (Qty. 1) Switch Actuator Side Only (244-5003-00) Tool required for Item 15: 5/32" or 4mm Allen Wrench			

Item 14® is also shown separated from Item 13, Crank Bar, for clarity.

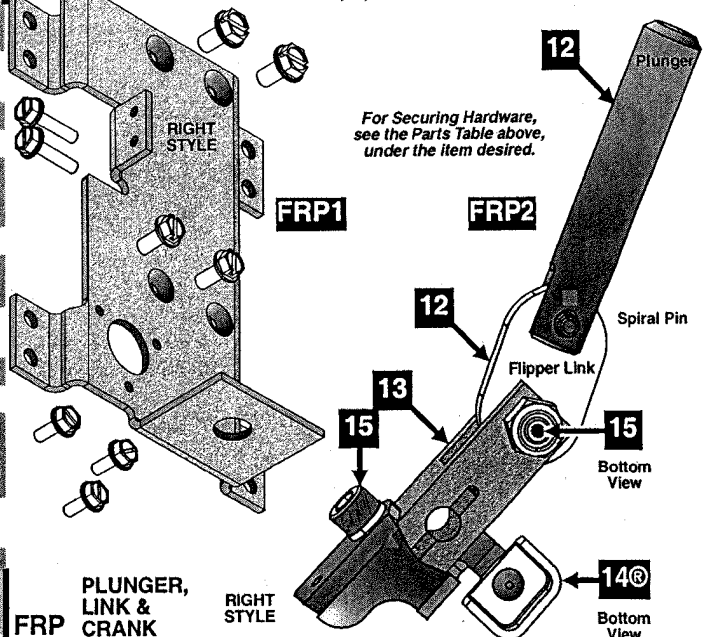


ASSOCIATED PARTS ARE NOT INCLUDED WITH THE ABOVE ASSEMBLY.

Nr.	ASSOCIATED PART(S)	QTY.	SPI PART Nr.
AP-A	Yellow Mini Flip Bat & Shaft Assembly (Non-Knurled End) without Rubber Ring	1	515-6275-06
AP-B	Small Flip RED Rubber Ring	1	545-5207-22

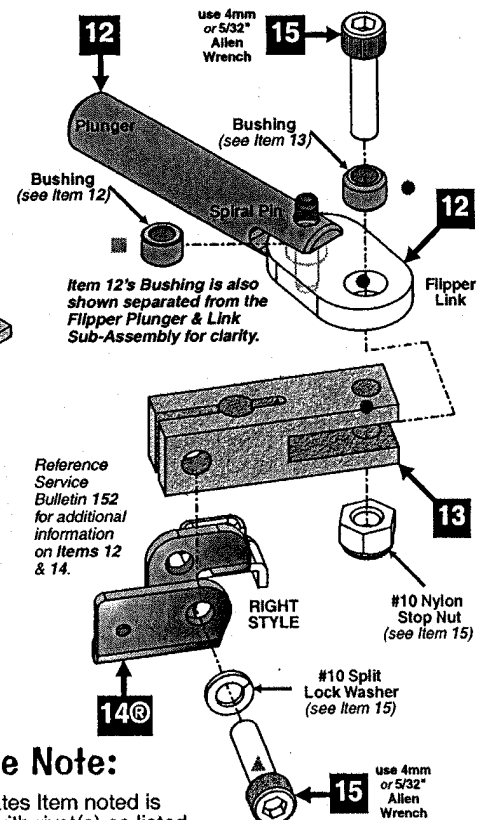
Flipper Rebuild Parts for Easier Installation, Save \$:

FRP 1 FLIPPER BASE PLATE KIT (RIGHT):
 Includes Item 1 pre-threaded >+< Securing Hardware for Items 2, 3, 6 & 8. 515-6617-00



FRP 2 PLUNGER, LINK & CRANK (RIGHT STYLE) ASSEMBLY: Includes Items 12, 13, 14 & 15 (comes assembled). 515-7203-00

FRP 3 FLIPPER (RIGHT) REBUILD KIT:
 Includes Items 6, 10 AND above FRP2 500-6307-00



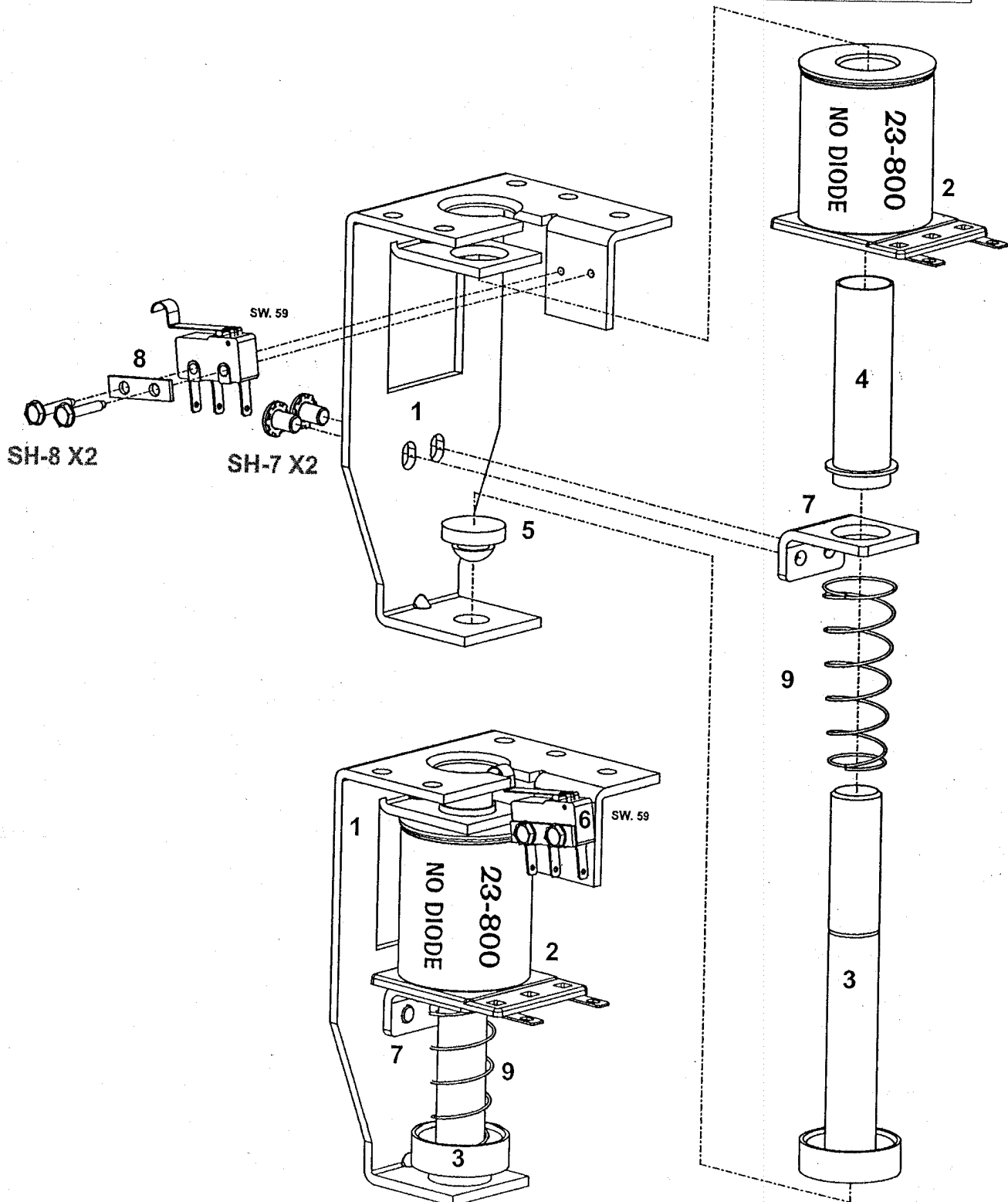
Take Note:

® "R" indicates Item noted is secured with rivet(s) as listed.

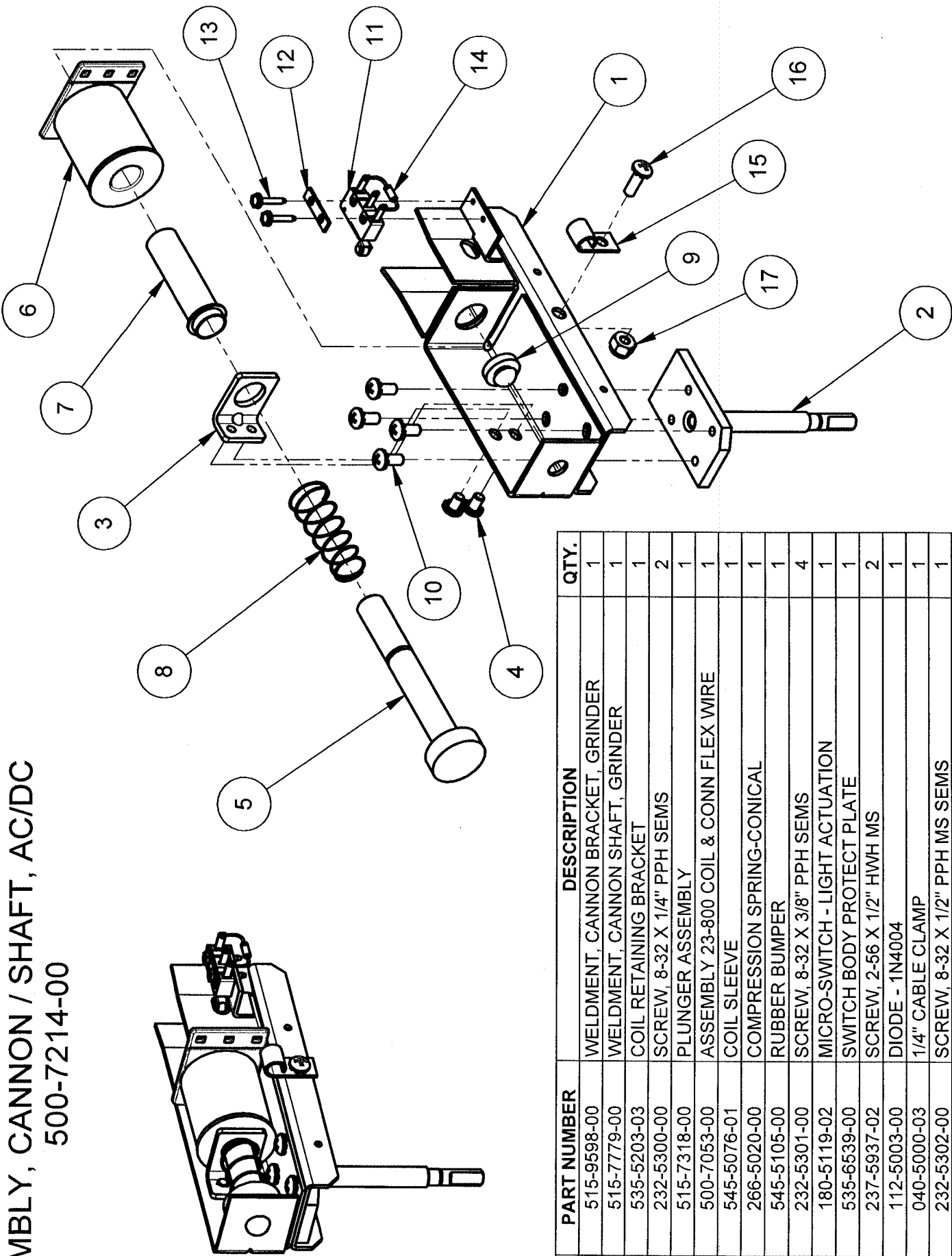
Sec. 4: Drawings ...

Vertical Up-Kicker (VUK) Asm. (Right Style), 500-7078-01 (Items 1-9)

ITEM #	QTY	PART #	DESCRIPTION
1	1	535-9590-03	VUK BRACKET - R.H. - NO ACTUATOR
2	1	090-5001-ND	COIL - 23-800, NO DIODE
3	1	515-5941-01	PLUNGER ASSEMBLY
4	1	545-5076-01	COIL SLEEVE
5	1	545-5105-00	RUBBER BUMPER
6	1	180-5209-00	SUB MINATURE SWITCH - SIM. ROLLER
7	1	535-5203-03	COIL RETAINING BRACKET
8	1	535-6539-00	SWITCH BODY PROTECT PLATE
SH-8	2	237-5937-02	SCREW, 2-56 X 1/2" HWH MS
SH-7	2	232-5300-00	SCREW, 8-32 X 1/4" PPH SEMS
9	1	266-5020-00	COMPRESSION SPRING-CONICAL



ASSEMBLY, CANNON / SHAFT, AC/DC
500-7214-00

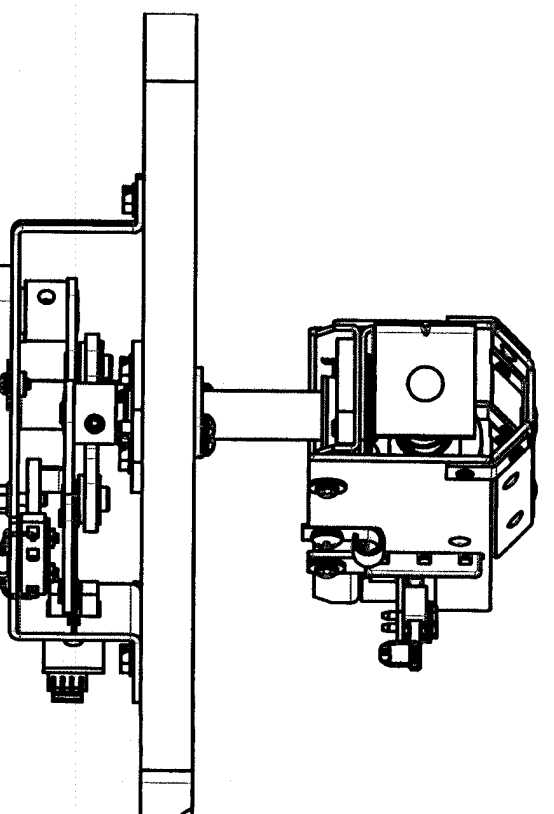
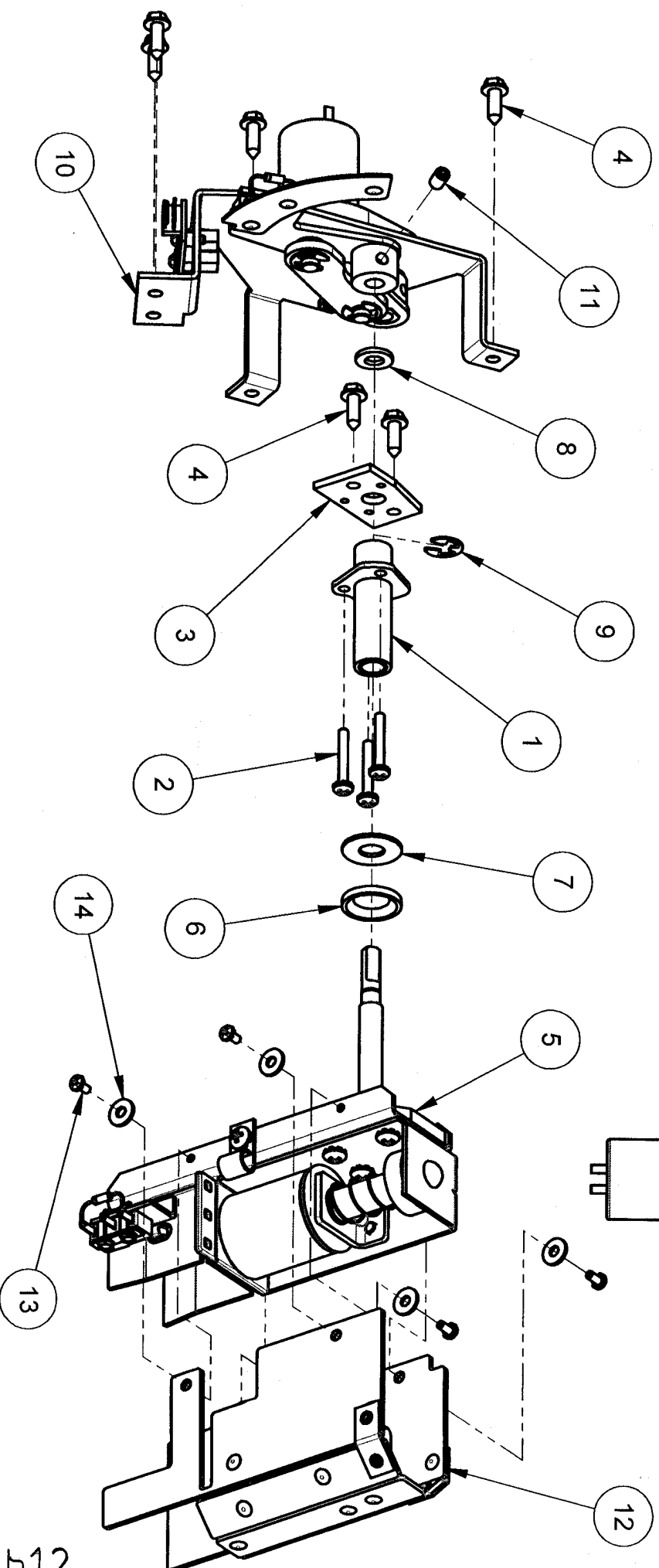


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	515-9598-00	WELDMENT, CANNON BRACKET, GRINDER	1
2	515-7779-00	WELDMENT, CANNON SHAFT, GRINDER	1
3	535-5203-03	COIL RETAINING BRACKET	1
4	232-5300-00	SCREW, 8-32 X 1/4" PPH SEMS	2
5	515-7318-00	PLUNGER ASSEMBLY	1
6	500-7053-00	ASSEMBLY 23-800 COIL & CONN FLEX WIRE	1
7	545-5076-01	COIL SLEEVE	1
8	266-5020-00	COMPRESSION SPRING-CONICAL	1
9	545-5105-00	RUBBER BUMPER	1
10	232-5301-00	SCREW, 8-32 X 3/8" PPH SEMS	4
11	180-5119-02	MICRO-SWITCH - LIGHT ACTUATION	1
12	535-6539-00	SWITCH BODY PROTECT PLATE	1
13	237-5937-02	SCREW, 2-56 X 1/2" HWH MS	2
14	112-5003-00	DIODE - 1N4004	1
15	040-5000-03	1/4" CABLE CLAMP	1
16	232-5302-00	SCREW, 8-32 X 1/2" PPH MS SEMS	1
17	240-5102-00	8-32 NYLON LOCK NUT	1
99*	036-5573-21-C7	CABLE CANNON FIRE SW	1

* ITEM NOT SHOWN

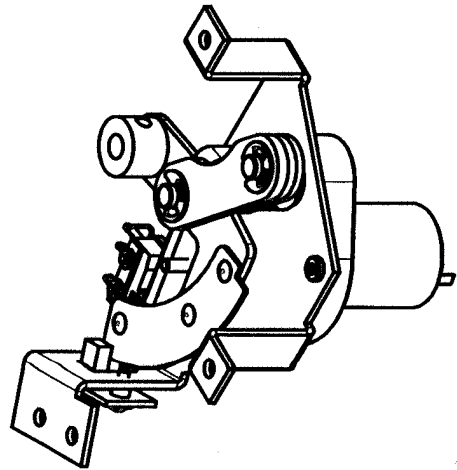
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	515-7780-00	SUPPORT TUBE, CANNON GRINDER	1
2	232-5205-00	SCREW, 6-32 X 7/8" PPH SEMS	3
3	535-0490-00	PLATE, CANNON TUBE MNT, GRINDER	1
4	234-5101-00	SCREW, #8 X 1/2" SLT HWH AB ZINC	6
5	500-7214-00	ASSEMBLY, CANNON / SHAFT, GRINDER	1
6	242-5105-00	WASHER, CANNON BEARING, GRINDER	1
7	242-5106-00	SHIM WASHER, 13/16 X 11/32 X .048	1
8	242-5008-00	WASHER, 1/4" ID X 1/2" OD X 1/16" THICK	1
9	270-5002-00	RETAINING RING - 1/4"	1
10	500-7213-00	ASSY, CANNON MOTOR / SWITCH, GRINDER	1
11	237-6092-00	SET SCREW, 10-32 X 5/16, SOCKET CUP PT	1
12	510-5146-33	RIVETED ASSY, CANNON COVER, GRINDER LE	1
13	237-5909-00	SCREW, 4-40 X 1/4" PPH SEMS	4
14	242-5001-00	#6 WASHER	4

CANNON REFERENCE ASSEMBLY, AC/DC



ASSY, CANNON MOTOR / SWITCH, AC/DC

500-7213-00



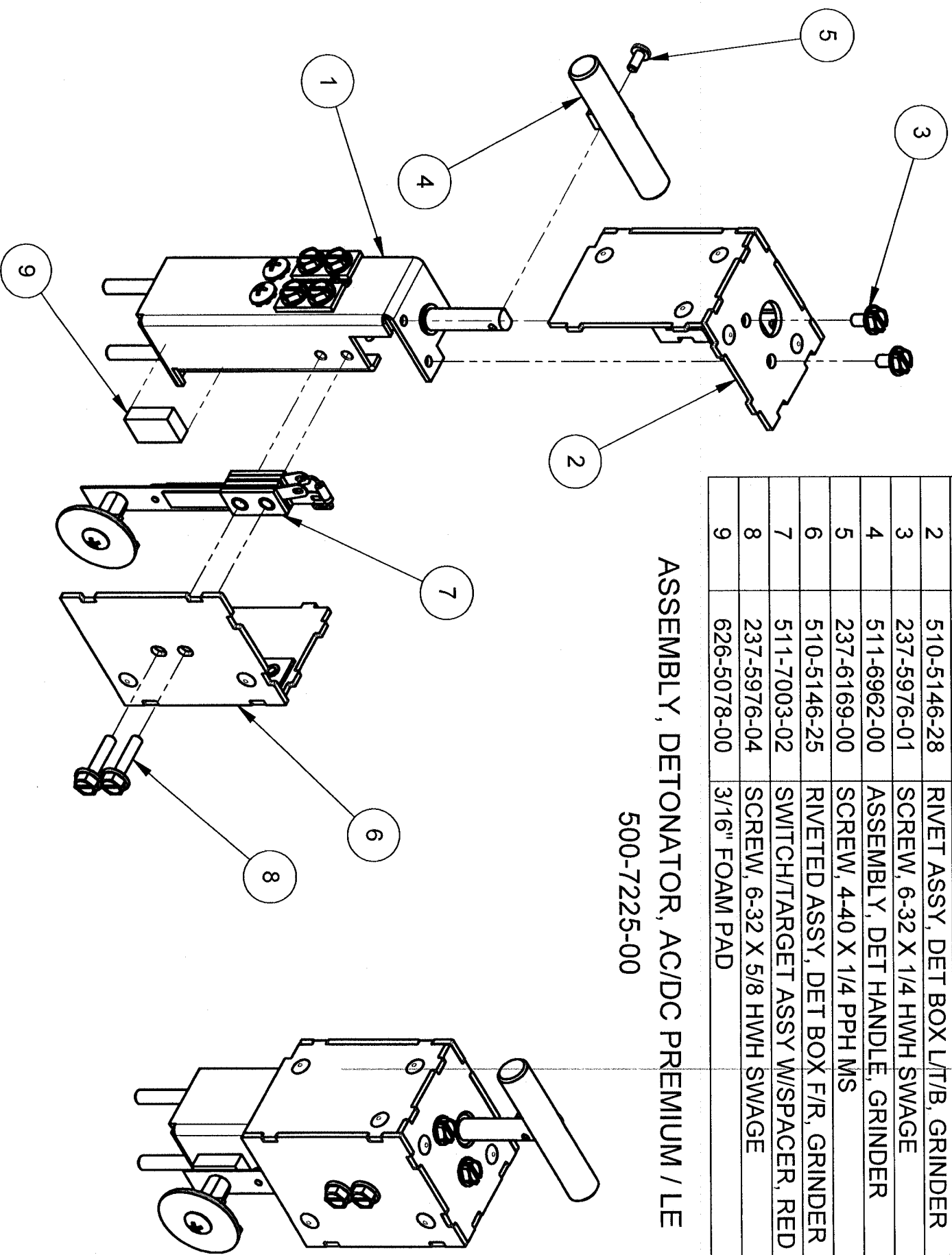
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	515-7781-00	BRACKET, CANNON MOTOR, GRINDER	1
2	511-6968-00	MOTOR & CONN ASSY, 24 VDC, 12 RPM	1
3	237-5909-00	SCREW, 4-40 X 1/4" PPH SEMS	2
4	242-5072-01	NYLON WASHER .252 ID X .472 OD	1
5	515-7777-00	CRANK ASSEMBLY, CANNON, GRINDER	1
6	237-6092-00	SET SCREW, 10-32 X 5/16, SOCKET CUP PT	1
7	545-7280-00	CONNECTOR ARM, CANNON, GRINDER	1
8	270-5002-00	RETAINING RING - 1/4"	2
9	510-5152-00	RIVET ASSEM, CANNON DRIVEN, GRINDER	1
10	520-5292-00	OPTO INTERRUPTOR BOARD - IDLER DISC	1
11	254-5062-02	SPACER, #4 ID, 3/16" OD X .125"	2
12	237-5979-00	SCREW, 4-40 X 3/8", PPH TF (ZINC)	2
13	242-5008-00	WASHER, 1/4" ID X 1/2" OD X 1/16" THICK	2
14	180-5010-04	MICRO-SWITCH	1
15	535-6539-00	SWITCH BODY PROTECT PLATE	2
16	237-5806-00	SCREW, 2-56 X 1/2" PPH MS ZINC	2
17	240-5301-00	2-56 HEX NUT	2
18	112-5003-00	DIODE - 1N4004	1
19	242-5002-00	#4 FLAT WASHER - 5/16" O.D.	2
20	237-5976-02	SCREW, 6-32 X 3/8 HWH SWAGE	1
99*	036-5573-18-C7	CABLE CANNON MOTOR SW	1

* ITEM NOT SHOWN

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	511-6961-00	ASSY, DET COIL / PLUNGER, GRINDER LE	1
2	510-5146-28	RIVET ASSY, DET BOX L/T/B, GRINDER	1
3	237-5976-01	SCREW, 6-32 X 1/4 HWH SWAGE	2
4	511-6962-00	ASSEMBLY, DET HANDLE, GRINDER	1
5	237-6169-00	SCREW, 4-40 X 1/4 PPH MS	1
6	510-5146-25	RIVETED ASSY, DET BOX F/R, GRINDER	1
7	511-7003-02	SWITCH/TARGET ASSY W/SPACER, RED	1
8	237-5976-04	SCREW, 6-32 X 5/8 HWH SWAGE	2
9	626-5078-00	3/16" FOAM PAD	1

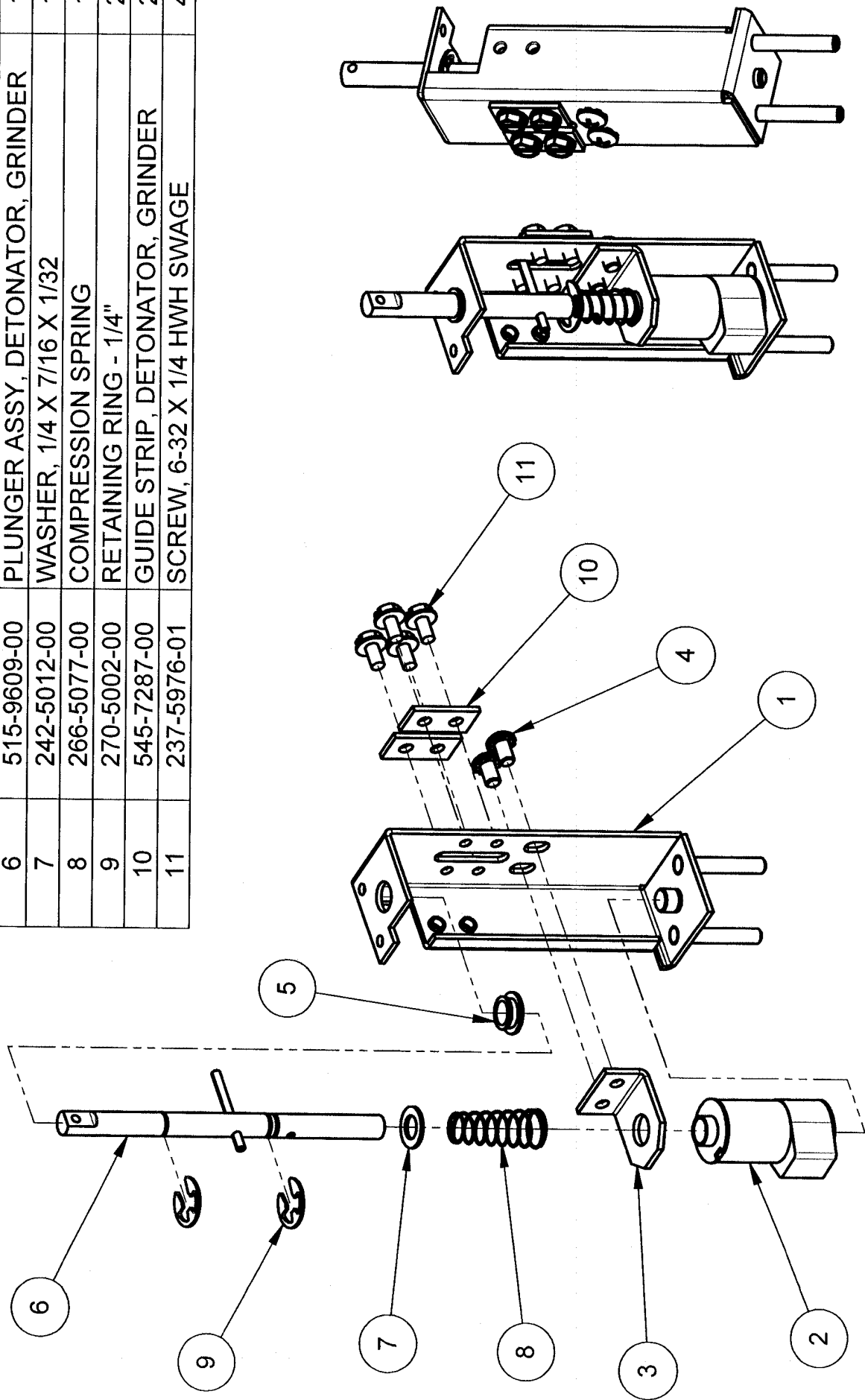
ASSEMBLY, DETONATOR, AC/DC PREMIUM / LE

500-7225-00

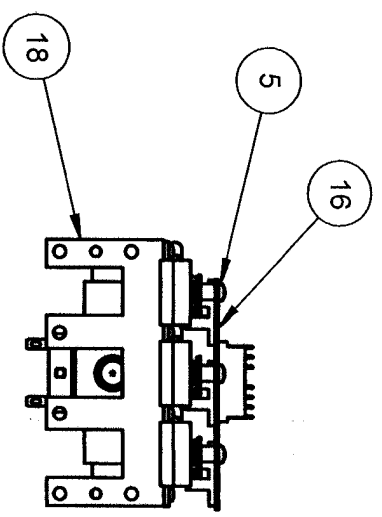
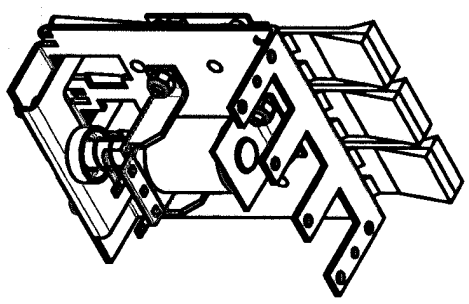


ASSEMBLY, DETONATOR
COIL / PLUNGER
AC/DC PREMIUM / LE
511-6961-00

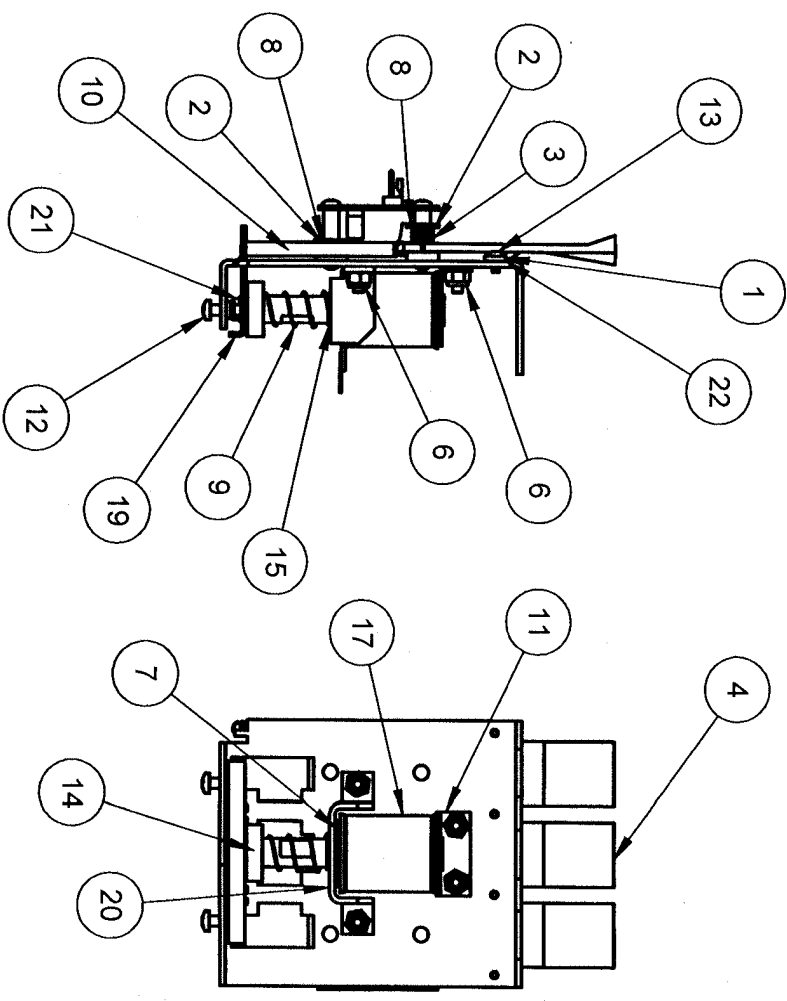
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	515-9608-00	BRACKET ASSY, DETONATOR, GRINDER	1
2	500-6818-00-ND	COIL AND 2-PIN ASSEMBLY, NO DIODE	1
3	535-0540-00	COIL BRACKET, DETONATOR, GRINDER	1
4	232-5300-00	SCREW, 8-32 X 1/4" PPH SEMS	2
5	545-5423-00	NYLINER, 1/4" SHAFT, 4L1-FF	1
6	515-9609-00	PLUNGER ASSY, DETONATOR, GRINDER	1
7	242-5012-00	WASHER, 1/4 X 7/16 X 1/32	1
8	266-5077-00	COMPRESSION SPRING	1
9	270-5002-00	RETAINING RING - 1/4"	2
10	545-7287-00	GUIDE STRIP, DETONATOR, GRINDER	2
11	237-5976-01	SCREW, 6-32 X 1/4 HWH SWAGE	4



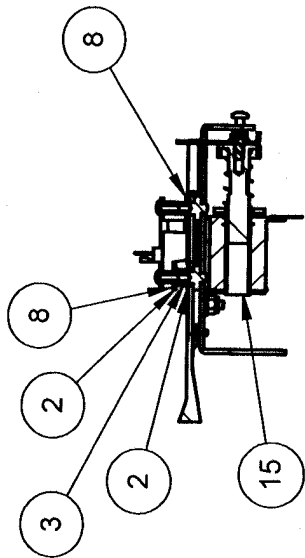
3-BANK DROP TARGET ASSEMBLY 500-7216-03



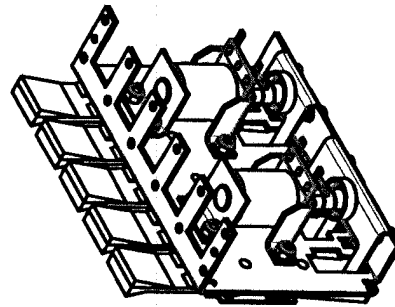
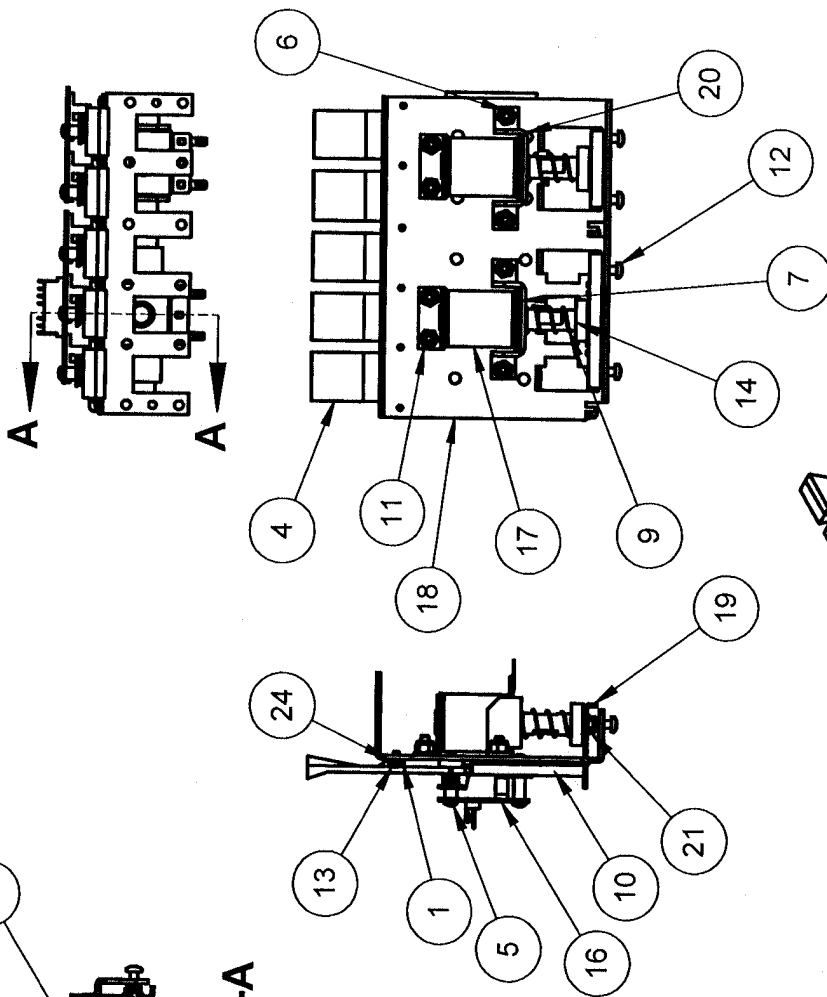
ITEM #	PART NUMBER	DESCRIPTION	QTY.
1	545-6163-03	LEDGE, 3-BANK DROP TARGET	1
2	242-5091-00	WASHER, 1/2 X 17/64 X .03 - DT	9
3	266-5089-00	SPRING COMPRESSION - DT	3
4	545-6305-00	TARGET - ROLLOVER - BLACK	3
5	237-5501-00	SCREW, 6-32 X 3/8" PPH MS ZINC	6
6	240-5102-00	8-32 NYLON LOCK NUT	4
7	269-5002-00	SPRING WASHER	1
8	270-5002-00	RETAINING RING - 1/4"	6
9	266-5020-00	COMPRESSION SPRING-CONICAL	1
10	265-5003-02	TARGET RESET SPRING	3
11	535-9959-00	STOP BRKT	1
12	237-5602-00	SCREW, 8-32 X 1/2 PPH MS, ZINC	2
13	237-6169-00	SCREW, 4-40 X 1/4 PPH MS	4
14	530-5757-00	PLUNGER - D.T. ASSY.	1
15	545-5076-01	COIL SLEEVE	1
16	520-5252-03	3 BANK DROP TARGET PCB-OPTO	1
17	090-5034-ND	COIL 25-1240 - NO DIODE	1
18	515-7784-03	DROP TARGET FRAME ASSY -3-BANK	1
19	535-9996-03	LIFT BRACKET - 3 BANK	1
20	535-9995-01	COIL BRACKET	1
21	237-5985-00	10-32 X 3/8 SHWH SWAGE SCREW	1
22	545-6798-00	SHIM - FICHE PAPER - D.T. SINGLE	2
98*	036-5542-00	DROP TARGET CABLE	1
99*	605-5006-00	1/8" PVC TUBING	.1 FT



* ITEM NOT SHOWN



SECTION A-A



ITEM #	PART NUMBER	DESCRIPTION	QTY.
1	545-6163-05	LEDGE, 5-BANK DROP TARGET	1
2	242-5091-00	WASHER, 1/2 X 17/64 X .03 - DT	15
3	266-5089-00	SPRING COMPRESSION - DT	5
4	545-6305-00	TARGET - ROLLOVER - BLACK	5
5	237-5501-00	SCREW, 6-32 X 3/8" PPH MS ZINC	10
6	240-5102-00	8-32 NYLON LOCK NUT	8
7	269-5002-00	SPRING WASHER	2
8	270-5002-00	RETAINING RING - 1/4"	10
9	266-5020-00	COMPRESSION SPRING-CONICAL	2
10	265-5003-02	TARGET RESET SPRING	5
11	535-9959-00	STOP BRKT	2
12	237-5602-00	SCREW, 8-32 X 1/2 PPH MS, ZINC	4
13	237-6169-00	SCREW, 4-40 X 1/4 PPH MS	6
14	530-5757-00	PLUNGER - D.T. ASSY.	2
15	545-5076-01	COIL SLEEVE	2
16	520-5252-03	3 BANK DROP TARGET PCB-OPTO	1
17	090-5034-ND	COIL 25-1240 - NO DIODE	2
18	515-7784-05	DROP TARGET FRAME ASSY - 5-BANK	1
19	535-9996-03	LIFT BRACKET - 3 BANK	1
20	535-9995-01	COIL BRACKET	2
21	237-5985-00	10-32 X 3/8 SHWH SWAGE SCREW	2
22	520-5252-02	2 BANK DROP TARGET PCB-OPTO	1
23	535-9996-02	LIFT BRACKET - 2 BANK	1
23	535-9996-02	LIFT BRACKET - 2 BANK	1
24	545-6798-01	SHIM - FICHE PAPER - D.T. DOUBLE	2
98*	036-5542-00	DROP TARGET CABLE	2
99*	605-5006-00	1/8" PVC TUBING	.2 FT

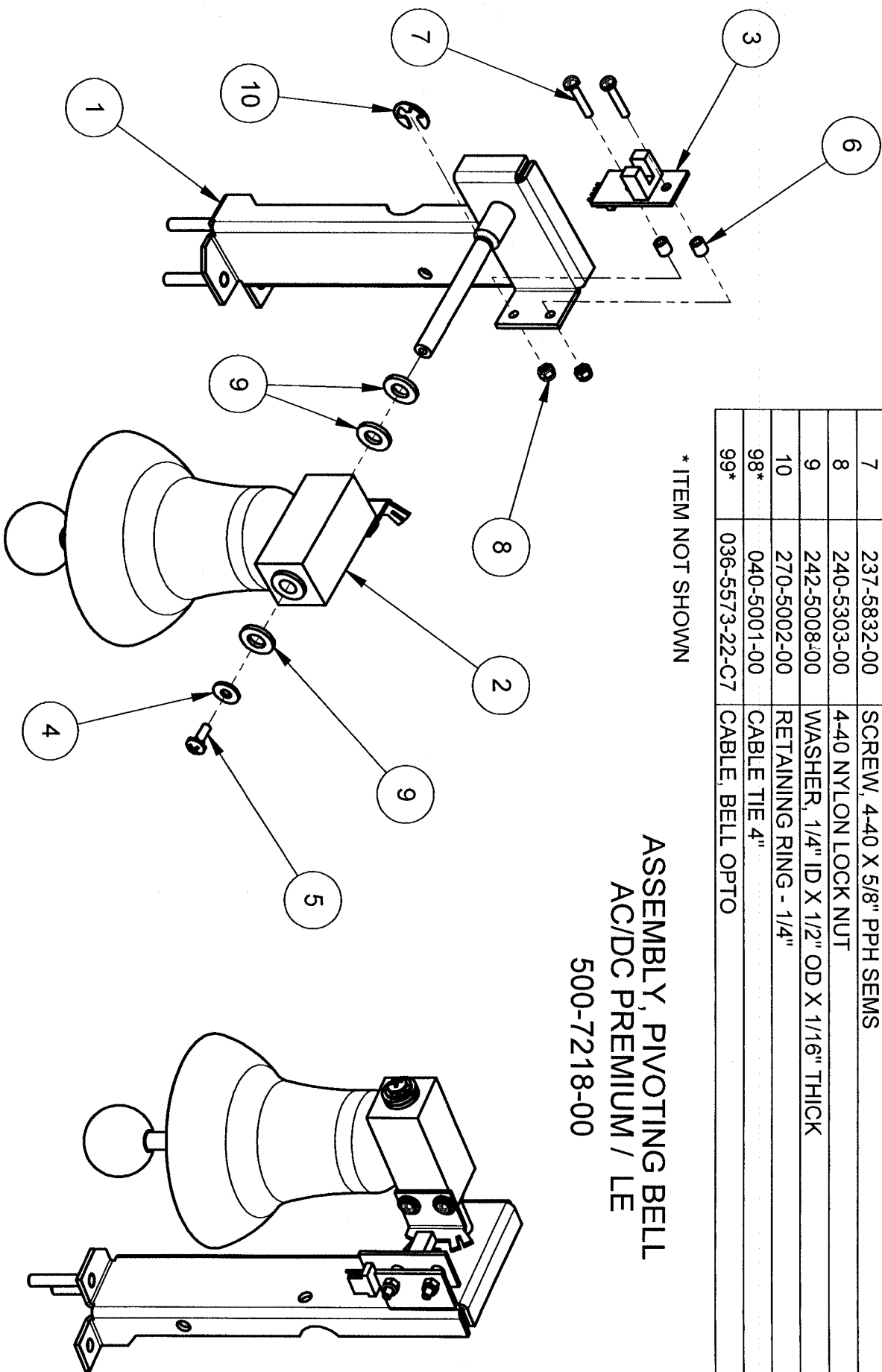
* ITEM NOT SHOWN

5-BANK DROP TARGET ASSEMBLY
500-7216-05

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	515-0123-00	WELDMENT, BELL MOUNT, GRINDER LE	1
2	511-6950-00	ASSEMBLY, BELL & BLOCK, GRINDER LE	1
3	520-5292-00	OPTO INTERRUPTOR BOARD - RIGHT ANGLE CONNECTOR	1
4	242-5001-00	#6 WASHER	1
5	232-5201-00	SCREW, 6-32 X 3/8" PPH MS SEMS	1
6	254-5062-03	SPACER, #4 ID, 3/16" OD X .187"	2
7	237-5832-00	SCREW, 4-40 X 5/8" PPH SEMS	2
8	240-5303-00	4-40 NYLON LOCK NUT	2
9	242-5008-00	WASHER, 1/4" ID X 1/2" OD X 1/16" THICK	3
10	270-5002-00	RETAINING RING - 1/4"	1
98*	040-5001-00	CABLE TIE 4"	2
99*	036-5573-22-C7	CABLE, BELL OPTO	1

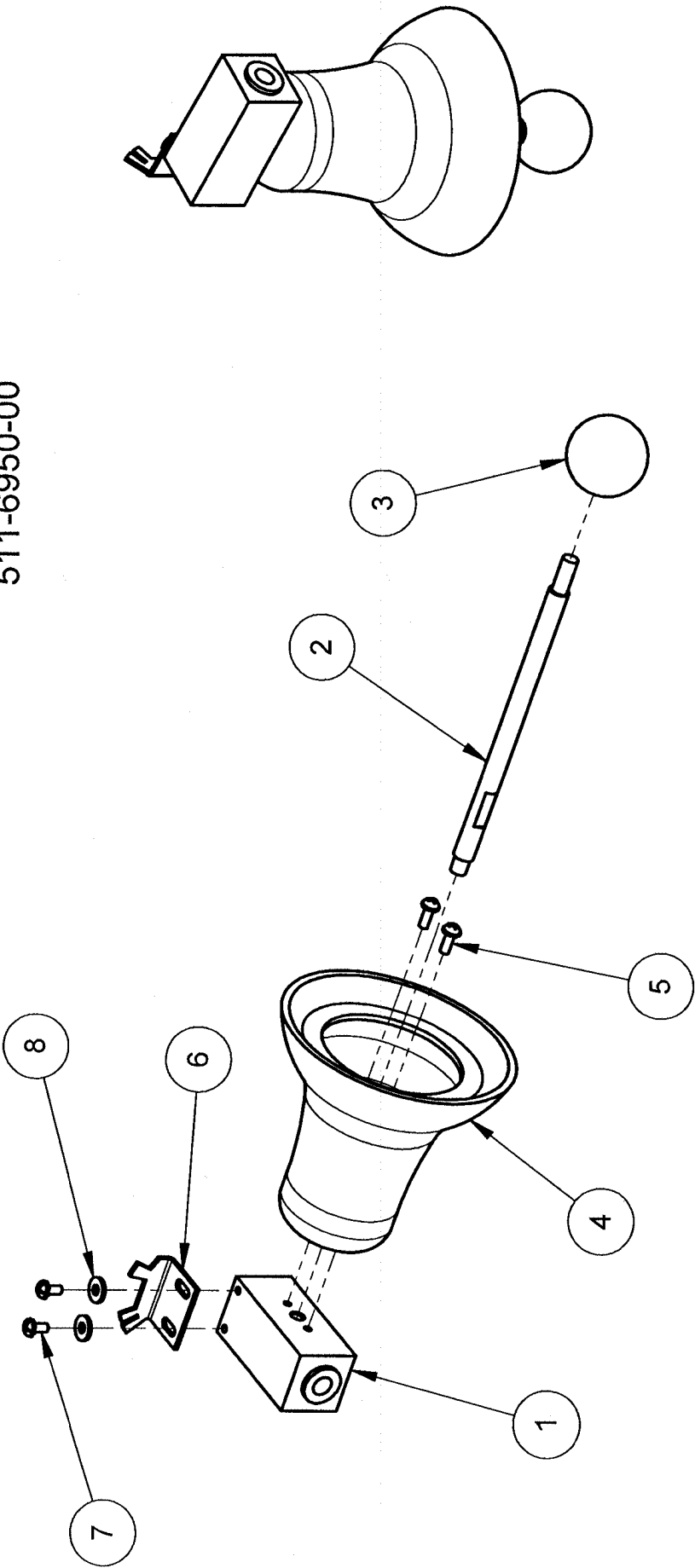
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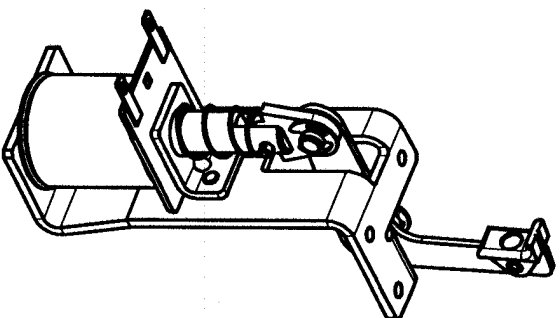
ASSEMBLY, PIVOTING BELL AC/DC PREMIUM / LE 500-7218-00



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	515-9600-00	BELL PIVOT BLOCK, GRINDER LE	1
2	530-7756-00	CLAPPER ROD, BELL, GRINDER LE	1
3	260-5013-00	BALL, CARBON, THREADED	1
4	545-7283-00	MOLDED BELL, GRINDER	1
5	237-5882-00	SCREW, #4-40 X 5/16 PRH SEMS	2
6	535-0512-00	OPTO BRACKET, BELL, GRINDER LE	1
7	237-5909-00	SCREW, 4-40 X 1/4" PPH SEMS	2
8	242-5002-00	#4 FLAT WASHER - 5/16" O.D.	2

ASSEMBLY, BELL & BLOCK
GRINDER PREMIUM / LE
511-6950-00

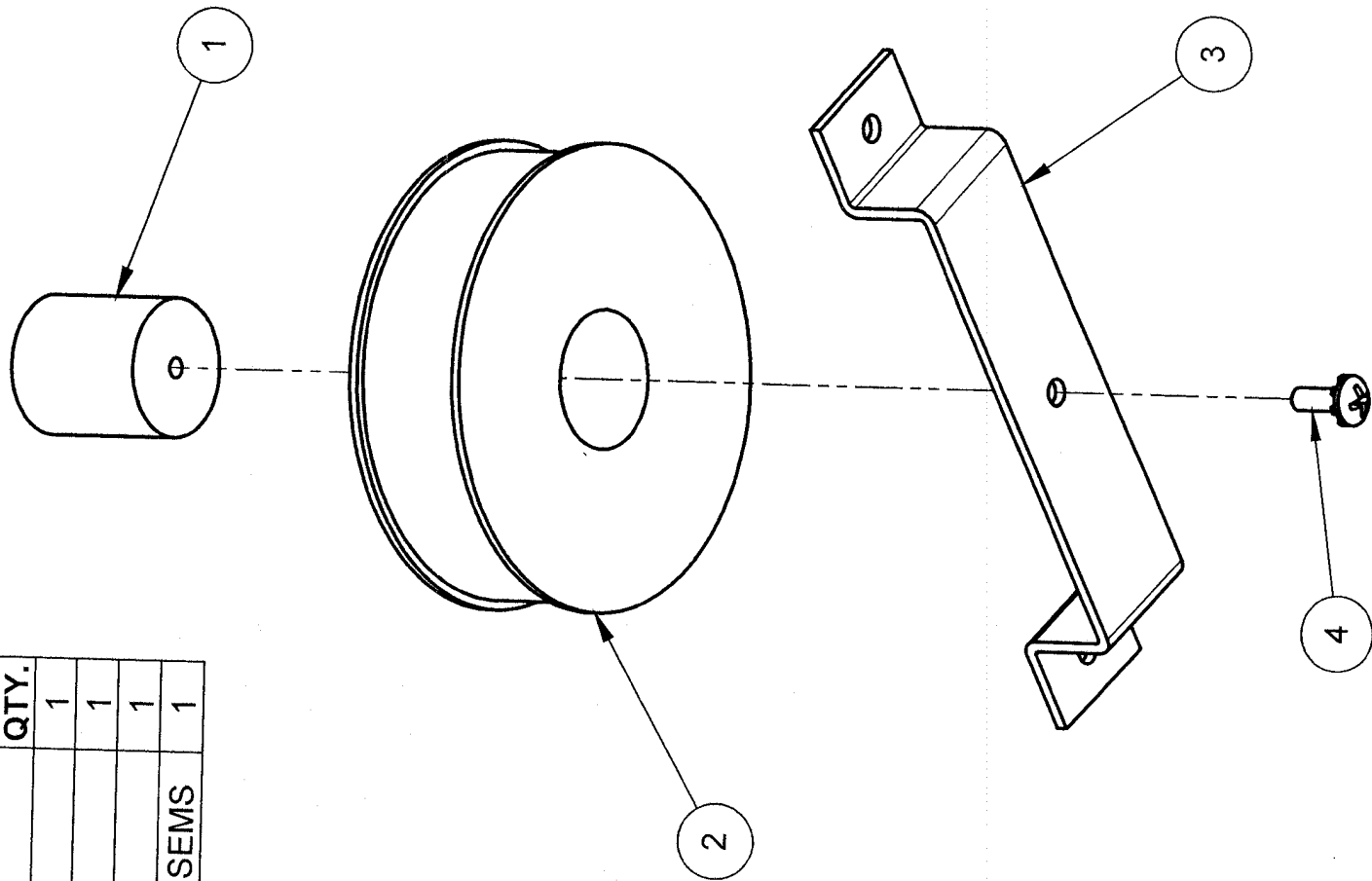




ASSEMBLY, KICKER ARM AC/DC PREMIUM / LE 500-7217-00

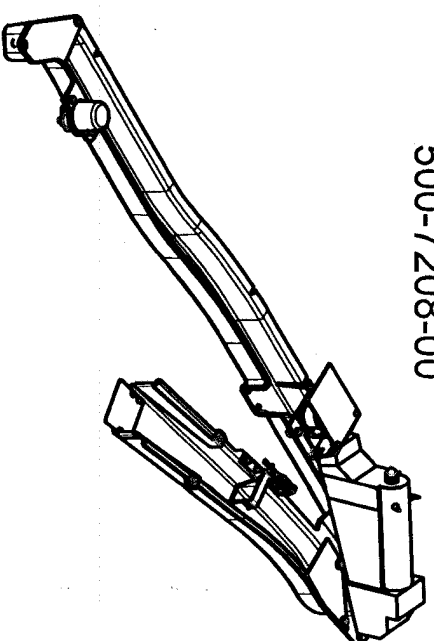
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	515-7785-00	KICKER BRACKET ASSEMBLY	1
2	515-5340-01	ARM & TIP ASSY	1
3	545-5411-00	COIL SLEEVE	1
4	090-5044-ND	COIL 26-1200 - NO DIODE	1
5	535-5203-03	COIL RETAINING BRACKET	1
6	232-5300-00	SCREW, 8-32 X 1/4" PPH SEMS	2
7	515-5338-00	PLUNGER & LINK ASSEMBLY	1
8	266-5020-00	COMPRESSION SPRING-CONICAL	1
9	270-5002-00	RETAINING RING - 1/4"	2

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	530-5266-01	MAGNET CORE	1
2	090-5042-00	MAGNET, 22-650 COIL	1
3	535-6637-01	MAGNET BRACKET	1
4	232-5201-00	SCREW, 6-32 X 3/8" PPH MS SEMS	1

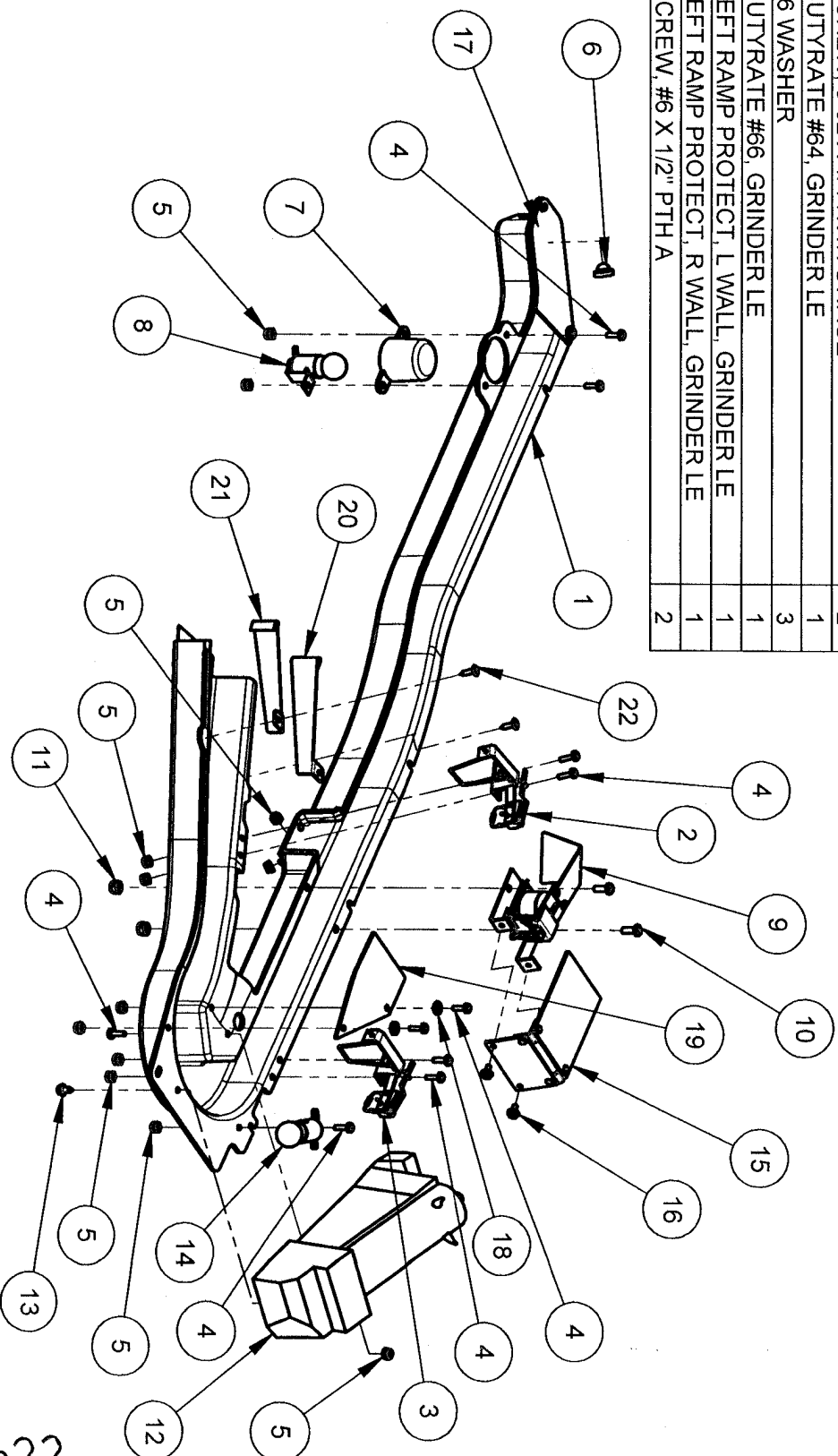


ASSEMBLY, LEFT PLASTIC RAMP AC/DC PREMIUM / LE

500-7208-00

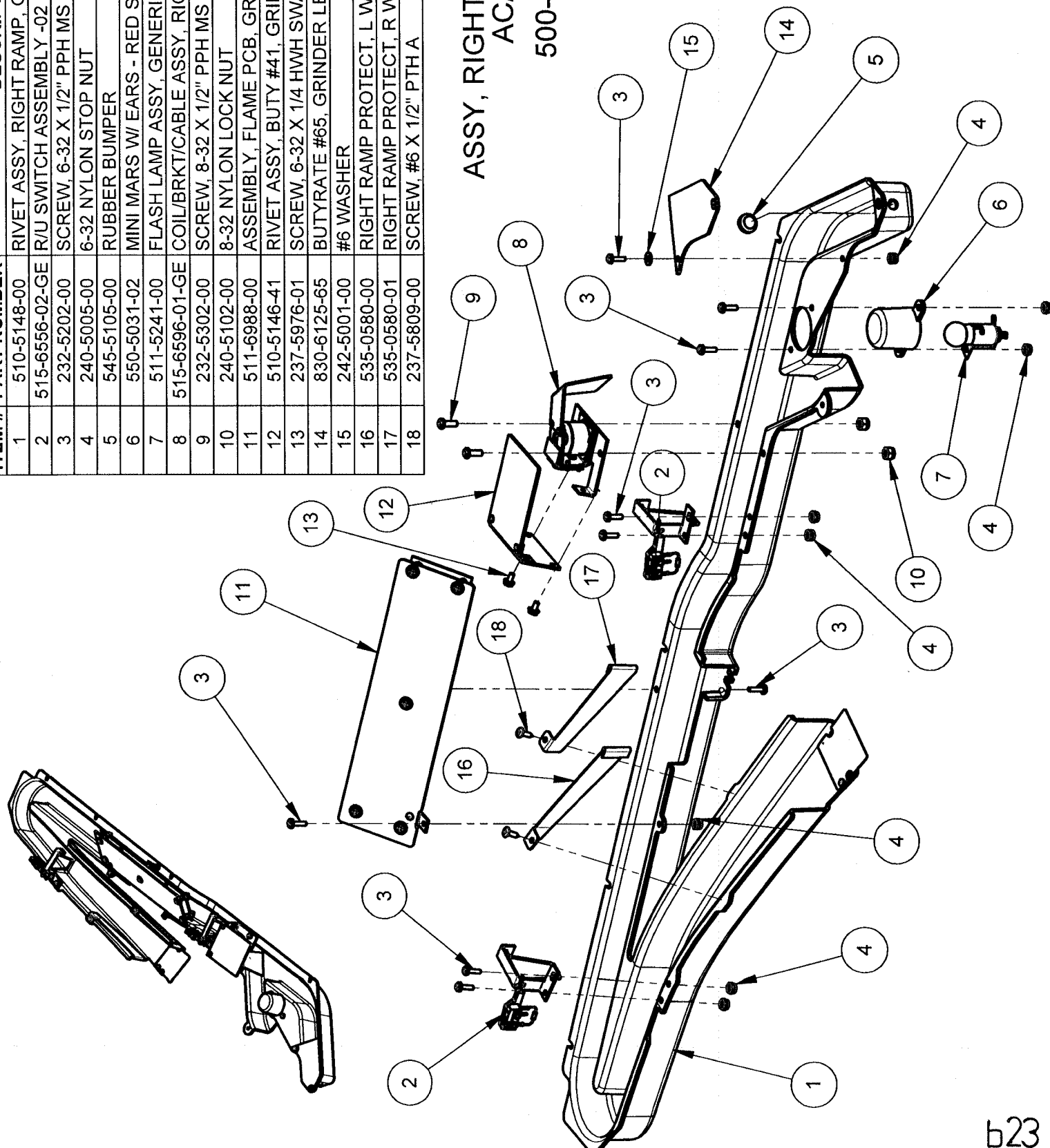


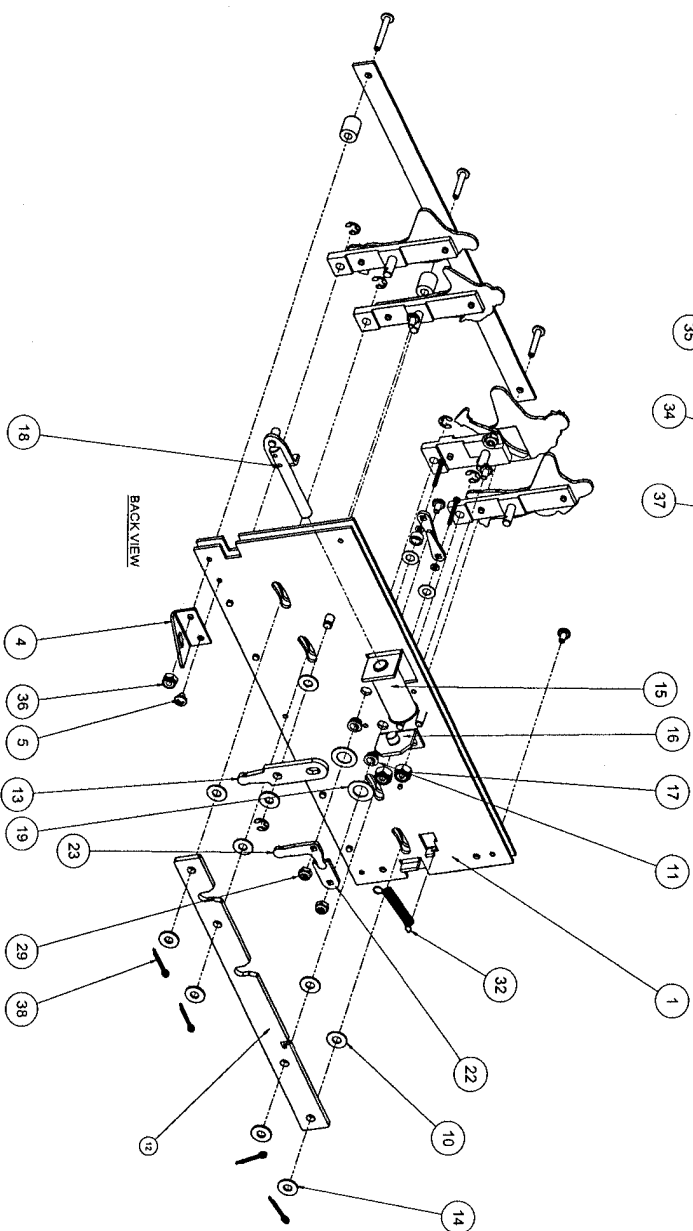
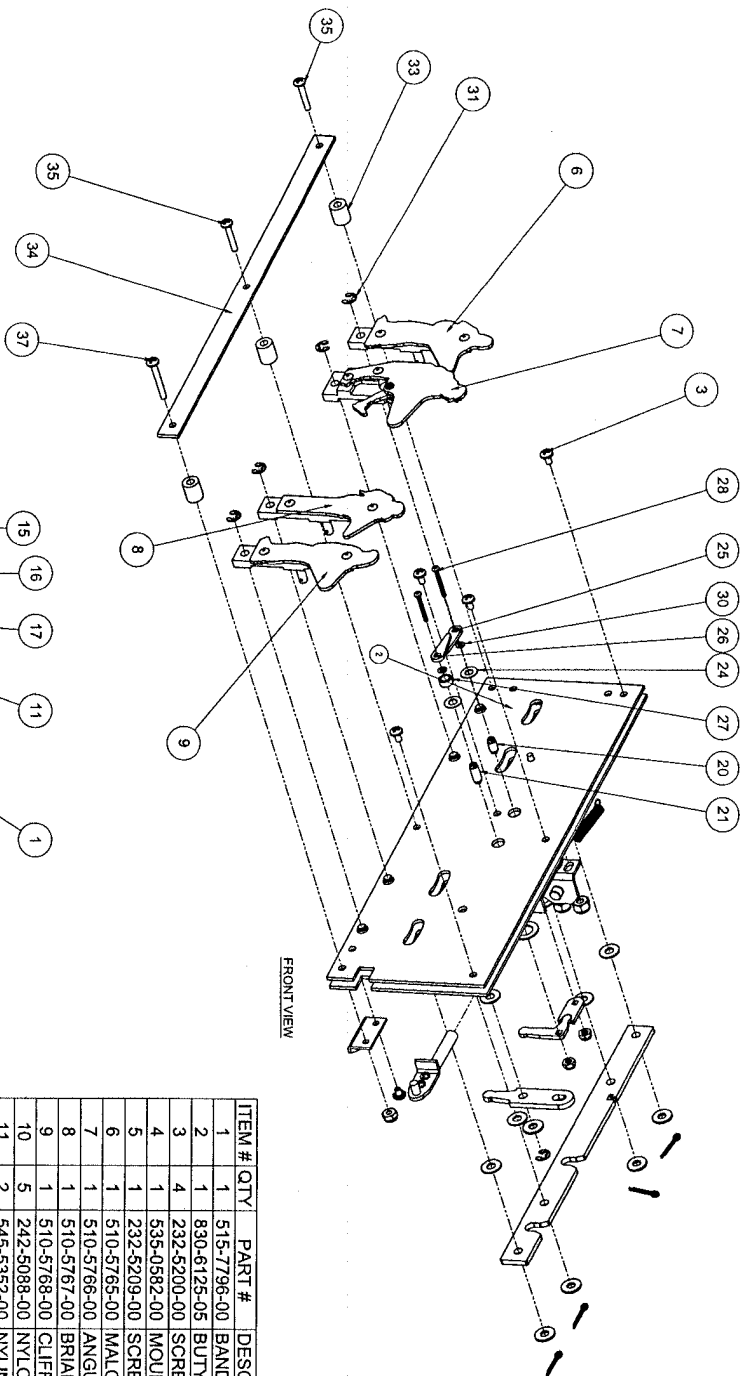
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	510-5147-00	RIVETED ASSY, LEFT RAMP, GRINDER	1
2	515-6556-03-GE	RU SWITCH ASSEMBLY -03 W/ GENERIC CABLE	1
3	515-6556-02-GE	RU SWITCH ASSEMBLY -02 W/ GENERIC CABLE	1
4	232-5202-00	SCREW, 6-32 X 1/2" PPH MS SEMS	11
5	240-5005-00	6-32 NYLON STOP NUT	13
6	545-5105-00	RUBBER BUMPER	1
7	550-5031-06	MINI MARS W/ EARS - YELLOW SB	1
8	511-5241-00	FLASH LAMP ASSY, GENERIC	1
9	515-6596-00-GE	COIL/BRKT/CABLE ASSY, LEFT	1
10	232-5302-00	SCREW, 8-32 X 1/2" PPH MS SEMS	2
11	240-5102-00	8-32 NYLON LOCK NUT	2
12	511-6987-00	ASSEMBLY, TRAIN W/ LED, GRINDER LE	1
13	234-5100-00	#8 X 3/8" HWH SLOT AB	1
14	511-5241-01	ASSY FLASH LAMP	1
15	510-5146-41	RIVET ASSY, BUTY #41, GRINDER LE	1
16	237-5976-01	SCREW, 6-32 X 1/4 HWH SWAGE	2
17	830-6125-64	BUTYRATE #64, GRINDER LE	1
18	242-5001-00	#6 WASHER	3
19	830-6125-66	BUTYRATE #66, GRINDER LE	1
20	535-0579-00	LEFT RAMP PROTECT, L WALL, GRINDER LE	1
21	535-0579-01	LEFT RAMP PROTECT, R WALL, GRINDER LE	1
22	237-5809-00	SCREW, #6 X 1/2" PTH A	2



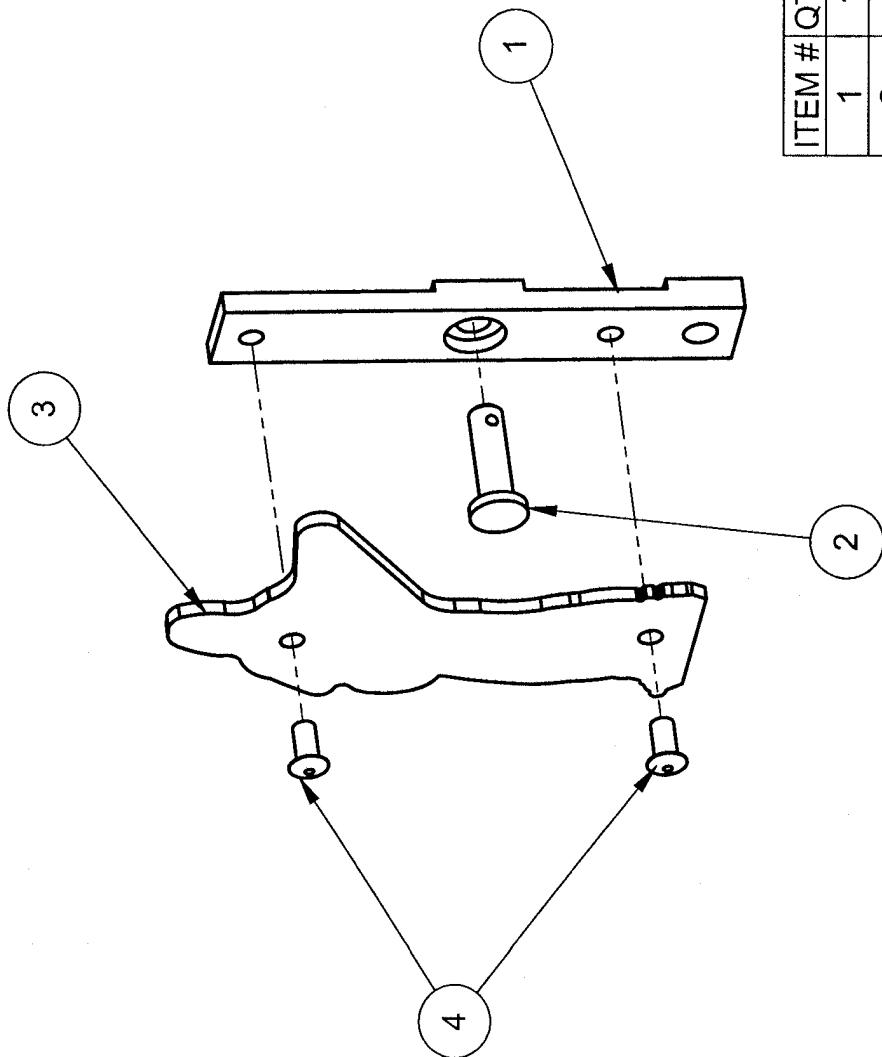
ITEM #	PART NUMBER	DESCRIPTION	QTY.
1	510-5148-00	RIVET ASSY, RIGHT RAMP, GRINDER LE	1
2	515-6556-02-GE	R/U SWITCH ASSEMBLY -02 W/ GENERIC CABLE	2
3	232-5202-00	SCREW, 6-32 X 1/2" PPH MS SEMS	9
4	240-5005-00	6-32 NYLON STOP NUT	8
5	545-5105-00	RUBBER BUMPER	1
6	550-5031-02	MINI MARS W/ EARS - RED SB	1
7	511-5241-00	FLASH LAMP ASSY, GENERIC	1
8	515-6596-01-GE	COIL/BRKT/CABLE ASSY, RIGHT	1
9	232-5302-00	SCREW, 8-32 X 1/2" PPH MS SEMS	2
10	240-5102-00	8-32 NYLON LOCK NUT	2
11	511-6988-00	ASSEMBLY, FLAME PCB, GRINDER LE	1
12	510-5146-41	RIVET ASSY, BUTY #41, GRINDER LE	1
13	237-5976-01	SCREW, 6-32 X 1/4 HVH SWAGE	2
14	830-6125-65	BUTYRATE #65, GRINDER LE	1
15	242-5001-00	#6 WASHER	1
16	535-0580-00	RIGHT RAMP PROTECT, L WALL, GRINDER LE	1
17	535-0580-01	RIGHT RAMP PROTECT, R WALL, GRINDER LE	1
18	237-5809-00	SCREW, #6 X 1/2" PTH A	2

ASSY, RIGHT PLASTIC RAMP
AC/DC LE
500-7209-00





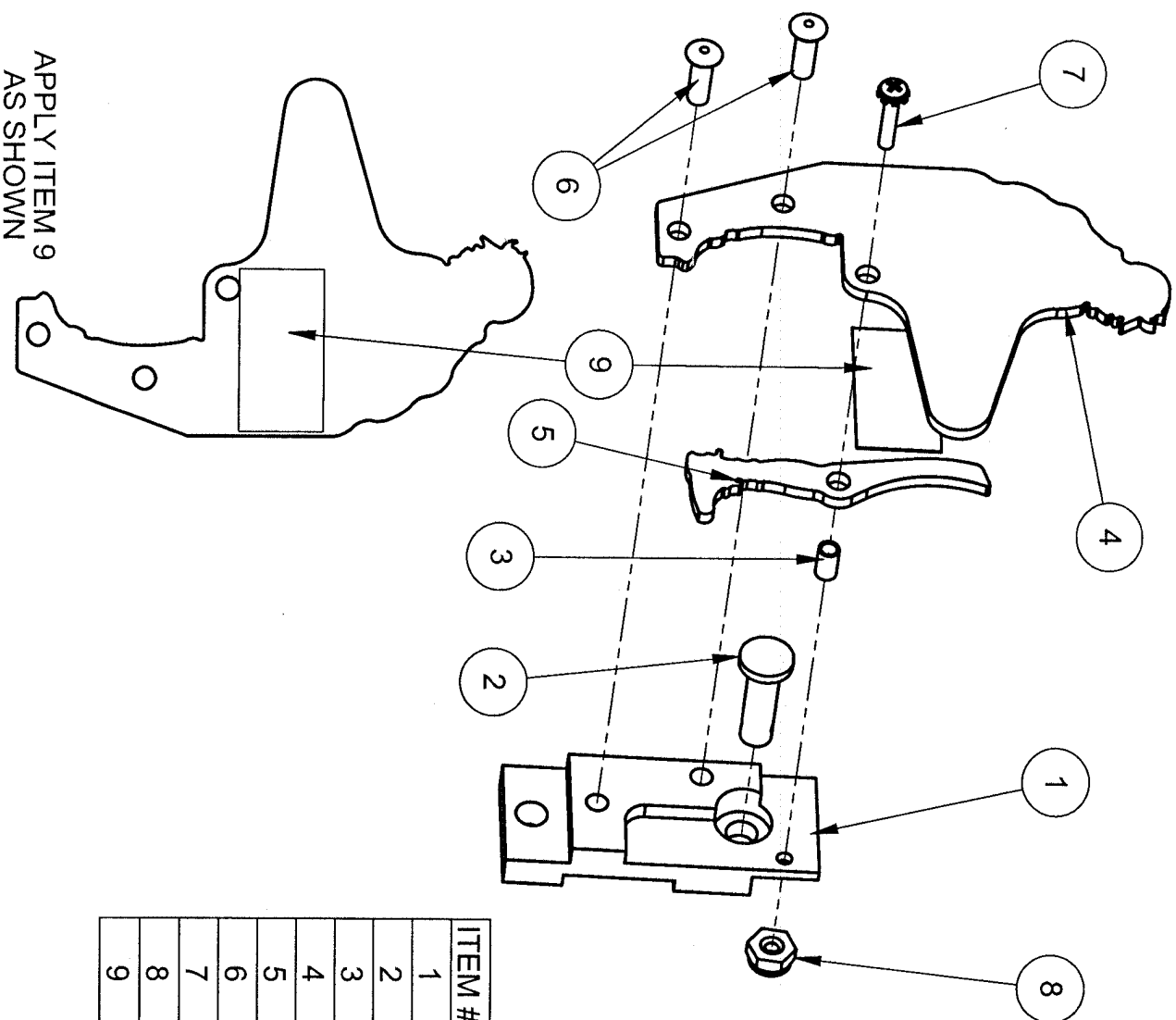
ITEM #	QTY	PART #	DESCRIPTION
1	1	515-7796-00	BAND MTG. PLATE
2	1	830-6125-05	BUTY # 5 - BAND STAGE
3	4	232-5200-00	SCREW, 6-32 X 1/4" PPH SEMS
4	1	535-0582-00	MOUNTING BRACKET - RIGHT
5	1	232-5209-00	SCREW, 6-32 X 3/16" PPH SEMS
6	1	510-5765-00	MALCOLM ASSEMBLY
7	1	510-5766-00	ANGUS ASSEMBLY
8	1	510-5767-00	BRIAN ASSEMBLY
9	1	510-5768-00	CLIFF ASSEMBLY
10	5	242-5088-00	NYLON WASHER, 1.95" X .437" X .031"
11	2	545-5352-00	NYLINER, 3/16" SHAFT
12	1	545-7299-00	MAIN LINK ACTUATOR
13	1	545-7302-00	COIL ACTUATOR
14	5	242-5005-00	#8 WASHER
15	1	090-5072-03	MINIATURE COIL - 29-1400 - 10520424
16	1	515-7797-00	COIL STOP ASSEMBLY
17	2	240-5102-00	8-32 NYLON LOCK NUT
18	1	511-6986-00	PLUNGER ASSEMBLY
19	2	242-5100-00	WASHER, .328 ID X .562 OD X .031 ACETAL
20	1	530-7799-00	PIVOT PIN - RIGHT ARM
21	1	530-7800-00	PIVOT PIN - LEFT ARM
22	1	545-7301-00	ARM LINK - RIGHT
23	1	545-7300-00	ARM LINK - LEFT
24	2	242-5606-00	3/16 X 3/8 X 1/64 FIBER WASHER - GRAY
25	1	830-6125-45	BUTY # 45 - RIGHT ARM - PHIL
26	1	830-6125-46	BUTY # 46 - LEFT ARM - PHIL
27	1	254-5070-00	NYLON SPACER
28	2	237-6064-00	2-56 X 3/4 PHILLIPS PAN HEAD ZINC
29	2	240-5321-00	2-56 NYLON LOCK NUT
30	2	242-5605-00	#2 FLAT WASHER - NARROW
31	5	270-5001-00	RETAINING E-RING, 3/16" SHAFT OD
32	1	265-5003-02	TARGET RESET SPRING
33	3	254-5000-22	NYLON SPACER - BLACK - 3/8 OD X .175 ID X 7/16"
34	1	830-6125-49	BUTY # 49 - BAND STAGE BOTTOM COVER
35	2	237-5504-00	SCREW, 6-32 X 3/4" PPH MS
36	1	240-5005-00	6-32 NYLON STOP NUT
37	1	237-5506-00	SCREW, 6-32 X 1" PPH MS
38	4	251-5006-00	1/16 X 1/2 COTTER PIN



ITEM #	QTY	PART #	DESCRIPTION
1	1	545-7297-00	BUTY MOUNT - STAND UP
2	1	530-7798-00	3/16 DIA. X 5/8" CLEVIS PIN
3	1	830-6125-43	BUTY # 43 - MALCOLM
4	2	249-5003-00	RIVET - 1/8 X 1/4

MALCOLM ASSEMBLY

510-5765-00

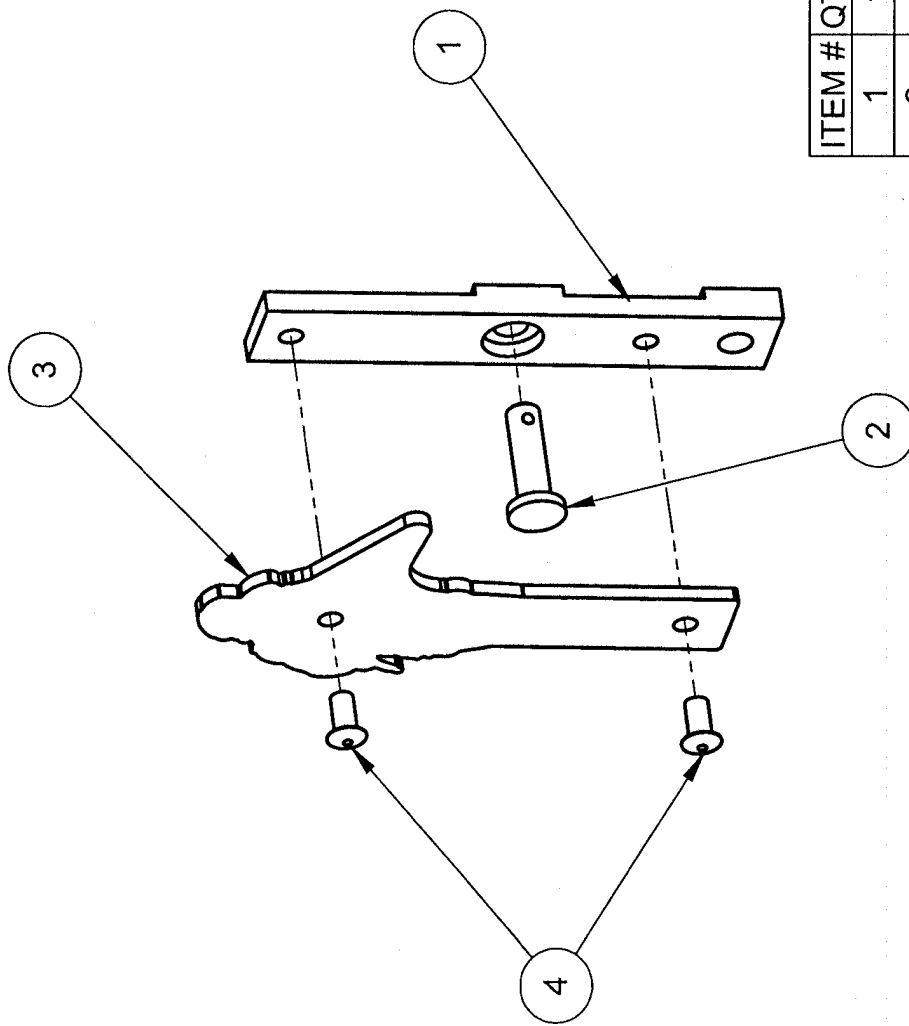


ITEM #	QTY	PART #	DESCRIPTION
1	1	545-7298-00	BUTY MOUNT - ANGUS
2	1	530-7798-00	3/16 DIA. X 5/8" CLEVIS PIN
3	1	254-5071-00	TUBULAR SPACER
4	1	830-6125-44	BUTY # 44 - ANGUS BODY
5	1	830-6125-50	BUTY # 50 - ANGUS LEG
6	2	249-5014-00	RIVET - 1/8 X 3/8
7	1	237-5872-01	SCREW, 2-56 X 7/16" PPH SEMS
8	1	240-5321-00	2-56 NYLON LOCK NUT
9	1	626-5095-01	ADHESIVE TEFLON STRIP

APPLY ITEM 9
AS SHOWN

ANGUS ASSEMBLY

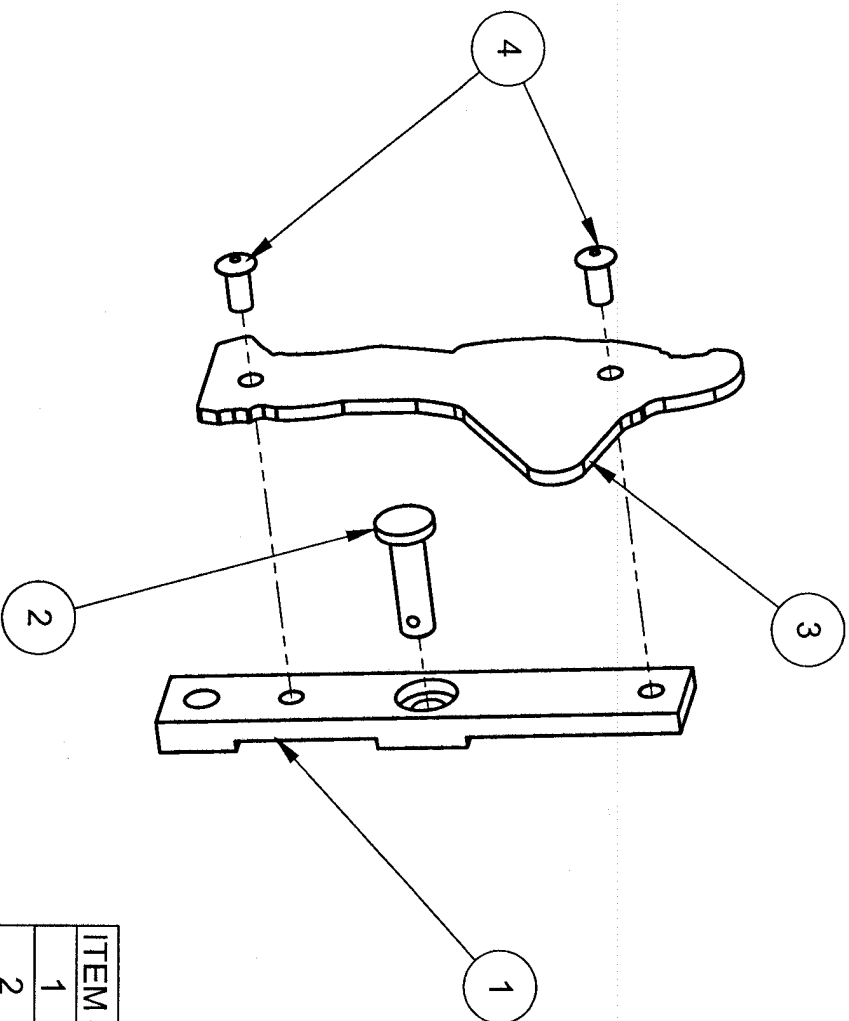
510-5766-00



ITEM #	QTY	PART #	DESCRIPTION
1	1	545-7297-00	BUTY MOUNT - STAND UP
2	1	530-7798-00	3/16 DIA. X 5/8" CLEVIS PIN
3	1	830-6125-47	BUTY # 47 - BRIAN
4	2	249-5003-00	RIVET - 1/8 X 1/4

BRIAN ASSEMBLY

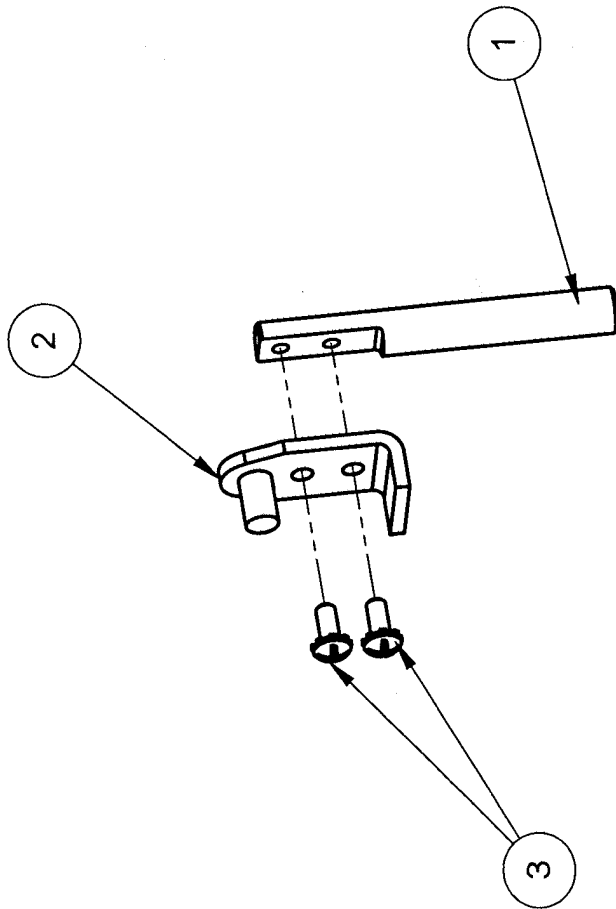
510-5767-00



ITEM #	QTY	PART #	DESCRIPTION
1	1	545-7297-00	BUTY MOUNT - STAND UP
2	1	530-7798-00	3/16 DIA. X 5/8" CLEVIS PIN
3	1	830-6125-48	BUTY # 48 - CLIFF
4	2	249-5003-00	RIVET - 1/8 X 1/4

CLIFF ASSEMBLY

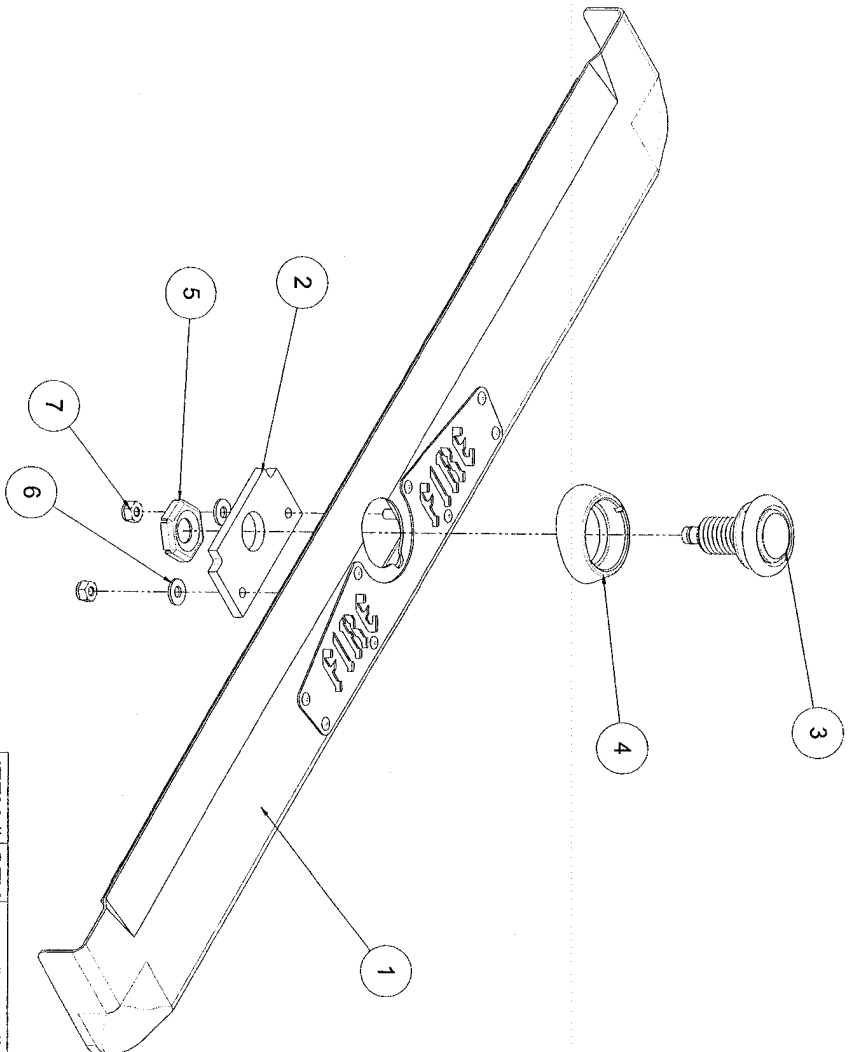
510-5768-00



ITEM #	QTY	PART #	DESCRIPTION
1	1	530-7801-00	PLUNGER
2	1	515-7798-00	PLUNGER BRACKET
3	2	237-5909-00	SCREW, 4-40 X 1/4" PPH SEMS

PLUNGER ASSEMBLY

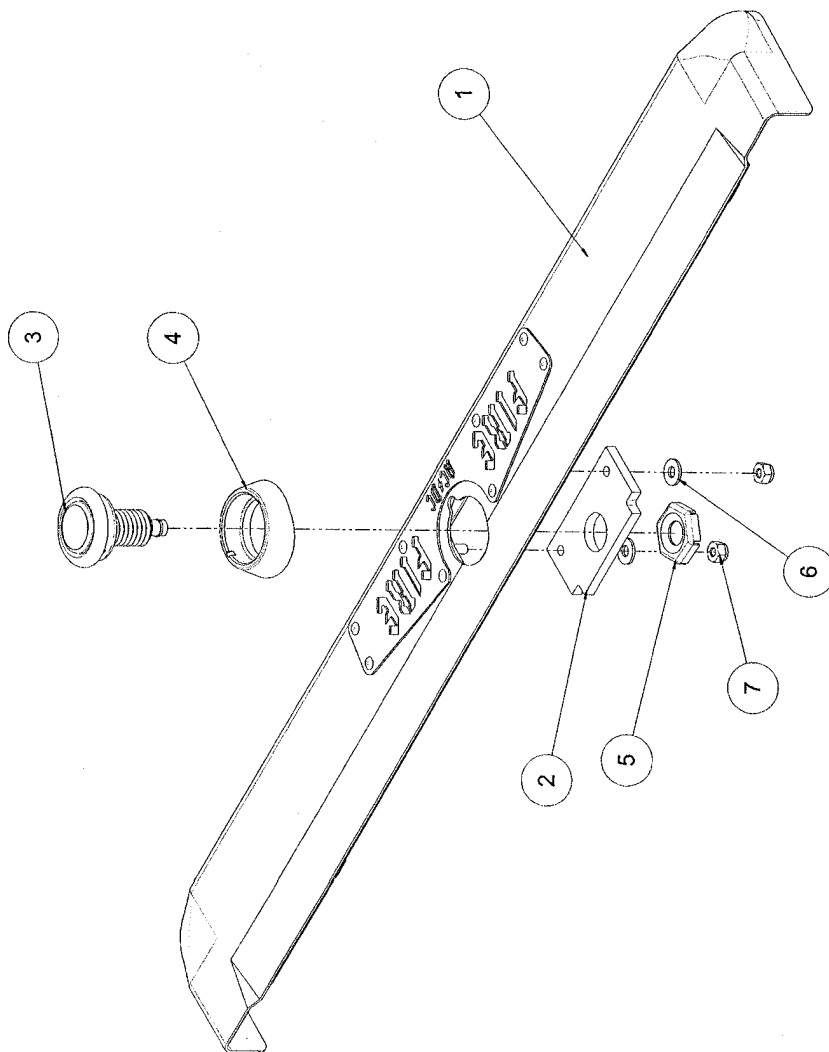
511-6986-00



ITEM #	QTY	PART #	DESCRIPTION
1	1	500-7249-02-25	FRONT MOLD ASSEMBLY - LOCKDOWN - CENTER BUTTON - BIB
2	1	545-7291-00	TOP BUTTON BAR
3	1	515-7791-00	BUTTON ASSY - CLEAR
4	1	545-7292-10	TOP BUTTON SPACER-MOLDED
5	1	240-5003-01	PAL NUT
6	2	242-5005-00	#8 WASHER
7	2	240-5102-00	# 8-32 NYLON LOCK NUT

FRT MOLD FINAL ASSY - LOCKDOWN - CENTER BUTTON - BIB

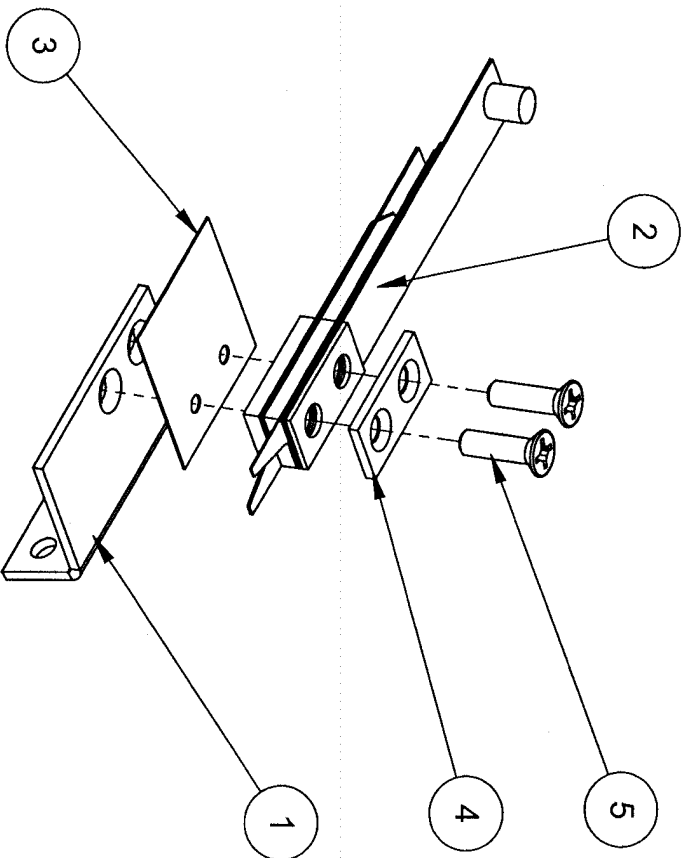
500-7250-25



ITEM #	QTY	PART #	DESCRIPTION
1	1	500-7235-02-23	FRONT MOLD ASSEMBLY - LOCKDOWN - CENTER BUTTON
2	1	545-7291-00	TOP BUTTON BAR
3	1	515-7791-00	BUTTON ASSY - CLEAR
4	1	545-7292-10	TOP BUTTON SPACER-MOLDED
5	1	240-5003-01	PAL NUT
6	2	242-5005-00	#8 WASHER
7	2	240-5102-00	# 8-32 NYLON LOCK NUT

FRT MOLD FINAL ASSY - LOCKDOWN - CENTER BUTTON - LTBR/PREM

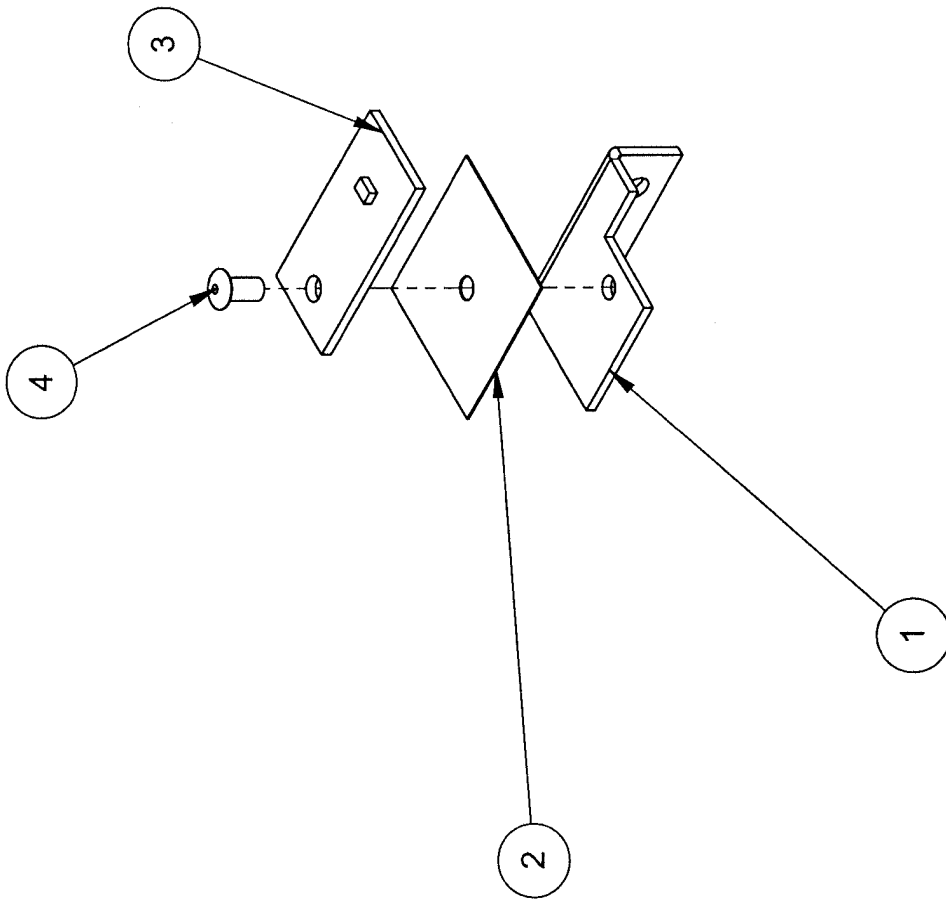
500-7241-23



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	535-0559-00	SWITCH BRACKET	1
2	180-5218-00	SINGLE FLIPPER SWITCH/ w NYLON LIFTER	1
3	545-6268-00	FISCHE PAPER	1
4	535-5045-01	SWITCH PLATE - C'SUNK	1
5	237-5918-00	6-32 x 1/2 PHILLIPS FLAT HEAD ZINC	2

TOP BUTTON SWITCH ASSEMBLY

511-6971-00



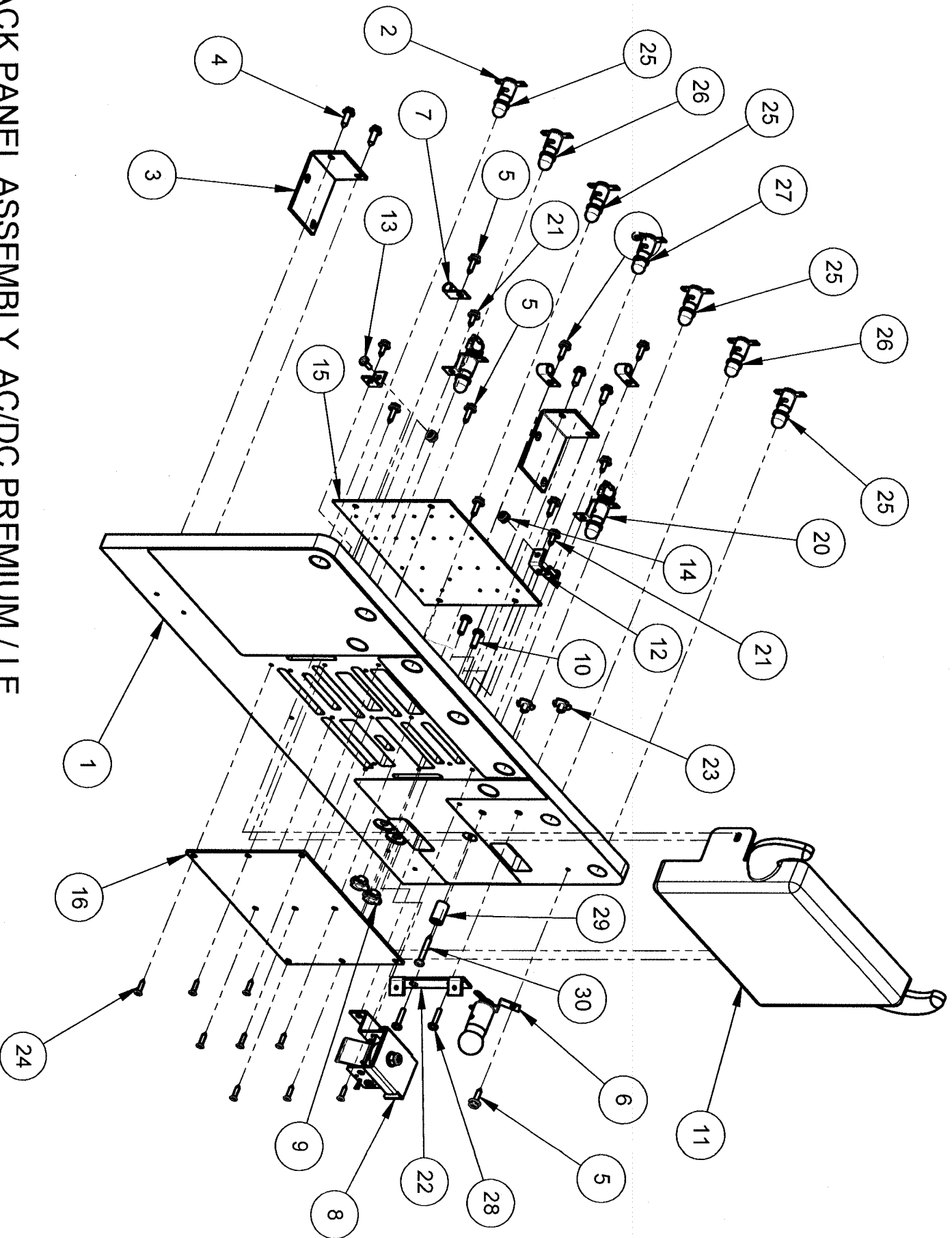
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	535-0368-00	TOP BUTTON LED BRACKET	1
2	545-6268-01	FISCHE PAPER	1
3	520-5333-00	PCB - TRI-COLOR LED	1
4	249-5003-00	RIVET - 1/8 X 1/4	1

LED BOARD ASSEMBLY

511-6980-00

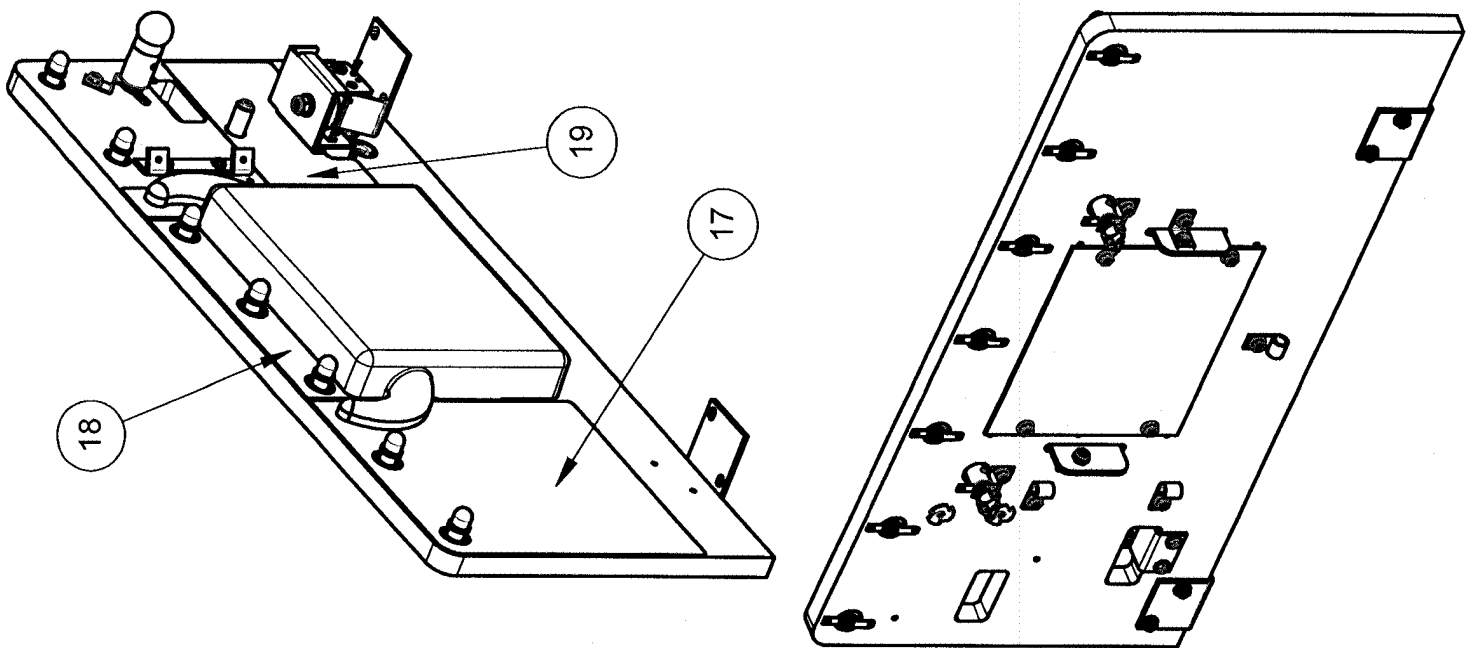
BACK PANEL ASSEMBLY, AC/DC PREMIUM / LE

500-7207-00



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	525-5713-00	BACK PANEL, GRINDER LE	1
2	077-5000-00	SOCKET - STAPLED - 2 LUGS	7
3	535-8964-00	BRACKET - BACK PANEL SUPPORT	2
4	234-5101-00	SCREW, #8 X 1/2" SLT HWH AB ZINC	4
5	234-5001-02	SCREW, #6 X 1/2" HWH	8
6	519-5106-00-HF	SOCKET#89 BULB ASSY - RVRS MNT - HEAVY FIL	1
7	040-5000-03	1/4" CABLE CLAMP	3
8	511-5096-01	ASSY, ELEC GATE RIGHT, RAIL MT	1
9	240-5101-00	8-32 T-NUT	2
10	232-5302-00	SCREW, 8-32 X 1/2" PPH MS SEMS	2
11	545-6845-00	JUKEBOX COVER, GRINDER	1
12	535-8941-04	BRACKET - PLASTIC MTG	2
13	232-5201-00	SCREW, 6-32 X 3/8" PPH MS SEMS	2
14	240-5005-00	6-32 NYLON STOP NUT	2
15	520-5324-02	LED PCB ONLY, BACK PANEL, GRINDER	1
16	830-6125-32	BUTY #32, BACK PANEL, GRINDER LE	1
17	820-7000-12	DECAL #12, BACK PANEL LEFT, GRINDER	1
18	820-7000-14	DECAL #14, BACK PANEL CENTER, GRINDER	1
19	820-7000-13	DECAL #13, BACK PANEL RIGHT, GRINDER	1
20	519-5008-02-LED	SOCKET/BULB/DIODE, RED - LED	2
21	234-5000-00	SCREW, #6 X 3/8" HWH	4
22	535-0583-00	MOUNTING BRACKET - BP	1
23	240-5002-00	6-32 T-NUT	2
24	237-5840-00	SCREW, #4 X 1/2" PFH AB	9
25	112-5034-08	DOUBLE LED, BAYONET BASE - CLEAR	4
26	112-5034-05	DOUBLE LED, BAYONET BASE - RED	2
27	112-5034-02	DOUBLE LED, BAYONET BASE - RED	1
28	232-5203-00	SCREW, 6-32 X 5/8 PPH SEMS ZINC	2
29	254-5000-14	NYLON SPACER - BLACK - 3/8 OD X .175 ID X 5/8"	1
30	232-5004-00	SCREW, #6 X 1 PPH AB ZINC	1
97*	036-5549-30	FLASH CABLE 10"	1
98*	631-5000-00	STAPLE - 5/16	14
99*	036-5573-04-C7	BACK PANEL CABLE ASSEMBLY	1

* ITEM NOT SHOWN



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Backbox Wiring

- ▶ Coils Detailed Chart Table
- ▶ Backbox I/O Power Driver Board Detailed Wiring Diagram
- ▶ Backbox Board Layout Wiring Diagram
 - ▷ 128 X 32 Dot Matrix Display PCB (USA)..... 520-5052-15
 - ▷ 128 X 32 Dot Matrix CES-LED // EURO ONLY RoHS //..... 520-5052-15

Playfield Wiring

- ▶ General Illumination Circuit Detailed Wiring Diagram
- ▶ Playfield Switch Wiring Diagram
- ▶ Playfield Lamp Wiring Diagram
- ▶ Playfield Terminal Strips, Fuses & Misc. Wiring Descriptions & Locations
- ▶ #-Flipper Circuit Wiring Diagram

Cabinet and Coin Door Wiring

- ▶ Transformer Power Wiring Diagram
- ▶ Cabinet Wiring Diagram
- ▶ Coin Door Wiring Diagram
- ▶ Cabinet Universal Voltage Jumper Plugs (for use with Universal AC Cable, 036-5530-00 ONLY)

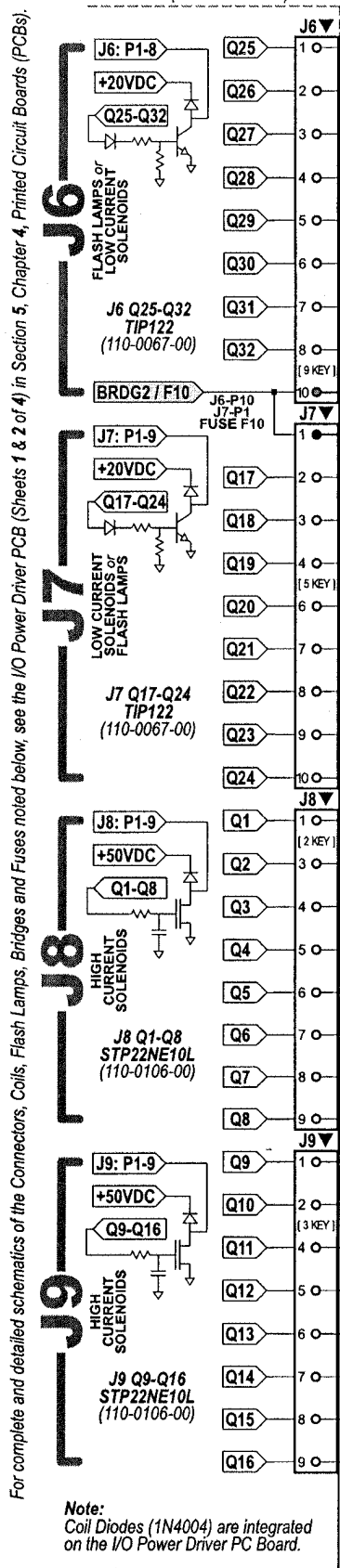
I/O and CPU — SCHEMATICS

COILS DETAILED CHART TABLE

High Current Coils Group 1		Drive Transistor	Driver Output PCB	Power Line Color	Power Line Connection	Power Voltage	Drive Transistor Control Line Color	D.T. Control Line Connect	Coil GA-Turn or Bulb Type
#1	TROUGH UP-KICKER	Q1	I/O Power Driver	YEL-VIO	J10-P9/10	50VDC	BRN-BLK	J8-P1	28-1200 090-5044-ND
#2	AUTO LAUNCH	Q2		YEL-VIO	J10-P9/10	50VDC	BRN-RED	J8-P3	24-940 090-5038-ND
#3	LOWER PLAYFIELD EJECT	Q3		YEL-VIO	J10-P9/10	50VDC	BRN-ORG	J8-P4	28-1200 090-5044-ND
#4	LOWER PLAYFIELD LEFT FLIPPER	Q4		GRY-YEL	J10-P9/10	50VDC	BRN-YEL	J8-P5	22-1080 090-5032-ND
#5	LOWER PLAYFIELD RIGHT FLIPPER	Q5		BLU-YEL	J10-P9/10	50VDC	BRN-GRN	J8-P6	22-1080 090-5032-ND
#6	LEFT 5- BANK DROP RESET (X2)	Q6		YEL-VIO	J10-P9/10	50VDC	BRN-BLU	J8-P7	25-1240 090-5034-ND
#7	CENTER 3- BANK DROP RESET	Q7		YEL-VIO	J10-P9/10	50VDC	BRN-VIO	J8-P8	25-1240 090-5034-ND
#8	SHAKER MOTOR (OPTIONAL)	Q8		RED-WHT	J17-P7	16VAC	BRN-GRY	J8-P9	502-5027-00
High Current Coils Group 2		Drive Transistor	Driver Output PCB	Power Line Color	Power Line Connection	Power Voltage	Drive Transistor Control Line Color	D.T. Control Line Connect	Coil GA-Turn or Bulb Type
#9	LEFT POP BUMPER	Q9	I/O Power Driver	YEL-VIO	J10-P9/10	50VDC	BLU-BRN	J8-P1	28-1200 090-5044-ND
#10	RIGHT POP BUMPER	Q10		YEL-VIO	J10-P9/10	50VDC	BLU-RED	J8-P2	28-1200 090-5044-ND
#11	BOTTOM POP BUMPER	Q11		YEL-VIO	J10-P9/10	50VDC	BLU-ORG	J8-P4	28-1200 090-5044-ND
#12	TOP EJECT	Q12		YEL-VIO	J10-P9/10	50VDC	BLU-YEL	J8-P5	23-800 090-5001-ND
#13	LEFT SLINGSHOT	Q13		YEL-VIO	J10-P9/10	50VDC	BLU-GRN	J8-P6	28-1200 090-5044-ND
#14	RIGHT SLINGSHOT	Q14		YEL-VIO	J10-P9/10	50VDC	BLU-BLU	J8-P7	28-1200 090-5044-ND
#15	LEFT FLIPPER (50V RED/YEL)	Q15		GRY-YEL-3A Fuse-RED-YEL	J10-P6/7	50VDC	ORG-GRY	J8-P8	22-1080 090-5032-ND
#16	RIGHT FLIPPER (50V RED/YEL)	Q16		GRY-YEL-3A Fuse-RED-YEL	J10-P6/7	50VDC	ORG-VIO	J8-P9	22-1080 090-5032-ND
Low Current Coils Group 1		Drive Transistor	Driver Output PCB	Power Line Color	Power Line Connection	Power Voltage	Drive Transistor Control Line Color	D.T. Control Line Connect	Coil GA-Turn or Bulb Type
#17	TRAIN FLASHER	Q17	I/O Power Driver	ORG	J6-P10	20VDC	VIO-BRN	J7-P2	#89 BULB 165-5000-89
#18	DETONATOR	Q18		BRN	J7-P1	20VDC	VIO-RED	J7-P3	29-1400 090-5072-03
#19	BOTTOM ARCH FLASHER (X2)	Q19		ORG	J6-P10	20VDC	VIO-ORG	J7-P4	LED BD. 520-5328-00
#20	LEFT RAMP FLASHER	Q20		ORG	J6-P10	20VDC	VIO-YEL	J7-P6	#89 BULB 165-5000-89
#21	LEFT SIDE FLASHER	Q21		ORG	J6-P10	20VDC	VIO-GRN	J7-P7	#89 BULB 165-5000-89
#22	BACK PANEL FLASHER	Q22		ORG	J6-P10	20VDC	VIO-BLU	J7-P8	#89 BULB 165-5000-89
#23	TOP EJECT FLASHER	Q23		ORG	J6-P10	20VDC	VIO-BLK	J7-P9	#89 BULB 165-5000-89
#24	OPTIONAL (e.g. COIN METER)	Q24		RED	J16-P4-8	5VDC	VIO-GRY	J7-P10	COIN METER
Low Current Coils Group 2		Drive Transistor	Driver Output PCB	Power Line Color	Power Line Connection	Power Voltage	Drive Transistor Control Line Color	D.T. Control Line Connect	Coil GA-Turn or Bulb Type
#25	POP BUMPERS FLASH (X3)	Q25	I/O Power Driver	ORG	J6-P10	20VDC	BLK-BRN	J6-P1	#89 BULB 165-5000-89
#26	BELL ARROW FLASHER	Q26		ORG	J6-P10	20VDC	BLK-RED	J6-P2	#89 BULB 165-5000-89
#27	LEFT RAMP LEFT SIDE FLASHER	Q27		ORG	J6-P10	20VDC	BLK-ORG	J6-P3	#161 BULB 165-5032-00
#28	LEFT RAMP RIGHT SIDE FLASHER	Q28		ORG	J6-P10	20VDC	BLK-YEL	J6-P4	#161 BULB 165-5032-00
#29	RIGHT RAMP RIGHT SIDE FLASHER	Q29		ORG	J6-P10	20VDC	BLK-GRN	J6-P5	#161 BULB 165-5032-00
#30	RIGHT RAMP FLASHER	Q30		ORG	J6-P10	20VDC	BLK-BLU	J6-P6	#89 BULB 165-5000-89
#31	RIGHT SIDE FLASHER	Q31		ORG	J6-P10	20VDC	BLK-VIO	J6-P7	#89 BULB 165-5000-89
#32	CANNON MOTOR	Q32		BRN	J7-P1	20VDC	BLK-GRY	J6-P8	MOTOR 041-5111-00

Backbox I/O Power Driver Board (Coils Q1-Q32) Detailed Wiring Diagram Partial View (520-5249-00)

ALL FUSES RATED 250V SLO-BLO
I/O FUSE CHART INFO IN BACKBOX & PAGE DR. 1



#33 - #35 Note: If this game is equipped with an optional Ticket Dispenser & Meter, see the end of Sec. 5, Chapter 4 for wiring information. Ensure Std. Adj. 56, Ticket Dispenser = YES.

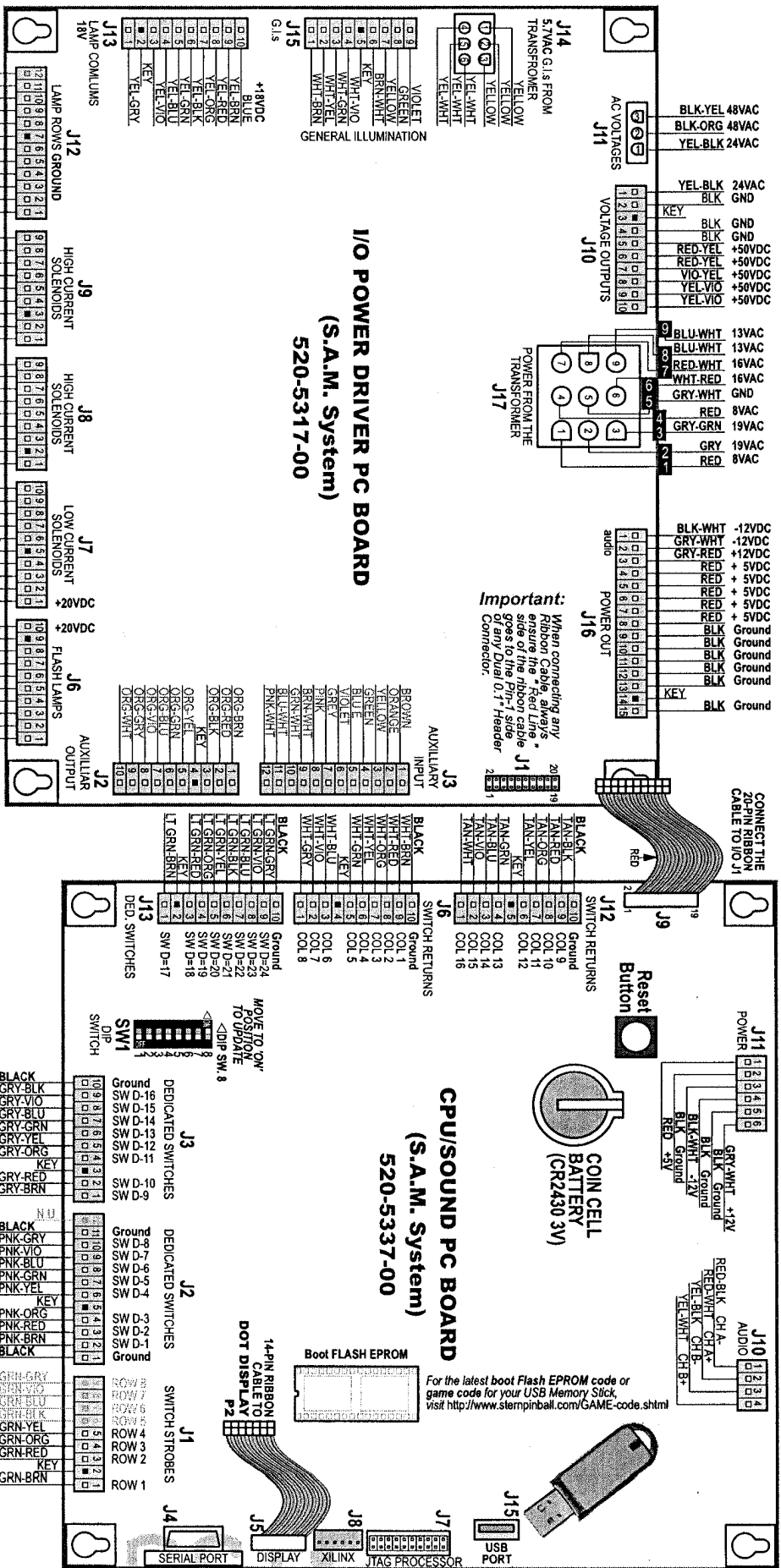
Backbox
Wiring

Backbox Wiring

Backbox Board Layout Wiring Diagram

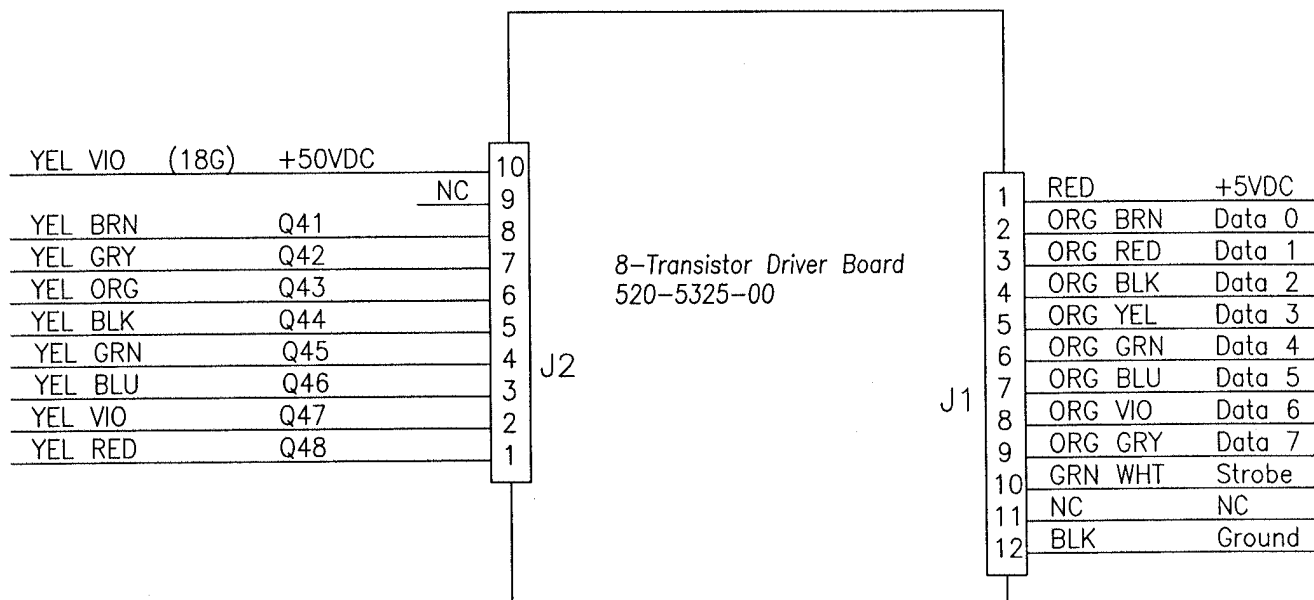
128 X 32 Dot Matrix Display PCB	1	520-5052-15
// EURO ONLY Rohs // 128 X 32 DM CES PCB		520-5052-15
// EURO ONLY Rohs // Dot Matrix Bezl		545-6281-00
Ribbon Cable, 14-Pin (33")		036-5260-33
// EURO ONLY Rohs // LED Ribbon Cable Filter PCB		520-5259-00
Display Cable (Wiring Harness)		036-5454-01
// EURO ONLY Rohs // LED Display Adapter Harness		036-5520-00

128 DOT MATRIX x 32 DISPLAY PCB	
14 NOT USED 13 SER DATA	
12 GROUND 11 SER DATA	
10 GROUND 9 PIX CLOCK	
8 GROUND 7 GND 6 GND	
5 GROUND 4 GND 3 GND	
2 GROUND 1 ROW DATA	
0 GROUND 01 DISPLAY ENABLE	
DALE P1	
DALE P2	
DALE P3	
DALE P4	
DALE P5	
DALE P6	
DALE P7	
DALE P8	
DALE P9	
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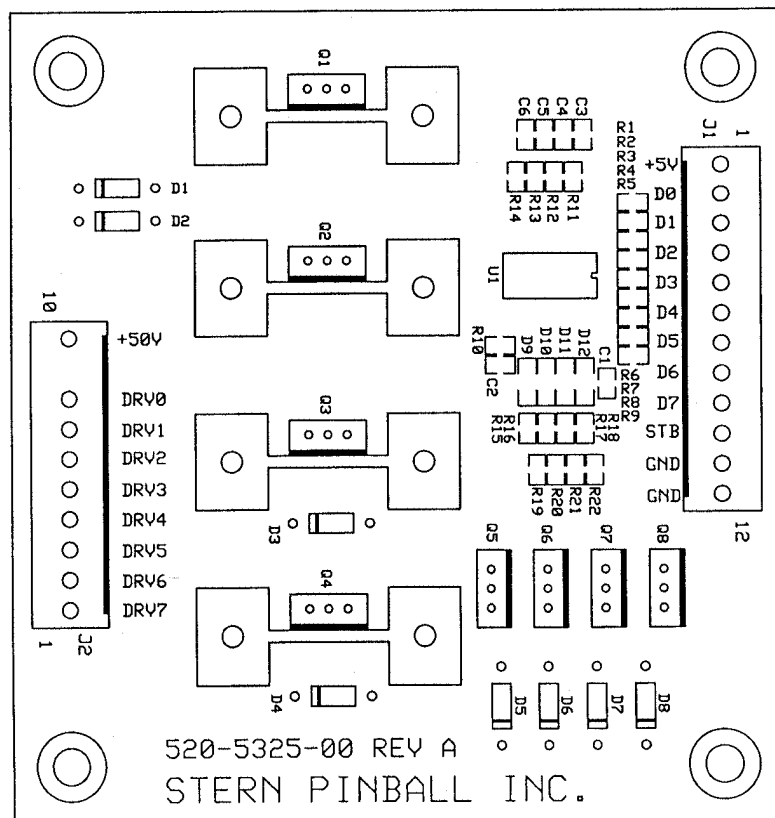


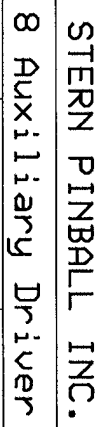
AC-DC PREMIUM

Wiring for the 8-Transistor driver board, 520-5325-00



Actual Board Layout

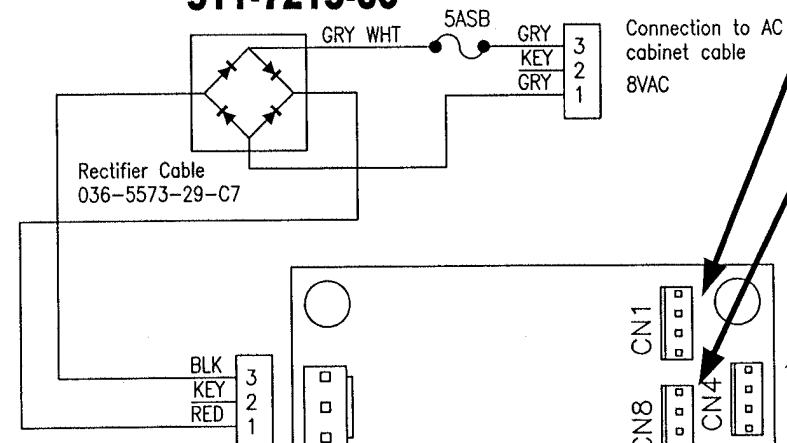




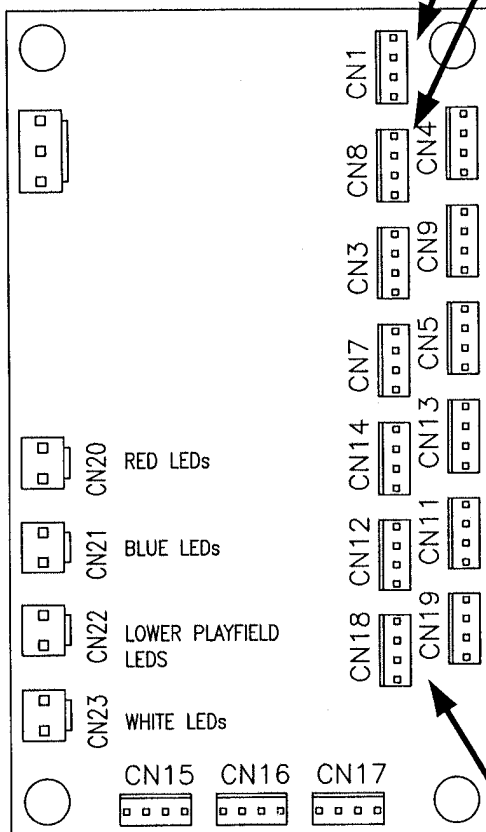
Rev A	Page 1 of 1
9/22/2011	

Cable Connections to 520-5331-00 Driver Board

Rectifier and Heat Sink Assy 511-7215-00



22	RED	2
20	RED BLK	1
21	RED BRN	2
20	BLU BLK	1
23	RED ORG	2
70	VIO BLK	1
24	RED YEL	2
90	WHT BLK	1



1	NC
2	23 RED ORG
3	53 GRN ORG
4	63 BLU ORG
5	KEY
6	NC
7	20 RED BLK
8	52 GRN RED
9	62 BLU RED
10	KEY
11	NC
12	21 RED BRN
13	51 GRN BRN
14	61 BLU BRN

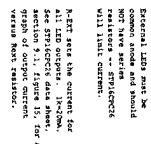
1	RED	22
2	RED YEL	24
3	GRN YEL	54
4	BLU YEL	64

1	RED	22
2	RED GRN	25
3	GRN	55
4	BLU GRN	65
5	KEY	
6	RED	22
7	RED BLU	26
8	GRN BLU	56
9	BLU	66
10	KEY	
11	RED	22
12	RED VIO	27
13	GRN VIO	57
14	BLU VIO	67

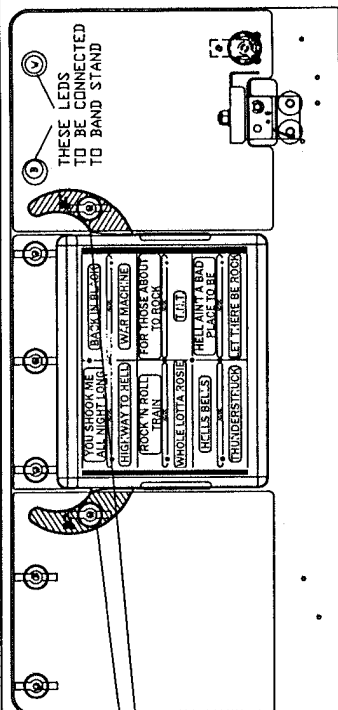
1	RED	22
2	PNK RED	P2
3	YEL RED	52
4	VIO RED	72
5	KEY	
6	RED	22
7	PNK ORG	P3
8	YEL ORG	43
9	VIO ORG	73
10	KEY	
11	RED	22
12	PNK YEL	P4
13	YEL	44
14	VIO YEL	74

1	RED	22
2	RED GRY	28
3	GRN GRY	58
4	BLU GRY	68
5	KEY	
6	RED	22
7	RED WHT	29
8	GRN WHT	59
9	BLU WHT	69
10	KEY	
11	RED	22
12	PNK BRN	P1
13	YEL BRN	41
14	VIO BRN	71

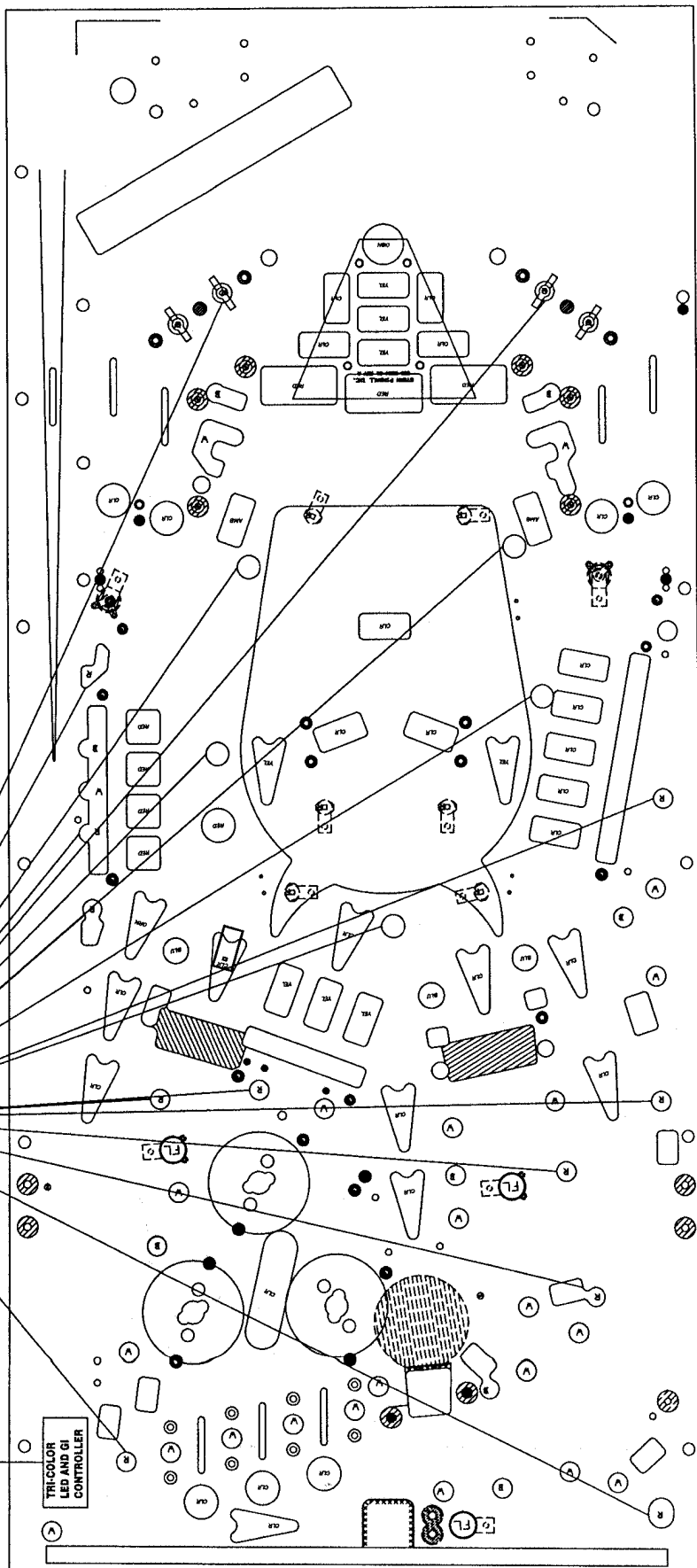
1	RED	22
2	PNK GRN	P5
3	YEL GRN	45
4	VIO GRN	75
5	KEY	
6	RED	22
7	PNK BLU	P6
8	YEL BLU	46
9	VIO BLU	76
10	KEY	
11	RED	22
12	PNK VIO	P7
13	YEL VIO	47
14	VIO	77



AC-DC PREMIUM RED LED GI LAMPS



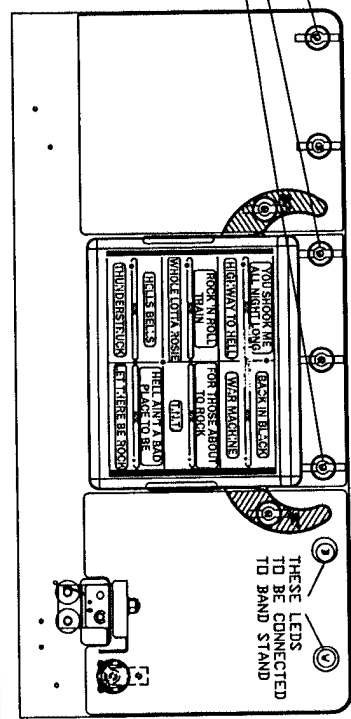
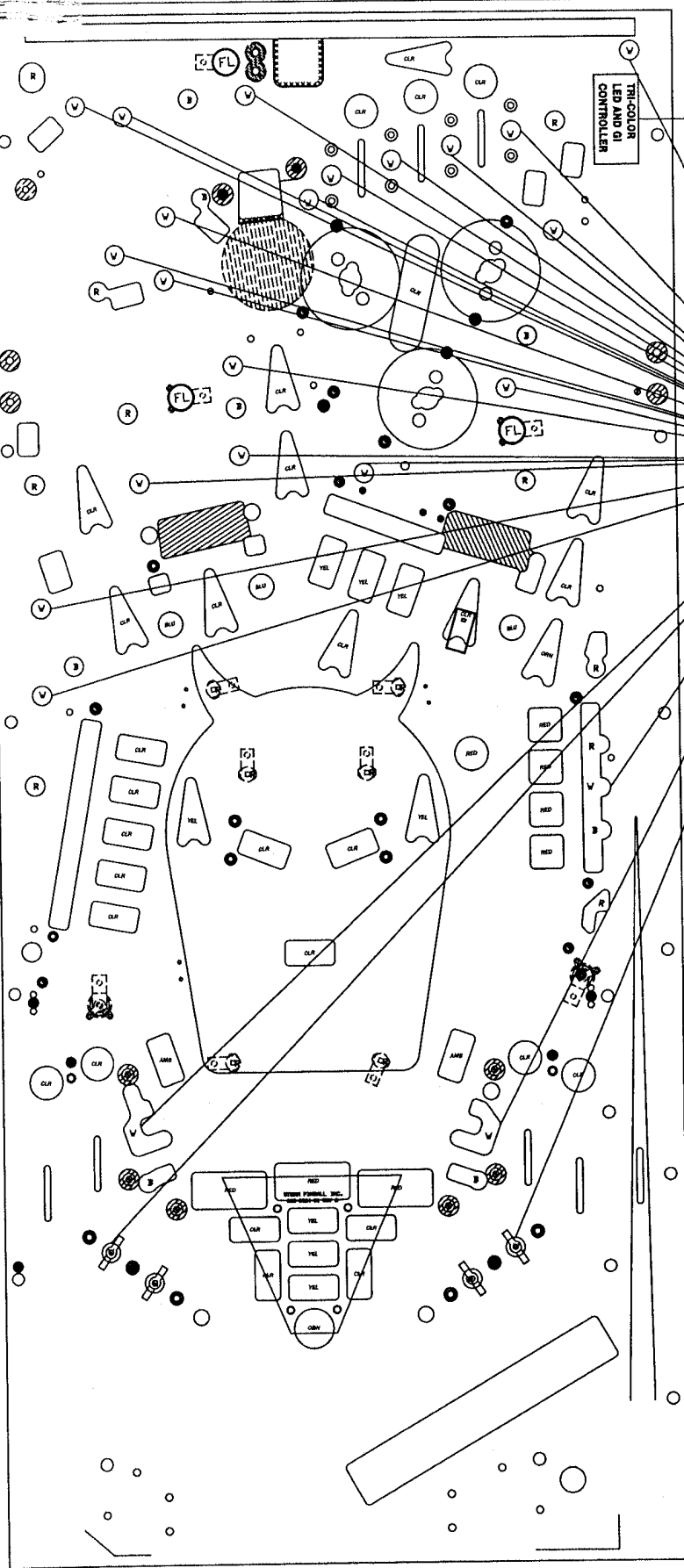
Location of GI
LED controller



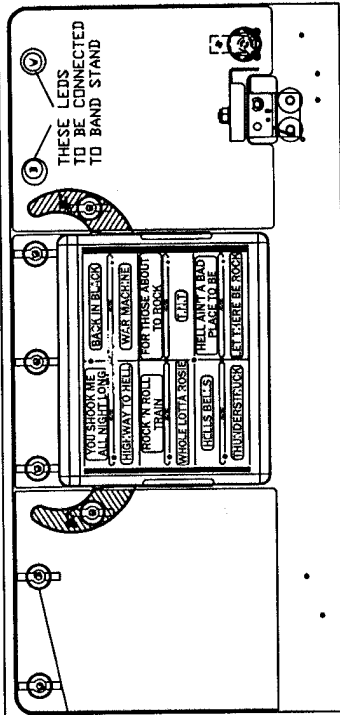
AC-DC PREMIUM WHITE LED GI LAMPS

Location of GI
LED controller

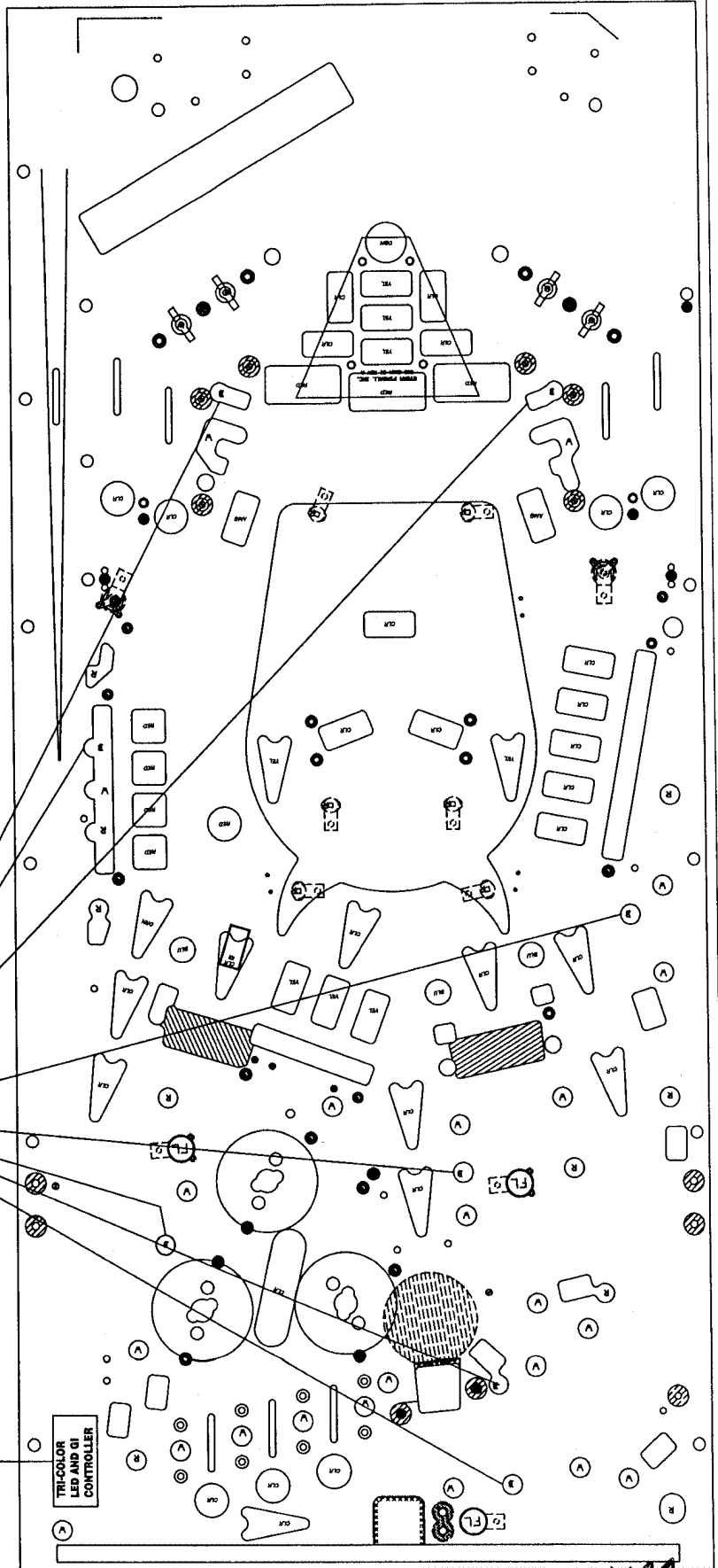
TRI-COLOR
LED AND GI
CONTROLLER



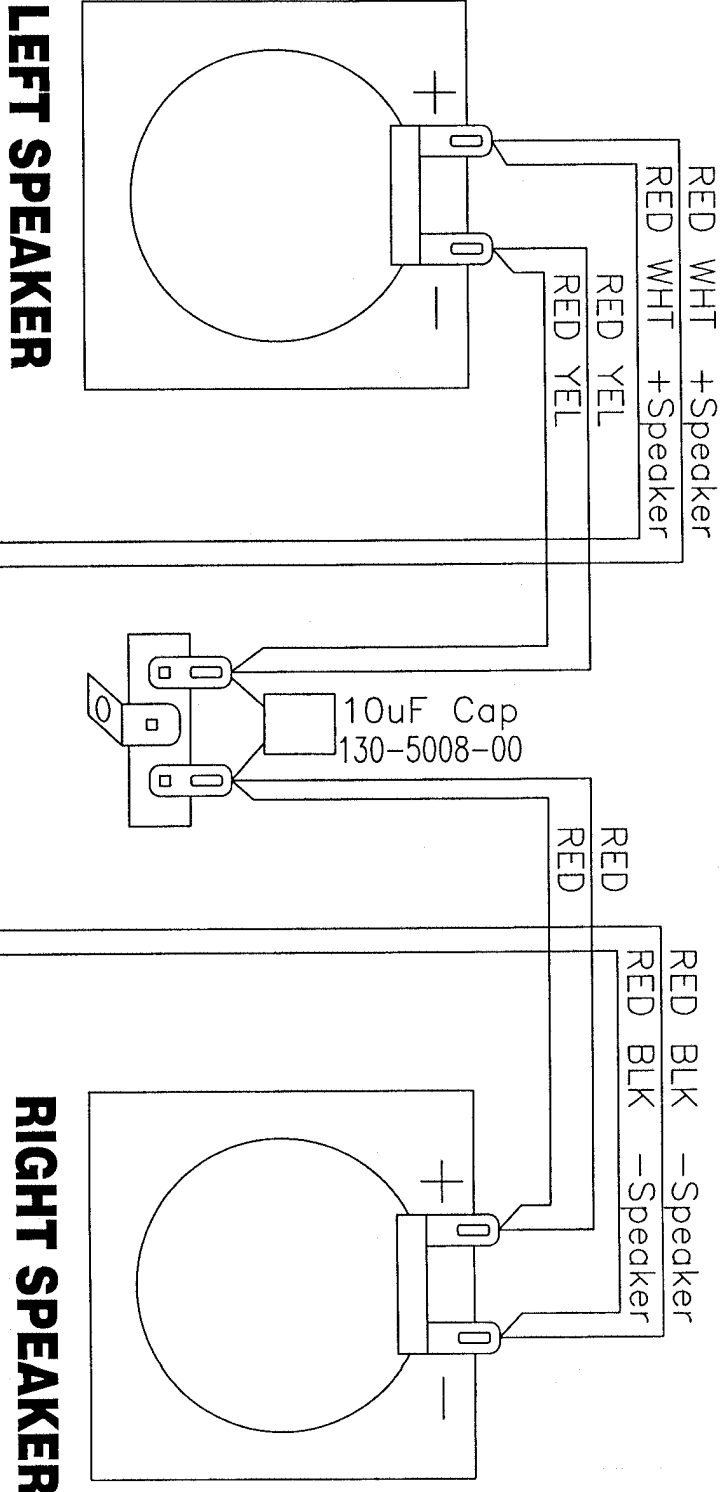
AC-DC PREMIUM BLUE LED GI LAMPS



Location of GI
LED controller

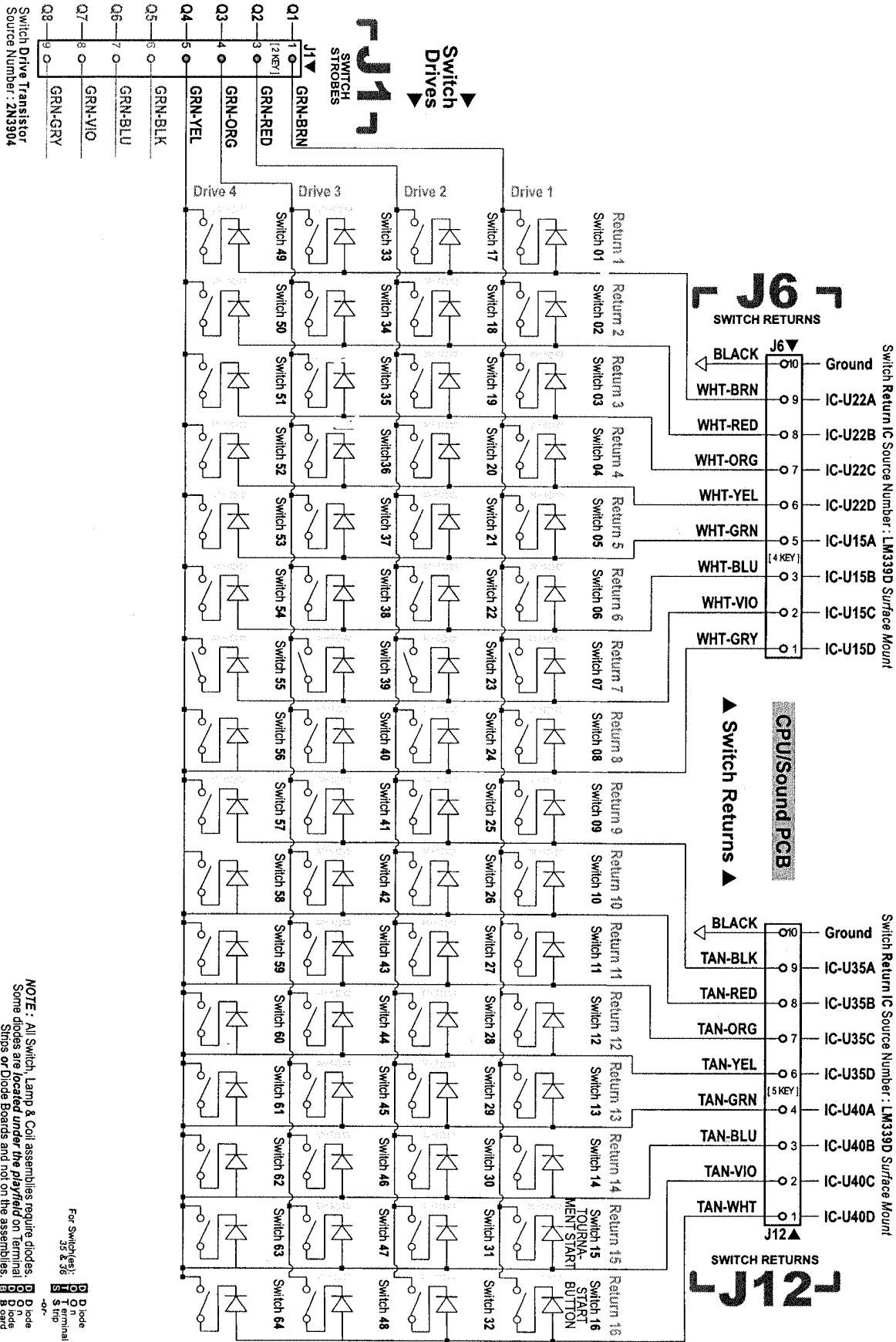


SPEAKER PANEL ASSY AC-DC PREMIUM



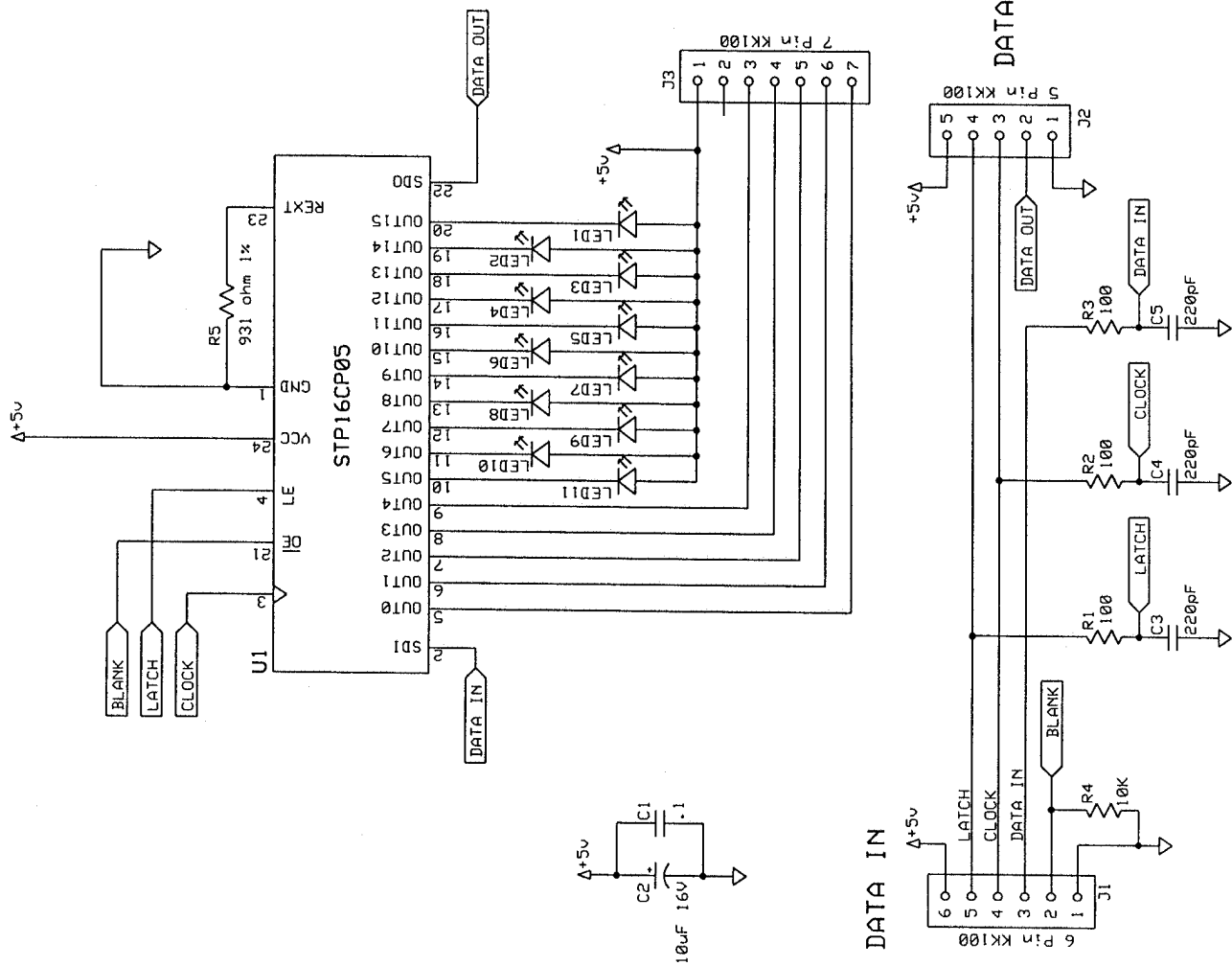
036-5573-02-C7
February 20, 2012

Playfield Switch Wiring Diagram



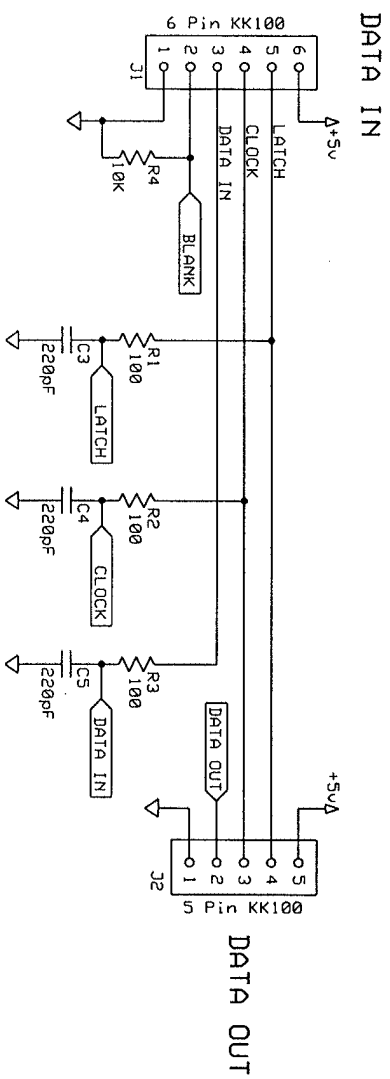
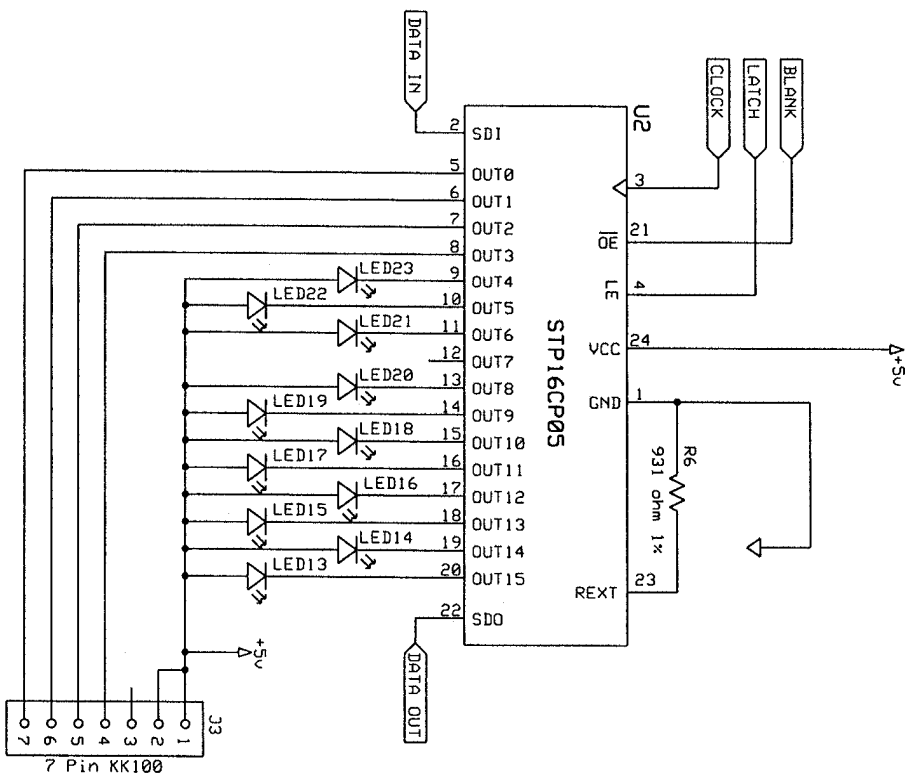
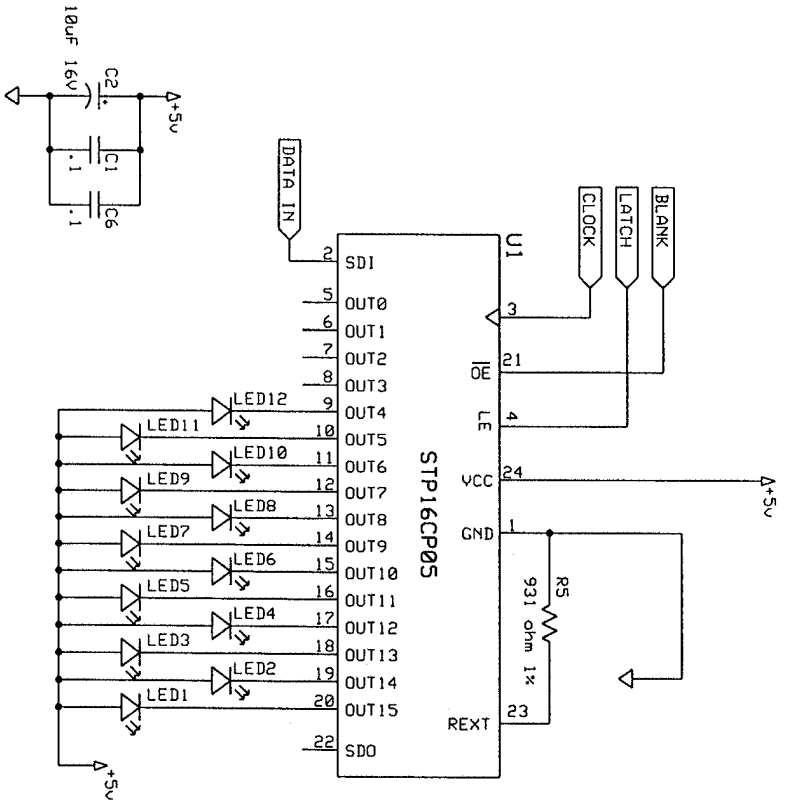
Please Note: Switch & Lamp Descriptions may differ slightly from that of the Dot Display due to space restrictions.

Playfield Wiring



STERN PINBALL, INC.

AC/DC LED #1



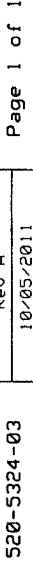
STERN PINBALL, INC.

AC/DC Backpanel LED Board

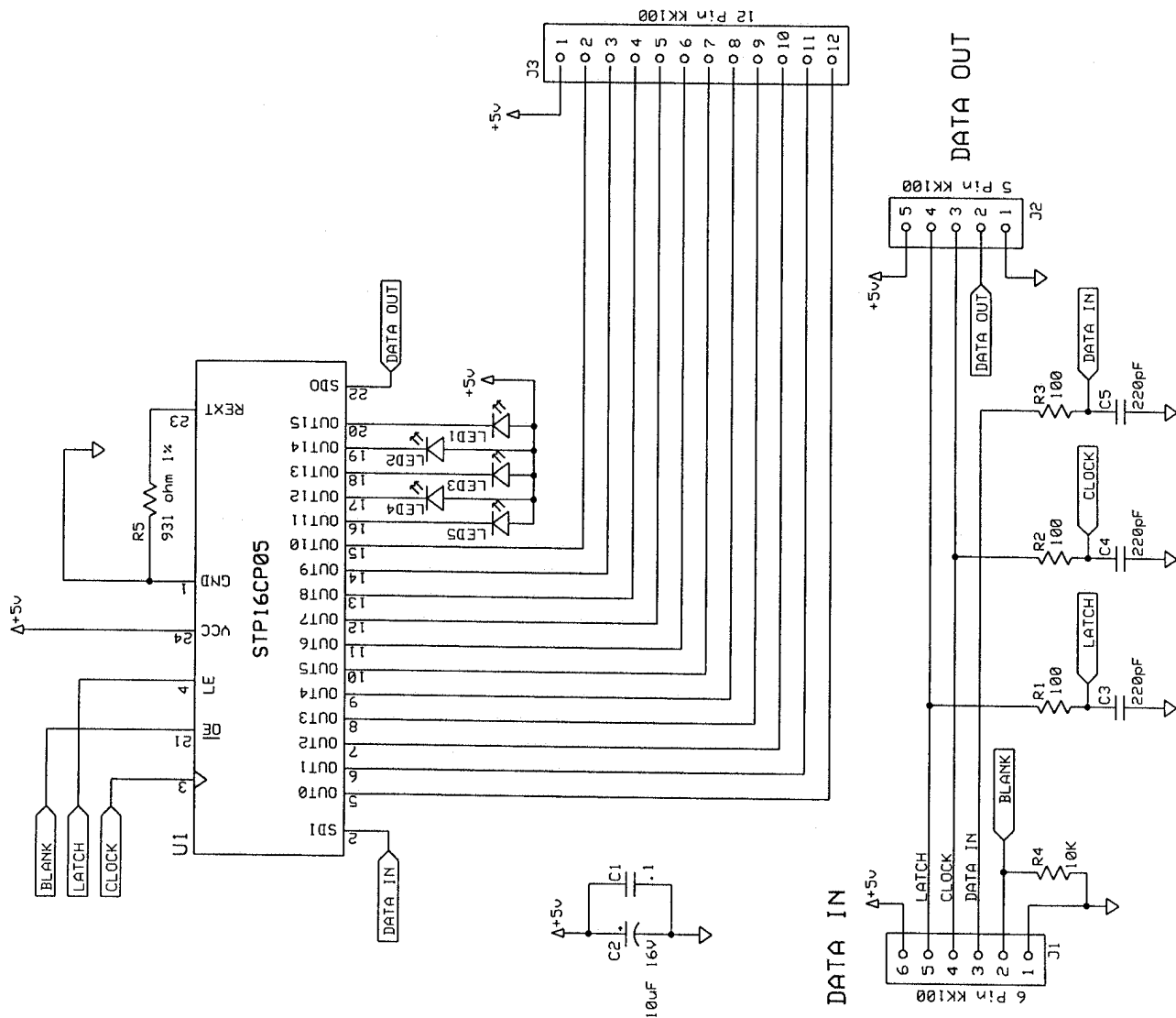
S20-S324-02

Rev A

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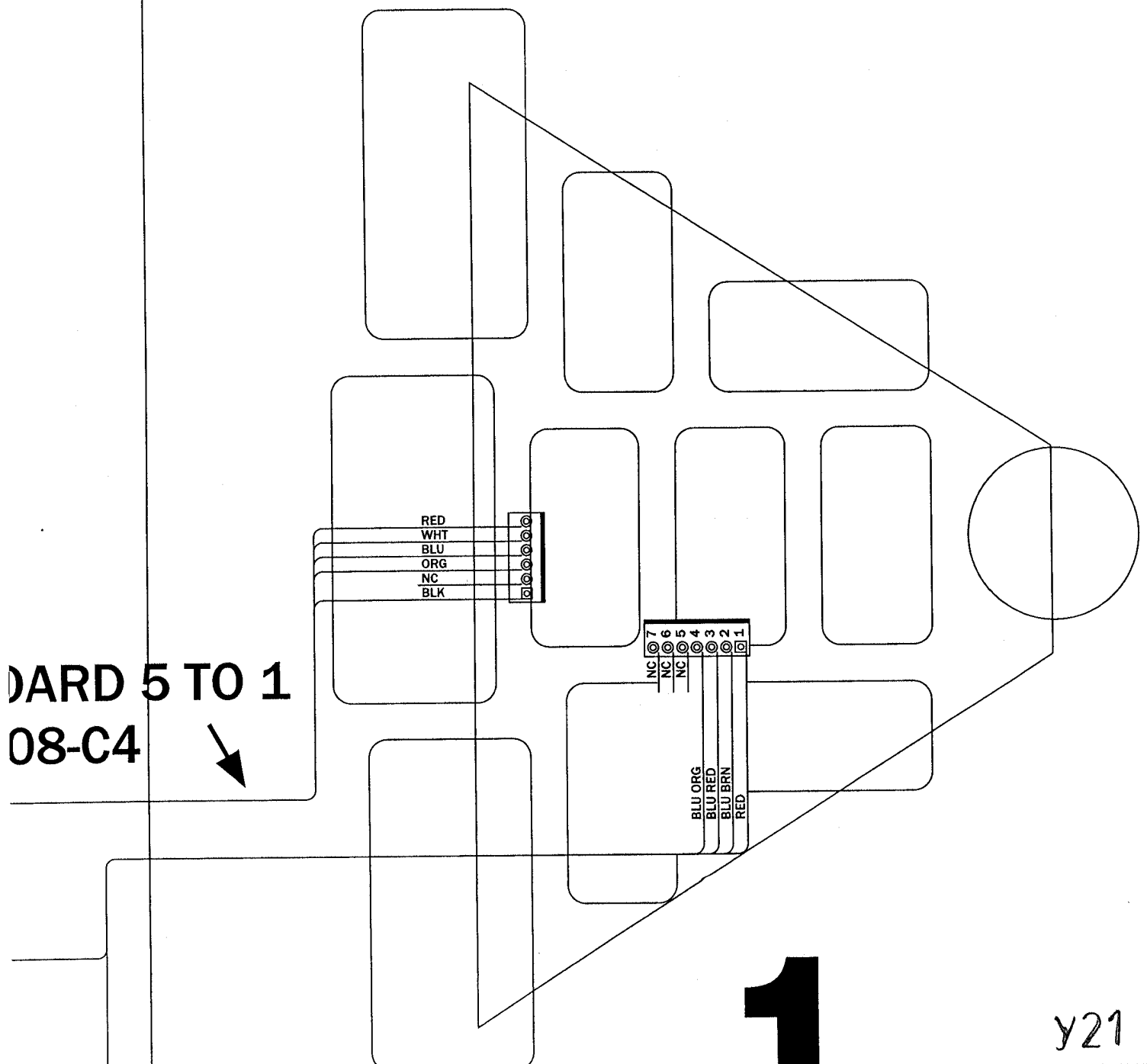


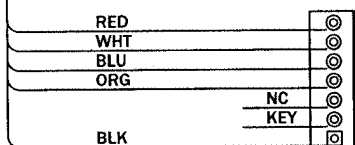




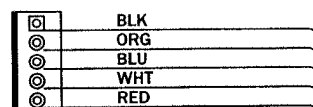
LED BOARD WIRING

Detail of Board 1 Input and Output wiring





2



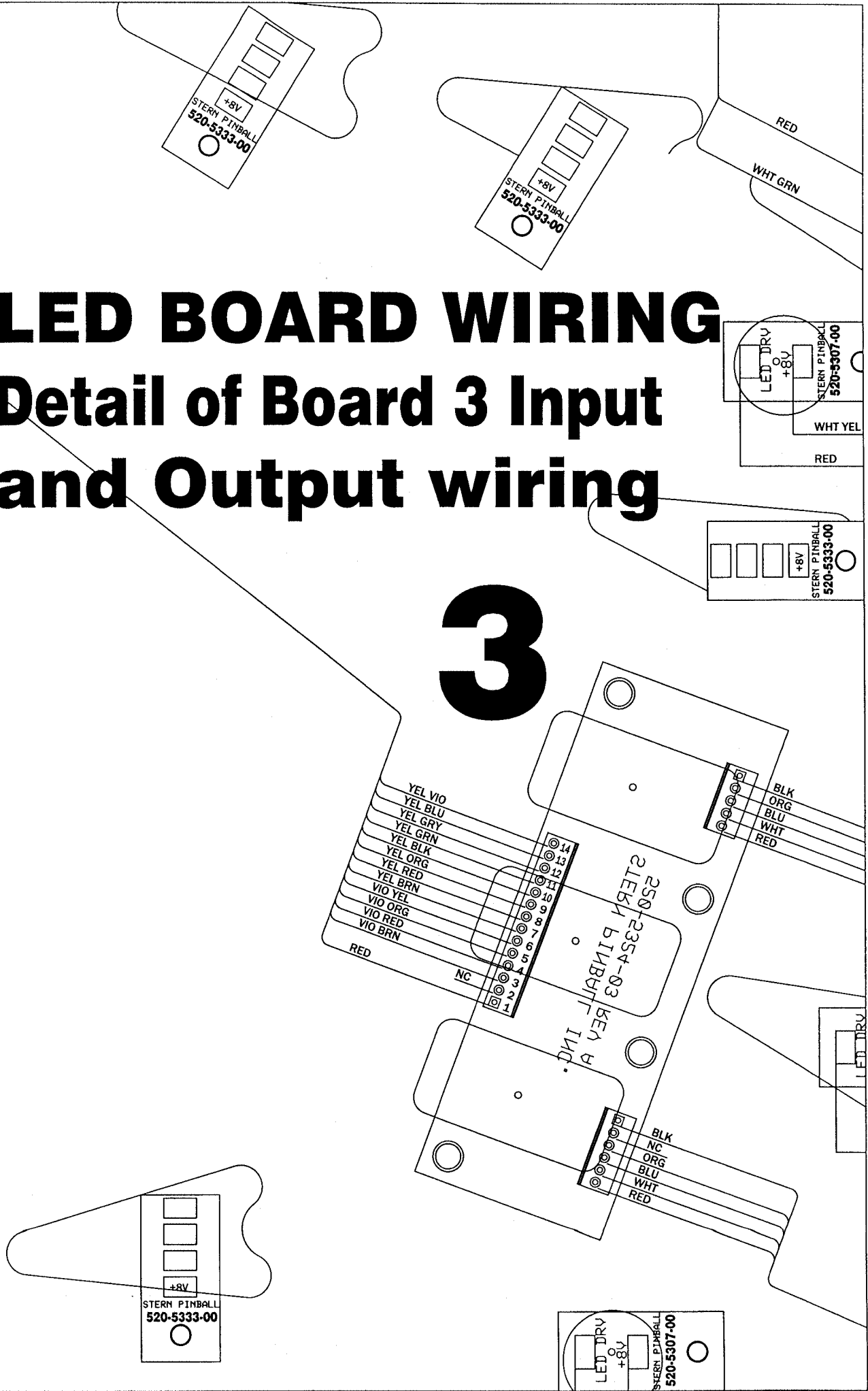
LED BOARD WIRING

Detail of Board 2 Input and Output wiring

LED BOARD WIRING

Detail of Board 3 Input and Output wiring

3

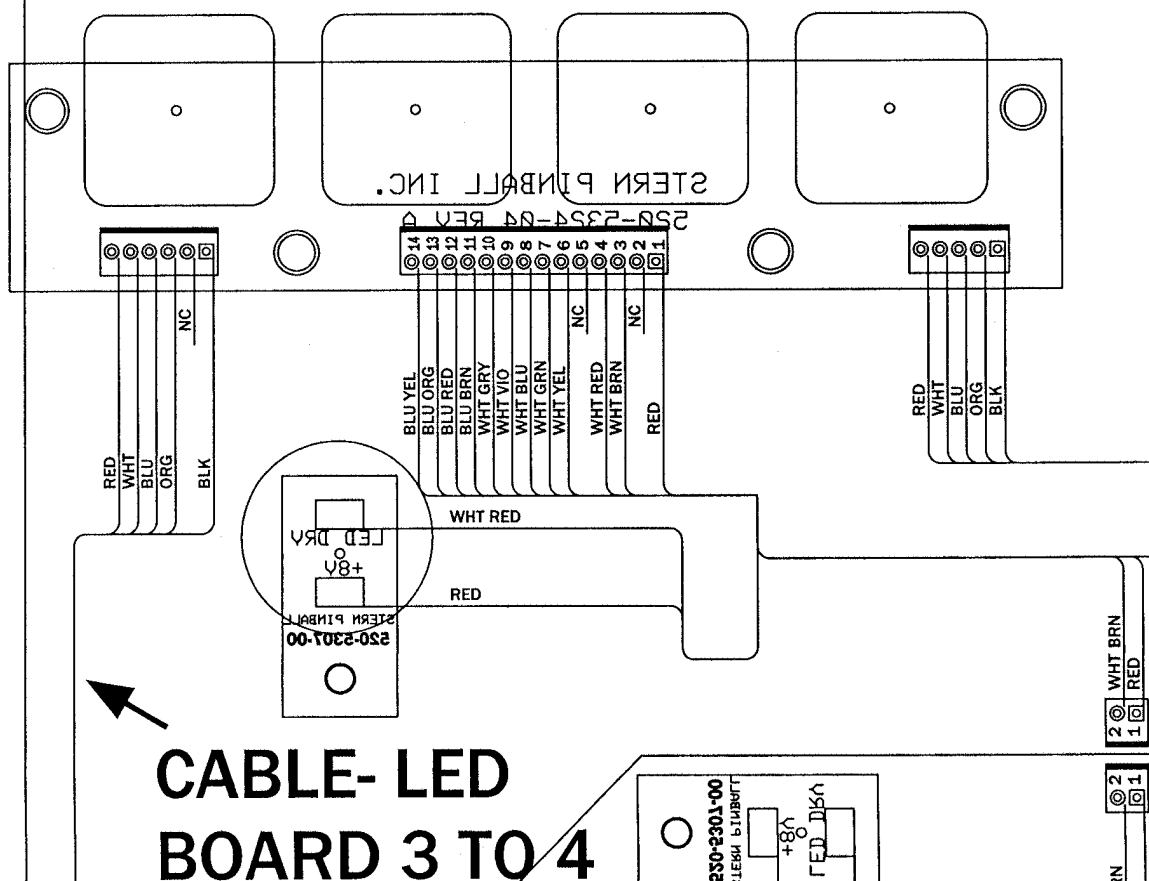


LED BOARD WIRING

Detail of Board 4 Input and Output wiring

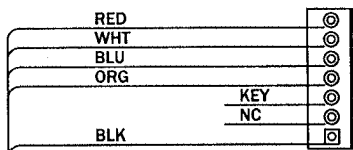
4

CABLE- LED BOARD 4 C
036-5572-10-C4



CABLE- LED
BOARD 3 TO 4

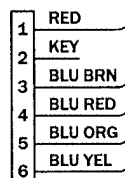
Y 25



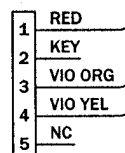
LED BOARD WIRING

Detail of Back panel, cabinet, and topper box connections

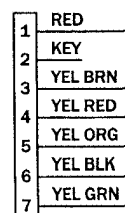
To future
optional
Topper box



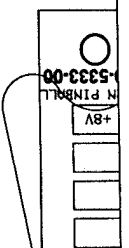
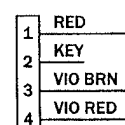
To future
optional
Topper box

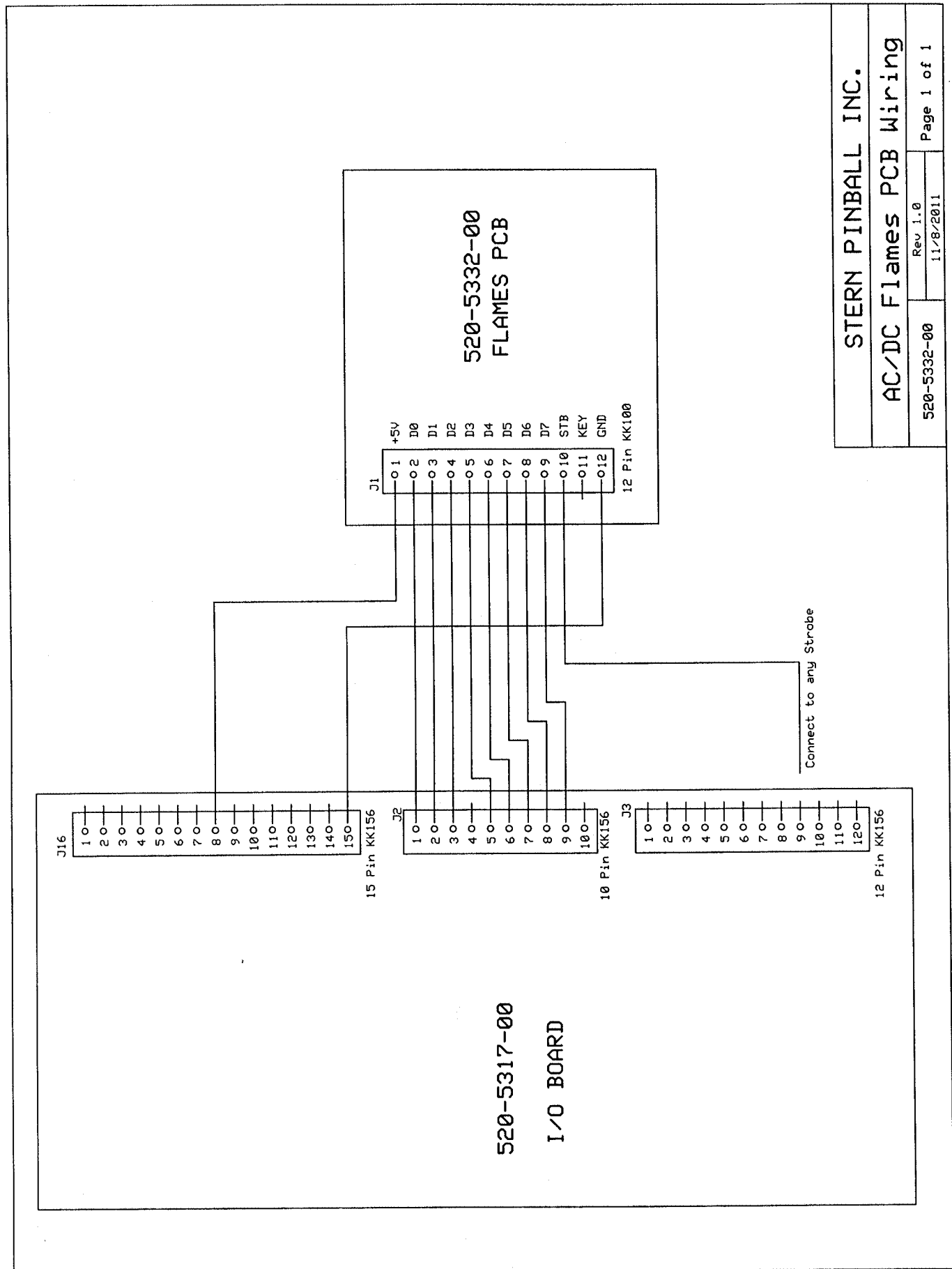


To Cabinet
Cable



To Back
Panel Cable





STERN PINBALL INC.		
AC/DC Flames PCB Wiring		
520-5332-00	Rev 1.0 11/8/2011	Page 1 of 1

Playfield Terminal Strips



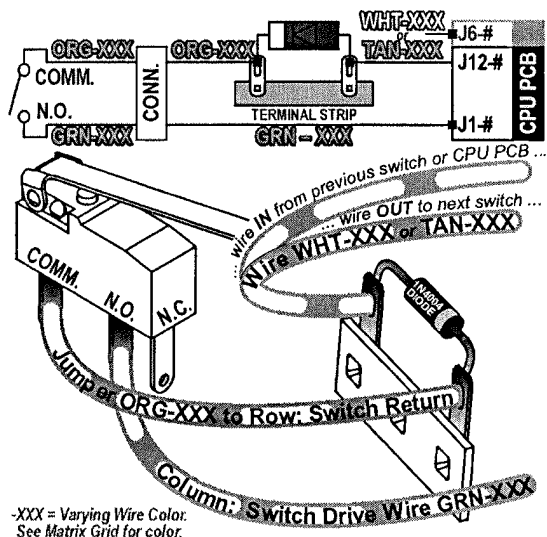
Explanation:

All Switches, Lamps & Coils require diodes. Coil diodes are located on the I/O Power Driver PCB (in Backbox). Some diodes from switches or lamps are moved onto Terminal Strips (*located under the playfield*). This is done where space constraints or excessive vibrations are present. The Switch & Lamp Matrix Grids also note which Switch or Lamp has a diode on a Terminal Strip, noted by **DOTS** (Diode On Terminal Strip).

Note: Some wires 'appear' to be doubled on the lugs. The switches and lamps are in a series, so you may see 1 or 2 wires depending where the switch or lamp is in the string.

Typical Switch Wiring & Schematic

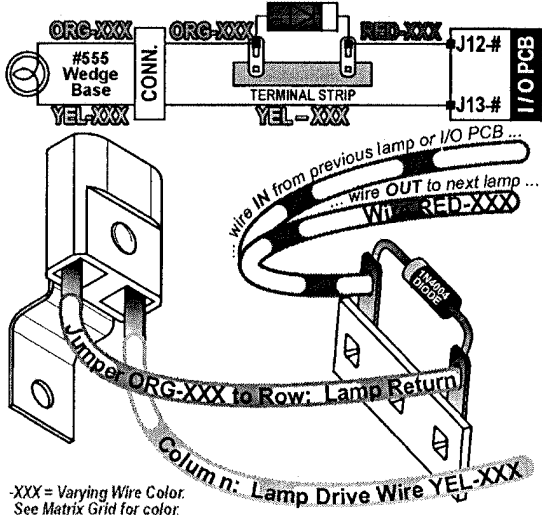
... with Switch Diode on a Terminal Strip (DOTS)



Typical Lamp Wiring & Schematic

... with Lamp Diode on a Terminal Strip (DOTS)

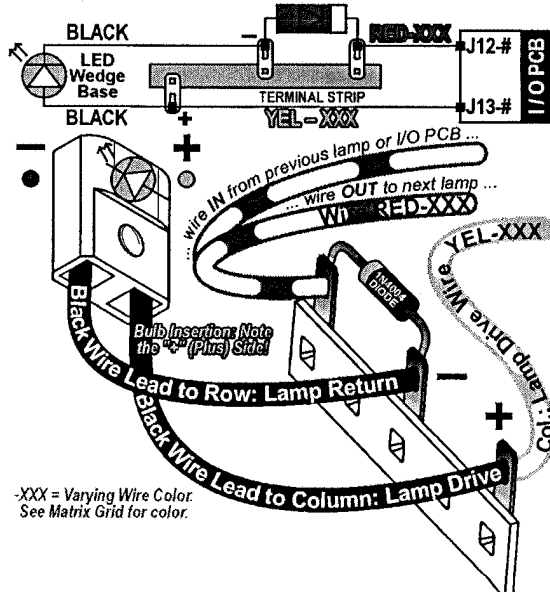
Usually when a #555 Bulb is used as a Controlled Lamp for a Spot Light.



Typical Lamp Wiring & Schematic

... with Lamp Diode on a Terminal Strip (DOTS)

Usually when an LED Module is used as a Controlled Lamp for a Pop Bumper.

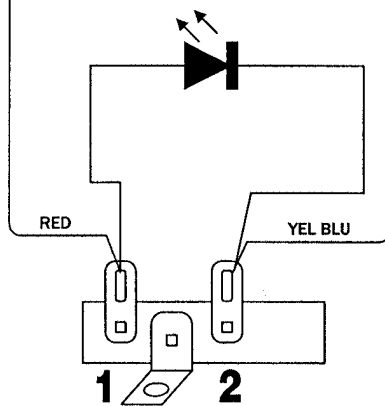


CABLE- LED BOARD 3 OUTPUTS

036-5572-09-C4

LED BOARD WIRING Detail of Board Pop Bumper terminals

LED 63
RIGHT POP BUMPER



BLK LED RIGHT



BLK LED RIGHT

YEL GRY

LEFT
POP BUMPER
LED 62

RED

BLK LED LEFT



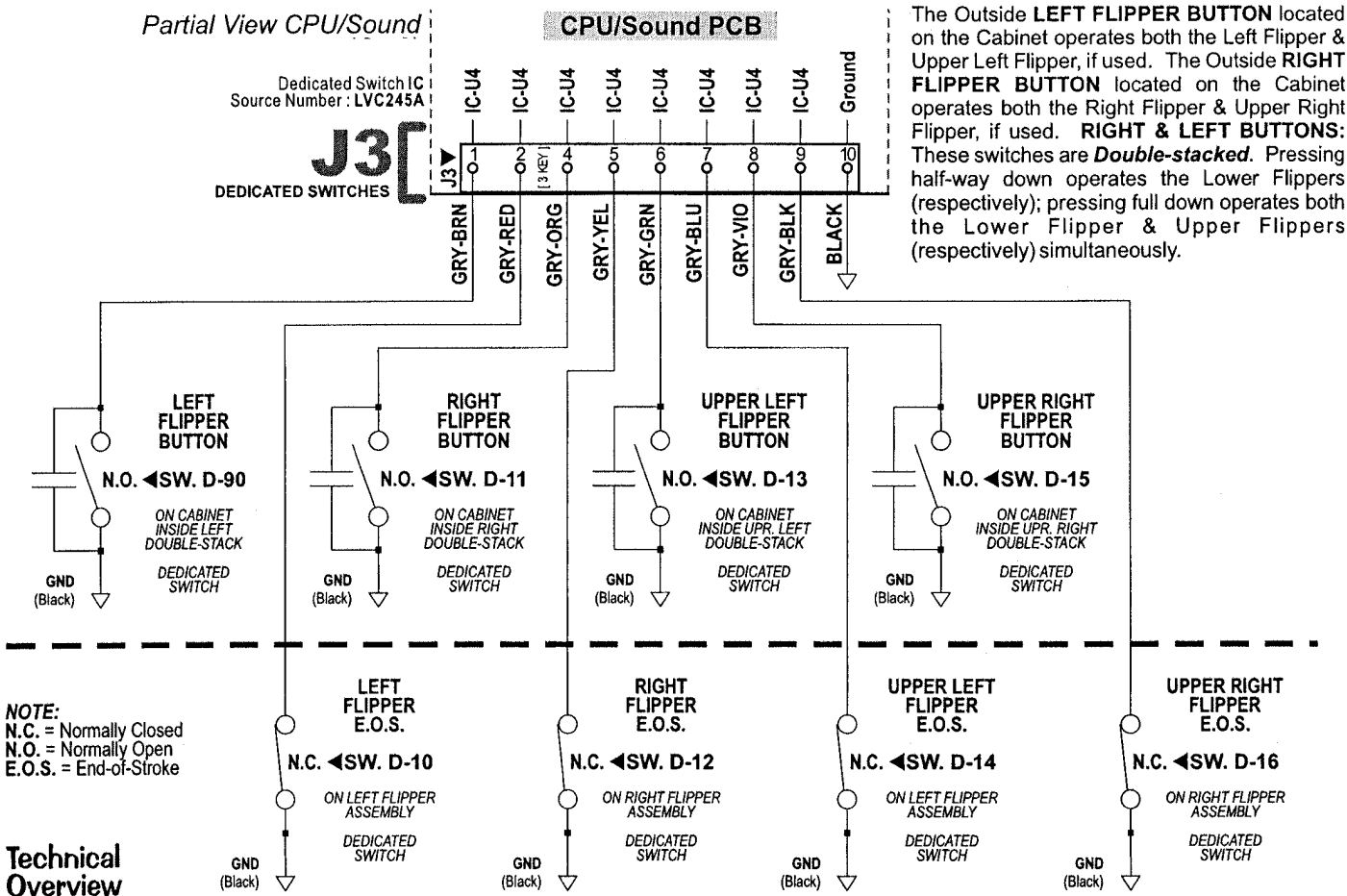
BLK LED LEFT

YEL VIO

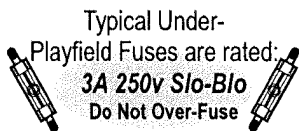
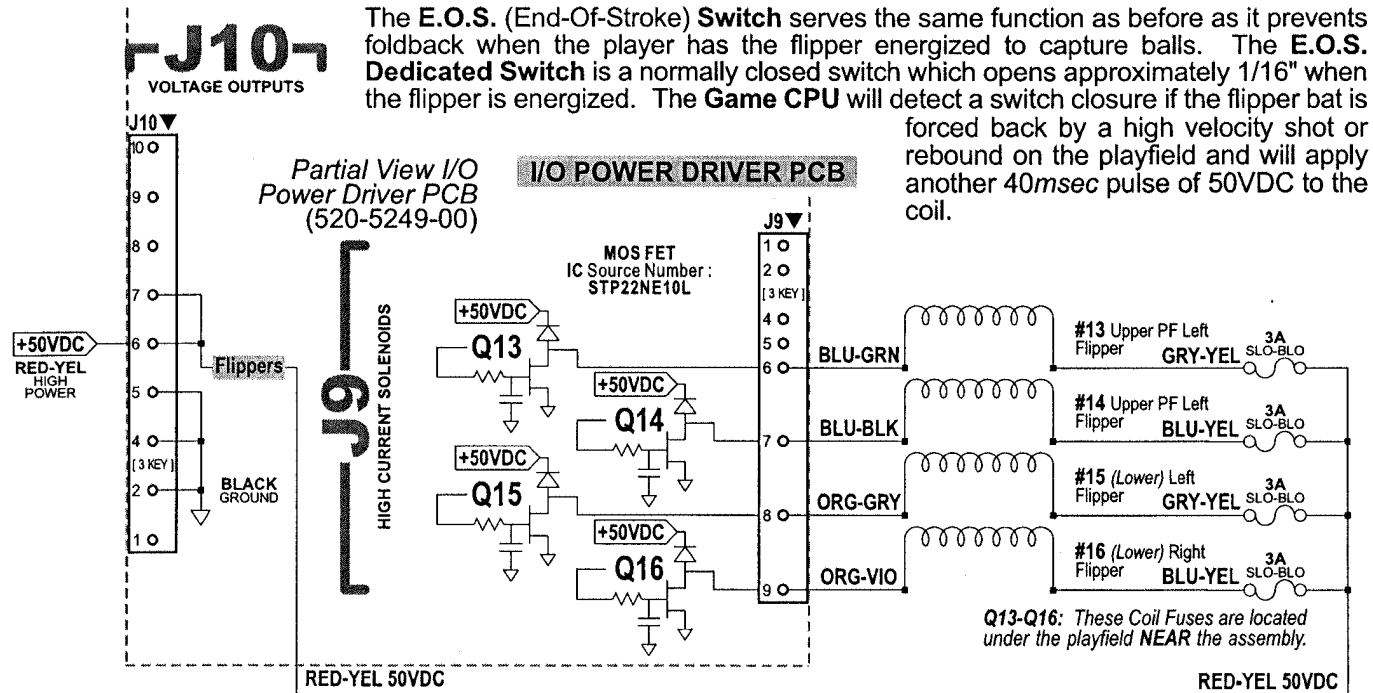
BOTTOM
POP BUMPER
LED 64

1 2 3

#-Flipper Circuit Wiring Diagram



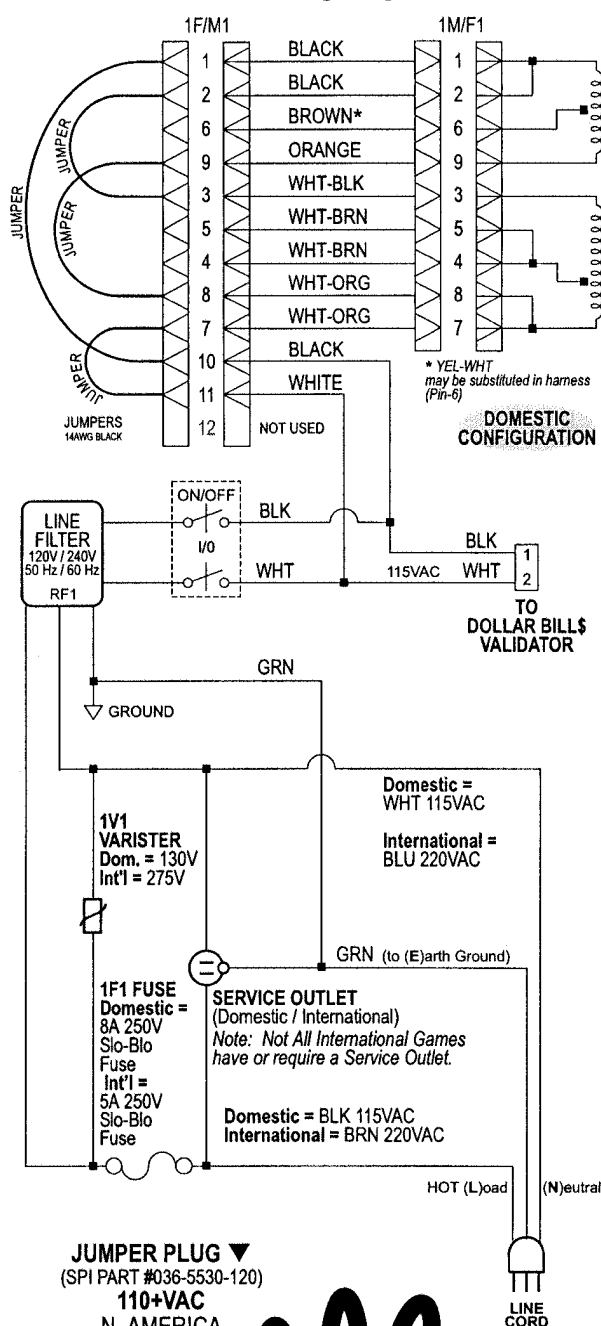
Our **Flipper System** uses one supply voltage (+50VDC) for both **kick & hold**. Once the **Game CPU** detects a Flipper Cabinet Switch closure (*during game play*) it applies a 40msec pulse to the gate of the Flipper Drive Transistor (STP22NE10L). If it continues to detect a Flipper Cabinet Switch closure (*the player holding the button in*) it will continue to pulse the flipper drive transistor 1msec every 12msecs for the duration of the hold cycle.



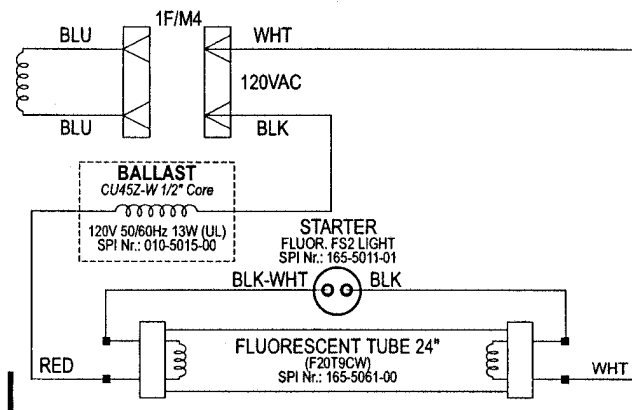
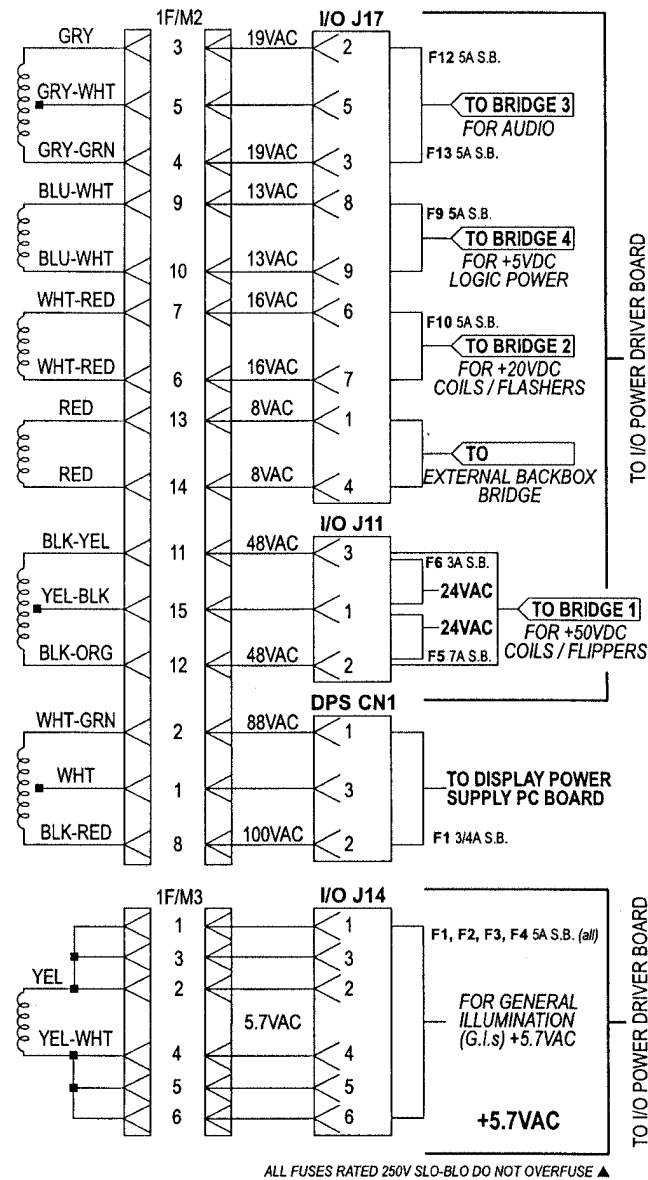
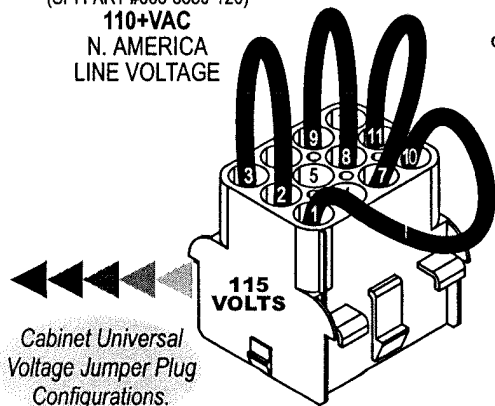
Playfield Wiring

Playfield Wiring

Transformer Power Wiring Diagram



JUMPER PLUG ▼
(SPI PART #036-5530-120)
110+VAC
N. AMERICA
LINE VOLTAGE

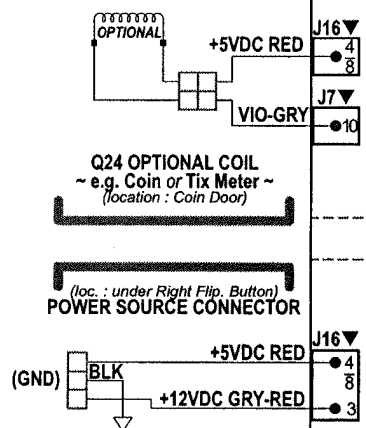
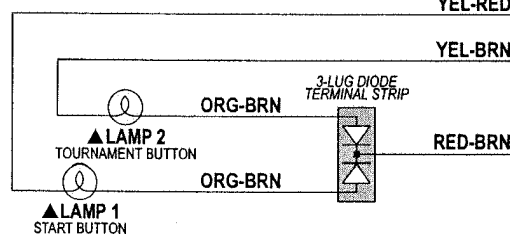
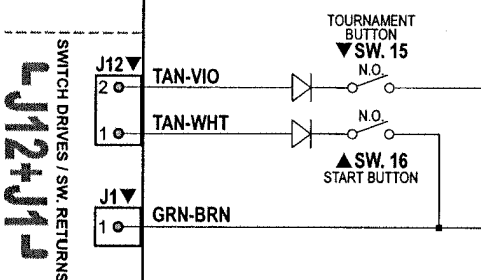
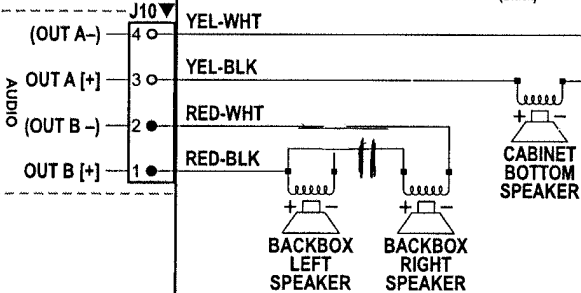
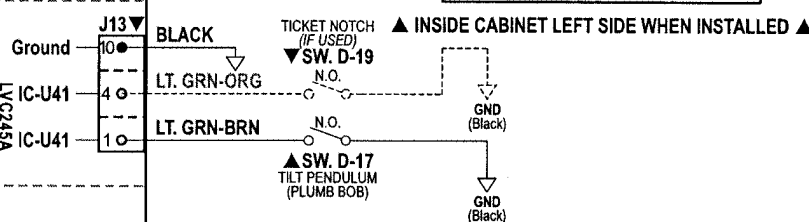
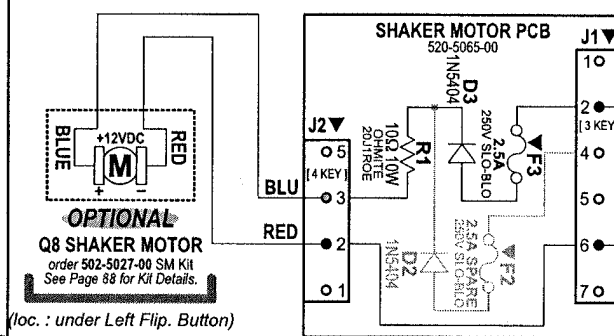
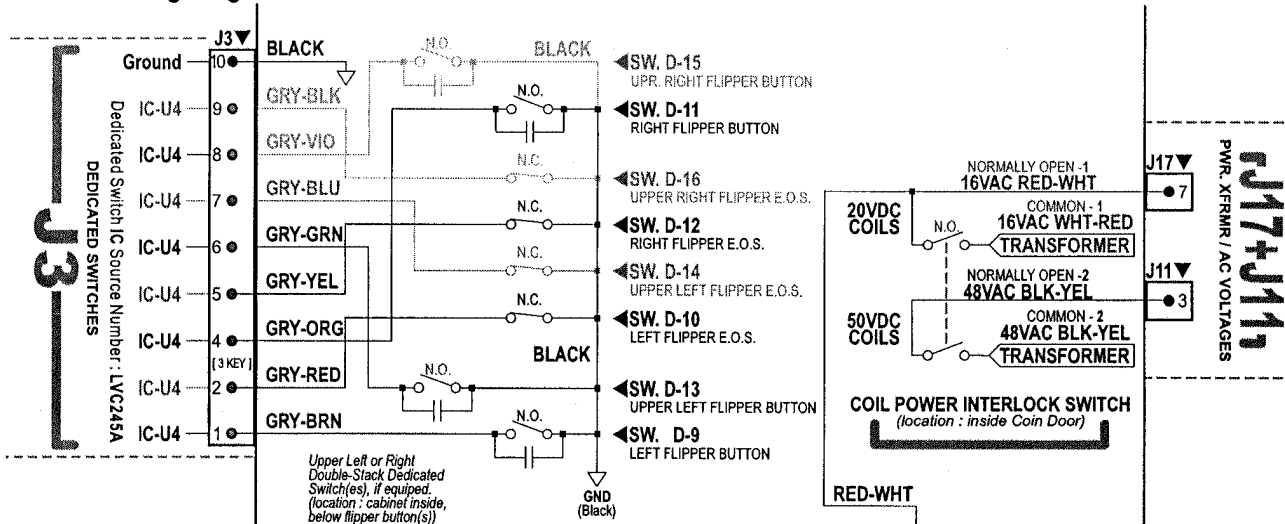


FLUORESCENT TUBE, STARTER & BALLAST
LOCATED IN THE BACKBOX

Cabinet Wiring

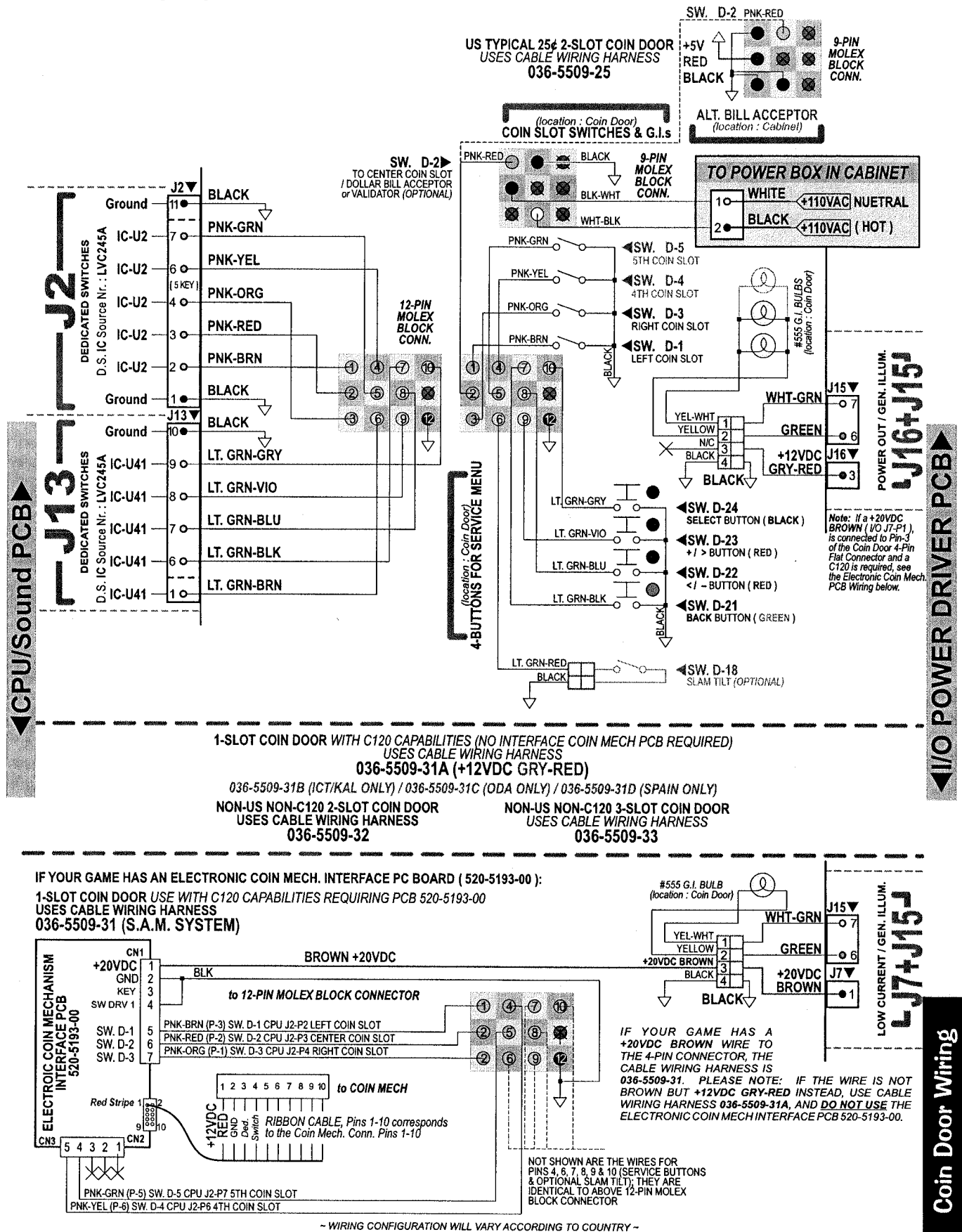
Cabinet and Coin
Door Wiring

Cabinet Wiring Diagram



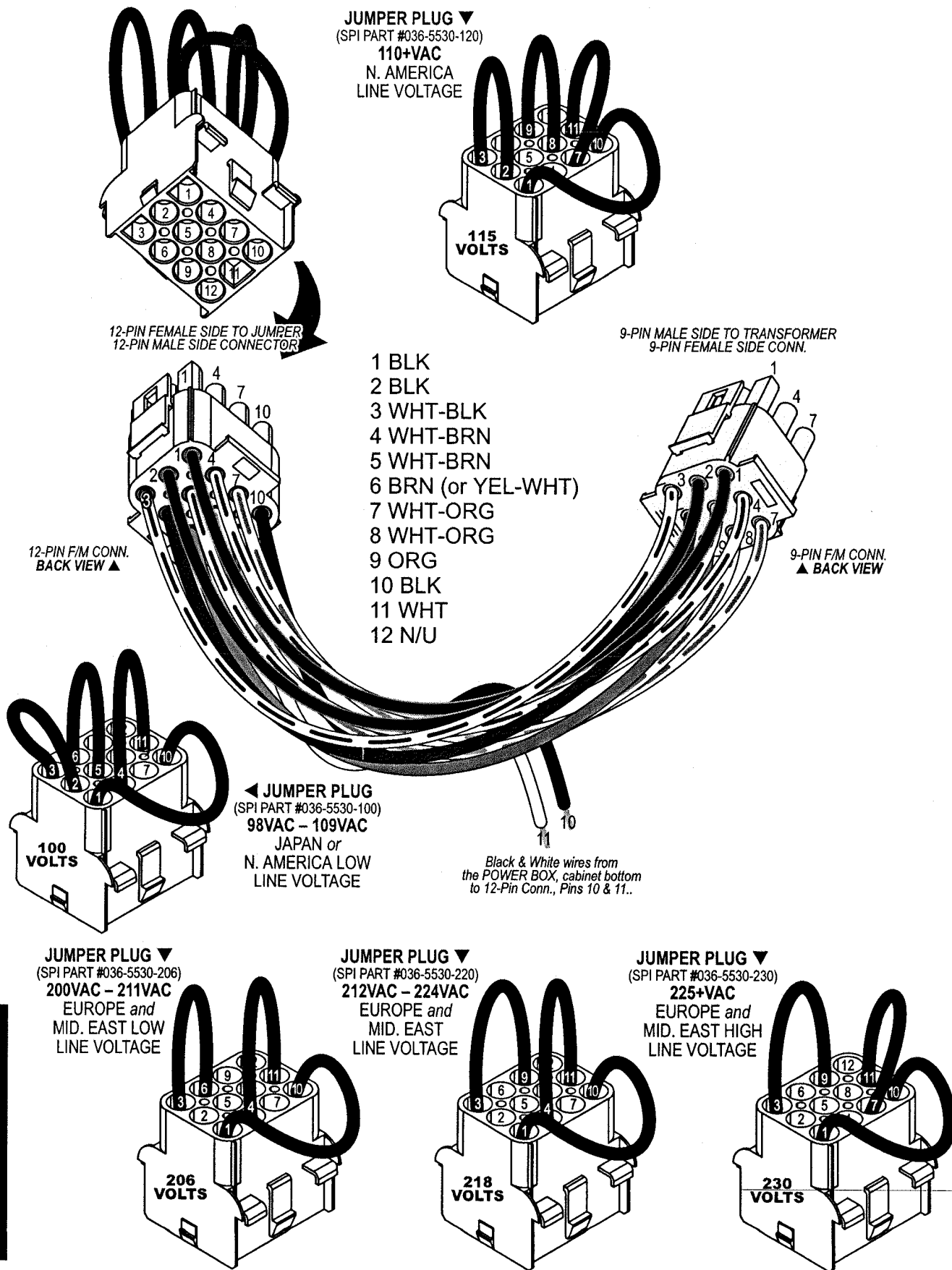
Cabinet and Coin Door Wiring

Coin Door Wiring Diagram

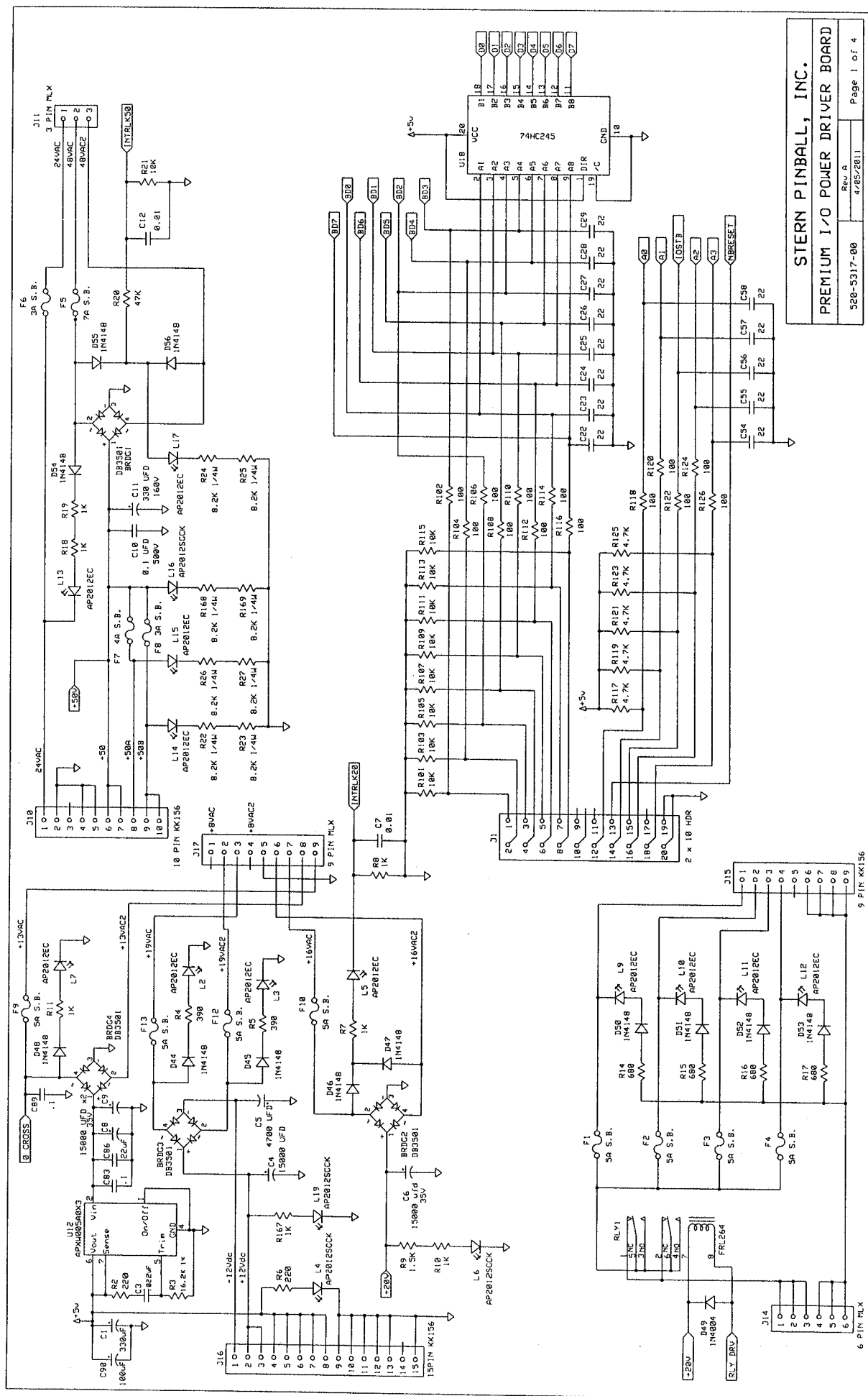


Cabinet and Coin
Door Wiring

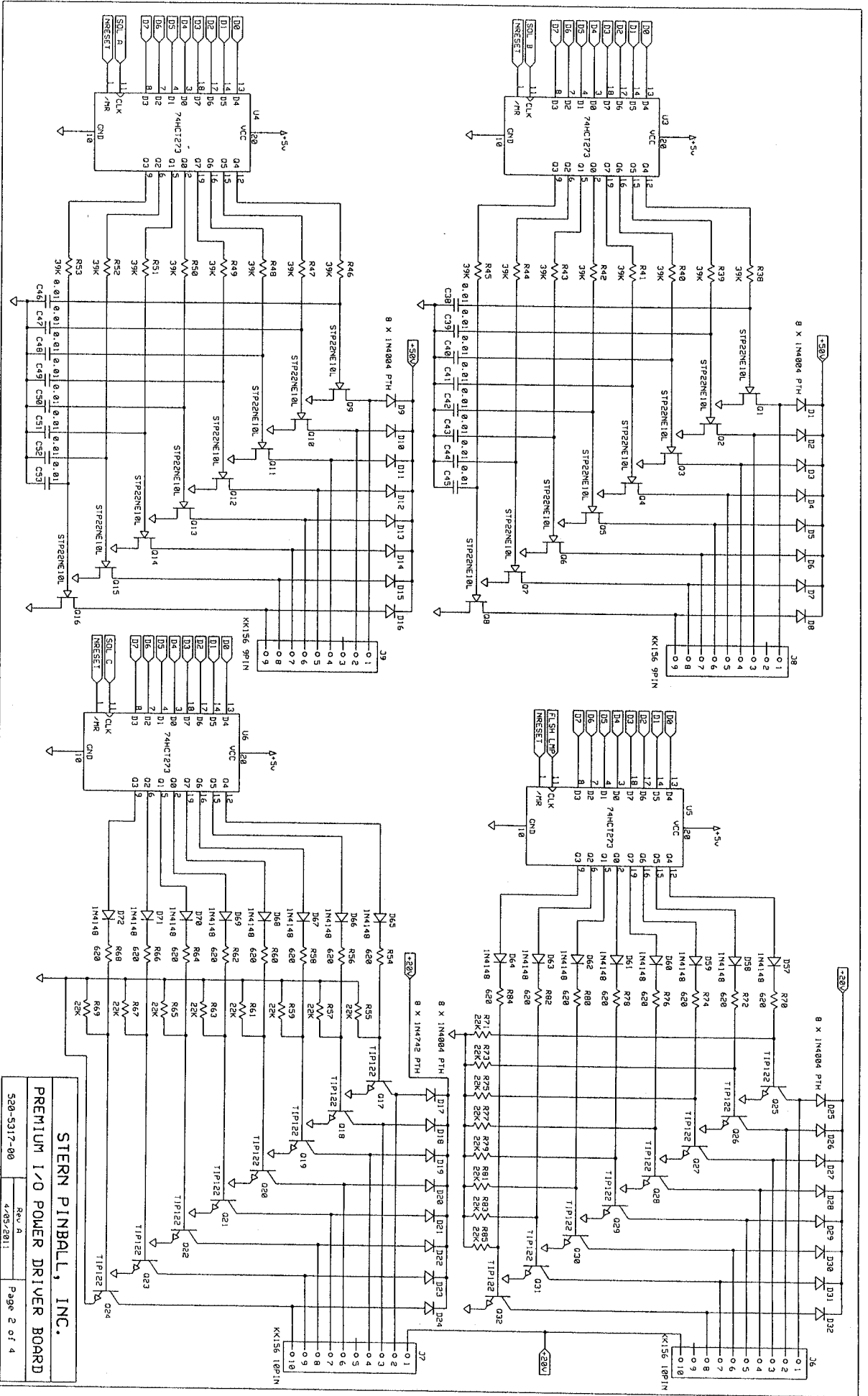
Cabinet Universal Voltage Jumper Plugs (for use with Universal AC Cable, 036-5530-00 ONLY)

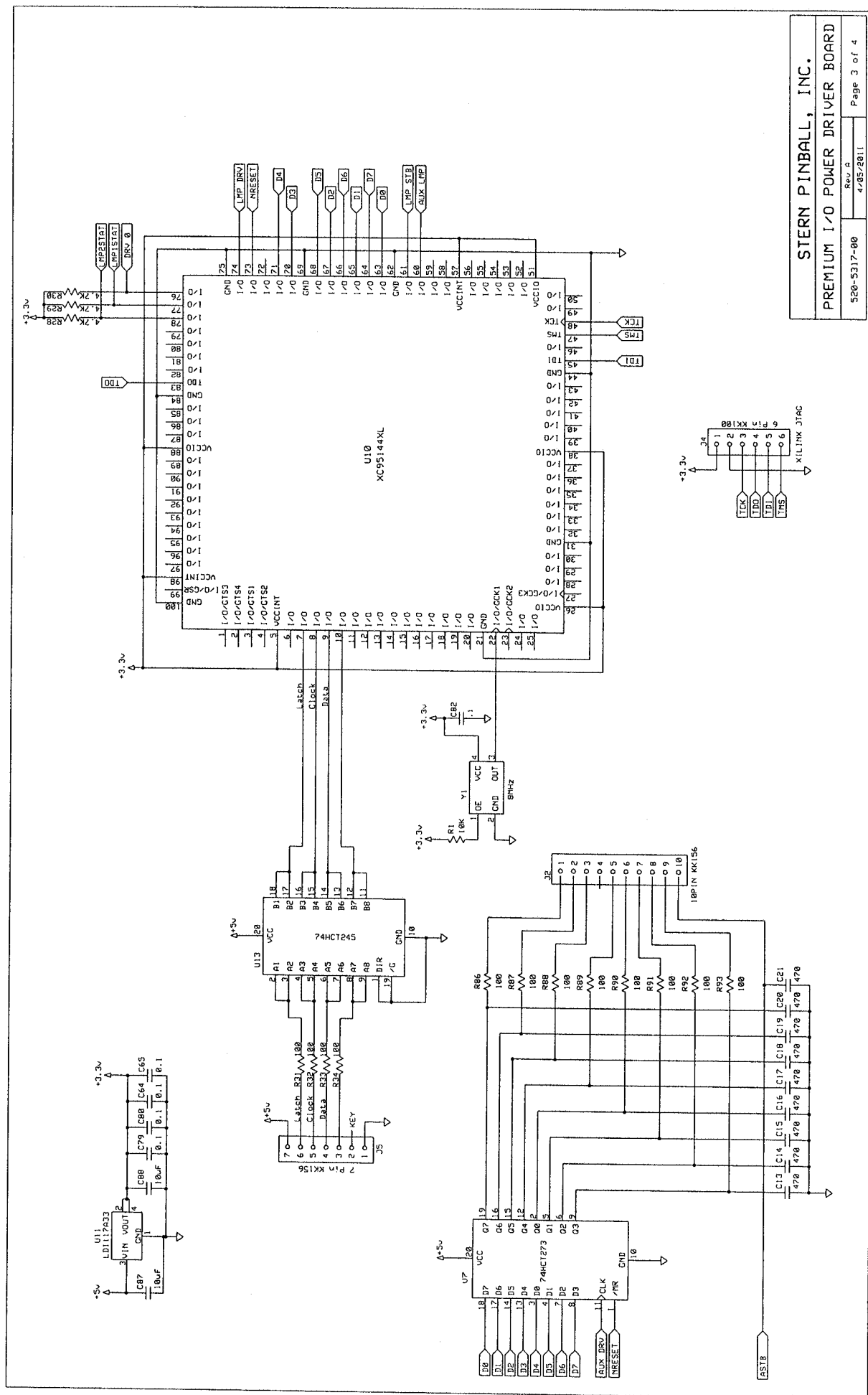


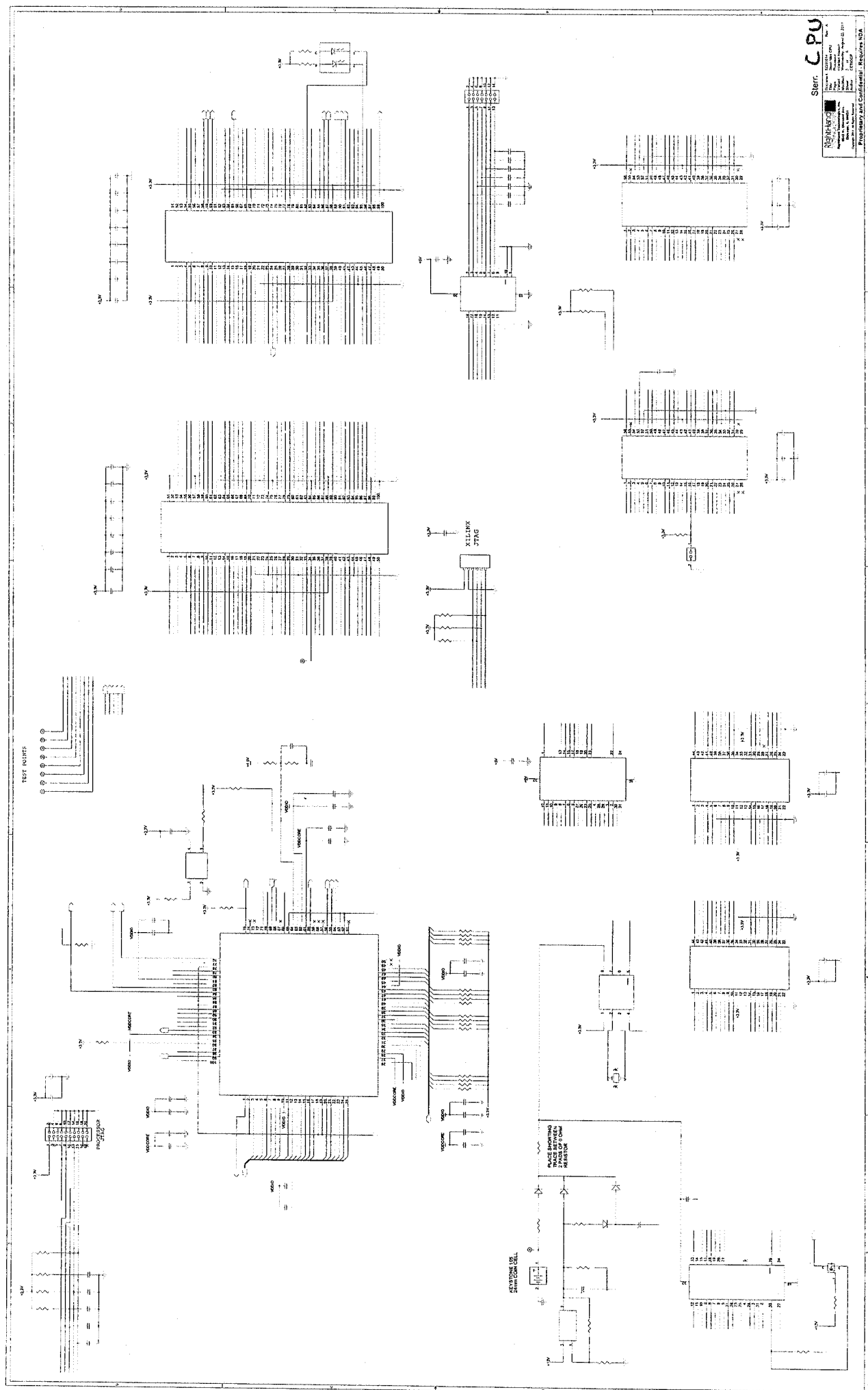
**Cabinet and Coin
Door Wiring**

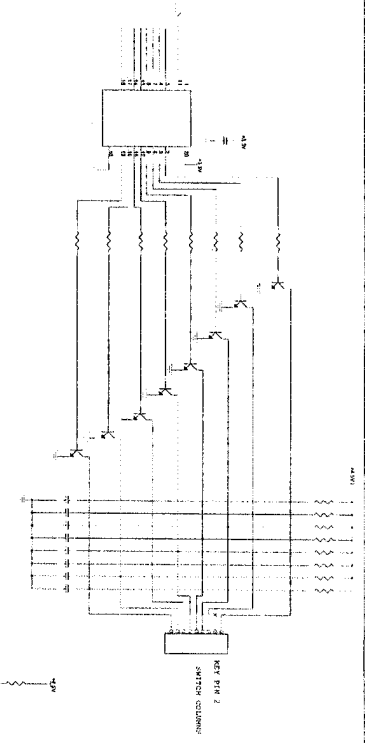
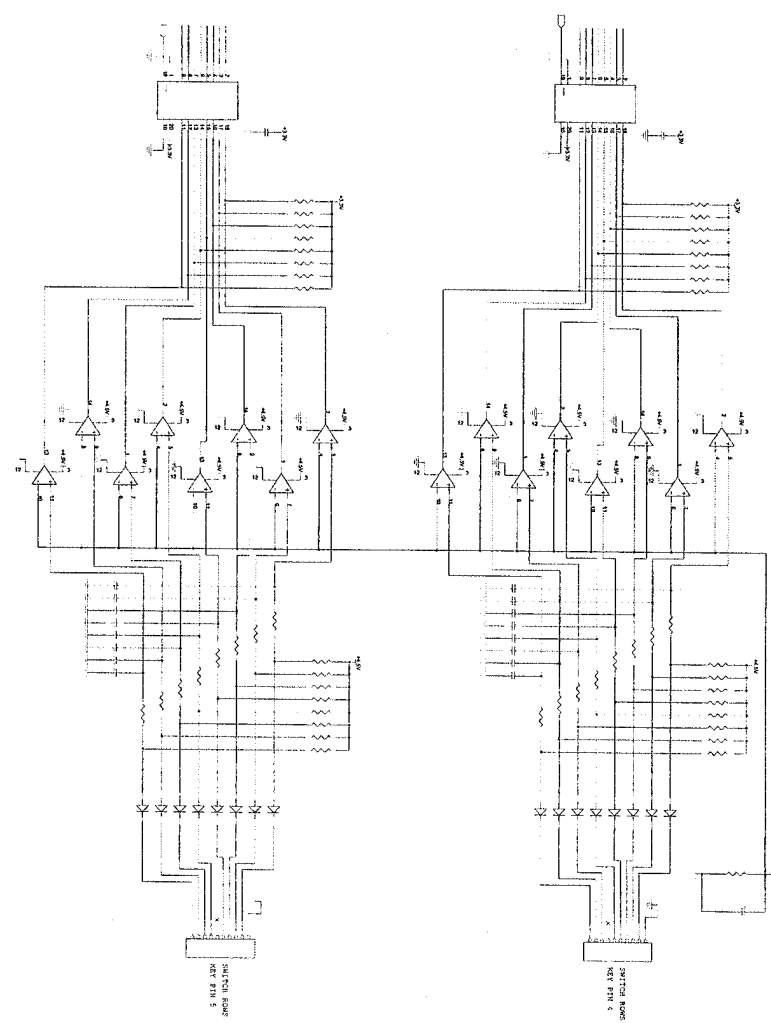
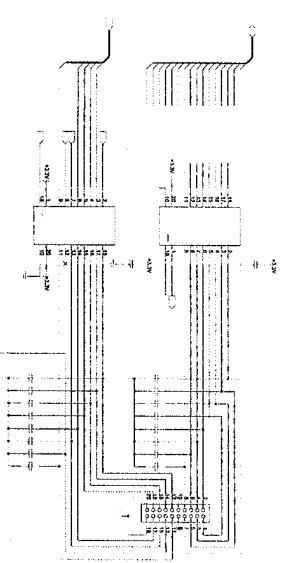
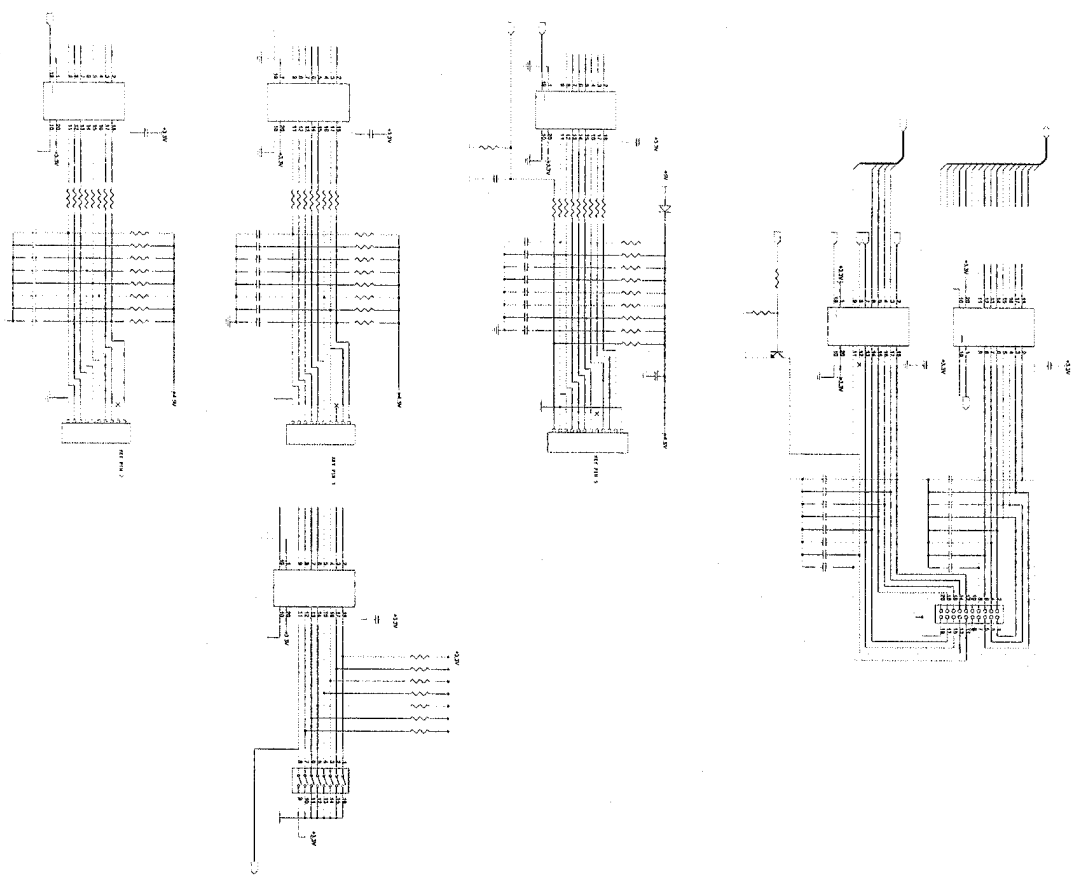


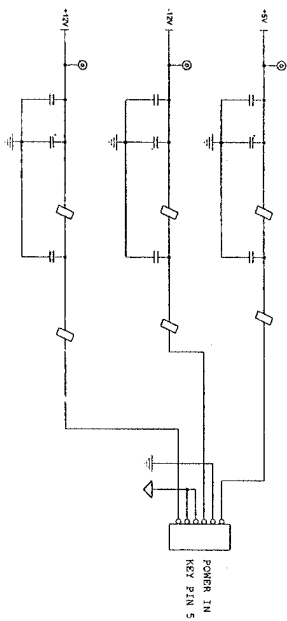
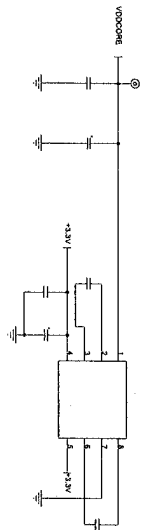
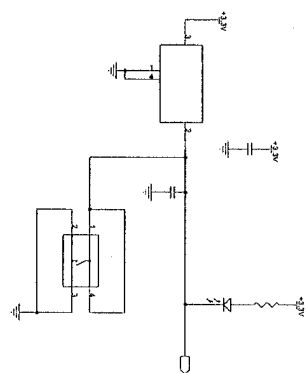
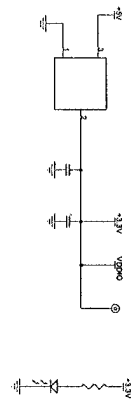
Y35



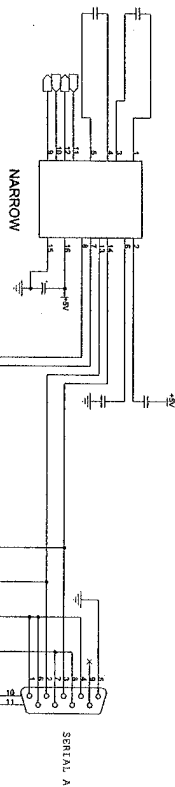
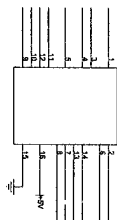




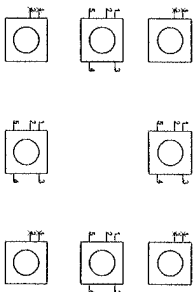




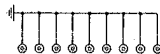
WIDE
ALTERNATE FOOTPRINT



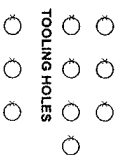
MOUNTING HOLES



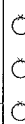
GROUND POSTS



FIDUCIALS



TOOLING HOLES



RightHand
RightHand Technologies, Inc.
4000 E. 1st Ave.
Orem, UT 84057
Phone: 801.224.1111
Fax: 801.224.1112
Email: sales@righthandtech.com
Website: www.righthandtech.com

Stern

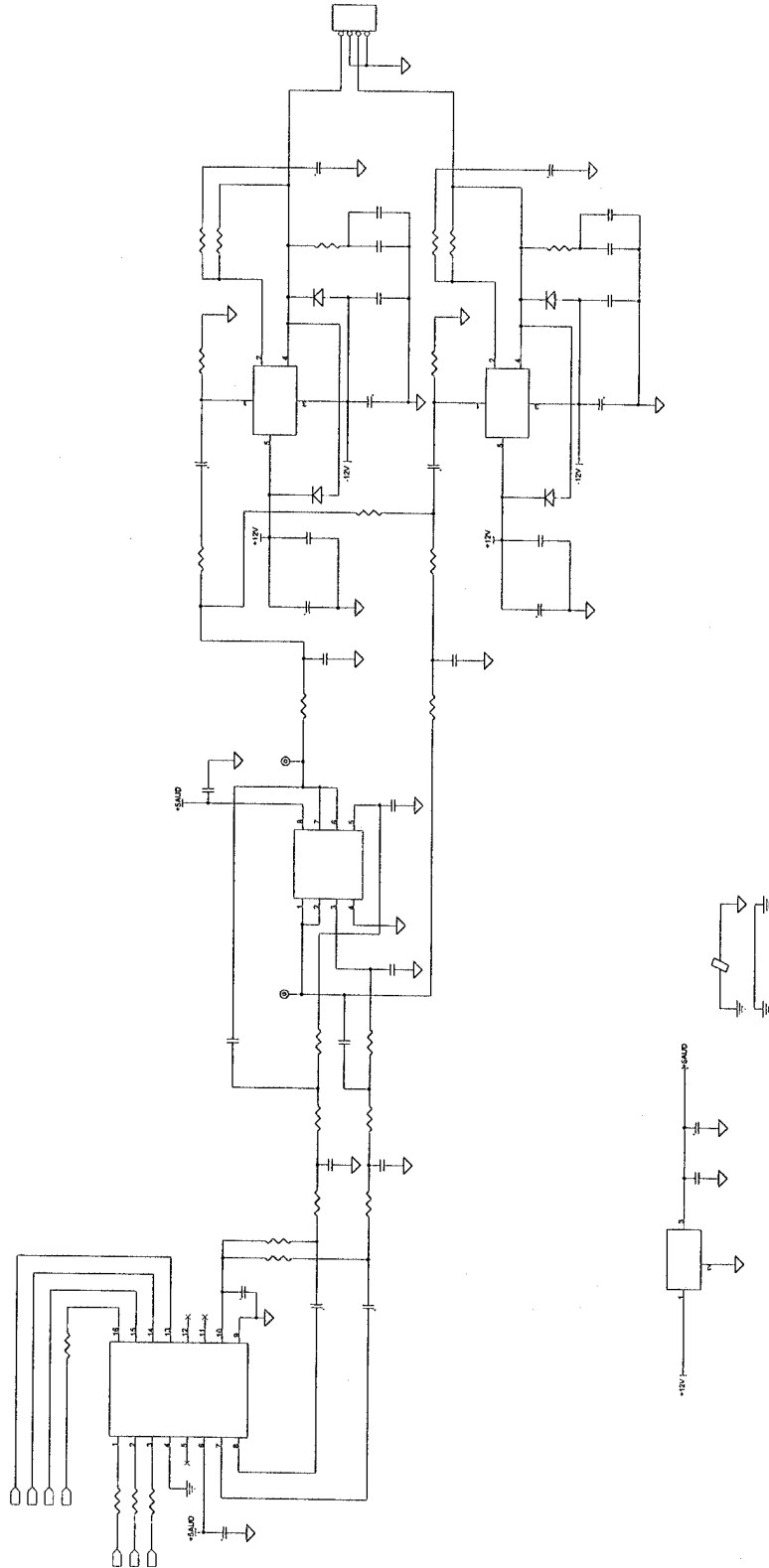
Document: RCH014
Rev: 1.0
Type: Regulatory Compliance Part
Version: 1.0
Date: 01/01/01
Stern

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Stem

Right-hand	Rev. A
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Author	Stem
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Modified	Wednesday, August 02, 2011
Author	Stem

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ATTENTION

**REMOVE 3 NUTS MARKED "X" ON
BACK OF LOWER PLAYFIELD AND
REMOVE BALL EJECTOR UNIT.**

**INSERT 1 BALL, REPLACE EJECTOR
UNIT AND TIGHTEN 3 NUTS
CAREFULLY.**

