

Gottlieb

AMAZON HUNT



Instruction Manual

AMAZON HUNT
(GAME 684A)

FINAL EDITION

APPLICABLE TO ALL GAMES
NOT HAVING THE LETTER "S"
IN THEIR SERIAL NUMBER

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AMAZON HUNT PROMS

GAME PROM 684A/**1**

SOUND PROMS 684/S1, 684/S2

SYSTEM 80A

Gottlieb's 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. Open the cabinet door and loosen the front moulding locking arm.
5. Remove the moulding from the playfield.
6. Slide the cabinet glass forward and remove it.
7. Raise the playboard, slide it forward and rest it on its supports.
8. From the inside of the cabinet, remove the binding strap from the power cord. Feed the cord to the outside of the cabinet through the black plastic line cord housing.
9. Unlock the lightbox and remove the backglass.
10. Loosen and lower the shipping bracket at the top center of the lightbox insert panel.
11. Lift the insert; then swing it out.
12. Secure the lightbox to the cabinet with the bolts and washers provided.

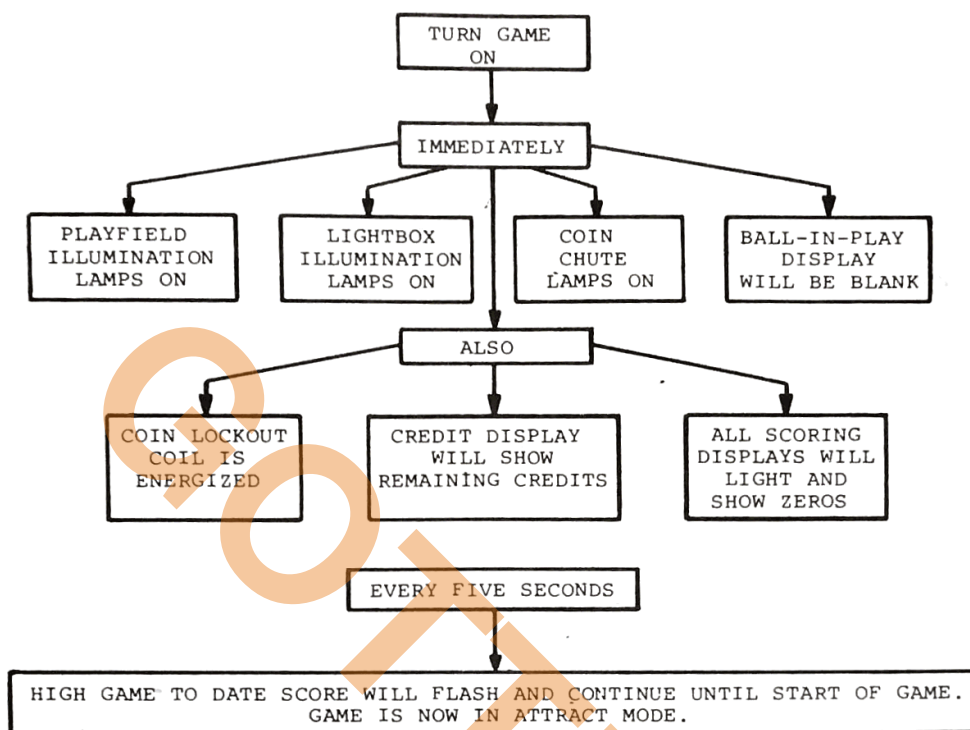
B. CHECK-OUT

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 transformers for any foreign matter across terminals.
6. Be sure transformer wiring 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. Reassemble and level the game.
9. 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.

The ball-roll tilt can be adjusted by loosening the front screw and raising the tilt bracket to increase sensitivity, or lowering it to decrease its sensitivity.
10. With the line cord unplugged, drop a coin into one of the chutes. It should be rejected.
11. Plug the line-cord into a properly grounded 3-wire receptacle ONLY!
12. 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.
4. When the ball enters the outhole, any bonus earned is scored.

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

III. GAME OPERATION

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 multipliers are lost.

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.
4. All of the target banks will reset.

IV. GAME PLAY AND SCORING

TOP "A" ROLLOVER

- Unlit-Scores 500 points.
- Lit-Scores 5000 points.
Scores 3000 points
(5 ball).
Adds 1 bonus.
- Turns off "A" rollover lamp.
- Lights left hole value lamp.
- Lights left pop bumper.

BOTTOM "A" ROLLOVER

- Same as Top "A" Rollover.

TOP "B" ROLLOVER

- Unlit-Scores 500 points.
- Lit-Scores 5000 points.
Scores 3000 points
(5 ball).
Adds 1 bonus.
- Turns off "B" rollover lamp.
- Lights center hole value lamp.
- Lights center pop bumper.

BOTTOM "B" ROLLOVERS (2)

- Same as Top "B" Rollover.

TOP "C" ROLLOVER

- Unlit-Scores 500 points.
- Lit-Scores 5000 points.
Scores 3000 points
(5 ball).
Adds 1 bonus.

- Turns off "C" rollover lamp.
- Lights right hole value lamp.
- Lights right pop bumper.

BOTTOM "C" ROLLOVER

- Same as Top "C" Rollover.

OUTLANE ROLLOVERS

- Score 5000 points.
- Score 3000 points (5 ball).
- Add 1 bonus.

SPOT TARGETS (4)

- Unlit-Score 500 points.
- Lit-Score 5000 points.
Score 3000 points
(5 ball).
Add 1 bonus.
Alternate special lights
when lit (5 ball).

Note: Two of the four spot targets are lit (3 ball). One of the four spot targets is lit (5 ball). The lights are toggled (rotated on 5 ball) by the 10 point switches, 100 point switches, lit pop bumpers and the spot targets themselves.

POP BUMPERS (3)

- Unlit-Score 100 points.
- Lit-Score 1000 points.
Toggle spot target lights.
Rotate spot target lights
(5 ball).
Alternate Special lights
when lit (5 ball).

IV. GAME PLAY AND SCORING

100 POINT SWITCHES

- Score 100 points.
- Toggle spot target lights.
- Rotate spot target lights (5 ball).
- Alternate Special lights when lit (5 ball).

- Completing A-B-C and the right drop target bank lights the right hole for Special.
- Completing A-B-C and both drop target banks lights one hole for Special (5 ball).

Note: Special lamps are alternated by the spot targets, pop bumpers, 10 point switches and 100 point switches (5 ball).

10 POINT SWITCHES

- Score 10 points.
- Toggle spot target lights.
- Rotate spot target lights (5 ball).
- Alternate Special lights when lit (5 ball).

HOLES (2)

- Scores 10,000 points.
- Scores additional 10,000 points for each lit lamp.
- Awards Special when lit.

DROP TARGETS

- Score 5000 points.
- Score 3000 points (5 ball).
- Add 1 bonus.

Note: Target banks reset only after both banks have been dropped. Once both banks are dropped, only the center targets reset. Center targets then score 50,000 points each and reset when both are dropped.

EXTRA BALL

- Completing A-B-C lights the Extra Ball lamp above the Top "B" Rollover.
- The Extra Ball is awarded when completing the Top "B" Rollover when the Extra Ball lamp is lit.

BONUS

- Bonus is collected at the outhole only.
- Completing A-B-C lights the 2X multiplier. The 2X multiplier is automatically lit on the last ball only. Completing A-B-C on the last ball lights the 3X multiplier. Maximum bonus is 190,000 points.

SPECIAL (1 PER BALL)

- Completing A-B-C and the left drop target bank lights the left hole for Special.

V. SOUND

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

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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

S1	S2	S3	S4	S5	COIN CHUTE ADJUSTMENTS
S9	S10	S11	S12	S13	Left Coin Chute
S17	S18	S19	S20	S21	Right Coin Chute
					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 SPARE

ADDITIONAL COIN CHUTE COMBINATIONS CREDIT INCENTIVES

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

SWITCHES

S1 S2 S3 S4 S5 - Left Coin Chute
S9 S10 S11 S12 S12 - Right Coin Chute
S17 S18 S19 S20 S21 - Center Coin Chute

					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.

C. POST ADJUSTMENTS

The inner lexan posts at the mouth of the left and right outlanes can be repositioned for liberal/conservative play. The smaller opening produces a more liberal 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. Information is displayed on the player's and credit display. Bookkeeping is listed in Steps 01 through 15. Section VII, A details the Bookkeeping system, while Section VII, C details the Self/Test operation. The Flow Chart in Section VII, B gives the 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 the 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, close a tilt switch, or wait 60 seconds. The game will return to the attract mode. Then press the SELF-TEST button.

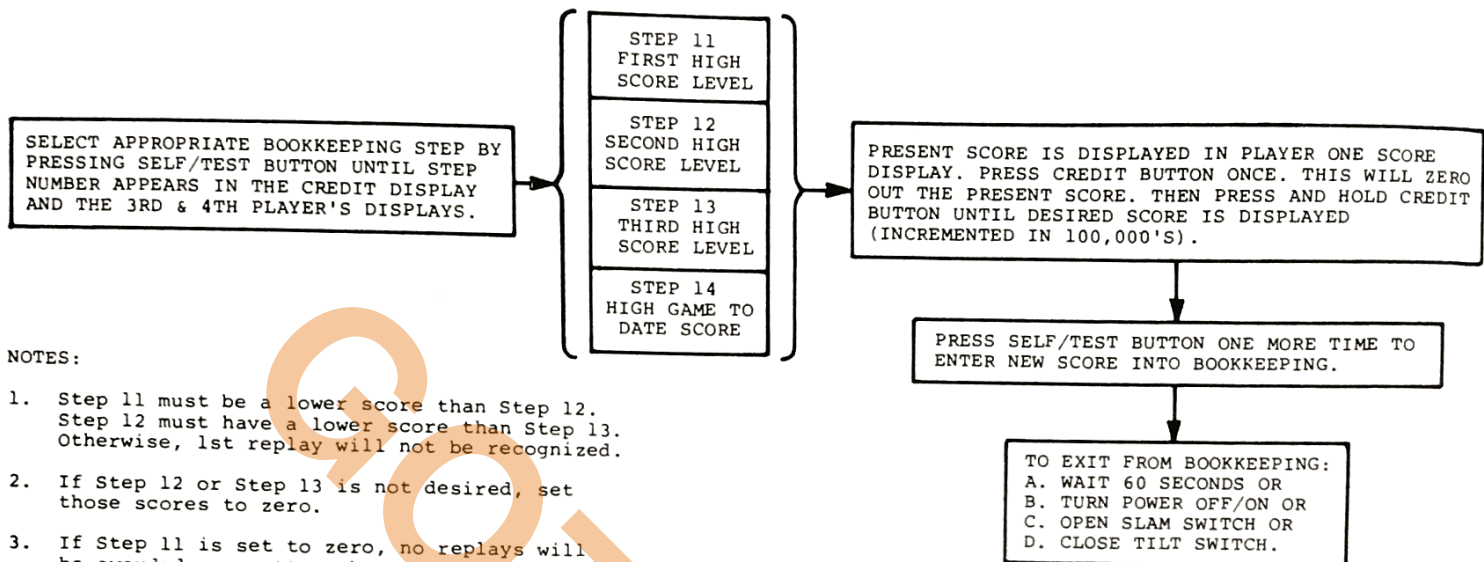
4. To exit from Bookkeeping at any time:
 - a. Wait 60 seconds or
 - b. Turn power OFF/ON or
 - c. Open slam switch or
 - d. Close a tilt switch.

II. HOW TO SET BOOKKEEPING INFORMATION TO ZERO

1. For a Particular Bookkeeping Step
 - 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

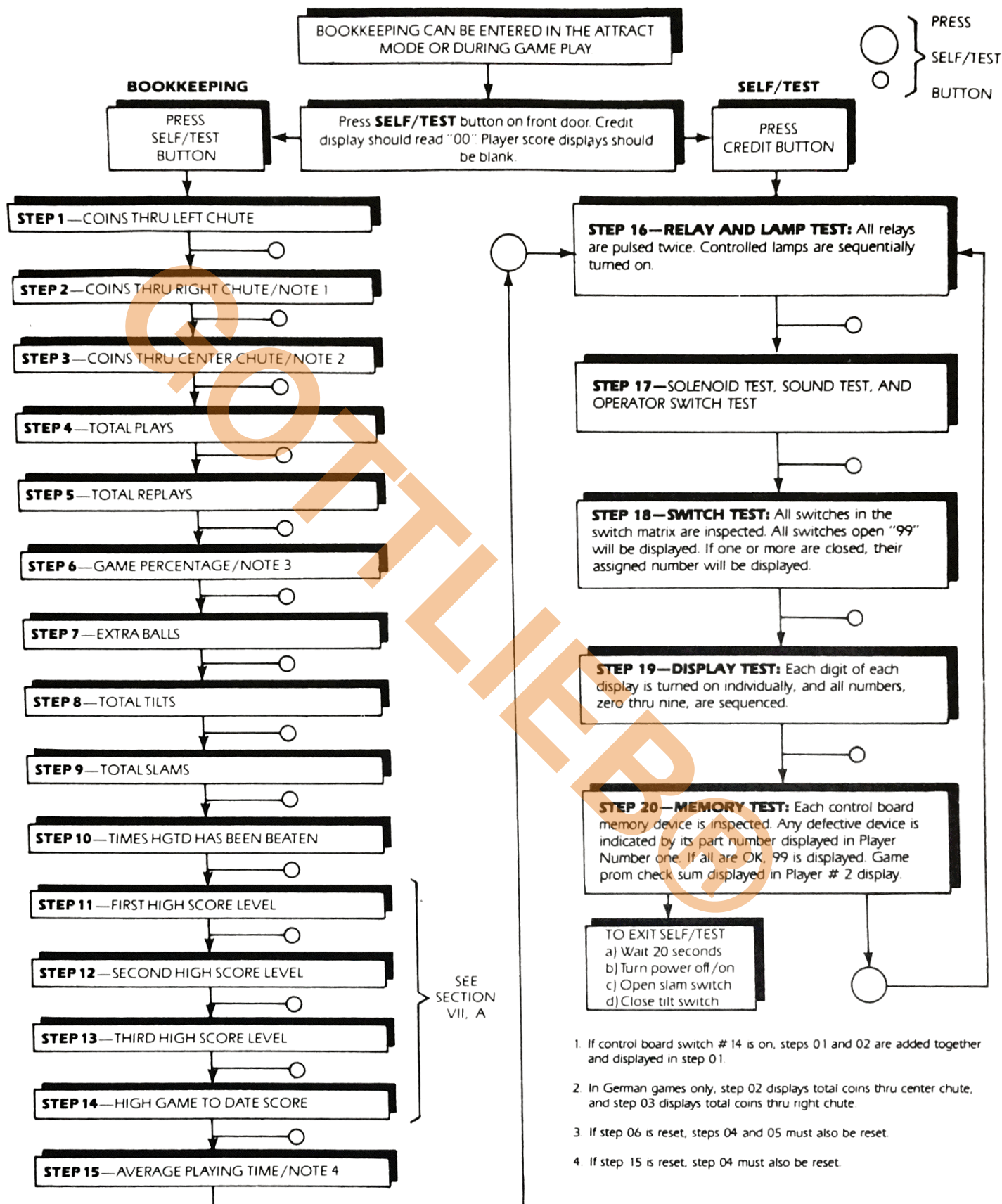


NOTES:

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

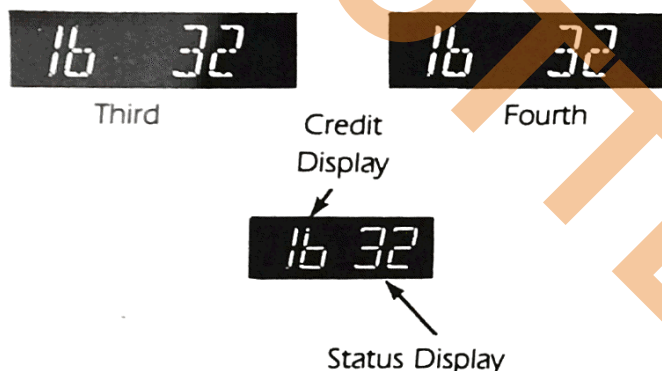


VII. BOOKKEEPING AND SELF TEST

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:

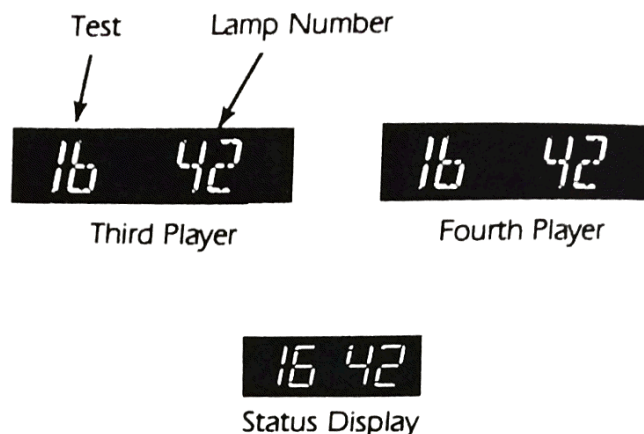


STEP 16—RELAY AND LAMP TEST

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

O (Game Over) Relay	-	A3 Driver Board Transistor Assignment (See Schematic)
T (Tilt) Relay	-	A3J3 PIN #A Q1
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	Rt. Bank Trip	Q60
Sol. 2	Lt. Bank Trip	Q57/Q58
Sol. 3	Not Used	Q54
Sol. 4	Not Used	Q55
Sol. 5	Lt. Bank Reset	Q61/Q62
Sol. 6	Rt. Bank Reset	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

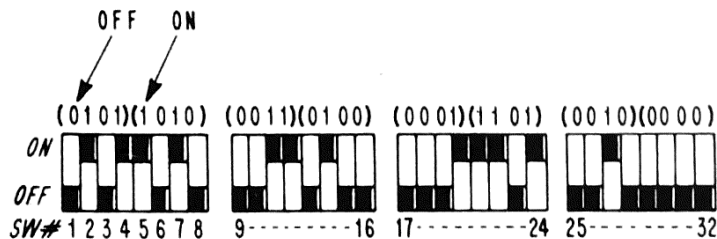
- c. The first and second player's score displays show hexadecimal representative of the operator switch positions. Converting hexadecimal to binary will give the switch positions in binary form.

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	SW 17-24	SW 25-32
5c	34	15	20
First Player	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:



First Player



Second Player

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



First Player



Second Player

To repeat test #17, push the credit button.

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

STEP 18—SWITCH TEST



Third Player



Fourth Player

Credit
Display



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
A8 - Pop Bumper Driver Boards
A14 - 7-Digit Display
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 Slate
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-SLATE-SLATE striped wire.

C. FUSES

BOTTOM CABINET FUSES

F1	Sound/Speech Power Supply	12VAC	1/2 Amp
F2	Power Supply	10VAC	5 Amp SLO-BLO
F3	Displays	60VAC	1/4 Amp SLO-BLO
F4	Solenoids	25VAC	8 Amp SLO-BLO
F5	Controlled Lamps	8VAC	5 Amp SLO-BLO
F6	Playboard Illumination	6.3VAC	8 Amp
F7	Lightbox Illumination	6.3VAC	15 Amp
F8	Sound/Speech Power Supply	+24VDC	1 Amp SLO-BLO
F9	Primary Power	115VAC	5 Amp SLO-BLO
		230VAC	2 1/2 Amp SLO-BLO

PLAYFIELD FUSES

F10	Outhole	1 Amp SLO-BLO
F11	Left and Right Target Banks	2 Amp SLO-BLO
F12	Left and Right Hole Kickers	2 Amp SLO-BLO
F13	Right Pop Bumper	2 Amp SLO-BLO
F14	Center Pop Bumper	2 Amp SLO-BLO
F15	Left Pop Bumper	2 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	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	Q, 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.

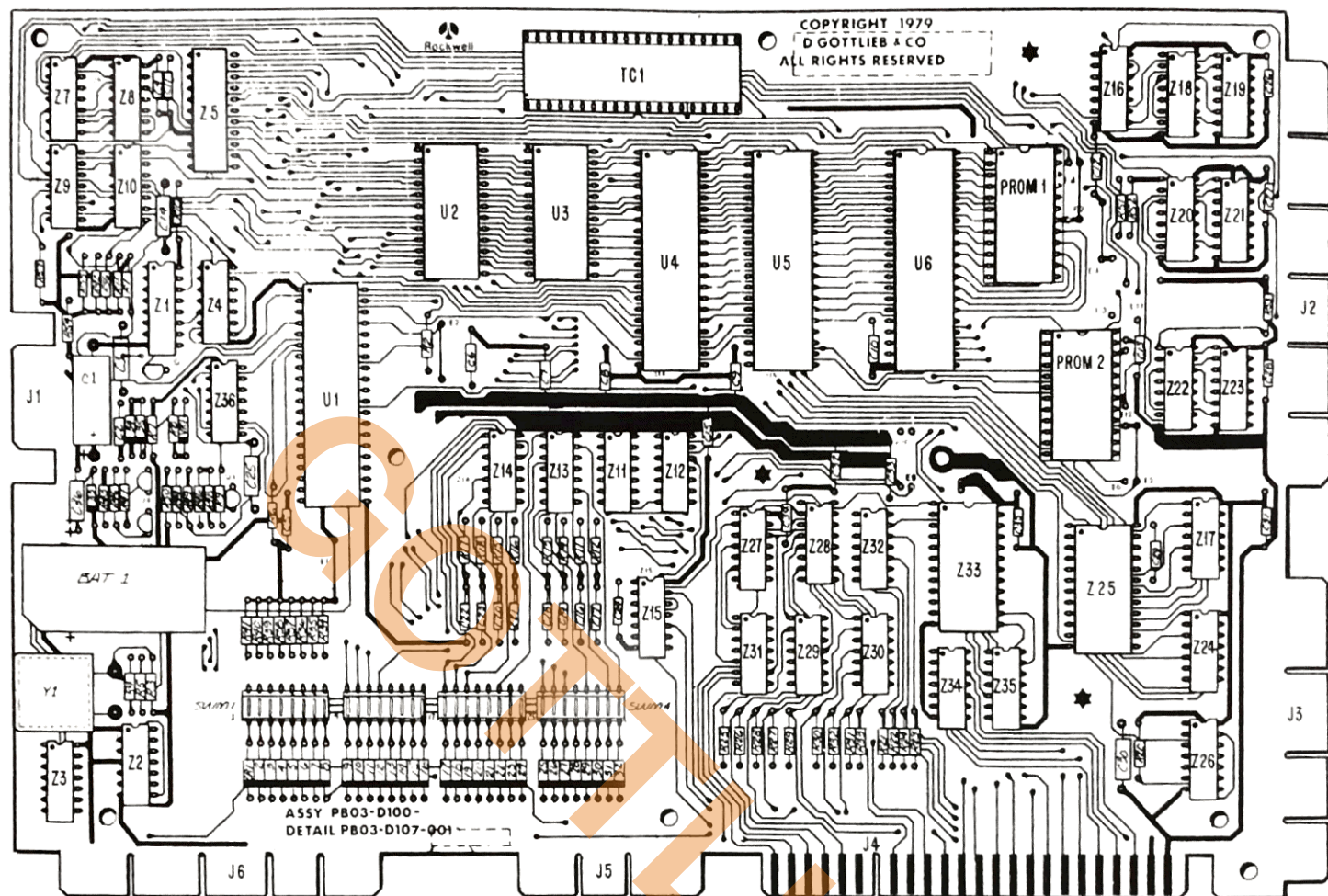
X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

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X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

CONTROL BOARD (A1) COMPONENT LOCATION

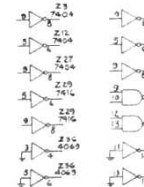


CONTROL BOARD (A1) PARTS LIST

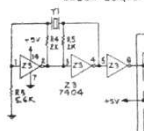
REFERENCE	DESCRIPTION	PART NUMBER	REFERENCE	DESCRIPTION	PART NUMBER
	CONTROL BOARD	MA-291			
Bat. 1	Battery-3.6V 326R10-002	XO-458	U3	ROM R3272-12	XO-327
C1	Capacitor, 100 mfd., 10V	XO-211	U4, U5, U6	PRIOT R6532-18	XO-361
C2, C4-C13,	Capacitor, 01 mfd., 50V	XO-229	VR1	Diode-3.0V, 5% IN5225B or IN5987B	XO-269
C15-C24, C26-			Y1	Crystal, 3.579545 MHZ	XO-456
C29, C31-C35			Z1	IC-Cmos-Dual 1 Shot SCL4528BE	XO-414
C3, C14, C25,	Capacitor, 1 mfd., 50V	XO-230	Z2	IC-Dual Flip Flop SN7474N	XO-423
C30			Z3, Z11, Z12,	IC-Hex Inverter SN7404N	XO-402
C36	10 mfd., 10V, TNT-AX CAP	XO-209	Z16, Z17, Z24,		
CR1-CR35	Diode, GP 1N4148	XO-261	Z26, Z27, Z34,		
Q1, Q4	Transistor-PNP MPS-A70	XO-309	Z35		
Q2, Q3	Transistor, NPN (Motorola) 2N4400	XO-313	Z4	IC-Cmos-Quad 2 Input	
R1, R6, R11-R24,	Resistor, 30K ohm, 5%, 1/4W	XO-23		"And" SCL4081BE	XO-401
R42, R45, R46,			Z5	IC-Static Ram S5101-L	XO-356
R48, R51-R57			Z7	IC-Hex Inverter SN74LS04N	XO-418
R2, R34-R41	Resistor, 4.7K ohm, 5%, 1/4W	XO-7	Z8	IC-2 Input "Nor" SN7402N	XO-421
R3, R43, R49	Resistor, 5.6K ohm, 5%, 1/4W	XO-19	Z9, Z13, Z14	IC-2 Input "Nand" SN7400N	XO-420
R4, R5, R44	Resistor, 2.0K ohm, 5%, 1/4W	XO-14	Z10	IC-Open Collector Inverter SN74LS05N	XO-411
R7	Resistor, 62 ohm, 5%, 1/4W	XO-3	Z15	IC-2 Input "Or" SN7432N	XO-407
R8, R50	Resistor, 180 ohm, 5%, 1/4W	XO-24	Z18, Z20, Z22	IC-"D" Flip Flop SN74175N	XO-410
R9	Resistor, 1K ohm, 5%, 1/4W	XO-5	Z19, Z21, Z23	IC-4 to 7 Decoder SN7448N	XO-408
R10	Resistor, 2.7M ohm, 5%, 1/4W	XO-13	Z25, Z33	IC-4-16 Decoder SN74154N	XO-409
R25-R33	Resistor, 620 ohm, 5%, 1/4W	XO-4	Z28	IC-2 to 4 Decoder SN74LS139N	XO-419
R47	Resistor, 24K ohm, 5%, 1/4W	XO-10	Z29, Z30	IC-Hex Inverter-OC/HV SN7416N	XO-405
SW1-SW4	Dip Switch 100B-692	XO-505	Z31	IC-2 Input "And" SN7408N	XO-404
TC1	Socket, 40 Pin 640379-3	XO-530	Z32	IC-Hex Buffer-OC SN7417N	XO-406
U1	CPU R6502-13	XO-360	Z36	IC-Cmos SCL4069B	XO-424
U2	ROM R3273-12	XO-326		Socket 24 Pin 640361-3	XO-529

NOTE: UNLESS OTHERWISE INDICATED:
RESISTORS ARE 1/4W, 5%, 100K.
CAPACITORS ARE 100PF, 50V.
3-DIGITS ARE TYPE INTRAB.
4-REF. DERIVATION Z4 NOT USED.

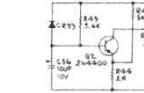
SPARE GATES



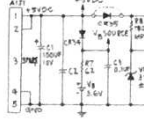
CLOCK LOGIC



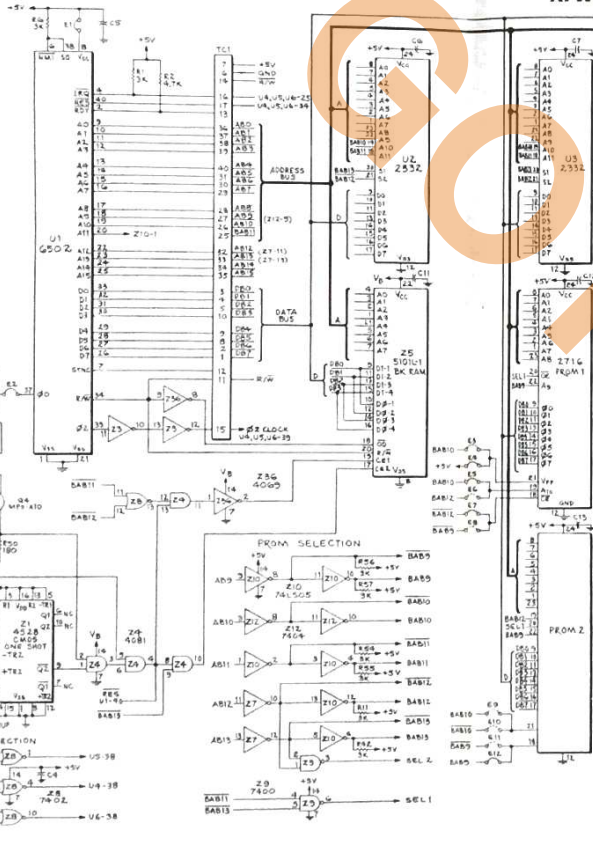
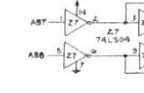
DELAY CIRCUIT



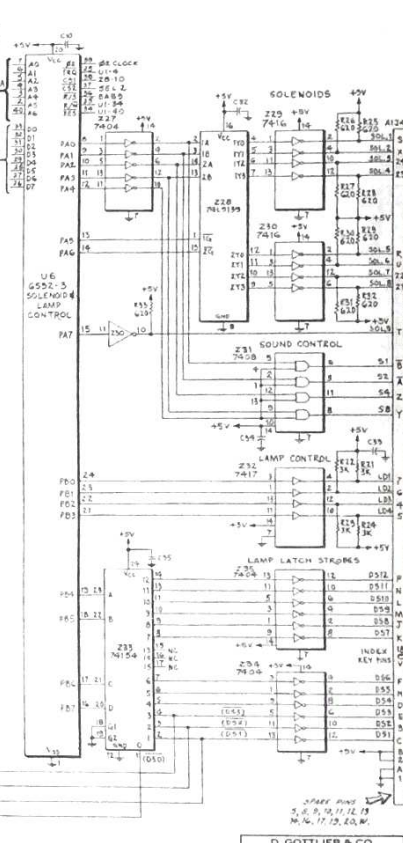
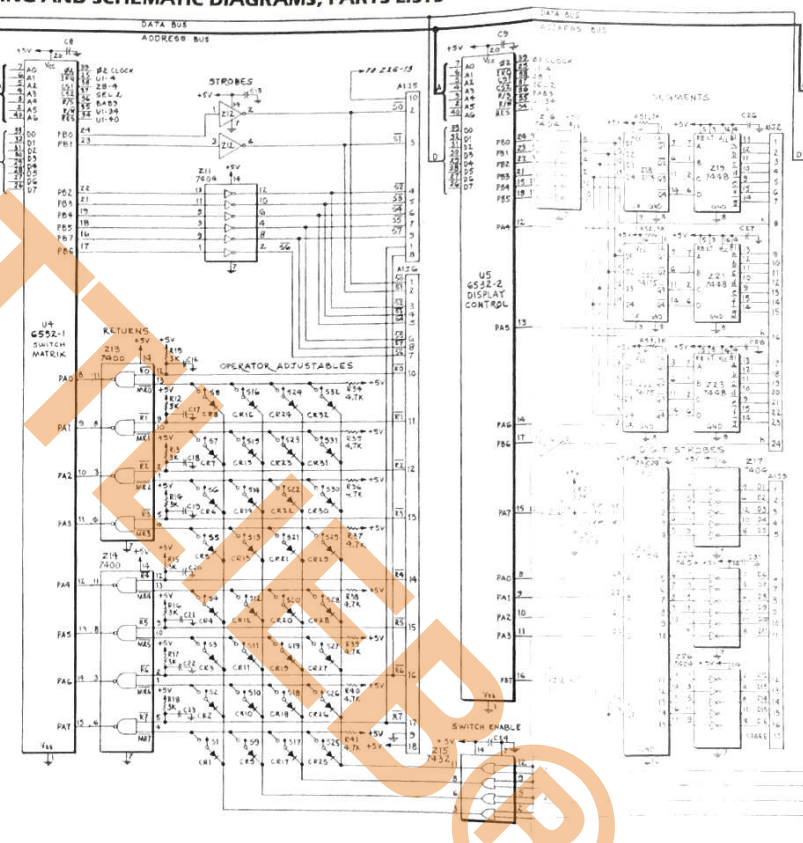
UP/DOWN MEMORY PROTECT LOGIC



INPUT/OUTPUT DEVICE SELECTION

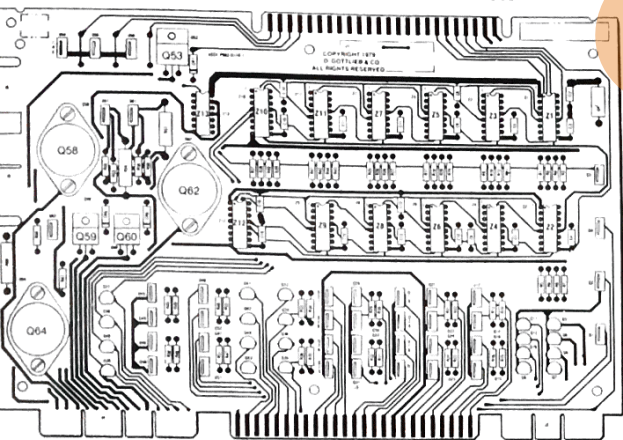


X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

DRIVER BOARD (A3) COMPONENT LOCATION

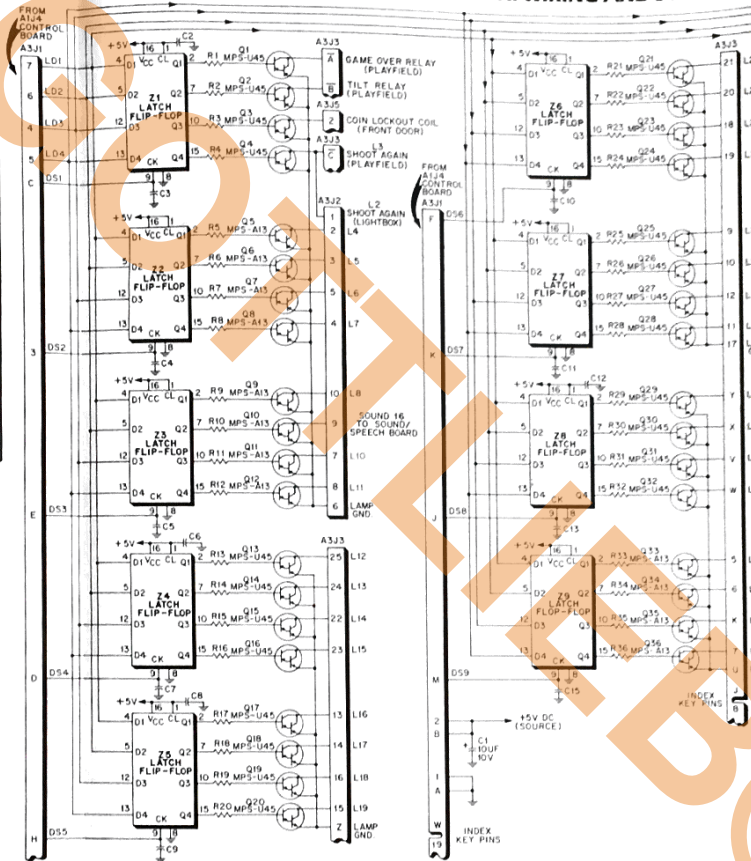


DRIVER BOARD (A3) PARTS LIST

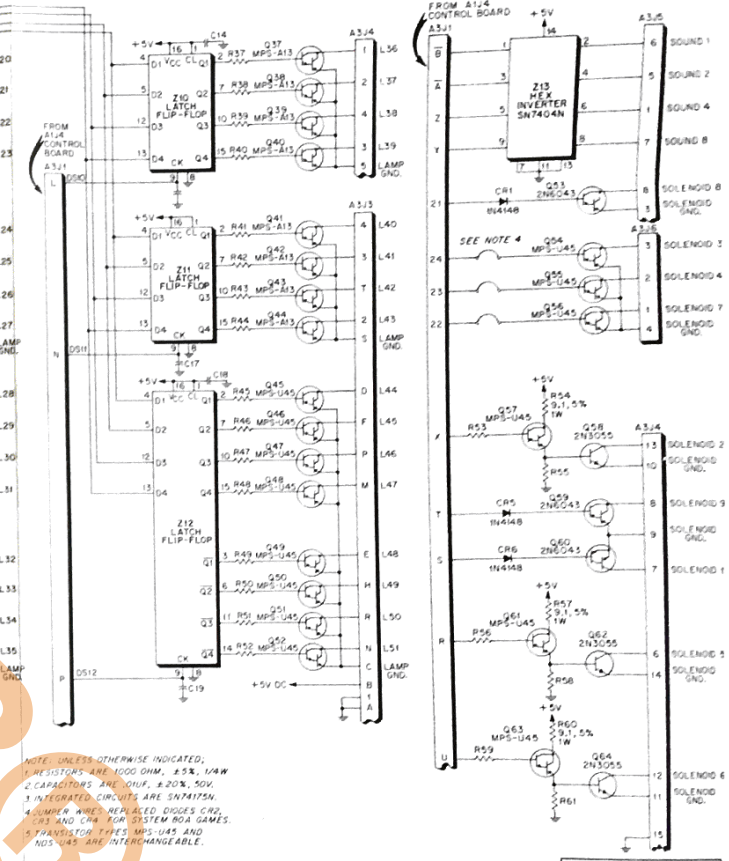
REFERENCE	DESCRIPTION	PART NUMBER
C1	Capacitor 10 mfd 10V Tantalum	XC-209
C2-C19	Capacitor .01 mfd .50V Ceramic	XC-229
C81-C85	Diode - Silicon 1N4148	XC-361
R1-R51-R61	Resistor 10K ohm 5% 1/4W	XC-5
R55-R56-R58-R59	Resistor 91 ohm 5% 1/4W	XC-158
Q1-Q4-Q11	Transistor NPN Darlington MPS-445	XC-306
Q12-Q13-Q14	Transistor NPN Darlington MPS-411	XC-304
Q15-Q17-Q18	Transistor NPN Darlington 2N6043	XC-303
Q19-Q20-Q21	Transistor NPN 2N3055	XC-301
Q22-Q23-Q24	IC Quad D Latch Flip-Flop SN74175	XC-402
Q25	IC Hex Inverter SN7404N	XC-402
Q26	Insulator Thermally 4301-4	XC-512

NOTE:
1. JUMPER WIRES REPLACED DIODES CR2, CR3 AND CR4 FOR SYSTEM A04 GAMES.
2. TRANSISTOR TYPES MPS-445 AND MPS-445 ARE INTERCHANGEABLE.

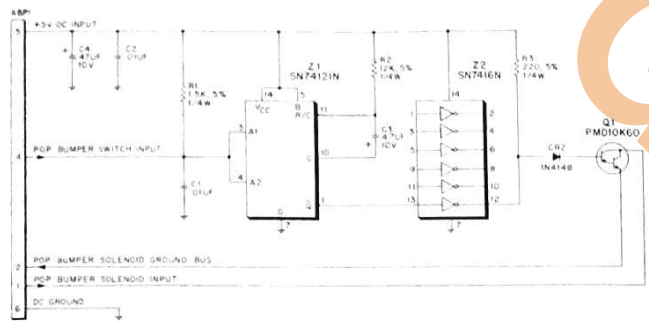
X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



NOTE: UNLESS OTHERWISE INDICATED:
1. RESISTORS ARE 1000 OHM, 5%, 1/4W
2. CAPACITORS ARE .001F, 50V, 50V
3. INTEGRATED CIRCUITS ARE SN74175N
4. JUMPER WIRES REPLACED DIODES CR2, CR3 AND CR4 FOR SYSTEM A04 GAMES.
5. TRANSISTOR TYPES MPS-445 AND MPS-445 ARE INTERCHANGEABLE.

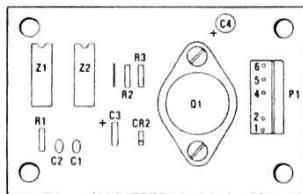


X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



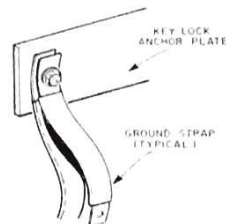
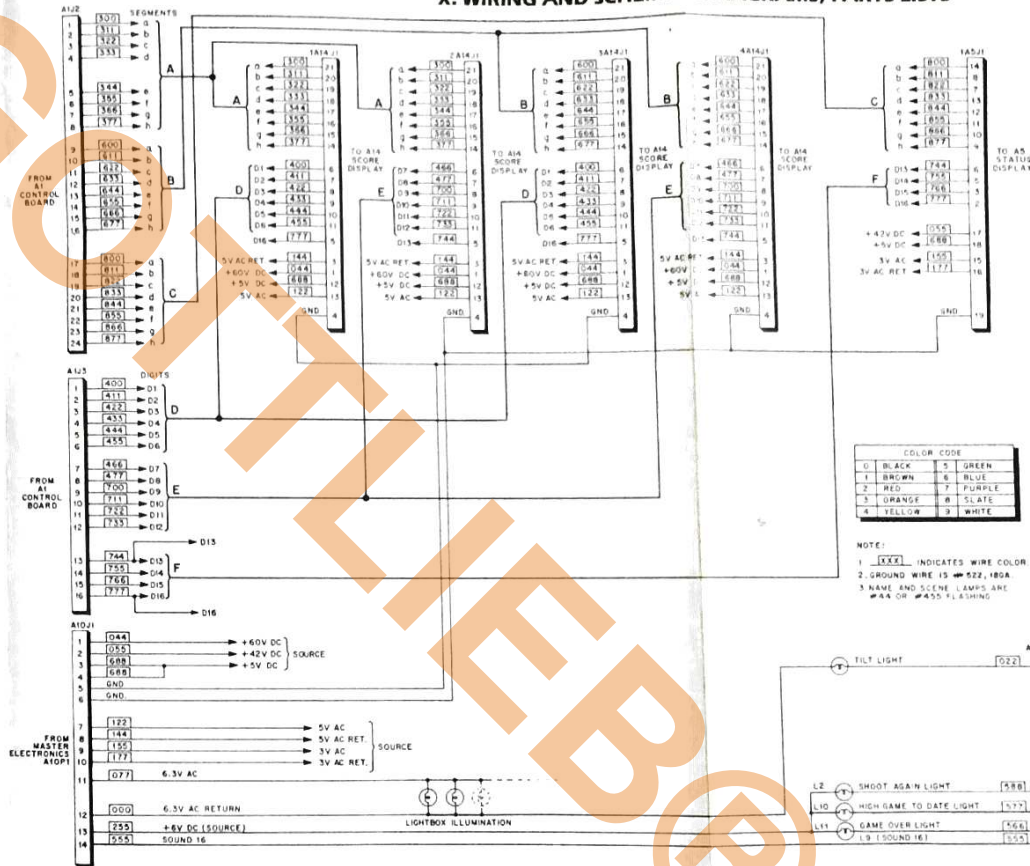
D. GOTTLIEB & CO
POP BUMPER DRIVER BOARD (A8)
REV. 1/74
D-20923

POP BUMPER DRIVER BOARD (A8) COMPONENT LOCATION



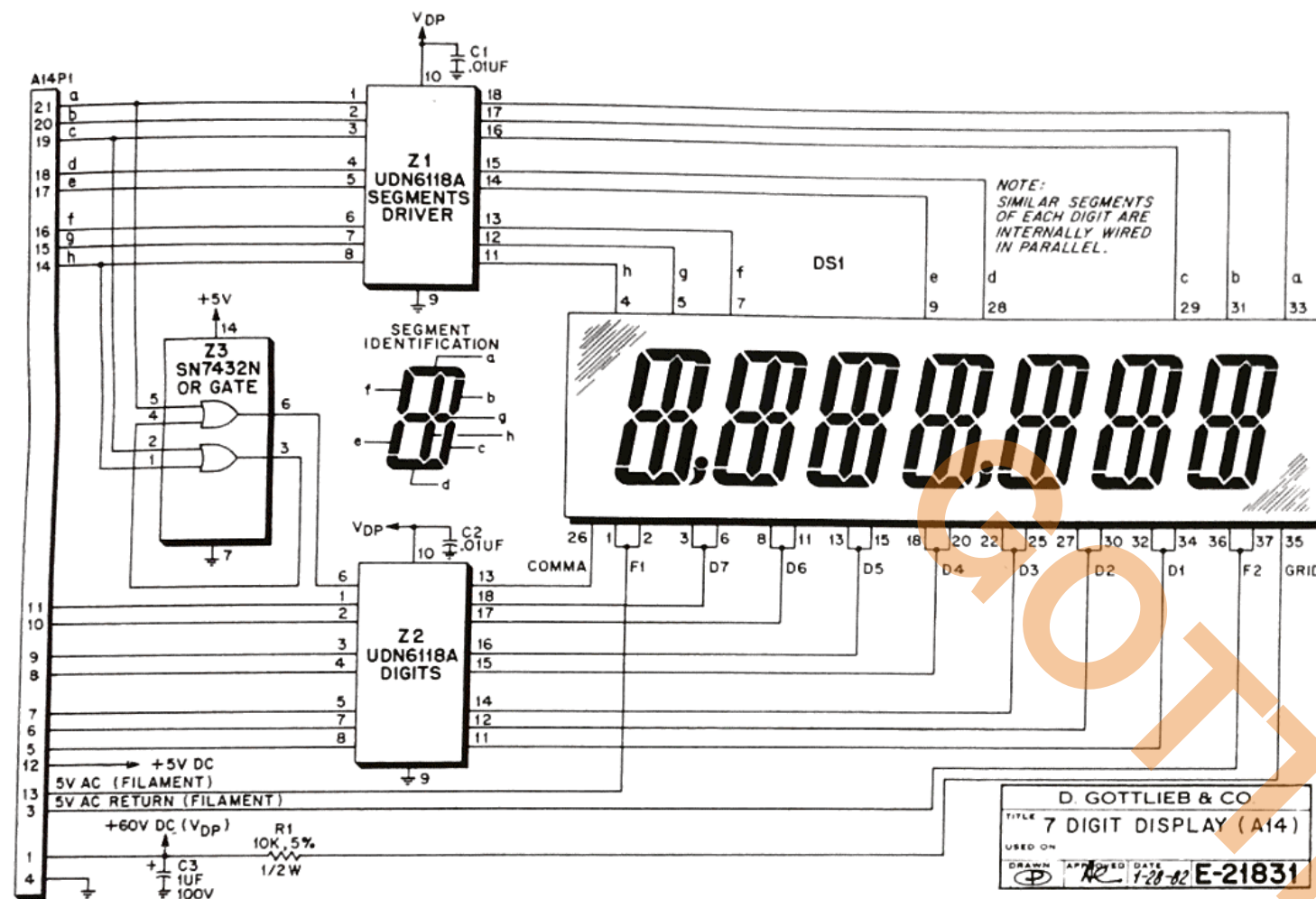
POP BUMPER DRIVER BOARD (A8) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	POP BUMPER DRIVER BOARD	A-10741
C1, C2	Capacitor 0.01 mfd. 100V	XO-202
C3	Capacitor 4.7 mfd. 50V	XO-206
C4	Tantalum Axial	XO-226
CR2	Capacitor 4.7 mfd. 50V	XO-227
P1	Connector 09-55 1061	XO-261
R1	Resistor 15k ohm 5% 1/4W	XO-20
R2	Resistor 12k ohm 5% 1/4W	XO-7
R3	Resistor 220 ohm 5% 1/4W	XO-21
Q1	Transistor Lambda PMDTOK60	XO-310X
Z1	IC SN7412N	XO-417X
Z2	IC SN7416N	XO-405X

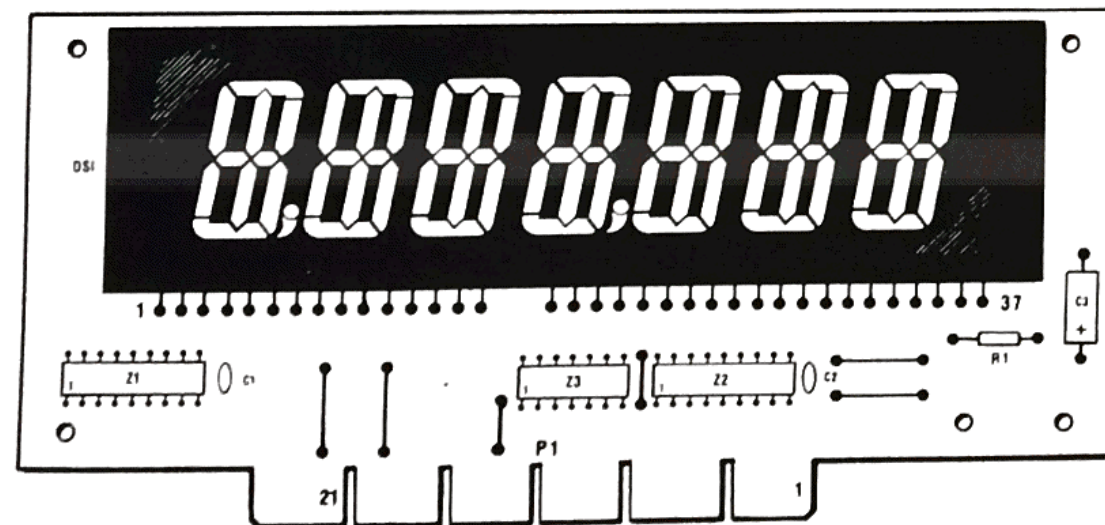


D. GOTTLIEB & CO
LIGHTBOX SCHEMATIC DIAGRAM
REV. 1/74
E-23051

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

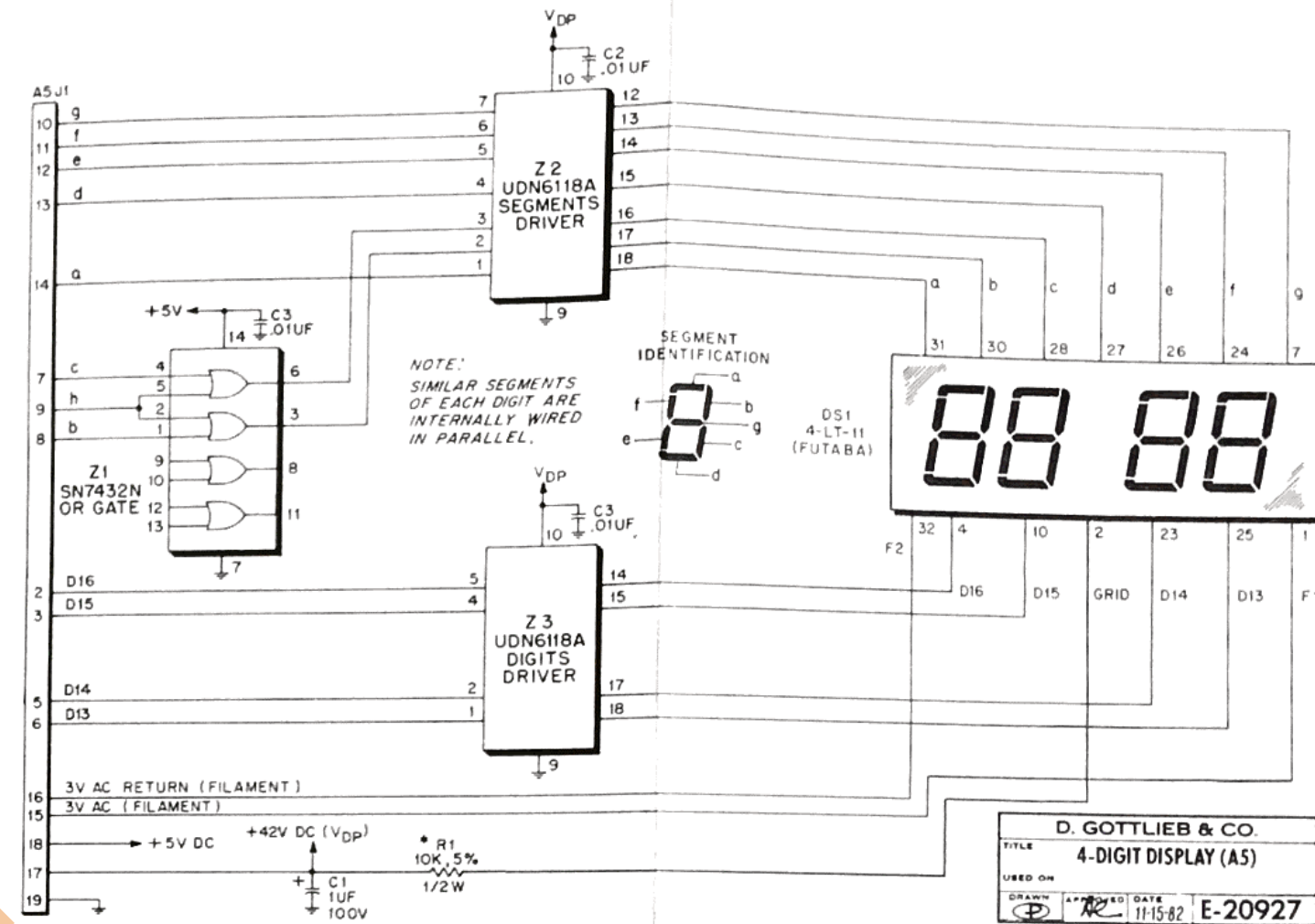


7-DIGIT DISPLAY (A14) COMPONENT LOCATION

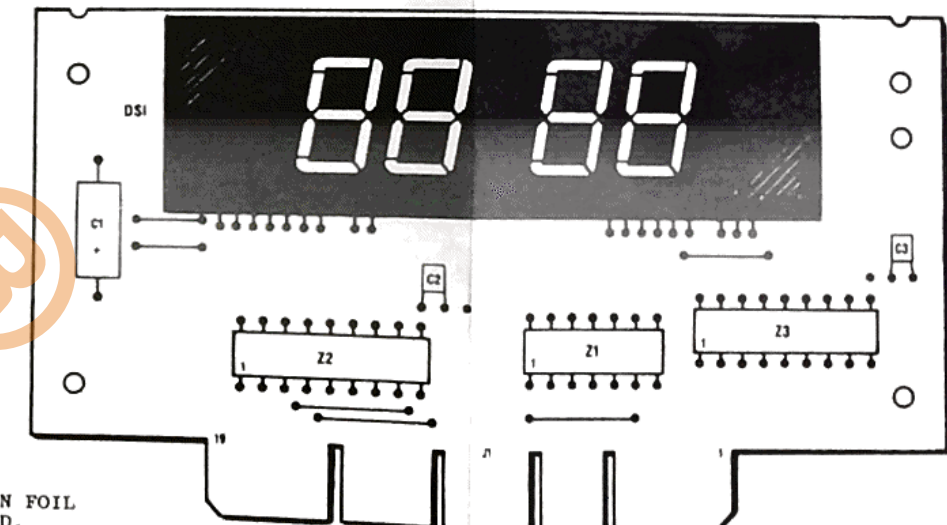


7-DIGIT DISPLAY (A14) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
C1, C2	7 DIGIT DISPLAY	MA-238
C3	Capacitor .01 mfd. 100V Kemet	XO-202
DS1	Capacitor 1 mfd. 100V Sprague	XO-206
R1	7 Digit Display Tube - FUTABA	XO-477
Z1, Z2	Resistor, 10K Ohm, 5%, 1/2W	XO-62
Z3	IC-Fluorescent Display Driver—Sprague	XO-415
	IC Quad or Gate	XO-407



4-DIGIT DISPLAY (A5) COMPONENT LOCATION

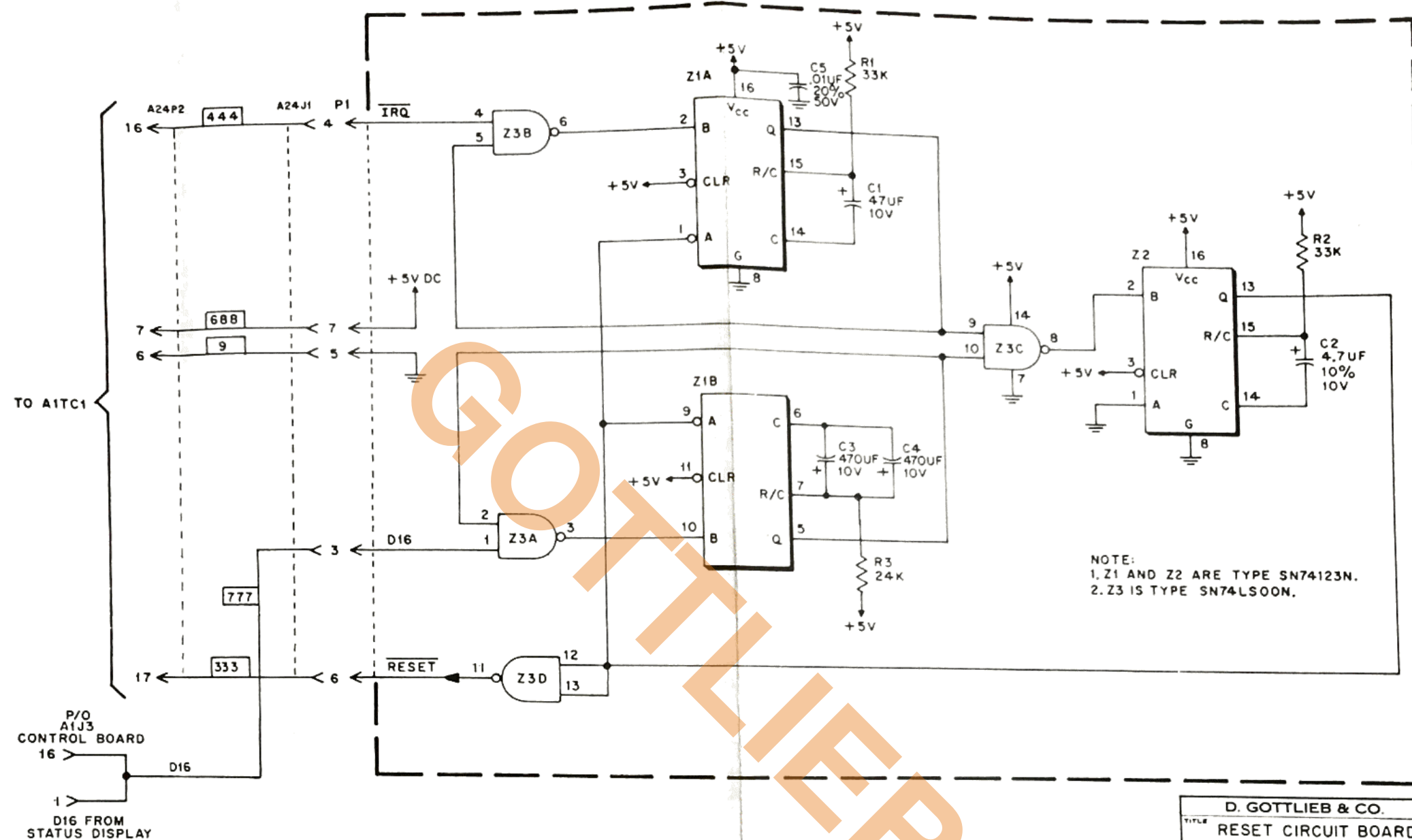


*NOTE:
R1 MOUNTED ON FOIL
SIDE OF BOARD.

4-DIGIT DISPLAY (A5) PARTS LIST

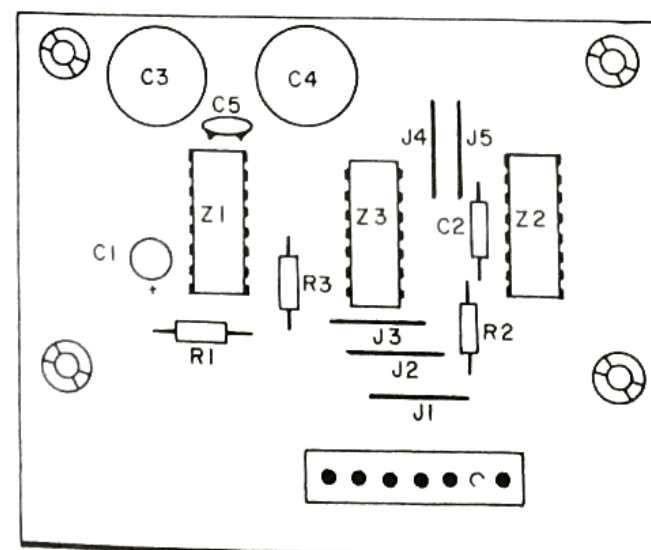
REFERENCE	DESCRIPTION	PART NUMBER
C1	4 DIGIT DISPLAY	MA-115
C2, C3	Capacitor, 1 mfd. 100V Sprague 1E1400	XO-206
DS1	Capacitor, .01 mfd. 100V Kemet C320C103MIR5CA	XO-202
*R1	4-Digit Display Tube—Futaba 4-LT-11	XO-455X
Z1	Resistor, 10K Ohm, 5%, 1/2W	XO-62
Z2, Z3	IC-Quad or Gate—T1 SN7432N	XO-407
	IC-Fluorescent Display Driver—Sprague UDN6118A	XO-415

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



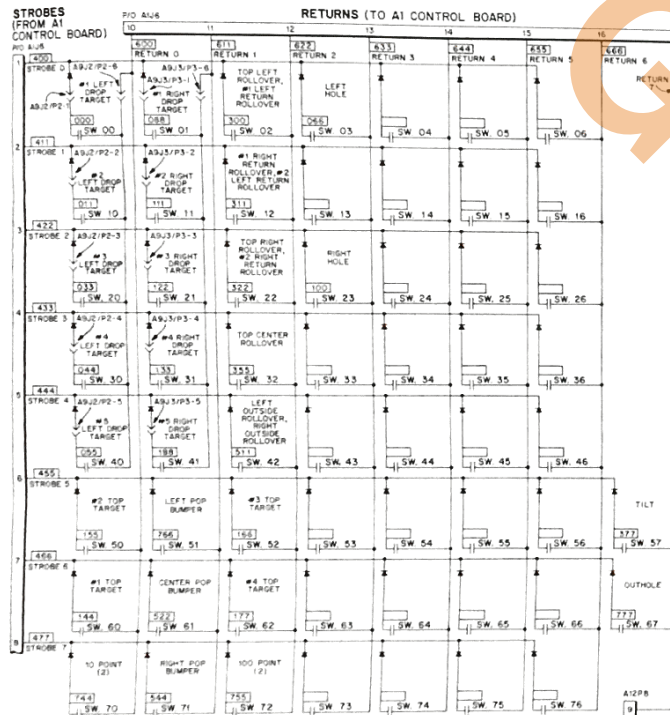
D. GOTTLIEB & CO.			
TITLE RESET CIRCUIT BOARD			
USED ON			
DRAWN	APPROVED	DATE	C-21063
AC		11-15-82	

RESET BOARD (A24)
COMPONENT LOCATION

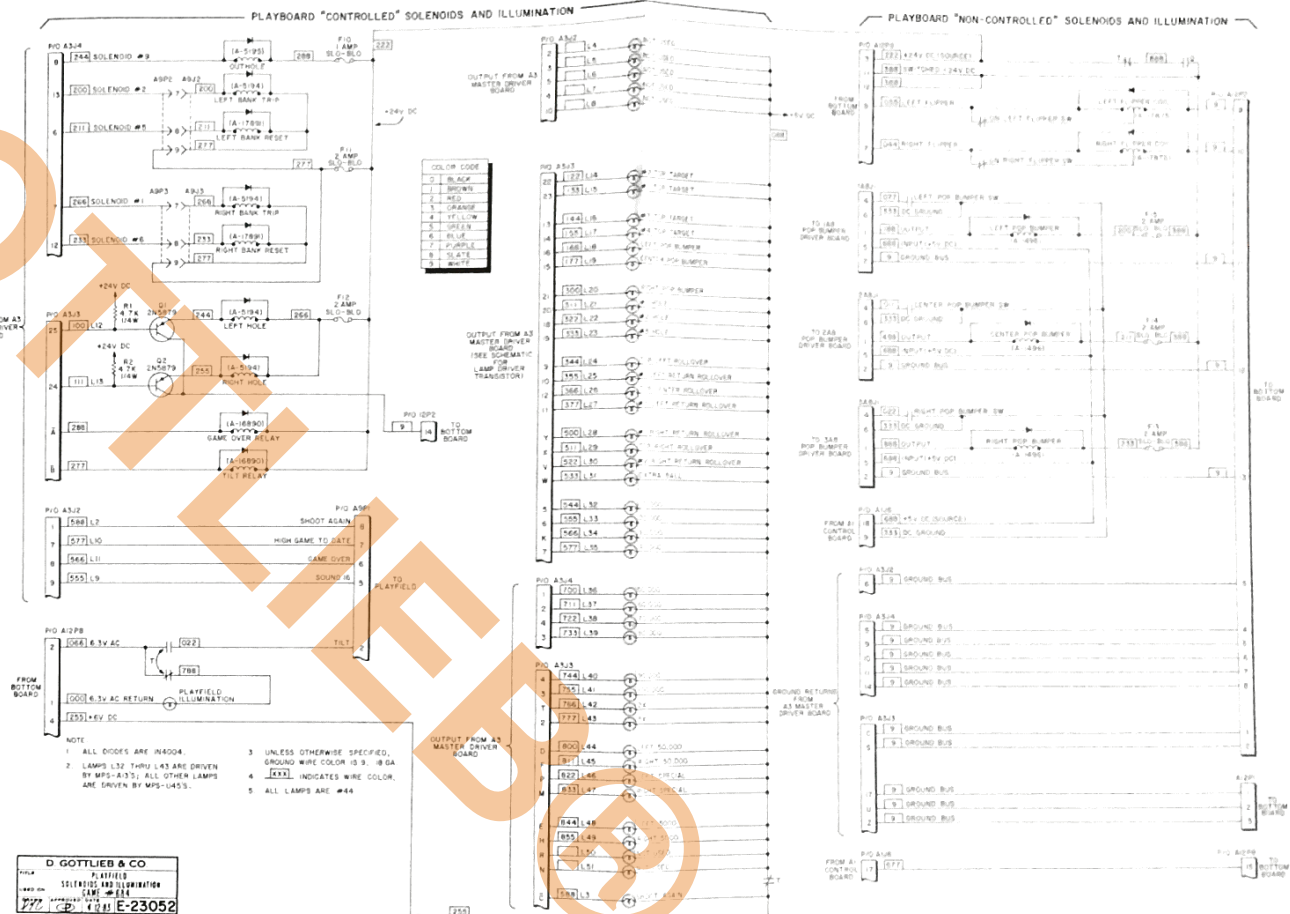


RESET BOARD (A24) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	RESET BOARD	MA-164
R1, R2	Resistor 33K ohm, 5%, 1/4W	XO-43
R3	Resistor 24K ohm, 5%, 1/4W	XO-10
C1	Capacitor 47 µfd., 10V	XO-227
C2	Capacitor 4.7 µfd., 10V	XO-226
C3, C4	Capacitor 470 µfd., 16V	XO-214
C5	Capacitor 0.01 µfd., 50V	XO-229
Z1, Z2	IC 74123N	XO-398
Z3	IC 74LS00N	XO-427
	7 Pin Connector	XO-526

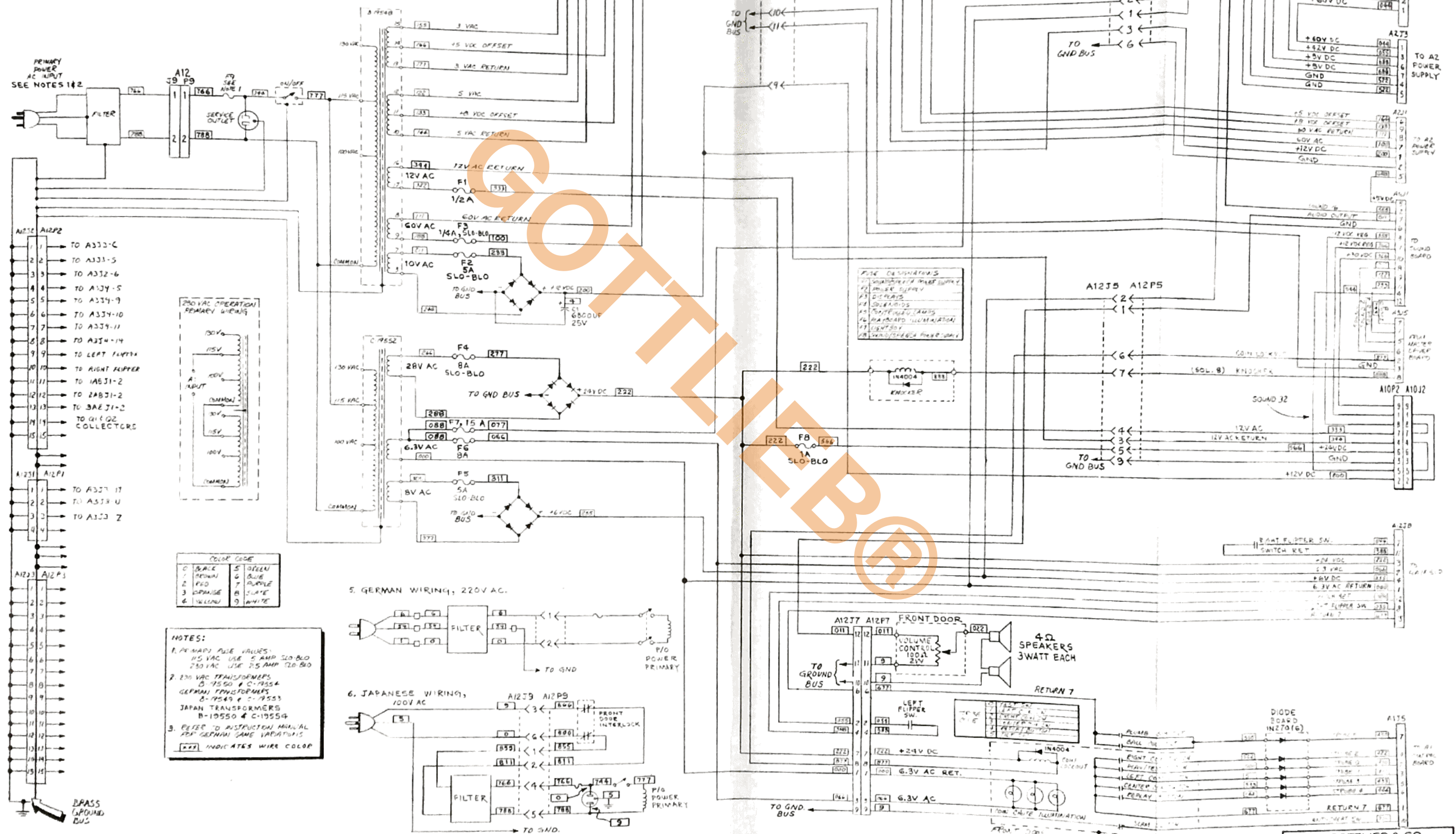
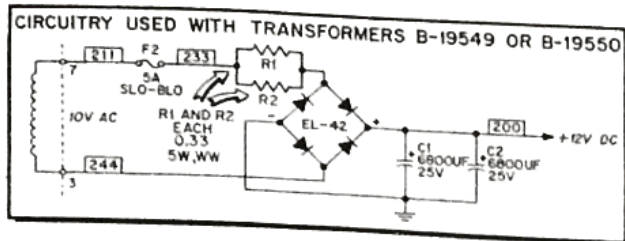


D. GOTTLIEB & CO
SWITCH MATRIX
CAGE #684
E-23050



D. GOTTLIEB & CO
PLAYFIELD
ILLUMINATION
CAGE #684
E-23052

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

XI. PARTS INFORMATION

PLAYBOARD SWITCH AND LAMP ASSIGNMENTS

LAMP NO. LAMP ASSIGNMENT

L3 Shoot Again
L14 #1 Top Target
L15 #2 Top Target
L16 #3 Top Target
L17 #4 Top Target
L18 Left Pop Bumper
L19 Center Pop Bumper
L20 Right Pop Bumper
L21 #1 Hole
L22 #2 Hole
L23 #3 Hole
L24 Top Left Rollover
L25 #1 Left Return Rollover
L26 Top Center Rollover
L27 #2 Left Return Rollover
L28 #1 Right Return Rollover
L29 Top Right Rollover
L30 #2 Right Rollover
L31 Extra Ball
L32 10,000
L33 20,000
L34 30,000
L35 40,000
L36 50,000
L37 60,000
L38 70,000
L39 80,000
L40 90,000
L41 100,000
L42 2X
L43 3X
L44 Left 50,000
L45 Right 50,000
L46 Left Special
L47 Right Special
L48 Left 5000
L49 Right 5000

SWITCH MATRIX NO.

SWITCH ASSIGNMENT

00	#1 Left Drop Target	B-18094
01	#1 Right Drop Target	B-18094
02	Top Left Rollover	B-18892
	#1 Left Return Rollover	B-18892
03	Left Hole	B-19857
10	#2 Left Drop Target	B-18094
11	#2 Right Drop Target	B-18094
12	#1 Right Return Rollover	B-18892
	#2 Left Return Rollover	B-18892
20	#3 Left Drop Target	B-18095
21	#3 Right Drop Target	B-18095
22	Top Right Rollover	B-18892
	#2 Right Return Rollover	B-18892
23	Right Hole	B-19857
30	#4 Left Drop Target	B-18093
31	#4 Right Drop Target	B-18093
32	Top Center Rollover	B-18892
40	#5 Left Drop Target	B-18093
41	#5 Right Drop Target	B-18093
42	Left Outside Rollover	B-18892
	Right Outside Rollover	B-18892
50	#2 Top Target	B-20867
51	Left Pop Bumper	B-21352
52	#3 Top Target	B-20867
57	Tilt	B-9141
60	#1 Top Target	B-20867
61	Center Pop Bumper	B-21352
62	#4 Top Target	B-20867
67	Outhole	B-18892
70	10 Point (2)	B-22227
71	Right Pop Bumper	B-21352
72	100 Point (2)	B-18096

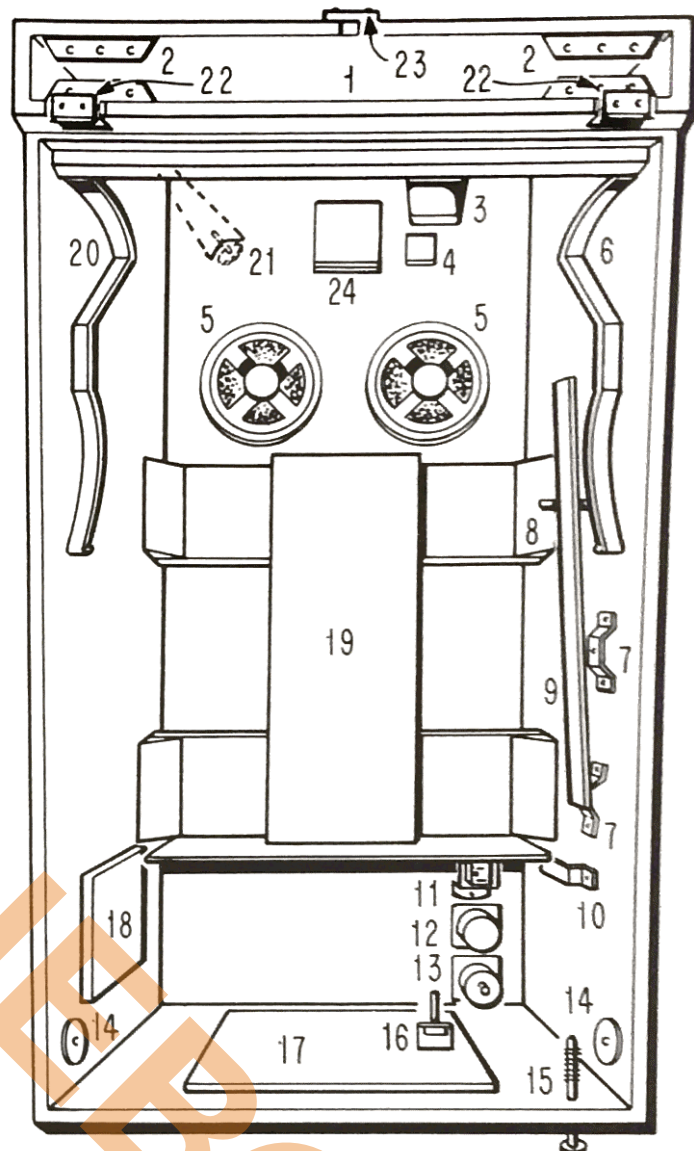
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XI. PARTS INFORMATION

CABINET PARTS

ITEM	DESCRIPTION	PART NO.
1.	Cabinet	Specify Game
2.	Lightbox Mounting Bracket (4)	A-19916
3.	Line Cord Housing	C-18534
4.	Line Filter	EL-50
5.	Speakers, 4 Ohm (2)	EL-83
6.	Right Playboard Support	D-19932
7.	Front Rest Saddle (2)	A-21960
8.	Stop Bracket	A-5024
9.	Playboard Prop	B-21625
10.	Knocker	MA-12
11.	Convenience Outlet	MA-17
12.	Switch, On/Off	A-18317
13.	Switch Housing	B-15163
14.	Fuse Assembly	MA-186
15.	Flipper Switch Assembly	B-17838
16.	Ball Shooter	B-8835
17.	Volume Control	XO-104
18.	Front Door Assembly	Specify Game
19.	Ball Roll Tilt	MA-344
20.	6 Diode and Term Strip	A-21028
21.	Transformer Board Assembly	MA-332
22.	Bridge Rectifier (3)	EL-42
23.	Capacitor, 6800 UF, 25 Volt (2)	XO-228
24.	F1, 1/2 Amp Fuse	EL-28
25.	F2, 5 Amp SLO-BLO Fuse	EL-8
26.	F3, 1/4 Amp SLO-BLO Fuse	EL-5
27.	F4, 8 Amp SLO-BLO Fuse	EL-26
28.	F5, 5 Amp SLO-BLO Fuse	EL-8
29.	F6, 8 Amp Fuse	EL-30
30.	F7, 15 Amp Fuse	EL-25
31.	F8, 1 Amp SLO-BLO Fuse	EL-6
32.	Left Playboard Support	D-19931
33.	Cabinet Leg (4)	D-4337
34.	3" Leg Adjuster	MH-21
35.	Hinge (shown for reference only-P/O Lightbox)	B-22734
36.	Latch Bar	A-22733
37.	Latch Assembly (P/O Lightbox)	A-21969
38.	Ground Strap Bracket	B-22156



XI. PARTS INFORMATION

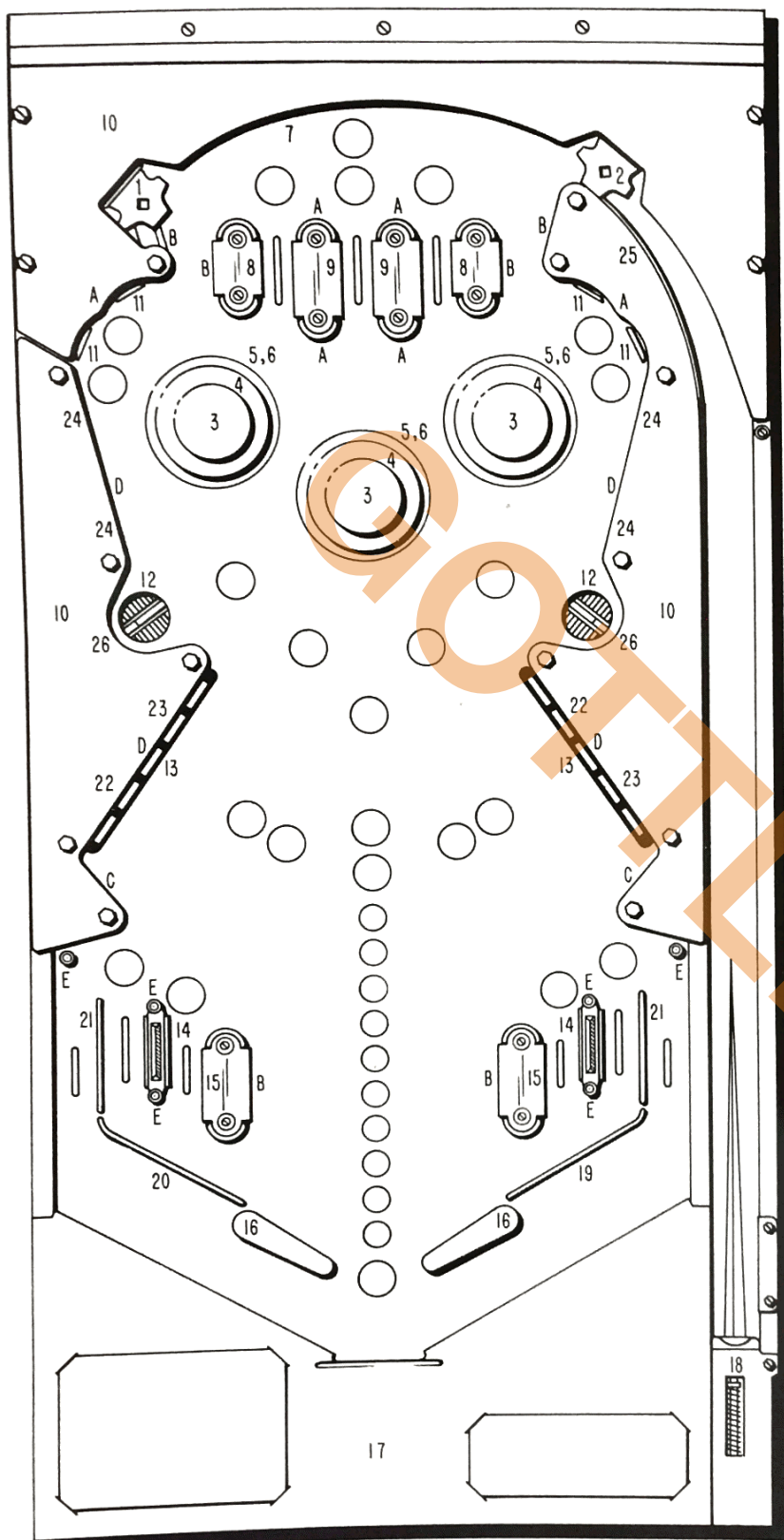
PLAYBOARD PARTS

RUBBER RINGS

A	A-10217	5/16"	(6)
B	A-10219	1"	(6)
C	A-10220	1-1/2"	(2)
D	A-10224	3-1/2"	(4)
E	A-15705	Mini	(6)

PARTS LIST

1. B-19646 Arch Rebound
2. B-19645 Arch Gate
3. C-10434Z Pop Bumper Cap, White (3)
4. A-13905 Pop Bumper Body, White (3)
5. C-10433Z Pop Bumper Skirt, White (3)
6. B-8246 Pop Bumper Trim Platter (3)
7. D-22744 Arch Rod
8. A-9393Z Guide Rail, White (2)
9. A-9396Z Guide Rail, White (2)
10. D-22988 Plastic Shield Set
11. A-9383 Target, Yellow (4)
12. A-11151 Hole Liner (2)
13. A-17181 Target Bank, Yellow (8)
14. A-15177 Target Bank, Black (2)
15. C-15648Z Rollover Guide, White (2)
16. A-9395Z Guide Rail, White (2)
17. C-13150 Flipper, White (2)
18. D-13647 Cardholder
19. C-9767 Ball Shooter Gauge
20. A-14571 Ball Guide Rail
21. A-14572 Ball Guide Rail
22. A-4832 Ball Guide Rail (2)
23. A-3722 Ball Guide Rail (2)
24. A-17650 Ball Guide Rail (2)
25. A-6931 Ball Guide Rail (4)
26. A-5775 Ball Guide Rail
27. A-5891 Metal Shield (2)
28. C-11561P Plastic Post (32)
29. A-14792 Mini Post Screw (6)





Gottlieb
AMUSEMENT GAMES

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(312) 562-7400 Telex 72-8463

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