



D. Gottlieb & Co. 
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**INSTRUCTION
MANUAL**

Price
\$3.00

I. INSTALLATION

To assemble the game, first bolt the legs to the cabinet. Place the lightbox atop the pedestal and insert the four #10-32 truss-head screws into the back of the pedestal. Open the lightbox and secure it to the cabinet with the long lightbox bolts. Connect all cables and gently but fully insert the connectors onto the printed circuit boards. Be sure to touch only the edges of the boards.

Inspecting the following items before plugging in the line cord may prevent future trouble:

1. Check that cables are clear of moving parts.
2. Look for any disconnected wires.
3. Check switches for loose solder or other foreign matter.
4. Check the soldering generally for cold joints.
5. Be certain all fuses are firmly seated.
6. Check the transformers for foreign matter across the terminals.

7. Be sure that the transformer wiring corresponds to the supply voltage.

8. Check the setting of the tilt switch on the underside of the playfield. One blade of this switch is free-floating with a weight on the end.

After levelling the machine, adjust the plumb-bob tilt (on left side of cabinet near front door) to the sensitivity desired.

II. GAME ADJUSTMENTS

A. Playfield Adjustments

Posts controlling access to the left and right outlanes can be adjusted. See page 8. The "conservative" (easier entry) position decreases playing time and scoring while the "liberal" position has the opposite effect.

The game is shipped with adjustable posts in the position found to be suitable for the greatest number of players. Therefore the posts should not be changed unless the need is clearly evident.

NOTE: TOUCHING THE STATIC-SENSITIVE MOS COMPONENTS ON THE CPU CONTROL BOARD CAN DAMAGE THEM, MAKING THE GAME INOPERATIVE AND INVALIDATING THE WARRANTY.

CAUTION: IF GAME WAS SUBJECTED TO EXTREME COLD, ALLOW GAME TO WARM UP TO ROOM TEMPERATURE BEFORE PLUGGING IN LINE CORD.

COUNT-DOWN

USES PROM MARKED

“F”

INSERT PROM WITH
INDENT NOTCH UP

B. Lightbox Adjustments

There are 24 switches on the Control Board (A1) which permit adjustment of the game parameters. These switches are contained in three packages of eight switches each, as shown below.



WARNING: TURN OFF POWER BEFORE MAKING ADJUSTMENTS!

SWITCHES				COIN CHUTE ADJUSTMENTS
S1	S2	S3	S4	#1 Coin Chute
S5	S6	S7	S8	#2 Coin Chute
				Coins/Credits
OFF	OFF	OFF	OFF	1/1
OFF	OFF	OFF	ON	1/2
OFF	OFF	ON	OFF	1/3
OFF	OFF	ON	ON	1/4
OFF	ON	OFF	OFF	1/5
OFF	ON	OFF	ON	1/6
OFF	ON	ON	OFF	1/7
OFF	ON	ON	ON	1/8
ON	OFF	OFF	OFF	1/9
ON	OFF	OFF	ON	2/1
ON	OFF	ON	OFF	2/2
ON	OFF	ON	ON	2/3 Note 1
ON	ON	OFF	OFF	2/4
ON	ON	OFF	ON	2/5
ON	ON	ON	OFF	2/3 Note 2
ON	ON	ON	ON	3/1 Note 3

Note 1: No credits until second coin is deposited.

Note 2: First coin gives one credit. Second coin gives two credits provided that no score is made between first and second coin. If scoring occurred, second coin becomes a "first" coin, giving one credit.

Note 3: No credit until third coin is deposited.

SWITCH 9	BALLS PER GAME
ON	3
OFF	5

SWITCH 10	MATCH FEATURE
ON	IN
OFF	OUT

SWITCH 11	(See Note A)	GAME MODE
ON		REPLAY
OFF		EXTRA BALL

SWITCH 12	TILT EFFECT
ON	BALL IN PLAY ONLY
OFF	GAME OVER

SWITCH 13	CREDITS DISPLAYED?
ON	YES
OFF	NO

SWITCH 14	CREDIT BUTTON TUNE?
ON	YES
OFF	NO

SWITCH 15	} NOT USED—MAY BE ON OR OFF
SWITCH 16	

SWITCHES		MAXIMUM CREDITS
17	18	
OFF	OFF	5
OFF	ON	8
ON	OFF	10
ON	ON	15

SWITCH 19	(See Note B)	COIN CHUTE CONTROL
ON		CHUTES SAME
OFF		CHUTES SEPARATE

SWITCH 20	CHIMES WHEN SCORING?
ON	YES
OFF	NO

SWITCH 21	HIGH GAME TO DATE DISPLAYED?
ON	YES
OFF	NO

SWITCH 22	BEATING HIGH GAME TO DATE AWARDS.
ON	3 REPLAYS
OFF	NO REPLAYS

SWITCH 23	COIN SWITCH TUNE?
ON	YES
OFF	NO

SWITCH 24—NOT USED—MAY BE ON OR OFF

Note A: IF SWITCH 11 IS OFF, SWITCHES 10 AND 22 HAVE NO EFFECT; THE MATCH FEATURE IS DISABLED AND NO REPLAYS ARE AWARDED FOR BEATING HIGH GAME TO DATE.

Note B: WHEN SWITCH 19 IS ON, SWITCHES 5-8 HAVE NO EFFECT; SWITCHES 1-4 CONTROL BOTH COIN CHUTES.

III. COUNT-DOWN

GAME FEATURES (5 BALL)

Completing a group of drop targets resets that group and increases the value of the completed group to 5000 points each. Completing any two groups of drop targets lights the "extra ball" rollover. Completing any three groups of drop targets lights the "special" rollover.

The bonus multiplier is increased by completing groups of drop targets in sequential order.

Bonus count-down hole lights to score bonus when the bonus value is 20,000.

FEATURE CHANGES FOR 3 BALL OPERATION ARE:

Completing a group of drop targets resets that group and scores 5000 points. Completing one group of drop targets lights the "extra ball" rollover. Completing 2 groups of drop targets lights the "special" rollover.

IV. GAME OPERATION

With the line cord unplugged drop a coin into one of the chutes. It should be rejected. Plug the line cord *only* into a properly-grounded 3-wire receptacle of the correct voltage. Turn on the game by pressing the main switch located on the cabinet bottom near the front right corner.

After a five-second delay all score displays will light and read zeros. The credit display will show the number of credits remaining and the ball in play display will show "70." If the credits fail to light, turn off the game and inspect the normally closed switch on the ball-roll assembly and on the front door. Turn on the game; if the problem remains, refer to Section VI. (Trouble-shooting).

Five seconds after the score displays light, they will flash "High Game to Date" score for one second. This cycle continues until the game is started. All playfield lights controlled by the micro-processor will be off.

Insert one or more coins and note that the correct number of credits are added on the credit display according to the information on the coin entrance plate. Press the credit button to reset the game; the ball should now be at the shooter. The first player score reads "0" and flashes, indicating that that player is now scoring. The other player displays are blank and a "1" appears on the ball-in-play display.

Additional players are indicated by a "0" showing in each corresponding player display. Thus if there are three players, a "0" will show in the first three player displays. After the fourth player has been added (or when the credit display reads "0"), the credit button has no effect.

The game features are described in Section III. When the ball enters the outhole, the bonus is scored, the ball is kicked to the shooter, and the display of the player now scoring begins to flash and continues to flash until a score is made. All playfield features reset after each ball. When the "Shoot Again" light is lit, neither the player designation (the flashing display) nor the ball-in-play display changes when the ball enters the outhole. Only one extra ball per ball in play can be given.

The number of balls per game is adjustable. When the last ball enters the outhole, the "Game Over" and "Number to Match" lights come on. A random number appears in the ball-in-play display and if this number matches the last two digits in the player's

score, a replay is added to the credit display. At this time a "High Game to Date" score is periodically flashed in all four player displays. When this score is achieved, three replays are given. This feature is adjustable.

Tilting the machine results in the loss of the ball in play or the entire game, depending upon the Tilt Reset adjustment. With this adjustment "on," the game comes on again when the ball enters the outhole, and play resumes. There is a normally-closed switch on the front door and one in the ball-roll assembly. If either of these switches opens from raising the front of the cabinet or pounding the front door, the entire game is ended. The "Game Over" light comes on and for three seconds the coin chute switches and replay button are inactive. This prevents accidental closing of these switches from residual vibration.

V. BOOKKEEPING FUNCTIONS AND SELF-TESTING

The circuitry in this game helps the operator perform many bookkeeping functions. The information is shown one step at a time on the first player score display while the step number is shown in the credit display. Pressing the button on the inside of the front door (the play/test button) begins the bookkeeping and advances it to the next step each time the button is pressed. If the button is not pressed within sixty seconds of each step, the machine returns to normal playing condition.

The data in any bookkeeping step may be reset to zero while it is displayed by pressing Switch Button #25 on A1, the CPU control board in the lightbox. Then the play/test button must be pressed to enter the zero.

STEP (Credit Display)	INFORMATION SHOWN (First Player Display)
0	Total coins through #1 coin chute (left chute).
1	Total coins through #2 coin chute.*
2	Total plays.
3	Total replays given.
4	Number of times anti-cheat switches on front door and on ball-roll assembly have opened.
5	Total extra balls.
6	Number of tilts.
7	First high score replay.
8	Second high score replay.
9	Third high score replay.
10	Current "High Game to Date" score.
11	Display test: All digits in first and third player displays step "0" through "9."**
12	Display test: All digits in second and fourth player displays step "0" through "9."**
13	Self-test: All CPU-controlled lights come on for five seconds. Each solenoid is energized one at a time. All closed switches noted by a code number in ball-in-play display.

*If chutes are adjusted to be the same, coins deposited in either chute add only to the #1 chute total.

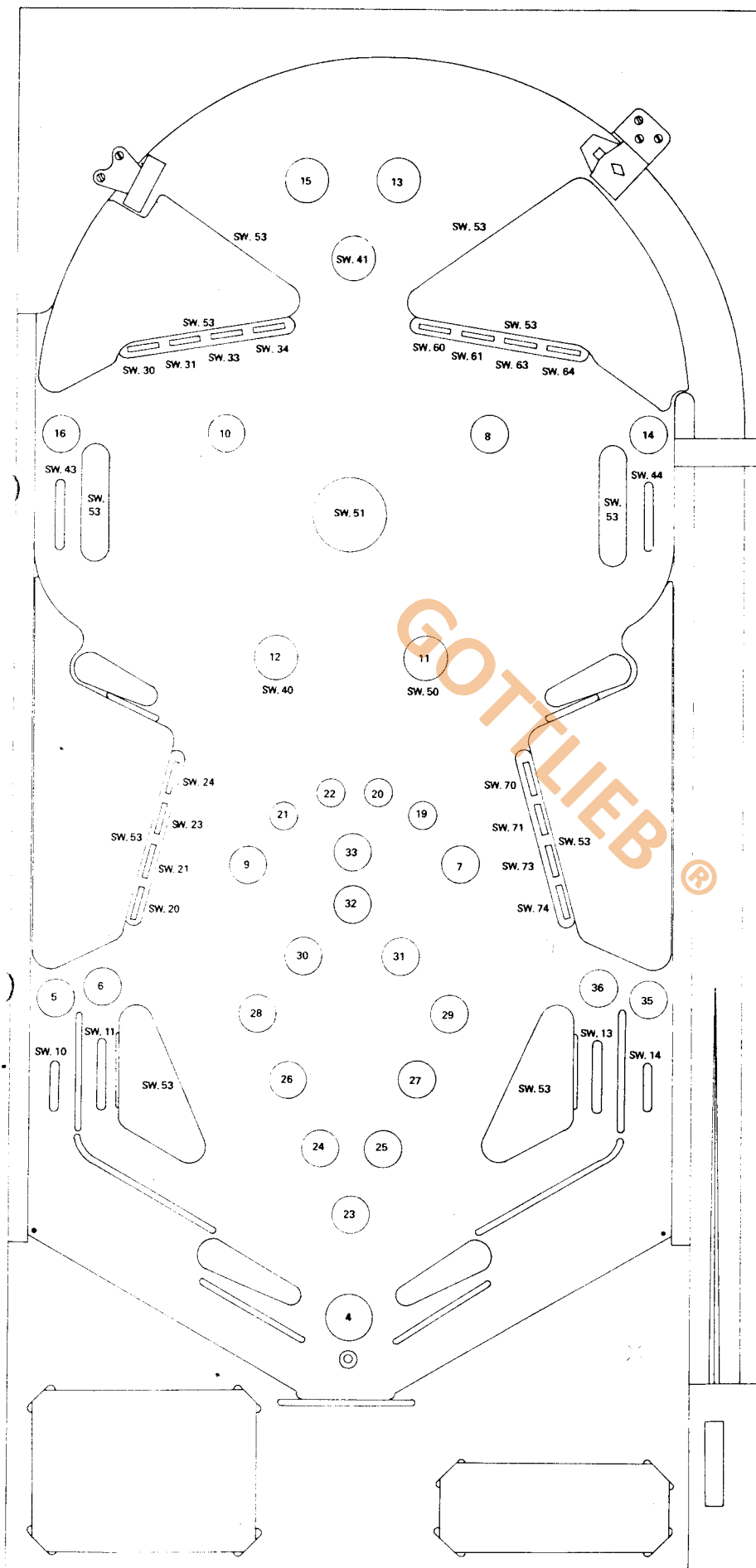
**If button is not pressed within two 0-9 cycles, machine returns to normal playing condition.

SWITCH MATRIX AND LAMP LOCATION SWITCHES ON MATRIX

SW. MATRIX NUMBER	SWITCH FUNCTION
SW.00	Test Button (On Front Door)
SW.01	#1 Coin Chute (On Front Door)
SW.02	#2 Coin Chute (On Front Door)
SW.03	Replay Button (On Front Door)
SW.04	Tilt Switches
SW.10	Red Rollover
SW.11	Green Rollover
SW.13	Yellow Rollover
SW.14	Blue Rollover
SW.20	#1 Red Drop Target
SW.21	#2 Red Drop Target
SW.23	#3 Red Drop Target
SW.24	#4 Red Drop Target
SW.30	#1 Green Drop Target
SW.31	#2 Green Drop Target
SW.33	#3 Green Drop Target
SW.34	#4 Green Drop Target
SW.40	Left Rollover Button
SW.41	Hole Switch
SW.43	Extra Ball Rollover
SW.44	Special Rollover
SW.50	Right Rollover Button
SW.51	Pop Bumper
SW.53	10 Point Switches (10)
SW.60	#1 Yellow Drop Target
SW.61	#2 Yellow Drop Target
SW.63	#3 Yellow Drop Target
SW.64	#4 Yellow Drop Target
SW.70	#1 Blue Drop Target
SW.71	#2 Blue Drop Target
SW.73	#3 Blue Drop Target
SW.74	#4 Blue Drop Target

CPU CONTROLLED LAMPS

LAMP NUMBER	LAMP FUNCTION
1	Game Over Relay (Lamp in Lightbox)
2	Tilt Relay (Lamp in Lightbox)
3	High Game to Date (Lamp in Lightbox)
4	Same Player Shoots Again (Playfield & Lightbox)
5	Red Rollover
6	Green Rollover
7	Blue Drop Target
8	Yellow Drop Target
9	Red Drop Target
10	Green Drop Target
11	Right Rollover Button
12	Left Rollover Button
13	500 or 5000 When Lit Hole
14	Special
15	Bonus Count-Down When Lit Hole
16	Extra Ball
19	"5X" Bonus
20	"4X" Bonus
21	"2X" Bonus
22	"3X" Bonus
23	"1000" Bonus
24	"2000" Bonus
25	"3000" Bonus
26	"4000" Bonus
27	"5000" Bonus
28	"6000" Bonus
29	"7000" Bonus
30	"8000" Bonus
31	"9000" Bonus
32	"10,000" Bonus
33	"20,000" Bonus
35	Blue Rollover
36	Yellow Rollover



TO CHANGE REPLAY SCORES OR "HIGH GAME TO DATE" SCORE:

- 1) Press the play/test button on the front door at one-second intervals to advance to step 7 (first high score replay).
- 2) Reset the display by pressing Switch Button #25 on A1, the CPU control board.
- 3) Press the replay button. This causes the display to advance by 10,000's. Hold in the replay button until the desired replay score is shown.
- 4) The new score is entered by advancing to the next function by pressing the play/test button.

To eliminate entirely one or more replay scores, set step 7, 8, or 9 at zero (as in #2 above), then press the play/test button to enter the value.

The switches and solenoids are checked in Step 13 in the order given in the following lists. A faulty solenoid or a closed switch that should be open will not stop the test sequence; the code number of the component will be shown in the ball-in-play display. The machine returns to the normal playing condition at the end of the test. It will do so also if a tilt switch is closed, if an anti-cheat switch is opened, or if the power is interrupted.

SOLENOID NUMBER	SOLENOID
1	Outhole
2	Knocker
3	Tens
4	Hundreds
5	Thousands
6	Hole
7	Green Target Bank Reset
8	Red Target Bank Reset

VI. TROUBLE-SHOOTING GUIDE

Trouble-shooting the solid-state pinball game on location includes inspection and repair of the electro-mechanical devices and wiring, and inspection and replacement of printed circuit boards. Repair of printed circuit boards on location, while possible, is best done in a properly equipped shop.

Before replacing the control board (A1) or the driver board (A3), measure the voltages on the power supply (A2) after first disconnecting the two connectors A2J2 and A2J3. Before replacing any printed circuit board, check all connectors, crimp connections, and wire continuity.

WARNING! TURN OFF POWER BEFORE REMOVING ANY WIRE CONNECTORS OR REPLACING ANY PRINTED CIRCUIT BOARDS. ALL CONNECTORS MUST BE RECONNECTED BEFORE TURNING POWER ON AGAIN.

Basic game troubleshooting involves determining that the game powers up 5 seconds after power is turned on. If the 5 second delay does not occur, check the TILT and SLAM (anti-cheat) switches. Cycle the game through the self-test procedures described in SECTION V and observe any malfunctions. Detailed troubleshooting procedures and diagrams are in the Solid-State Pinball Game Service Manual.

VII. ROUTINE MAINTENANCE

After a successful completion of the self-test, check the playfield for dirt or particles. The playfield should be cleaned frequently with a non-abrasive wax-based cleaner. Any of the polishes made specifically for use on pinball machine playfields may be used. Make certain that kicker fulcrums and all pivot points receive a drop of fine oil. The pop bumper cup switches, the drop target shanks and the discs of Vari-targets should be lightly coated with White Lube, a special Gottlieb lubricant available at distributors.

When the playboard is clean and all components are working properly, start the game and try each feature. Make certain each rollover operates, that each pop bumper scores and kicks correctly and that in general everything works as it should. If an intermittent or dirty switch is found, clean the points by pressing them together with a piece of paper or a business card between them, moving the card back and forth.

WARNING: DO NOT FILE, BURNISH OR IN ANY WAY ABRASE GOLD-PLATED SWITCH CONTACTS.

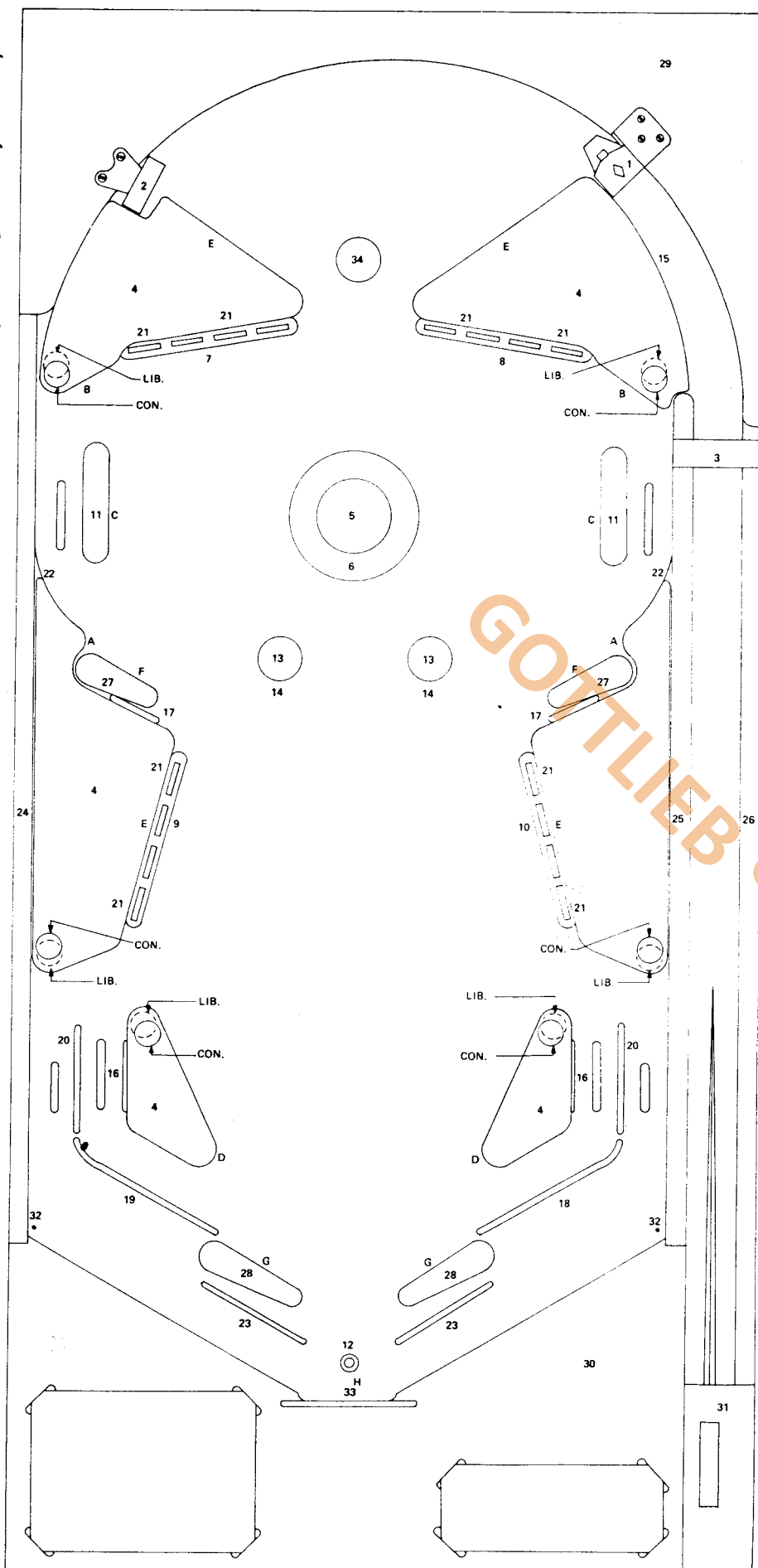
The only switches whose points may be burnished are the pop bumper cup switches, the rubber-actuated switches on kicking rubber units, and the flipper button switches.

VIII. SERVICE AND PARTS

PARTS LIST

A-9430	Plunger Link
A-18354	Assembly Ball Striker Arm
A-18356	Assembly of Track Frame and Studs
B-18358	Ball Return Fence
C-18359	Ball Return Fence
A-18549	Ball Return Plunger
C-18638	Complete Ball Return Unit (Less Fences)
A-18687	Assembly of Plunger and Link
A-18688	Assembly Rollover Wire, Switch and Bracket
A-18702	Assembly of Coil Stop Bracket
A-18664	Assembly of Hole Kicker Cam

NOTE Count-Down Uses Prom
Marked "F"



PLAYBOARD INFORMATION

RUBBER RINGS

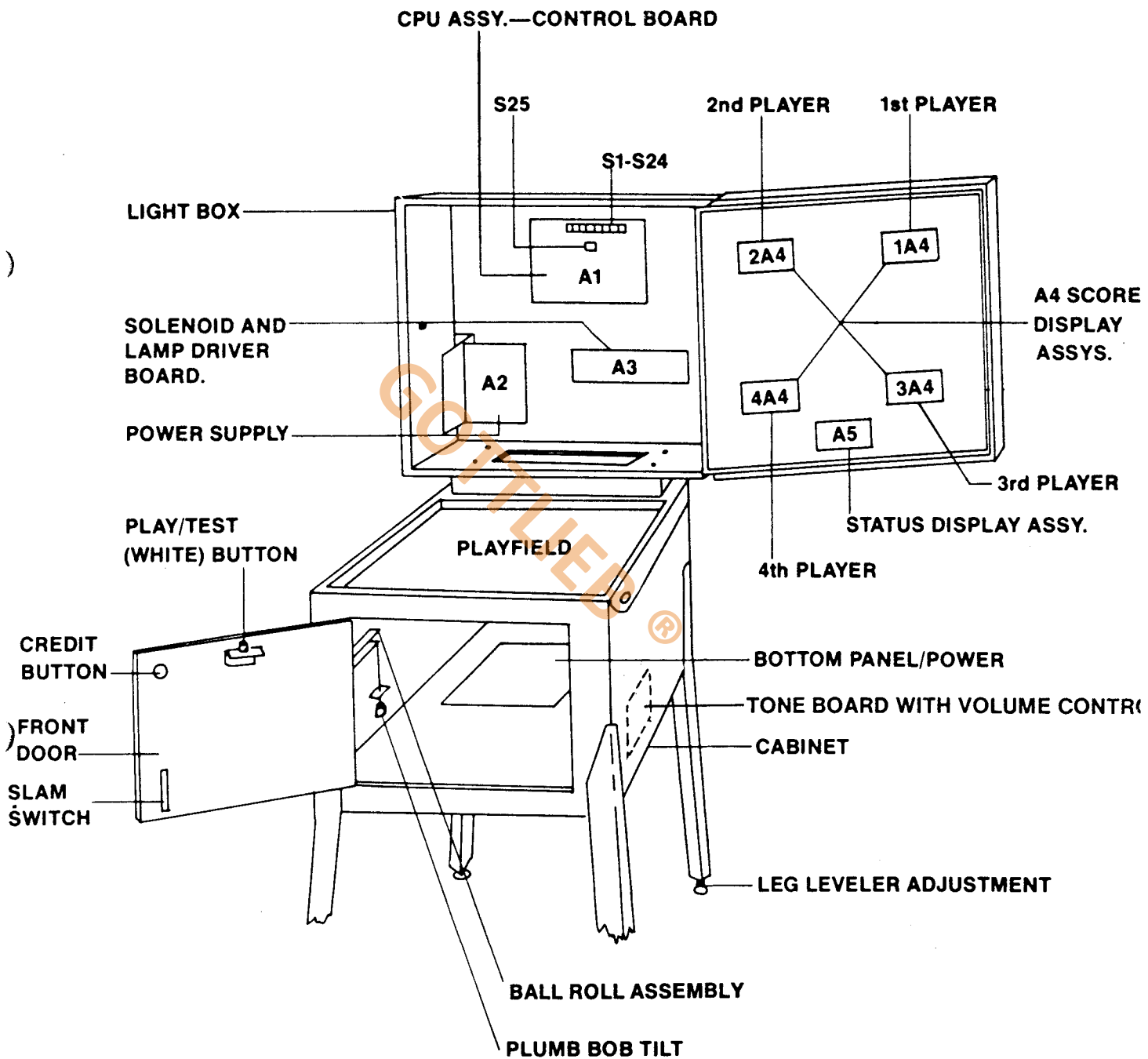
A-A-10217	(2)
B-A-10218	(2)
C-A-10220	(2)
D-A-10221	(2)
E-A-10224	(4)
F-A-13149	(2)
G-A-13151	(2)
H-A-15705	(1)

PARTS LIST

1. A-3290 Ball Gate.
 2. A-9143 Rebound Rubber.
 3. A-8215 Ball Deflector.
 4. C-18193 Plastic Shield Set.
 5. Red Pop Bumper A-10436 and A-16883 Cap Red.
 6. B-8246 Pop Bumper Platter.
 7. 4 Pos. Green Drop Target with A-15177 Stamped in Gold.
 8. 4 Pos. Yellow Drop Target with A-15177 Stamped in Gold.
 9. 4 Pos. Red Drop Target with A-15177 Stamped in Gold.
 10. 4 Pos. Blue Drop Target with A-15177 Stamped in Gold.
 11. A-9397 Red Plastic Guide Rail.—(2)
 12. A-14792 Mini Post Screw.
 13. D-11966 Red Plastic Rollover Insert.—(2)
 14. D-11968 White Plastic Rollover Button.—(2)
 15. A-4246 Ball Guide Rail. (Wire Form)—(1)
 16. A-6612 Ball Guide Rail. (Wire Form)—(2)
 17. A-6931 Ball Guide Rail. (Wire Form)—(2)
 18. A-14571 Ball Guide Rail. (Wire Form)—(1)
 19. A-14572 Ball Guide Rail. (Wire Form)—(1)
 20. A-17106 Ball Guide Rail. (Wire Form)—(2)
 21. A-17650 Ball Guide Rail. (Wire Form)—(8)
 22. A-9991 Metal Flat Rail.—(2)
 23. A-13798 Ball Snubber. (Wire Form)—(2)
 24. C-7393 Wood Rail. (Left Side)
 25. C-9771 Wood Rail. (Center)
 26. C-13977 Wood Rail. (Right Side)
 27. C-11241 White Small Flipper.—(2)
 28. C-13150 White Jumbo Flipper.—(2)
 29. D-4806 Top Arch with "G"—"5"&"6" Pos.
 30. D-13647-1E Card Holder.
 31. C-9767 Ball Shooter Gauge.
 32. A-10542 Steel Pins.—(2)
 33. C-18638 Ball Return Unit.
 34. A-18664 Hole Kicker.
- C-11561 White Plastic Post 1" High.—(24)
C-11562 White Plastic Post 1 3/16" High.—(4)

LIB. = LIBERAL
CON. = CONSERVATIVE

COMPONENT LOCATION DIAGRAM



NOTE:
The number in box on wire corresponds to a color as indicated in color code chart.

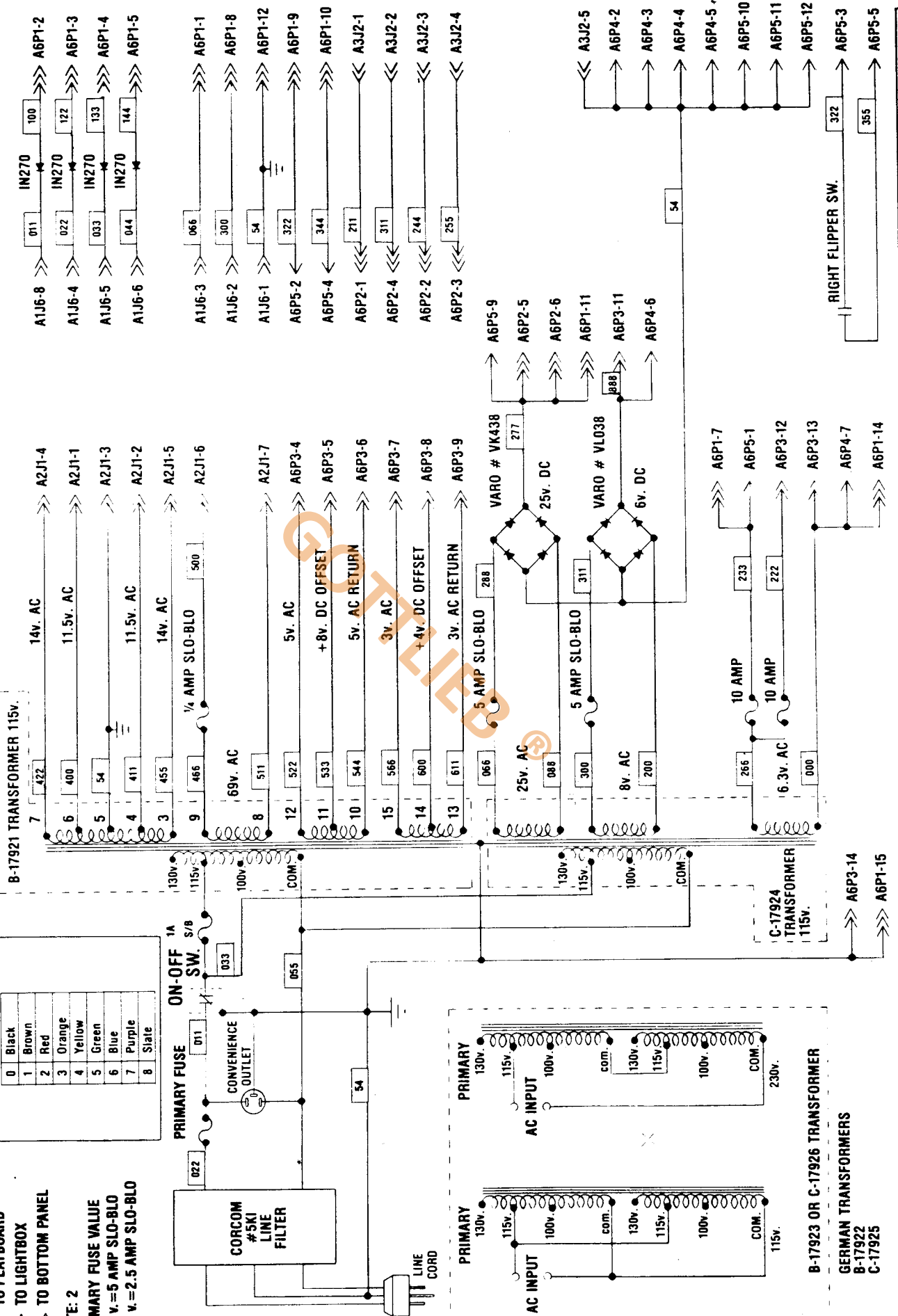
Color Code Chart
0 Black
1 Brown
2 Red
3 Orange
4 Yellow
5 Green
6 Blue
7 Purple
8 Slate

NOTE: 1

- > TO PLAYBOARD
- >> TO LIGHTBOX
- >>> TO BOTTOM PANEL

NOTE: 2

PRIMARY FUSE VALUE
115 v. = 5 AMP SLO-BLO
230 v. = 2.5 AMP SLO-BLO



D. GOTTLIEB & CO.			
FILE	ADDED FUSE	WIRE COLORS REVISED	WIRE ON SOLID STATE
3		2	
2			
1			

BOTTOM BOARD SCHEMATIC

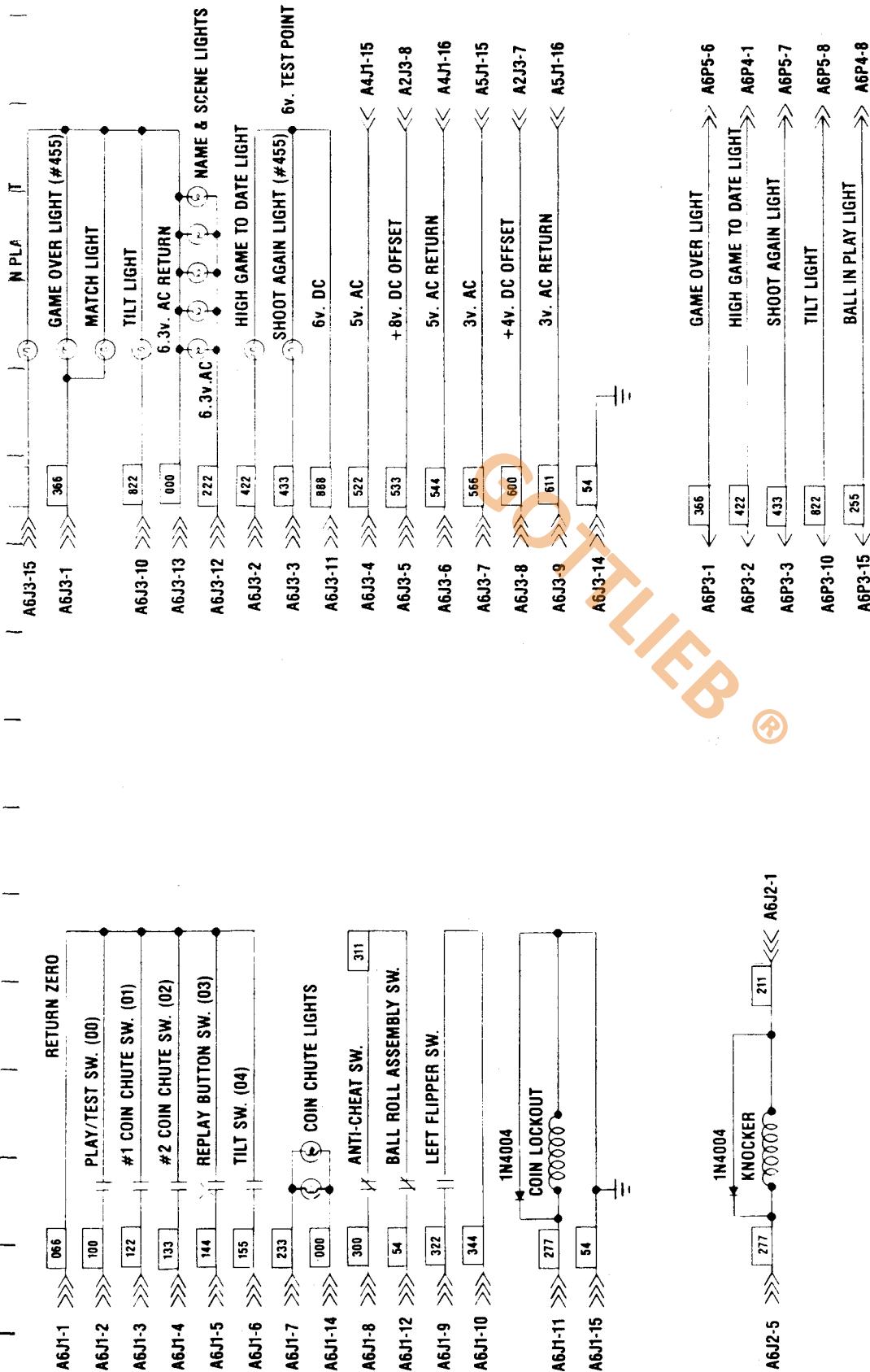
WIRE ON SOLID STATE

WIRE COLORS REVISED

ADDED FUSE

FILE

D. GOTTLIEB & CO.



NOTE:
The number in box on wire corresponds to a color as indicated in color code chart.

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

COILS USED

PART NO.	DESCRIPTION
A-5195	KNOCKER COIL
A-16890	COIN LOCKOUT COIL

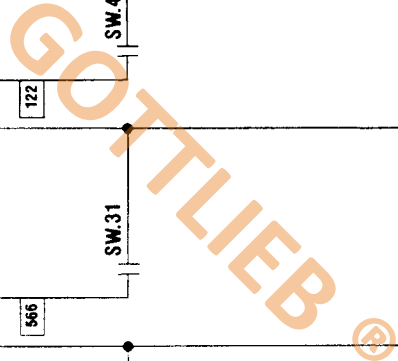
NOTE:

>	FROM PLAYBOARD
>>	FROM LIGHT BOX
>>>	FROM BOTTOM BOARD

D. GOTTLIEB & CO.	
TITLE	BOTTOM BOARD & LIGHT BOX
DATE	SCHEMATIC
APPROVED DATE	SOLID STATE
REVISIONS	C-18645

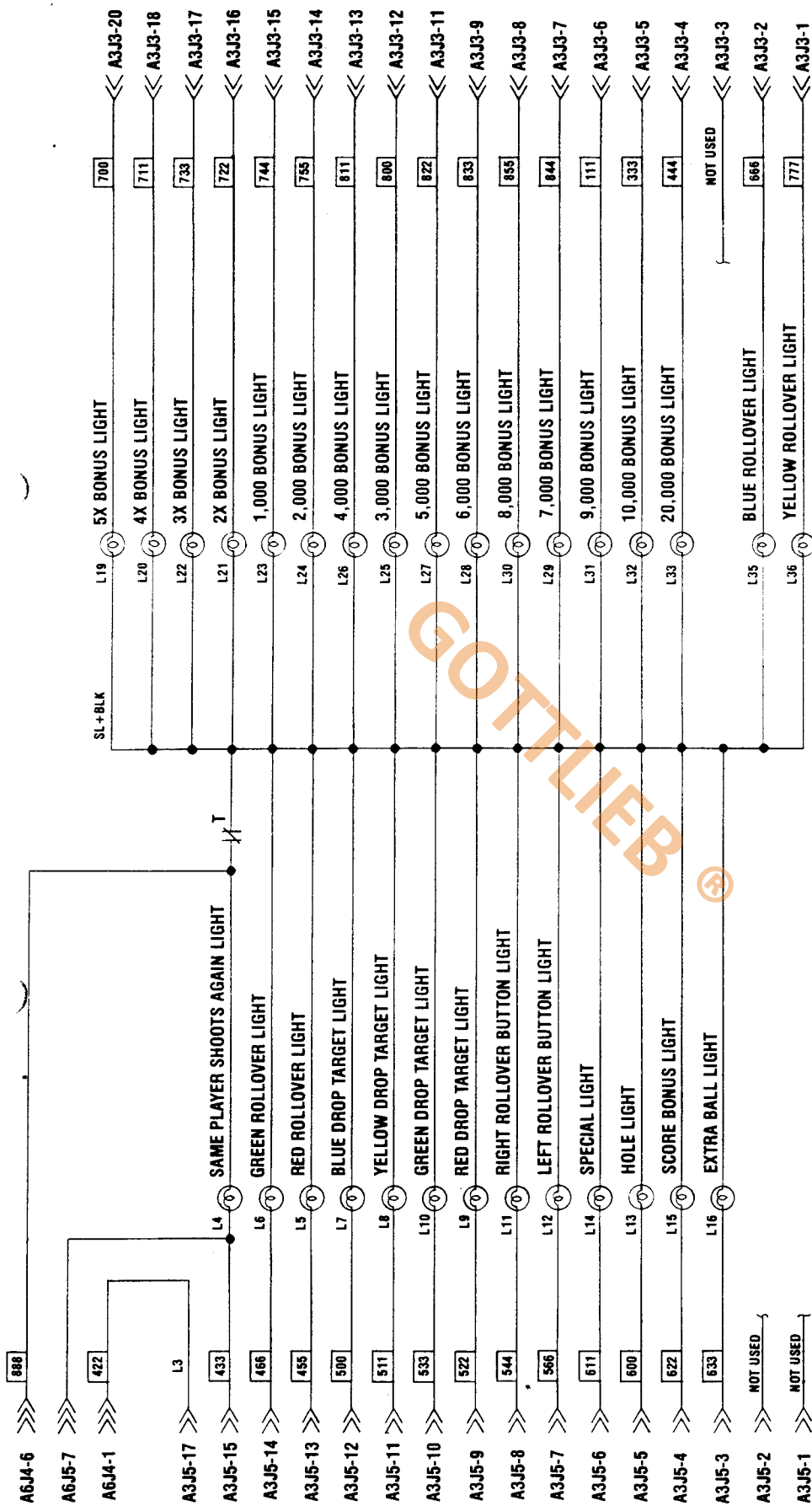
RETURNS

STROBES



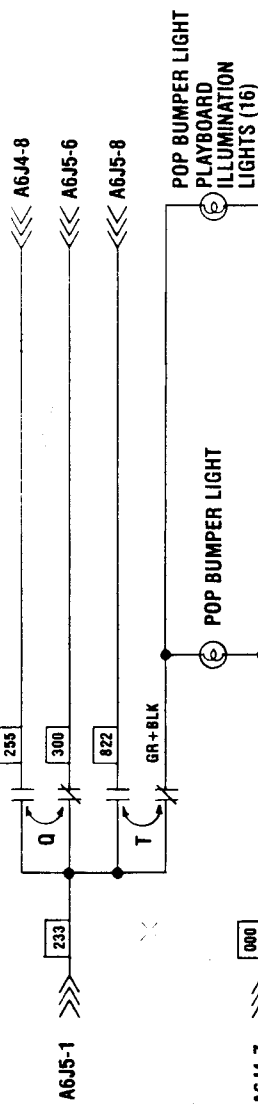
OUTHOLE SW. 54 A1J7-1 >> << A1J7-8

	D. GOTTlieb & CO.
TITLE	SWITCH MATRIX
USED ON	COUNT-DOWN #422
PROJECT NO.	68-09070 P-337

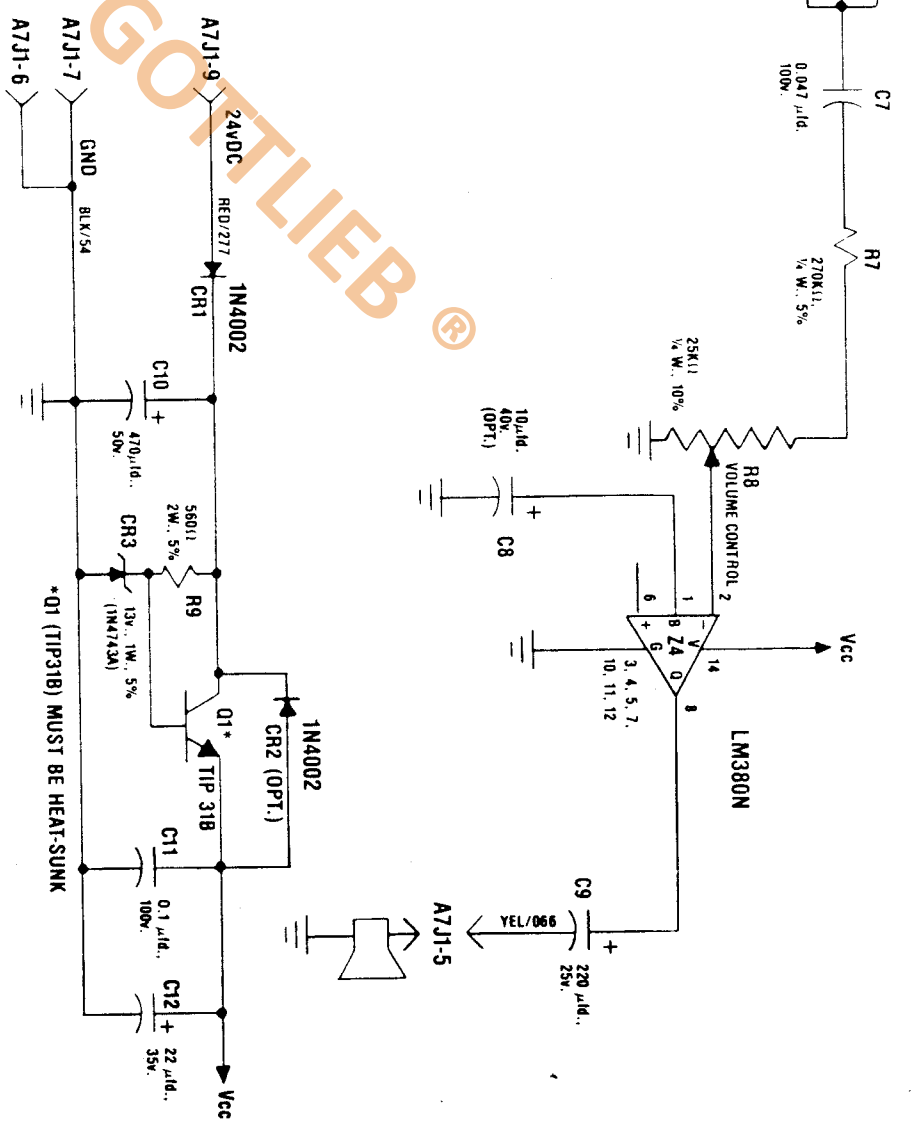
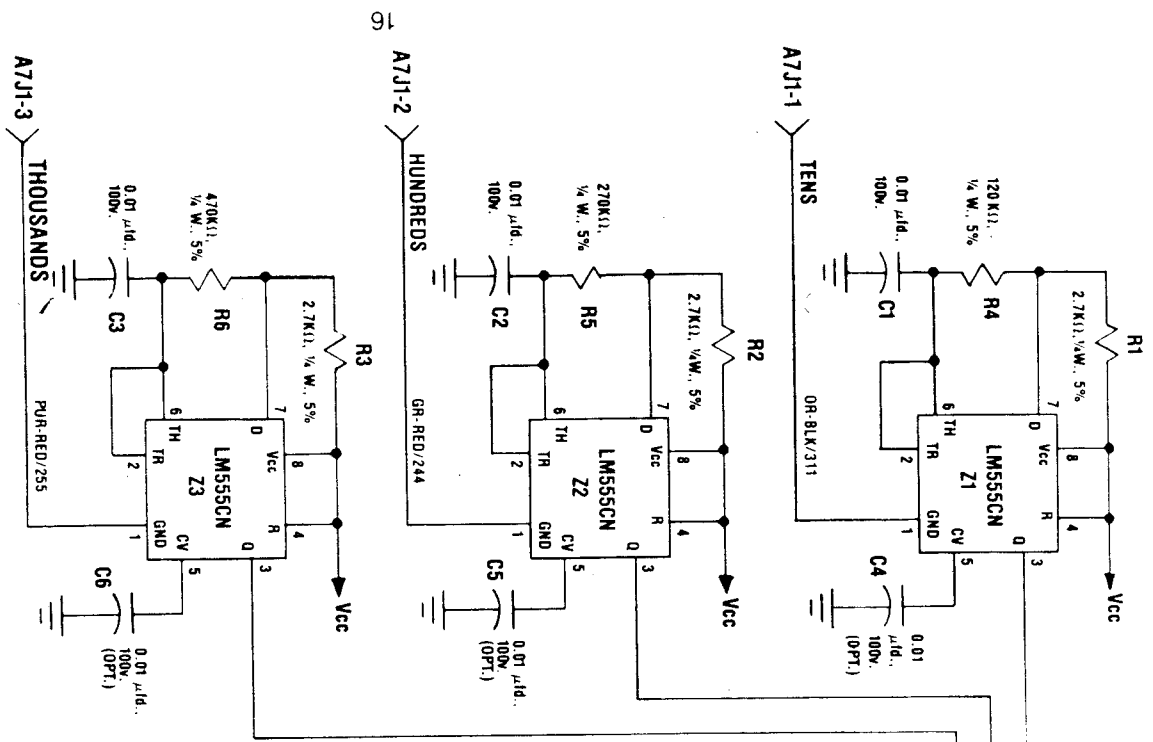


NOTE:
The number in box on wire corresponds to a color as indicated in color code chart.

Color Code Chart	
0	Black
1	Brown
2	Red
3	Orange
4	Yellow
5	Green
6	Blue
7	Purple
8	Slate
9	White



NOTE:
 >>> FROM LIGHTBOX
 >>> FROM PLAYBOARD



Note:
The number after the wire color indicates a possible color change. The numbers correspond to a color as indicated in the color code chart.

Color Code Chart

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

1	6/78 Added Colors	TITLE	D. GOTTlieb & CO.
		USED ON	SYNTHESIZED TONES
DATE	REVISIONS	DRAWN	APPROVED DATE
			B-18555-1

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