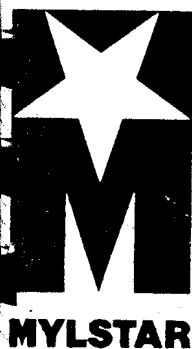


THE GAMES™



FLIPPERSPILL.COM

INSTRUCTION MANUAL

THE GAMES
(GAME #691)

INSTRUCTION MANUAL
Applicable for all games.

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THE GAMES
GAME PROM 691
SOUND PROM 691/S

SYSTEM 80A

The enhanced System 80 Program, System 80A, will permanently replace System 80 in future games.

System 80A has improved bookkeeping and self test capabilities, permits the use of seven digit displays and allows for greater coin/credit combination flexibility. The control boards' ROM memory chips, U2 and U3, have been reprogrammed for System 80A. They have also been socketed. In doing so, the control board can be used for either system by simply using the appropriate set of ROM memory chips.

The part numbers of each set are as follows:

SYSTEM	U2 PART NO.	U3 PART NO.	SOCKET PART NO.
80	XO-363	XO-362	XO-529
80A	XO-326	XO-327	XO-529

The ROMS are labeled as follows:

SYSTEM	U2	U3
80	R3273-12	R3272-12
80A	XO-326	XO-327

I. INSTALLATION

A. SET-UP

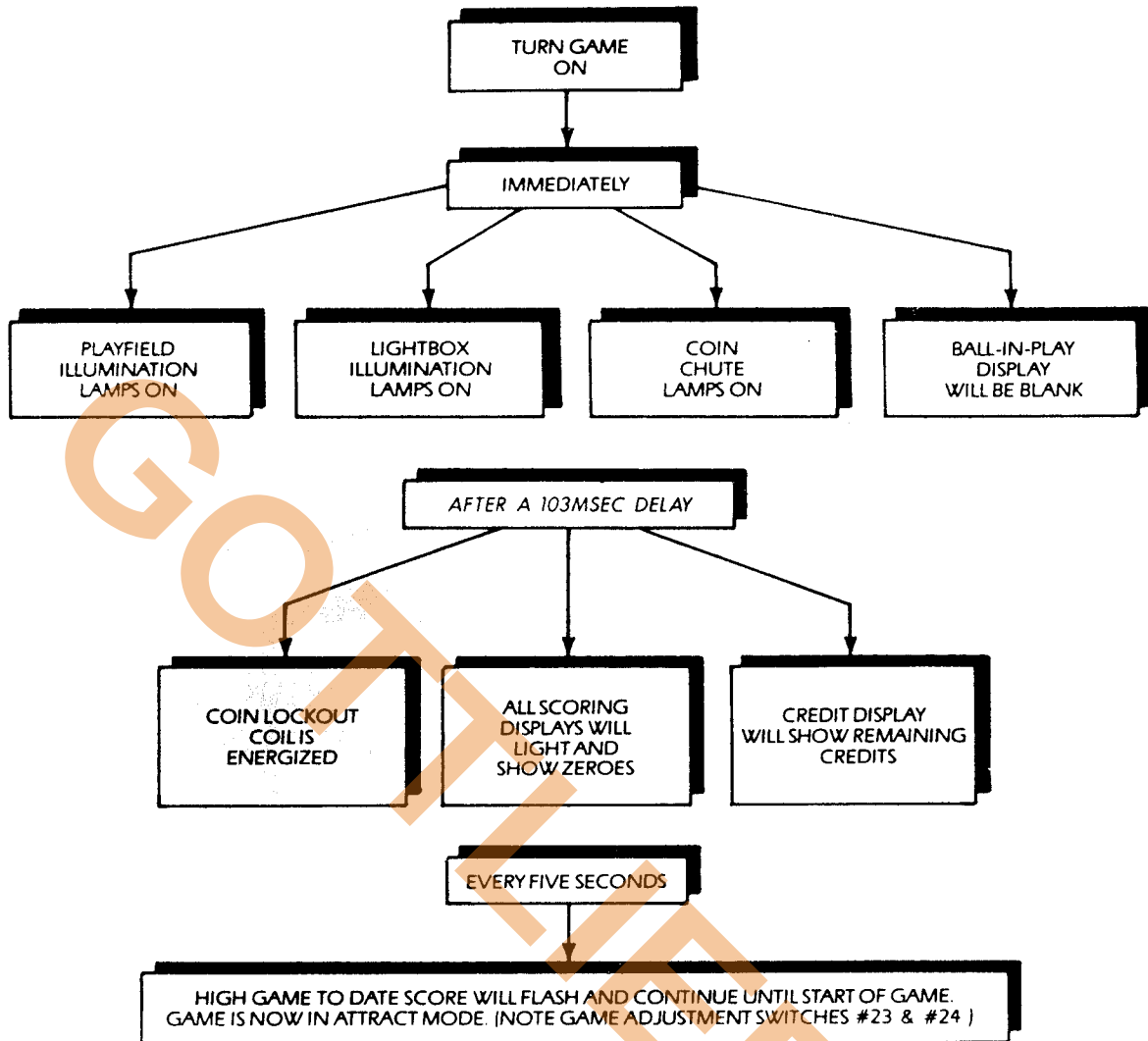
1. Bolt the legs to the cabinet.
2. Lift lightbox into an upright position. Be sure none of the cables are crimped in between the lightbox and cabinet.
3. Engage the snap in the rear of the lightbox to the cabinet.
4. Unlock the lightbox and remove the backglass.
5. Loosen and lower the shipping bracket at the top center of the lightbox insert panel.
6. Lift the insert; then swing it out.
7. Secure the lightbox to the cabinet with the bolts and washers provided.
8. Open the cabinet door and loosen the front moulding locking arm.
9. Remove the moulding from the playfield.
10. Slide the cabinet glass forward and remove it.
11. Raise the playboard, slide it forward and rest it on its support.
12. Unravel and straighten out the power line cord located at the rear of the pinball cabinet.
13. Proceed to "B. CHECK-OUT".

B. CHECK-OUT

1. Check that all cables are clear of moving parts.
2. Check for any loose wires.
3. Check switches for loose solder or other foreign matter.
4. Be certain all fuses are firmly seated.
5. Check transformer for any foreign matter across terminals.
6. Be sure that the Transformer Panel power input connector A12J6, corresponds to the supply voltage.
7. Check the setting of the normally open tilt switch on the underside of the playfield. One blade should be free-floating with a weight on the end.
8. Lower the playfield to its normal playing level and insert the two captive balls at the upper left spot target opening.
9. Reassemble and level the game.
10. The plumb-bob tilt can be adjusted by loosening the wing nut and raising the plumb-bob to increase its sensitivity, or lowering it to decrease its sensitivity.
11. With the line cord unplugged, drop a coin into one of the chutes. It should be rejected.
12. Plug the line-cord into a properly grounded 3-wire receptacle ONLY!
13. Refer to Section VI to make all necessary game adjustments.

II. INITIALIZATION, III. GAME OPERATION

II. INITIALIZATION



III. GAME OPERATION

A. GAME START

The ball must be in the ball return trough to start a game.

1. Insert coins into coin chute.
 - a. Coin chute tune is played.
 - b. Total credits are displayed in status display.
2. Press Credit Button to start game.
 - a. Credit tune is played.
 - b. Total credits displayed decrease by one.
3. All playfield features reset.
4. The first player score display flashes 2 zeros.
5. When the ball is released to the shooter, the playfield-controlled lamps flash.

B. FIRST PLAYER

1. First player's score display flashes two zeros.
2. The other player's displays are now blank.
3. A "1" appears on the ball-in-play display.

III. GAME OPERATION

4. When the ball enters the outhole, any bonus earned is scored.

multipliers are lost.

C. ADDITIONAL PLAYERS

1. Additional players are indicated by 2 zeros (not flashing) in each corresponding player's display.
2. After the maximum number of players are added, or no more credits remain, the Credit Button has no effect.
3. Additional players can be added anytime the first player's ball is still in play. If the Credit Button is pressed after the first player's first ball has entered the outhole, all players' scores will be erased with the first player's score display showing a flashing zero, indicating a new game only for the first player.

D. EXTRA BALLS

1. When the SHOOT AGAIN lamp is lit, neither the player-up nor the ball-in-play display changes when the ball enters the outhole.
2. Only one extra ball per ball-in-play is given.

E. TILT MODE

1. Tilting the game results in a loss of ball in play.
2. When the game is tilted, all the playfield lamps go off.
3. All accumulated bonus and bonus

F. SLAM MODE

1. If the normally closed slam switch (located inside front door) is opened, the entire game is ended for all players.
2. The GAME OVER lamp comes on.
3. The entire switch matrix is inactive for three seconds.
4. All coins will be rejected if dropped into any coin chute during the three-second delay.
5. If the match feature exists (dependent on Switch #26), a replay can be won even if the game is slammed.
6. Game returns to the attract mode.

G. GAME OVER

1. When the last ball enters the outhole, the GAME OVER lamp continually flashes.
2. A random number appears in the ball-in-play display. If this number matches the last two digits in any player's score, a replay (dependent on Switch #27) is awarded.
3. HGTD is periodically flashed in all players' displays. When a score higher than this is achieved, an award (dependent on Switches #23 and #24) is given.

IV. GAME PLAY AND SCORING

HOW TO PLAY

THE GAMES™

#1 AND #4 TOP ROLLOVERS

- Score 1000 and add 1 bonus unlit.
- Score 10,000, add 3 bonus, and light corresponding return rollover when lit.

#2 AND #3 TOP ROLLOVERS

- Score 5000 and add 1 bonus.
- Award special when flashing.

VARI-TARGET (4 POSITION)

- Score 10,000 for each Vari-Target lamp lit or flashing and advance lamps if hit to or above current lamp position.
- Score 1000 and subtract 1 lamp if hit below current lamp position.
- Subtract all lamps if hit below current lamp position (5 BALL).
- Completing the sequence (all lamps lit):
 - 1st Time - Enables a top rollover special and lights event medal.
 - 2nd Time - Enables both top rollover specials.
 - 3rd Time - Scores additional 50,000.

SPINNER

- Score 1000 plus 1000 for each lamp lit.
- Score 500 plus 500 for each lamp lit (5 BALL).
- Completing the sequence (all lamps lit) lights event medal corresponding to lit event.

LEFT LANE

- Score 10,000 and light a lane lamp for each rollover hit.
- Score 5000 for each rollover hit (5 BALL).
- Score 20,000 and light top lane lamp if target hit.
- Score 10,000 if target is hit (5 BALL).
- Completing the sequence (all lamps lit) lights event medal corresponding to lit event.

HOLE

- Score 10,000 and toggle event lamps.
- Collect bonus when flashing.

IV. GAME PLAY AND SCORING

LEFT AND RIGHT SPOT TARGETS

- Score 2000 and add 1 bonus.
- Start flashing if hit when lit. Turn off if hit when flashing. Completing sequence (both lamps off) when enabled awards an extra ball.

LEFT AND RIGHT RETURN ROLLOVERS

- Score 1000 and add 1 bonus unlit.
- Score 10,000, add 3 bonus, and light corresponding top rollover (#1 or #4) when lit.

LEFT AND RIGHT OUTSIDE ROLLOVERS

- Score 10,000 and add 1 bonus.

10 POINT SWITCHES

- Score 10. Toggle #2 and #3 top rollovers when either is lit.

POP BUMPERS

- Score 1000.
- Score 500 (5 BALL).

OUTHOLE

- Each bonus scores 1000 plus 1000 for each event medal lit.

ADDITIONAL INFORMATION

- Bonus can be collected in the hole when equal to 20 or above.
- Bonus value is held and restored when bonus is collected in the hole with all 5 medals lit.
- Bonus value is held and restored on next ball in play if all 5 medals are lit.
- Lighting medals according to the table below enables the left and right spot targets (extra ball).

GAME	CONTROL BOARD SWITCH 32	
	ON	OFF
	LIBERAL	CONSERVATIVE
(3 BALL)	2 MEDALS	3 MEDALS
(5 BALL)	3 MEDALS	4 MEDALS

V. SOUND

The Sound Board installed in this game has been programmed for sound only.

GOTTLEB®

VI. GAME ADJUSTMENTS

A. CONTROL BOARD SWITCH ADJUSTMENTS

NOTE: The following switch adjustments pertaining to system 80A only. There are 32 switches on the control board which permit adjustment of the game parameters. These switches are contained in four packages of eight switches each, as shown below.

COIN CHUTE COMBINATIONS SYSTEM 80A

SWITCHES					COIN CHUTE ADJUSTMENTS
S1	S2	S3	S4	S5	Left Coin Chute
S9	S10	S11	S12	S13	Right Coin Chute
S17	S18	S19	S20	S21	Center Coin Chute
					CREDITS/COINS
OFF	OFF	OFF	OFF	OFF	1/1
OFF	OFF	OFF	OFF	ON	2/1
OFF	OFF	OFF	ON	OFF	3/1
OFF	OFF	OFF	ON	ON	4/1
OFF	OFF	ON	OFF	OFF	5/1
OFF	OFF	ON	OFF	ON	6/1
OFF	OFF	ON	ON	OFF	7/1
OFF	OFF	ON	ON	ON	8/1
OFF	ON	OFF	OFF	OFF	9/1
OFF	ON	OFF	OFF	ON	10/1
OFF	ON	OFF	ON	OFF	1/2
OFF	ON	OFF	ON	ON	2/2
OFF	ON	ON	OFF	OFF	3/2
OFF	ON	ON	OFF	ON	4/2
OFF	ON	ON	ON	OFF	5/2
OFF	ON	ON	ON	ON	6/2
ON	OFF	OFF	OFF	OFF	7/2
ON	OFF	OFF	OFF	ON	8/2
ON	OFF	OFF	ON	OFF	9/2
ON	OFF	OFF	ON	ON	10/2
ON	OFF	ON	OFF	OFF	1/3
ON	OFF	ON	OFF	ON	2/3
ON	OFF	ON	ON	OFF	1/4
ON	OFF	ON	ON	ON	3/4
ON	ON	OFF	OFF	OFF	1/5

* All of the above do not give credits until the last coin is inserted.

SWITCHES 6, 7 AND 8 SPARES

SWITCH 14 COIN CHUTE 1 & 2 CONTROL
ON Same
OFF Separate

SWITCHES 15 16 MAXIMUM CREDITS
OFF OFF 8
OFF ON 10
ON OFF 15
ON ON 25

SWITCH 22 PLAYFIELD SPECIAL
ON Extra Ball
OFF Special

SWITCHES 23 24 HIGH GAME TO DATE AWARDS
OFF OFF None
OFF ON None
ON OFF 2 Replay
ON ON 3 Replay

SWITCH 25 BALLS/GAME
ON 3
OFF 5

SWITCH 26 MATCH
ON On
OFF Off

SWITCH 27 REPLAY LIMIT
ON 1
OFF No Limit

SWITCH 28 NOVELTY
ON Yes
OFF Normal

SWITCH 29 GAME MODE
ON Extra Ball
OFF Replay

SWITCH 30 3RD COIN CHUTE CREDIT CONTROL
ON Add 9
OFF No Effect

SWITCH 31 BACKGROUND SOUND ENABLE
ON Background Sound Enabled
OFF Background Sound Disabled

SWITCH 32 PLAYFIELD EXTRA BALL ADJUSTMENTS
ON Liberal
OFF Conservative

ADDITIONAL COIN CHUTE COMBINATIONS CREDIT INCENTIVES

ALL OF THE BELOW CANNOT HAVE 9 CREDITS ADDED BASED ON SWITCH 30

SWITCHES					Left Coin Chute	Right Coin Chute	Center Coin Chute								
S1	S2	S3	S4	S5	S9	S10	S11	S12	S13	S17	S18	S19	S20	S21	
					COIN/CREDIT GIVEN	COIN/CREDIT GIVEN	COIN/CREDIT GIVEN	COIN/CREDIT GIVEN	COIN/CREDIT GIVEN	TOTAL COIN/ TOTAL CREDIT					
ON	ON	OFF	OFF	ON	1st/1	2nd/2									2/3
ON	ON	OFF	ON	OFF	1st/0	2nd/1		3rd/1	4th/1						4/3
ON	ON	OFF	ON	ON	1st/0	2nd/1		3rd/0	4th/2						4/3
ON	ON	ON	OFF	OFF	1st/1	2nd/1		3rd/1	4th/2						4/5
ON	ON	ON	OFF	ON	1st/1	2nd/2		3rd/1	4th/3						4/7
ON	ON	ON	ON	OFF	1st/1	2nd/2		3rd/2	4th/2						4/7
ON	ON	ON	ON	ON	1st/0	2nd/0		3rd/1	4th/0			5th/1			5/2

VI. GAME ADJUSTMENTS

B. SOUND ADJUSTMENTS

The speaker output is controlled by the potentiometer mounted on the front door.

Turning the potentiometer counter clockwise will decrease the volume. Turning it clockwise will increase the volume.

SWITCH BANK SETTINGS:

SB1-1 SOUND TEST ENABLE
ON Test Mode (Game Over Tune)
OFF Normal
SB1-2 NOT USED

By placing switch 1 on the Sound Board to the ON position, the

Game Over Tune will continually play for test.

NOTE:

If switch 1 on the Sound Board is left in the ON position, upon power up the Game Over Tune will be the only tune played. Be certain switch 1 is in the OFF position for game play.

VII. BOOKKEEPING AND SELF TEST

The circuitry in this game helps the Operator perform many Bookkeeping and Self/Test functions. These functions are accessed by the Self/Test Switch inside the front door and information is displayed on the player's and credit displays. Bookkeeping is listed in Steps 16 through 20. Section VII A., details the Bookkeeping system, while Section VII B., details the Self/Test operation. The Flow Chart in Section VII D., gives the general order and function of both Bookkeeping, and Self/Test steps.

A. BOOKKEEPING SYSTEM 80A

- See Flow Chart for Bookkeeping Assignments.
- Bookkeeping Steps (01-15) are displayed in the credit display and the 3rd and 4th player's score display.
- Information for the particular bookkeeping step displayed will appear in the 1st player's score display.
- All bookkeeping information is checked against itself to insure that it is correct. If any data is invalid or bad, that information will flash while it is displayed.

I. STEPPING THROUGH BOOKKEEPING

1. Press the SELF-TEST button inside the front door.

Double zeros (00) should appear in the designated bookkeeping step displays.

2. Press the SELF-TEST button again. Step 01 and its information will be displayed.
3. Pressing the SELF-TEST button will increment the bookkeeping step number and appropriate information will be displayed.

NOTE:

If the SELF-TEST button is not pressed within 60 seconds of

each step, the game will return to the attract mode.

Pressing the SELF-TEST button after Step 15 will start the SELF-TEST function (Step 16-20). At this point Bookkeeping cannot be reentered by pressing the SELF-TEST button. To reenter, turn the game OFF/ON, open the slam switch, or wait 60 seconds. The game will return to the attract mode. The press the SELF-TEST button.

4. To exit from Bookkeeping at a time:

- a. Wait 60 seconds or
- b. Turn power OFF/ON or
- c. Open slam switch or
- d. Close a tilt switch.

II. HOW TO SET BOOKKEEPING INFORMATION TO ZERO

1. For a Particular Bookkeeping

- a. Advance Bookkeeping so the step to be zeroed is displayed.
- b. Press the replay button. Notice all zeros will appear in the 1st player's display.
- c. Press the SELF-TEST button. This will enter zeros into memory.

NOTE:

If the SELF-TEST button is not pressed, the bookkeeping memory will retain its information.

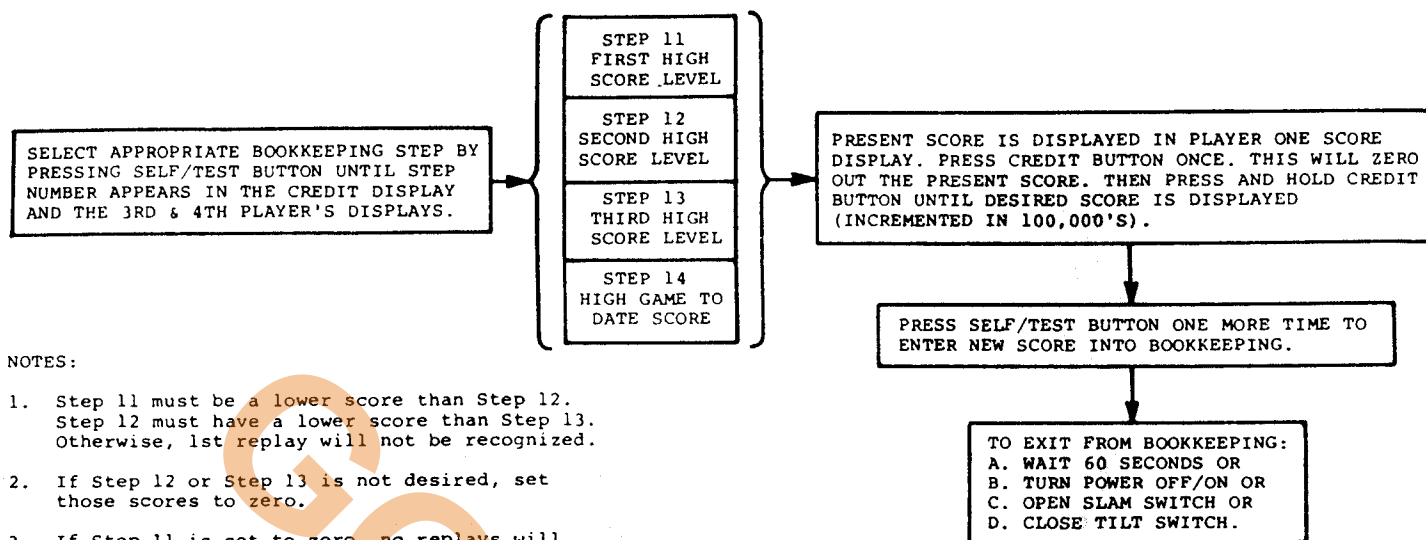
2. Zeroing All Bookkeeping Steps Except #11, 12, 13 and 14.

(These are the replay level and high game to date scores)

- a. Go to Step #15.
- b. Press the credit button. Step 15 data will zero.
- c. Press the SELF-TEST button.
- d. Zeroing is complete.

VII. BOOKKEEPING AND SELF TEST

III. HOW TO RESET HIGH SCORE LEVELS OR HIGH GAME TO DATE SCORES

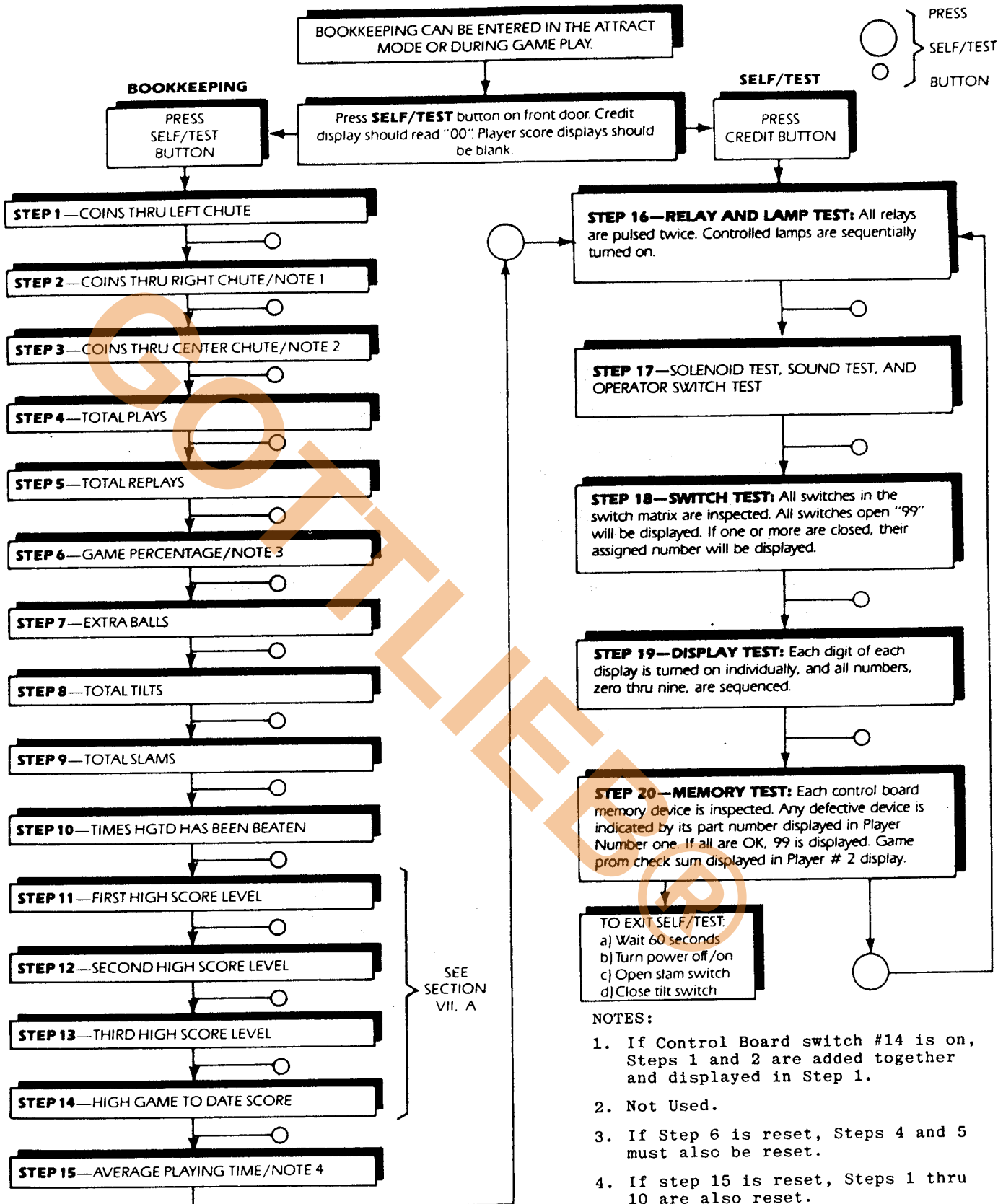


NOTES:

1. Step 11 must be a lower score than Step 12. Step 12 must have a lower score than Step 13. Otherwise, 1st replay will not be recognized.
2. If Step 12 or Step 13 is not desired, set those scores to zero.
3. If Step 11 is set to zero, no replays will be awarded, no matter what the settings are for Step 12 and Step 13.

VII. BOOKKEEPING AND SELF TEST

B. FLOW CHART

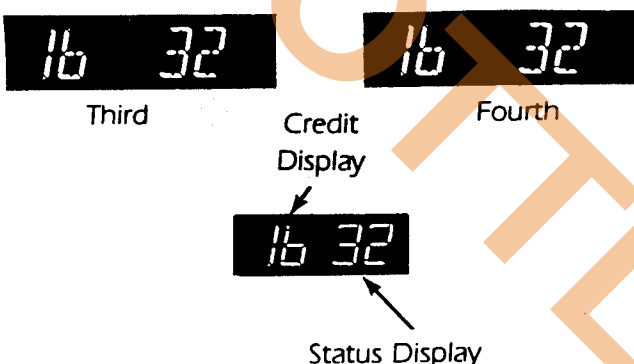


VII. BOOKKEEPING AND SELF TEST

C. SELF/TEST

- Steps 16 through 20 are SELF/TEST or game tests the operator can use for quick troubleshooting.
- All the tests are explained in the flow chart.
- Each test can be repeated by pressing the replay button on the front door.
- If the SELF/TEST button or the replay button is not pressed within 20 seconds after completion of a tests complete cycle, the game will return to the attract mode.

EXAMPLE:

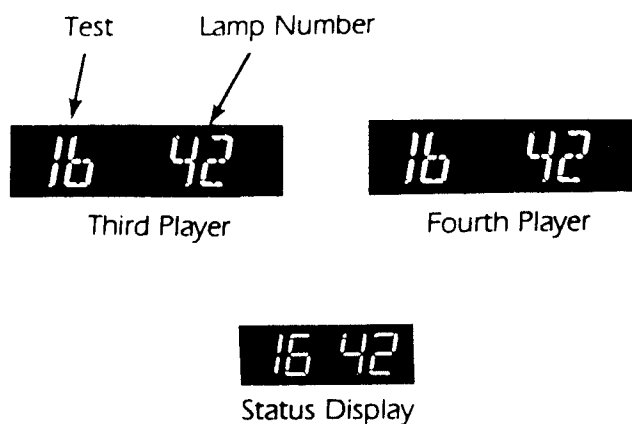


STEP 16—RELAY AND LAMP TEST

- a. Relay Test-All relays are pulsed twice in the following order:

A3 Driver Board Transistor Assignment (See Schematic)		
Q (Game Over) Relay	-	A3J3 PIN #A Q1
T (Tilt) Relay	-	A3J3 PIN #B Q2
Coin Lockout Relay	-	A3J5 PIN #2 Q3

- b. Lamp Test-Lamps are sequentially strobed. Lamp assignment numbers appear in the third and fourth player's score display and the status display:



Lamp number (L9, L16, etc.) can be referenced to the Driver Board Schematic where the specific transistor for each lamp can be identified.

To repeat test, push the credit button. To advance to test #17, push the Self/Test Button.

STEP 17—SOLENOID TEST, SOUND TEST, OPERATOR SWITCH TEST.

- a. Solenoid Test-Each solenoid on the playfield is sequentially pulsed. The solenoid number displayed identifies which solenoid is being tested. The following chart lists solenoid assignments.

NUMBER DISPLAYED	ASSIGNMENT	A3 DRIVER BOARD TRANSISTOR ASSIGN. SEE SCHEMATIC
Sol.1	Hole	Q60
Sol.2	Not Used	Q57/Q58
Sol.3	Not Used	Q54
Sol.4	Not Used	Q55
Sol.5	Not Used	Q61/Q62
Sol.6	Not Used	Q63/Q64
Sol.7	Not Used	Q56
Sol.8	Knocker	Q53
Sol.9	Outhole	Q59

- b. Sound Test-Immediately after the solenoid test, the sound enable signals (inputted to the A6 Sound Board) will be tested in the following order:

VII. BOOKKEEPING AND SELF TEST

SOUND NUMBER ENABLE DISPLAYED

S16	17 (combination S1 & S16)	A3J2	PIN 9
S8	8	A3J5	PIN 7
S2	2	A3J5	PIN 5
S4	4	A3J5	PIN 1
S1	1	A3J5	PIN 6

A3 DRIVER BOARD TRANSISTOR ASSIGN. SEE SCHEMATIC

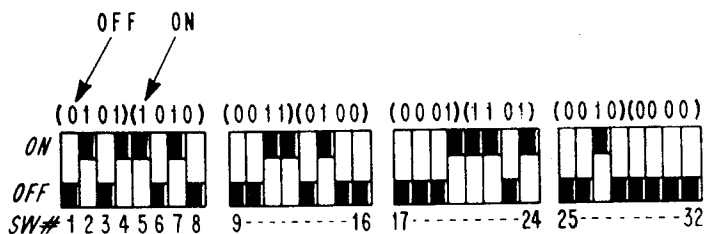
- c. The first and second player's score displays show hexadecimal representative of the operator switch positions. Converting hexadecimal to binary will give the switch positions in binary form.

CONVERSION TABLE

0 = OFF 1 = ON

DISPLAYED HEXIDEcimal	DECIMAL	BINARY
0	0	0000
1	1	0001
2	2	0010
3	3	0011
4	4	0100
5	5	0101
6	6	0110
7	7	0111
8	8	1000
9	9	1001
A	10	1010
B	11	1011
C	12	1100
D	13	1101
E	14	1110
F	15	1111
BLANK		

EXAMPLE:



DISPLAYED

SW 1-8 SW 9-16
5C 34

First Player

SW 17-24 SW 25-32
1E 20

Second Player

Checking Switches

- 1) Switch all odd number switches to the ON position, and all even switches to the OFF position. Display should show:

CC CC

First Player

CC CC

Second Player

- 2) Switch all even numbered switches to the ON position and all odd switches to the OFF position. Display should show:

55 55

First Player

55 55

Second Player

To repeat test #17, push the credit button.

To advance to test #18, push the Self/Test switch.

STEP 18—SWITCH TEST

18 67

Third Player

18 67

Fourth Player

Credit
Display
18 67
Status Display

- 1) All switches open. 99 will be displayed. (Note: The slam switch is not part of the switch test (normally closed).

- 2) Switch(es) closed. Designated number(s) will be sequentially displayed. The last switch number will remain displayed, unless test is repeated.

VII. BOOKKEEPING AND SELF TEST, VIII. OPTIONS

VII. BOOKKEEPING AND SELF TEST

STEP 19—DISPLAY TEST: Each digit of each display is individually turned on, and numbers zero through nine are sequenced.

- Test number is not displayed.

NOTE: On the second and fourth player displays only, the least significant digits are strobed first. Then the most significant digits and the remaining digits are sequentially strobed. This is normal operation.

STEP 20—MEMORY TEST - Each control based memory device is checked. If all are good, a 99 will be displayed.

If a memory chip located on the A1 Control Board is defective, a corresponding number in the following chart will be displayed.

NUMBER DISPLAYED

99
5 10 1
2332-1
2332-2
6532-1
6532-2
6532-3
27 16*

CHIP ASSIGNMENT/ DESCRIPTION

All Memory Good
Z5 Bookkeeping Ram
U2 Background Rom
U3 Background Rom
U4 Ram
U5 Ram
U6 Ram
Prom 1 Game E Prom

Player #2 displays the check sum for the game prom in hexadecimal. Refer to the conversion Table for interpretation.

To repeat test #20, push the credit button. To advance to Step # 16, push the Self/Test button.

* James Bond (658) and later System 80 games up to and including Haunted House will display 764 1-1 for a bad 27 16 game prom.

VIII. OPTIONS

There are no options for this game.

IX. GENERAL INFORMATION

A. PRINTED CIRCUIT BOARDS ARE DESIGNATED AS FOLLOWS:

A1 - Control Board
A2 - Power Supply
A3 - Driver Board
A5 - Status Display
A6 - Sound Board
A7 - Diode Boards
A8 - Pop Bumper Driver Boards
A14- 7-Digit Displays
A24- Reset Board

B. WIRE COLORS ARE SHOWN AS NUMBERS:

0 Black
1 Brown
2 Red
3 Orange
4 Yellow
5 Green
6 Blue
7 Purple
8 Gray
9 White

Printed circuit board connectors will be labeled AX-JX. For example, A3-J4 is the connector J4 on the driver board (A3).

For example, 688 is a BLUE-GRAY-GRAY striped wire.

C. FUSES

TRANSFORMER PANEL FUSES

F1	Sound/Speech Power Supply (A6)....	12V AC		1/2 Amp
F2	Power Supply (A2).....	10V AC		5 Amp SLO-BLO
F3	Displays	60V AC		1/4 Amp SLO-BLO
F4	Solenoids (+24V DC).....	28V AC		8 Amp SLO-BLO
F5	Controlled Lamps.....	8V AC		10 Amp
F6	Playboard Illumination.....	6.3V AC		8 Amp SLO-BLO
F7	Lightbox Illumination.....	6.3V AC		10 Amp
F8	Primary Power.....	115V AC		5 Amp SLO-BLO
		230V AC		2-1/2 Amp SLO-BLO

PLAYFIELD FUSES

F9	Right Pop Bumper.....	2 Amp	SLO-BLO
F10	Left Pop Bumper.....	2 Amp	SLO-BLO
F11	Bottom Pop Bumper.....	2 Amp	SLO-BLO
F12	Top Pop Bumper.....	2 Amp	SLO-BLO
F13	Hole, Outhole.....	1 Amp	SLO-BLO

IX. GENERAL INFORMATION

D. COIL CHART

SOLENOID COILS					
PART NUMBER	GENERAL USAGE	RESISTANCE (OHMS)	NUMBER OF TURNS	WIRE GAUGE	WRAPPER COLOR
A-1496	KICKING TARGET KICKING RUBBERS POP BUMPERS	2.95	635	#23	Yellow
A-4893	UP KICKER POP BUMPERS BALL KICKER	2.1	535	#22	Red
A-5194	UP KICKER GONG KICKING TARGETS POP BUMPERS	4.5	780	#24	Blue
A-5195	CONTACT KICKER KNOCKER HOLE KICKER	12.3	1305	#26	White
A-16570	HOLE KICKER, OUTHOLE	15.5	1450	#27	Green
A-17875	FLIPPERS	2.8/40.0	560/1100	#24/31	Yellow
A-17891	5 BANK RESET	3.35	850	#22	White
A-18102	3 BANK RESET, 7 BANK RESET USES 2	9.0	1430	#24	Red
A-18318	4 BANK RESET	6.7	1130	#24	Orange
A-19300	BALL KICKER	7.8	1075	#25	Orange
A-20095	SUPER FLIPPER	1.55/35.5	450/900	#22/31	Red
A-21741	UP KICKER	2.5	575	#23	Orange
RELAY COILS					
A-16890	O, T, AND COIN LOCKOUT RELAYS	231.0	4000	#35	Orange
A-20558	GATE RELAY	156.0	3400	#34	White
A-18642	MEMORY/ DROP TARGETS	58.0	1590	#33	White

*Coils may vary from game to game. Check game manual for exact coil usage.

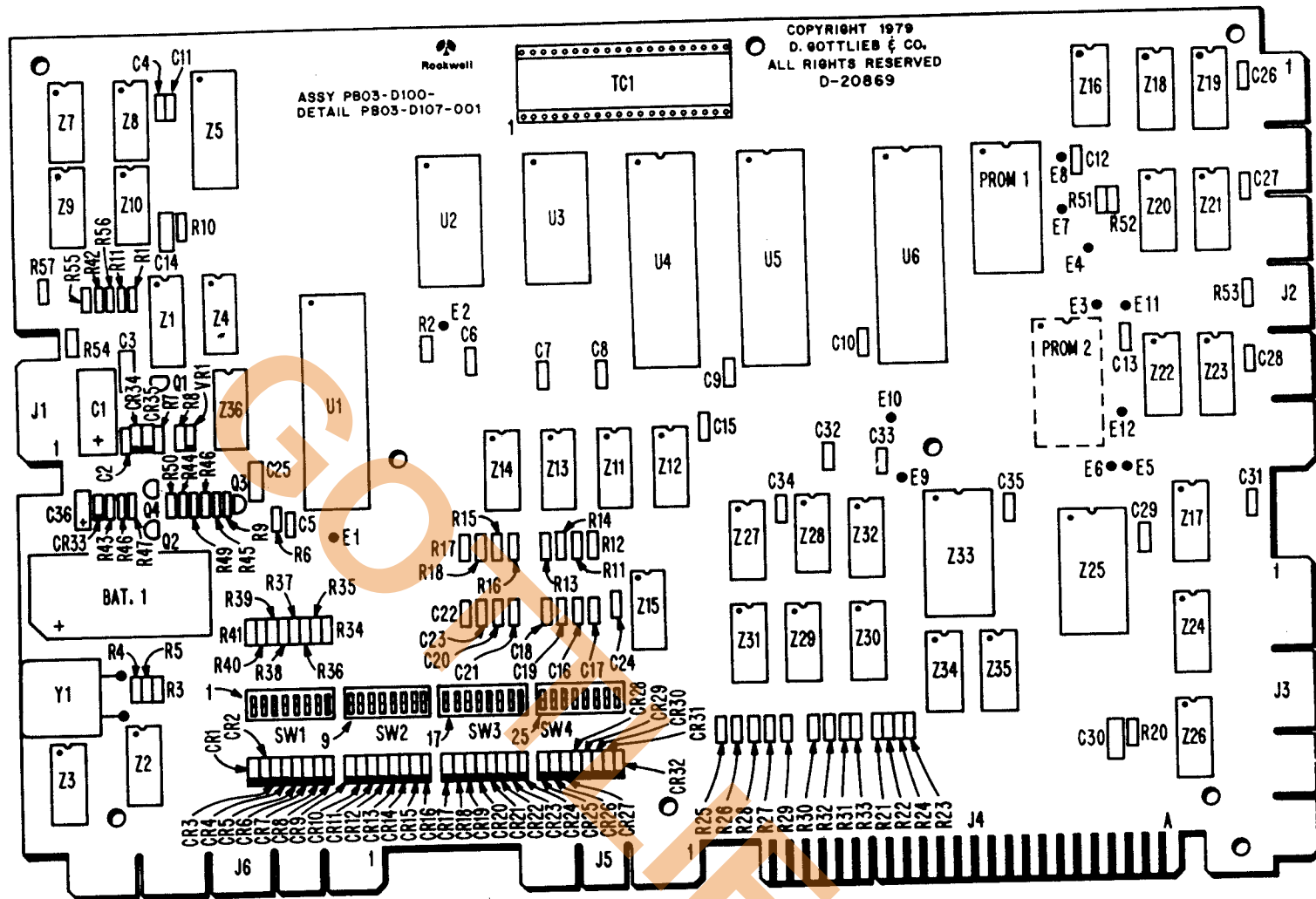
X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

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X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

CONTROL BOARD (A1) COMPONENT LOCATION



CONTROL BOARD (A1) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER	REFERENCE	DESCRIPTION	PART NUMBER
	CONTROL BOARD	MA-291	U3	ROM	XO-327
Bat. 1	Battery-3.6V 326R10-002	XO-458	U4, U5, U6	PRIOT R6532-18	XO-361
C1	Capacitor, 100 mfd., 10V	XO-211	VR1	Diode-3.0V, 5% 1N5225B or 1N5987B	XO-269
C2, C4-C13,	Capacitor, 01 mfd., 50V	XO-229	Y1	Crystal, 3.579545 MHZ	XO-456
C15-C24, C26-			Z1	IC-Cmos-Dual 1 Shot SCL4528BE	XO-414
C29, C31-C35			Z2	IC-Dual Flip Flop SN7474N	XO-423
C3, C14, C25,	Capacitor, 1 mfd., 50V	XO-230	Z3, Z11, Z12,	IC-Hex Inverter SN7404N	XO-402
C30			Z16, Z17, Z24,		
C36	10 mfd., 10V, TNT-AX CAP	XO-209	Z26, Z27, Z34,		
CR1-CR35	Diode, GP 1N4148	XO-261	Z35		
Q1, Q4	Transistor-PNP MPS-A70	XO-309	Z4	IC-Cmos-Quad 2 Input	XO-401
Q2, Q3	Transistor, NPN (Motorola) 2N4400	XO-313		"And" SCL4081BE	XO-356
R1, R6, R11-R24,	Resistor, 3.0K ohm, 5%, 1/4W	XO-23		IC-Static Ram S5101-L	XO-418
R42, R45, R46,				IC-Hex Inverter SN74LS04N	XO-421
R48, R51-R57				IC-2 Input "Nor" SN7402N	XO-420
R2, R34-R41	Resistor, 4.7K ohm, 5%, 1/4W	XO-7		IC-2 Input "Nand" SN7400N	XO-411
R3, R43, R49	Resistor, 5.6K ohm, 5%, 1/4W	XO-19		IC-Open Collector Inverter SN74LS05N	XO-407
R4, R5, R44	Resistor, 2.0K ohm, 5%, 1/4W	XO-14		IC-2 Input "Or" SN7432N	XO-410
R7	Resistor, 62 ohm, 5%, 1/4W	XO-3		IC-"D" Flip Flop SN74175N	XO-408
R8, R50	Resistor, 180 ohm, 5%, 1/4W	XO-24		IC-4 to 7 Decoder SN7448N	XO-409
R9	Resistor, 1K ohm, 5%, 1/4W	XO-5		IC-4-16 Decoder SN74154N	XO-419
R10	Resistor, 2.7M ohm, 5%, 1/4W	XO-13		IC-2 to 4 Decoder SN74LS139N	XO-405
R25-R33	Resistor, 620 ohm, 5%, 1/4W	XO-4		IC-Hex Inverter-OC/HV SN7416N	XO-404
R47	Resistor, 24K ohm, 5%, 1/4W	XO-10		IC-2 Input "And" SN7408N	XO-406
SW1-SW4	Dip Switch 1008-692	XO-505		IC-Hex Buffer-OC SN7417N	XO-424
TC1	Socket, 40 Pin 640379-3	XO-530		IC-Cmos SCL4069B	XO-529
U1	CPU R6502-13	XO-360		Socket 24 Pin 640361-3	
U2	ROM	XO-326			

XI. PARTS INFORMATION

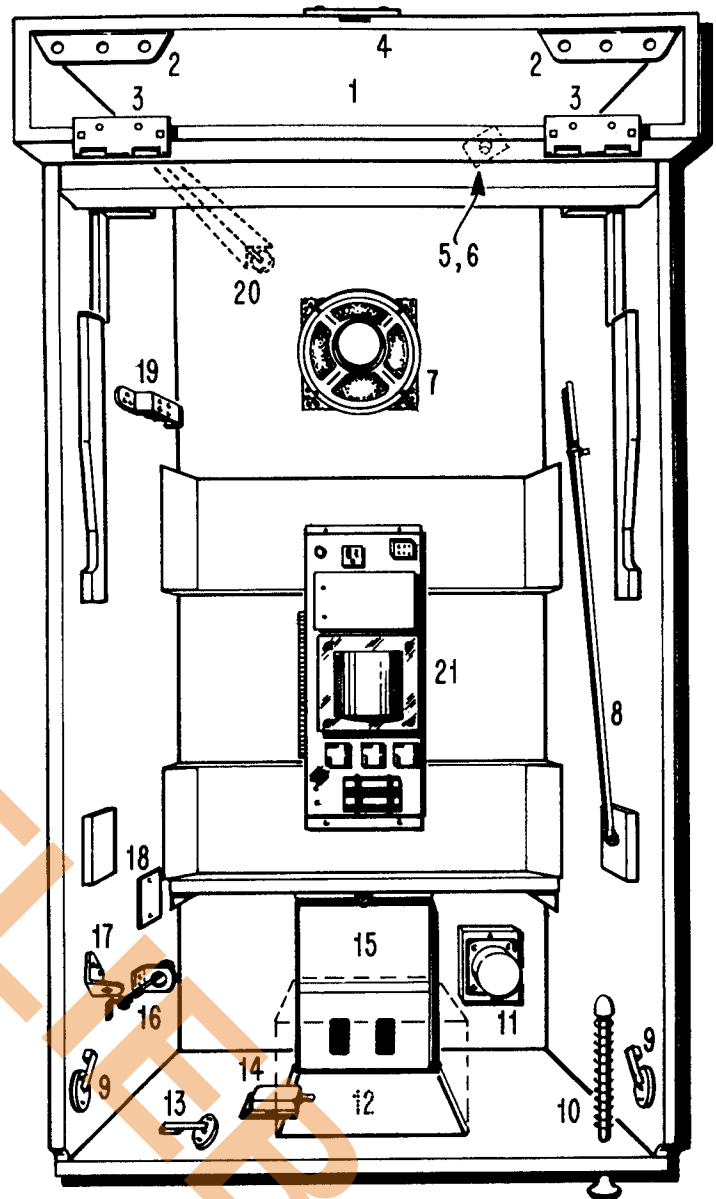
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XI. PARTS INFORMATION

CABINET PARTS

ITEM	DESCRIPTION	PART NO.
1.	Cabinet (Specify Game)	19916
2.	Lightbox Mounting Bracket (2)	22734
3.	Butt Hinge, (Shown For Reference Only, P/O Lightbox Assy.) (2)	22733
4.	Latch Bar	21969
5.	Latch Assembly (P/O Lightbox)	MA-589
6.	Cable Assembly, Domestic (High Voltage)	23365
7.	Line Cord (Domestic)	21955
8.	Line Cord Cover Plate	EL-83
9.	Speaker, 4 Ohm, 3W	20931
10.	Speaker Guard	23940
11.	Prop Stick, Playfield	17838
12.	Flipper Switch Assembly (2)	8835
13.	Ball Shooter Assembly	23799
14.	Switch, On/Off	18769
15.	Switch Plate	15163
16.	Switch Housing	MA-590
17.	Front Door Assembly (Universal)	FD-10
18.	Bar, Locking	MA-597
19.	Cable Assembly	FD-9
20.	Cam Locking Assembly	FD-11
21.	Coil, Coin Lockout (2)	XO-104
22.	Control, Volume, 100 Ohm, 2W	XO-254
23.	Diode, 1N4004 (2)	FD-5
24.	Insert, Domestic (2)	FD-2
25.	Lamp, 6V Wedge (2)	FD-8
26.	Lock and Key Assembly with Hardware	FD-3
27.	Socket, Lamp Wedge (2)	FD-4
28.	Spring, Torsion	FD-6
29.	Switch, Coin (2)	FD-7
30.	Wire, Switch (2)	FD-12
31.	Switch, Slam	18092
32.	Replay Switch Assembly	EL-66
33.	Interlock Switch	21888
34.	Interlock Switch Cover	23879
35.	Cashbox	23880
36.	Cashbox Cover	23878
37.	Cashbox Lockkey Assembly	358
38.	Plumb Bob Tilt Switch Assembly	MH-30
39.	Strike Plate	357
40.	Carbon, Tilt Bob	18578
41.	Rod, Tilt	23839
42.	Locator Bracket	XO-265
43.	Diode Board Assembly	MA-12
44.	Diode, 1N270 (5)	4337
45.	Knocker Assembly	3775
46.	Cabinet Leg (4)	MH-21
47.	Leg Bolt (8)	MA-588
48.	3" Leg Adjuster (4)	EL-42
49.	Transformer Panel Assembly	MA-596
50.	Bridge Rectifier (3)	XO-774
51.	Cable Assembly (Secondary)	EL-50
52.	Capacitor, 6800UF, 25V	EL-11
53.	Filter, Line	23805
54.	Fuse Block (7 Pos.)	EL-78
55.	Fuse Cover (7 Pos.)	EL-28
56.	Fuse Holder (F8)	EL-8
57.	Fuses	EL-5
58.	F1, .50 Amp	EL-26
59.	F2, 5 Amp, SLO-BLO	EL-23
60.	F3, .25 Amp, SLO-BLO	EL-26
61.	F4, 8 Amp, SLO BLO	EL-36
62.	F5, 10 Amp	EL-8
63.	F6, 8 Amp, SLO-BLO	EL-21
64.	F7, 10 Amp, SLO-BLO	23833
65.	F8, 5 Amp, SLO-BLO (110V AC)	18133
66.	F8, 2.5 Amp, SLO-BLO (220V AC)	XO-154
67.	Ground Bus Connector (3)	23836
68.	Outlet, Service	
69.	Resistor, 0.33 Ohm, 10%	
70.	5W, Wire-Wound Transformer	



XI. PARTS INFORMATION

PLAYBOARD PARTS

RUBBER RINGS

ITEM	DESCRIPTION	PART NO.
A	Siamese (6)	17493
B	1/2" (1)	10218
C	Mini-Post (13)	15705
D	3" (1)	10223
E	2" (4)	10221
F	5/16" (4)	10217
G	Red (2)	13151

PARTS LIST

ITEM	DESCRIPTION	PART NO.
1.	Flat Rail	24009
2.	Arch Rebound Assy.	19646
3.	Arch Gate Assy.	19645
4.	Ball Guide Rail	3722
5.	Ball Guide Rail (2)	6612
6.	Ball Guide Rail (2)	19331
7.	Ball Guide Rail (2)	11703
8.	Ball Guide Rail	21164
9.	Ball Guide Rail	13833
10.	Ball Guide Rail	18563
11.	Ball Guide Rail	5775
12.	Ball Guide Rail (2)	6931
13.	Ball Guide Rail	14572
14.	Ball Guide Rail	14571
15.	Ball Deflector	21158
16.	Ball Snubber	16038
17.	Flat Rail (2)	24008
18.	Flat Rail	21382
19.	Pop Bumper Cap, with Design (4)	24091
20.	Pop Bumper Body, White (4)	10435Z
21.	Pop Bumper Skirt, White (4)	10433Z
22.	Pop Bumper Trim Platter (2)	8246
23.	Pop Bumper Trim Platter	24003
24.	Pop Bumper Trim Platter	24004
25.	Vari-Target Assy.	MA-237
26.	Rollover Guide, Orange (2)	15646V
27.	Rollover Guide, Orange	15647V
28.	Spot Target, with Design (3)	9398
29.	Hole Base Plate, Red	15707U
30.	Swinging Target	20388
31.	Swinging Target Switch Rod	20406
32.	Rollover Guide, Orange (2)	15648V
33.	Flipper, White (2)	13150
34.	Cardholder	13647
35.	Ball Shooter Gauge	9767
36.	Mylar Overlay	24007
37.	Plastic Shield Set	24002
38.	Steel Ball (2)	21864
39.	"L" Bracket (2)	17494
40.	Ball Return Unit	21622

Plastic Post 1" (18) 11561PX
 Siamese Post (2) 17492Z
 Plastic Support Post (2) 20635P

LIMITED WARRANTY

Mylstar Electronics, Inc. warrants to the initial purchaser of the Mylstar Electronics, Inc. machine that the items listed in the following schedule as installed and used in the original Mylstar Electronics, Inc. machine will for the applicable period set forth in the schedule, computed from the initial date of purchase from an authorized Mylstar Electronics, Inc. distributor, be free of defects in materials and workmanship:

SCHEDULE

GAME	ITEM	WARRANTY PERIOD
Pinball	All Electronic Printed circuit boards	90 days
Pinball-Video	All Electronic Printed Circuit Boards	90 days
	Card Cage	90 days
	Television Monitor	30 days
Video	All Electronic Printed Circuit Boards	90 days
	Television Monitor	30 days

This Limited Warranty does not apply to any parts damaged in the course of handling or assembling by the customer or damage due to other than normal use or use in violation of instructions or reasonable practices, or further damaged in return shipment. This Limited Warranty is made only to the original customer, and is and shall be in lieu of all other warranties expressed or implied, and of all other obligations or liabilities on the part of Mylstar Electronics, Inc. and in no event shall Mylstar Electronics, Inc. be liable for any anticipated profits, consequential damages, loss of time, or other losses incurred by the customer in connection with the purchase or operation of Mylstar Electronics, Inc. machines or components thereof.

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