

Bally

GAME 1074 - E

NIGHT RIDER

ELECTRONIC



Bally MANUFACTURING CORPORATION

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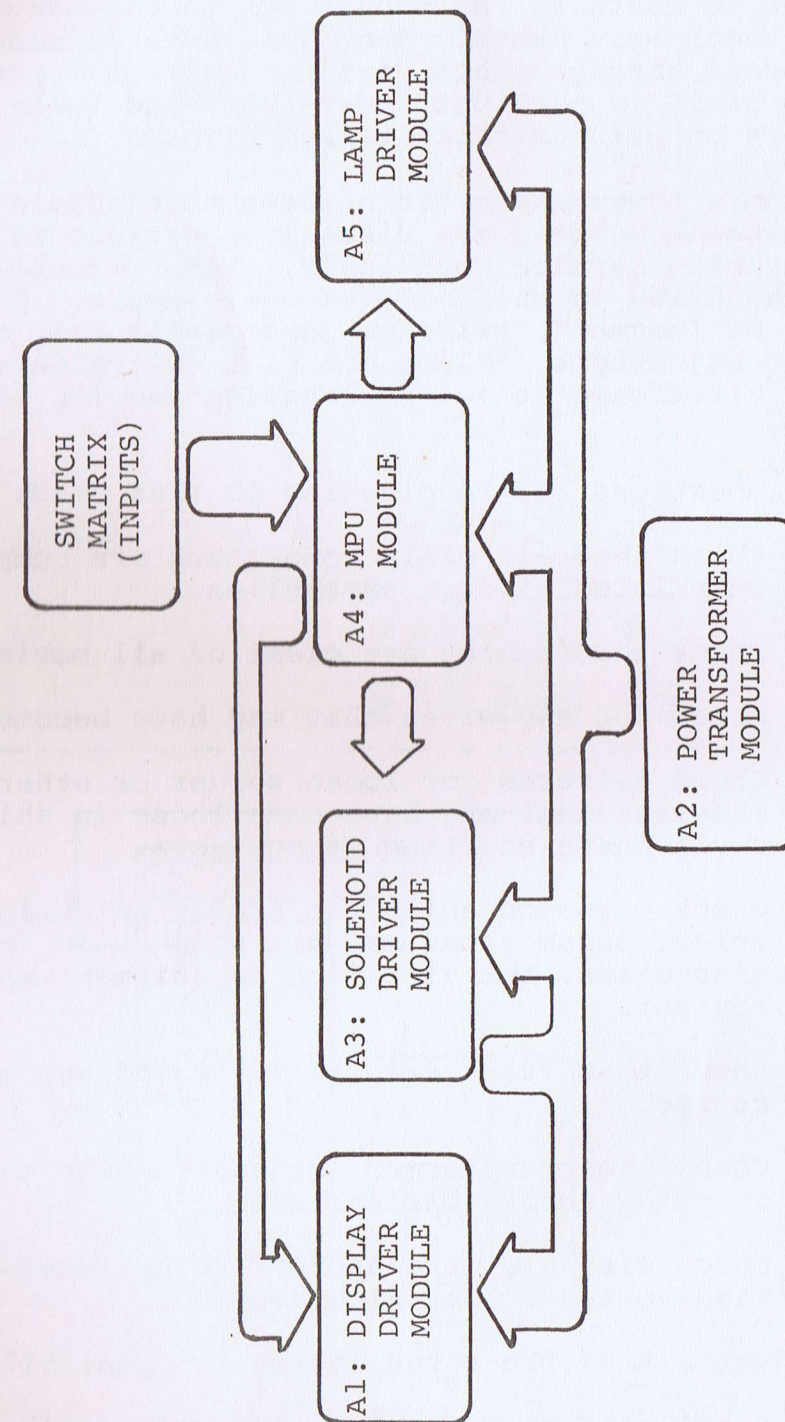
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INSTALLATION AND GENERAL GAME OPERATION INSTRUCTIONS

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BLOCK DIAGRAM - ELECTRONIC PINBALL GAME

I. INSTALLATION

Assemble the game as follows:

Bolt legs to cabinet. Bolt back box to cabinet. Use flat washers under bolt heads. Gently feed cable connectors and ground braid through cable port in back box. Screw ground braid to braid in back box. Carefully and fully insert connectors on printed circuit assemblies.

On all games there are certain items that should be checked after shipment. These are visual inspections which 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 switch should always be adjusted after game is set on location and leg levelers are adjusted.

Visual inspections before plugging in line cord:

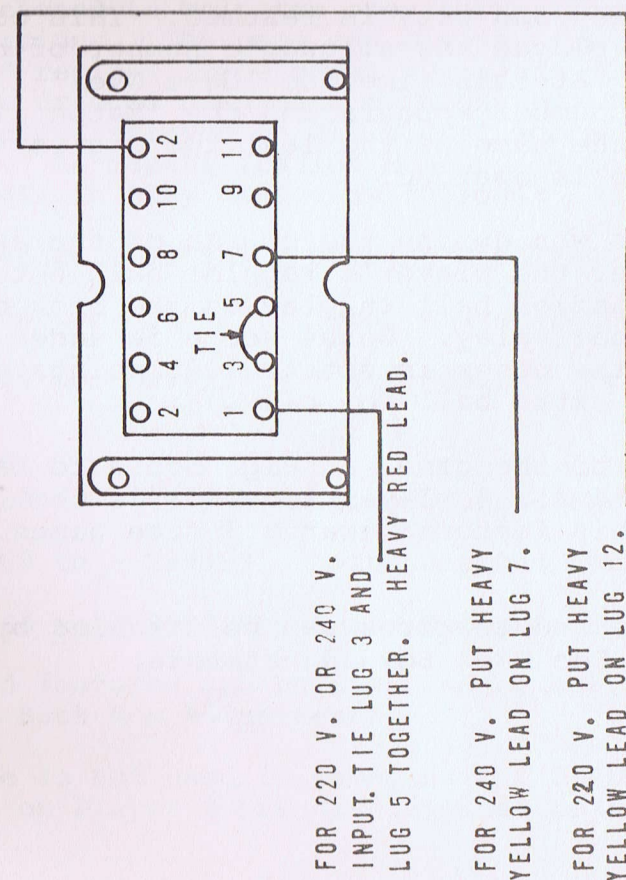
1. Check that all cable connectors are completely seated on printed circuit assemblies.
2. Check that cables are clear of all moving parts.
3. Check for any wires that may have become disconnected.
4. Check switches for loose solder or other foreign material that may have come loose in shipment and could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

Check adjustment of the three (normally open) tilt switches:

1. Panel tilt on bottom of playfield panel.
2. Plumb bob tilt on left side of cabinet near front door.
3. Ball tilt above plumb bob tilt. Insert the smaller ball (15/16" dia.) into the ball tilt assembly, and adjust the bracket so the ball will roll free to contact the switch blade, if front of cabinet is raised.

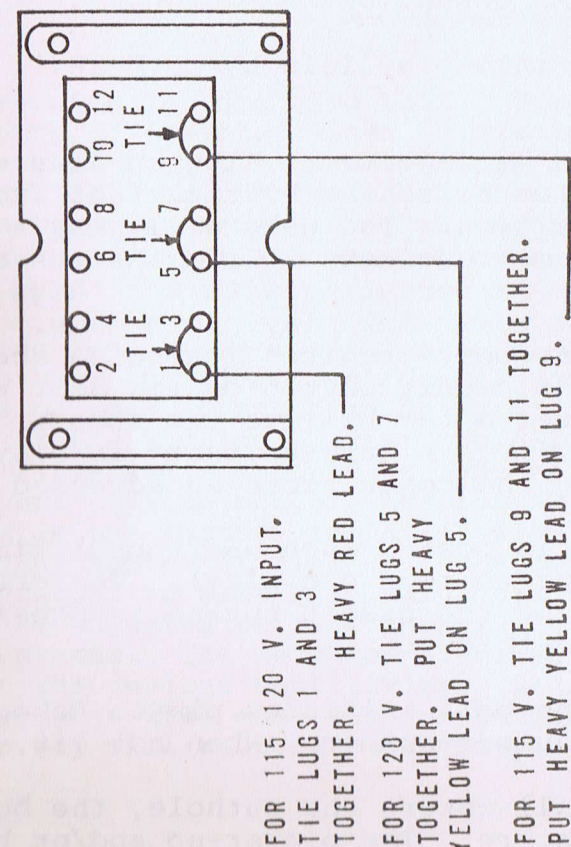
TRANSFORMER CONNECTION INSTRUCTIONS

E-122-125 TRANSFORMER WIRING FOR 220/240 V.,
50/60 CYCLE INPUT.



VARIATOR, BALLY PART NO. E-713-1,
LOCATED IN CABINET, MUST BE USED
FOR OPERATION AT 220 V. OR 240 V.A.C.

E-122-125 TRANSFORMER WIRING FOR 115/120 V.,
50/60 CYCLE INPUT.



VARIATOR, BALLY PART NO. E-713,
LOCATED IN CABINET, MUST BE USED
FOR OPERATION AT 115 OR 120 V.A.C.

**FIGURE 1. TRANSFORMER (PART OF POWER -
TRANSFORMER MODULE A2, LOCATED IN BACK BOX).**

II. GENERAL GAME OPERATION

Place ball into playfield by outhole.

Coin game.

Coin should be rejected. Plug in line cord. Move power ON-OFF master switch at bottom right front corner of cabinet to 'ON' position. The game will play a power-up tune to announce game-readiness. Drop targets are reset, scores are set to zero, alternating with the 'High Score to Date', and the game is ready for play. Coin game. The game should accept the coin and post credits* for coins accepted (adjustable). Pressing the credit button on the door will cause the outhole kicker to serve the ball to the shooter alley. The 1st player-up lite is lit. A game-up tune* is played to announce play-readiness. The bonus score is advanced to 1000 points.

One player is posted each additional 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.

Shooting the ball initiates play. Rebound switches score 10 points. Thumper-bumpers, when not lit, score 10 points.

When the ball enters the outhole, the bonus score is added to the total score. The player-up and/or ball in play on the back box is advanced one position. The bonus score is advanced to 1000 points. The outhole kicker serves the ball to the shooter alley and play is resumed. This continues until each player has played the allowable number of balls per game (adjustable). At this time the 'Game Over' light is lit. A random Match* number appears and the 'Match' light is lit. If the number is the same as the last two digits in a player's score, a free game is awarded.

Extra balls won during the course of the game are played immediately after the player's regular ball enters the outhole. The player-up and/or ball in play on the back box are not advanced for extra ball play. Bonus score is added to the player's score and the bonus is set to 1000 points before the game serves the extra ball for play.

At the end of the game, a 'High Score to Date' is alternately flashed with all 4 player scores. If the 'High Score to Date' is beat, this feature* awards 3 free games.

*Some tunes and features can be disabled by operator if so desired. See Back Box Adjustments.

Tilting the game results in loss of a ball. The flippers, thumper-bumpers, etc., go 'dead'. Bonus points are not scored. 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 ball kicker assembly serves the ball to the shooter alley.

Slamming the machine results in loss of the game. All switched lights go out, the game goes 'dead', and a time delay occurs. The purpose of the time delay is to discourage unnecessary abuse of the machine. After the delay, the 'Game Over' light lites and the power-up tune is played. The time delay occurs anytime one of the slam switches is made to contact. There is one factory installed slam switch on the front door. (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 the gap between contacts will make the switch more sensitive. Opening the gap will reduce sensitivity.

III. BOOKKEEPING FUNCTIONS

The game is designed to help the operator perform certain accounting functions. The game can display the number of total plays and replays (free games). It can display the number of coins dropped down each coin chute. The bookkeeping functions are displayed on all player score displays simultaneously. An identification number, 05 to 11 appears on the Match/Ball in Play window as follows:

- 05 - 000000 to - 999999 = Current Credits
- 06 - 000000 to - 999999 = Total Plays (Payed & Free Games)
- 07 - 000000 to - 999999 = Total Replays (Free Games)
- 08 - Not Used
- 09 - 000000 to - 999999 = Coins Dropped thru Coin Chute #1
- 10 - 000000 to - 999999 = Coins Dropped thru Coin Chute #2**
- 11 - 000000 to - 999999 = Coins Dropped thru Coin Chute #3**

*Some tunes and features can be disabled by operator is so desired. See Back Box Adjustments.

**If Coin Chute is not used in game, number displayed (if other than 000000) on Player Score displays has no significance.

The game displays the first bookkeeping entry if the red Self-Test switch (See Fig. III) on the inside of the front door is pressed nine times. Alternately push and release the Self-Test button at one second intervals. The number 05 appears in the 'Match/Ball in Play' window. Current credits appear on the player score displays. Each additional press of the button causes the next entry to be displayed.

After the data in each bookkeeping register is recorded, it can be set to zero simply by pressing switch button S33, located on A4, the MPU module in the back box. (See Fig. III). Any or all registers can be cleared by alternating between the Self-Test button and the switch button on the MPU module. The operator is given this option as a possible convenience and can elect to use or not use it as his needs direct.

Pressing the button once more with the eleventh entry displayed causes the game to play the power-up tune and light the Game-Over light.

IV. FEATURE OPERATION AND SCORING

A. BONUS SCORE FEATURES: A bonus score of 15,000 maximum points may be scored. The game starts with a bonus score of 1000. The bonus score advances one step at a time each time the ball goes into top saucer, knocks down a drop target, hits lit center target, or goes through a lit ball return lane. When the ball goes into the outhole, the lit bonus score is added to the player's total score; if the double bonus lite is lit, twice the lit bonus score is added to the player's total score. A tilt nullifies the bonus score.

B. DOUBLE BONUS FEATURE: The double bonus is awarded when the ball goes into the top saucer when the double bonus lite is lit below saucer.

C. DROP TARGET FEATURE: (See VB, Back Box Game Adjustments) Each drop target scores 50 points.

a) 5 BALL PLAY: With drop target feature in the non-novelty mode, conservative, setting the lane adjustment feature in the following positions scores:

LANE ADJUSTMENT FEATURE

	<u>CONS.</u>	<u>LIB.</u>
1st time <u>both</u> target banks down (10) targets	X-Ball lite on (alternates) and scores <u>6,000</u>	X-Ball lite on (constantly) and scores <u>6,000</u>
2nd time <u>either</u> target bank down & each additional time	Special awarded and scores <u>3,000</u>	Special awarded and scores <u>3,000</u>

b) 3 BALL PLAY: With drop target feature in the non-novelty mode, liberal, setting the lane adjustment feature in the following positions scores:

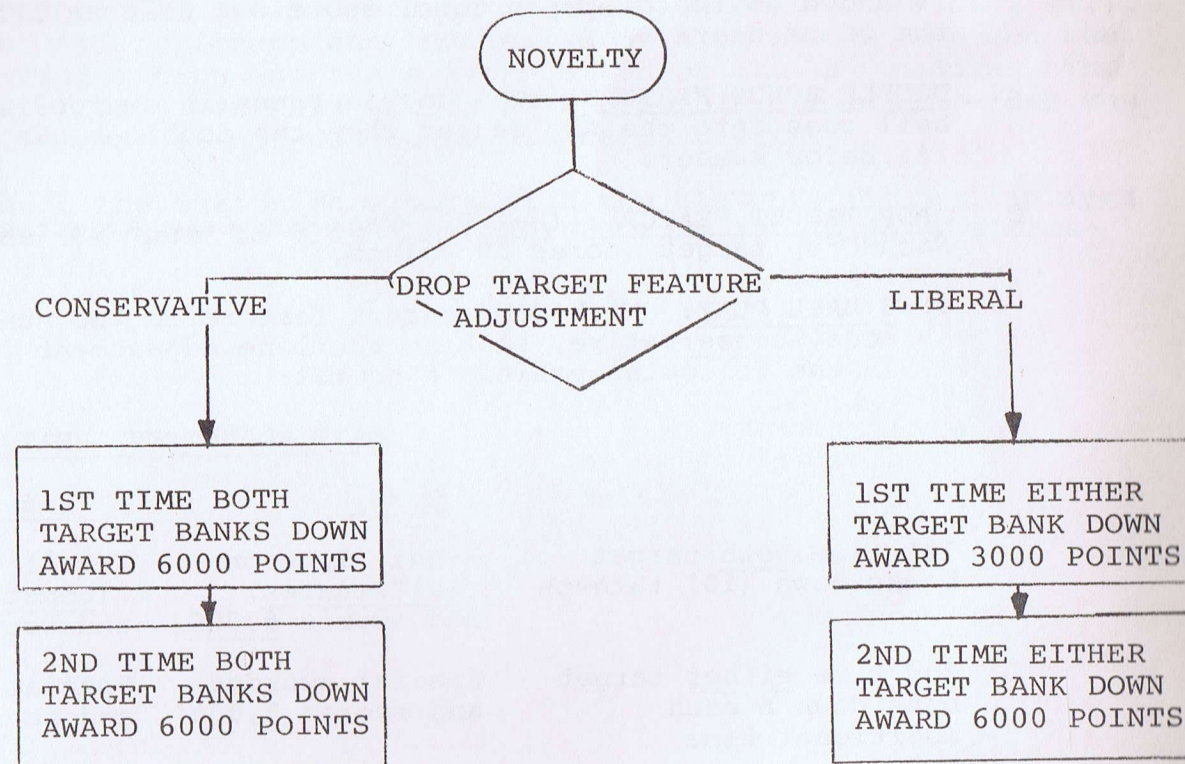
LANE ADJUSTMENT FEATURE

	<u>CONS.</u>	<u>LIB.</u>
1st time <u>either</u> target bank down	X-Ball lite on (alternates) & scores <u>3,000</u>	X-Ball lite on (constantly) & scores <u>3,000</u>
2nd time <u>either</u> target bank down & each additional time.	Special awarded and scores <u>3,000</u>	Special awarded and scores <u>3,000</u>

Only one extra ball is awarded at any one time. The extra ball earned must be played off before another extra ball can be scored.

The game is adjustable to award an extra ball when a pre-adjusted hi-score is registered or through the special feature. The 'Special' award is adjustable to score a credit or an extra ball.

- c) With Drop Target Feature in Novelty option, the scoring is as follows:



NOVELTY OPERATION:

To eliminate the awarding of replays and/or extra ball during and after the course of play:

- 1) Drop Target feature must be set for Novelty Option. (S-24 to 'ON', etc.)
- 2) Disable High Score to Date award. (S-15 to 'OFF')
- 3) Disable three score feature thresholds. See section on Front Door Game Adjustments.
- 4) Disable Match Feature (S-21 to 'OFF')

V. GAME ADJUSTMENTS

A. PLAYFIELD PANEL POST ADJUSTMENTS:

Posts that control left and right outlane opening on panel can be moved to make access to outlanes easier or harder for ball to enter. See Figure II.

Easier entry will decrease playing time and scoring (conservative). Harder entry will increase playing time and scoring (liberal).

B. BACK BOX GAME ADJUSTMENTS:

Each game has thirty-two switches located on A4, the MPU module, located in the back box, that allow play to be customized to the location. See Figure III. Credits per coin, maximum credits, credit display, balls per game, match feature, high game feature, special award and melody are selectable by means of the 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" toggle position is marked on the assembly. Turn off power before making adjustments.

CREDITS/COIN ADJUSTMENTS:

The credits given per coin are selectable by means of switches 1-5 incl., for coin chute #1 and switches 9-13 incl., for coin chute #3. Thirty-one different credit ratios are available for each coin chute. The switch settings and resultant credits/coin are listed on page 11.

Coin Chute #2 is preset to give one game for one coin.

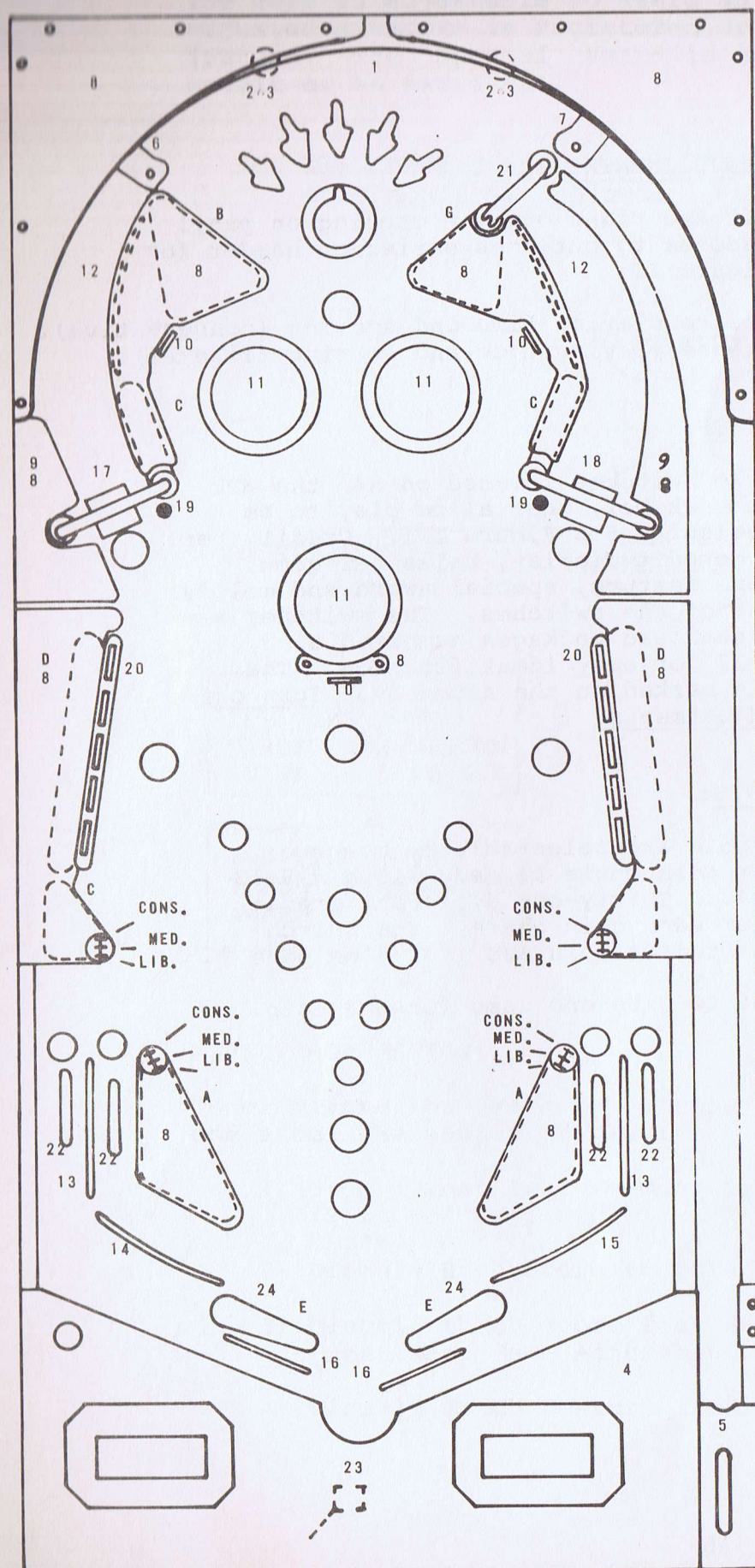


FIGURE II NIGHT RIDER #1074-E

#1074-E NIGHT RIDER

RUBBER PARTS

A.	R521-4	2½" dia.	(2)
B.	R521-3	2" dia.	(1)
C.	R521-1	1" dia.	(4)
D.	R521-5	3" dia.	(4)
E.	R406-3	Flipper	(2)
F.	R243	5/16 dia.	(9)
G.	R521-2	1½" dia.	(1)

PANEL TOP PARTS

1.	Arch Rail	M-1774
2.	Rail Post (2)	C-907
3.	Rail Post Cap. (2)	C-908
4.	Bottom Arch	P-5871-55
5.	Shooter Gauge	P-6359-21
6.	Ball Gate (L)	A-1475-10
7.	Ball Gate (R)	A-1475-9
8.	Screened Plastics	A-2890-121
9.	Clear Plastic	A-2890-122
10.	Target Assem.	AS-982-112
11.	Thumper Cap	A-3713-12
12.	Guide Wire (2)	M-121-62
13.	Guide Wire (2)	M-121-18
14.	Guide Wire	M-121-43
15.	Guide Wire	M-121-44
16.	Guide Wire (2)	M-121-53
17.	Spinner Gate (L)	AS-2250-34
18.	Spinner Gate (R)	AS-2250-35
19.	Mini Post & Rubber (2)	AS-2836
20.	Drop Target Assy. (2)	AS-2795-10
21.	Ball Gate Assem.	AS-2250-18
22.	Rollover Wire (4)	AS-2806
23.	Outhole Wire	AS-2806-21
24.	Flipper & Shaft (2)	AS-2214-24

CONS. = CONSERVATIVE
 MED. = MEDIUM
 LIB. = LIBERAL
 INDICATES MOVEABLE POSTS
 FOR SCORING ADJUSTMENTS.

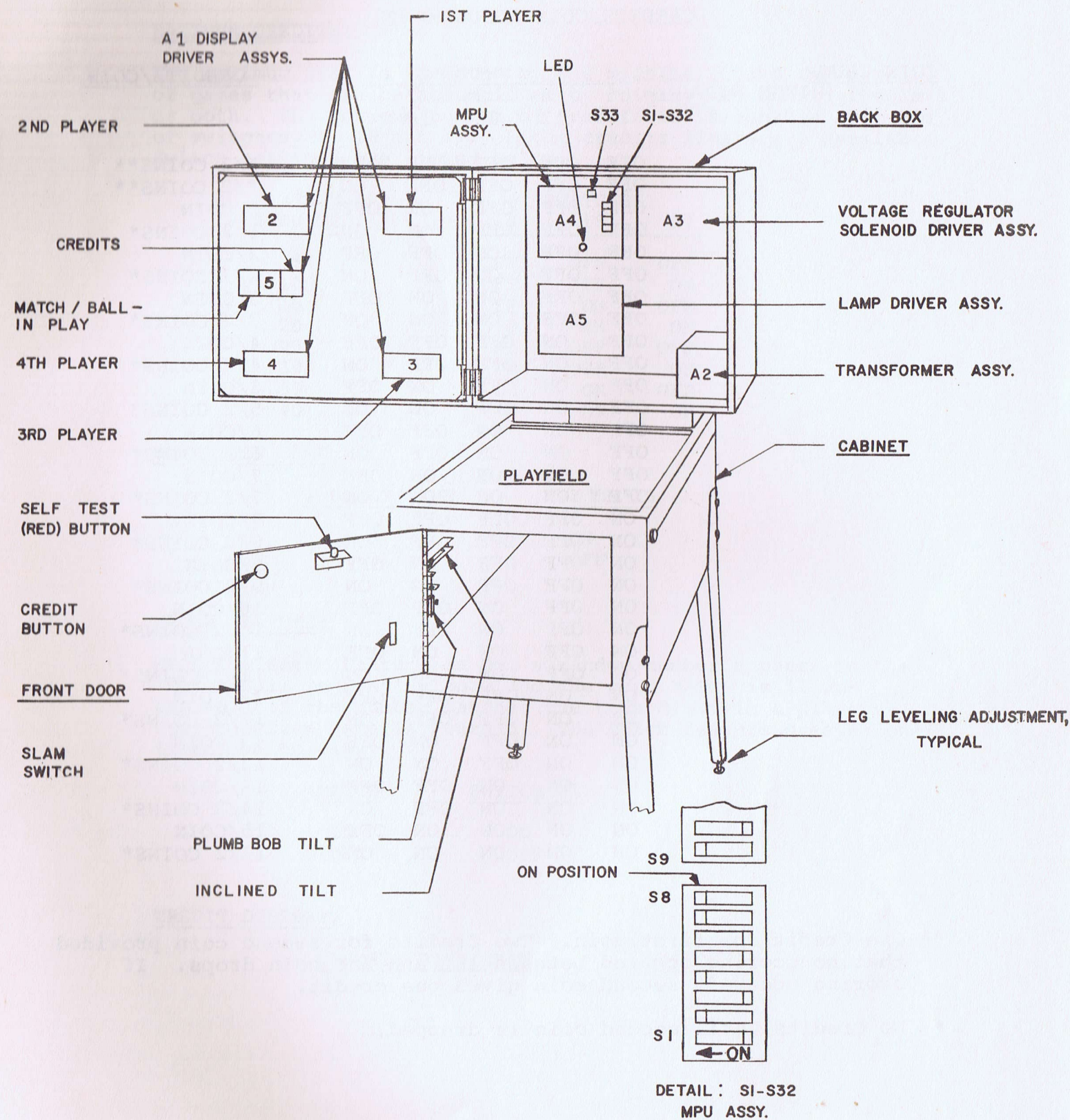


FIGURE III. ELECTRONIC PIN BALL MACHINE

CREDITS/COIN ADJUSTMENTS

COIN CHUTE		SWITCHES					CREDITS/COIN
#1 (HINGE SIDE)		5	4	3	2	1	
OR #3		13	12	11	10	9	
		OFF	OFF	OFF	OFF	OFF	3/2 COINS**
		OFF	OFF	OFF	OFF	ON	3/2 COINS**
		OFF	OFF	OFF	ON	OFF	1/COIN
		OFF	OFF	OFF	ON	ON	1/2 COINS*
		OFF	OFF	ON	OFF	OFF	2/COIN
		OFF	OFF	ON	OFF	ON	2/2 COINS*
		OFF	OFF	ON	ON	OFF	3/COIN
		OFF	OFF	ON	ON	ON	3/2 COINS*
		OFF	ON	OFF	OFF	OFF	4/COIN
		OFF	ON	OFF	OFF	ON	4/2 COINS*
		OFF	ON	OFF	ON	OFF	5/COIN
		OFF	ON	OFF	ON	ON	5/2 COINS*
		OFF	ON	ON	OFF	OFF	6/COIN
		OFF	ON	ON	OFF	ON	6/2 COINS*
		OFF	ON	ON	ON	OFF	7/COIN
		OFF	ON	ON	ON	ON	7/2 COINS*
		ON	OFF	OFF	OFF	OFF	8/COIN
		ON	OFF	OFF	OFF	ON	8/2 COINS*
		ON	OFF	OFF	ON	OFF	9/COIN
		ON	OFF	OFF	ON	ON	9/2 COINS*
		ON	OFF	ON	OFF	OFF	10/COIN
		ON	OFF	ON	OFF	ON	10/2 COINS*
		ON	OFF	ON	ON	OFF	11/COIN
		ON	OFF	ON	ON	ON	11/2 COINS*
		ON	ON	OFF	OFF	OFF	12/COIN
		ON	ON	OFF	OFF	ON	12/2 COINS*
		ON	ON	OFF	ON	OFF	13/COIN
		ON	ON	OFF	ON	ON	13/2 COINS*
		ON	ON	ON	OFF	OFF	14/COIN
		ON	ON	ON	OFF	ON	14/2 COINS*
		ON	ON	ON	ON	OFF	15/COIN
		ON	ON	ON	ON	ON	15/2 COINS*

** One Credit for first coin. Two Credits for second coin provided that no scoring occurred between 1st and 2nd coin drops. If scoring occurred, second coin gives one credit.

* No Credits until second coin is dropped.

MAXIMUM CREDITS:

The maximum credits accepted by the machine limits the number of games that can be accumulated by coining, by winning replays or both. The maximum number of credits is selectable by means of switches 17, 18 and 19. Eight credits limits are available. Switch settings are listed below.

MAXIMUM CREDITS	SWITCHES		
	19	18	17
5	OFF	OFF	OFF
10	OFF	OFF	ON
15	OFF	ON	OFF
20	OFF	ON	ON
25	ON	OFF	OFF
30	ON	OFF	ON
35	ON	ON	OFF
40	ON	ON	ON

BALLS PER GAME:

# BALLS/GAME	SWITCH 16
5	ON
3	OFF

MATCH FEATURE:

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

MATCH	SWITCH 21
ON	ON
OFF	OFF

CREDIT DISPLAY:

CREDITS DISPLAYED	SWITCH 20
YES	ON
NO	OFF

HIGH SCORE FEATURE:

The game is designed to award an Extra Ball or Free game at each of the three score levels. See Front Door Game Adjustments.

AWARD	SWITCH 6
EXTRA BALL	OFF
REPLAY	ON

MELODY OPTION:

The game is designed to play several melodies to announce power-up, game-up, etc. The tunes are intended to attract attention to the game and increase game usage. The tunes are controlled by switch 8.

TUNES	SWITCH 8
ON	ON
OFF	OFF

HIGH SCORE TO DATE FEATURE:

The game is designed to award three free games as an option if 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.

HIGH SCORE TO DATE FEATURE	SWITCH 15
ON	ON
OFF	OFF

DROP TARGET FEATURE AWARD:

The scoring options for the 'Drop Target Feature' are detailed in Section IV.

- A) To select the Novelty Option (No free balls or free games), position S24 to the ON position. Step "B" is not necessary. To select the Non-Novelty Option, set S24 to the OFF position. Proceed to step B.
- B) To select the Liberal Award Option, position S31 to ON. To select the more Conservative Award Option, position S31 to OFF.

LANE ADJUSTMENT FEATURE:

When drop target feature is set to non-novelty, lane adjustment (See Section IV) is as follows:

- A) Liberal - Set S32 to ON
- B) Conservative - Set S32 to OFF

C. FRONT DOOR GAME ADJUSTMENTS:

HIGH SCORE FEATURE ADJUSTMENTS:

The game is designed to award an extra ball (option) or a free game at each of three score levels. The recommended levels are on the score card in the game.

Any level from 2,000 to 998,000 can be set, as desired. It is also 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 approximately five times or until number 01 appears on the Match/Ball in Play display.
- 2) The number on the Player Score Displays is the 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 number appears. Note that the level changes 2,000 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 score levels. The number '02' and '03' on the Match/Ball in Play display are for the second and third levels, respectively.

HIGH SCORE TO DATE FEATURE:

The game is designed to award three free games when 'High Score to Date' is beat. The recommended, factory reset level is 140,000.

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 Adjustment, 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 998,000 can be set as desired. It is to be noted that '00' does not turn off the feature, as it does on High Score feature. The feature is turned off by positioning switch 15 to the 'OFF' position, and 'ON' by positioning switch 15 to the 'ON' position, as discussed under "Back Box Game Adjustments".

*Can be quickly set to '00' by pressing S33 on the MPU assembly in the back box. See Figure III.

Recommended:

Instruction, Score Cards and High Score feature settings to be used on NIGHT RIDER ELECTRONIC.

3 BALL

REPLAYS

Instruction Card M-1508-63-I
Score Card M-1508-63-T

- 1 Replay at 72,000
- 1 Replay at 100,000
- 1 Replay at 124,000

Drop Target Fea. Adj. - Liberal
Lane Adj. Fea. - Liberal

EXTRA BALL

Instruction Card M-1508-63-M
Score Card M-1508-63-AJ

- 1 Extra Ball at 68,000
- 1 Extra Ball at 106,000

Drop Target Fea. Adj. - Liberal
Lane Adj. Fea. - Conservative

5 BALL

REPLAYS

Instruction Card M-1508-63-A
Score Card M-1508-63-S

- 1 Replay at 92,000
- 1 Replay at 108,000
- 1 Replay at 130,000

Drop Target Fea. Adj. - Conservative
Lane Adj. Fea. - Conservative

EXTRA BALL

Instruction Card M-1508-63-F
Score Card M-1508-63-AL

- 1 Extra ball at 92,000
- 1 Extra Ball at 122,000

Drop Target Fea. Adj. - Conservative
Lane Adj. Fea. - Conservative

(ALL PLAYFIELD ADJUSTABLE POSTS IN MEDIUM POSITION)

ADDITIONAL CARDS

REPLAYS

M-1508-63-U	56,000	110,000
M-1508-63-V	62,000	110,000
M-1508-63-W	68,000	110,000
M-1508-63-X	74,000	122,000
M-1508-63-Y	80,000	126,000
M-1508-63-Z	92,000	128,000
M-1508-63-AA	98,000	128,000
M-1508-63-AB	104,000	130,000
M-1508-63-AC	108,000	130,000
M-1508-63-AD	56,000 94,000	122,000
M-1508-63-AE	62,000 96,000	124,000
M-1508-63-AF	68,000 98,000	124,000
M-1508-63-AG	80,000 102,000	126,000

EXTRA BALL

M-1508-63-AH	50,000	98,000
M-1508-63-AI	58,000	102,000
M-1508-63-AK	76,000	108,000

INSTRUCTION

SEE PAGE

BLANKS

M-1508-63-AM
M-1508-63-AN
M-1508-63-AO

INSTRUCTION CARD OPTIONS FOR NIGHT RIDER
GAME #1074-E

5 BALL		NON-NOVELTY				CONSERVATIVE											
OPTION DESCRIPTION	INSTRUCTION CARD LETTER DESIGNATION																
	A	B	C	D	E	F	G	H	I								
REPLAY	X	X	X	X													
EXTRA BALL					X	X	X	X									
MATCH	X	X			X	X											
HIGH SCORE TO DATE	X		X		X		X										

3 BALL		NON-NOVELTY				LIBERAL											
OPTION DESCRIPTION	INSTRUCTION CARD LETTER DESIGNATION																
	I	J	K	L	M	N	O	P									
REPLAY	X	X	X	X													
EXTRA BALL					X	X	X	X									
MATCH	X	X			X	X											
HIGH SCORE TO DATE	X		X		X		X										

3 AND 5 BALL NOVELTY *		
OPTION DESCRIPTION	INSTRUCTION CARD LETTER DESIGNATION	
	Q	R
CONSERVATIVE	X	
LIBERAL		X

X OPTION CONTAINED ON CARD
* NO REPLAY OR EXTRA BALL

VI. ROUTINE MAINTENANCE ON LOCATION:

Self-Test routines are written into the game design. They are particularly useful for routine maintenance. The tests are described below. The first test is automatic and occurs on power-up. This test causes the MPU module A4 to examine itself for failures. Seven flashes of an LED indicates proper operation. The second series of self-diagnostic tests causes the MPU to 'exercise' each of the other modules in such a way as to make their faults, if any, obvious. See Figure III and Page ii.

It is recommended that these tests be used several times a week to check out the games before play. If faults are discovered, they may be corrected on location if the operator has a stock of replacement modules. See "Trouble Shooting on Location".

MPU MODULE SELF-TEST:

At power on, the LED on the MPU module flashes once. (Flicker-Flash). After a pause, it flashes six more times and goes out. A power-up tune is played to announce game readiness. This indicates proper MPU operating condition and successful completion of the power-up test.

GAME SELF-DIAGNOSTIC TESTS:

- 1) Pressing the Self-Test button inside the door initiates the Self-Test routine. See Figures III and IV. All switched lamps flash off and on continuously.
- 2) Pressing the Self-Test button again causes each digit on each display to cycle from 0 thru 9, and repeat continuously.
- 3) Pressing the Self-Test button again causes each solenoid to be energized, one at a time, in a continuous sequence. Hold both flipper buttons 'in' during this test. The number appearing on the Player Score displays is the same as the number assigned to the solenoid. The sound of a solenoid pulling-in as a number appears indicates proper operation. The absence of sound is improper. If sound is absent, see Page 21 for help in Solenoid identification.

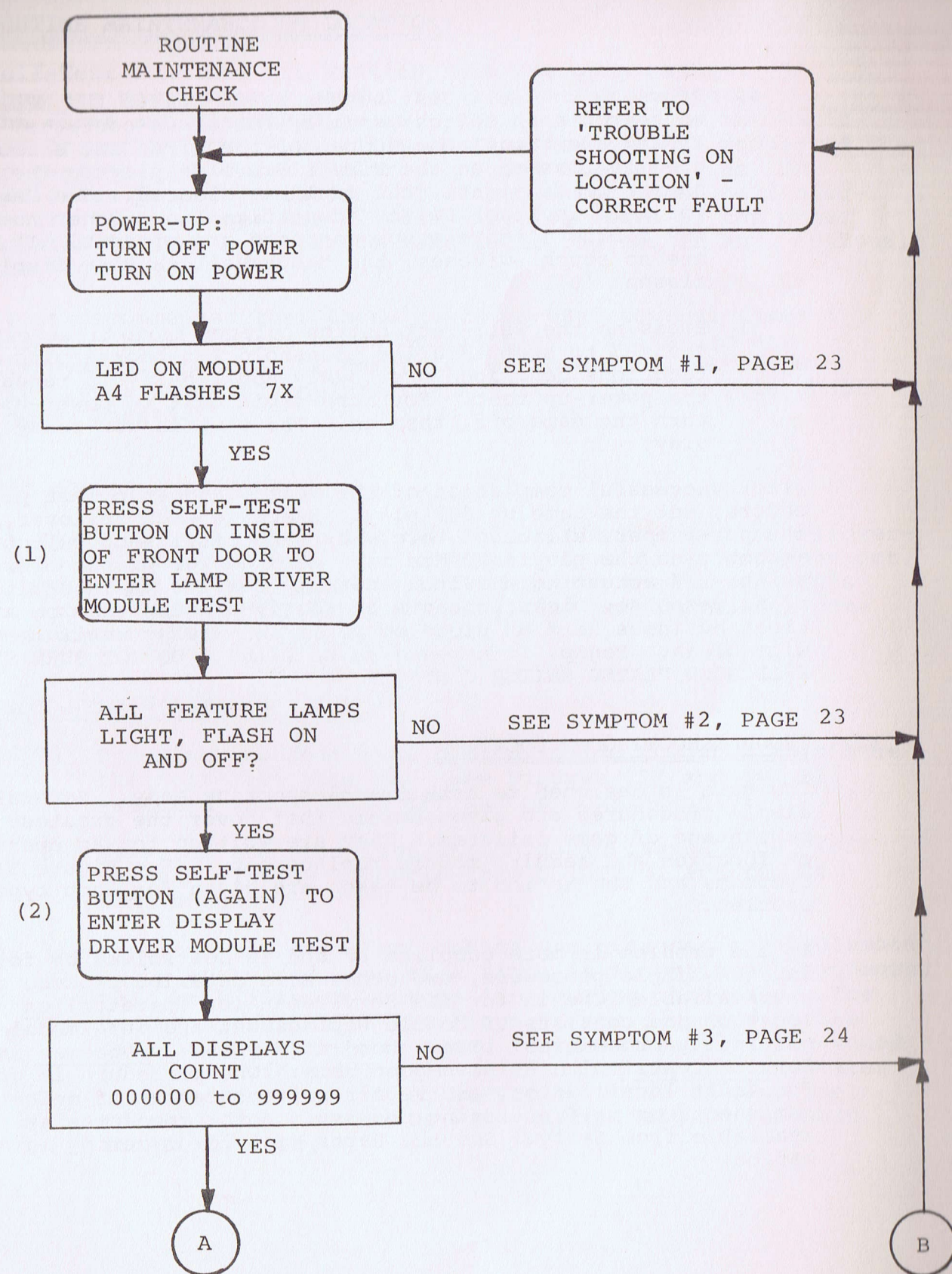
- 4) Pressing the Self-Test button again causes the MPU to search each switch assembly for stuck contacts. If any are found, the number of the first set encountered is flashed on the Player Score displays. The number remains until the fault is cleared. See Page 22 for help in Stuck Switch identification. Other numbers may follow if more stuck contacts are present. If there are no stuck switches, the Match/Ball in Play display flashes '0'.
- 5) Pressing the Self-Test button eleven more times causes the MPU to step thru the threshold and bookkeeping functions described previously and finally to repeat the power-up test. For more rapid exit to power-up, turn the game off, then on. The game is now ready to play.

After successful completion of the Self Diagnostic Test procedure, set the game up for play. Exercise each rollover, thumper-bumper, slingshot, etc., by hand until each switch assembly on the playfield has been checked for proper operation. If actuating a switch assembly results in intermittent or no response, clean contacts by gently closing them on a clean business card or piece of paper and wiping until they wipe clean. Regap, if necessary, to 1/16". DO NOT BURNISH OR FILE GOLD PLATED SWITCH CONTACTS.

VII. TROUBLESHOOTING ON LOCATION

The game is designed to make troubleshooting easy. Several simple procedures are given herein that cover the greatest percentage of game failures. They are written for an operator on location and require module replacement. (See Figure III) Symptoms and the action to be taken are given for each type of problem.

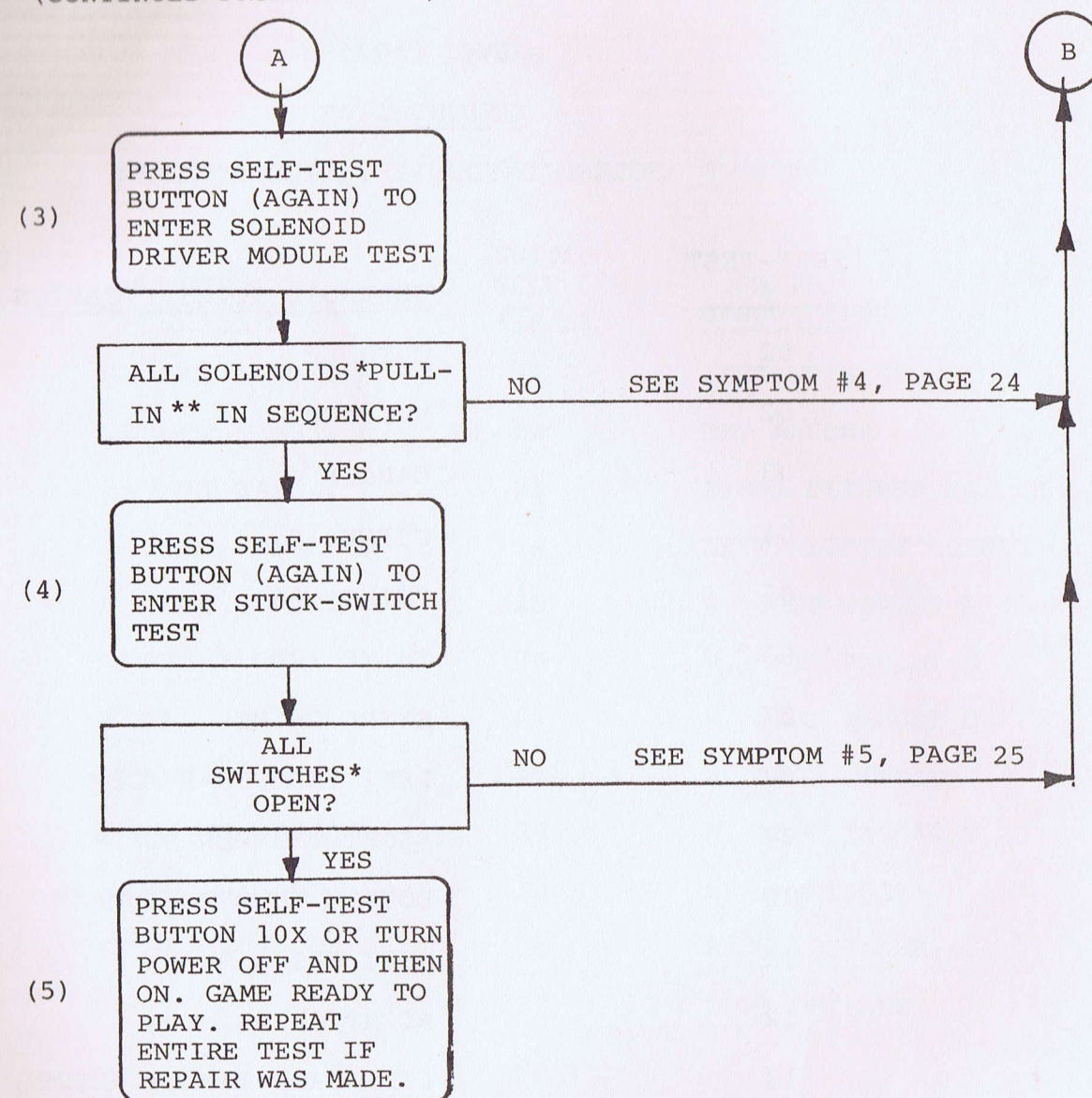
If the problem is more complicated and is not solved by following the simple procedure, two other more detailed procedures are available. One is for the Serviceman (or Operator) on location and consists of Module Replacement and intermodule continuity procedures. The second is for the Serviceman in a Service Center with a known-good game. The procedure is written for fault localization, and repair or replacement of defective components on malfunctioning modules. Both procedures are available from Bally. See the Parts List for ordering information.



(CONTINUED ON PAGE 20)

FIGURE IV - SELF DIAGNOSTIC TEST

(CONTINUED FROM PAGE 19)



*SOLENOID AND STUCK-SWITCH NUMBER IS FLASHED ON PLAYER SCORE DISPLAYS AS AN AID IN TROUBLESHOOTING.

** HOLD FLIPPER BUTTONS IN DURING TEST.

FIGURE IV -SELF DIAGNOSTIC TEST (CONTINUED)

GAME #1074-E

NIGHT RIDER

SOLENOID IDENTIFICATION TABLE

<u>SELF-TEST #</u>	<u>SOLENOID IDENTIFICATION</u>
01	OUTHOLE
02	KNOCKER
03	SAUCER
04	CHIME 10
05	CHIME 100
06	CHIME 1000
07	EXTRA CHIME
08	LEFT THUMPER-BUMPER
09	RIGHT THUMPER-BUMPER
10	BOTTOM THUMPER-BUMPER
11	LEFT SLING SHOT
12	RIGHT SLING SHOT
13	LEFT DROP TARGET RESET
14	RIGHT DROP TARGET RESET
15	COIN LOCK-OUT
16	K1 RELAY (FLIPPER ENABLE)

GAME #1074-E

NIGHT RIDER

SWITCH ASSEMBLY SELF-TEST DISPLAY NUMBERS

<u>SWITCH SELF-TEST #</u>	<u>SWITCH DESCRIPTION</u>	<u>SWITCH SELF-TEST #</u>	<u>SWITCH DESCRIPTION</u>
01	L. DROP TARGET A (TOP)	21	LEFT SPINNER
02	L. DROP TARGET B	22	TOP SAUCER
03	L. DROP TARGET C	23	RIGHT FLIPPER FEEDER LANE
04	L. DROP TARGET D	24	LEFT FLIPPER FEEDER LANE
05	L. DROP TARGET E	25	R. DROP TARGET A (TOP)
06	CREDIT BUTTON	26	R. DROP TARGET B
07	TILT	27	R. DROP TARGET C
08	OUTHOLE	28	R. DROP TARGET D
09	COIN III (RIGHT)	29	R. DROP TARGET E
10	COIN I (LEFT)	30	CENTER TARGET
11	COIN II (IF USED)	31	RIGHT OUTLANE
12		32	LEFT OUTLANE
13		33	
14		34	
15		35	
16	SLAM	36	RIGHT SLINGSHOT
17	LEFT-RIGHT TOP TARGETS	37	LEFT SLINGSHOT
18	SCORE 100 (GP)*	38	BOTTOM BUMPER
19	SCORE 10 (GP)*	39	RIGHT BUMPER
20	RIGHT SPINNER	40	LEFT BUMPER

*GENERAL PURPOSE OR MULTIPLE

1A) SYMPTOM: Game does not play power-up tune when power is turned on. General Illumination is present.

ACTION: A) Turn power OFF. Open back box. Locate light emitting diode (LED) on MPU module A4.
B) Turn Power ON. LED must flash 7X to indicate that module A4 is good. Correct flash sequence is flicker/flash-pause-and then six more flashes and LED goes out.
C) If LED does not come on, or does not flash, or flashes, but less than 7X, turn off power. Replace MPU module A4.

CAUTION: REPLACEMENT MPU MODULE MUST HAVE SAME PART NUMBER OR INCORRECT OPERATION WILL RESULT!
SEE PARTS LIST FOR MPU MODULE PART NUMBER

Turn power ON.

D) If game is correct, it is now ready for play. If game is not correct, refer to Module Replacement procedure. (See Parts List.)

2A) SYMPTOM: Not all feature lamps light during game play.

ACTION: A) With power ON, open front door. Press red button (Self-Test switch) once. If the game is correct, all feature lamps flash ON and OFF.
B) Carefully raise playfield or open back box to gain access to lamps.
C) Replace bulbs that do not flash.
D) If game is correct, it is now ready for play.
E) If game is not correct, turn power OFF. Replace Lamp Driver Module A5. Turn power ON and repeat A.
F) If game is correct, it is now ready for play.*
G) If game is not correct, turn power OFF. Replace MPU module A4. See CAUTION, 1C. Turn power ON and repeat A.
H) If game is correct, it is now ready for play.*
If game is not correct, refer to Module Replacement procedure. (See Parts List)

2B) SYMPTOM: One or some switched lamps always ON.

ACTION: Repeat 2AA, AB, AE, and AF and, if necessary AG & AH.

*Turn power ON-OFF switch OFF and then ON.

3A) SYMPTOM: Display digits improper on one or several, but less than all Display Driver module(s), A1.
Improper: One or several segments always OFF, digits mottled or several segments or digit(s) always ON.

ACTION: A) With power ON, open front door. Press red button (Self-Test switch) twice. If the game is correct, each digit on each Display Driver Module A1 (5 used/game) displays the count 1-9 and 0 continuously in all 6 digit positions. Note defective Display Driver modules.
B) Turn power OFF.

CAUTION: HIGH VOLTAGE IS SUPPLIED TO THE DISPLAY DRIVER MODULES, A1, FROM THE SOLENOID DRIVER/VOLTAGE REGULATOR MODULE A3. WAIT 30 SECONDS FOR HIGH VOLTAGE TO BLEED OFF.

C) Replace Display Driver module(s) A1. Turn power ON. Repeat A

D) If game is correct, it is now ready to play.*
If game is not correct, refer to Module Replacement procedure. (See Parts List).

3B) SYMPTOM: All displays improper (all five display Driver modules). Improper: Digit(s) always on or off/segment(s) always on or off, all displays.

ACTION: A) Repeat 3AA, and AB
B) Replace MPU module A4. See CAUTION NOTE, 1C. Turn power ON. Repeat A.
C) If game is correct, it is now ready to play.*
If game is not correct, refer to Module Replacement procedure. (See Parts List)

3C) SYMPTOM: One or several displays always off.

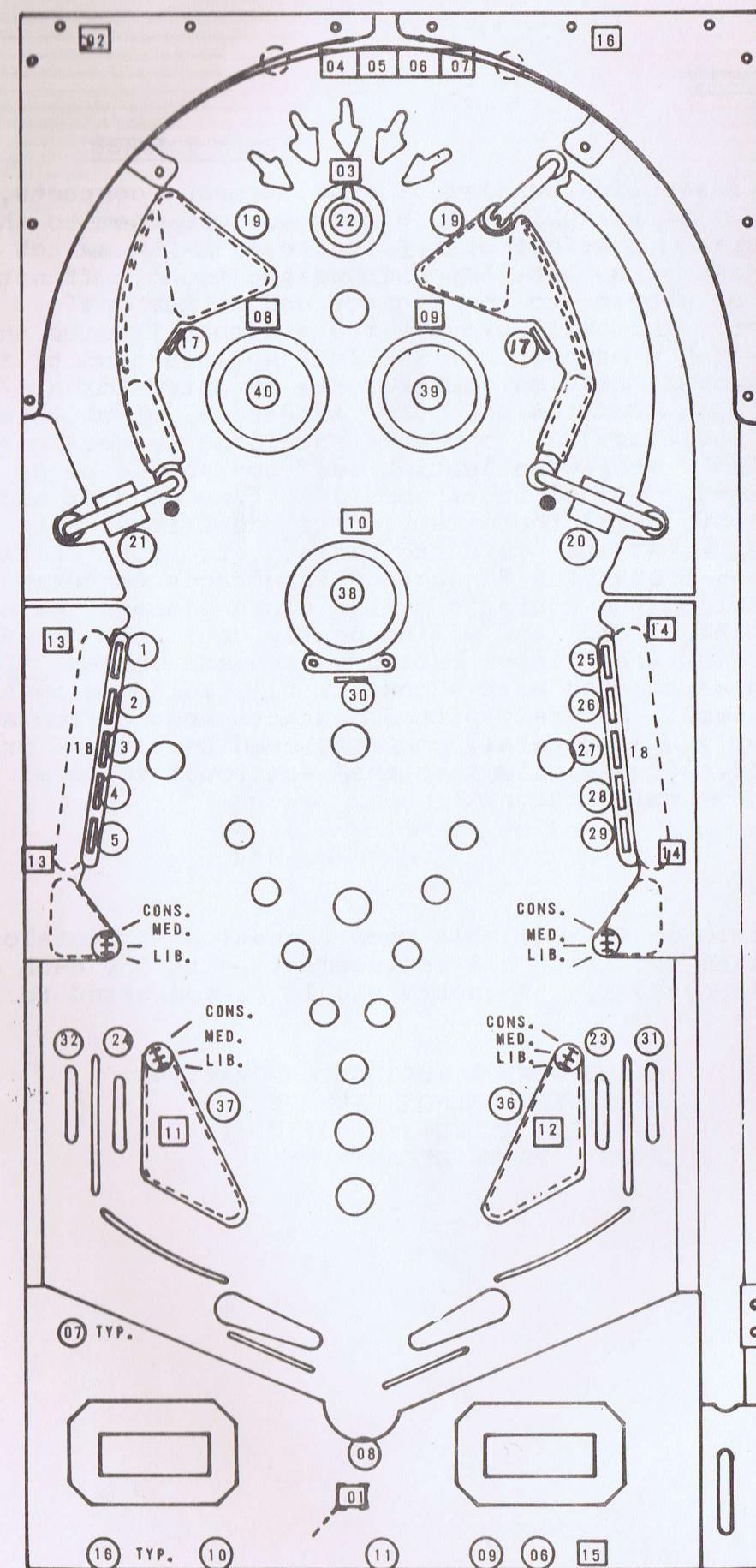
ACTION: A) Do 3AA, AB, AC, and AD.
B) Repeat 3BB and BC, if necessary.

4A) SYMPTOM: Solenoid(s) do(es) not pull-in during course of game.

ACTION: A) With power ON, open front door. Press red button (Self-Test switch) three times.
B) If game was correct, each solenoid would be energized. A number is flashed on the Player Score displays as each solenoid is pulsed. Note any numbers that do not have the sound of a solenoid associated. See Solenoid Identification Table, Page 21 and Figure V.
C) Carefully lift the playfield (or open the back box) to gain access to the solenoid. Turn power OFF. Inspect the solenoid.

*Turn power On-Off switch OFF and then ON.

- 4A) (Con't) D) If a lead is broken off, repair. Repeat A & B.
If game is correct, it is now ready for play.*
If solenoid wiring was correct, turn power OFF.
E) Replace Solenoid Driver/Voltage Regulator module A3. See CAUTION NOTE 3AB.
F) Repeat AA & AB.
If game is correct, it is now ready to play.*
If game is not correct, turn power OFF.
G) Replace MPU module A4. See CAUTION NOTE, 1C.
H) Repeat A & B.
If game is correct, it is now ready to play.*
If game is not correct, refer to Module Replacement Procedure. (See Parts List)
- 4B) SYMPTOM: Solenoid(s) always energized- Note: If impulse solenoids (chimes, ball ejects, slingshots, thumper-bumpers, etc.) are energized continuously, they are subject to damage. Limit troubleshooting to one minute with power ON, followed by five minutes with power OFF. Repeat as necessary. Replace damaged solenoids.
- ACTION: Do 4AA, AB, AE, AF and if necessary, AG and AH.
- 5) SYMPTOM: Feature (Drop Targets, etc.) does not score.
- ACTION: A) With power ON, open front door. Press red button (Self-Test switch) four times.
B) If the game is correct, Match/Ball in Play display would flash '0'. If a number appears on the Player Score displays, see Switch Assembly Identification Table, page 22 and Figure V.
C) Carefully lift the playfield. Locate the switch assembly identified from the number. Visually inspect the switch assembly.
If the contacts are 'stuck', regap them to 1/16". See section under ADJUSTMENTS. Repeat A & B.
If the game is correct, it is now ready to play.*
If the game is not correct, turn the power OFF.
D) Replace MPU module A4. See CAUTION NOTE 1, C.
E) Repeat A & B.
If the game is correct, it is now ready to play.*
If the game is not correct, refer to Module Replacement Procedure. (See Parts List).
- 6) SYMPTOM: Game blows fuse(s) repeatedly.
- ACTION: See Module Replacement Procedure. (See Parts List)
- *Turn power On-Off switch OFF and then ON.



INDICATES SWITCH ASSEMBLY IDENTIFICATION NUMBERS. NOTE THAT 07 IS IN CABINET; 06, 09, 10, 11 & 16 ARE ON DOOR.

INDICATES SOLENOID IDENTIFICATION NUMBERS. NOTE THAT 04, 05, 06, & 07 ARE IN CABINET; 15 IS ON DOOR.

CONS. - CONSERVATIVE
MED. - MEDIUM
LIB. - LIBERAL
INDICATES MOVABLE POSTS FOR SCORING ADJUSTMENTS.

FIGURE V - NIGHT RIDER SELF-DIAGNOSTIC TEST READ-OUTS

ASSEMBLY ADJUSTMENTS:

GENERAL:

All switch assemblies consist of leaf springs, contacts, separators, plastic tubing and screws to hold them to the mounting surface. Before attempting to adjust a switch assembly, make sure that these screws are tight. If not, tighten screw closest to the contact end of the leaf spring first. This will prevent the assembly from being secured in such a manner that the leaf springs tend to fan out. In general, all leaf springs are adjusted for a 1/16" gap in the open position and .010" overtravel or wipe in the closed position. All contacts should be in good condition. Unless otherwise instructed, they should be dry or non-lubricated. All contacts should be free of dust and dirt. Contacts, with the exception of the flipper button switch assemblies, are plated to resist corrosion. Filing or burnishing breaks the finish and encourages corrosion. Clean by closing the contacts over a clean piece of paper (e.g. a business card) and wiping gently until the contacts are clean. For the flipper button switch assemblies ONLY: Tarnish can be removed with a contact file followed by a burnishing tool. Severely pitted contacts must be replaced as an assembly. In general, contacts need be cleaned or replaced and adjusted only when they are found to be a source of game malfunction.

VIII. SERVICE PARTS:

A parts catalogue is available upon request. The catalogue is illustrated and lists all replacement parts for each game manufactured by Bally. Requests should be addressed to:

BALLY MANUFACTURING CORPORATION
2640 WEST BELMONT AVENUE
CHICAGO, ILLINOIS 60618
ATTN: PARTS DEPARTMENT

SERVICE HINTS:

The Bally playfield has an improved tuff-coat finish with excellent wearing properties. It's life expectance, as well as play appeal, can be extended by periodic cleaning of the playfield.

DO: Bally recommends you clean your playfield with Wildcat #125 (Wildcat Chemical Co., 1333 W. Seminary Drive, Ft. Worth, Texas 76115). Wildcat #125 is a combination cleaner and polish. Bally has tried and tested this product and found it to be very effective. If Wildcat #125 is not available, Bally suggests you ask your Distributor to order it. Inspect and hand polish the ball in a clean cloth. A chipped ball must be replaced. It can ruin the finish on the playfield in a short period of time.

DON'T: Use water in large quantities, highly caustic cleaners, abrasive cleaners or cleaning pads on the playfield. Do not allow a wax or polish build up. Waxes yellow with age and spoil play appeal.

GAME #1074-E NIGHT RIDER

PARTS LIST

MISCELLANEOUS

Transformer (Domestic or Export)
Bulbs, #44

ASSEMBLY COILS

Chimes (4)
Coin Lockout
Flipper Left & Right (2)

Knocker
Outhole Kicker
Saucer Eject
Thumper-Bumper (3)
Sling-Shot (2)

PLAYFIELD PARTS

UNIT COILS

Drop Target (Reset) (4)

MODULES

Lamp Driver A5
Display Driver A1
(5 Used)
Solenoid Driver/
Voltage Regulator A3
MPU A4
Transformer & Rectifier A2
Rectifier Board (Part of A2)

MODULE COMPONENTS

SEE PARTS CATALOGUE

REPAIR PROCEDURES/AIDS

Module Replacement Level
Component Replacement Level
AID (Assistance in Diagnostics)
Kit, used with F.O. 512, F.O. 513

PART NUMBER

E-122-125
E-125-22

CN-31-2000
FO-36-7000
AQ-25-500/
34-5050
AR-26-1200
AN-26-1200
AO-27-1300
AN-26-1200
AN-26-1200

SEE FIGURE II

NO-26-2300

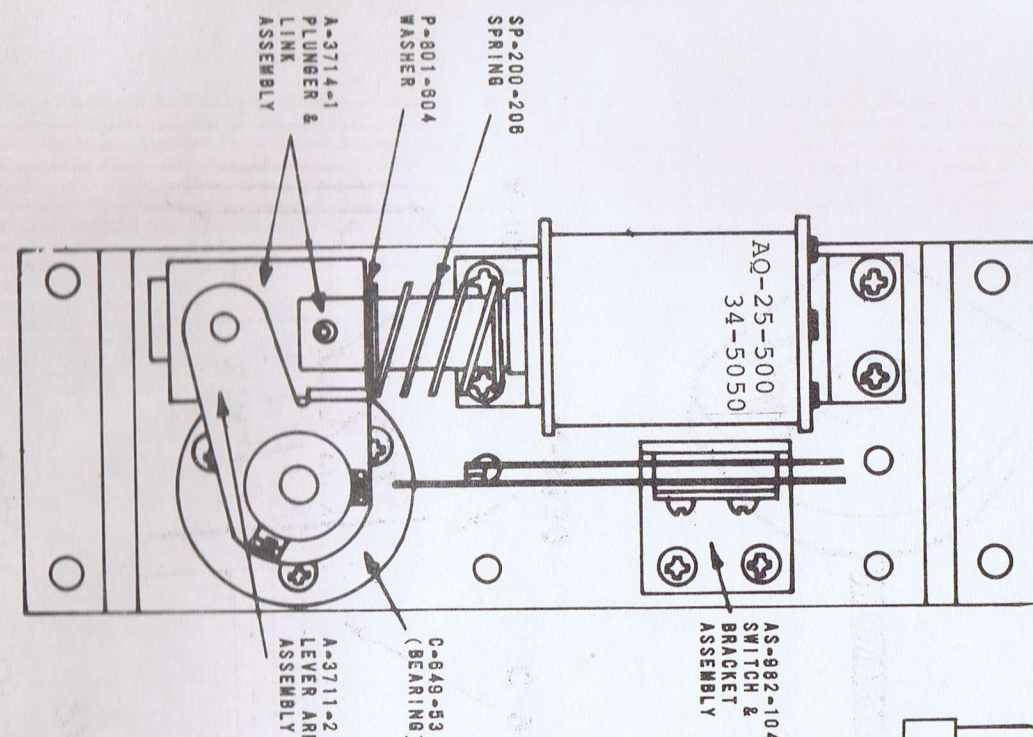
AS-2518-14
AS-2518-15
AS-2518-16

AS-2887-2
AS-2877
AS-2518-18

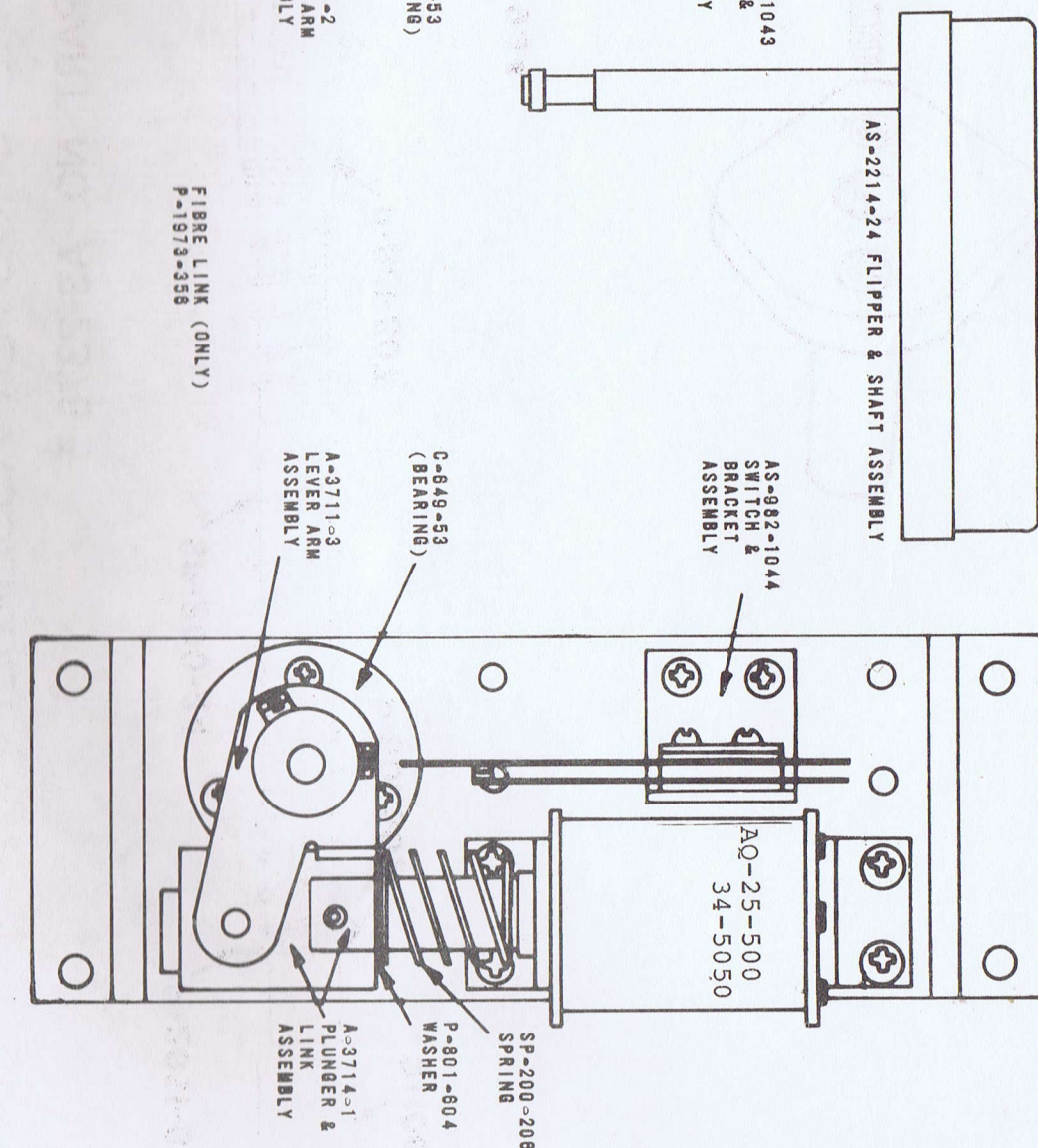
F.O. 512
F.O. 513

KIT #485

AS-1587-99 FLIPPER UNIT (LEFT) (AS SHOWN)



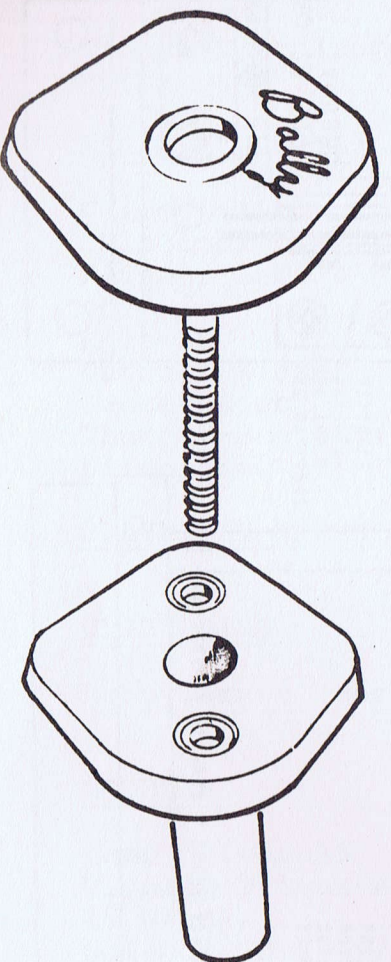
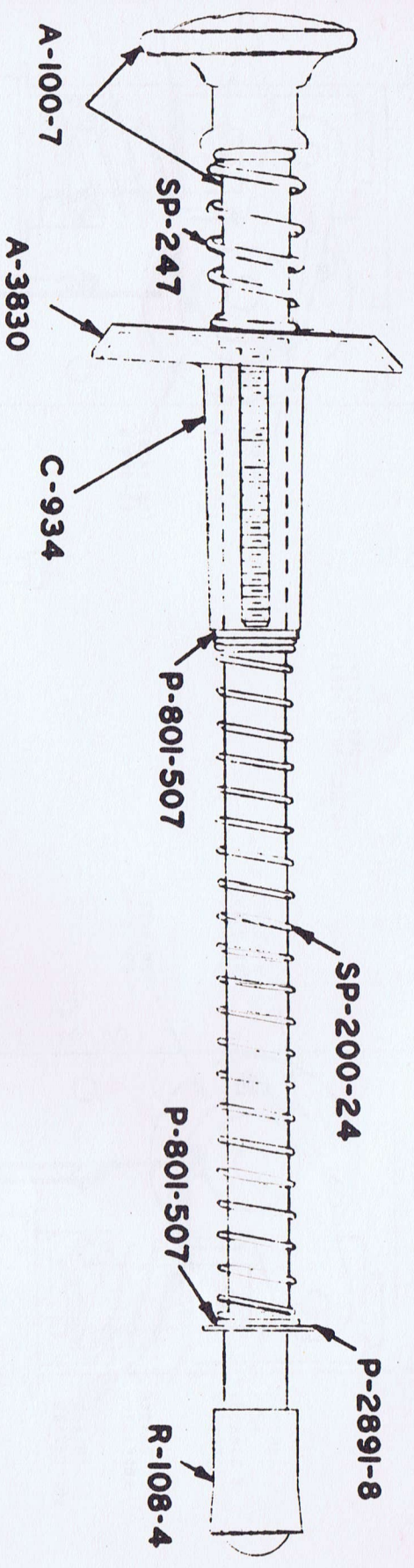
AS-1587-100 FLIPPER UNIT (RIGHT) (AS SHOWN)



FLIPPER UNITS
(WITH SINGLE SWITCH)



NEW BALL SHOOTER ASSEMBLY
PART NO. AS-2378-5



SHOOTER HOUSING COVER
PART NO. A-3830

SHOOTER GUIDE HOUSING
PART NO. C-934