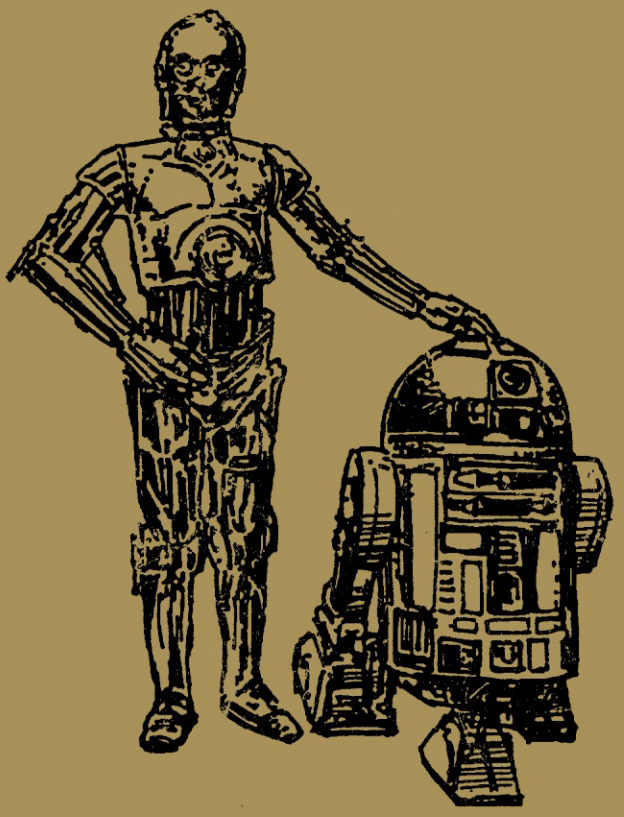
DATA EAST

STAR WARS™



1990 Janice Avenue
Meirose Park, IL 60160
708-345-7700
FAX 708-345-7718
1-800-KICKERS

DATA EAST PINBALL ®

Copyright © Data East Pinball, inc. 1992

780-5024-00

CPU JUMPER TABLE

Game	CPU* Version	ROM Location	Jumpers Installed	Jumpers Removed
Torpedo Alley	Ver 2	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a
Time Machine	Ver 2	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a
Playboy	Ver 2	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a
ABC M.N. Football	Ver 2	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a
Robocop	Ver 2	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a
Phantom of the Opera	Ver 2	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a
Back to the Future	Ver 3	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a
The Simpsons	Ver 3	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a
Checkpoint	Ver 3	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a
Teen. Mut. Ninja Turtles	Ver 3	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a
Batman	Ver 3	5B,5C	J1b,J3,J4,J5b,J6b,J7b,&J8	J1a,J2,J5,J5a,J6a,&J7a
Star Trek	Ver 3	5C	J1b,J3,J5,J5b,J6b,J7b,&J8	J1a,J2,J4,J5a,J6a,&J7a
Hook	Ver 3	5C	J1b,J3,J5,J5b,J6b,J7b,&J8	J1a,J2,J4,J5a,J6a,&J7a
Lethal Weapon 3	Ver 3	5C	J1b,J3,J5,J5b,J6b,J7b,&J8	J1a,J2,J4,J5a,J6a,&J7a
Star Wars	Ver 3	5C	J1b,J3,J5,J5b,J6b,J7b,&J8	J1a,J2,J4,J5a,J6a,&J7a

*Version 1 has a 2K RAM which is a 24-pin IC at location 5D.
*Version 2 has an 8K RAM which is a 28-pin IC at location 5D.

Power-up CPU Self Tests

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

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

PIA LED	SUSPECT COMPONENT
Stays On	One of the 6821 PIAs
Flashes 1 Time	6064 RAM at location D5.
Flashes 2 Times	EPROM at location B5.
Flashes 3 Times	EPROM at location C5.

QUICK REFERENCE FUSE CHART

PPB BOARD

F1 5A Slo-Blo G.I. 6.3VAC
F2 5A Slo-Blo G.I. 6.3VAC
F3 5A Slo-Blo G.I. 6.3VAC
F4 5A Slo-Blo G.I. 6.3VAC
F5 5A Slo-Blo Flipper Power 48VAC
F6 5A Slo-Blo PPB Solenoids/Flash Lamps (34VDC)

POWER SUPPLY BOARD

F1 7A Slo-Blo +5VDC Regulator Input (9VAC)
F2 7A Slo-Blo +5VDC Regulator Input (9VAC)
F3 Not Used
F4 8A Slo-Blo Switched Illumination Buss (18VDC)
F5 5A Slo-Blo Solenoid Buss (34VDC)
F6 5A Slo-Blo Solenoid Buss (34VDC)
F7 0.5A Slo-Blo Display Reg. Input (90VAC)

STAR WARS
TABLE OF CONTENTS

GAME SPECIFICATIONS 1
- Power Requirements 1
- Major Assembly and Fuse Locations 1
- Circuit Board PROM Locations 1
- Transportation 1

ASSEMBLY PROCEDURES 1

GAME OPERATION 3
- Standard Features 3
- Manual Percentaging 3
- Game Specific Features 4

AUDIT FUNCTIONS 7
- General 7
- 'Quick Look' Functions 7
- Expanded Functions 9
- Game Specific Functions 10

GAME ADJUSTMENTS 13
- General 13
- Replay and Generic Features 13
- Single-Function Difficulty Adjustments 15
- Novelty/5-Ball/Add-A-Ball Rules 15
- Game Pricing 16
- Additional Generic Features 18
- Game Specific Features 19

DIAGNOSTIC PROCEDURES 21
- Entering Diagnostics 21
- Service Credits 21
- Tech Alert 21
- Burn In Minutes 21
- Sound Tests 22
- Digital Display Tests 23
- Switch Tests 24
- Lamp Tests 26
- Coil/Flash Lamp Tests 28
- Return to Game Over 28

PARTS IDENTIFICATION 30
- Cabinet Parts 30
- Playfield - Major Assemblies 31
- Playfield Rubbers 32
- Backbox Parts 32
- Playfield Top Parts 33

UNIQUE PARTS 34
- Up/Down Switch Assembly & Target Motor Cam Brkt. Assy. 34
- 2 Target Assembly. 35
- Super Vertical Up Kicker 35
- Flipper Assembly 36
- Slingshot Assembly 37
- Trough Eject Assembly 37
- Outhole Ball Return Assembly 38
- Jump Bumper 38
- Knocker \ Kickback Assembly 39
- Ball Launch Assembly 39
- 3 Bank Drop Target Assembly 40
- Power Scoop / Kickbig Assemblies 41
- Up - Down Shifter Assembly 42

Continued on next page

© Copyright Data East Pinball, Inc. 1992

Lamp Part Numbers 43
Trough Ramp Assembly 68
R2D2 Assembly 69
SERVICING DIAGRAMS 44
Cabinet Wiring Diagram 44
Combined Display Connections 45
Power Wiring Diagram 46
Backbox Wiring Diagram 47
Playfield Coil/Flash Lamp Wiring Diagram 48
Playfield Special Coil Diagram 49
Playfield Switch Wiring Diagram 50
Playfield Lamp Wiring Diagram 51
CPU Board 52
Power Supply Board 57
Digital Stereo Sound Board 58
Display Board 60
PPB Board 65
Solid State Flipper 66

"THE EMPIRE STRIKES BACK"(THEME)
(John Williams)
©1980 WARNER-TAMERLANE PUBLISHING CORP.
All Rights Reserved. Used By Permission.

"RETURN OF THE JEDI"(THEME)
(John Williams)
©1983 BANTHA MUSIC. All rights
administered byWARNER-TAMERLANE PUBLISHING CORP.
All Rights Reserved. Used By Permission.

"STAR WARS"(THEME)
(John Williams)
©1977 WARNER-TAMERLANE PUBLISHING CORP.
BANTHA MUSIC. All rights administered by
WARNER-TAMERLANE PUBLISHING CORP.
All Rights Reserved. Used By Permission.

GAME SPECIFICATIONS

POWER REQUIREMENTS

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

Normal Line: 109 to 129 Vac (211 to 225 Vac)

High Line: (226 to 235 Vac)

Low Line: 95 to 108 Vac (200 to 210 Vac)

MAJOR ASSEMBLY AND FUSE LOCATIONS

Refer to the Game Illustration (page 2) to identify locations of the major assemblies, and fuse values and locations.

PROM SUMMARY

CPU Board: Location 5C
Sound Board: Locations U17 (Voice ROM 1), U21 (Voice ROM 2), and U7 (Sound ROM)
Display Controller Board: Locations U12 & U14

TRANSPORTATION

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

GAME ASSEMBLY PROCEDURES
(Refer to the Game Illustration on page 2)

1. Open the top of the carton and lay it on its side with the bottom of the cabinet down. Using the plastic banding strip as a handle, slide the game out of the carton.

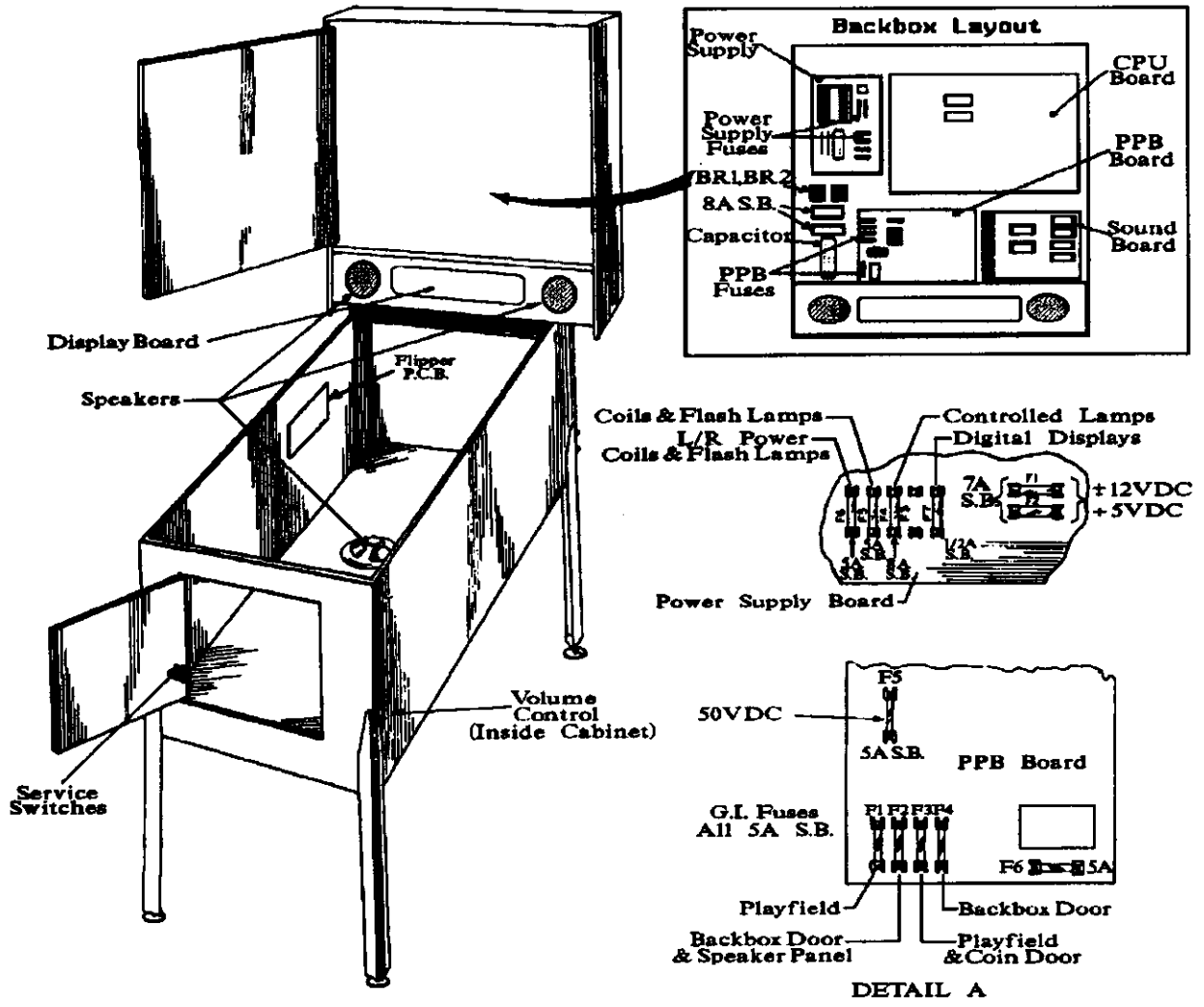
2. Remove all packing material. Locate cabinet legs in filler packing inserts and assembly parts package in the cashbox. There should be four leg levelers, eight leg bolts, three pinballs and a large Allen Wrench used for securing the backbox.

3. Attach leg leveler from the parts package to each leg, make sure that each leveler is threaded through a hex nut before threading it into the leg.

4. Support rear of cabinet and attach rear legs using two leg bolts for each leg.

5. Support front of cabinet and attach front legs using two leg bolts for each leg.

6. While assuring that no cables are being pinched, carefully raise the backbox and secure it in its upright position by inserting the Allen Wrench in the hole in the back of the cabinet and rotating the wrench 270 degrees(3/4 turn).



GAME ILLUSTRATION

7. Remove the backbox keys from the clip on the inside of the coin door and unlock and carefully remove the backglass. Set the backglass aside.

8. Carefully remove the playfield glass and set it aside.

9. Check all connectors in the backbox for loose wire terminations. Reseat any loose wire by pushing in on the terminal.

10. Push on all connectors plugged into the CPU board, Sound Board, Power Supply Boards, and (on insert board) Display board to check that they are properly seated.

11. Check that the fuses on the Power Supply board, PPB board and fuse panel are seated properly.

12. Raise the playfield and support it, by connecting the strap located in the left rear of the cabinet, to the eyebolt on the playfield. (Use the instruction sheet provided in the game to see alternative methods of accessing the playfield bottom.)

13. Check all cabinet cable and playfield lamp board connector terminations.

14. Remove the Plumb tilt from the parts package and install on the panel on the inside left of the cabinet. Note that this game is not equipped with a ball roll tilt.

15. Lower the playfield and level the playfield side-to-side by adjusting leg levelers and using the 2 Way Level located beneath the pricing card on the bottom arch.

16. Using the 2 Way Level below the pricing card, adjust the pitch of the playfield to approximately 6.5 degrees.

NOTE

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

17. Check the plumb tilt and adjust as required.

18. If desired, perform any self tests at this time. With the insert door closed, carefully reinstall and lock the backglass.

19. Place the three pinballs on the playfield near the outhole and carefully reinstall the playfield glass.

20. If desired, make game pricing and Add-A-Ball, Novelty, or 5-Ball Play adjustments at this time.

GAME OPERATION

STANDARD FEATURES

Insert coin(s), the game makes a sound for the first credit and generates sounds for each subsequent coin and the Player 4 display indicates the number of credits posted. Depress the credit button and a start-up sound is produced, the posted credits are reduced by one, Player 1 display flashes, Player 4 display indicates BALL 1, and a ball is served to the plunger trough. Additional players may be added by depressing the Credit button before the end of ball 1.

The second closure (adjustable) of the plumb bob tilt switch tilts the ball in play. Closure of the slam tilt switch in the coin door ends the current game(s).

At the end of each ball, earned bonuses are collected. At the end of the last ball for the last player and after bonuses are collected, the system produces a random 2-digit number (a multiple of 10; 00 to 90) for a Match feature (adjustable). Matching the last two digits of a player score with this number awards a credit. Players exceeding high score levels receive free credits (adjustable) and are able to enter their initials with the new High Score achieved. The game then proceeds into the game-over mode and then to the attract mode. A custom message (adjustable) can be displayed during the attract mode.

MANUAL PERCENTAGING

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

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

You may choose to ignore the recommended change; for example, you may not think last week's players were the usual crowd . Just close the door and the message will disappear without altering the existing level. Or you may choose to make a different score to beat adjustment; this is done by utilizing adjustment AD02.

GAME SPECIFIC FEATURES

SKILL SHOT

Use the Fire Button (1) on Shifter Handle(2) (Located on the front of the cabinet) to shoot the moving ship in the display. The awards are 2 Million (ball #1), 3 Million (ball #2) & 4 Million (ball #3).

STAR WARS

STAR WARS letters (5) are lit by completing the left or right orbit shots (6) or the Ramp (13) .
Right return lane (7) to left orbit (6) will spot 2 letters.(5).Competing all letters awards 10 Million

SARLACC PIT

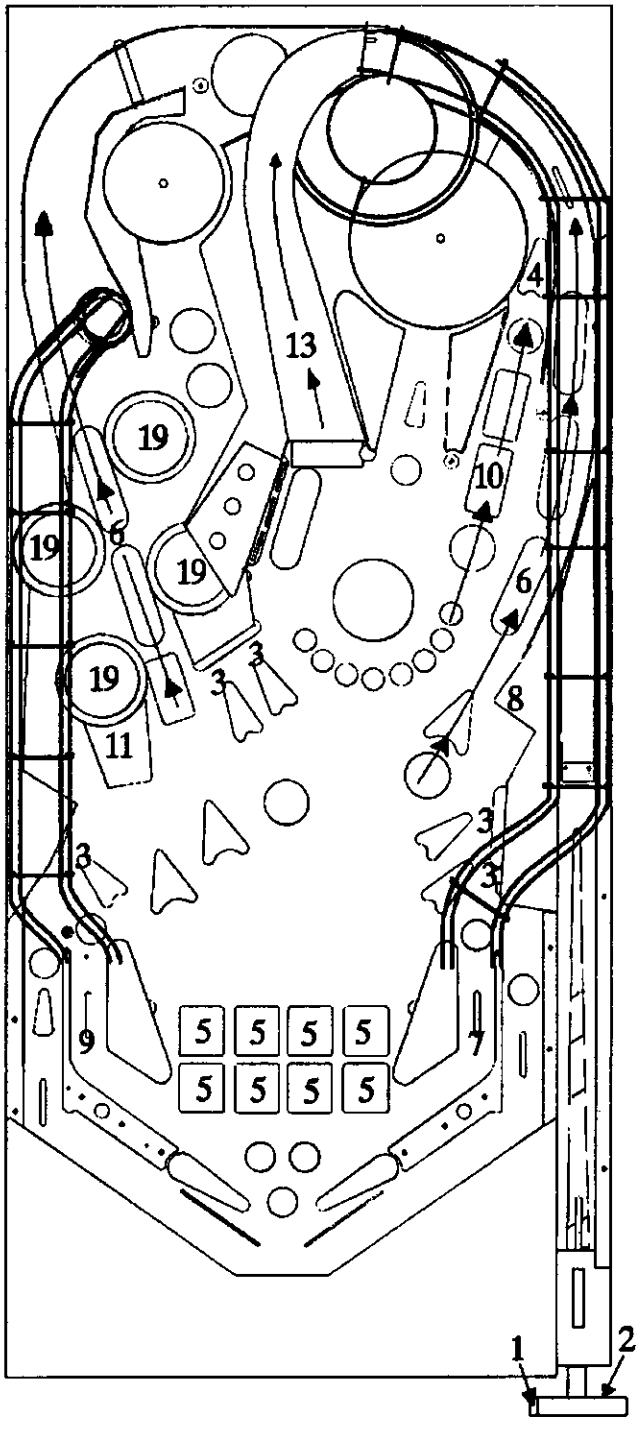
Shooting the scoop (8) awards 500,000 points. Each Turbo Bumper made adds 20,000 points to the Sarlacc Value.

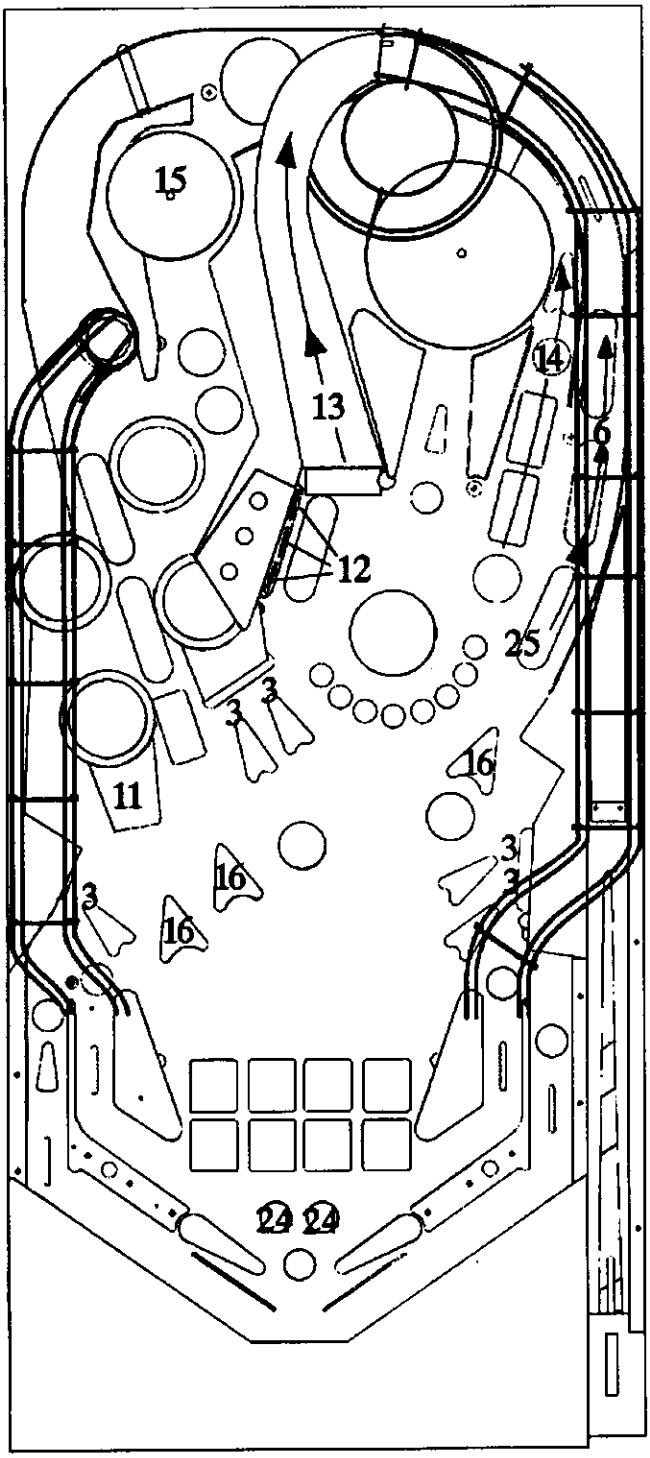
JABBA THE HUT

Left Return lane (9) to right scoop (8) awards the Jabba Feature which randomly dispenses one of 15 Features ie. Bonus Hold, Advance Multiplier etc.

THE FORCE

Shoot lane (10) when lit to lite Force Scoop (11).Shoot the Scoop (11) to collect 1 of the 4 awards shown on the Display.Collect all 4 awards to reveal the hidden award behind the 4 Displayed.Shooting the Force scoop again awards the hidden feature.
See the Dark Side (page 5).





THE DARK SIDE

Shooting the left scoop (11) when not lit takes you to the Dark Side. Shooting the Dark Side 4 times awards 25 Million.

HYPERSPACE

Shooting the 3 bank Drop Targets (12), 3 times, lites the ramp (13) for Hyperspace effect awards a multiplier and awards 5 Million points. Shooting 3Bank again during Hyperspace awards another multiplier. Every 3rd time Hyperspace is enabled the Ramp (13) is lit for Super Hyperspace which awards 10 Million points.

EXTRA BALL

The Extra Ball may be lit from the Force, Jabba or ramp & collected via lane (14).

VICTORY

When player reaches the Replay Value, R2D2 (15) is lit for 25 Million & collected via lane (6).

X-WING MULTI MILLIONS

This timed feature is lit by shooting the Force scoop (11) when lit.
While the timer is active shoot the X-wing Targets (3) for 1 Million points each .

JEDI RETURN

This feature is randomly lit by the Force.
Jedi Return arrows (16) lite
for 10 Million per shot on a timer.

R2D2 Runaway

Shooting Lane (10) lites a C3PO eye(24).
When both eyes are completed,
lamp (25) is lit for the R2D2 Runaway initiating a Countdown Bonus of
15 Million points. Shooting the ball via lane (6) to R2D2 (15) collects the points remaining in the Countdown Bonus.

Super R2D2

This feature is randomly lit by the Force. The countdown bonus starts with 50 Million points. Shooting the ball via lane (6) to R2D2 (15) collects the points remaining in the Countdown Bonus.

MASTER YODA

Master Yoda is lit by the Force & Hyperspace.Shoot Lane (10) when lamp (20) is lit to start the feature. Yoda will appear on the Display and the player may then select one of two features displayed on the Dot Matrix using the flipper buttons.

Death Star TRI-BALL

Shoot the Death Star target (21) to advance the Yavin Moons (22). When all the Moons are completed, the Death Star target will drop down providing access to the Death Star(23). Shooting the ball into this opening will start Auto - 3 Ball.

Jackpot

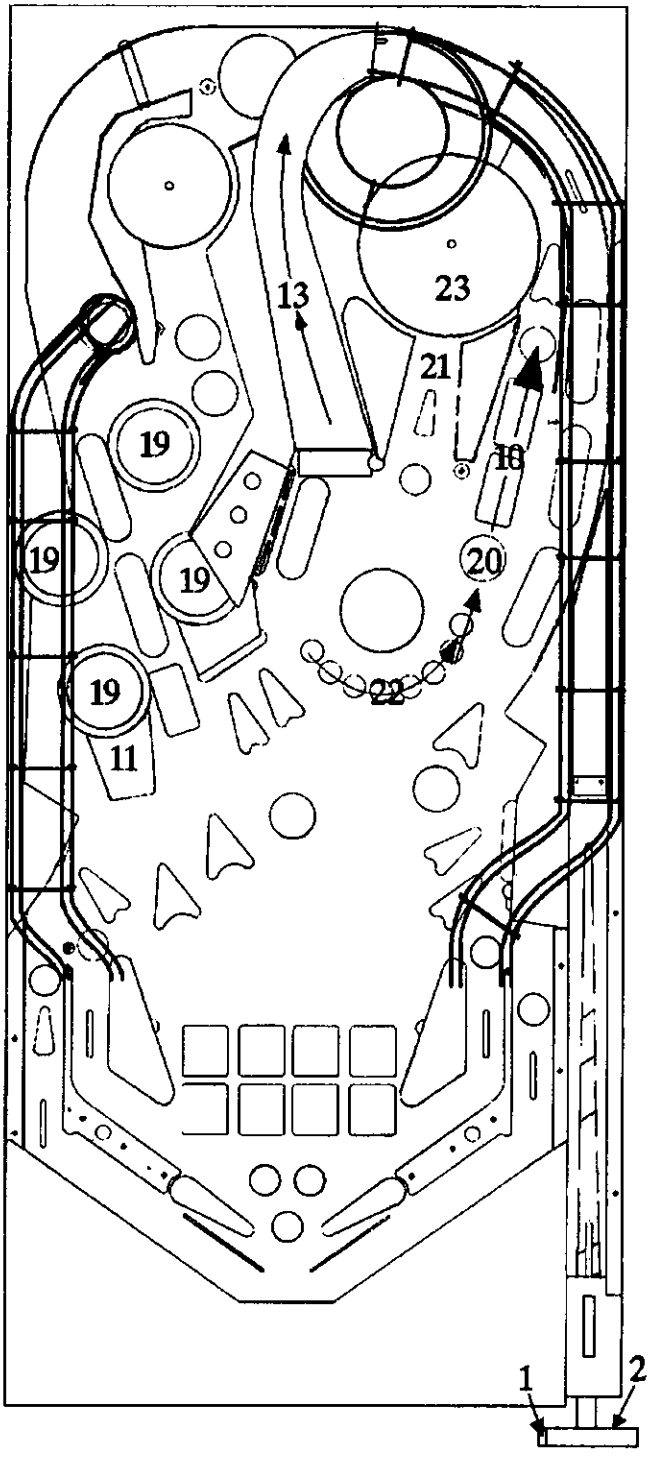
In TRI-BALL, shoot the Death Star Target (21) one time, to light the Jackpot on the ramp (13). Each hit to the target (21) increases the Jackpot value. Completing the ramp (13) awards the Jackpot Value. The Jackpot can be re-lit after Double Jackpot (see Below) by shooting target (21) twice.

Double Jackpot

After the Jackpot is collected the Death Star target (21) will drop and the double Jackpot timer will start. Shooting the ball into the Death Star (23) before the timer elapses will award the Double Jackpot.

Skill TRI-BALL

Shooting the Death Star Target (21) advances the Yavin Moons (22). When the 5th moon is lit the player can push the Shifter handle (2) in the down position and press the Fire button (1) to drop the Death Star Target (21). When the target is operated by this method, the player must shoot the ball into the Death Star (23) before the countdown timer runs out, to initiate TRI-BALL.
If the timer runs out before the shot is completed the target returns returns to its original position blocking access to the Death Star.



AUDIT FUNCTIONS

GENERAL

There are 85 audit functions provided for accounting purposes and for evaluation of game difficulty adjustments. Audit functions are split into two groups. There are nine most-used audits (1 through 9) in a 'quick look' group and 75 less-used audits (11 through 85), in an 'expanded' group. The various auditing functions are summarized in the **AUDITING FEATURES TABLE** and, when accessed, are shown on the player score displays. The *Audit Number* is shown in the top of the display, the *Description* is shown next and the *Audit Total* in the display. bottom Access and control is provided from switches located on the inside of the coin door.

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

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

To access expanded audits, operate the step push-button until AUDIT 10, EXPAND AUDITS is displayed. Set the choice to YES as indicated in the lower display by depressing the Game Start push-button and then depress the step push-button. The request is installed and Audit 11 is displayed. When you exit audits and adjustments, the Audit 10 setting is returned to off for the next time that a review of audits are required.

Audit totals may be reset to zero using Game Adjustment **ADJUSTMENT 11,** AUDITS RESET. Game adjustments (1 to 13 and 14 to 49) begin after the last audit function (10 or 85). Once audits functions have been recorded, and if no adjustments are required, you may return the game to the attract mode. If adjustments are required, continue pressing the STEP button until the game adjustments are reached. See Game Adjustments for details.

'QUICK LOOK' FUNCTIONS

Total Paid Credits (AUDIT 1) - the total number of paid credits is displayed.

Free Percent (AUDIT 2) is Free Total (E AUDIT 24) divided by Plays Total (E AUDIT 25).

Ball Time Average (in seconds) (AUDIT 3) is Total Play Time divided by Total Balls Played (AUDIT10) .

Average Game Time (AUDIT 4) is the Average Game Time expressed in minutes and seconds.

Coins (AUDIT 5, 6, 7 and 8) - These four audit totals are provided to show the amount of coins registered for the left, right, center, and 4th coin chutes, respectively.

Total Coins (AUDIT 9) is the toal number of coins dropped through all 4 coin chutes.

Expand Audits (AUDIT 10) permits viewing of expanded audits.

STAR WARS

Audit Table

Audit Number	Audit Description	Audit Number	Audit Description
	Star Wars PROM ID		
1	Total Paid Credits	44	Proprietary
2	Free Game Percentage	45	Proprietary
3	Average Ball Time	46	Total Buyin Games
4	Av Game Time	47	Drains Left
5	Coins Left	48	Drains Center
6	Coins Right	49	Drains Right
7	Coins Center	50	Extraball Lit from Ramp
8	Coins 4th Chute	51	Extraball Lit from Force
9	Total Coins	52	2X Made
10	Expand Audits (ON/OFF)	53	4X Made
11	Balls Total	54	6X Made
12	Extra Balls Total	55	8X Made
13	Extra Ball Percent	56	# of Bonus Holds
14	Replay 1 Awards	57	Yoda ExBall
15	Replay 2 Awards	58	Laser Kick Used
16	Replay 3 Awards	59	Freeze Used
17	Replay 4 Awards	60	TRI-BALL Lit
18	Total Replays	61	TRI-BALL Award
19	Replay Percent	62	Rerace Award
20	Total Specials	63	Jackpot Lit
21	Special Percent	64	1 Jackpot Award
22	Total Matches	65	2 Jackpot Award
23	Hi Score Wins	66	3 Jackpot Award
24	High Score Percent	67	4 or More Jackpots
25	Total Free Plays	68	Star Wars Completed
26	Total Games	69	Timer Double Jackpot
27	0.0 - 9.9 Million	70	Hyperspace Award
28	10.0 - 24.9 Million	71	Yoda Lit
29	25.0 - 49.9 Million	72	Yoda Award
30	50.0 - 74.9 Million	73	Dark Side
31	75.0 - 99.9 Million	74	25 M Dark Side
32	Over 100 Million	75	Cantina
33	Average Scores	76	Force Award
34	Games 1Player	77	Force Completed
35	Games 2Player	78	R2D2 Runaway Award
36	Games 3Player	79	Max # of Ramps
37	Games 4Player	80	Left Orbits
38	Attract Minutes	81	Right Orbits
39	Cycles H.S. Reset	82	Jabba Awarded
40	Coins No Credit	83	Sarlacc Awarded
41	Service Credits	84	Victory Ramps Awarded
42	Proprietary	85	Total Clicks
43	Proprietary		

EXPANDED FUNCTIONS

Balls Total (Audit 11) is the total of regular and extra balls.

Extra Balls Total (Audit12) is the total number of extra balls awarded.

Extra Ball Percentage (Audit13) is Audit12 divided by Plays Total (Audit 26).

Replay Awards (Audit 14 through 17) provide the total awards (credit, extra ball, or audit) for replay levels 1 through 4, respectively.

Total Replays (Audit 18) is the total awards (credits, extra balls, or audit only) for exceeding replay score levels.

Replay Percentage (Audit 19) is the Replay Total awards for exceeding replay score levels (Audit 18) divided by Plays Total (Audit 26).

Total Specials (Audit 20) is the total awards (credits, extra balls, or scores) for making specials.

Special Percentage (Audit 21) is Special Total (Audit20) divided by Plays total (Audit 26).

Total Matches (Audit 22) is the total credits awarded for matching the last two digits of the score with the system-generated Match Number at the end of the game. Percentage of match credits will be adjustable from 0% to 10%, by **Adj. 14** if enabled.

High Score Wins (Audit 23) is the total credits awarded for exceeding the high-score-to-date scores.

High Score Percentage (Audit 24) is High Score Wins (Audit 23) divided by Plays Total (Audit 26).

Total Free Plays (Audit 25) is the total free credits for replays, high-score-to-date, specials, and match.

Total Games (Audit 26) is the sum of Total Paid Credits (Audit 1) and Free Total (Audit 25). Note that free credits are not recorded in the Audit until they are actually used.

0.0- 9.9 Million (Audit 27) provides the total number of games the Player's final score was between 0 and 9,999,990 points.

10.0 - 24.9 Million (Audit 28) provides the total number of games the Player's final score was between 10,000,000 and 24,999,990 points.

25.0 - 49.9 Million (Audit 29) provides the total number of games the Player's final score was between 25,000,000 and 49,999,990 points.

50.0 - 74.9 Million (Audit 30) provides the total number of games the Player's final score was between 50,000,000 and 74,999,990 points.

75.0 - 99.9 Million (Audit 31) provides the total number of games the Player's final score was between 75,000,000 and 99,999,990 points.

Over 100 Million (Audit 32) provides the total number of games the Player's final score was over 100,000,000 points.

Average Scores (Audit 33) provides the Average Score by adding the Final Score of each game to a table and dividing this sum by the Total Plays .

Games - Player (Audit 34 through 37) provide individual totals of 1- player, 2-player, 3-player, and 4-player games, respectively.

Attract Minutes (Audit 38) provides the number of minutes the game is in Attract Mode (Factory use).

Cycles High Score Reset (Audit 39) provides the number of times that the high score levels have been automatically reset (if enabled).

Coin No Credit (Audit 40) provides the number of times the coin switch was closed without awarding credit(s)-This option is used in multiple coin conditions.(ie. 2 quarters 1 Play)

Service Credits (Audit 41) provides the total number of Service credits added to the game. *See Game Diagnostics on page 19 for instructions regarding entry of Service Credits.*

Proprietary (Audit 42 - Audit 45) provide information to the game designer to aid in design development. (Factory use only.)

Total Buyin Games (Audit 46) provides the number of times a player utilized the Buy In Feature. (See E Ad 40)

Drains Left (Audit 47) provides the number of times the ball drained out the left drain.

Drains Center (Audit 48) provides the number of times the ball drained out the center drain.

Drains Right (Audit 49) provides the number of times the ball drained out the right drain.

GAME SPECIFIC FUNCTIONS

Extra Ball Lit From Ramp (Audit 50) provides the total number of times the Ramp lit the Extra Ball light.

Extra Ball Lit From Force (Audit 51) provides the total number of times the Force lit the Extra Ball light.

2X Made (Audit 52) provides the number of times 2X bonus was enabled.

4X Made (Audit 53) provides the number of times 4X bonus was enabled.

6X Made (Audit 54) provides the number of times 6X bonus was enabled.

8X Made (Audit 55) provides the number of times 8X bonus was enabled.

# of Bonus Holds (Audit 56) provides the number of times Bonus Hold was enabled.

Yoda ExBall (Audit 57) provides the number of times the Yoda feature lit the Extra Ball light.

Laser Kick Used (Audit 58) provides the number of times the Laser Kick returned a ball into play.

Freeze Used (Audit 59) provides the number of times the Freeze Feature was enabled.

TRI-BALL Lit (Audit 60) provides the number of times the TRI-BALL Feature was lit.

TRI-BALL Award (Audit 61) provides the number of times the TRI-BALL Feature was awarded.

Rerace Award (Audit 62) provides the number of times the Rerace Feature was awarded.

Jackpot Lit (Audit 63) provides the number of times the Jackpot Feature was lit.

1 Jackpot Award (Audit 64) provides the number of times 1 Jackpot were awarded.

2 Jackpot Award (Audit 65) provides the number of times 2 Jackpots were awarded.

3 Jackpot Award (Audit 66) provides the number of times 3 Jackpots were awarded.

4 or More Jackpots (Audit 67) provides the number of times 4 Jackpots or more were awarded.

Star Wars Completed (Audit 68) provides the number of times, all the letters were completed in STAR WARS.

Timer Double Jackpot (Audit 69) provides the number of times the Timer Double Jackpot was awarded.

Hyperspace Award (Audit 70) provides the number of times the Hyperspace feature was awarded.

Yoda Lit (Audit 71) provides the number of times the Yoda feature was lit.

Yoda Award (Audit 72) provides the number of times the Yoda feature was awarded.

Dark Side (Audit 73) provides the number of times the Dark Side Feature was awarded.

25M Dark Side (Audit 74) provides the number of times the Dark Side Feature awarded 25 Million points.

Cantina (Audit 75) provides the number of times the Cantina Feature was awarded.

Force Award (Audit 76) provides the number of times the Force awarded one of the features on the display.

Force Completed (Audit 77) provides the number of times the Force completed all of the features on the display.

R2D2 Runaway Award (Audit 78) provides the number of times the R2D2Runaway Feature was awarded

Max # of Ramps (Audit 79) provides the maximum number of Ramps completed in a single game.

Left Orbits (Audit 80) provides the total number of left orbits completed.

Right Orbits (Audit 81) provides the total number of right orbits completed.

Jabba Award (Audit 82) provides the number of times the Jabba feature was awarded.

Sarlacc Award (Audit 83) provides the number of times the Sarlacc feature was awarded.

Victory Ramps Awarded (Audit 84) provides the number of times the Victory Ramp was Awarded.

Meter Clicks (Audit 85) provides the total number of money clicks accumulated, based on the country's lowest coin denomination used on the front door.

Notes

GAME ADJUSTMENTS

GENERAL

There are 49 adjustable functions provided to vary difficulty of play and to periodically reset audits and the high score levels. The various game adjustments are summarized in the **Game Adjustments Table** and, when accessed, are shown on the player score displays. The *Adjustment Number* is shown in the top of the display, the *Description* is shown next, and the setting, in the bottom of the display. Access and control is provided from switches located on the inside of the coin door.

Game adjustments are accessed from the audit mode. With the audits displaying AUDIT 1 and the FORWARD/REVERSE switch in the REVERSE (down) position, depress the STEP switch and ADJUSTMENT49 is shown at the topof the display, FACTORY RESTORE is shown in the middle of the display,and NO is shown in the bottom of the display.With the audits displaying AUDIT 10 or 85)and the FORWARD/REVERSE switch in the FORWARD (up) position, depress the STEP switch and ADJUSTMENT 1 is shown in the top of the display, REPLAY/MANUAL is shown in the middle of the display, and the setting is shown in the bottom of the display.

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

REPLAY AND GENERIC FEATURES

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

REPLAYS (Adjustment 1 through 6)

ADJ.1 Replay Manual/Fixed

- **Manual:** Adjust for percentage of awards for replay levels (1% through 50%). Proceed to ADJ.02 and 03 for starting replay levels.
- **Fixed:** Lower the automatic value below 1% and Player 1 display indicates FIXED. Proceed to ADJ. 2 and 3 for fixed replay levels.

ADJ. 2 Start Replay

- **Manual:** Adjust the starting Replay 1 setting to between 20,000,000 and 9,999,000,000.

ADJ. 3 Levels Replay/Level 1,2,3 & 4 Replay

- Adjust the number of replay levels to be active (1 to 4). Any additional starting replay levels are automatically set to values higher than Replay 1
- Adjust Replay 1 level to between 20,000,000 and 9,999,000,000. (Same as Start Replay)
  If ADJ. 3 is set for 2, adjust Replay 2 level to between 20,000,000 and 9,999,000,000.
  If ADJ. 3 is set for 3, adjust Replay 3 level to between 20,000,000 and 9,999,000,000.
  If ADJ. 3 is set for 4, adjust Replay 4 level to between 20,000,000 and 9,999,000,000.

STAR WARS
Game Adjustment Table

Adjustment Number	Description	Factory Setting
1	Replay/Manual	10%
2	Start Replay	150,000,000
3	Levels Replay *	01
4	Game Awards	CREDIT
5	Limit Freegame	03
6	Limit Extraball	03
7	Game Rules	FACTORY
8	Game Price*	USA2
9	Game Cleaned	NO
10	Coin Reset	NO
11	Audits Reset	NO
12	Restore H.S.T.D.	NO
13	Expand Adjustments	NO
14	Match Percent	08
15	Balls Per Game	03
16	Tilt Warnings	01
17	Replay Boost	NO
18	Credits Limit	30
19	High Scores Allowed	YES
20	Hiscore 1 Awards	03
21	Hiscore 2 Awards	01
22	Hiscore 3 Awards	00
23	Hiscore 4 Awards	00
24	Backup World Record	400,000,000
25	Backup Hiscore 2	350,000,000
26	Backup Hiscore 3	300,000,000
27	Backup Hiscore 4	250,000,000
28	Backup Hiscore 5	200,000,000
29	Backup Hiscore 6	150,000,000
30	Reset H.S.T.D. Every	700
31	Clean Game Every	1500
32	Free Play	NO
33	Custom Mesage	ON
34	Attract Mode Music	ON
35	Flash Lamps	NORMAL
36	Coils Pulse	NORMAL
37	Level Adjust By	ANY
38	Install Country	USA
39	Next Game Promo	ON
40	Buy In Enabled	NO
41	Game Restart	NO
42	Extra Ball Percentage	25
43	Background Volume	100
44	Bill Validator	NO
45	Save Ramp Ex.Ball	YES
46	Spot D.S. Moons	EASY
47	Rerace Criterion	EASY
48	Proprietary	-
49	Factory Restore	NO

* Some settings result in Drop-Down Tables- See Text

Adj. 4 Game Awards Set for replays to award: **CREDIT, EXTRA BALL, NONE** or **SPECIAL** (when score threshold is achieved a playfield special is lit).

Adj. 5 Limit FreeGame - Adjust for the maximum number of free games that may be accumulated per game; 0 to 9 .

Adj. 6 Limit Extra Balls - Adjust for the maximum number of extra balls that may be accumulated per game; 1 to 9 or OFF.

SINGLE-FUNCTION DIFFICULTY ADJUSTMENT (Adj. 7)

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

Adj. 07 Game Rules - Set to EXTRA EASY, EASY, FACTORY, HARD or **EXTRA HARD.**
(Note - Additional game features not variable by the Expanded Adjustments may also change using this setting.)

Install Adjustment	Adj. 7 Extra Easy	Adj. 7 Easy	Adj. 7 Factory	Adj. 7 Hard	Adj. 7 Extra Hard
Adj.45 Save Ramp Ex.Balls	YES	YES	YES	NO	NO
Adj.46 Spot D.S. Moons	EXEASY	EASY	EASY	HARD	EXHARD
Adj.47 Rerace Criterion	EXEASY	EASY	EASY	HARD	EXHARD

NOVELTY / 5-BALL/ADD-A-BALL SETTINGS

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

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

Adj. 1 Manual Replay = Fixed
Adj. 2 Start Replay = 00
Adj. 3 Levels Replay = None
Adj. 4 Game Awards = None
Adj. 5 Limit Freegame =0
Adj. 6 Limit Extra Balls = 0
Adj. 14 Match Percent = Off
Adj. 20 World Record Awards=0
Adj. 21-23 Todays 1-3 Awards= 0

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

Adj. 1 Manual Replay =07%
Adj. 2 Replay Start = 145,000,000
Adj. 3 Replay Levels = 01
Adj. 4 Game Awards = Credit
Adj. 5 Limit Freegame =3
Adj. 6 Limit Extra Balls = 3
Adj. 14 Match Percent = 04
Adj. 15 Balls/Game =5
Adj. 20 World Record Awards = 3
Adj. 21 Todays 1 Award= 1
Adj. 45 Save Ramp Ex.balls =No
Adj. 46 Spot D.S. Moons =Factory
Adj. 47 Rerace Criterion =Hard

Extra Ball Settings-To disable awarding of credits and provide awards with an extra ball make the following adjustments:

Adj. 4 Game Awards = Extra Ball
Adj. 5 Limit Freegame = 0
Adj. 14 Match Percent = OFF
Adj. 19 Scores Highest = No
Adj. 20 to 23 World Record & Todays High Awards= 0

GAME PRICING (Adj. 8)

There are two methods available for coin switch programming; Standard and Custom. Standard pricing uses a single adjustment (Adj. 8) to select a pricing scheme shown in the **Standard /CustomPricing Table**. Custom pricing is used to select additional pricing schemes defined by a Drop Down menu .

With Adj. 8 set to **CUSTOM** operating the step button again initiates a drop down menu representing coin switch pulses for the left, right, and center coin slots.The prescribes the number of pulses required for one credit. For example, if *Left Coin Pulses,* was set to 02 and *Coin Switch Pulses Required for 1 Credit*, to 01 a coin in the left slot would produce two credits. Further, if *Left Coin Pulses,* was set to 01 and *Coin Switch Pulses Required for 1 Credit*, to 02, two coins in the left slot would be required for one credit.

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

Standard/Custom Pricing - Set for the desired pricing scheme from the Standard Pricing Table as indicated in the Player 1 and 2 displays. For Custom Pricing, set to **CUSTOM**. When set to CUSTOM, the following adjustments are utilized to tailor each individual coin chute.

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

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

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

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

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

CUSTOM PRICING TABLE

Coin Mechs					Adjustments						
Left	Right	Center	4th	Plays/Coins	Adj. 8	Left Pulses	Right Pulses	Mid Pulses	4th Pulses	Pulses / Credit	Pulses / bonus
25¢	25¢	$1.00	n/u	1/25¢ 3/50¢	Custom	01	01	04	00	01	02
				1/25¢ 5/$1.00	Custom	01	01	04	00	01	04
				1/25¢/ 6/$1.00	Custom	05	05	20	00	04	20
5SCH	10SCH	10SCH	n/u	1/10 SCH	Custom	01	02	02	00	02	00
				1/10 SCH 4/30SCH	Custom	04	08	08	00	06	00
10P	£1	50P	20P	1/30P 2/50P 5/£1	Custom	01	15	06	02	03	00
				1/50P 3/£1	Custom	01	15	05	02	05	00
				1/30P 4/£1	Custom	01	12	05	02	03	00
20¢	$1.00	n/u	n/u	1/60¢ 2/$1.00	Custom	01	05	00	00	03	05

STANDARD PRICING TABLE

Adj. 8 Standard Pricing Select 1 2 4	Coin Mechs Left	Center	Right	Plays/Coins Left	Center	Right
USA1 1COIN 1PLAY	25¢	$1.00	25¢	1 PLAY/ 1COIN	4 PLAY/ 1COIN	1 PLAY/ 1COIN
USA2 4COINS 3PLAYS	25¢	$1.00	25¢	1 PLAY/ 2COIN 2 PLAY/ 3COIN 3 PLAY/ 4COIN	3 PLAY/ 1COIN	1 PLAY/ 2COIN 2 PLAY/ 3COIN 3 PLAY/ 4COIN
USA3 2COINS 1 PLAY	25¢	$1.00	25¢	1 PLAY/ 2COIN	2 PLAY/ 1COIN	1 PLAY/ 2COIN
USA4 2COINS 1 PLAY 1COIN BUY-IN	25¢		25¢	2 COINS FOR THE 1st PLAY 1PLAY/ 1 COIN *ONLY DURING* BUY-IN		
AUSTRIA COINAGE	5 SCH	10 SCH	10SCH	1 PLAY/ 2COIN 2 PLAY/ 3COIN 3 PLAY/ 4COIN	1 PLAY/ 1COIN 3 PLAY/ 2COIN	1 PLAY/ 1COIN 3 PLAY/ 2COIN
AUSTRALIA COINAGE	20¢	$1.00	$2.00	1 PLAY/ 3COIN	2 PLAY/1 COIN	4 PLAY/ 1COIN
UK COINAGE	10P	50P	£1	1 PLAY/ 3COIN	2 PLAY/ 1COIN	5 PLAY/ 1COIN
SWISS 1 SWISS 2	1 SFR	2 SFR	5 SFR	Same as German 1 Same as German 2		
BELGIUM COINAGE	20*f*	50*f*	20*f*	1 PLAY/ 1COIN	3 PLAY/ 1COIN	1 PLAY/ 1COIN
GERMAN 1 5DM 7 PLAYS	1DM	2DM	5DM	1 PLAY/ 1COIN	2 PLAY/ 1COIN	7 PLAY/ 1COIN
GERMAN 2 5DM 9 PLAYS	1DM	2DM	5DM	1 PLAY/ 1COIN 3 PLAY/ 2COIN 5 PLAY/ 3COIN 7 PLAY/ 4COIN 9 PLAY/ 5COIN	3 PLAY/ 1COIN 7 PLAY/ 2COIN 10 PLAY/ 3COIN 14 PLAY/ 4COIN	9 PLAY/ 1COIN
NETHERLAND COINAGE	1 Guilder	1 Guilder	2.5Guilder	1 PLAY/ 1COIN	1 PLAY/ 1COIN	3 PLAY/ 1COIN
SWEDEN COINAGE	1KR	5KR	5KR	1 PLAY/ 3COIN 2 PLAY/ 5COIN	2 PLAY/ 1COIN	2 PLAY/ 1COIN
FRANCE 1 COINAGE	1*f*	5*f*	10*f*	1 PLAY/ 3COIN 2 PLAY/ 5COIN	2 PLAY/ 1COIN	5 PLAY/ 1COIN
FRANCE 2 COINAGE	1*f*	5*f*	10*f*	1 PLAY/ 5COIN	1 PLAY/ 1COIN	3 PLAY/ 1COIN
ITALY COINAGE	500L		500L	1 PLAY/ 1COIN		1 PLAY/ 1COIN
SPAIN COINAGE	100 Pts		500 Pts	1 PLAY/ 1COIN		6 PLAY/ 1COIN
JAPAN COINAGE			100¥			1 PLAY/ 1COIN 3 PLAY/ 2COIN

ADDITIONAL GENERIC FEATURES

Adj. 9 Game Cleaned - When enabled (set to **YES**) the game cleaning counter will be reset to zero and Game Clean-Me message in Tech Alert will go out when STEP is depressed.(Also see Adj.31.)

Adj. 10 Coin Reset - When enabled (set to **YES**) all coin and paid credit totals will be reset to zero when STEP is depressed.

Adj. 11 Audits Reset - When enabled (set to **YES**) all audit totals except for coins and paid credits will be reset to zero when STEP is depressed.

Adj. 12 Restore High Score - When enabled (set to **YES**) the High Score Levels and associated initials will be restored to backup settings when STEP is depressed .

Adj. 13 Expand Adjustments - When set to **NO**, depressing the STEP push-button advances directly to Adj. 46, FACTORY RESTORE. When set to **YES**, depressing the STEP push-button sequences through the expanded adjustments. When exiting from expanded adjustments, this function is reset to **OFF** for the next time that adjustments are required.

Adj. 14 Match Percent- Set Match percent from **00%** to **10%** or **OFF**. At 00% the match display occurs at the end of the game but never awards a credit.

Adj. 15 Balls Per Game - Adjust the number of balls per game; **2** to **5**.

Adj. 16 Tilt Warnings - Adjust the number of plumb bob tilt switch closures before the ball in play is tilted; **1** to **3** or **OFF**.

Adj. 17 Replay Boost - Set to **YES** or **NO**. When set to **YES**, exceeding a replay will set a temporary replay level for each time a replay level is surpassed. This new level will equal the player's final score (when the replay was awarded) for each following game, until the replays have all been played. At this time the previous level is resumed.

Adj. 18 Credits Limit - Adjust the maximum number of credits that may be posted; 4 to 50.

HIGH SCORE LEVELS (Adj. 19 through 30)

There are four of the six high score levels with associated player initials that are displayed during the attract mode. This provides a high-score-to-date feature. When players exceed these levels, the player initials may be entered to replace the previous ones. These levels may be adjusted to award credits and to be reset to backup values after a selected number of games.

Adj. 19 Hiscores Allowed - Set to enable or disable the four high score levels; YES or NO.

Adj. 20 World Record - Adjust the number of credits awarded for exceeding level 1 (the highest of the four levels); **0** to **5**.

Adj. 21 Highscore 2 Award- Adjust the number of credits awarded for exceeding level 1; 0 to 3.

Adj. 22 Highscore 3 Award - Adjust the number of credits awarded for exceeding level 2; 0 to 2.

Adj. 23 Highscore 4 Award - Adjust the number of credits awarded for exceeding level 3; 0 to 1.

Adj. 24 Backup World Record - Adjust the score level to which the world record (the highest of the four levels) may be altered. This adjustment is not affected by Adj.30 (Factory Reset defaults to 7,500,000).

Adj. 25 Backup Highscore 2 - Adjust the backup score level to which level 1 may be reset.

Adj. 26 Backup Highscore 3- Adjust the backup score level to which level 2 may be reset.

Adj. 27 Backup Highscore 4- Adjust the backup score level to which level 3 may be reset.

Adj. 28 Backup Highscore 5- Adjust the backup score level to which level 4 may be reset.

Adj. 29 Backup Highscore 6- Adjust the backup score level to which level 5 may be reset.

Adj. 30 High Score Reset Every - Adjust the number of games between automatic resets of high score levels to backup settings and ball time averager adjustments; 100 to 900 or OFF (no reset or adjustment).

Adj. 31 Clean Game Every- Adjust the number of games in which the Clean Game message appears in Tech Alert to indicate the playfield needs cleaning. Adjustable from 100 to 2000.

Adj. 32 Free Play - When set to **YES**, no coins are required for games.

Adj. 33 Custom Message - When desired, this function is used to establish a custom message periodically displayed during the attract mode. Set the feature to **CHANGE** using the Credit button and depress STEP. The letter **A** is indicated in the first position of the Player 1 display. Vary the letter by operating the left and right flippers. With the desired letter indicated, depress the CREDIT button to lock in the letter and advance to the next display character. Repeat this procedure until the desired message is indicated in the Player 1 and 2 displays. At this time, depress the STEP push-button switch to advance to Adj. 34.

Adj. 34 Attract Mode Music - Set to **ON** (approximately every 3 minutes), or **OFF**.

Adj. 35 Flash Lamps- Set to **NORMAL, DIM** or **OFF**. When set to **NORMAL** the Flash Lamps are active, when **DIM** the Flash Lamps impulse power is reduced by 25% and when **OFF** the Flash Lamps do not flash.

Adj. 36 Coils Pulse- Set To **NORMAL, HARD** or **SOFT**. When **HARD** the coil pulse power is increased by 12.5% of the normal pulse rate. When set to **SOFT** the coil pulse power is reduced by 12.5% of the normal pulse rate. These adjustments are provided to compensate for Low Line or High Line voltage conditions where the solenoids appear to kicking too weak or too hard.

Adj. 37 Level Adjust by - When set to **OPERATOR**, the Manual Percentage Replay Adjustment can only be altered with the front door open (see manual page 3). When set to **ANY**, the Manual Percentage Replay Adjustment will display the message "PRESS START TO CHANGE REPLAY LEVEL" on power up if a change is recommended, and anyone operating the replay button will initiate the change to the replay score.

Adj. 38 Install Country- Set to **USA, GERMAN, FRENCH, AUSTRIA, BELGIUM, SWISS** or **CANADA**. Determines the default settings for the respective country for game pricing etc.

Adj. 49 Factory Restore-Depressing STEP without changing the value shown in the Player 4 Display locks in any custom message set with Adj.33 and returns the game to GameOver.Set the value to **ON** and depress STEP switch to revert all game adjustments to factory settings, clear the Custom Message and return to Game Over.

GAME SPECIFIC FEATURES (Adj. 39 TO Adj. 48)

Adj. 39 Next Game Promo- Set to **ON** or **OFF**. When set to **ON**, the game, in attract mode will randomly display a short promotion for our next game. When set to **OFF**, the game in attract mode will not generate any sounds or graphics refering to the next game.

Adj. 40 Buy in Enabled - Set to **YES** or **NO**. When set to **YES**, the game will dispay a countdown timer at the end of each game allowing the player to "Buy in" most of the features accumulated during the previous game.When set to **NO**, none of the previous game features will be retained and no countdown timer will appear.

Adj. 41 Game Restart -Set to **YES** or **NO**. When set to **YES**, a new game may be started during any ball after the first ball is completed. (Note-Pressing start during the first ball will add additional players.) When set to **NO**, The game disables the start button after the first ball until the final ball is in play.

Adj. 42 Extra Ball Percentage -Set from **0** to **50**. Allows the operator to adjust how frequently the Extra Ball feature is made available to the player.

Adj. 43 Background Volume - Set to **0, 25, 50, 75** or **100** percent. Allows the operator to adjust the background music volume independantly from the normal game sounds.

Adj. 44 Bill Validator - Set to **YES** or **NO**. When set to **YES** , the display, in game attract mode, will show an "Insert Bill Animation". When set to **NO**, the display, in game attract mode will show "Insert Coin Animation".

Adj. 45 Save Ramp Ex.balls - Set to **YES** or **NO**. When set to **YES**, the number of ramps completed will be retained in memory from ball to ball for the same player. When set to **NO**, the number of ramps completed will be reset with each new ball in play.

Adj. 46 Spot D.S. Moons -Set to **EXEASY,EASY,FACTORY, HARD** or **EXHARD**.Determines how the Death Star Moons will be spotted at the begining of each ball.

EXEASY	EASY	FACTORY	HARD	EXHARD
Allways 2	Allways 1	1 Before TRI-BALL	1 Before Jackpot	Never

Adj. 47 Rerace Criterion -Set to **EXEASY,EASY,FACTORY, HARD** or **EXHARD**. Determines during TRI-BALL, when a drained ball will be kicked back into play.

EXEASY	EASY	FACTORY	HARD	EXHARD
If no Jackpot was completed or TRI-BALL time is low.	If no Jackpot was completed	If TRI-BALL time is low.	If no Jackpot was completed and TRI-BALL time is low.	Never

Adj. 48 Proprietary

GAME DIAGNOSTICS

The Data East Pinball system provides tests for sounds, digital displays, lamps, switches, and solenoids. Each feature may be tested manually or automatically using the STEP and FORWARD/REVERSE push-button switches inside the coin door and the Game Start push-button switch on the front of the cabinet. The automatic tests may be used for a quick verification of automatic test functions and the manual tests, for troubleshooting.

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

Wiring to switches, solenoids and controlled lamps uses color-coded wires that basically follows a resistor color-code scheme for the eight rows and eight columns. During the switch tests and during the discrete lamp test, identification of the color of the row and column wires are indicated in the Player 3 & 4 Displays. For example, making the right coin switch during the Switch Test results in the switch functional name (RIGHT COIN) shown in the Player 1 and 2 Displays, the row (WHT-YEL) and column (GRN-BRN) wire color codes shown in the Player 3 display, and the switch number shown in the Player 4 display.

BLK=Black	**GRN=Green**
BRN=Brown	**BLU=Blue**
RED=Red	**VIO=Violet**
ORN=Orange	**GRY=Grey**
YEL=Yellow	**WHT=White**

ENTERING DIAGNOSTICS

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

Service Credits

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

Tech Alert

The player displays will now indicate if there are any Bad Switches (Switches that are closed, that should not be or switches that have not been activated in 50 games) it also indicates if the game requires cleaning, based on the number set in E Ad 31.

Burn-In Minutes

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

To stop the test press the start button again. Cumulative Burn-In minutes will be displayed. To reset Burn-In minutes to 00, you must perform a Audit Reset Adj. 11 or a Factory Restore E Ad 49.

SOUND TESTS

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

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

SOUND TEST CHART

Auto/Manual Tests (Player 1 & 2)	**Sounds Produced**
LEFT SPEAKER	Left Sine (Left Speaker Only)
CENTER SPEAKER	Center Sine (All speakers)
RIGHT SPEAKER	Right Sine (Right Speaker Only)
VOICE ROM1 (Loc U17)	"I got him!"
VOICE ROM2 (Loc U21)	"Concentrate!"
MUSIC TEST (Sound ROM Loc U7)	Level 1 Through Level 3 Music

Speaker Phase Testing

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

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

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

DIGITAL DISPLAY TEST

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

The board is controlled by a 68B09E microprocessor and it's personality ROMs (Unique to the Game) . It receives Data, Reset & Clock information from the CPU Board via the ribbon cable and sends back multiple Status and Busy signals to the CPU . This is to insure syncronized communication between the CPU and the Display Controller board.

The Drivers for the rows and columns are provided on 4 surface mounted integrated circuits on the Display driver board.

Automatic Test

To enter Display tests, operate the STEP push-button switch from the Sound Manual test. The displays will first illuminate one vertical column of dots in the Display. After a slight delay it will cycle one column from left to right. After a period of time, it will begin the Row test by lighting the top row of the display, then turning it off and illuminating the next row, until each row has been has been indivudally lit, while the other rows are off. The test will then turn all the dots in the desplay on except for one column. It will then cycle this blank column from left to right. After a period of time, it will begin the second Row test by blanking the top row of the display, then turning it on and blanking the next row, until each row has been indivudally blanked, while the other rows are on. The next test begins with every other dot lit, in both the rows and columns.These dots then go out, and the unlit dots light, resulting in an alternating checkerboard pattern. The test will then repeat these cycles again until advanced to the next test or until the power is removed. (Please Note- these tests may be interrupted at any time by operating the STEP push-button switch to advance to the next test.)

Bar Motor Test

This Game has a feature which lowers a Target Switch (Death Star Entry) to allow a shot to the VUK below the playfield. The motor on this mechanism is controlled by a relay driven by Q27 on the CPU and there are 2 Limit switches (Bar Motor Up & Bar Motor Down) used by the CPU to determine the status of the Bar Motor.

After entering this test, press and hold the game's Start Button. This will cause the relay to energize as long as the Button is depressed. At the same time you will notice that the switch status (ON & OFF) will be indicated in both the upper and lower portions of the display (Bar Motor Up & Bar Motor Down). The appropriate switch should be closed just prior to the limit of the Bar Motor mechanism and both switches should not be closed (ON) at the same time.

This test is located before the Switch Tests so the technician can move the mechanism until both switches read OFF. This will help eliminate erronious readings while trying to trace a problem during Active Switch Test.

Laser Kick Test

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

Switches are configured in an 8 x 8 matrix of columns (switch drives) and rows (switch returns) with up to 64 switches possible. The switch tests include three parts; switch test, active switches, and bad switches. Row and column wire colors are indicated in each test using corresponding resistor color code numbers.

Switch Test

From the Laser Kick test, operate STEP push-button switch. Player 1 and 2 displays indicate SWITCH TEST. Close each switch and observe the displays. The Player 1 and 2 displays will indicate the switch name, the Player 3 display indicates the row and column wire colors, and the Player 4 display indicates the switch number. When a switch is released, the name and number disappear until another switch is closed or the test is exited.

Active Switches

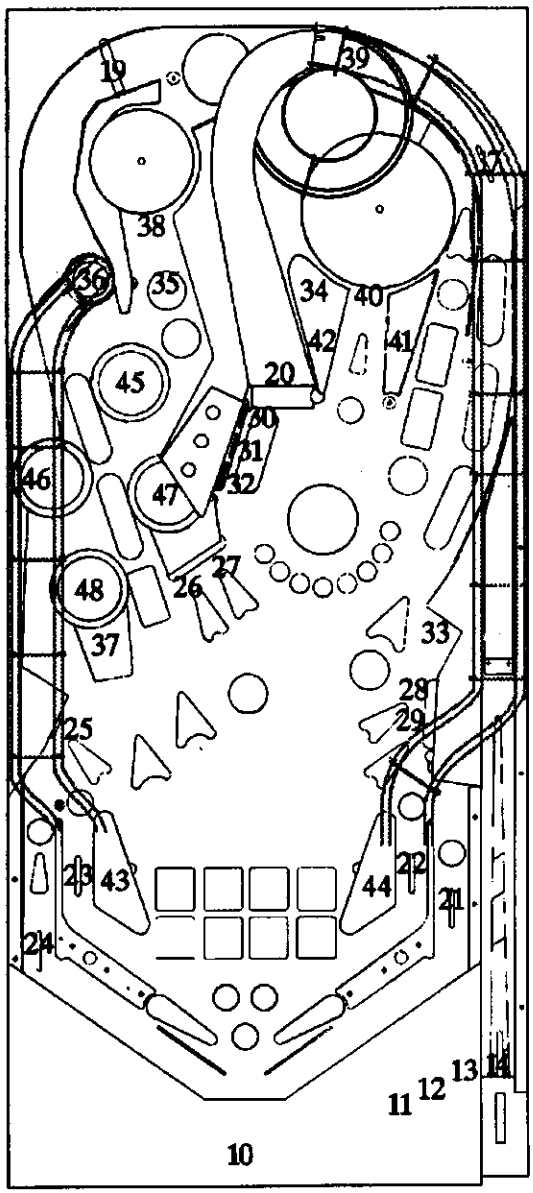
Operate the STEP push-button switch from the Switch Test. Player 1 and 2 Displays indicate ACTIVE SWITCHES. If any switches are stuck closed (or made from the presence of a ball), the Player 1 and 2 displays sequence through switch names, the Player 3 display indicates the row and column wire colors, and the switch numbers are indicated in the Player 4 display. This cycle continues until all switches are cleared or until the STEP push-button switch is depressed.

SWITCH MATRIX CHART

COLUMN / ROW	1 Q55 GRN-BRN CN8-1	2 Q54 GRN-RED CN8-2	3 Q53 GRN-ORN CN8-3	4 Q52 GRN-YEL CN8-4	5 Q51 GRN-BLK CN8-5	6 Q50 GRN-BLU CN8-7	7 Q49 GRN-VIO CN8-8	8 Q48 GRN-GRY CN8-9
1 WHT-BRN CN10-9	Plumb Tilt 1	Not Used 9	Right Loop 17	X-Wing Target 1 Left 25	Right Scoop 33	Bar Motor Up 41	Not Used 49	Not Used 57
2 WHT-RED CN10-8	4th Coin 2	Outhole 10	Not Used 18	X-Wing Target 2 26	Death Star Trough 34	Bar Motor Down 42	Shift Button 50	Not Used 58
3 WHT-ORN CN10-7	Credit Button 3	Left Trough 11	Left Loop 19	X-Wing Target 3 27	Obi-Wan Trough 35	Left Slingshot 43	Shift Down 51	Not Used 59
4 WHT-YEL CN10-6	Right Coin 4	Center Trough 12	Ramp Entrance 20	X-Wing Target 4 28	Left VUK 36	Right Slingshot 44	Not Used 52	Not Used 60
5 WHT-GRN CN10-5	Center Coin 5	Right Trough 13	Right Outlane 21	X-Wing Target 5 Right 29	Left Scoop 37	Top Turbo Bumper 45	Not Used 53	Not Used 61
6 WHT-BLU CN10-3	Left Coin 6	Shooter Lane 14	Right Return 22	Top Drop Target 30	R2D2 Entrance 38	Left Turbo Bumper 46	Not Used 54	Not Used 62
7 WHT-VIO CN10-2	Slam Tilt 7	Left Flipper 15	Left Return 23	Middle Drop Target 31	Ramp Exit 39	Right Turbo Bumper 47	Not Used 55	Not Used 63
8 WHT-GRY CN10-1	Not Used 8	Right Flipper 16	Left Outlane 24	Bottom Drop Target 32	Bar Target 40	Bottom Turbo Bumper 48	Not Used 56	Not Used 64

Star Wars- Switch Part Numbers

Switch Number	Description	Part No.
01*	Plumb Tilt	See Cabinet
02*	4th Coin	-
03*	Credit Button	500-5097-02
04*	Right Coin	180-5024-00
05*	Center Coin	180-5024-00
06*	Left Coin	180-5024-00
07*	Slam Tilt	180-5022-00
08	Not Used	-
09	Not Used	-



Switch Locations

Switch Number	Description	Part No.
10	Outhole	180-5011-00
11	Left Trough	180-5009-00
12	Center Trough	180-5009-00
13	Right Trough	180-5010-00
14	Shooter Lane	180-5100-01
15*	Left Flip. Cab	180-5048-01
16*	Right Flip. Cab.	180-5048-01
17	Right Loop	500-5142-00
18	Not Used	-
19	Left Loop	180-5087-00
20	Ramp Entrance	180-5087-00
21	Right Outlane	515-5138-00
22	Right Return	515-5138-00
23	Left Return	500-5142-00
24	Left Outlane	500-5142-00
25	X-Wing Target 1 (Left)	180-5082-06
26	X-Wing Target 2	180-5082-06
27	X-Wing Target 3	180-5082-06
28	X-Wing Target 4	180-5082-06
29	X-Wing Target 5 (Right)	180-5082-06
30	Top Drop Target	180-5092-00
31	Mid.Drop Target	180-5092-00
32	Bot. Drop Target	180-5092-00
33	Right Scoop	180-5057-00
34	Death Star Trough	180-5057-00
35	Obi-Wan Trough	180-5057-00
36	Left Vertical Up Kicker	180-6064-00
37	Left Scoop	180-5057-00
38	R2D2 Entrance	500-5142-00
39	Ramp Exit	180-5093-00
40	Bar Target	515-5630-00
41	Bar Motor Up	180-5052-00
42	Bar Motor Down	180-5052-00
43	Left Slingshot	180-5054-00
44	Right Slingshot	180-5054-00
45	Top Turbo Bumper	180-5015-00
46	Left Turbo Bumper	180-5015-00
47	Right Turbo Bumper	180-5015-00
48	Bottom Turbo Bumper	180-5015-00
49	Not Used	-
50	Shift Button	180-5110-00
51	Shift Down	180-5111-00
52	Not Used Through 64	-

* Indicates Cabinet Switches

LAMP TESTS

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

All Lamps

From the Active Switch test, operate the STEP push-button switch. Player 1 and 2 displays indicate ALL LAMPS and all controlled lamps will light.

Lamp Returns

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

Lamp Drives

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

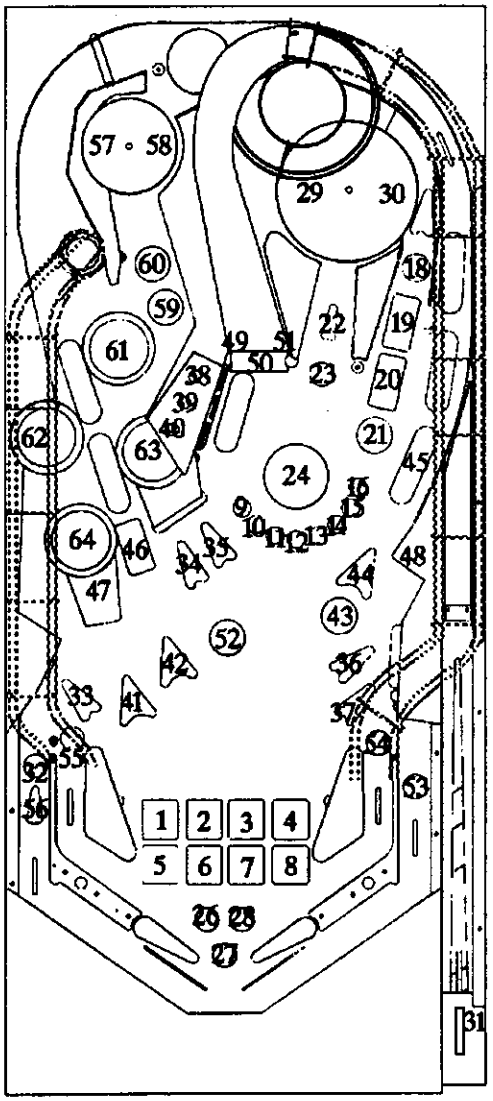
SingleLamp

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

LAMP MATRIX CHART

COLUMN / ROW	1 Q71 YEL-BRN CN7-1	2 Q70 YEL- RED CN7-2	3 Q69 YEL-ORN CN7-3	4 Q68 YEL-BLK CN7-4	5 Q67 YEL-GRN CN7-6	6 Q66 YEL-BLU CN7-7	7 Q65 YEL-VIO CN7-8	8 Q64 YEL-GRY CN7-9
1 Q72 RED-BRN CN6-1	STAR WARS 1	D.S. Moon 1 Left 9	Not Used 17	Credit Button 25	X-Wing Target 1 Left 33	10 Million Left 41	Ramp Hyper Space 49	R2D2 Dome Left 57
2 Q73 RED-BLK CN6-2	STAR WARS 2	D.S. Moon 2 10	Extra Ball 18	C3PO Left Eye 26	X-Wing Target 2 34	10 Million Center 42	Ramp Jackpot 50	R2D2 Dome Right 58
3 Q74 RED-ORN CN6-3	STAR WARS 3	D.S. Moon 3 11	Lite C3PO Eyes 19	C3PO Mouth 27	X-Wing Target 3 35	Large Tie Fighter 43	Ramp Empire 51	Victory 59
4 Q75 RED-YEL CN6-5	STAR WARS 4	D.S. Moon 4 12	Lite The Force 20	C3PO Right Eye 28	X-Wing Target 4 36	10 Million Right 44	Light Saber Arc 52	Special 60
5 Q76 RED-GRN CN6-6	STAR WARS 5	D.S. Moon 5 13	Yoda 21	Death Star Sph.1 29	X-Wing Target 5 Right 37	R2D2 When Lit 45	Right Outlane 53	Top Turbo Bumper 61
6 Q77 RED-BLU CN6-7	STAR WARS 6	D.S. Moon 6 14	D.S. X-Wing Mult. 22	Death Star Sph.2 30	Drop Target Top 38	Lite Laser Kick 46	Right Return Lane 54	Left Turbo Bumper 62
7 Q78 RED-VIO CN6-8	STAR WARS 7	D.S. Moon 7 15	D.S. Tie Fighter 23	Launch 31	Drop Target Center 39	Power Scoop Left 47	Left Return Lane 55	Right Turbo Bumper 63
8 Q79 RED-GRY CN6-9	STAR WARS 8	D.S. Moon 8 Right 16	Death Star Insert 24	Upper Left Outlane 32	Drop Target Bottom 40	Power Scoop Right 48	Laser Kick 56	Bottom Turbo Bumper 64

Lamp Number	Description
01	STAR WARS
02	STAR WARS
03	STAR WARS
04	STAR WARS
05	STAR WARS
06	STAR WARS
07	STAR WARS
08	STAR WARS
09	D.S. Moon 1 Left
10	D.S. Moon 2
11	D.S. Moon 3



Lamp Locations

12	D.S. Moon 4
13	D.S. Moon 5
14	D.S. Moon 6
15	D.S. Moon 7
16	D.S. Moon 8 Right
17	Not Used
18	Extra Ball
19	Lite C3PO Eyes
20	Lite the Force
21	Yoda
22	D.S. X Wing Mult.
23	D.S. Tie Fighter
24	Death Star Insert
25	Credit Button
26	C3P0 Left Eye
27	C3P0 Mouth
28	C3P0 Right Eye
29	Death Star Sphere 1
30	Death Star Sphere 2
31	Launch (Shooter Lane)
32	Upper Left Outlane
33	X-Wing Target 1 Left
34	X-Wing Target 2
35	X-Wing Target 3
36	X-Wing Target 4
37	X-Wing Target 5 (Right)
38	Drop Target Top
39	Drop Target Center
40	Drop Target Bottom
41	10 Million Left
42	10 Million Center
43	Large Tie Fighter
44	10 Million Right
45	R2D2 When Lit
46	Lite Laser Kick
47	Power Scoop Left
48	Power Scoop Right
49	Ramp Hyper Space
50	Ramp Jackpot
51	Ramp Empire
52	Light Saber Arc
53	Right Outlane
54	Right Return Lane
55	Left Return Lane
56	Laser Kick
57	R2D2 Dome Left
58	R2D2 Dome Right
59	Victory
60	Special
61	Top Turbo Bumper
62	Left Turbo Bumper
63	Right Turbo Bumper
64	Bottom Turbo Bumper

FLASH LAMP COIL TESTS

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

Flash Lamp

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

Automatic Test

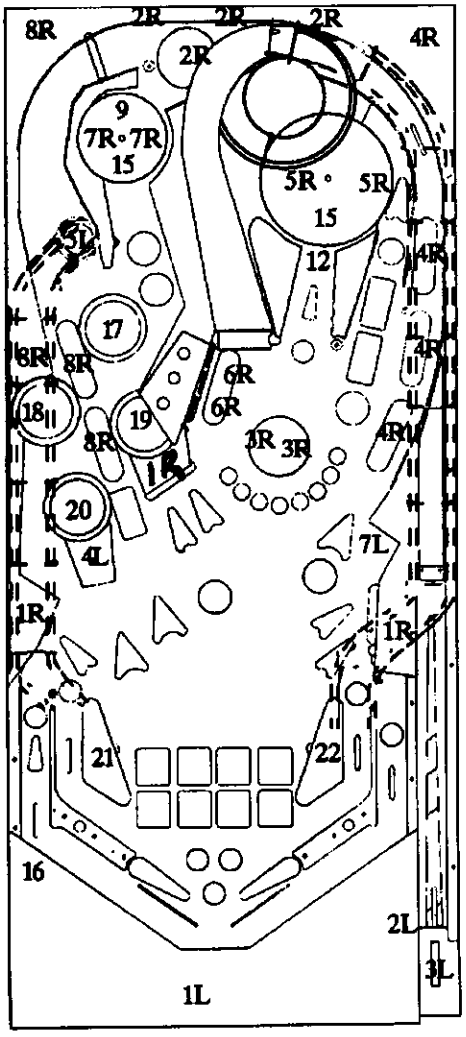
From the Flash Lamps test, depress the STEP push-button switch. Player 1 and 2 displays indicate ALL COILS. The test pulses each regular solenoid or flash lamp sequentially with the coil/flash lamp name indicated in the Player 1 and 2 displays and the wire colors in the Player 3 and 4 displays.

Select Coil

From the Coil Test, depress the STEP push-button switch. Player 1 and 2 displays indicate SELECT COIL and then the name of 1st drive , the wire colors are indicated in the Player 3 and 4 displays. Operate either Flipper push-button switch to select the coil or flash lamp to be tested. With the desired drive number indicated in the Player 4 display, depress the START push-button switch to cause it to be pulsed repeatedly.

RETURN TO GAME OVER

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

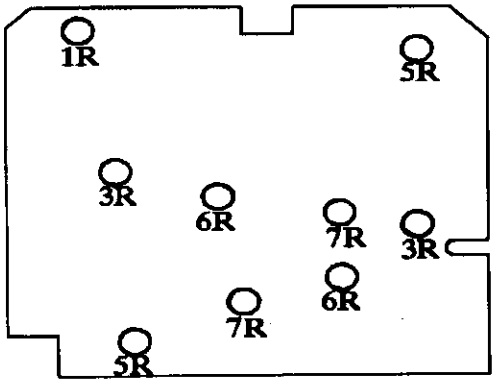


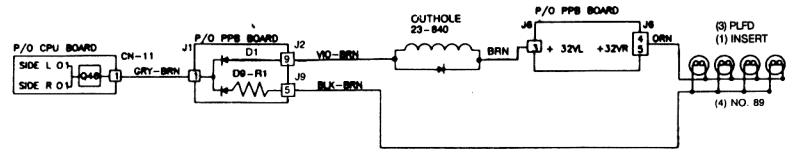
CPU Controlled Auxiliary Solenoids

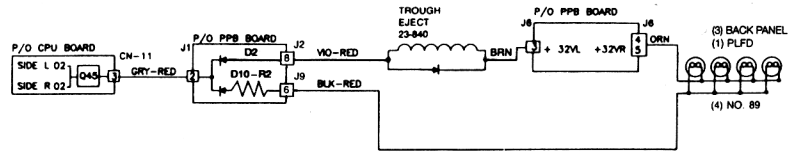
Coil Number	Coil Description	Control Line (CPU to Coil	Power Line (PS to Coil)	Drive Transistor	Coil Type
17	Top Turbo Bumper	BLU-BRN CPU CN19-7	RED PS CN3-6	Q11	23-800
18	Left Turbo Bumper	BLU-RED CPU CN19-4	RED PS CN3-6	Q9	23-800
19	Right Turbo Bumper	BLU-ORN CPU CN19-3	RED PS CN3-6	Q8	23-800
20	Bottom Turbo Bumper	BLU-YEL CPU CN19-6	RED PS CN3-6	Q10	23-800
21	Left Slingshot	BLU-GRN CPU CN19-5	RED PS CN3-6	Q12	23-800
22	Right Slingshot	BLU-BLK CPU CN19-9	RED PS CN3-6	Q13	23-800

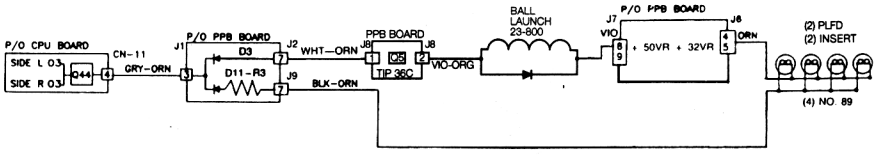
Flipper Solenoids

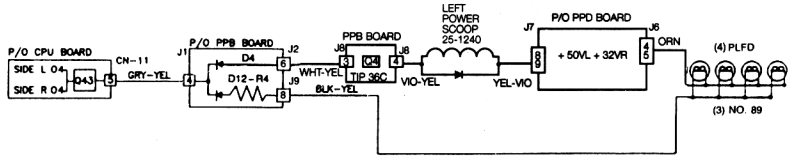
Coil Description	Flipper GND CPU to Coil	Sw. to Flip.PCB	Power Lines FlipPc toCoil	Coil Type	Power Input To Flip PCB
Left Flipper 090-5032-00 RightFlipper 090-5032-00	ORN-GRY CPU CN19-2 ORN-VIO CPU CN19-1	BLU-GRY CN1-9 BLU-VIO CN1-1	GRY-YEL CN2-1,2 BLK-WHT CN1-1	22-1080 22-1080	BLK-WHT 50VDC GRY, GRY-GRN 8VAC

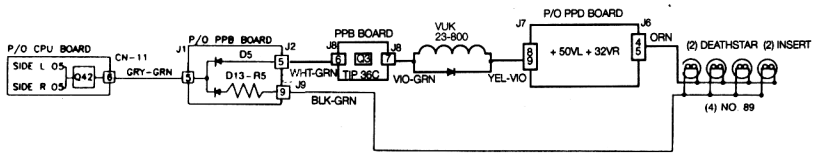


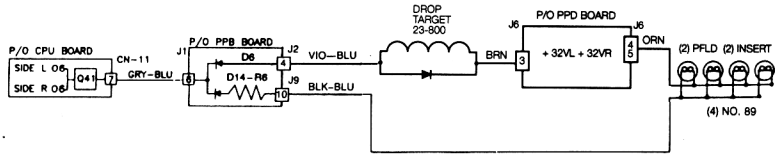

P/O CPU BOARD
SIDE L 01
SIDE R 01
Q45
CN-11
GRY-BRN
P/O PPB BOARD
J1
J2
D1
D9-R1
J9
VIO-BRN
BLK-GRN
OUTHOLE
23-840
BRN
P/O PPB BOARD
J6
+ 32VL
+32VR
ORN
(3) PLFD
(1) INSERT
(4) NO. 89

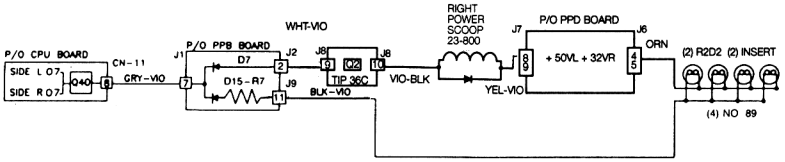

P/O CPU BOARD
SIDE L 02
SIDE R 02
Q46
CN-11
GRY-RED
P/O PPB BOARD
J1
J2
D2
D10-R2
J9
VIO-RED
BLK-RED
TROUGH
EJECT
23-840
BRN
P/O PPB BOARD
J6
+ 32VL
+32VR
ORN
(3) BACK PANEL
(1) PLFD
(4) NO. 89

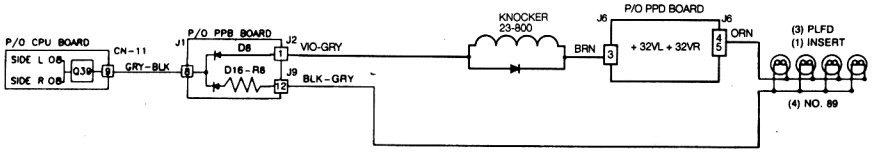

P/O CPU BOARD
SIDE L 03
SIDE R 03
Q44
CN-11
GRY-ORN
P/O PPB BOARD
J1
J2
D3
D11-R3
J9
WHT-ORN
BLK-ORN
PPB BOARD
J8
Q5
TIP 36C
VIO-ORG
BALL
LAUNCH
23-800
P/O PPB BOARD
J7
VIO
+ 50VR + 32VR
J6
ORN
(2) PLFD
(2) INSERT
(4) NO. 89

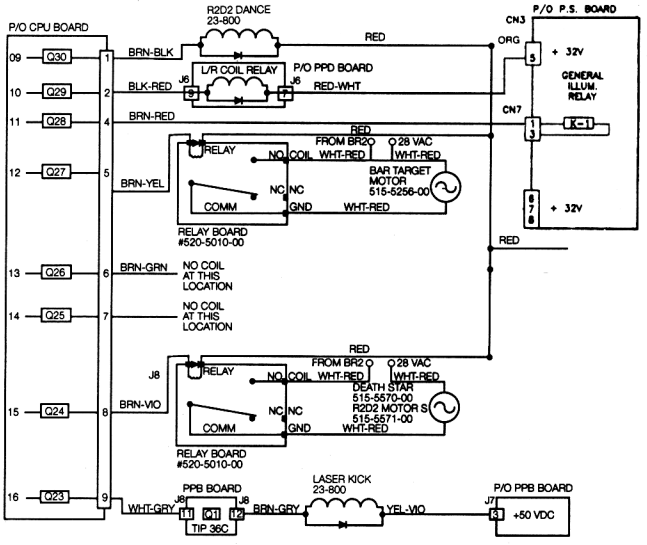

P/O CPU BOARD
SIDE L 04
SIDE R 04
Q43
CN-11
GRY-YEL
P/O PPB BOARD
J1
J2
D4
D12-R4
J9
WHT-YEL
BLK-YEL
PPB BOARD
J8
Q4
TIP 36C
VIO-YEL
LEFT
POWER
SCOOP
25-1240
YEL-VIO
J7
P/O PPD BOARD
+ 50VL + 32VR
J6
ORN
(4) PLFD
(3) NO. 89


P/O CPU BOARD
SIDE L 05
SIDE R 05
Q42
CN-11
GRY-GRN
P/O PPB BOARD
J1
J2
D5
D13-R5
J9
WHT-GRN
BLK-GRN
PPB BOARD
J8
Q3
TIP 36C
VIO-GRN
VUK
23-800
YEL-VIO
J7
P/O PPD BOARD
+ 50VL + 32VR
J6
ORN
(2) DEATHSTAR (2) INSERT
(4) NO 89

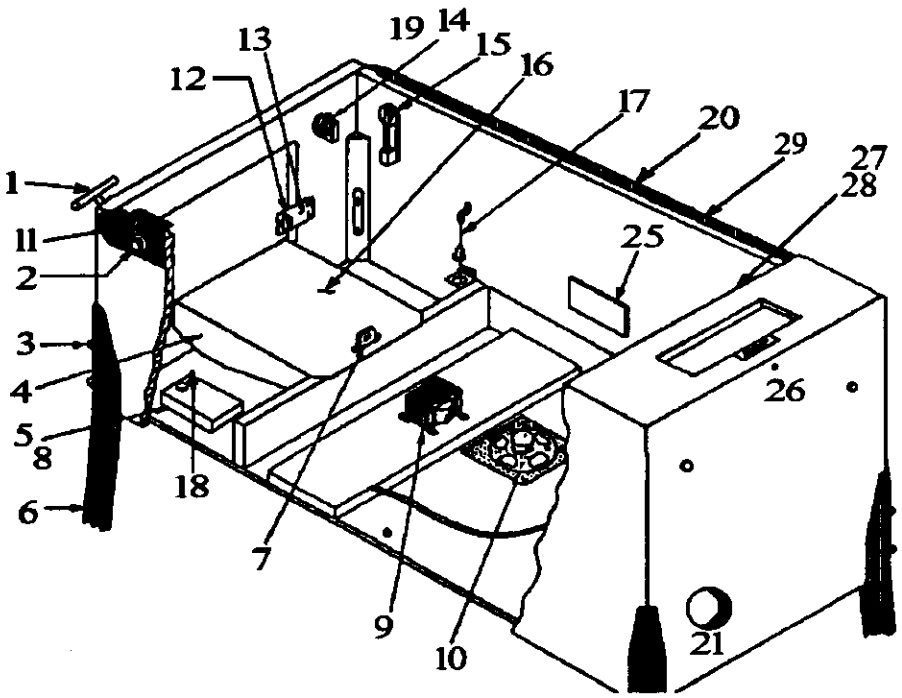

P/O CPU BOARD
SIDE L 06
SIDE R 06
Q41
CN-11
GRY-BLU
P/O PPB BOARD
J1
J2
D6
D14-R6
J9
VIO-BLU
BLK-BLU
DROP
TARGET
23-800
BRN
J6
P/O PPD BOARD
+ 32VL + 32VR
J6
ORN
(2) PFLD (2) INSERT
(4) NO. 89


P/O CPU BOARD
SIDE L 07
SIDE R 07
Q40
CN-11
GRY-VIO
P/O PPB BOARD
J1
J2
D7
D15-R7
J9
WHT-VIO
BLK-VIO
J8
Q2
TIP 36C
VIO-BLK
RIGHT
POWER
SCOOP
23-800
YEL-VIO
J7
P/O PPD BOARD
+ 50VL + 32VR
J6
ORN
(2) R2D2 (2) INSERT
(4) NO 89


P/O CPU BOARD
SIDE L 08
SIDE R 08
Q39
CN-11
GRY-BLK
P/O PPB BOARD
J1
J2
D8
D16-R8
J9
VIO-GRY
BLK-GRY
KNOCKER
23-800
BRN
J6
P/O PPD BOARD
+ 32VL + 32VR
J6
ORN
(3) PLFD
(1) INSERT
(4) NO. 89

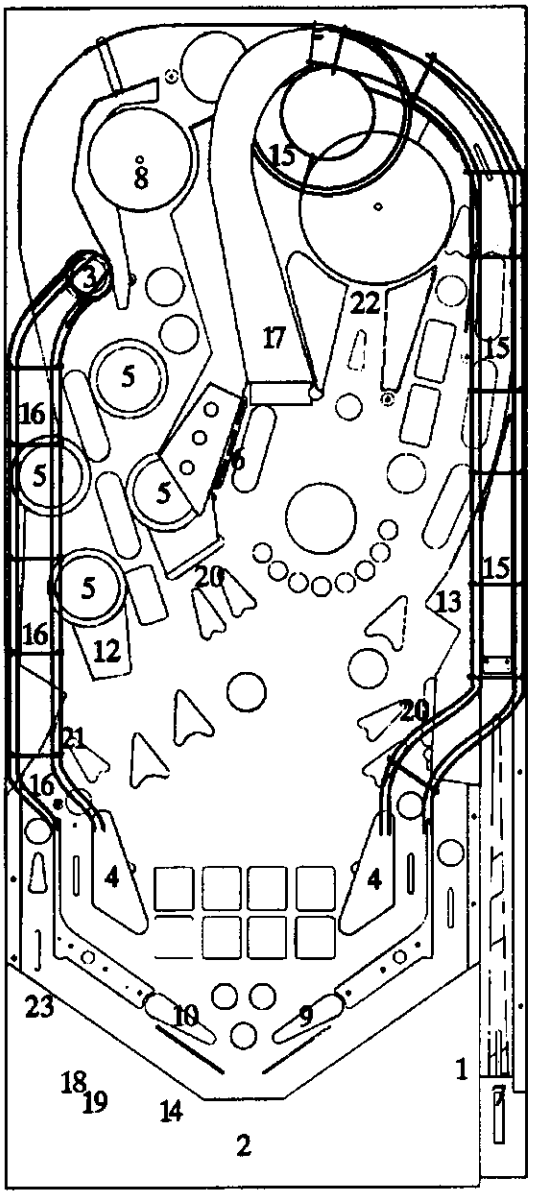

P/O CPU BOARD
09 Q30
10 Q29
11 Q28
12 Q27
13 Q26
14 Q25
15 Q24
16 Q23
R2D2 DANCE
23-800
BRN-BLK
L/R COIL RELAY
P/O PPD BOARD
BLK-RED
RED-WHT
BRN-RED
RED
RELAY
FROM BR2O
28 VAC
NO
COIL
WHT-RED
BAR TARGET
MOTOR
515-5256-00
NC
COMM
GND
BRN-YEL
RELAY BOARD
#520-5010-00
BRN-GRN
NO COIL
AT THIS
LOCATION
J8
BRN-VIO
DEATH STAR
515-5570-00
R2D2 MOTOR S
515-5571-00
P/O P.S. BOARD
CN3
ORG
+ 32V
GENERAL
ILLUM.
RELAY
K-1
CN7
PPB BOARD
Q1
TIP 36C
WHT-GRY
BRN-GRY
LASER KICK
23-800
YEL-VIO
P/O PPB BOARD
+50 VDC

CABINET PARTS ILLUSTRATION



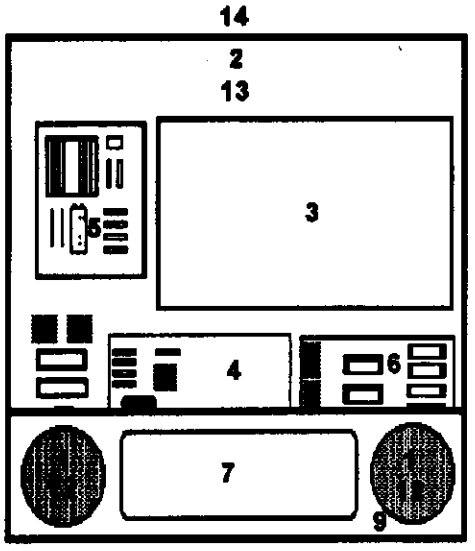
Item	Description	Part No.
1	Shifter Assembly	500-5620-00
2	Flipper Button	500-5026-22
3	Leg Bolt (Black)	231-5000-01
4	Cash Box Bottom	545-5090-00
5	On/Off Switch DP/ST	180-5001-00
6	Leg (Black)	535-5020-30
7	Lock Bracket-Cash Box	535-5215-00
8	Power Input Box Assy	515-5360-00
9	Transformer	010-5003-00
10	Speaker-Round (8")	031-5005-00
11	Side Armor-Right	535-5010-31
12	Memory Protect Switch	180-5000-00
13	Memory Protect Switch Bracket	535-6409-00
14	Start Switch Assembly	500-5407-02
15	Flipper Leaf Switch	180-5048-01
16	Cash Box Top	535-5013-03
17	Plumb Bob Tilt Assembly	500-5023-00
18	Volume Control	123-5000-00
19	Playfield Glass (Tempered) *	660-5001-00
20	Side Armor -Left	535-5010-32
21	Recessed cup for Line cord	545-5122-00
22	Service Switch (Not Shown)	180-5012-00
23	Front Molding Lockdown Assy.*	500-5020-00
24	Front Molding -Black *	500-5021-10
25	S.S.Flipper P.C.B.	520-5033-02
26	Roto Lock Bottom	355-5006-01
27	Rear Plastic Extrusion for Playfield Glass	545-5038-00
28	Mounting Foam for Extrusion	626-5004-00
29	Plastic Channel (Right & Left)	545-5017-00
30	Backbox Hinge Left *	535-6172-00
31	Backbox Hinge Right *	535-6172-01
32	Leg Leveler *	500-5017-00
33	Coin Door with Validator Blank*	500-5018-17

Playfield - Major Assemblies



Item	Description	Part No.
1.	Ball Feed Assy.(Trough)	500-5012-01
2.	Outhole Assy.	500-5082-00
3.	Super VUK	500-5116-04
4.	Sling Shot Assy	500-5226-00
5.	Turbo Bumper Assy.	500-5227-01
6.	3 Bank Drop Target Assy.	500-5621-03
7.	Ball Launch Assy.	500-5477-01
8.	R2D2 Unit	500-5484-00
9.	Flipper Assy. Right	500-5606-73
10.	Flipper Assy Left	500-5606-74
11.	Underchute Ramp	500-5612-00
12.	Ball Kicker Assy.(Scoop)	500-5468-02
13.	Ball Kicker Assy.(Scoop)	500-5468-00
14.	Bottom Arch Assy.	545-5302-04
15.	Loop Ramp	515-5682-00
16.	VUK Wire Ramp	535-6339-00
17.	Metal Ramp	500-5609-00
18.	Level (Horizontal)	670-5000-00
19.	Level (Vertical)	670-5001-00
20.	2 Bank S. U. Switch Assy.	500-5615-06
21.	Single S.U. Switch Assy.	500-5625-06
22.	Up-Down Target Assy.	500-5618-00
23.	Kick Back Assembly	500-5080-00

Individual part breakdowns for most of these assemblies can be found on pages 34 through 41.



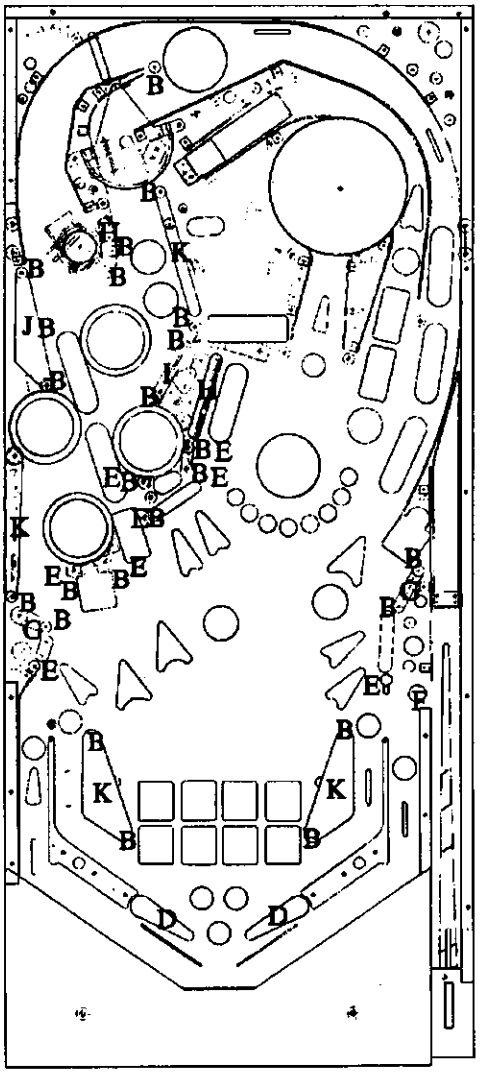
† When ordering PC Boards with ROMs please specify game name

Item	Description	Part No.
1	Speakers	031-5004-00
2	Back Box Lock	355-5008-00
3	CPU †	520-5003-03
4	PPB Board	520-5021-05
5	Power Supply	520-5047-01
6	Sound Board †	520-5050-01
7a	Dot Matrix-Babcock ‡	520-5052-01
7b	Dot Matrix-Dale ‡	520-5052-02
7c	Dot Matrix-Cherry ‡	520-5052-03
8	Display Controller Board †	520-5055-00
9	Speaker Housing	545-5180-01
10	Clear BackGlass *	660-5008-00
11	Glass Artwork *	830-5224-00
12	Speaker Grill	830-5620-00
13	Back Box Lock Plate	535-5860-00
14	Darth Vader Head	545-5373-00

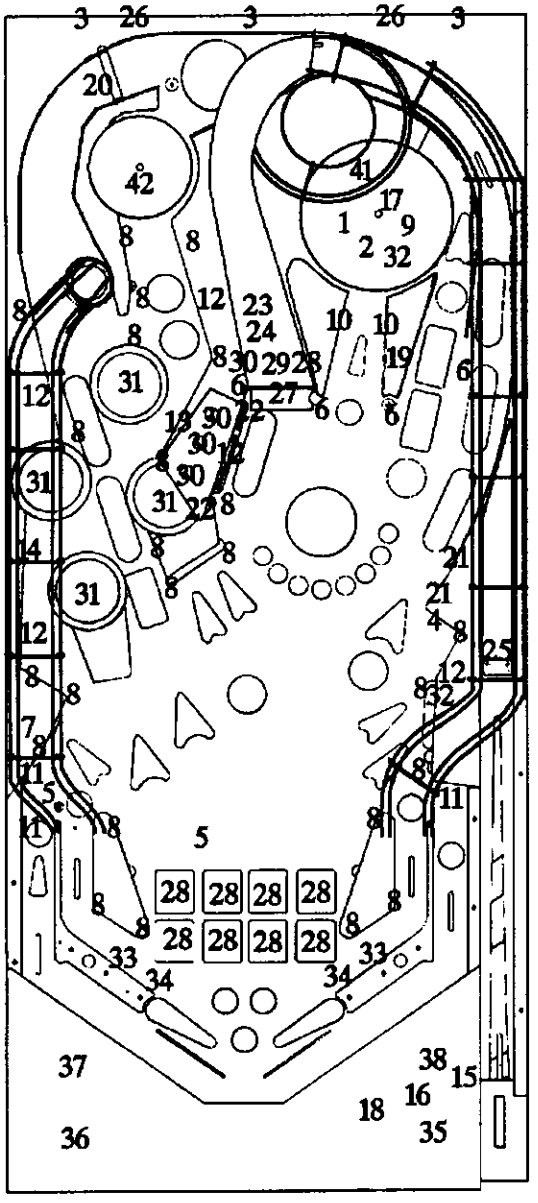
* Not Shown ‡ Indicate Manufacturer

RUBBER PARTS ILLUSTRATION

Item	Description	Part #
A	Bumper Post	545-5009-00
B	Post Rubber (23) Short	545-5151-00
C	Post Rubber (5) Long	545-5260-00
D	Flipper Rubber (2)	545-5277-00
E	3/16" (8)	545-5348-01
F	3/8" (1)	545-5348-03
G	1" (2)	545-5348-05
H	1 1/2" (2)	545-5348-07
I	2" (1)	545-5348-08
J	2 1/2" (1)	545-5348-09
K	2 3/4" (4)	545-5348-20



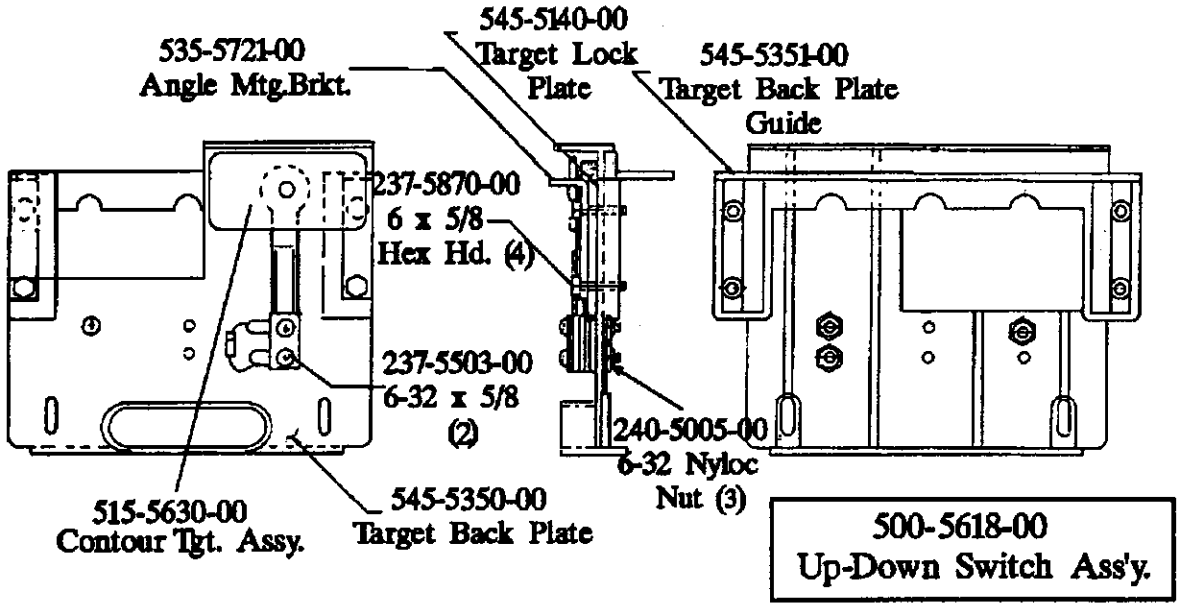
Playfield Parts

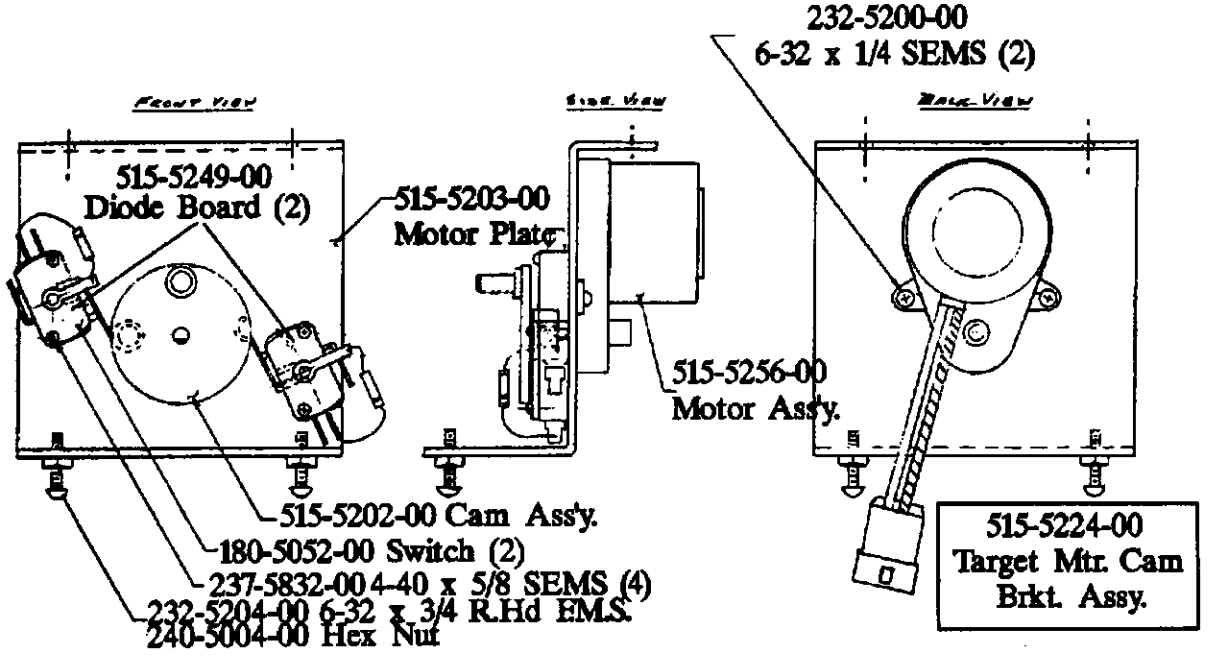


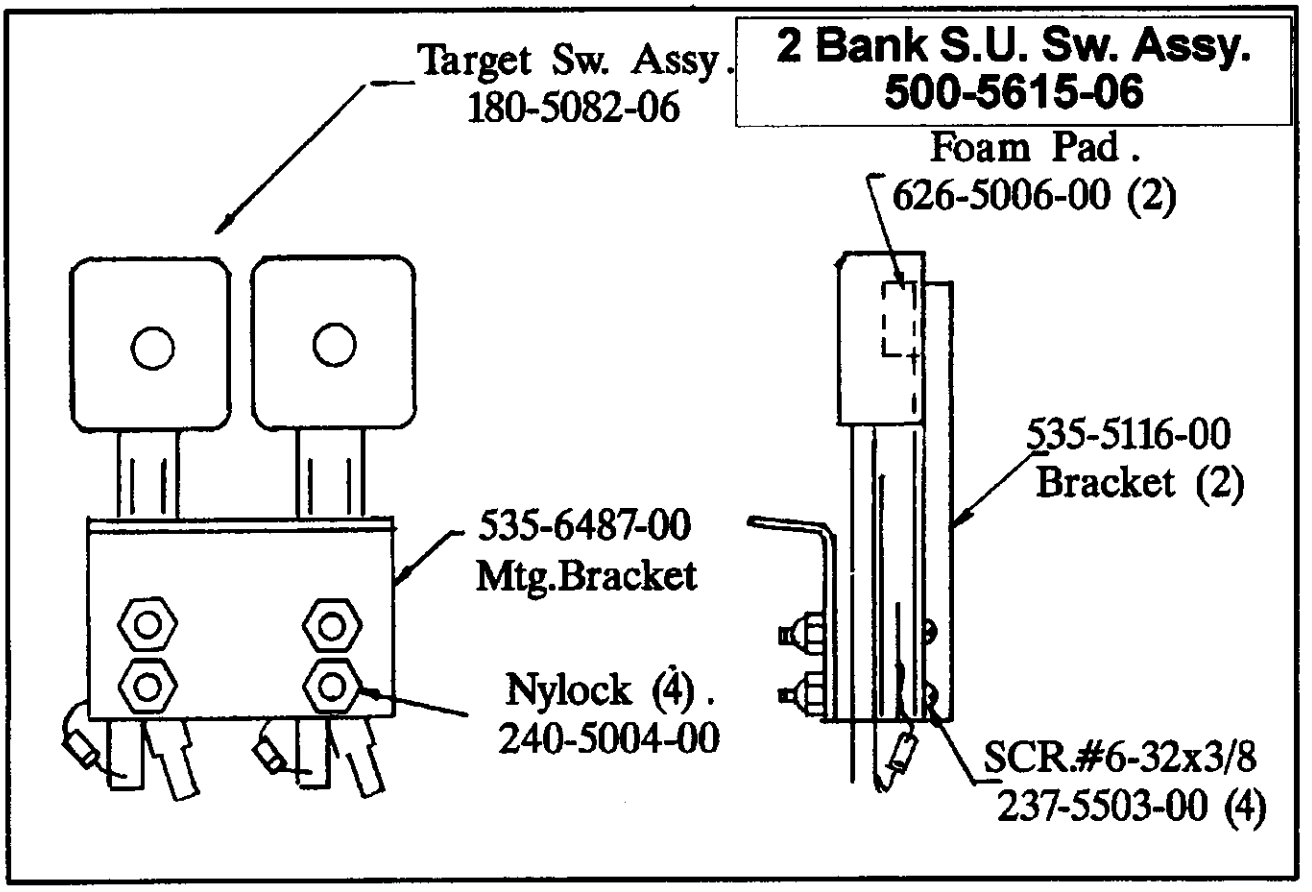
No.	Description	Part No.
1.	Motor Cam Assy.	515-5202-00
2.	Motor Mtg. Plate	515-5203-00
3.	Back Panel	525-5308-00
4.	Lite Panel	525-5311-00
5.	Mini Post Wood	530-5004-00
6.	Bumper Post	530-5007-00
7.	Metal Standoff	530-5035-00
8.	Metal Standoff	530-5035-01
9.	Nylon Roller	530-5083-00
10.	Side Rail Guard	535-5008-02
11.	Adjustable Outlane Plate	535-5091-02
12.	Wire Form 1" (5)	535-5300-05
13.	Wire Form 1 3/4"	535-5300-09
14.	Wire Form (2)	535-5300-12
15.	Rollover Wire-Outhole	535-5316-00
16.	Rollover Wire Outhole	535-5320-00
17.	Ball Deflector	535-5380-00
18.	Wire Gate Outhole	535-5393-00
19.	Ball Guide Wire	535-5396-00
20.	Wire Gate	535-5674-00
21.	Angle Mtg. Brkt. (2)	535-5721-00
22.	Joker Ramp Brkt. (2)	535-5890-00
23.	Gate W/Micro Brkt (Left)	535-6157-00
24.	Wire Gate	535-6390-00
25.	Ramp Flap (Shooter)	535-6467-00
26.	Back Panel Guard	535-6470-00
27.	Ramp Flap	535-6491-00
28.	Lite Cover Red	545-5014-02
29.	Lite Cover Green	545-5014-04
30.	Lite Cover Yellow	545-5014-06
31.	Jump Bumper Cap	545-5271-02
32.	Death Star Dome	545-5313-00
33.	Return Lane Guide	550-5037-01
34.	Right Return Lane Guide	550-5043-01
35.	Coinage Card (USA)	755-5008-02
36.	Instruction Card (USA)	755-5036-00
37.	Left Bottom Arch Decal	820-6090-00
38.	Right Bottom Arch Decal	820-6090-01
39.	Decal Sheet *	820-6090-XX
40.	Screened Plastics *	830-5441-00
41.	Death Star Motor	515-5570-00
42.	R2D2 Motor	515-5571-00

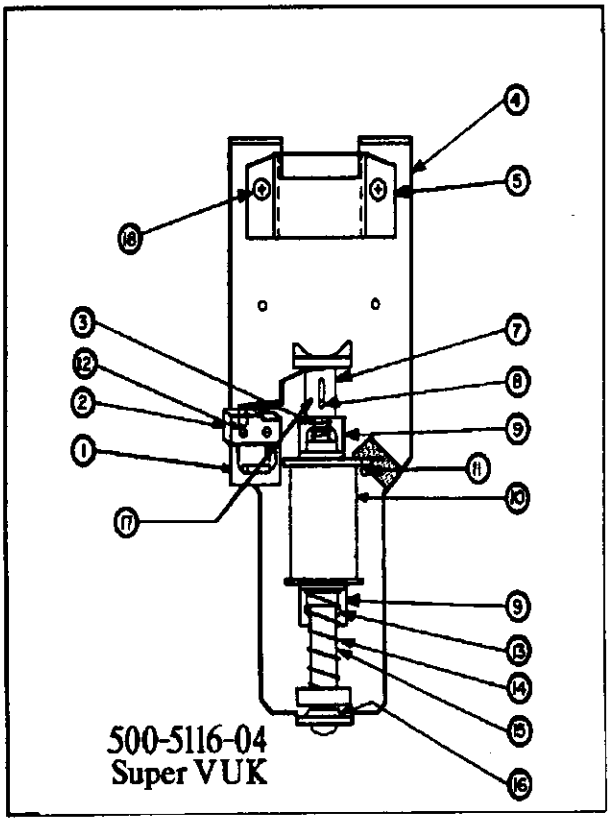
Note:
See page 25 for switch part numbers

* Indicates not shown


535-5721-00
Angle Mtg.Brkt.
545-5140-00
Target Lock
Plate
545-5351-00
Target Back Plate
Guide
237-5870-00
6 x 5/8
Hex Hd. (4)
237-5503-00
6-32 x 5/8
(2)
240-5005-00
6-32 Nyloc
Nut (3)
515-5630-00
Contour Tgt. Assy.
545-5350-00
Target Back Plate
500-5618-00
Up-Down Switch Ass'y.

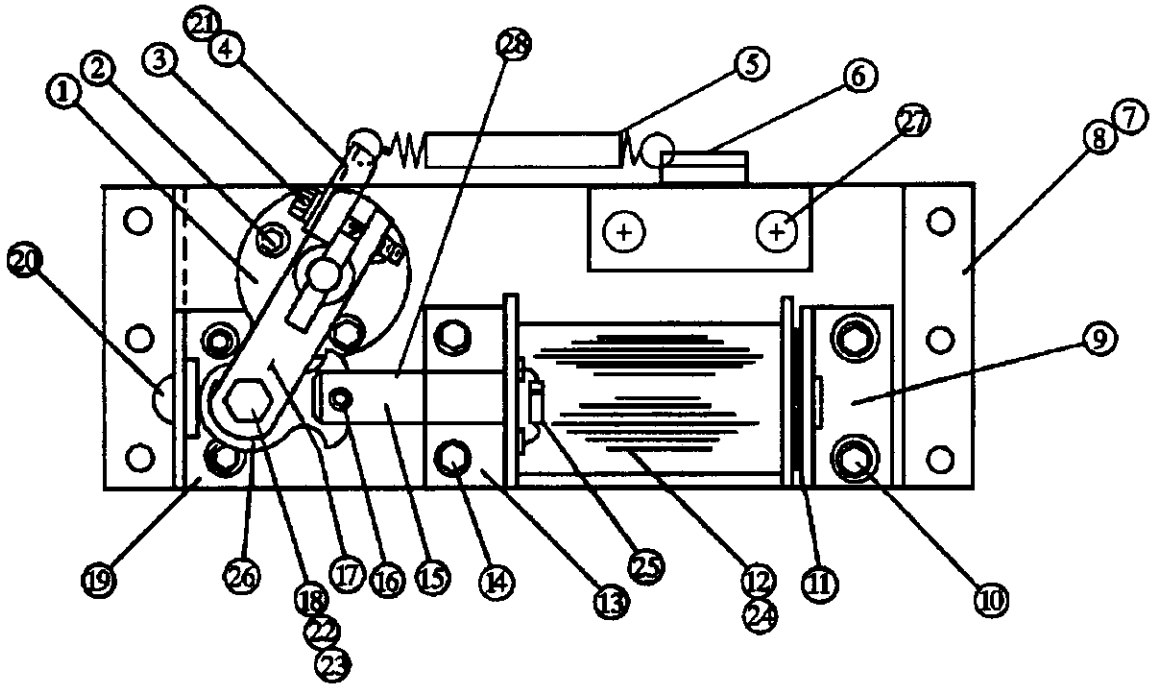

232-5200-00
6-32 x 1/4 SEMS (2)
515-5249-00
Diode Board (2)
515-5203-00
Motor Plate
515-5256-00
Motor Ass'y.
515-5202-00 Cam Ass'y.
180-5052-00 Switch (2)
237-5832-00 4-40 x 5/8 SEMS (4)
232-5204-00 6-32 x 3/4 R.Hd EMS.
240-5004-00 Hex Nut
515-5224-00
Target Mtr. Cam
Brkt. Assy.





Item	Description	Part #
1	Sw. Insulator	545-5193-00
2	Micro Switch	180-5064-00
3	Cap Spring	266-5025-00
4	Ball Kickup Mtg. Brkt.	535-5298-00
5	Ball Guide Brkt.	535-6047-00
6	# 6-32 x 3/8 SEMS (2)*	232-5201-00
7	Vert. Kick. Cap	545-5227-00
8	Pin 3/32 x 7/16	535-5111-00
9	Coil Retainer Brkt.(2)	535-5203-00
10	Coil 23-800	090-5001-00
11	1N4004 Diode	112-5003-00
12	2-56 x 1/2 Screw (2)	237-5806-00
13	# 6-32 x 1/4 Phil.M.S.	232-5200-00
14	Spring	266-5009-00
15	Plunger Assy.	515-5352-00
16	Bumper	280-5003-00
17	Compression Ring (3)	270-5010-00
18	#6-32 x 1/4 SEMS	232-5200-00

* Indicates not shown



Item	Description	Part #	Item	Description	Part #
1	Flipper Bushing	545-5070-00	15	Plunger, Link & Pawl	515-5051-01
2	#6 x 3/8 Hex Hd.scr.	234-5000-00	16	Pin	251-5000-00
3	#10-32 x 3/4 Soc.Hd.scr.	237-5864-00	17	Pawl	530-5070-00
4	Spring Brkt. (left)	535-6431-00	18	10-32x 3/4 Shoulder Bolt	231-5019-00
5	Flipper Return Spring	265-5029-02	19	Rebound Brkt.	535-5939-00
6	Spring Bracket	535-6469-00	20	Rubber Bumper	280-5003-00
7	Flipper Base (left)	515-5077-02	21	Spring Brkt. (right)	535-6422-00
8	Flipper Base (right)	515-5077-01	22	Bushing (inside Link)	530-5139-00
9	Coil Stop Brkt.	515-5346-00	23	10-32 Elastic Stop Nut	240-5206-00
10	1/4-20x 3/8 Soc.Hd.scr.	237-5861-00	24	Coil Sleeve	545-5031-00
11	Spring Washer	269-5002-00	25	1N4004 Diode	112-5003-00
12	Coil 22-1080	090-5032-00	26	Flipper Link	545-5219-00
13	Front Brkt.	515-5129-00	27	#8 3/8 Pan Hd.Thr.Form	237-5821-00
14	#8 x 3/8 Hex Hd.Scr.	234-5100-00	28	Plunger & Link Ass'y.	515-5052-01

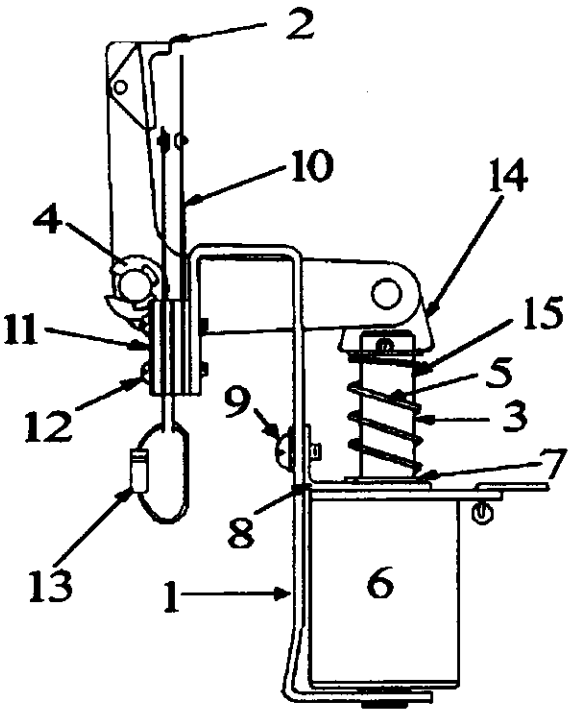
Flipper Assemblies

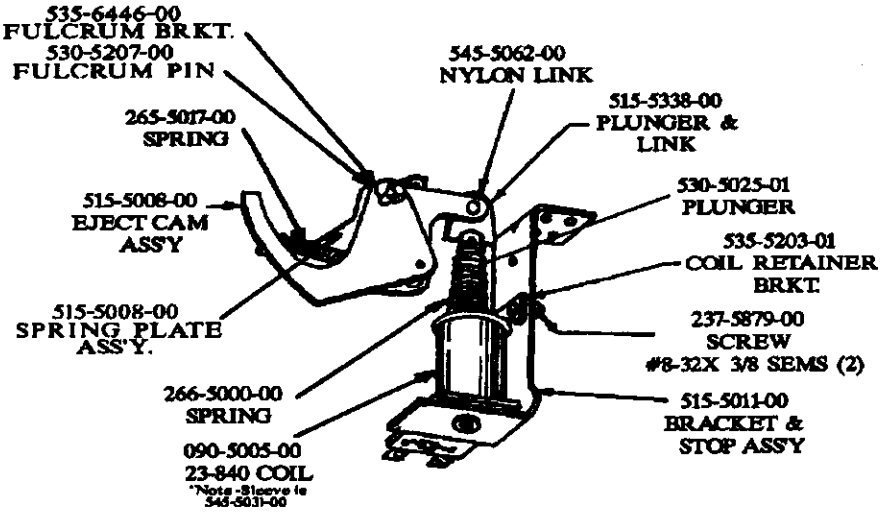
500-5606-73 Right

500-5606-74 Left

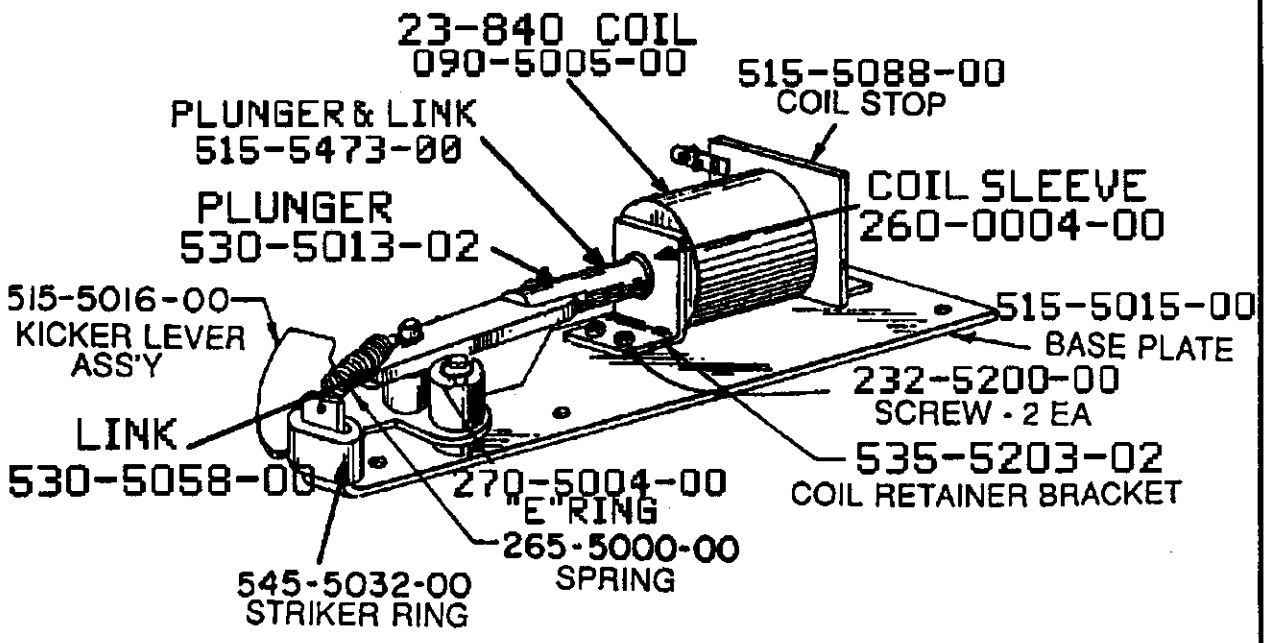
Slingshot Assembly
500-5226-00

Item	Description	Part No.
1	Slingshot Bracket	515-5339-00
2	S.S. Arm & Tip Assy.	515-5340-00
3	Plunger & Link Assy.	515-5338-00
4	1/4 Retaining Ring (2)	270-5002-00
5	Spring	266-5020-00
6	23-800 Coil	090-5001-02
7	Coil Sleeve	260-0004-00
8	Coil Retainer	535-5203-01
9	#8-32 X 1/4" Screw (2)	232-5300-00
10	Slingshot Switch (2)	180-5054-00
11	Tension Plate (2)	535-5846-00
12	#4-40 X 1/2" Screw (4)	237-5837-00
13	Diode 1N4004 (2)	112-5004-00
14	Link	545-5062-00
15	Plunger	530-5025-01

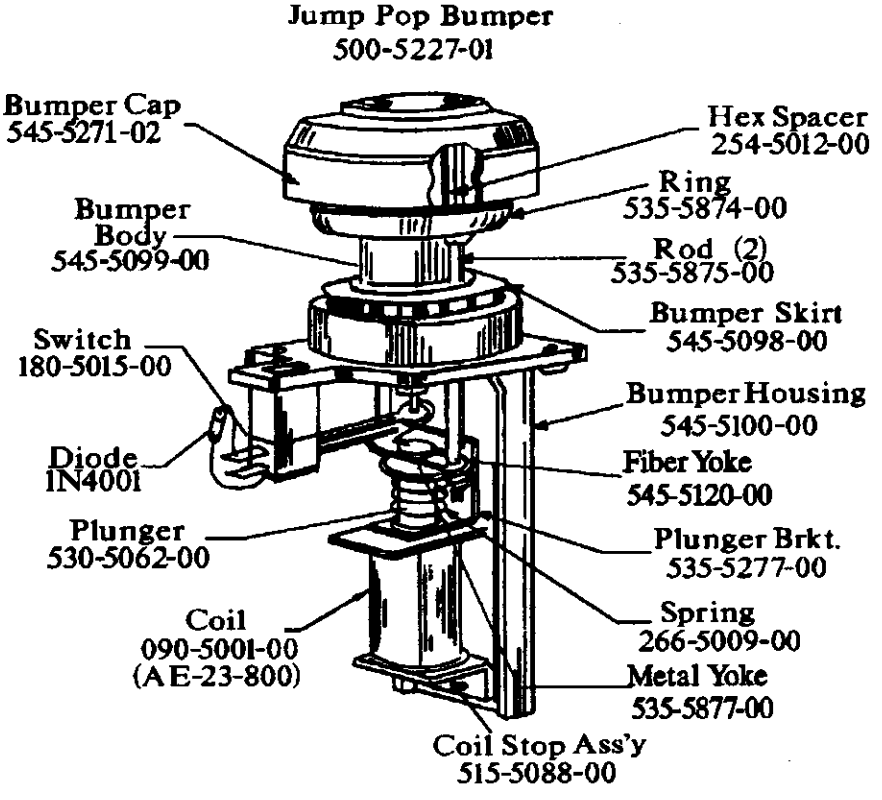


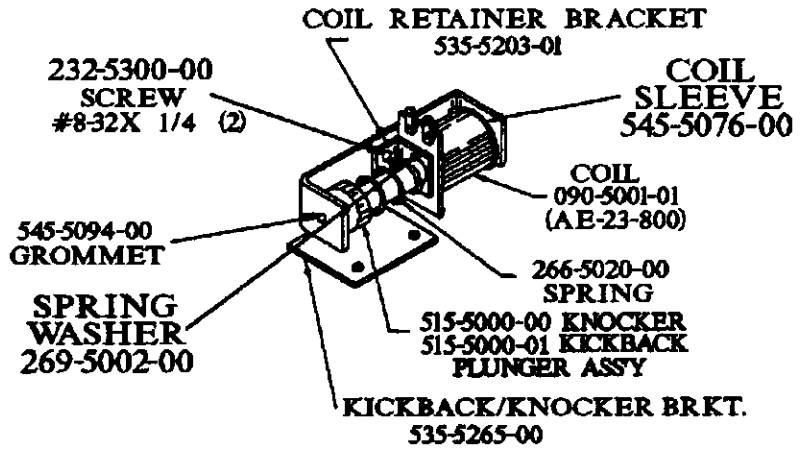


500-5012-01 BALL FEED ASSY (TROUGH EJECT)

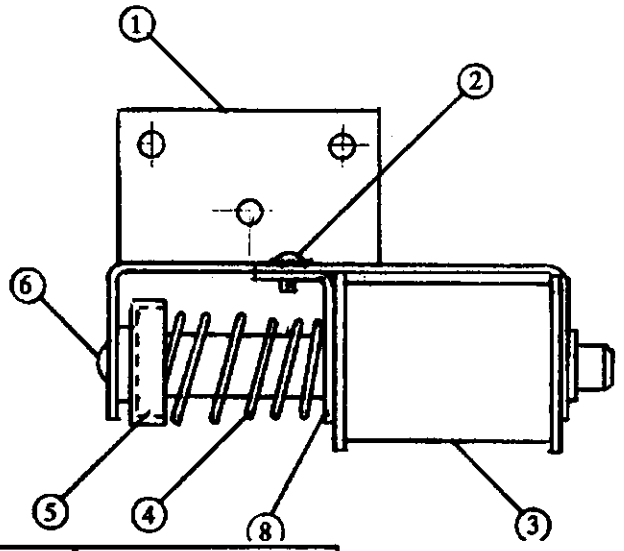


500-5082-00 OUTHOLE BALL RETURN ASSY





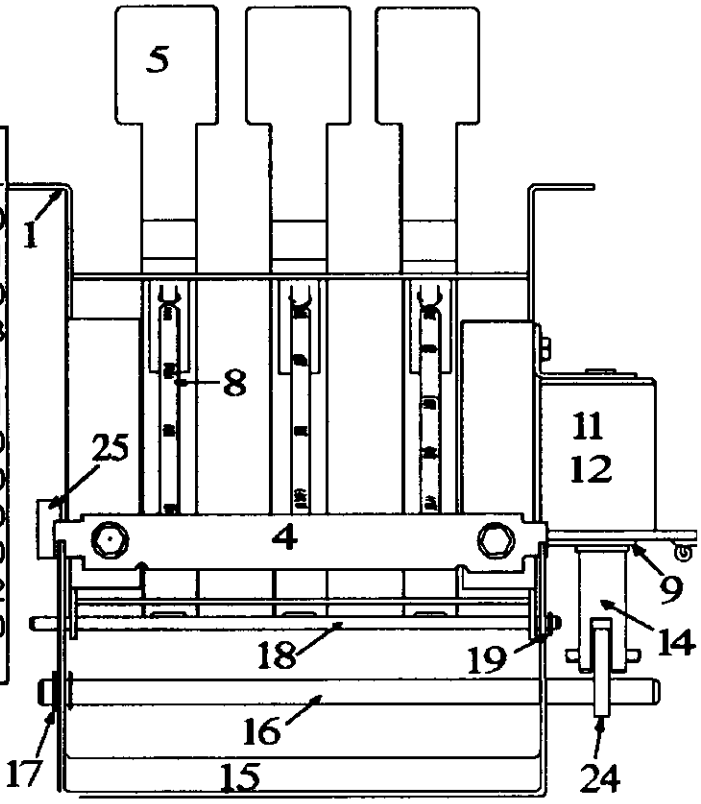
KICKBACK ASSEMBLY 500-5080-00 (COIL LUGS ON THE SIDE)
KNOCKER ASSEMBLY 500-5081-00 (PICTURED)

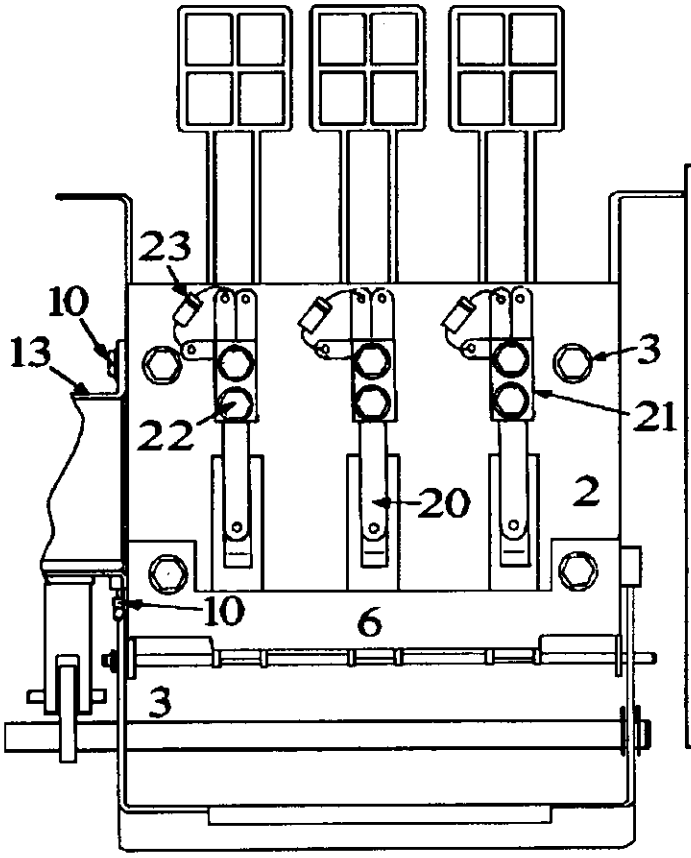


Item	Description	Part #
1	Coil Mtg. Brkt.	535-6385-00
2	8-32x1/4 Sems.(2)	232-5300-04
3	Coil 24-940	090-5036-01
4	Spring	266-5020-00
5	Plunger Ass'y.	515-5000-02
6	Grommet	545-5105-00
7	1N4004 Diode	112-5003-00
8	Coil Retainer Brkt.	535-5203-01

Ball Launch Ass'y
500-5477-01

Item	Description	Part No.
1	Target End Plate (2)	535-6162-00
2	Bank Target Frame	535-6159-01
3	#8-32 X 3/8 Screw (6)	237-5879-00
4	Spring Mounting Plate	535-6510-03
5	Target (3)	545-5048-01
6	Drop Tgt.Retain.Brkt.	535-5042-01
7	Washer 13/64 X 1/2 (2)	242-5018-00
8	Target Reset Spring (3)	265-5003-00
9	Coil Support Bracket	535-6154-00
10	#6-32 X 3/8 Screw (4)	237-5877-00
11	23-800-Coil	090-5001-02
12	Coil Sleeve	545-5076-00



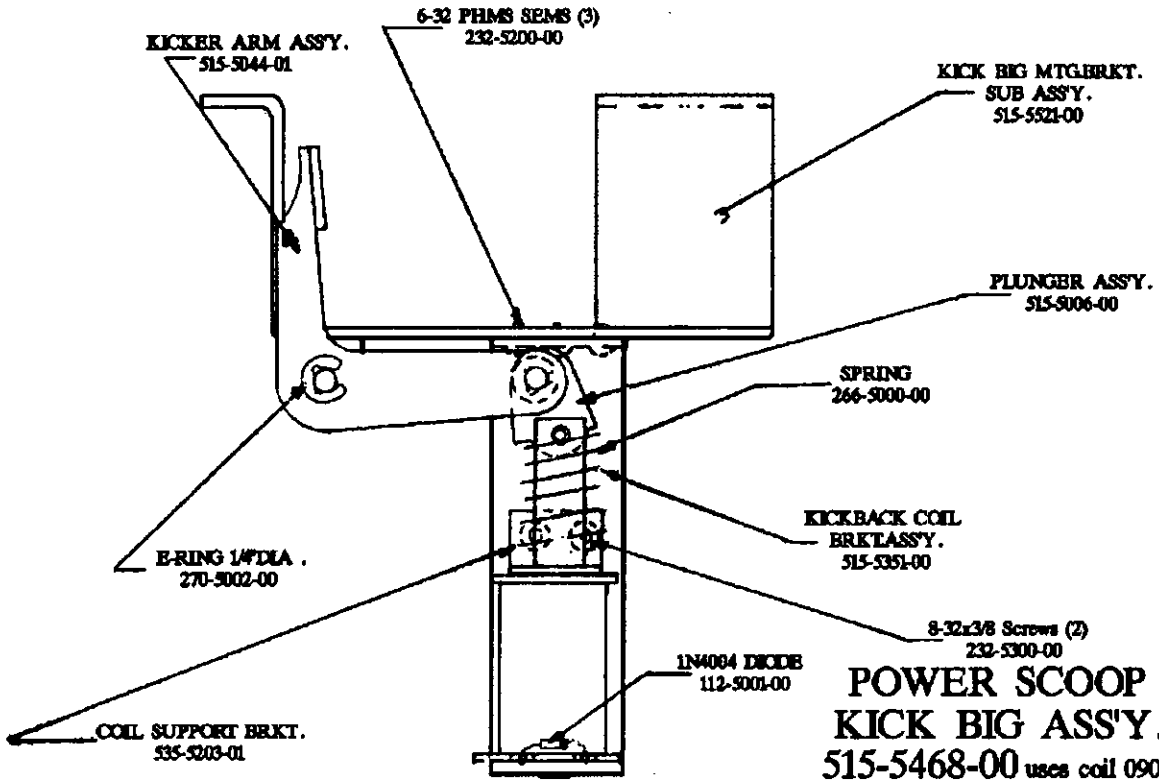


Item	Description	Part No.
13	Plunger Stop Assy.	515-5088-00
14	Plunger & Link Assy.	515-5338-00
15	Target Lift Bracket	535-6509-03
16	Target Shaft	530-5179-01
17	Retaining Ring (2)	270-5002-00
18	Pivot Shaft	530-5180-01
19	Retaining Ring (2)	270-5000-00
20	Switch (3)	180-5092-01
21	SwitchPlate (3)	535-5045-00
22	#6-32 X 1/2" (6)	237-5878-00
23	Diode 1N4001 (3)	112-5001-00
24	Link,Plunger	545-5062-00
25	Adjustable Bracket	535-6508-00

Adjustable

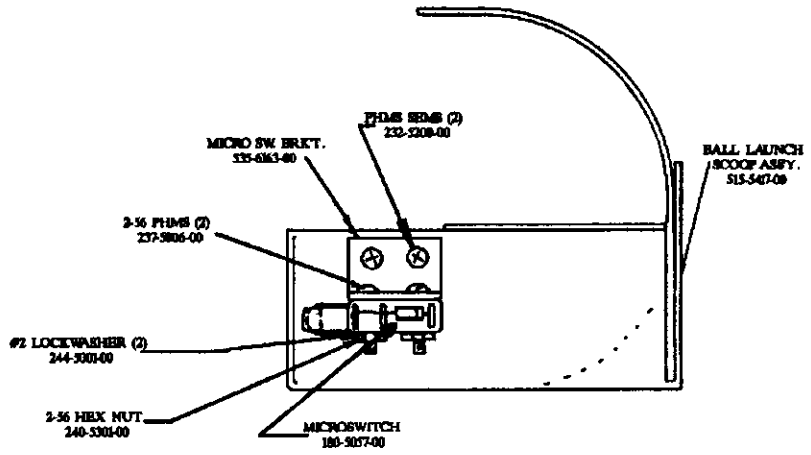
3 Bank Drop Target Ass'y

500-5621-03

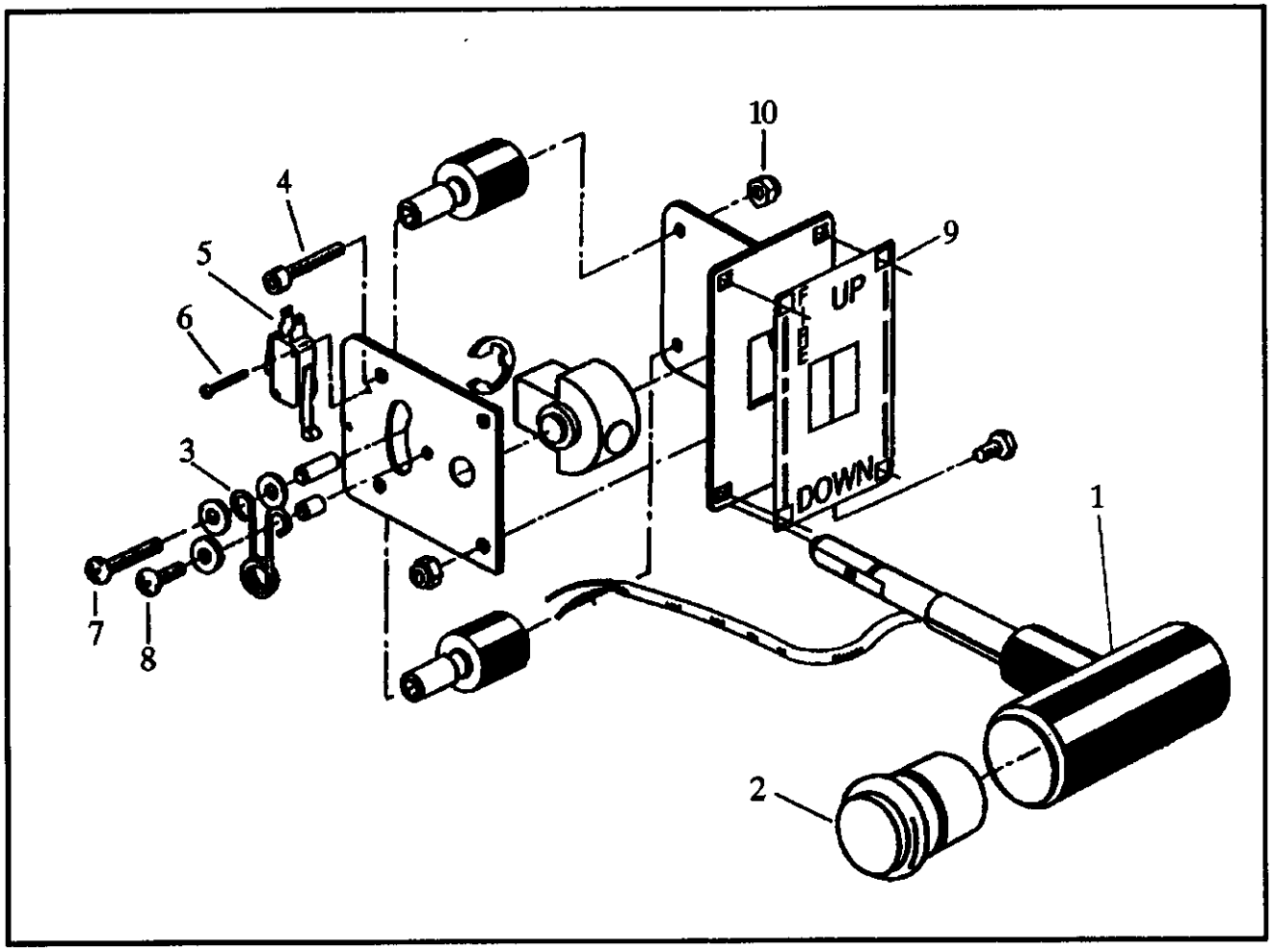


POWER SCOOP KICK BIG ASS'Y.

515-5468-00 uses coil 090-5001-01
515-5468-02 uses coil 090-5034-01



POWER SCOOP
W/SWITCH ASS'Y
515-5486-00



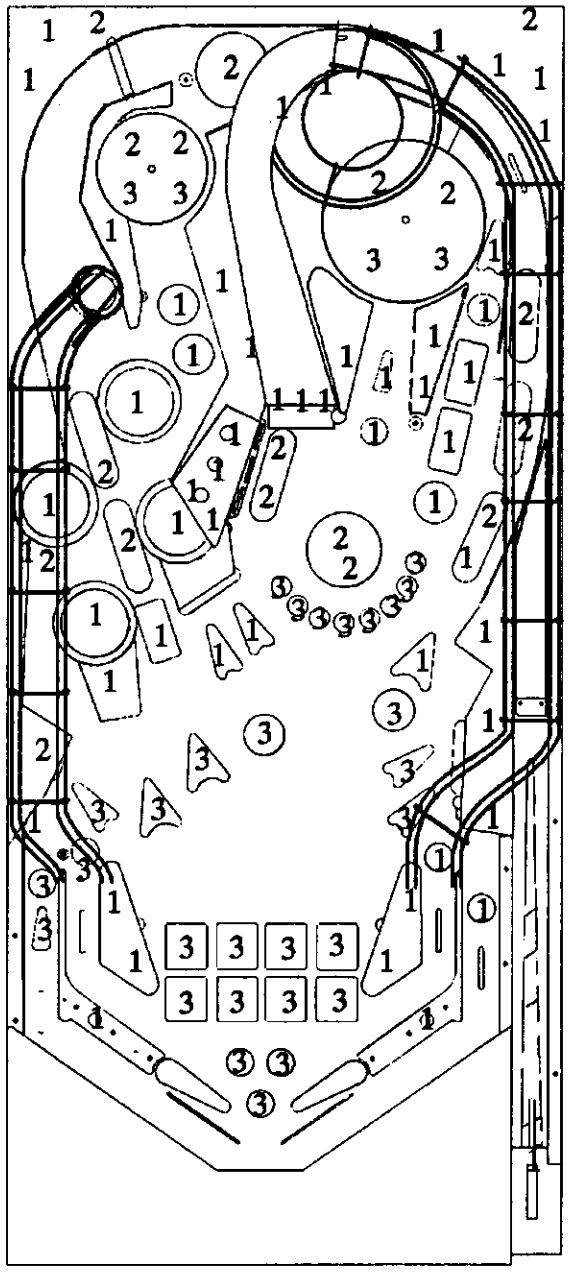
Up-Down Shifter
500-5620-00

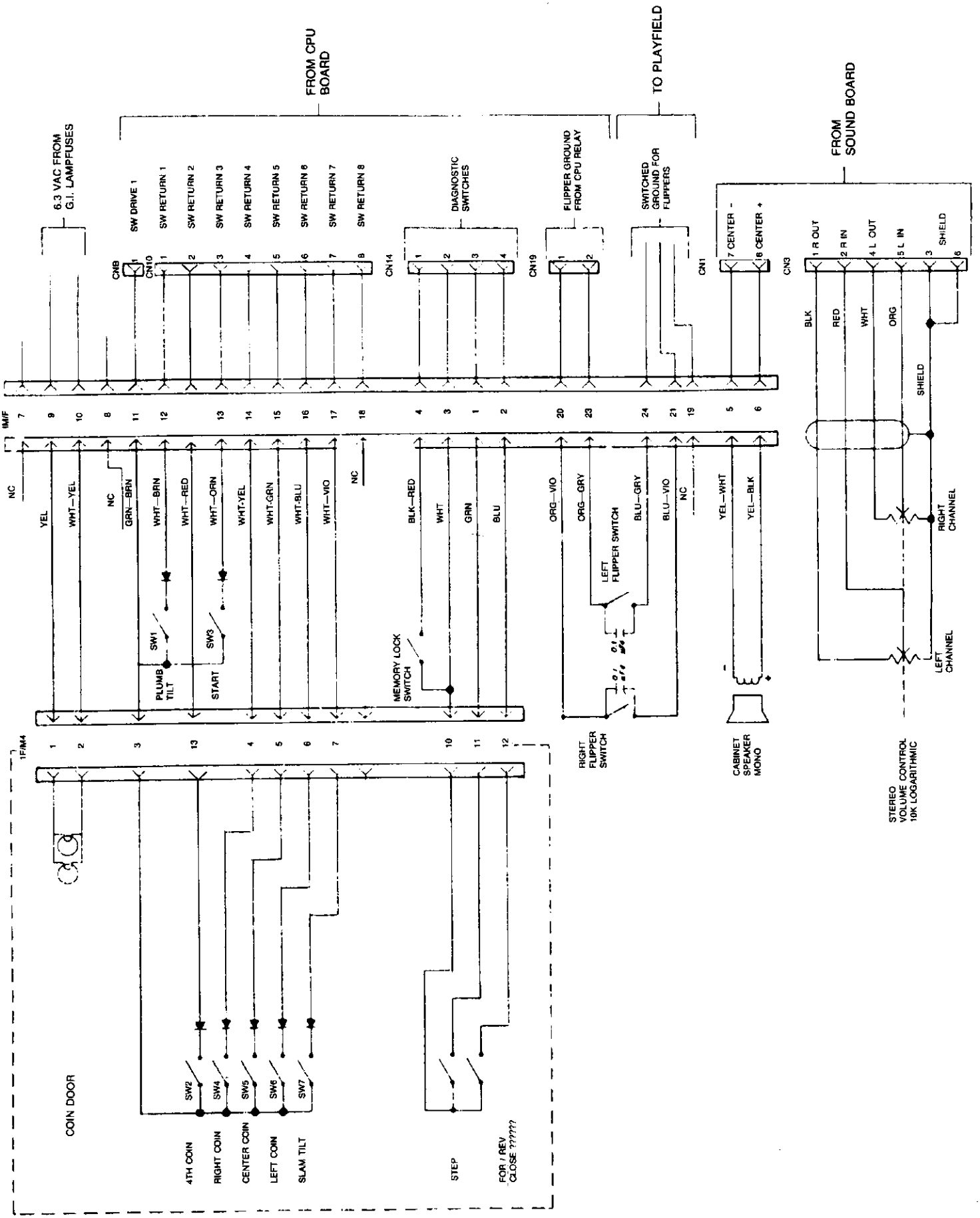
Item No.	Description	Part No.
1	Handle/Button/Harness	515-5691-00
2	Button & Harness	515-5692-00
3	Spring	266-5031-00
4	Screw 1/4-20 x 1 1/2 SCHS	231-5024-00
5	Micro Switch	180-5111-00
6	Screw 4-40 x 3/4 PHMS	237-5887-00
7	Screw 10-32 x 1 PHMS	237-5888-00
8	Screw 10-32 x 3/8 PHMS	237-5889-00
9	Decal	820-6097-00
10	Nylock Nut 1/4-20	240-5314-00
11	Wrench (Shipped w/Game)*	535-6410-01

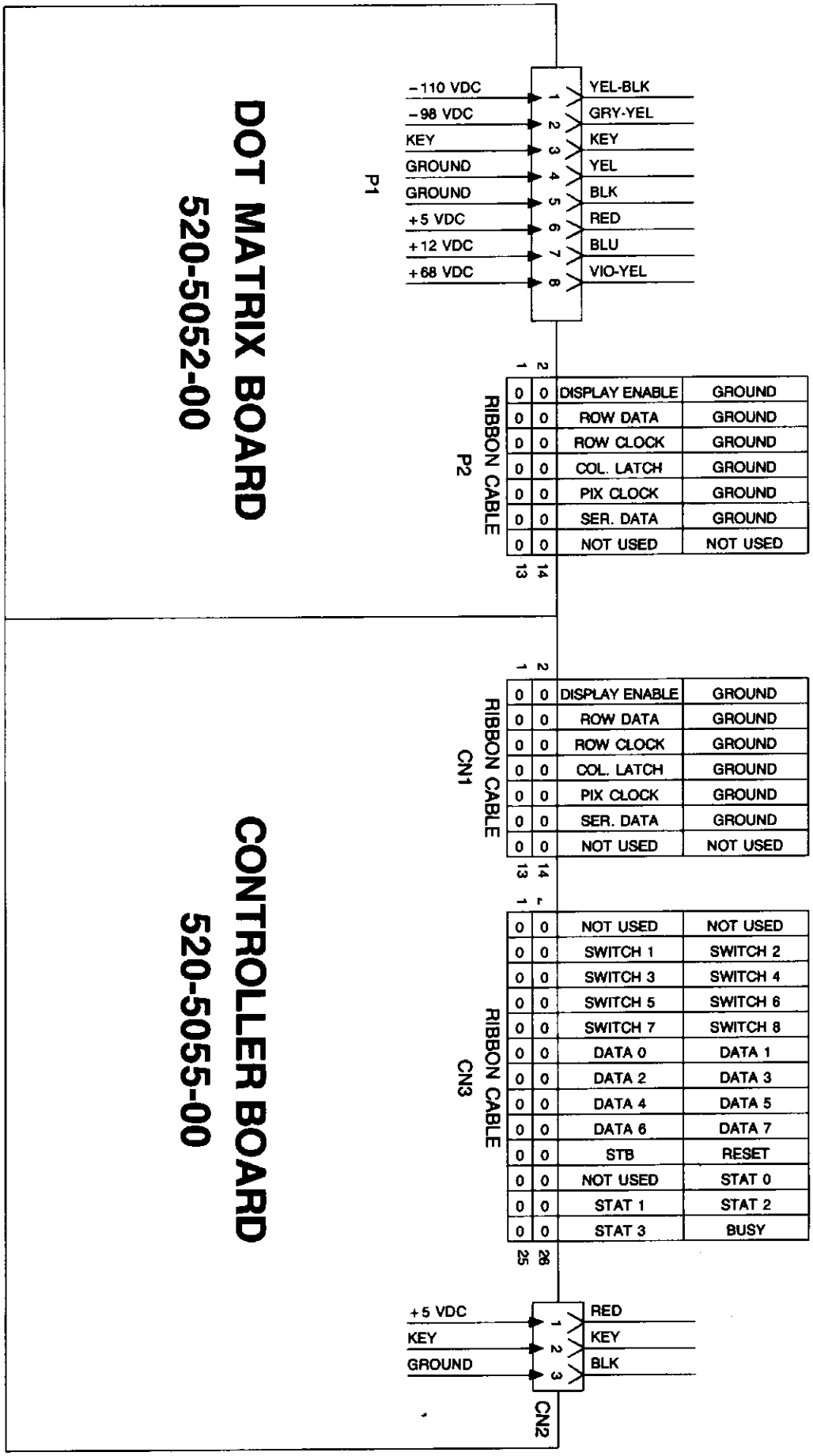
* Indicates Not Shown

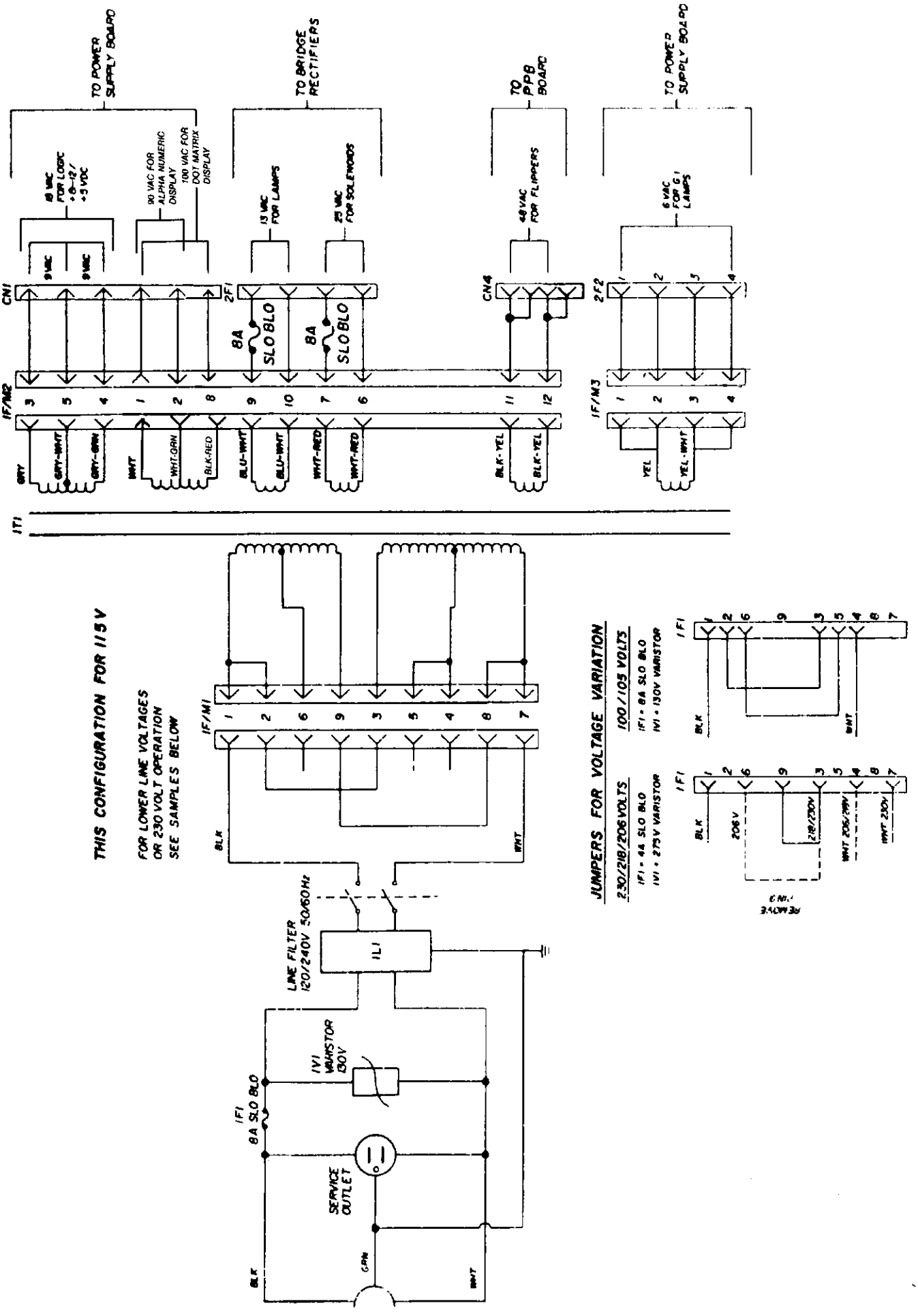
Lamp Bulb Part Numbers

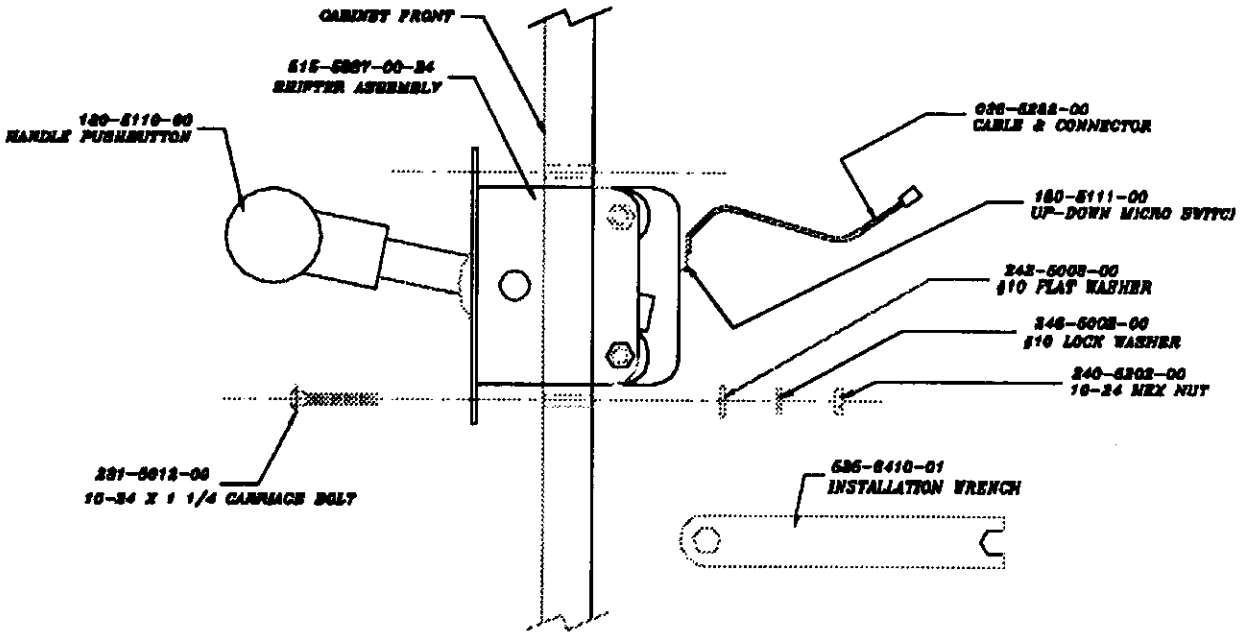
Item	Description	Part Number
1	#555 Bulb	165-5002-00
2	#44 Bulb	165-5000-44
3	#89 Bulb	165-5000-89
4	# 906 Bulb	165-5004-00




FROM CPU BOARD
TO PLAYFIELD
FROM SOUND BOARD
6.3 VAC FROM G.I. LAMPFUSES
SW DRIVE 1
SW RETURN 1
SW RETURN 2
SW RETURN 3
SW RETURN 4
SW RETURN 5
SW RETURN 6
SW RETURN 7
SW RETURN 8
DIAGNOSTIC SWITCHES
FLIPPER GROUND FROM CPU RELAY
SWITCHED GROUND FOR FLIPPERS
7 CENTER -
16 CENTER +
1 R OUT
2 R IN
4 L OUT
5 L IN
3
6 SHIELD
CN8
CN10
CN14
CN19
CN1
CN3
1M/F
NC
YEL
WHT—YEL
GRN—BRN
WHT—BRN
WHT—RED
WHT—ORN
WHT-YEL
WHT-GRN
WHT-BLU
WHT—VIO
BLK—RED
WHT
GRN
BLU
ORG—VIO
ORG—GRY
BLU—GRY
BLU—VIO
YEL—WHT
YEL—BLK
BLK
RED
WHT
ORG
SHIELD
SW1
PLUMB TILT
SW3
START
MEMORY LOCK SWITCH
LEFT FLIPPER SWITCH
0.1 µF
RIGHT FLIPPER SWITCH
CABINET SPEAKER MONO
RIGHT CHANNEL
LEFT CHANNEL
STEREO VOLUME CONTROL 10K LOGARITHMIC
1F/M4
COIN DOOR
SW2
SW4
SW5
SW6
SW7
4TH COIN
RIGHT COIN
CENTER COIN
LEFT COIN
SLAM TILT
STEP
FOR I REV CLOSE ?????


DOT MATRIX BOARD
520-5052-00
P1
-110 VDC
-98 VDC
KEY
GROUND
GROUND
+5 VDC
+12 VDC
+68 VDC
YEL-BLK
GRY-YEL
KEY
YEL
BLK
RED
BLU
VIO-YEL
P2
RIBBON CABLE
DISPLAY ENABLE
ROW DATA
ROW CLOCK
COL. LATCH
PIX CLOCK
SER. DATA
NOT USED
GROUND
NOT USED
CONTROLLER BOARD
520-5055-00
CN1
CN3
SWITCH 1
SWITCH 2
SWITCH 3
SWITCH 4
SWITCH 5
SWITCH 6
SWITCH 7
SWITCH 8
DATA 0
DATA 1
DATA 2
DATA 3
DATA 4
DATA 5
DATA 6
DATA 7
STB
RESET
STAT 0
STAT 1
STAT 2
STAT 3
BUSY
+5 VDC
KEY
GROUND
RED
KEY
BLK
CN2


TO POWER SUPPLY BOARD
TO BRIDGE RECTIFIERS
TO PPB BOARD
TO POWER SUPPLY BOARD
8 VAC FOR LOGIC +5-12/ +5 VDC
90 VAC FOR ALPHA NUMERIC DISPLAY
100 VAC FOR DOT MATRIX DISPLAY
13 VAC FOR LAMPS
25 VAC FOR SOLENOIDS
48 VAC FOR FLIPPERS
6 VAC FOR GI LAMPS
9 VAC
9 VAC
CN1
2F1
8A SLO BLO
8A SLO BLO
CN4
2F2
1F/M2
1F/M3
GRY
GRY-WHT
GRY-GRN
WHT
WHT-GRN
BLK-RED
BLU-WHT
BLU-WHT
WHT-RED
WHT-RED
BLK-YEL
BLK-YEL
YEL
YEL-WHT
1T1
THIS CONFIGURATION FOR 115 V
FOR LOWER LINE VOLTAGES OR 230 VOLT OPERATION SEE SAMPLES BELOW
1F/M1
BLK
WHT
LINE FILTER 120/240V 50/60Hz
1L1
1V1 VARISTOR 130V
1F1 8A SLO BLO
SERVICE OUTLET
BLK
GRN
WHT
JUMPERS FOR VOLTAGE VARIATION
230/218/206 VOLTS
1F1 = 4A SLO BLO
1V1 = 275V VARISTOR
100/105 VOLTS
1F1 = 8A SLO BLO
1V1 = 130V VARISTOR
1F1
BLK
206V
218/230V
WHT 206/218V
WHT 230V



INSTALLATION INSTRUCTIONS

1. REMOVE SHIFTER ASSEMBLY AND HARDWARE PACKAGE FROM CARTON.

2. POSITION THE SHIFTER ASSEMBLY OVER THE CUT-OUT LOCATED AT THE UPPER RIGHT CORNER OF THE CABINET FRONT.

3. SECURE THE ASSEMBLY TO THE CABINET WITH THE (4) CARRIAGE BOLTS, (4) LOCK WASHERS (4) HEX NUTS PROVIDED. FASTEN SECURELY FROM INSIDE OF CABINET WITH INSTALLATION WRENCH SUPPLIED.

4. ATTACH 3-PIN CONNECTOR TO MATING CONNECTOR IN CABINET.

INSTALLATIONSANLEITUNGEN

1.SCHALTERAUFBAU UND PAKET MIT EINBAUZUBEHÖR AUS DEM KARTON ENTFERNEN.

2.SCHALTERAUFBAU ÜBER DEM AUSSCHNITT AN DER OBEREN RECHTEN ECKE DER GEHÄUSEVORDERSEITE ANBRINGEN.

3.DEN AUFBAU AM GEHÄUSE BEFESTIGEN UNTER BENUTZUNG DER DAFÜR VORGESEHENEN (4) SCHLOßSCHRAUBEN, (4) SICHERUNGSUNTERLEGSCHEIBEN UND (4) SECHSKANTMUTTERN. VON DER INNENSEITE DES GEHÄUSES MIT DEM MITGELIEFERTEN INSTALLATIONSSCHLÜSSEL FEST ANZIEHEN.

4.3-STIFT ANSCHLUß MIT DEM ENTSPRECHENDEN ANSCHLUß IM GEHÄUSE VERBINDEN.

INSTRUCTIONS D'INSTALLATION

1.SORTEZ LE MONTAGE DU LEVIER DE CHANGEMENT ET LE PETIT MATERIEL DU CARTON.

2.PLACEZ LE MONTAGE DU LEVIER DE CHANGEMENT AU-DESSUS DE LA DECOUPE SITUEE DANS LE COIN SUPERIEUR DROIT DE LA PARTIE AVANT DE L'ARMOIRE.

3.FIXEZ SOLIDEMENT LE MONTAGE A L'AR OIRE A L'AIDE DES (4) BOULONS BRUTS A TETE BOMBEE ET COLLET CARRE, DES (4) RONDELLES D'ARRET ET DES (4) ECROUS A 6 PANS FOURNIS. SERREZ FORTEMENT DEPUIS L'INTERIEUR DE L'ARMOIRE, A L'AIDE DE LA CLE FOURNIE.

4.BRANCHEZ LE CONNECTEUR A 3 BROCHES SUR LE CONNECTEUR CORRESPONDANT DANS L'ARMOIRE.

INSTRUCCIONES DE INSTALACION

1. SAQUE DE LA CAJA EL CONJUNTO DESPLAZADOR Y EL PAQUETE DE TORNILLOS.

2. COLOQUE EL CONJUNTO DESPLAZADOR SOBRE EL CORTE UBICADO EN LA ESQUINA SUPERIOR DERECHA DE LA PARTE DELANTERA DE LA CAJA.

3. SUJETE EL CONJUNTO AL ARMAZON POR MEDIO DE LOS (4) PERNOS DE CABEZA DE HONGO Y CUELLO CUADRADO, (4) ARANDELAS DE TRABA Y (4) TUERCAS DE HEXAGONALES PROPORCIONADAS. APRIETELO BIEN DESDE DENTRO DEL ARMAZON CON LA LLAVE DE INSTALACION PROVISTA.

4. ENCHUFE EL CONECTOR DE 3 CLAVIJAS AL CONECTOR CORRESPONDIENTE DEL ARMAZON.