

DRAGONFIST

2



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12-G-10-153-M

WARNING: THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE INTERFERENCE TO RADIO COMMUNICATIONS. AS TEMPORARILY PERMITTED BY REGULATION IT HAS NOT BEEN TESTED FOR COMPLIANCE WITH THE LIMITS FOR CLASS A COMPUTING DEVICES PURSUANT TO SUBPART J OF PART 15 OF FCC RULES, WHICH ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST SUCH INTERFERENCE. OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE INTERFERENCE IN WHICH CASE THE USER AT HIS OWN EXPENSE WILL BE REQUIRED TO TAKE WHATEVER MEASURES MAY BE REQUIRED TO CORRECT THE INTERFERENCE.

SECTION I. INSTALLATION

Assemble the game as follows:

Bolt legs to cabinet. Using flat washers under bolt heads, bolt back box to cabinet. Feed cable connectors and ground braid through cable port in back box. Screw ground braid to braid in back box. Insert connectors so they are completely seated on printed circuit board assemblies.

On all games there are some items that must be checked after shipment. Making these visual inspections may avoid time consuming service work later. Minor troubles caused by abusive handling in shipment are unavoidable. Cable connectors may be loosened, switches (especially tilt switches) may go out of adjustment. Plumb bob tilt switches should always be adjusted after game is set on location and leg levelers are adjusted.

Visual inspections before plugging in line cord:

1. Check that wiring of transformer corresponds to location voltage.
2. Check the transformer for any foreign material shorting across wiring lugs.
3. Check that fuses are firmly seated and making good contact.
4. Check wire on coils for proper soldering. Cold solder connections may not show up in factory inspection, but vibration in shipment may break contact.
5. Check switches for loose solder or other foreign material that may have come loose in shipment and could cause shorting of contacts.
6. Check for any wires that may have become disconnected.
7. Check that all cable connectors are completely seated on printed circuit board assemblies.
8. Check that cables are clear of all moving parts.

Check adjustment of the (normally open) tilt switches:

1. Plumb bob tilt on left side of cabinet near front door.

STATIC DISCHARGE CAUTION

Integrated circuit chips can be damaged by static discharge from the body. Before touching chips, discharge body by touching any ground path.

SECTION II. ROUTINE MAINTENANCE ON LOCATION

Self tests, which are programmed into the design of the game, are very helpful. As with any solid state piece of equipment the three prong grounding receptacle is an important piece part of the game, that must not be tampered with and must be used properly.

MPU MODULE SELF-TEST:

During power-up, the MPU assembly tests itself, which can visibly be seen by the flashing of a LED on the board. When the game is turned on, the LED will flash, have a pause, flash again, a longer pause, then flash five more times and then will be dimly lit. Accompanying each flash is one note (total of seven), this indicates proper MPU game operation conditions.

GAME SELF-DIAGNOSTIC TESTS:

Pressing the Self-Test button inside the coin door activates the game into its "Self-Diagnostic Test."

1. BURN IN TEST - All outputs tested.
2. FEATURE LAMPS - All feature lamps will flash on and off continuously, determining any burnt lamps.
3. DISPLAYS - Each digit on all displays will cycle from 0 thru 9, then (a) number 8 will shift left to right. This test will recycle continuously.
4. SOLENOIDS - Each solenoid will be energized, one at a time, in a continuous sequence. (Holding both flipper buttons "in" during this test will cause the flipper coils to be energized). The number appearing on the "Player Score" display is the same as the number assigned to the solenoid and also the same transistor number on the SDU board. The sound of a solenoid pulling-in as a number appears indicates proper operation (providing transistor is being used), the absence of a solenoid sound shows a fault. If sound is absent, see Solenoid I.D. page in book for help in Solenoid Identification. (After the solenoids are tested, the game sounds are tested.)
5. SWITCHES - The MPU will look at each switch assembly for stuck contacts. *(Flipper Button and flipper End of Stroke switches are not included). If there are any stuck, the lowest number encountered is flashed on the Player Score displays. The number remains until the fault is corrected. See Switch I.D. page in book for help in switch identification. Other numbers may follow if more stuck contacts are present. If there are no stuck switches, the "Match/Ball in Play" display flashes '0'. DO NOT BURNISH OR FILE GOLD PLATED SWITCH CONTACTS.
6. GAME LEVELS AND BOOKKEEPING FUNCTIONS: - Pressing the Self-Test button eighteen more times causes the MPU to step thru the game levels and bookkeeping functions and finally to repeat the power-up test. To bypass these functions, turn the game off, then on. The game is now ready to play, after the MPU Self-Test.

PLAYFIELD SWITCH ADJUSTMENTS

All contact switches should be adjusted to have a gap 1/16" in the open position, and have .010" overtravel closed. All contact switches (except for flipper buttons & flipper end of stroke switches) are gold plated to resist corrosion and, **SHOULD NOT BE FILED OR BURNISHED**. If contacts have dirt or dust on them, a clean piece of paper should be used to clean them, by closing the contacts and wiping gently.

FLIPPER BUTTON & FLIPPER SWITCHES ONLY. Tarnish or pitted contacts can be corrected with a contact file followed by a burnishing tool. Severely pitted contact must be replaced as an assembly.

CLEAN AND WAX THE PLAYFIELD

Stern playfields have a durable long life playing finish. Its life expectancy, as well as playing appeal can be greatly extended by periodic cleaning. Inspect and hand polish the ball with a clean cloth. A chipped ball must be replaced, as it will ruin the finish on the playfield. (DO NOT USE WATER IN LARGE QUANTITIES, HIGHLY CAUSTIC CLEANERS, ABRASIVE CLEANERS OR CLEANING PADS ON THE PLAYFIELD SURFACE.)

DISPLAY DRIVER ASSEM'S
 1ST, 2ND, 3RD & 4TH PLAYERS, CREDITS
 AND MATCH/BALL IN PLAY.
 (SEE BACK-RACK GLASS FOR LOCATIONS)

B-605 SOUND BOARD

S-33 (MEMORY CLEAR)

S1 TO S32
 (SEE DETAIL)

MPU ASSY.

BACK-RACK

BACK-RACK INSERT

SOLENOID DRIVER,
 VOLT. REGULATOR
 ASSEM.

VOICE SYNTHESIZER UNIT
 (USED IN VOICE GAMES ONLY)

LED

LAMP DRIVER ASSEM.

CABINET

TRANSFORMER ASSEM.

PLUMB BOB TILT
 SPEAKER

S-33
 (MEMORY CLEAR)

KNOCKER
 (WHEN USED)

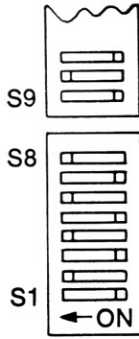
SELF TEST

CREDIT BUTTON

RECTIFIER BOARD
 VOLUME CONTROL

SLAM SWITCH
 FRONT DOOR

LEG LEVELING
 ADJUSTMENT (TYP)



DETAIL S1-S32
 MPU ASS'Y

ELECTRONIC PIN BALL GAME

SECTION III. GENERAL GAME OPERATION

PLACE BALL INTO PLAYFIELD BY OUTHOLE:

COIN GAME. Plug in line cord. (For proper game operation grounding circuit must be used.) Move power ON-OFF toggle switch at bottom right front corner of cabinet to "ON" position. Seven singular tones will be heard to indicate game-readiness. Feature lamps will flash in a programmed attract mode, "HIGH SCORE" lamp is lit, player displays flash high score to date, numbers 1 to 7 will display from right to left, all 7s will flash, "HIGH SCORE" lite goes off & previous played scores are flashed. The game should accept the coin and post credits for coins accepted (*). Pressing the credit button on the door will reset drop targets and cause the outhole kicker to move the ball to the shooter lane. The first player display will flash 00.

One player is registered each time the credit button is pressed (one to four can play.) The credits are reduced by one each time the credit button is pressed until the credits are reduced to zero. (Credit button is inoperative after 4 players are registered.) Shooting the ball initiates play.

When the ball enters the outhole, the bonus score is added to the player's score. The player-up and/or ball in play on the back box is advanced one position. The bonus score starts at ** points. The outhole kicker moves the ball to the shooter lane and play is resumed. This continues until each player has played the allowable number of balls per game (3 or 5). At this time the "Game Over" lamp becomes lit. A random "Match" number appears and the "Match" lamp becomes lit. If the match number is the same as the last two digits in the player's score a free game can be awarded (*).

Extra ball won during the course of the game is played immediately after the player's regular ball enters the outhole. The player-up and/or ball in play is not advanced for extra ball play. Bonus score is added to the player's score, the bonus is reset to ** and the bonus multiplier earned is restored (memory) or reset (*) before the game moves the extra ball for play.

At the end of the game, a "High Game" is flashed on all players' scores. If the "High Game" is beat, this feature (*) can award up to 3 free games.

Tilting while playing the game results in loss of the ball in play. The flippers, thumper-bumper, etc., go "dead". Bonus score is not added. The purpose of the tilt penalty is to discourage the player from jostling the machine in an attempt to prolong play. Game action becomes normal after the outhole kicker moves the ball to the shooter lane.

Slamming the machine results in the loss of the game. All feature lamps go out and the game becomes "dead" through a built-in delay circuit. The purpose of the time delay circuit is to discourage abuse of the machine. After the delay, the "Game Over" lamp lights, "Shoot Again" flashes and the game is ready for play. The time delay occurs any time one of the slam switches is made to contact.

There is a slam switch on the front door, one on the tilt board. (Any number of slam switches could be installed by the operator, to meet his individual requirement.) The switch should be adjusted to have approximately 1/16" gap between the contacts. The weighted blade should be adjusted to attain the desired sensitivity. Decreasing gap between contacts will make the switch more sensitive. Opening the gap will reduce sensitivity.

*Some tunes and features can be disabled by operator if so desired.

**Bonus starts at 0.

See back box adjustments.

DRAGON FIST OPERATION

Dragon Fist is a single ball pin game for 1-4 players. Each player gets 3 or 5 balls per game (optional). Shooting the first ball initiates play. The object of the game is to acquire as many points as possible.

Hitting each of the numbered stand-up targets 1-9, lites the left lane lamps. When all 9 lamps are lit, the extra ball lamp comes on and will alternate by hitting any 10 point bumper. By knocking down the middle drop target on the bank that is lit, will award an extra ball.

There are three drop target banks, each with three targets. Dropping all three targets on the bank with the lit "x" lamp, advances bonus multiplier—maximum 7x. When the bonus multiplier reaches 7x, the special lamp lites. It will alternate by hitting the 10 point bumpers. By knocking down the middle drop target on the bank that is lit, a special will be awarded.

When the spinner is hit, the left two digits on the ball/match display counts and displays the number of spins. Stopping on 20, 40, 60 or 80 awards a special.

When the ball enters the outhole, the bonus is collected times the bonus multiplier. The bonus points are acquired by knocking down individual drop targets. Maximum bonus awarded is 100,000 points.

SECTION IV. SELF TEST AND BOOKKEEPING FUNCTIONS

The game is designed to allow the operator to perform certain diagnostic tests as well as accounting functions as follows:

TABLE 4-1. SELF TEST FUNCTIONS

1st	Burn in test - all outputs tested.
2nd	Lamp test - all feature lamps on and off.
3rd	Display test - all digits display 0000000 thru 9999999 then an 8 shifts from left to right.
4th	Solenoid test - continuous sequence of solenoids pulsed with solenoid driver transistor, "Q" number displayed.
5th	Switch test - switch I.D. number appears on display when it is manually closed. (Flashing O if all cabinet switches are open and all balls moved from the outhole to the shooter position.)

TABLE 4-2. BOOKKEEPING FUNCTIONS

TEST SWITCH PUSH NUMBER	BALL/MATCH DISPLAY	DESCRIPTION	DISPLAYS
6th	01	1st Threshold (High Score)	
7th	02	2nd Threshold (High Score)	
8th	03	3rd Threshold (High Score)	
9th	04	Current High Game Threshold	
10th	05	Current Credits	00 to 99
11th	06	Total Plays	00 to 9999999
12th	07	Total Replays	00 to 9999999
13th	08	Total times high score is passed	00 to 9999999
14th	09	Number of coins thru Chute No. 2	00 to 9999999
15th	10	Number of coins thru Chute No. 1	00 to 9999999
16th	11	Number of coins thru Chute No. 3	00 to 9999999
17th	12	Total balls played	00 to 9999999
18th	13	Total Extra Balls Awarded	00 to 9999999
19th	14	Total Playfield Special Awards	00 to 9999999
20th	15	Total Level 1 Passed	00 to 9999999
21st	16	Total Level 2 Passed	00 to 9999999
22nd	17	Total Level 3 Passed	00 to 9999999

SECTION V. FRONT DOOR GAME ADJUSTMENTS:

HIGH SCORE FEATURE ADJUSTMENTS:

The game is designed to award an "Extra Ball" or "Free Game" (option) at three score levels. (See High Score Feature). The recommended levels are listed below.

Any level from 10,000 or 9,990,000 can be set, as desired. It is possible to reset or turn off (00) any or all of the levels, if desired.

1. Push and release Self-Test button at one second intervals six times or until number 01 appears on the Match/Ball in Play display.
2. The number on the Player Score Displays is the first score level*. It can be increased, if desired, by holding the credit button in. To decrease the score level, reset to '00', and then hold the credit button in. Release the credit button when the desired High Score appears. Note that the level changes 10,000 points at a time. If the number '00' is left on the displays, the high score feature is eliminated for that level.
3. Repeat steps 1 and 2 for the second and third high score levels. The number '02' and '03' on the Match/Ball-in-Play display are for the second and third levels, respectively.

HIGH GAME TO DATE FEATURE:

The game is designed to award up to 3 free games (option) when "High Score to Date" is beat. **For the recommended, factory preset level,** see below.

It is recommended that the level, which will build with game play, be periodically reset to the factory recommended level to encourage game play. The adjustment procedure is the same as for the High Score Feature Adjustments, Steps 1 and 2. Continue pushing the Self-Test button until the number '04' appears on the Match/Ball-in-Play display and then do Step 2.

Any level from '00' to 9,990,000 can be set as described. It is to be noted that '00' does not turn off the feature, as it does on High Score feature. The feature can be turned off by positioning the correct MPU switches.

*Can be quickly set to '00' by pressing S33 on the MPU assembly in the back box or front door.

RECOMMENDED SETTING

DRAGON FIST

3 BALLS

1ST LEVEL PAST	420,000	1 CREDIT
2ND LEVEL PAST	980,000	1 CREDIT
3RD LEVEL PAST	N/U	
4TH LEVEL PAST	1,340,000	HIGH SCORE TO DATE

5 BALLS

1ST LEVEL PAST	900,000	1 CREDIT
2ND LEVEL PAST	1,700,000	1 CREDIT
3RD LEVEL PAST	N/U	
4TH LEVEL PAST	2,000,000	HIGH SCORE TO DATE

GAME ADJUSTMENTS

A. PLAYFIELD POST ADJUSTMENTS:

Posts that control left and right outlane openings on playfield can be moved to make access to outlanes conservative or liberal for ball to enter. (See appropriate illustrations).

Conservative entry will decrease playing time and scoring.

Liberal entry will increase playing time and scoring.

B. BACK BOX GAME ADJUSTMENTS:

Each game has thirty-two switches located on the MPU module, located in the back box, that allows play to be customized to the location. (See Fig. 1.) Credits per coin, maximum credits, credit display, balls (3 or 5) per game, match feature, high game feature, special award, maximum extra balls and background sound are selectable by means of switches. The switches are contained in four-sixteen lead packages numbered S1-8, S9-16, S17-24 and S25-32 for easy identification. The "On" position is marked on the assembly. **TURN OFF POWER BEFORE MAKING ADJUSTMENTS. MAKE ADJUSTMENTS BEFORE TURNING POWER BACK ON.**

DRAGON FIST SWITCH ASSIGNMENTS

		ON	OFF
32	Special . . .	←	←
31	Award . . .	←	←
30	Multiplier Reset . . .	NO	YES
29	Special Replay . . .	1 Game	1 Ball
28	Coin Chute #3	See Catalog Or Label On Side Of Cabinet	
27		ON	OFF
26		3 Or 5	1
25		5	3
24	Special Allowed at 7x Multiplier . . .	ON	OFF
23	Add-A-Ball Feature . . .	ON	OFF
22	Maximum Add-A-Balls . . .	ON	OFF
21	Match Feature . . .	ON	OFF
20	Display Credits . . .	ON	OFF
19	Maximum Credit . . .	←	←
18		←	←
17	Not Used . . .	ON	OFF
16	High Score . . .	←	←
15		←	←
14	Middle Drop Target Award . . .	YES	NO
13	Extra Ball Allowed . . .	NO	YES
12	Coin Chute #2	See Catalog Or Label On Side Of Cabinet	
11		ON	OFF
10		5	3
9		Replay	X-Ball
8	Background Sound . . .	ON	OFF
7	Ball Per Game . . .	5	3
6	High Score Feature . . .	ON	OFF
5	Not Used . . .	ON	OFF
4	Coin Chute #1	See Catalog Or Label On Side Of Cabinet	
3		ON	OFF
2		ON	OFF
1		ON	OFF

SECTION VII. CREDIT/COIN AND GAME ADJUSTMENTS

CREDITS/COIN ADJUSTMENTS:

The credits given are selectable by means of MPU switches. Sixteen credit ratios are available. The MPU switch settings and resultant credits/coin are as follows:

TABLE 7-1. CREDITS/COIN ADJUSTMENTS

MPU SWITCHES										
SWITCH No. 1 (BLU) (NEXT TO HINGE)	4	3	2	1						
SWITCH No. 2 (BRN-WHITE) (CENTER)	12	11	10	9						
SWITCH No. 3 (RED-WHITE) (NEXT TO LOCK)	28	27	26	25	CREDITS	COIN				
OFF	OFF	OFF	OFF	OFF 1	} Per 1				
OFF	OFF	OFF	ON	OFF 2					
OFF	OFF	ON	OFF	OFF 3					
OFF	OFF	ON	ON	OFF 4					
OFF	ON	OFF	OFF	OFF 5					
OFF	ON	OFF	ON	OFF 6					
OFF	ON	ON	OFF	OFF 7					
OFF	ON	ON	ON	OFF 10					
ON	OFF	OFF	OFF	OFF 14					
					CREDITS		COINS	SEQUENCE OF CREDITS PER COIN		
							1	2	3	4
ON	OFF	OFF	ON	ON 1 2	0	1		
ON	OFF	ON	OFF	OFF 3 2	1	2		
ON	OFF	ON	ON	ON 5 2	0	5		
ON	ON	OFF	OFF	OFF 7 2	0	7		
ON	ON	OFF	ON	ON 3 4	0	1	0	2
ON	ON	ON	OFF	OFF 5 4	1	1	1	2
ON	ON	ON	ON	ON 7 4	1	2	1	3

If two or three coin chutes are adjusted the same for multiple coins, credits will increase as if dropped in same chute.

Credit sequence will reset when:

- 1) credit button is pressed
- 2) any points are scored

BALLS FOR GAME:

NO. OF BALLS PER GAME
3
5

MPU SWITCH 7
OFF
ON

CREDIT DISPLAY:

CREDIT DISPLAY
YES
NO

MPU SWITCH 20
ON
OFF

AWARDED MAXIMUM CREDITS:

In answer to public demand, we at "STERN" are trying to give the players what they want—MORE playfield excitement. In order to do this, additional features are NEEDED.

In an effort to do so, we have added a coil on the playfield and eliminated the "COIN LOCK OUT COIL."

This Stern game has a new feature not used in any previous Stern pinball: Coins will be accepted and credit for the amount of coins inserted.

There are no MPU switches to limit the amount of credits given as in older Stern pinballs (it is even possible to attain 99 credits). There are, however, two (2) MPU switches that will limit the amount of replays awarded. These two switches can be set for a limit of 10, 15, 25, and 40 replays. If the amount of credits shown in the credit/match window is greater than the MPU switches are set for, no replay credit will be awarded.

AWARDED MAXIMUM CREDITS	MPU SWITCHES	
	18	19
10	OFF	OFF
15	ON	OFF
25	OFF	ON
40	ON	ON

HIGH SCORE FEATURE:

The game is designed to award an "Extra Ball" or "Free Game" at one, two or three "High Score" levels. (See "Front Door Game Adjustments" for setting levels.)

AWARD
Extra Ball
Replay

MPU SWITCH 6
OFF
ON

BACKGROUND SOUND:

The background sound during game play can be controlled as follows:

SOUND
ON
OFF

MPU SWITCH 8
ON
OFF

EXTRA BALL:

EXTRA BALL ALLOWED
ON
OFF

MPU SWITCH 13
ON
OFF

MIDDLE DROP TARGET AWARD:

Middle Drop Target knocked down awards (Special or Extra Ball) if lit.

AWARD
YES
NO

MPU SWITCH 14
ON
OFF

SPECIAL REPLAY:

1 Per Game
1 Per Ball

MPU SWITCH 29
ON
OFF

HIGH GAME TO DATE FEATURE:

The game is designed to award up to 3 free games when "High Score to Date" is beat. Each time this happens, the winning score becomes the new "High Game Score to Beat". This score is displayed on all 4 player score displays at the end of each game as an incentive to play.

AWARD	MPU SWITCHES	
	15	16
No Free Game	OFF	OFF
1 Free Game	ON	OFF
2 Free Games	OFF	ON
3 Free Games	ON	ON

MATCH FEATURE:

When the "Match Feature" is ON, a random tens digit number appears in the "Match/Ball in Play" window and the word "Match" is illuminated. If the number matches the ten digit in a player's score, a free game is awarded. The "Match Feature" creates an incentive to play.

MATCH	MPU SWITCH 21
ON	ON
OFF	OFF

SPECIAL AWARD:

AWARD	MPU SWITCHES	
	31	32
No Award	OFF	OFF
Extra Ball	OFF	ON
100,000 Points	ON	OFF
Replay	ON	ON

ADD-A-BALL (Memory):

This adjustment can store in memory 1, 3 and 5 "Add-A-Balls."

NUMBER OF BALLS	MPU SWITCHES	
	22	23
1	OFF	OFF
3	OFF	ON
5	ON	ON

7X SPECIAL:

7X MULTIPLIER LIT AWARDS SPECIAL	MPU SWITCH 24
ON	ON
OFF	OFF

MULTIPLIER RESET:

OPTION	MPU SWITCH 30
NO	ON
YES	OFF

SPINNER (Pl. Sw. No. 5)

Scores 100 points and 200 points for each lit multiplier up to 1,200 points.

RIGHT & LEFT THUMPER BUMPERS (Pl. Sw. 9 [lt.] & Pl. Sw. 10 [rt.])

Scores 100 points on 5-ball and 1,000 points on 3-ball.

RIGHT & LEFT SLINGSHOTS (Pl. Sw. 11 [lt.] & Pl. Sw. 12 [rt.])

Scores 10 points and alternates extra ball and special lamps.

LEFT DROP TARGET BANK (Pl. Sw. 13 [lt.], Pl. Sw. 14 [mid.], Pl. Sw. 15 [rt.])

Scores 1,000 each and advances bonus—maximum 100,000 points. Scores 20,000 points when all three targets are dropped.

LEFT ROLLOVER BUTTON (Pl. Sw. 16)

Scores 5,000 points and 2,000 points for each left lane lamp lit.

STAND UP TARGETS 1-9 (Pl. Sw. 17, 18 and 26 thru 32)

Scores 500 points and 3,000 points when lit and lites left lane lamps. All 9 lamps lit, lites extra ball lamp.

RIGHT DROP TARGET BANK (Pl. Sw. 19 [lt.], Pl. Sw. 20 [mid.], & Pl. Sw. 21 [rt.])

Scores 1,000 points each and advances bonus—maximum 100,000 points. Scores 15,000 points when all three targets are dropped.

MIDDLE DROP TARGET BANK (Pl. Sw. 22 [lt.], Pl. Sw. 23 [mid.], & Pl. Sw. 24 [rt.])

Scores 1,000 points each and advances bonus—maximum 100,000 points. Scores 10,000 points when all three targets are dropped.

LEFT, UPPER RIGHT & LOWER RIGHT 10 POINT BUMPERS (Pl. Sw. 25, 39 & 40)

Scores 10 points and alternates extra ball and special lamps.

OUTHOLE (Pl. Sw. 33)

Counts down bonus and advances players.

RIGHT & LEFT OUT LANES (Pl. Sw. 35 & 36)

Scores 5,000 points.

RIGHT & LEFT RETURN LANES (Pl. Sw. 37 & 38)

Scores 2,000 points and advances bonus.

PARTS LIST

DRAGON FIST

MISCELLANEOUS

	PART NUMBER
Transformer (Domestic or Export)	16B-6
Transformer & Rectifier Board	B438-4
Bulbs, 344	8A-101
U1	E-153-U1-D8
U2	E-153-U2-D8
U5	E-153-U5-D8
U6	E-153-U6-D8

ASSEMBLY COILS (DIODES ON COILS ARE IN 4004)

3 Drop Target Bank (3)	B-27-2300
Flippers (2)	J-25-475/34-4500
Slingshot (2)	J-26-1500
Ball Ejector	J-28-2300
Knocker	N-26-1200
Thumper Bumper (2)	J-26-1200

MODULES

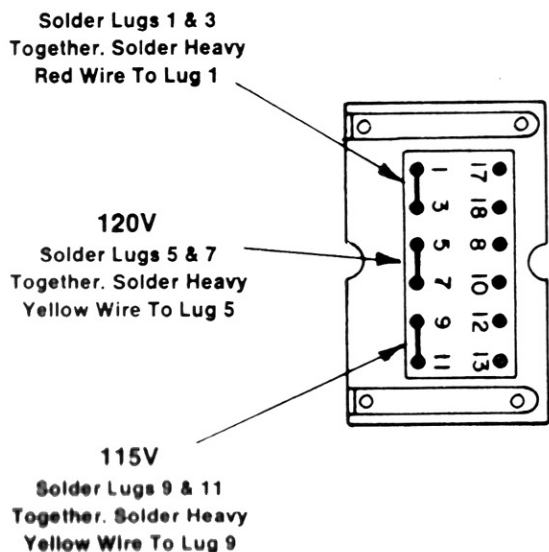
Lamp Driver	B-431
Display Driver	A-645
Match & Ball in Play Display	A-434
Solenoid Driver/Voltage Regulator	B-432
MPU (FOR E PROM SEE MISCELLANEOUS ABOVE)	C-602
Rectifier Board	A-430
Sound Module	C-605

PLAYFIELD PARTS

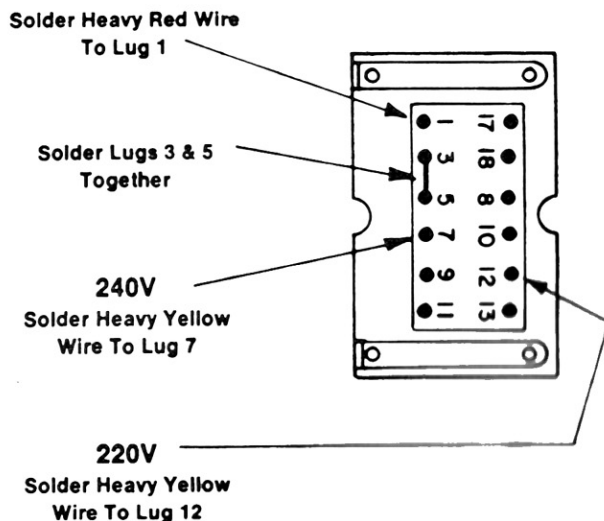
SEE PLAYFIELD DIAGRAM

FIGURE 8-1. STERN 16B-6 TRANSFORMER WIRING CONNECTION INSTRUCTIONS

115/120V., 50/60 Cycle Input.
Varistor - Soldered to Line Filter on Left Side of Cabinet
Must Be Stern Part No. 25A-18-1.

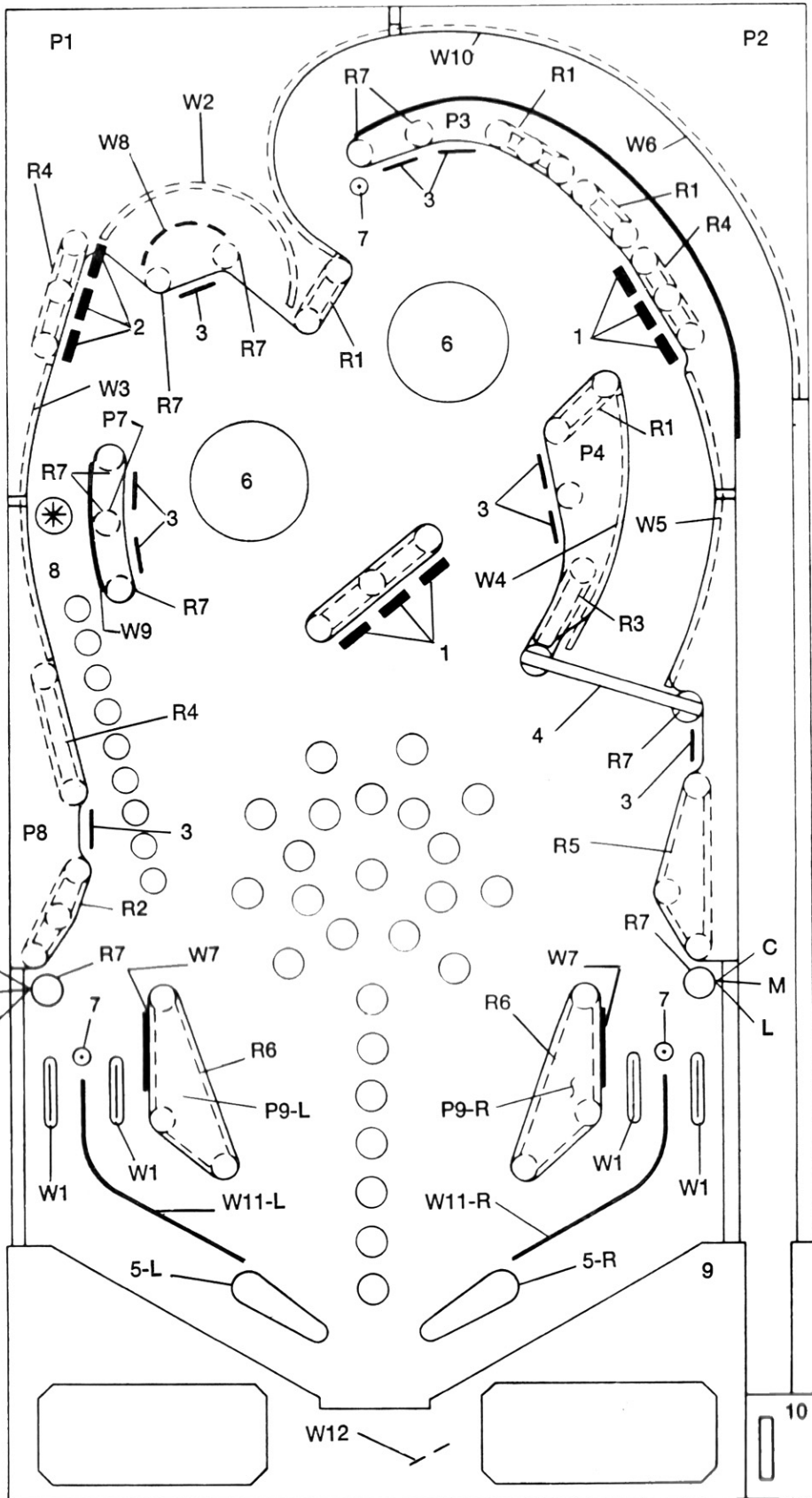


220/240V., 50/60 Cycle Input.
Varistor - Soldered to Line Filter on Left Side of Cabinet
Must be Stern Part No. 25A-18-2.



DRAGON FIST

PLAYFIELD PARTS



RUBBER RINGS

R1-7A-120-125	R5-7A-120-250
R2-7A-120-150	R6-7A-120-300
R3-7A-120-175	R7-7A-135
R4-7A-120-200	

BALL GUIDES & ROLL-OVERS

W1-A-149	W8-6A-313
W2-A-2071	W9-6A-314
W3-A-2072	W10-6B-315
W4-A-2073	W11-6A-316
W5-A-2074	(L&R)
W6-A-2075	W12-A-860
W7-6A-101	

PLASTIC SHIELDS

13C-153-1 to -9
(P1 to P9)

MISC. PARTS & ASSEMBLIES

1. 3-Bank Drop Target
D-823-3K (Targets Alone
4B-195-3R)
2. 3-Bank Drop Target
D-2085-3A (Targets Alone
4B-195-3R)
3. (9) Stand-Up Targets
A-722-L-2
4. Spin Target Assembly
A-563-4
5. Flipper Assembly
B-634-1-LY & -RY
6. Thumper Cap 4A-317-R
7. Ball Guide Post 2A-200
(Rubber Ring 7A-125)
8. Roll Over Button
4B-275
9. Instruction Plate 14B-3-7
10. Shooter Gauge 14A-2-16

POST ADJUSTMENT

C-CONSERVATIVE
M-MEDIUM
L-LIBERAL

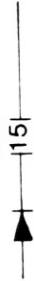
DRAGON FIST

SWITCH IDENTIFICATION

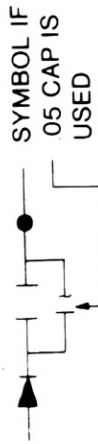
SWITCH
SYMBOL



SWITCH
NO.



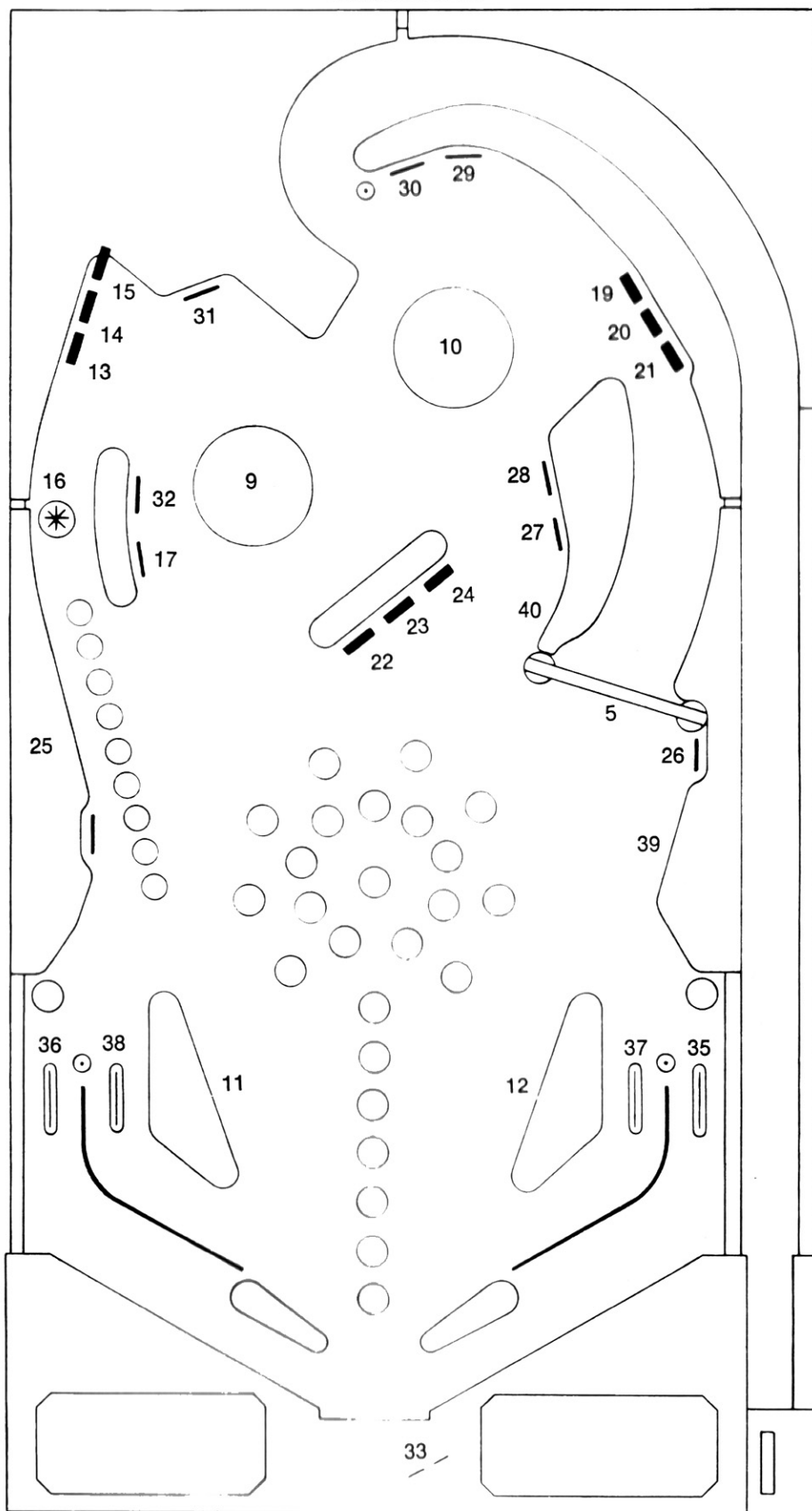
SWS. #1, 2, & 3 NO DIODE
ALL OTHER SWITCHES USE
DIODE IN4004



SWITCH NO.	WIRE COLOR	JACK NO.	DESCRIPTION
1	BLU	J3-9	COIN CHUTE #1
2	BRN-W	J3-10	COIN CHUTE #2
3	R-W	J3-11	COIN CHUTE #3
4	W-B	J2-11	SPINNER
5	W-G	J2-12	CREDIT (START) BUTTON
6	BLU-W	J3-14	TILT
7	BLU-O	J3-15	SLAM
8	-Y-	J3-16	SLAM
9	BRN	J2-8	LEFT THUMPER BUMPER
10	GREY	J2-9	RIGHT THUMPER BUMPER
11	W-O	J2-10	LEFT SLINGSHOT
12	W-B	J2-11	RIGHT SLINGSHOT
13	W-G	J2-12	LEFT D.T. (LEFT)
14	W-BRN	J2-13	LEFT D.T. (MIDDLE)
15	BRN-Y	J2-14	LEFT D.T. (RIGHT)
16	-O-	J2-15	LEFT ROLLOVER BUTTON
17	BRN	J2-8	LEFT 10 POINT BUMPER
18	GREY	J2-9	STAND UP TARGET
19	W-O	J2-10	STAND UP TARGET
20	W-B	J2-11	STAND UP TARGET
21	W-G	J2-12	STAND UP TARGET
22	W-BRN	J2-13	STAND UP TARGET
23	BRN-Y	J2-14	STAND UP TARGET
24	-O-	J2-15	STAND UP TARGET
25	BRN	J2-8	LEFT 10 POINT BUMPER
26	GREY	J2-9	STAND UP TARGET
27	W-O	J2-10	STAND UP TARGET
28	W-B	J2-11	STAND UP TARGET
29	W-G	J2-12	STAND UP TARGET
30	W-BRN	J2-13	STAND UP TARGET
31	BRN-Y	J2-14	STAND UP TARGET
32	-O-	J2-15	STAND UP TARGET
33	BRN	J2-8	OUTHOLE
34	GREY	J2-9	OUTHOLE
35	W-O	J2-10	RIGHT OUTLANE
36	W-B	J2-11	LEFT OUTLANE
37	W-G	J2-12	RIGHT FLIPPER RETURN LANE
38	W-BRN	J2-13	LEFT FLIPPER RETURN LANE
39	BRN-Y	J2-14	LOWER RIGHT 10 POINT BUMPER
40	-O-	J2-15	UPPER RIGHT 10 POINT BUMPER

DRAGON FIST

SWITCHES



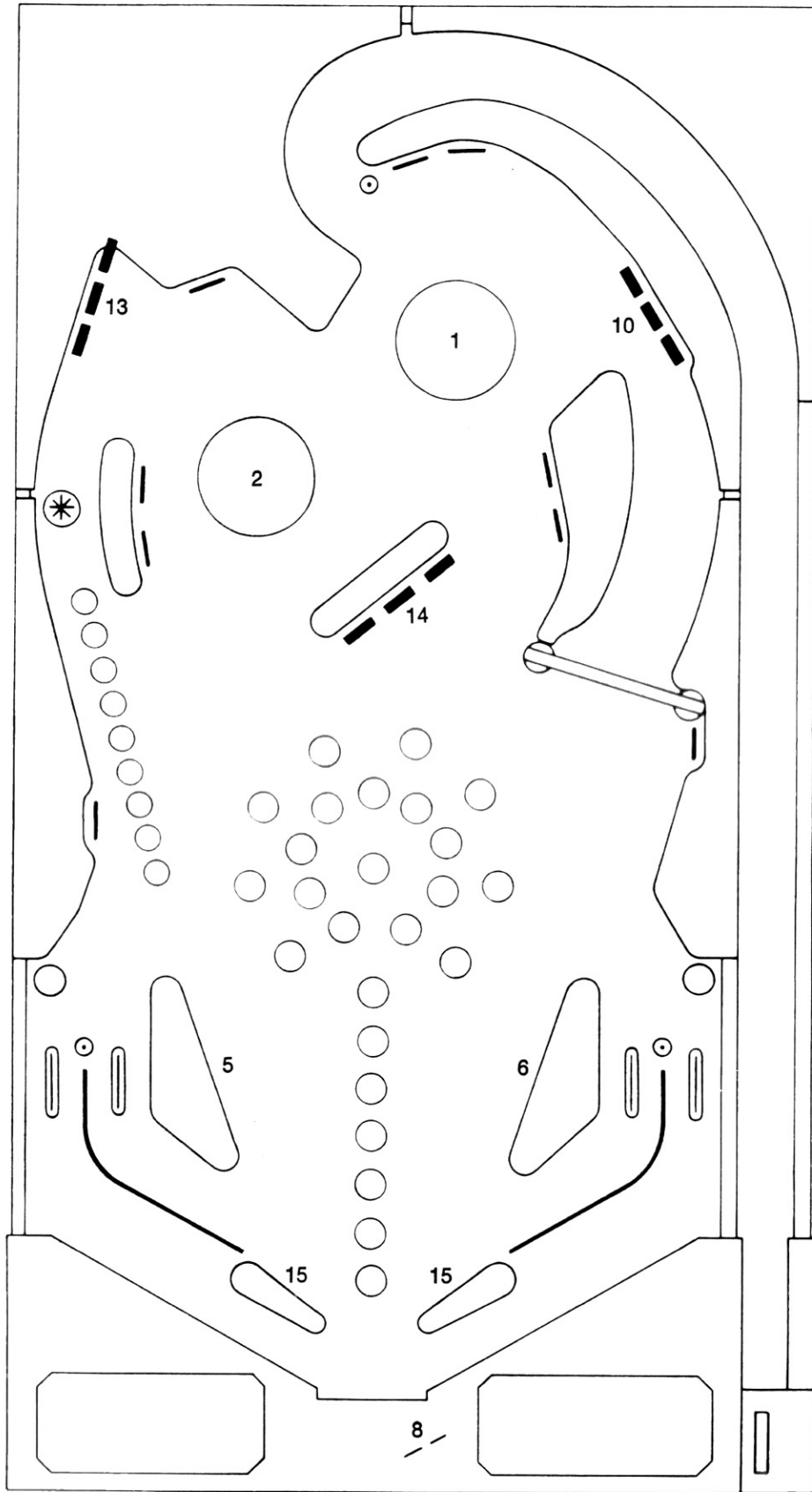
SWITCHES NOT ON PLAYFIELD

- | | |
|------------------|------------------|
| 1. *LEFT CHUTE | 6. CREDIT BUTTON |
| 2. *CENTER CHUTE | 7. TILT |
| 3. *RIGHT CHUTE | |

* SEE DRAWG. ON SWITCH IDENTIFICATION PAGE

DRAGON FIST

SOLENOIDS



SOLENOID NOT ON PLAYFIELD

3. KNOCKER

TABLE 8-3. DRAGON FIST SOLENOID IDENTIFICATION

I.D. NUMBER	TRANS. NUMBER	JACK	WIRE COLOR	DESCRIPTION
1	Q1	J2-9	G-O	RIGHT THUMPER BUMPER
2	Q2	J2-4	G-BLU	LEFT THUMPER BUMPER
3	Q3	J2-5	G-B	KNOCKER
4	Q4	J1-5	B-BLU	
5	Q5	J2-10	G-Y	LEFT SLINGSHOT
6	Q6	J2-11	G-R	RIGHT SLINGSHOT
7	Q7	J2-12	R-Y	
8	Q8	J5-10	B-O	OUTHOLE
9	Q9	J5-9	R-BLU	
10	Q10	J5-15	O-W	DROP TARGET RESET BANK RIGHT
11	Q11	J5-14	O-B	
12	Q12	J5-13	O-G	
13	Q13	J5-12	B-Y	DROP TARGET RESET BANK LEFT
14	Q14	J5-11	B-G	DROP TARGET RESET BANK MIDDLE
15	Q15	J1-8	8-G	FLIPPER ENABLE RELAY
		J1-9	9-O	
16	Q16	N/U	N/U	
17	Q17	N/U	N/U	
18	Q18	J2-15	R-W	
19	Q19	N/U	N/U	

TABLE 8-4. MPU-200 JUMPER COMBINATIONS

The MPU-200 can be converted to use 25A Roms or E-Proms or any combination of Roms or E-Proms. Below are listed the jumpers needed for each memory chip.

<p style="text-align: center;">U1</p> <p>ROM Stern #25A- _____</p> <p>E9 to E8</p> <p>E28 to E26</p>	<p style="text-align: center;">U5</p> <p>ROM _____</p> <p>E19 to E20</p> <p>E29 to E31</p>	
<p style="text-align: center;">U2</p> <p>E-PROMS (paper on top)</p> <p>E9 to E10</p> <p>E28 to E27</p>	<p style="text-align: center;">U6</p> <p>E-PROM</p> <p>E19 to E21</p> <p>E29 to E30</p>	
<p>ROM _____</p> <p>E5 to E1</p> <p>E2 to E6</p>	<p>E-PROM</p> <p>E5 to E7</p> <p>E2 to E3</p>	
	<p>ROM _____</p> <p>E13 to E12</p> <p>E25 to E22</p>	<p>E-PROM</p> <p>E13 to E14</p> <p>E25 to E23</p>

The MPU-200 can be down graded to act as a MPU-100 (Rom's Only) following are jumper modifications:

- Remove - E32 - E33
- Remove - E34 - E35

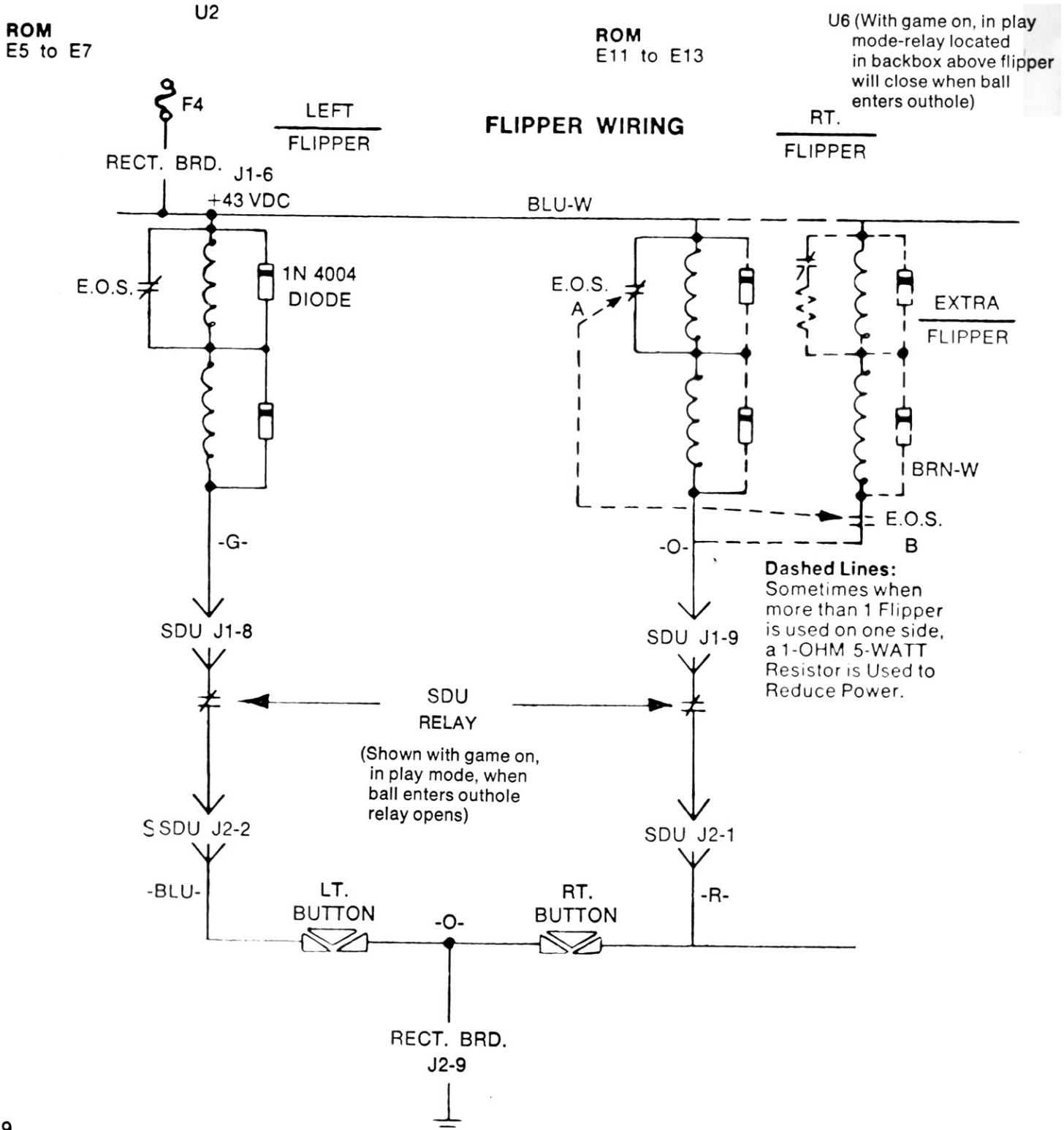


FIGURE 8-4. ADDITIONAL FLIPPER WIRING

NOTES



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