

DRAGONFIST

2



STERN

SEEBURG

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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

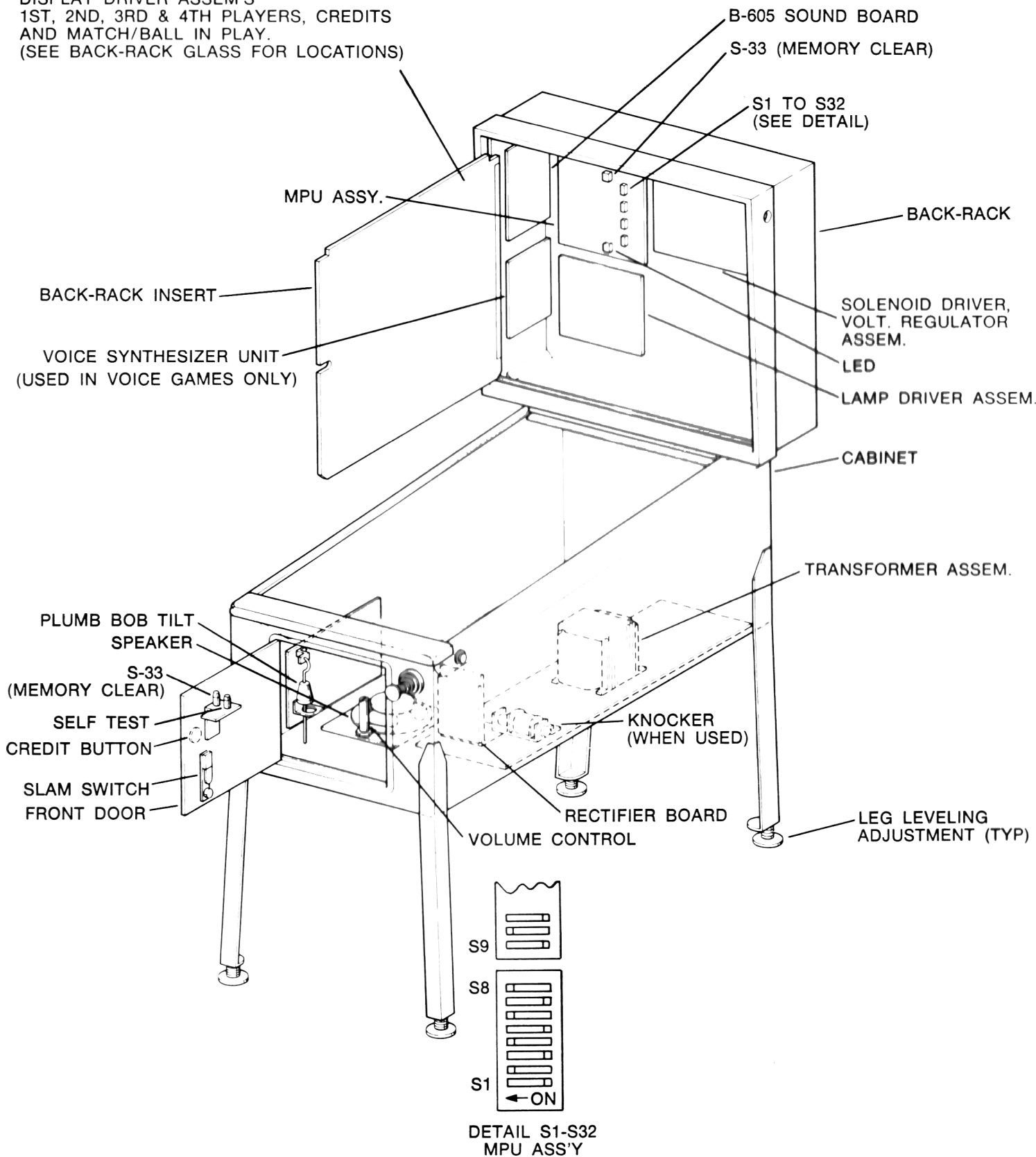
All contact switches should be adjusted to have a gap $1/16''$ in the open position, and have $.010''$ overtravel closed. All contact switches (except for flipper buttons & flipper end of stroke switches) are gold plated to resist corrosion and, **SHOULD NOT BE FILED OR BURNISHED**. If contacts have 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)



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 . . .	<table><tr><th>NONE</th><th>X BALL</th><th>100K</th><th>REPLAY</th></tr><tr><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr></table>	NONE	X BALL	100K	REPLAY	OFF	ON	OFF	ON	←	←				
NONE	X BALL	100K	REPLAY													
OFF	ON	OFF	ON													
31	Award . . .	<table><tr><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr></table>	OFF	OFF	ON	ON	←	←								
OFF	OFF	ON	ON													
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																
26																
25																
24	Special Allowed at 7x Multiplier . . .		ON	OFF												
23	Add-A-Ball Feature . . .		3 Or 5	1												
22	Maximum Add-A-Balls . . .		5	3												
21	Match Feature . . .		ON	OFF												
20	Display Credits . . .		ON	OFF												
19	Maximum Credit . . .	<table><tr><th>10</th><th>15</th><th>25</th><th>40</th></tr><tr><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr><tr><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr></table>	10	15	25	40	OFF	OFF	ON	ON	OFF	ON	OFF	ON	←	←
10	15	25	40													
OFF	OFF	ON	ON													
OFF	ON	OFF	ON													
18			←	←												
17	Not Used . . .		ON	OFF												
16	High Score . . .	<table><tr><th>0</th><th>1</th><th>2</th><th>3</th></tr><tr><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr><tr><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td></tr></table>	0	1	2	3	OFF	OFF	ON	ON	OFF	ON	OFF	ON	←	←
0	1	2	3													
OFF	OFF	ON	ON													
OFF	ON	OFF	ON													
15	Feature . . .		←	←												
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																
10																
9																
8	Background Sound . . .		ON	OFF												
7	Ball Per Game . . .		5	3												
6	High Score Feature . . .		Replay	X-Ball												
5	Not Used . . .															
4	Coin Chute #1		See Catalog Or Label On Side Of Cabinet													
3																
2																
1																

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

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

10
 15
 25
 40

MPU SWITCHES

18	19
OFF	OFF
ON	OFF
OFF	ON
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

No Free Game
1 Free Game
2 Free Games
3 Free Games

MPU SWITCHES

15	16
OFF	OFF
ON	OFF
OFF	ON
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

ON
OFF

MPU SWITCH 21

ON
OFF

SPECIAL AWARD:

AWARD

No Award
Extra Ball
100,000 Points
Replay

MPU SWITCHES

31	32
OFF	OFF
OFF	ON
ON	OFF
ON	ON

ADD-A-BALL (Memory):

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

NUMBER OF BALLS

1
3
5

MPU SWITCHES

22	23
OFF	OFF
OFF	ON
ON	ON

7X SPECIAL:

7X MULTIPLIER LIT AWARDS SPECIAL

ON
OFF

MPU SWITCH 24

ON
OFF

MULTIPLIER RESET:

OPTION

NO
YES

MPU SWITCH 30

ON
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

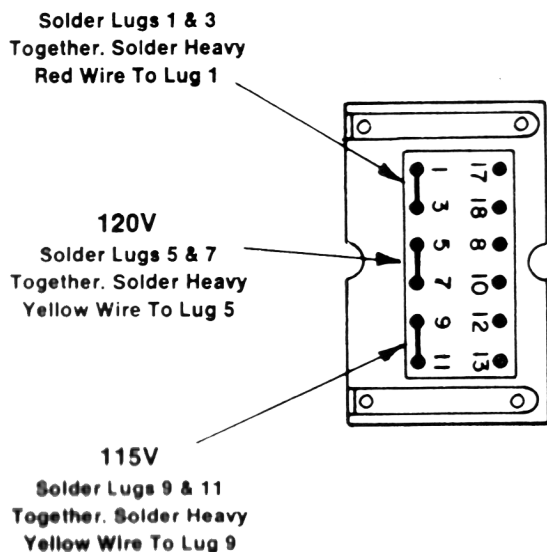
Lamp Driver	B-431
Display Driver	A-645
Match & Ball in Play Display	A-434
Solenoid Driver/Voltage Regulator	B-432
MPU (FOR E PROM SEE MISCELLANEOUS ABOVE)	C-602
Rectifier Board	A-430
Sound Module	C-605

PLAYFIELD PARTS

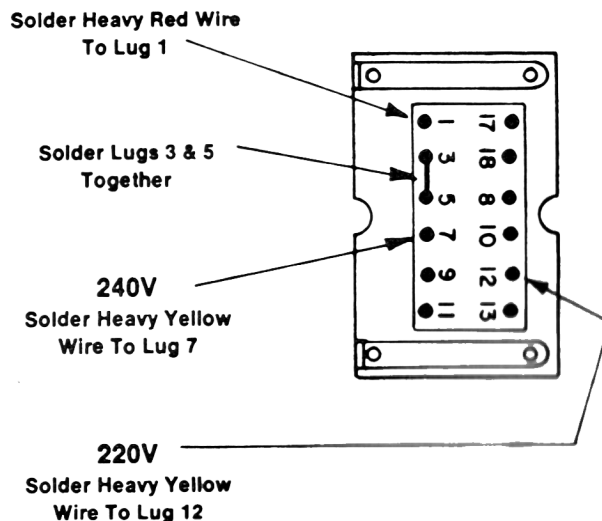
SEE PLAYFIELD DIAGRAM

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.

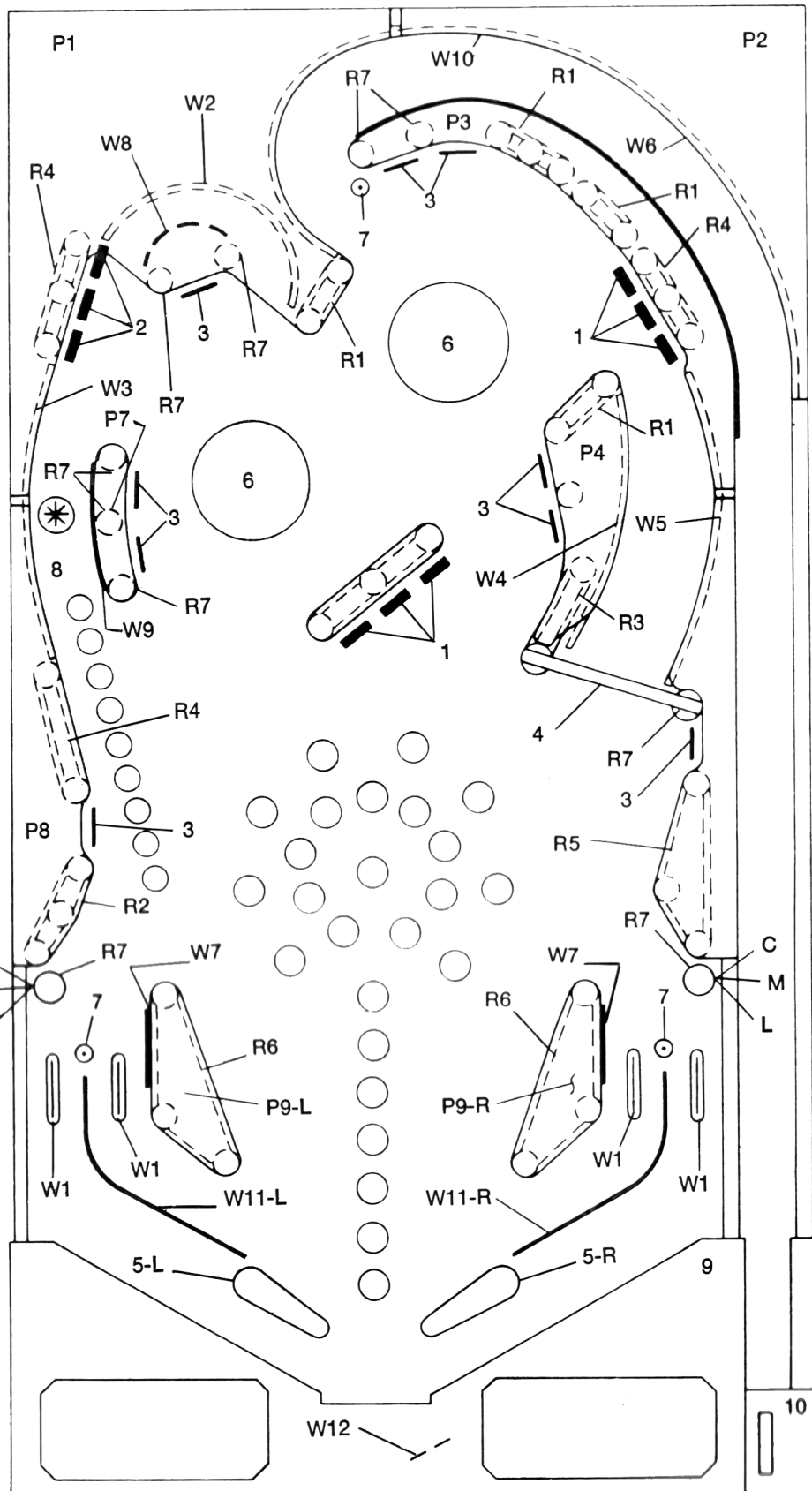


220/240V., 50/60 Cycle Input.
Varistor - Soldered to Line Filter on Left Side of Cabinet
Must be Stern Part No. 25A-18-2.



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

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

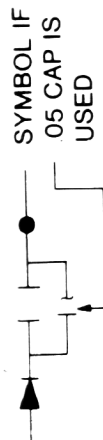
POST ADJUSTMENT

C-CONSERVATIVE
M-MEDIUM
L-LIBERAL

DRAGON FIST SWITCH IDENTIFICATION



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

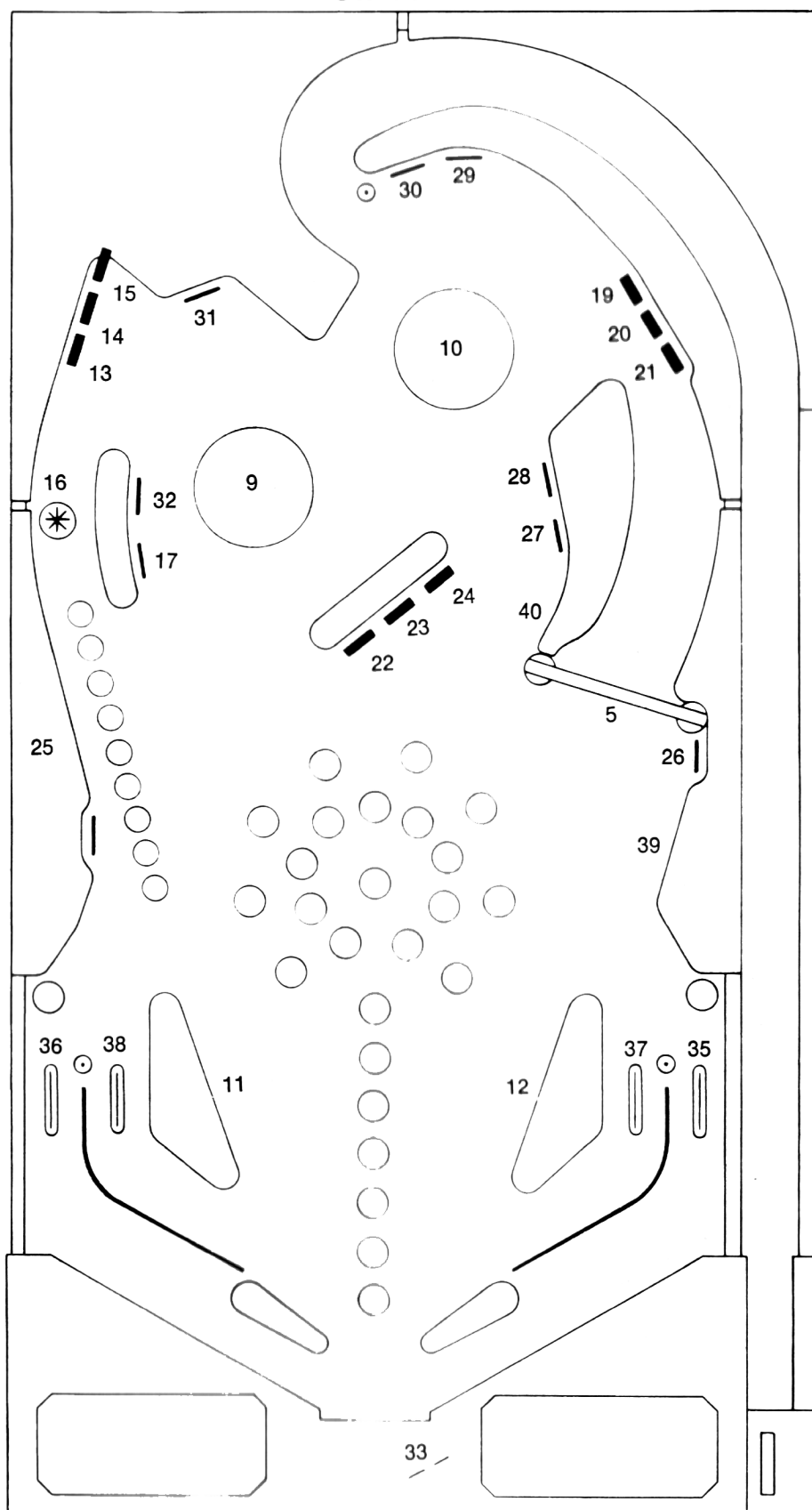


W-BLU (J2-3)	17	*	BRN	J2-8	• STAND UP TARGET
W-Y (J2-4)	18	*	GREY	J2-9	• STAND UP TARGET
	19		W-O	J2-10	• RIGHT D.T. (LEFT)
	20		W-B	J2-11	• RIGHT D.T. (MIDDLE)
	21		W-G	J2-12	• RIGHT D.T. (RIGHT)
	22		W-BRN	J2-13	• MIDDLE D.T. (LEFT)
	23		BRN-Y	J2-14	• MIDDLE D.T. (MIDDLE)
	24		-O-	J2-15	• MIDDLE D.T. (RIGHT)
Y-R (J2-5)	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
J2-8	133		BRN	J2-8	• OUTHOLE
	134		GREY	J2-9	•
	135		W-O	J2-10	• RIGHT OUTLANE
	136		W-B	J2-11	• LEFT OUTLANE
	137		W-G	J2-12	• RIGHT FLIPPER RETURN LANE
	138		W-BRN	J2-13	• LEFT FLIPPER RETURN LANE
	139		BRN-Y	J2-14	• LOWER RIGHT 10 POINT BUMPER
	140		-O-	J2-15	• UPPER RIGHT 10 POINT BUMPER

W-R (J2-1)	1		BLU	J3-9	• COIN CHUTE #1
R-Y (J3-3)	2		BRN-W	J3-10	• COIN CHUTE #2
	3		R-W	J3-11	• COIN CHUTE #3
	4		W-B	J2-11	•
	5		W-G	J2-12	• SPINNER
	6		BLU-W	J3-14	• CREDIT (START) BUTTON
	7		BLU-O	J3-15	• TILT
	8		-Y-	J3-16	• SLAM
J2-8	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

DRAGON FIST

SWITCHES



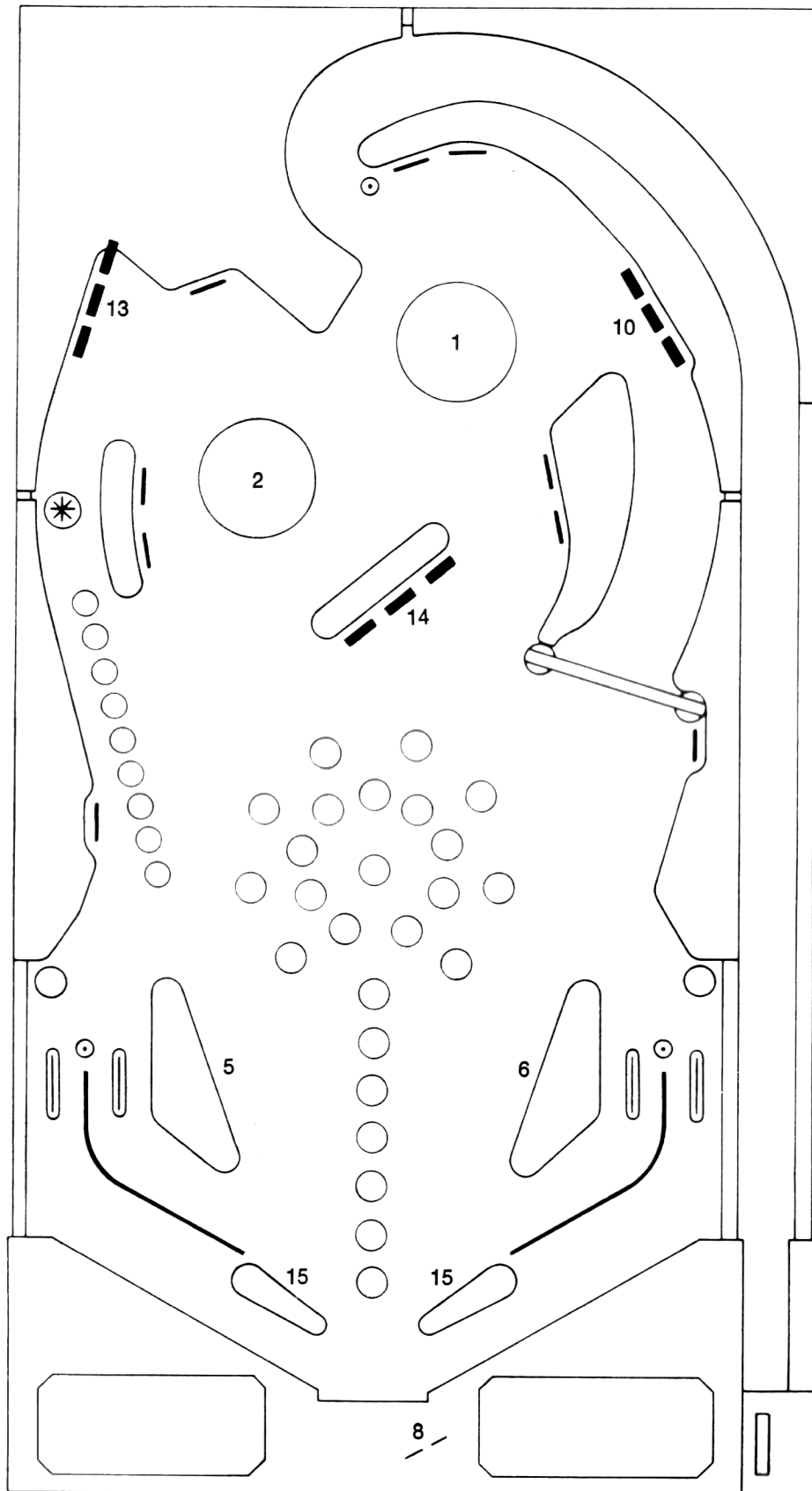
SWITCHES NOT ON PLAYFIELD

- | | |
|------------------|------------------|
| 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.

U1 ROM Stern #25A- E9 to E8 E28 to E26		E-PROMS (paper on top) E9 to E10 E28 to E27		U5 ROM E19 to E20 E29 to E31		E-PROM E19 to E21 E29 to E30	
U2 ROM E5 to E1 E2 to E6		E-PROM E5 to E7 E2 to E3		U6 ROM E13 to E12 E25 to E22		E-PROM E13 to E14 E25 to E23	

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

ROM
E5 to E7

ROM
E11 to E13

U6 (With game on, in play mode-relay located in backbox above flipper will close when ball enters outhole)

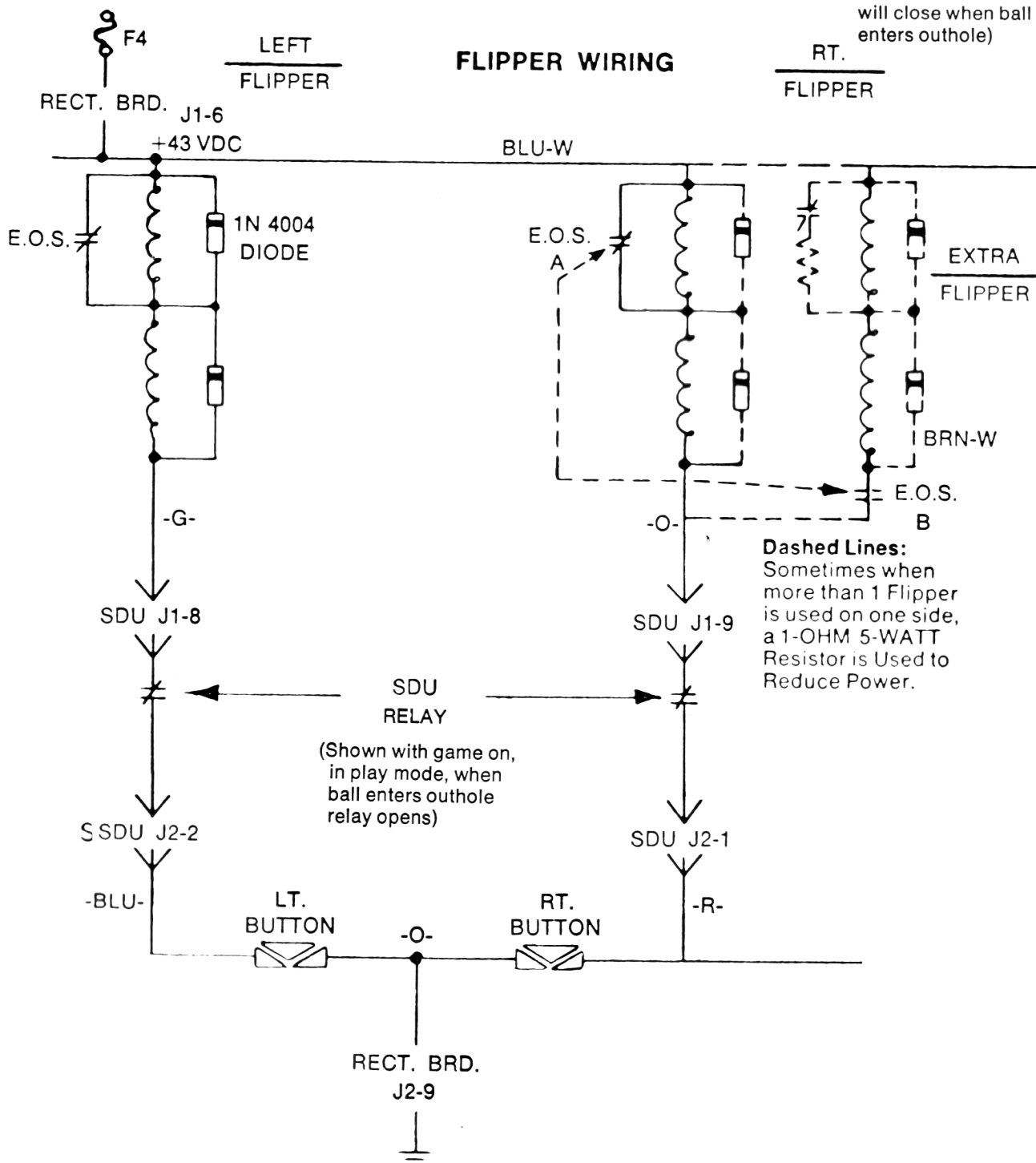
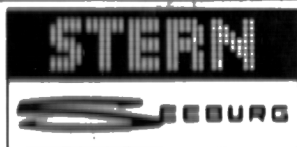
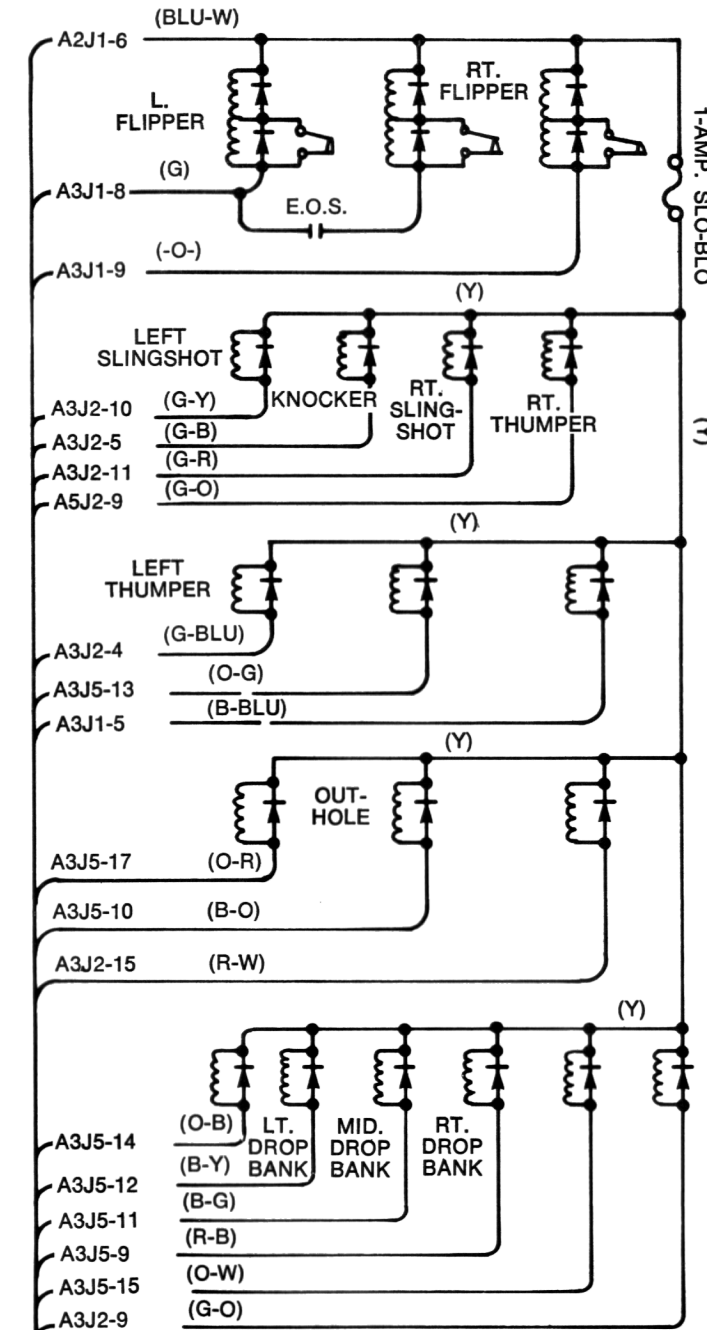
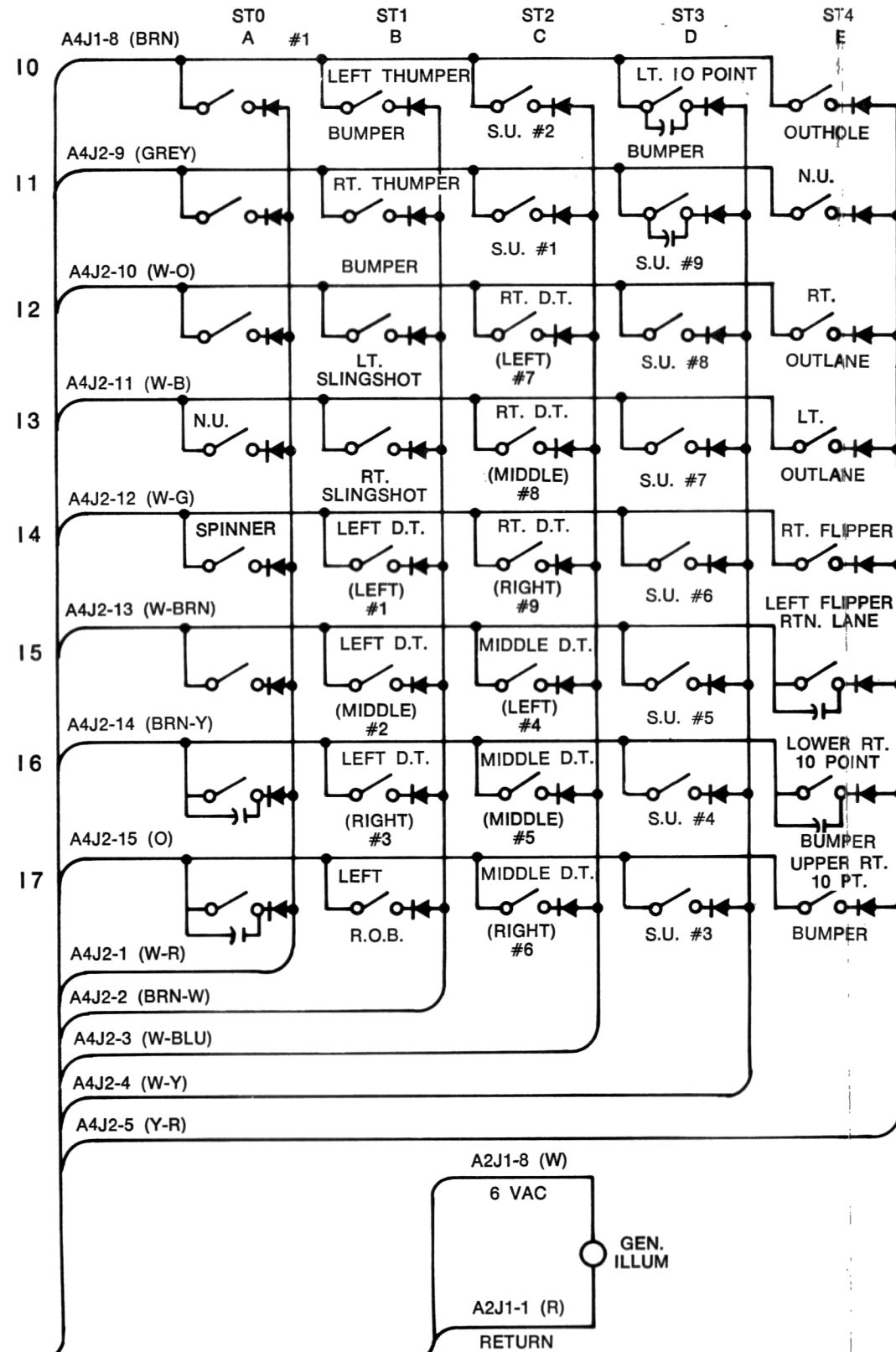


FIGURE 8-4. ADDITIONAL FLIPPER WIRING

NOTES



1725 Diversey Parkway, Chicago, Illinois 60614
(312) 935-4600, Telex 25-4657
Toll Free Service Assistance (800) 621-6424



R.O.W.=ROLL OVER WIRE
S.U.=STAND-UP TARGET
D.T.=DROP TARGET

1. KAS908 IS AN APPROVED ALTERNATE PART FOR TRANSISTOR G1-Q19.
2. PIN 1 OF J1 U104 IS EMITTER CONNECTED TO GROUND.
3. THE TAB ON 5E902 IS CONNECTED TO THE COLLECTOR OF THE TRANSISTOR.
4. LAST 'R' NUMBER USED R75
LAST 'C' NUMBER USED C29
LAST 'CR' NUMBER USED CR22
LAST 'U' NUMBER USED U4
LAST 'Q' NUMBER USED Q24



L. SLINGSHOT (G-Y)

RT. SLINGSHOT (G-R)

KNOCKER

8. OUTHOLE (B-O)

13 DROP BANK (B-Y)

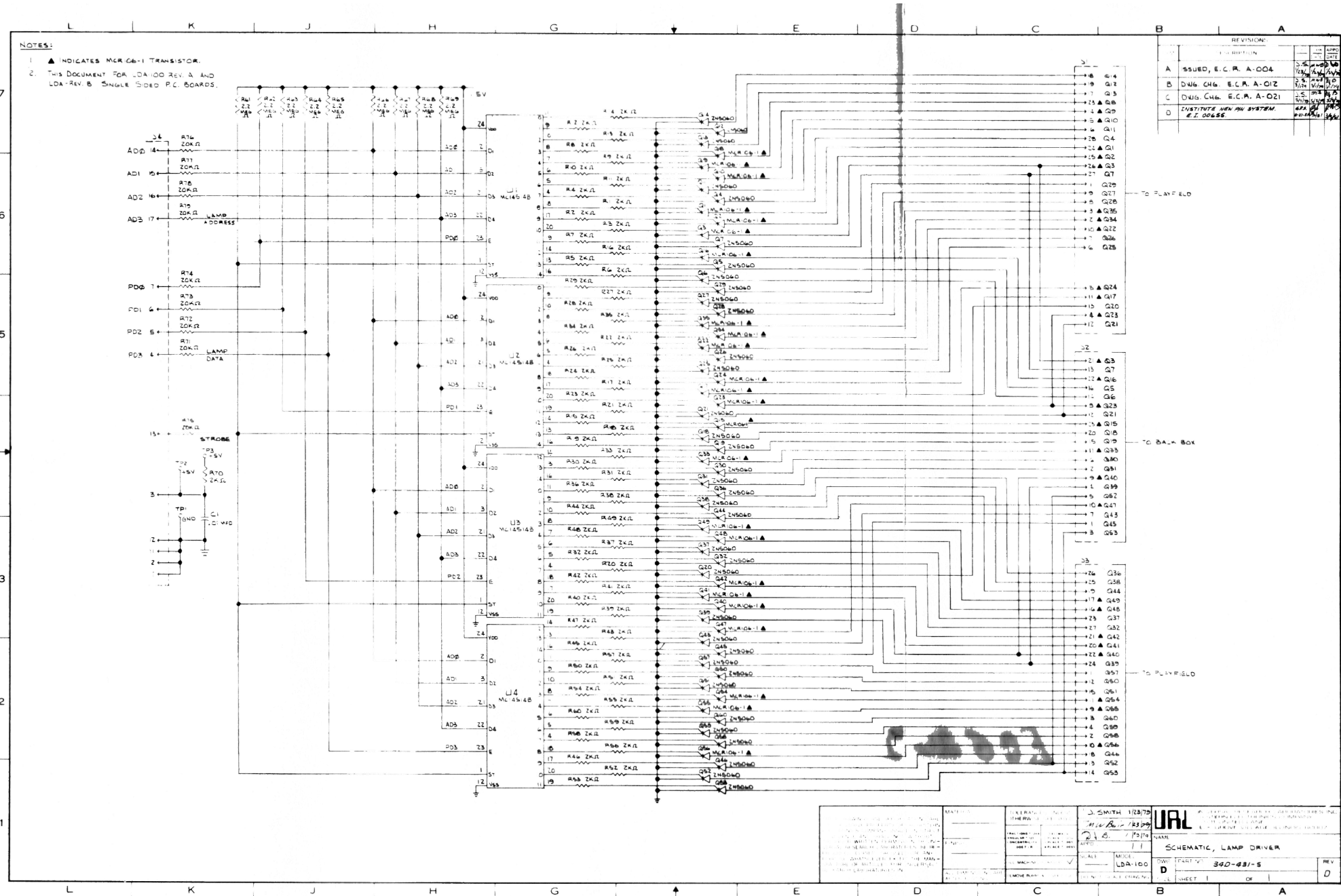
14 MID. DROP BANK (B-G)

9 RT. DROP BANK (R-BLU)



TP8	GROUND
TP7	PRE DRIVER BASE PROBE
TP6	DARLINGTON BASE PROBE
TP5	+13V DC Q20 UNREGULATED INPUT
TP4	+230V DC Q21 UNREGULATED INPUT
TP3	+5V DC BUS LINE
TP2	+185V DC Q21 REGULATOR OUTPUT
TP1	+5V DC Q20 REGULATOR OUTPUT
TEST POINT	CONNECTION

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	A. _____ B. _____ C. _____ D. _____ E. _____ F. _____ G. _____ H. _____ I. _____ J. _____ K. _____ L. _____ M. _____ N. _____ O. _____ P. _____ Q. _____ R. _____ S. _____ T. _____ U. _____ V. _____ W. _____ X. _____ Y. _____ Z. _____	DIMENSIONS AND TOLERANCES _____ FINISHES _____	DIMENSIONS AND TOLERANCES _____ FINISHES _____	J. SMITH 8/7/79 To Jack 9/9/79 M. 5/23/79 C. B. 9/8/79



DESCRIPTION	WIRE COLOR	JACK LDA	PIN NO.	TRAN- SISTOR	IC	PIN NO.	CODE
BONUS 1000	O-R	J1	18	Q14	U1	11	0000
BONUS 2000	R-Y	J1	1	Q29	U2	11	0000
BONUS 3000	GREY	J3	26	Q36	U3	11	0000
BONUS 4000	GREY-Y	J3	1	Q57	U4	11	0000
BONUS 6000	BLU-Y	J1	9	Q27	U2	9	0001
BONUS 7000	BLU-R	J3	25	Q38	U3	9	0001
BONUS 8000	BLU-W	J3	12	Q50	U4	9	0001
BONUS 9000	B-G	J1	17	Q13	U1	10	0010
BONUS 10K	G-W	J1	8	Q28	U2	10	0010
BONUS 20K	BRN-BLU	J3	19	Q44	U3	10	0010
BONUS 30K	W-B	J3	15	Q51	U4	10	0010
BONUS 40K	BLU-W	J1	23	Q8	U1	8	0011
BONUS 50K	R-G	J1	3	Q35	U2	8	0011
BONUS 60K	Y-BLU	J3	17	Q49	U3	8	0011
BONUS 70K	-W-	J3	11	Q54	U4	8	0011
BONUS 80K	GREY-O	J1	14	Q9	U1	7	0100
BONUS 90K	GREY	J1	2	Q34	U2	7	0100
BONUS 100K	O-BLU	J3	16	Q48	U3	7	0100
S.U. TARGET #1	O-B	J3	9	Q55	U4	7	0100
S.U. TARGET #2	GREY-Y	J1	15	Q10	U1	6	0101
S.U. TARGET #3	GREY-BLU	J1	10	Q22	U2	6	0101
S.U. TARGET #4	GREY-W	J3	23	Q37	U3	6	0101
S.U. TARGET #5	W-BLU	J3	3	Q60	U4	6	0101
LEFT X RIGHT	-B-	J1	16	Q11	U1	5	0110
LEFT X MIDDLE	Y-G	J1	7	Q26	U2	5	0110
LEFT X LEFT	O-W	J3	27	Q32	U3	5	0110
LEFT EXTRA BALL RIGHT	R-W	J3	4	Q59	U4	5	0110
LEFT EXTRA BALL MIDDLE	R-W	J1	28	Q4	U1	4	0111
LEFT EXTRA BALL LEFT	BRN-R	J1	6	Q25	U2	4	0111
LEFT LANE ROLL OVER #1	BLU-O	J3	13	Q20	U3	4	0111
LEFT LANE ROLL OVER #2	BRN-BLU	J1	24	Q1	U1	18	1000
LEFT LANE ROLL OVER #3	PUR-W	J1	5	Q24	U2	18	1000
LEFT LANE ROLL OVER #4	G-B	J3	21	Q42	U3	18	1000
LEFT LANE ROLL OVER #5	GREY-B	J3	10	Q56	U4	18	1000
LEFT LANE ROLL OVER #6	B-BLU	J1	25	Q2	U1	17	1001
LEFT LANE ROLL OVER #7	B-O	J1	11	Q17	U2	17	1001
LEFT LANE ROLL OVER #8	W-O	J3	20	Q41	U3	17	1001
LEFT LANE ROLL OVER #9	R-BLU	J3	18	Q46	U4	17	1001
SHOOT AGAIN	GREY-R	J1	26	Q3	U1	20	1010
MULTIPLIER 2X	B-R	J2	8	Q23	U2	20	1010
MULTIPLIER 3X	W-R	J2	9	Q40	U3	20	1010
MULTIPLIER 4X	B-Y	J2	5	Q52	U4	20	1010
MULTIPLIER 5X	GREY-G	J2	13	Q7	U1	19	1011
MULTIPLIER 6X	R-W	J2	12	Q21	U2	19	1011
MULTIPLIER 7X	PUR-B	J2	4	Q39	U3	19	1011
HIGH SCORE TO DATE	B-W	J2	3	Q53	U4	19	1011
GAME OVER	GREY-W	J2	11	Q33	U3	14	1100
TILT	GREY-BLU	J2	10	Q47	U4	14	1100
S.U. TARGET #6	-B-	J2	16	Q5	U1	13	1101
S.U. TARGET #7	-O-	J2	20	Q18	U2	13	1101
S.U. TARGET #8	-Y-	J2	6	Q30	U3	13	1101
S.U. TARGET #9	BLU-W	J2	7	Q43	U4	13	1101
SPECIAL #3 (RIGHT)	BRN-R	J2	14	Q6	U1	16	1110
SPECIAL #2 (MIDDLE)	O-BLU	J2	15	Q19	U2	16	1110
SPECIAL #1 (LEFT)	G-O	J2	2	Q31	U3	16	1110
MATCH	GREY-W	J2	1	Q45	U4	16	1110