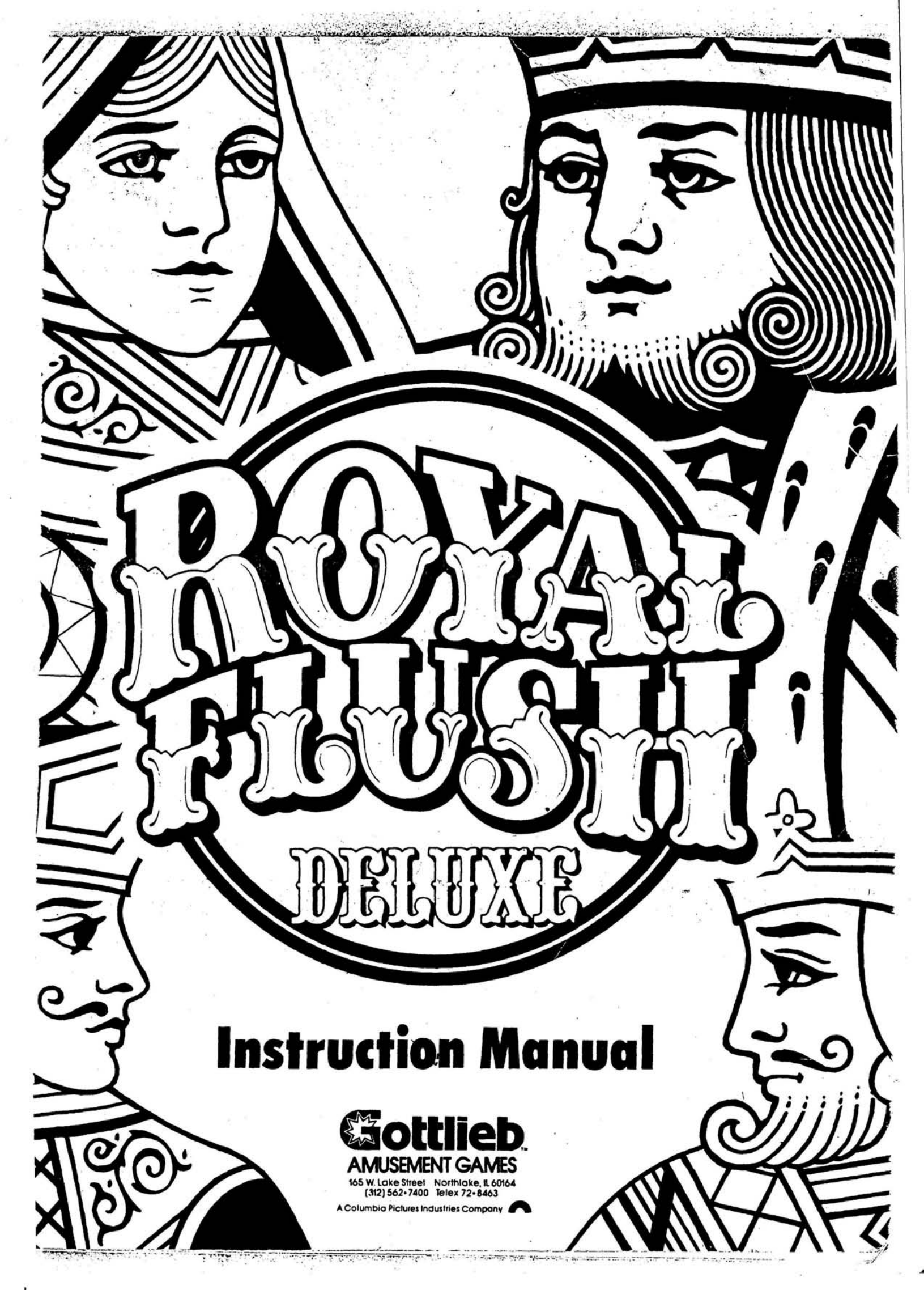




ROYAL FLUSH DELUXE

Instruction Manual

 **Gottlieb**
AMUSEMENT GAMES

165 W. Lake Street Northlake, IL 60164
(312) 562-7400 Telex 72-8463

A Columbia Pictures Industries Company

LIMITED WARRANTY

D. Gottlieb & Co. warrants to the initial purchaser of the D. Gottlieb & Co. machine that the items listed in the following schedule as installed and used in the original D. Gottlieb & Co. machine will for the applicable period set forth in the schedule, computed from the initial date of purchase from an authorized D. Gottlieb & Co. 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

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 **Gottlieb**
AMUSEMENT GAMES

WARNING: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference."

A-22670

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

ADDENDUM

ATTACHED TO AND PART OF ROYAL FLUSH DELUXE GAME #681

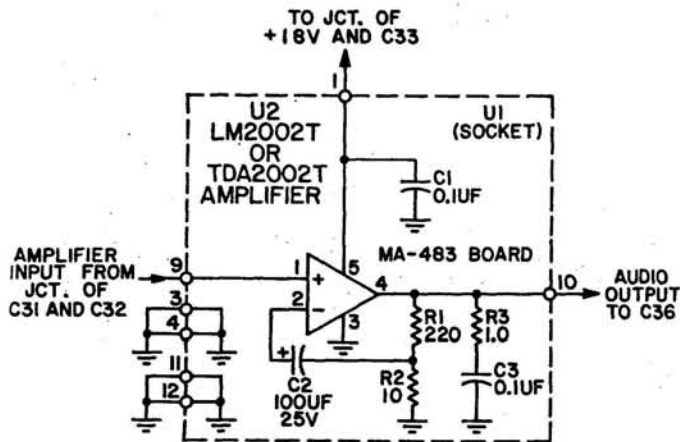
INSTRUCTION MANUAL

GAME AS SHIPPED VARIES FROM THE INSTRUCTION MANUAL AS PRINTED.

1. The game number has been changed to #681A.
2. The existing Sound Board (MA-309) becomes an MA-484 with the addition of the Piggyback Board (MA-483) mounted on the Sound Board. Delete the following parts from the SOUND BOARD ASSY. parts list on page 25 of the instruction manual:

C37	Capacitor, 4.7UF, 35V	XO-291
R18, R21	Resistor, 100K ohm, 5%, 1/4W	XO-45
R22	Resistor, 2K ohm, 5%, 1/4W	XO-14
U23	IC, LM379S	XO-395

Delete:	Sound Board Assembly	MA-309
Add:	Sound Board Assembly	MA-484



Add the following parts list for the Piggyback Board on page 25 of the instruction manual.

C1, C3	Capacitor, 0.1UF, 50V	XO-230
C2	Capacitor, 100UF, 25V	XO-212
R1	Resistor, 220 ohm, 5%, 1/2W	XO-185
R2	Resistor, 10 ohm, 5%, 1/4W	XO-32
R3	Resistor, 1 ohm, 5%, 1/2W	XO-593
U1	Socket, 14 Pin	XO-619
U2	IC, LM2002T or TDA2002T	XO-550
	Clip Heat Sink	XO-472

In addition, the Sound/Speech Power Supply Board (A7) was MA-188, now becomes MA-481 with the following changes. These changes should be implemented on page 40, SOUND/SPEECH POWER SUPPLY (A7) PARTS LIST, in the instruction manual:

DELETE:
R1 Resistor, 430 ohm, 5%, 1/2W XO-54

ADD:
R1 Resistor, 1.5K ohm, 5%, 1/2W XO-58

Delete:
CR1 Diode, Zener 30V, 5%, 1W, 1N4751A XO-271

ADD:
CR1 Diode, Zener 18V, 5%, 1W, 1N4746A XO-258

NOTE: Connector A7P1 pin 2 now has +18V DC instead of the previous +30V DC. Change the voltage on the schematic on top of page 40, SOUND/SPEECH POWER SUPPLY, in the instruction manual.

ROYAL FLUSH DELUXE
(GAME #681)

FINAL EDITION

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

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ROYAL FLUSH DELUXE PROMS

GAME PROM 681/2

SOUND PROMS 681/S1, 681/S2

FOR SERVICE, CALL TOLL FREE: 1-800-323-9121; (ILLINOIS): 1-800-942-1620

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.

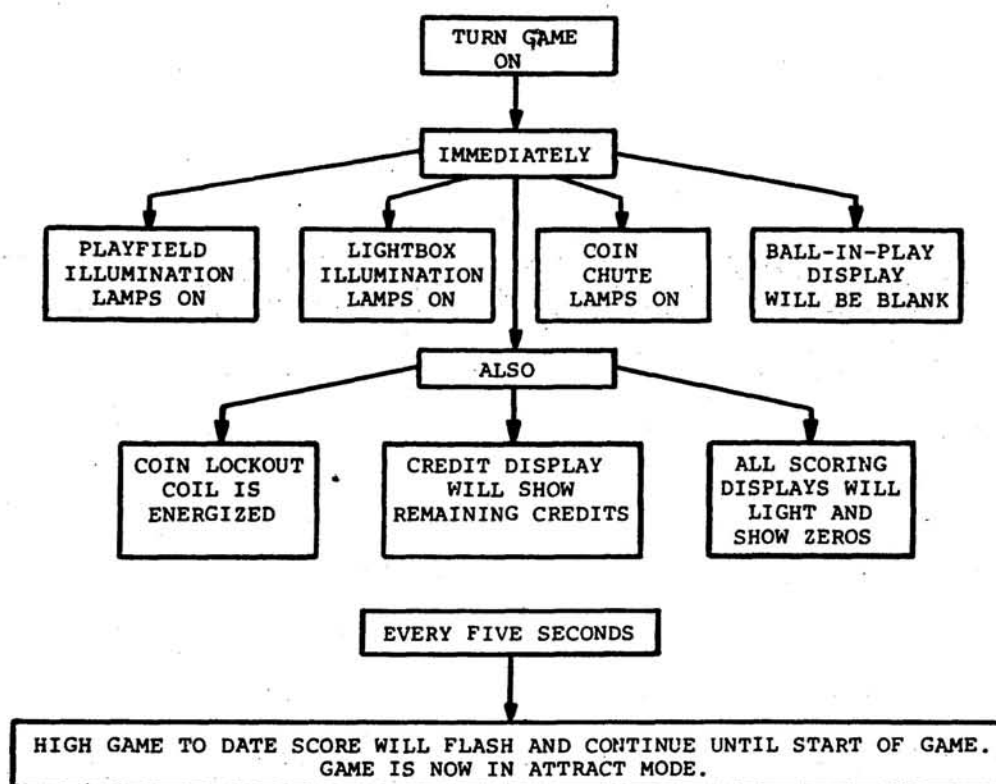
B. CHECK-OUT

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. 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.

E. 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.

F. 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. HIGH GAME TO DATE is periodically flashed in all players score displays. When a score higher than HIGH GAME TO DATE 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 LEFT ROLLOVER, LEFT SPOT TARGET

- Scores 500 points.
- Scores 5000 points when lit.
- Turns top left rollover lamp off.
- Turns left spot target lamp off.
- Lights left outlane rollover lamp.
- Lights right return rollover lamp.
- Lights corresponding colored lamp at hole kicker.

TOP CENTER ROLLOVER, TOP SPOT TARGET

- Scores 500 points.
- Scores 5000 points when lit.
- Turns top center rollover lamp off.
- Turns top spot target lamp off.
- Lights left side rollover lamp.
- Lights right side rollover lamp.
- Lights corresponding colored lamp at hole kicker.

TOP RIGHT ROLLOVER, RIGHT SPOT TARGET

- Scores 500 points.
- Scores 5000 points when lit.
- Turns top right rollover lamp off.
- Turns right spot target lamp off.
- Lights left return rollover lamp.
- Lights right outlane rollover lamp.
- Lights corresponding colored lamp at hole kicker.

SPECIAL

- Lighting all three lamps at the hole kicker lights the hole kicker for special.
- Awarded when ball enters hole kicker when lit.

HOLE KICKER

- Scores 10,000 points plus 10,000 points for each lit lamp at the hole kicker (40,000 points maximum).
- Awards special when lit.

IV. GAME PLAY AND SCORING

DROP TARGETS

- Scores 10,000 points plus 10,000 points for each lit lamp at the hole kicker (40,000 points maximum).
- Scores 1000 points plus 1000 points for each lit lamp at the hole kicker (4000 points maximum) (5 ball).
- Completing proper combinations lights corresponding bonus lamps (left side lights first).

BONUS

- Ball entering outhole collects bonus.
- Ball entering open gate when all bonus lamps are lit collects bonus, resets target bank and turns off all bonus lamps.
- Double bonus lit on last ball only.

RIGHT SIDE ROLLOVER

- Scores 5000 points.
- Scores 30,000 points when lit.
- Opens gate.

LEFT SIDE ROLLOVER

- Scores 5000 points.
- Scores 30,000 points when lit.

LEFT OUTLANE ROLLOVER, LEFT RETURN ROLLOVER, RIGHT OUTLANE ROLLOVER, RIGHT RETURN ROLLOVER

- Scores 5000 points.
- Scores 30,000 points when lit.

DIP TARGETS

- Lights when drop target in front of it is down.
- Left target scores 500 points when lit (behind the black king).
- Right target scores 500 points when lit (behind the black jack).
- Center target scores 3000 points when lit (behind the red queen).

POP BUMPER

- Scores 1000 points.
- Scores 3000 points when lit.
- Lights with center DIP target (behind the red queen).

V. SOUND

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

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

SWITCHES
31 32 _____ NOT USED
ON
OFF

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	S13	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	ON	OFF	1st/1	2nd/2	3rd/1	4th/3		=		4/7	
ON	ON	ON	ON	ON	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.

IMPORTANT: Each of the potentiometers installed on the Sound Board have been factory adjusted. The potentiometer settings should never be changed except when performing the recommended calibration procedure.

SWITCH BANK (SB1) SETTINGS:

SB1-1	NOT USED
SB1-2	NOT USED
SB1-3	SB1-4 Attract Mode
OFF	OFF Disabled
ON	OFF Every 10 Seconds
OFF	ON Every 2 Minutes
ON	ON Every 4 Minutes
SB1-5	ON Background Sound Enabled
	OFF Background Sound Disabled
SB1-6	NOT USED
SB1-7	NOT USED
SB1-8	NOT USED

C. POST ADJUSTMENTS

The upper and lower posts of the left and right outlanes can be repositioned for liberal/conservative game play. The upper post at the mouth of the Right Side Roll-over can also be repositioned. 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.

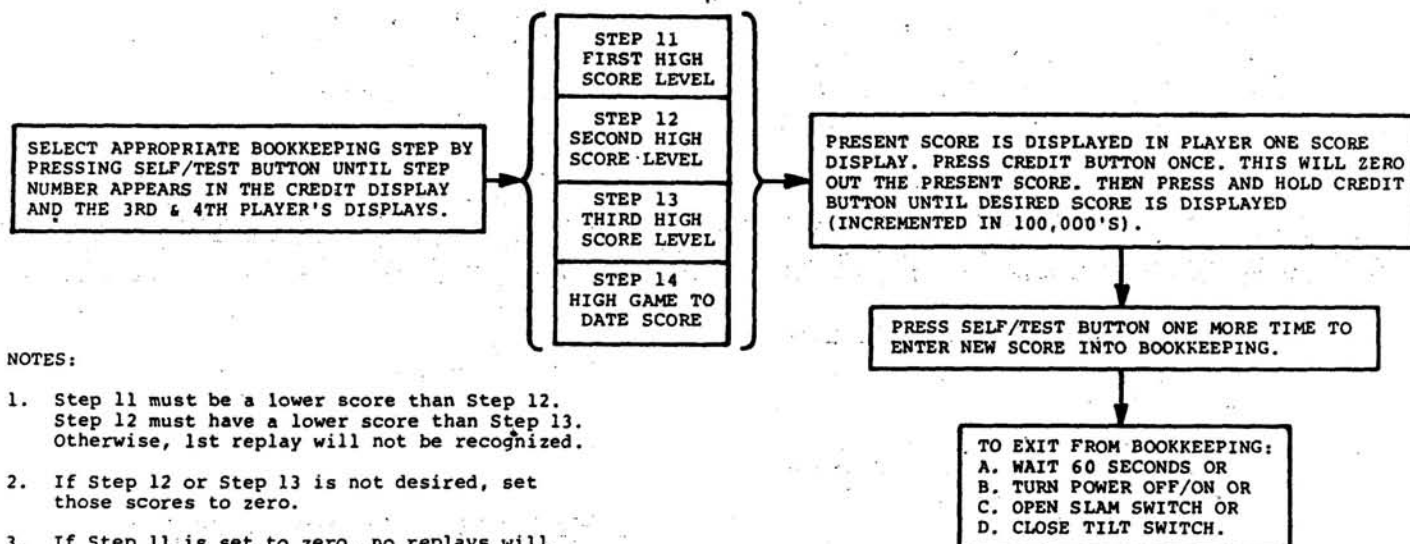
2. Zeroing All Bookkeeping Steps Except #11, 12, 13 and 14.

(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 SCORE

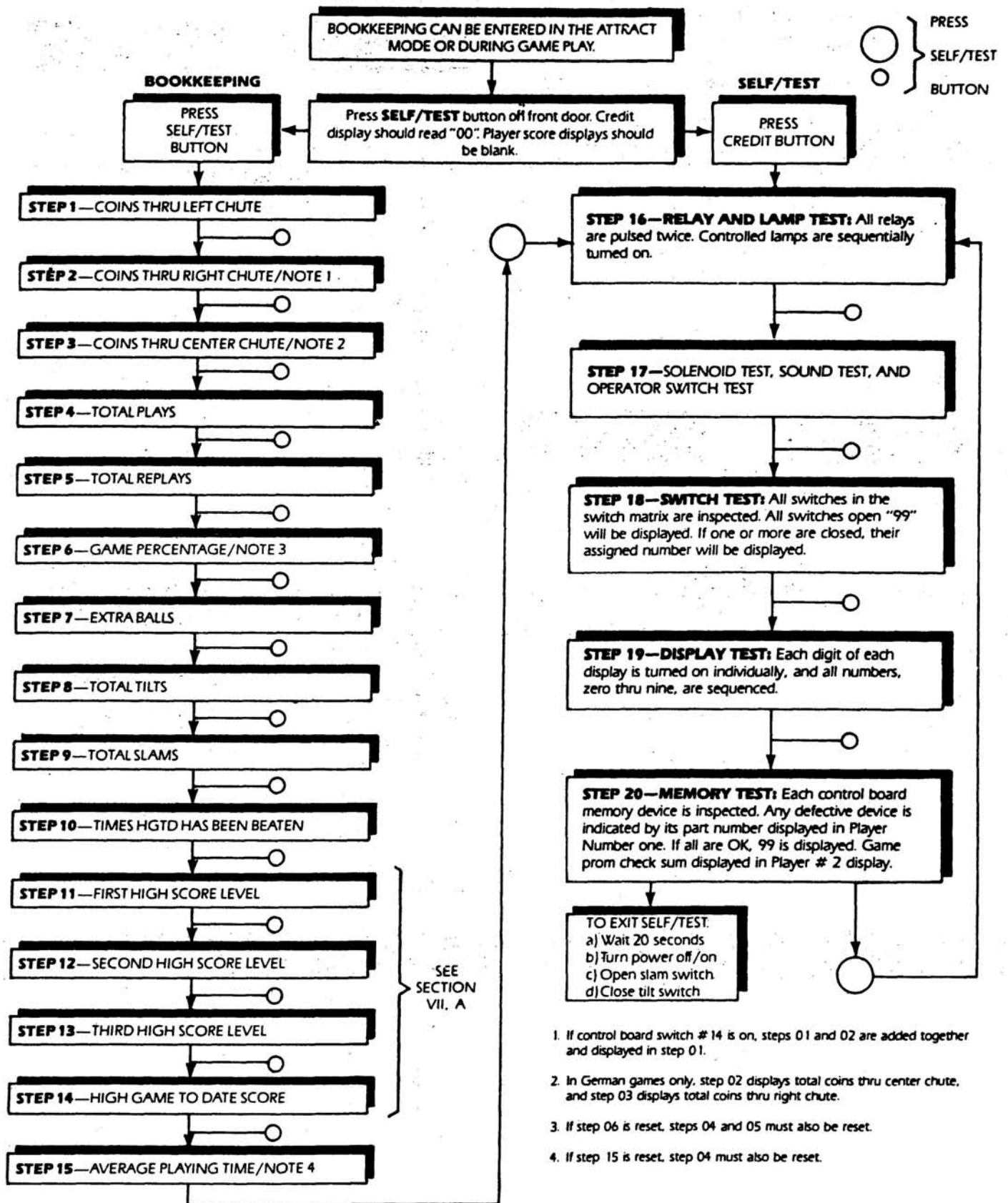


NOTES:

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

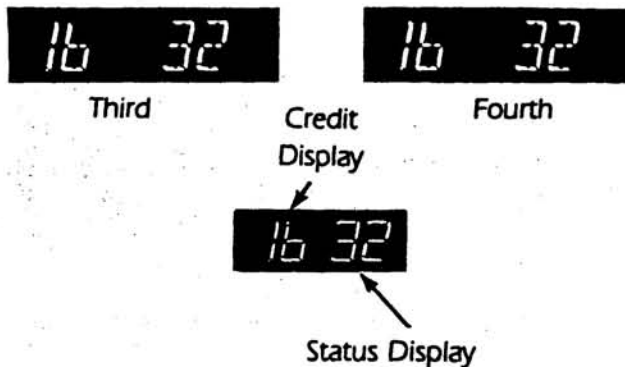


VII. BOOKKEEPING AND SELF TEST

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:

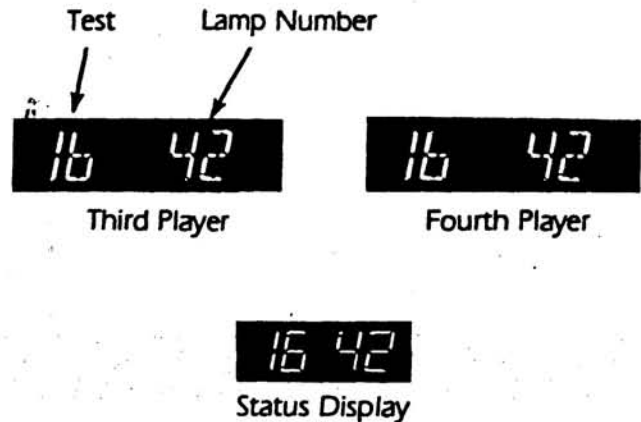


STEP 16—RELAY AND LAMP TEST

- 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	Not Used	Q60
Sol. 2	Target Bank Reset	Q57/Q58
Sol. 3	Not Used	Q54
Sol. 4	Not Used	Q55
Sol. 5	Hole	Q61/Q62
Sol. 6	Target 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)
S8 8
S2 2
S4 4
S1 1

A3 DRIVER BOARD TRANSISTOR ASSIGN. SEE SCHEMATIC

A3J2 PIN 9
A3J5 PIN 7
A3J5 PIN 5
A3J5 PIN 1
A3J5 PIN 6

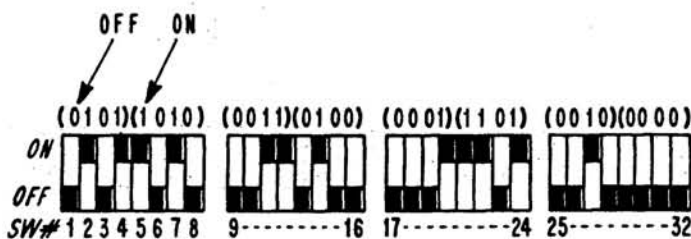
- c. The first and second player's score displays show hexadecimal representative of the operator switch positions. Converting hexadecimal to binary will give the switch positions in binary form.

CONVERSION TABLE

0 = OFF 1 = ON

DISPLAYED HEXADecimal	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.

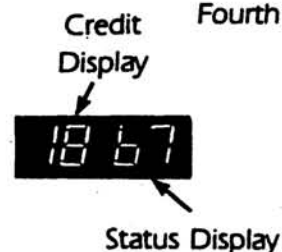
STEP 18—SWITCH TEST

18 67

Third Player

18 67

Fourth Player



- 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
5 101
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 - Sound/Speech Power Supply
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	7-1/2 Amp
F6	Playboard Illumination	6.3VAC	7-1/2 Amp
F7	Lightbox Illumination	6.3VAC	10 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	Pop Bumper	2 Amp SLO-BLO
F11	Outhole and Hole	1 Amp SLO-BLO
F12	9 Position Target	2 Amp SLO-BLO
	Bank Reset	

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	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.

E. SOUND BOARD (A6) TEST

1. Game must be in game over mode to initiate test.
2. Pressing the test button on the sound board will initiate test.
3. After the test button has been pressed, the sound board must correctly reproduce all of the sounds of game play and scoring. If not, the board is defective.

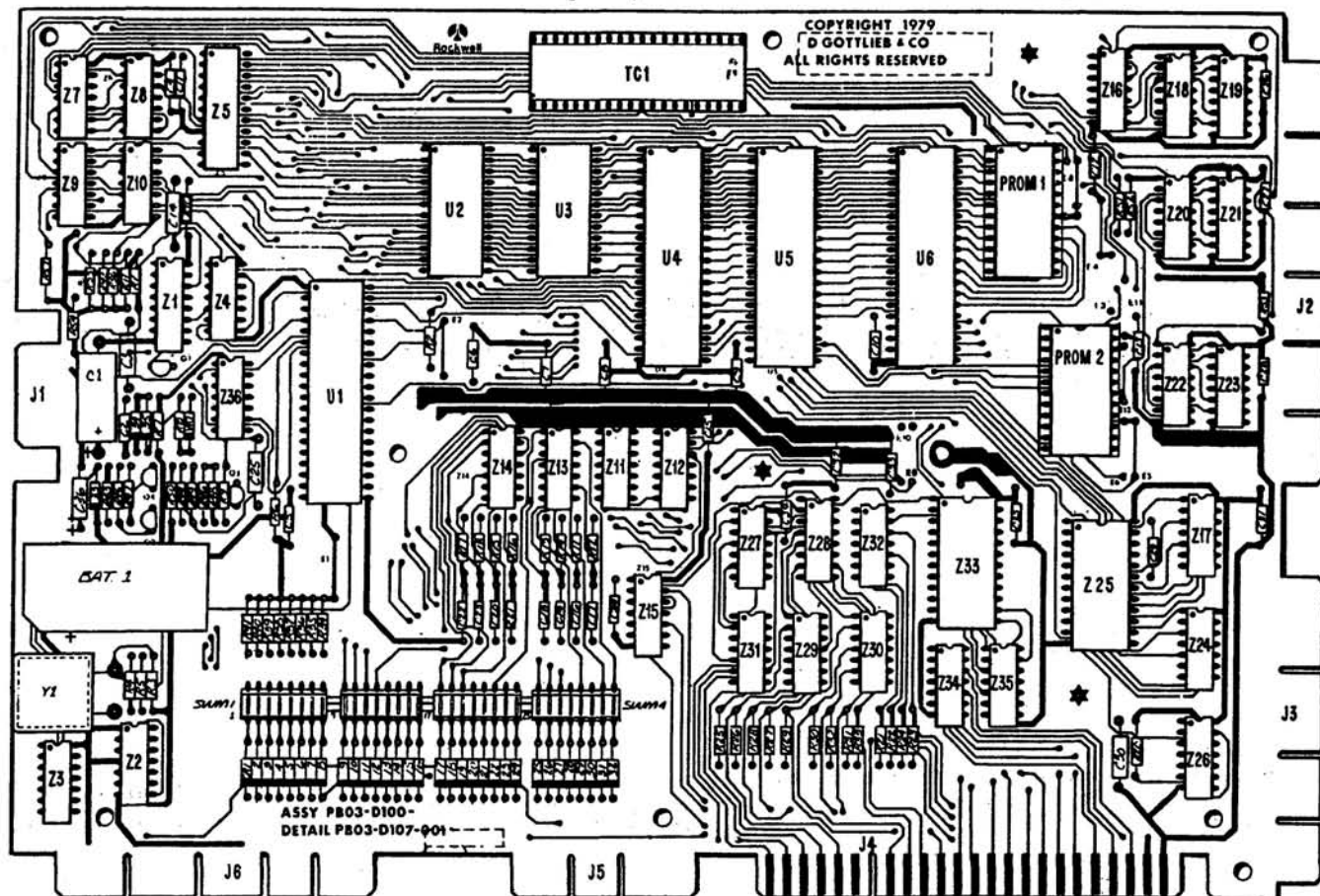
X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

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X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

CONTROL BOARD (A1) COMPONENT LOCATION

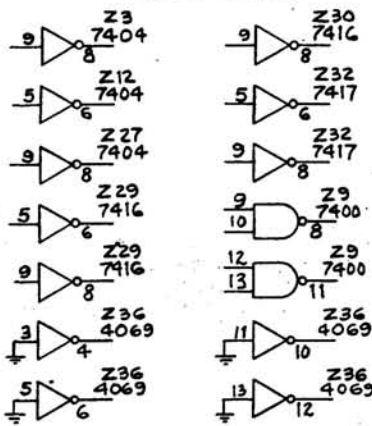


CONTROL BOARD (A1) PARTS LIST

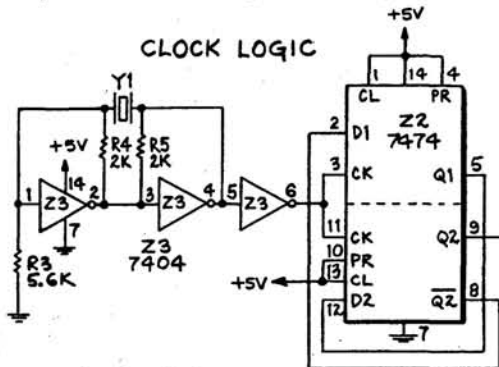
REFERENCE	DESCRIPTION	PART NUMBER	REFERENCE	DESCRIPTION	PART NUMBER
	CONTROL BOARD	MA-291	U3	ROM	XO-327
Bat. 1	Battery-3.6V 326R10-002	XO-458	U4, U5, U6	PRIOT R6532-18	XO-361
C1	Capacitor, 100 mfd., 10V	XO-211	VRI	Diode-3.0V, 5% 1N5225B or 1N5987B	XO-269
C2, C4-C13, C15-C24, C26-C29, C31-C35	Capacitor, .01 mfd., 50V	XO-229	Y1	Crystal, 3.579545 MHz	XO-456
C3, C14, C25, C30	Capacitor, .1 mfd., 50V	XO-230	Z1	IC-Cmos-Dual 1 Shot SCL4528BE	XO-414
C36	10 mfd., 10V, TNT-AX CAP	XO-209	Z2	IC-Dual Flip Flop SN7474N	XO-423
CR1-CR35	Diode, GP 1N4148	XO-261	Z3, Z11, Z12, Z16, Z17, Z24, Z26, Z27, Z34, Z35	IC-Hex Inverter SN7404N	XO-402
Q1, Q4	Transistor-PNP MPS-A70	XO-309	Z4	IC-Cmos-Quad 2 Input "And" SCL4081BE	XO-401
Q2, Q3	Transistor, NPN (Motorola) 2N4400	XO-313	Z5	IC-Static Ram 55101-L	XO-356
R1, R6, R11-R24, R42, R45, R46, R48, R51-R57	Resistor, 3.0K ohm, 5%, 1/4W	XO-23	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	XO-326		Socket 24 Pin 640361-3	XO-529

NOTE: UNLESS OTHERWISE INDICATED;
 1. RESISTORS ARE $\pm 5\%$, 1/4W.
 2. CAPACITORS ARE .01UF, 50V.
 3. DIODES ARE TYPE 1N4148.
 4. REF. DESIGNATION Z6 NOT USED.

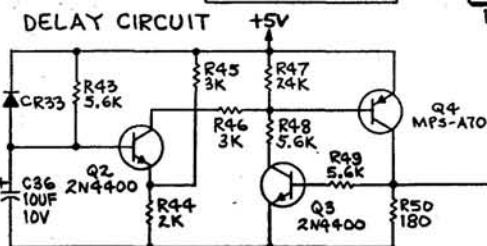
SPARE GATES



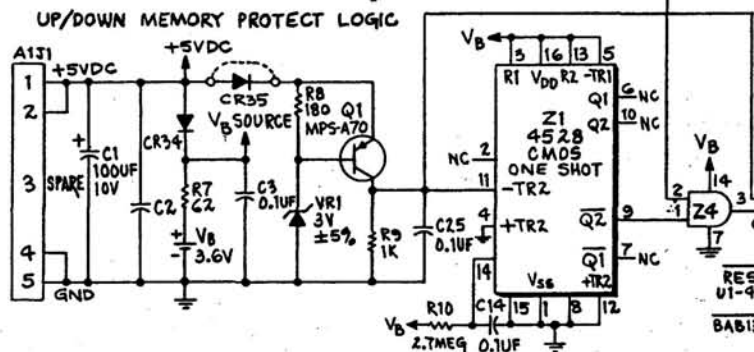
CLOCK LOGIC



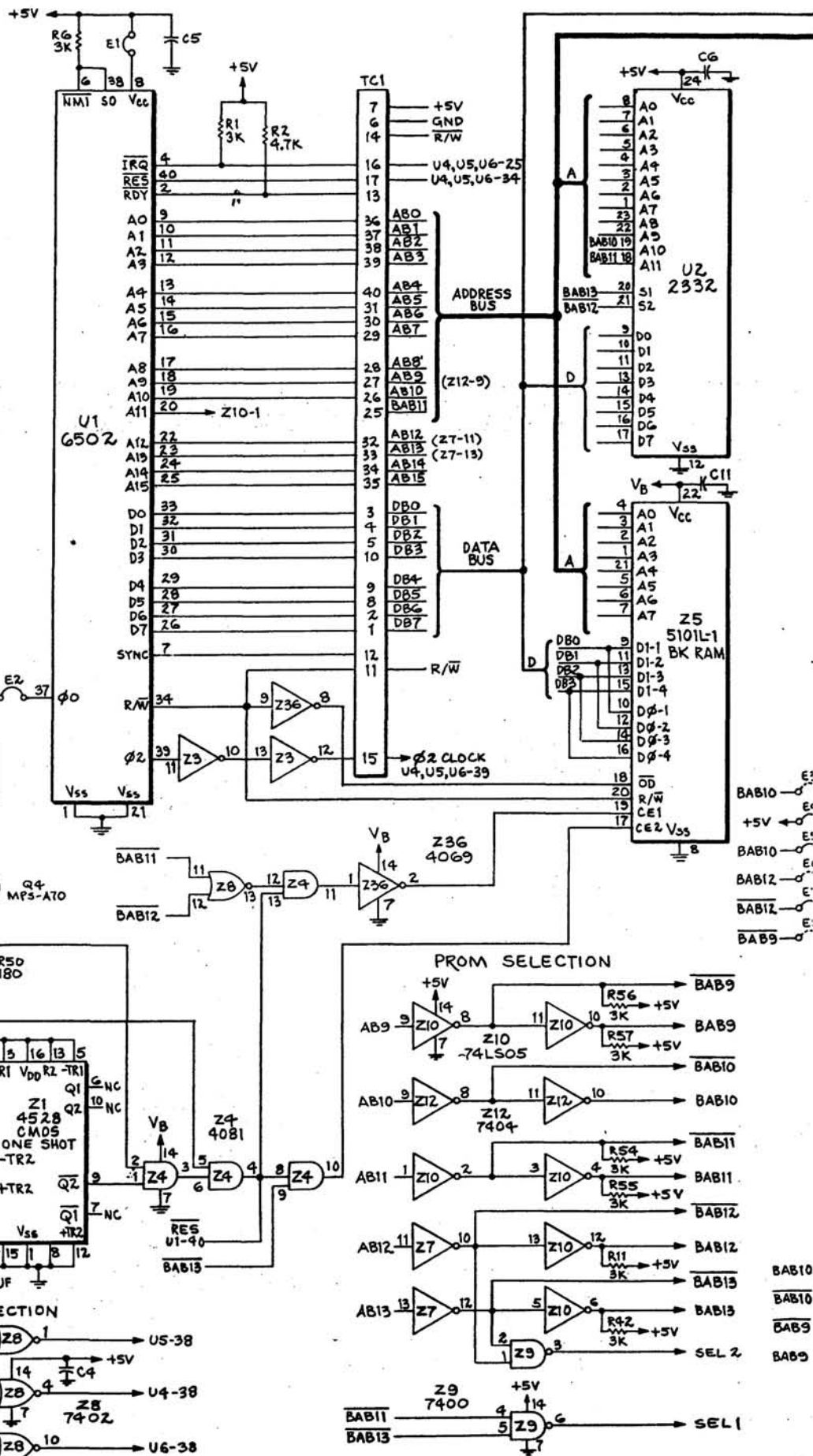
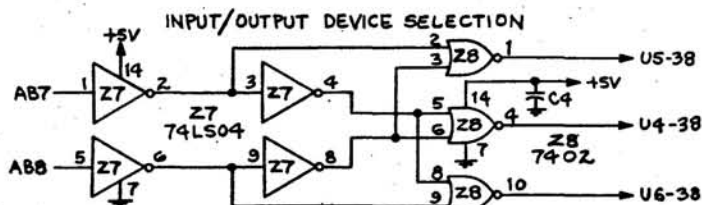
DELAY CIRCUIT



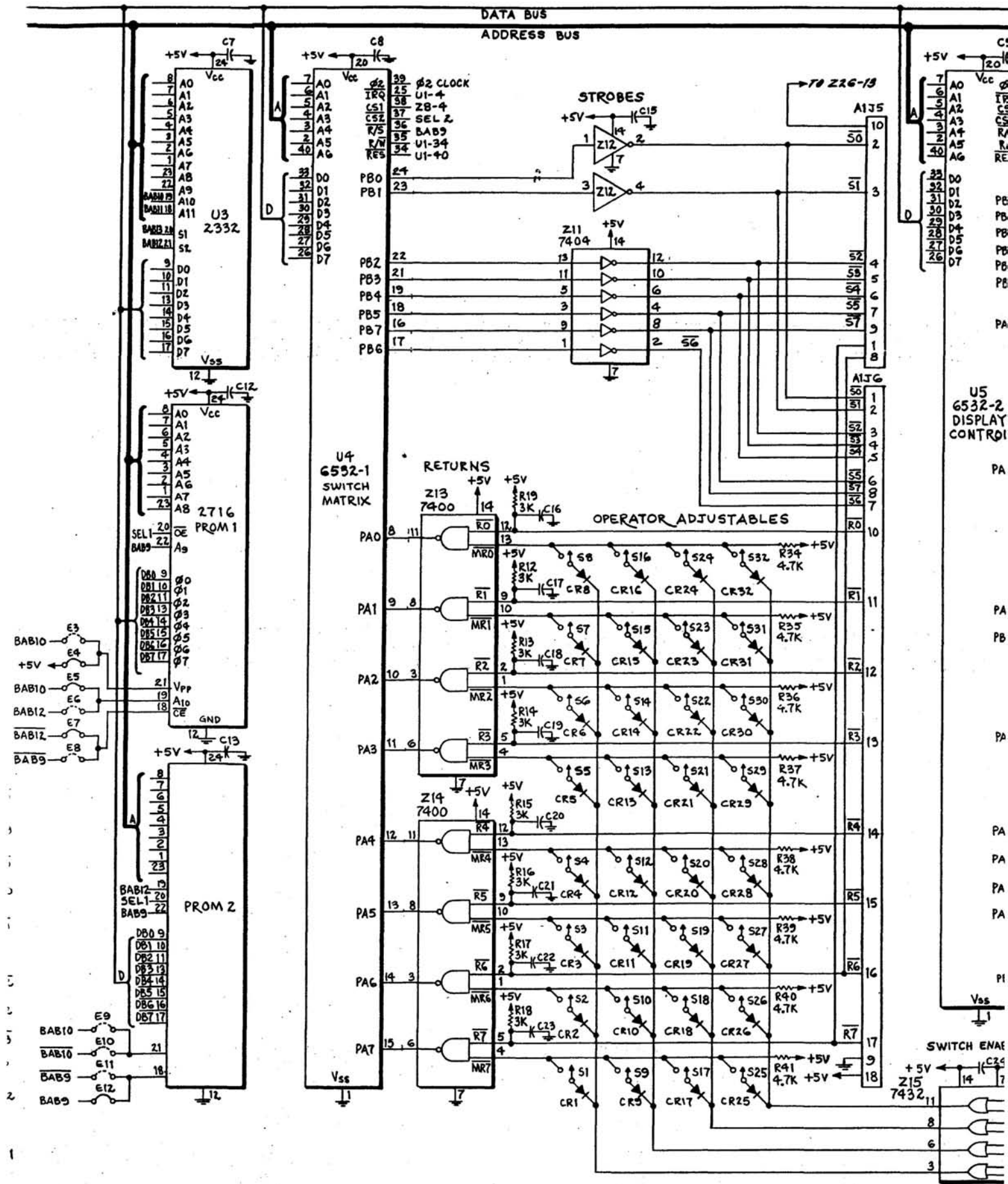
UP/DOWN MEMORY PROTECT LOGIC

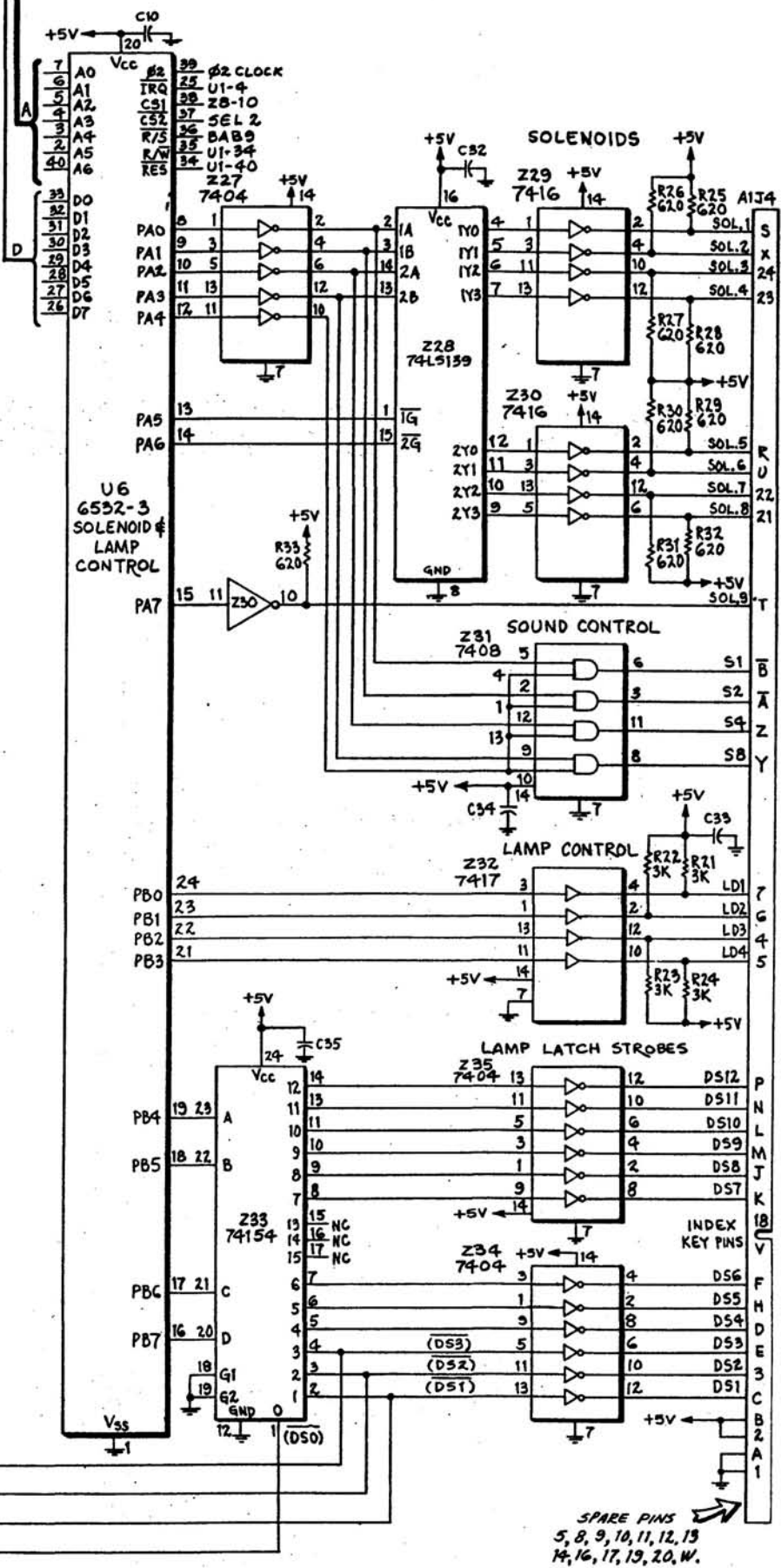
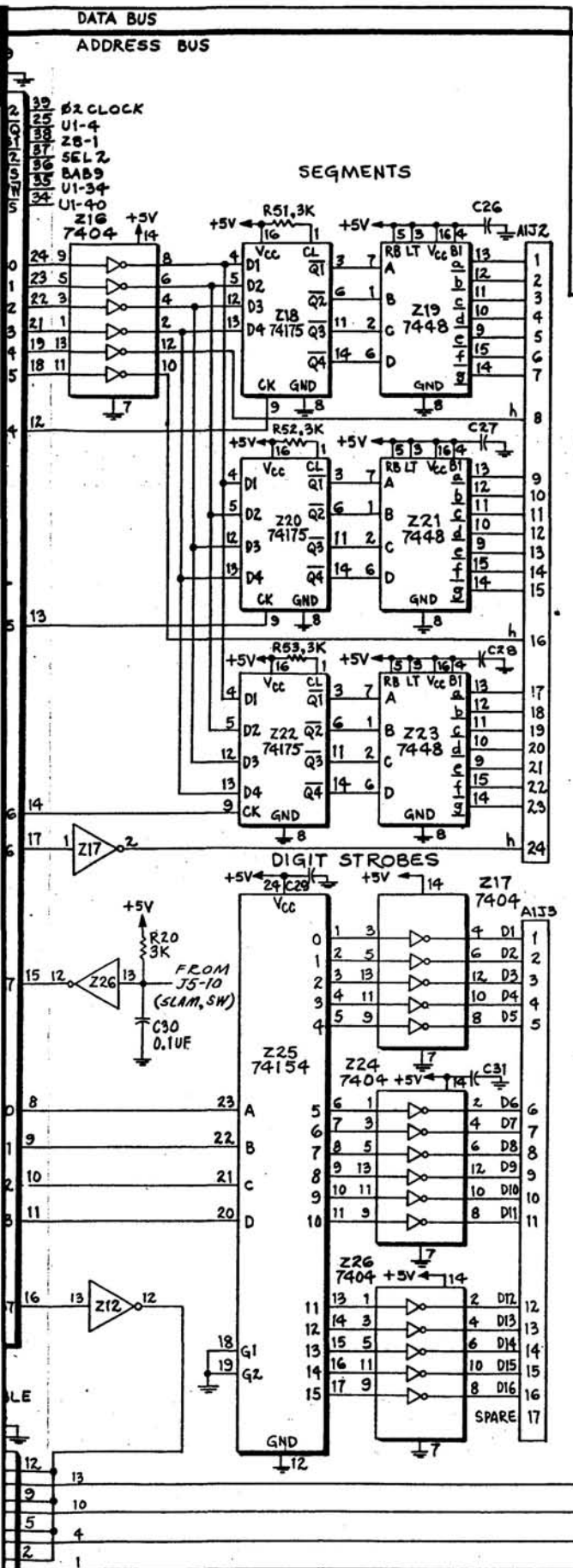


INPUT/OUTPUT DEVICE SELECTION



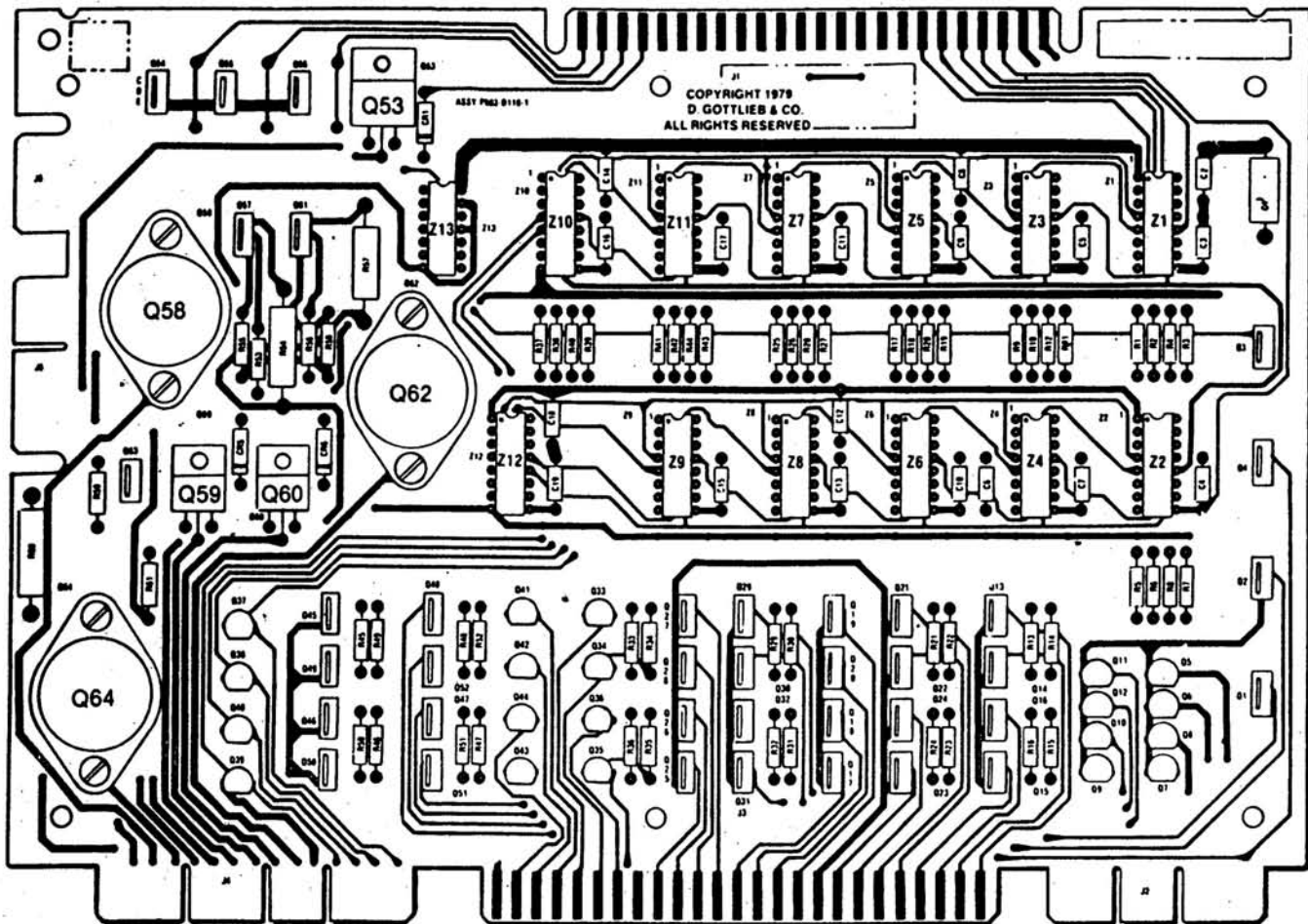
X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS





X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

DRIVER BOARD (A3) COMPONENT LOCATION



DRIVER BOARD (A3) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	DRIVER BOARD	MA-295
C1	Capacitor, 10 mfd., 10V Tantalum	XO-209
C2-C19	Capacitor, 01 mfd., 50V Ceramic	XO-229
CR1-CR6	Diode—Silicon 1N4148	XO-261
R1-R53, R61, R55, R56, R58, R59	Resistor 1.0K ohm, 5%, 1/4W	XO-5
R54, R57, R60	Resistor, 9.1 ohm, 5%, 1W	XO-158
Q1-Q4, Q13- Q32, Q45-Q52, Q54-Q57, Q63	Transistor, NPN, Darlington MPS-U45	XO-306
Q5-Q12, Q33-Q44	Transistor, NPN, Darlington MPS-A13	XO-304
Q53, Q59, Q60	Transistor, NPN, Darlington 2N6043	XO-303
Q58, Q62, Q64	Transistor, NPN, 2N3055	XO-301
Z1-Z12	IC-Quad "D" Latch Flip Flop SN74175N	XO-410
Z13	IC-Hex Inverter SN7404N	XO-402
	Insulator-Thermalloy 43-03-4	XO-512

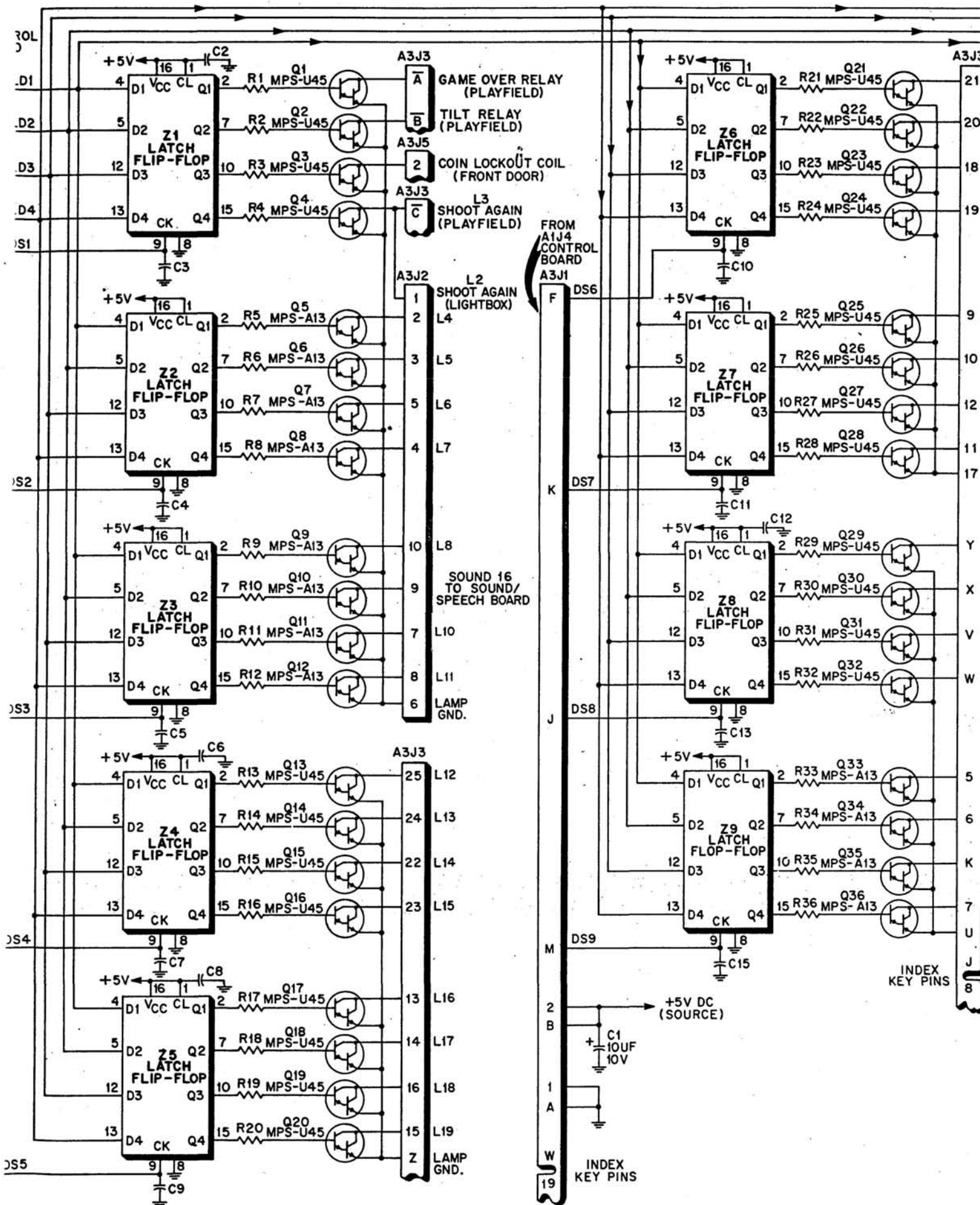
NOTE:

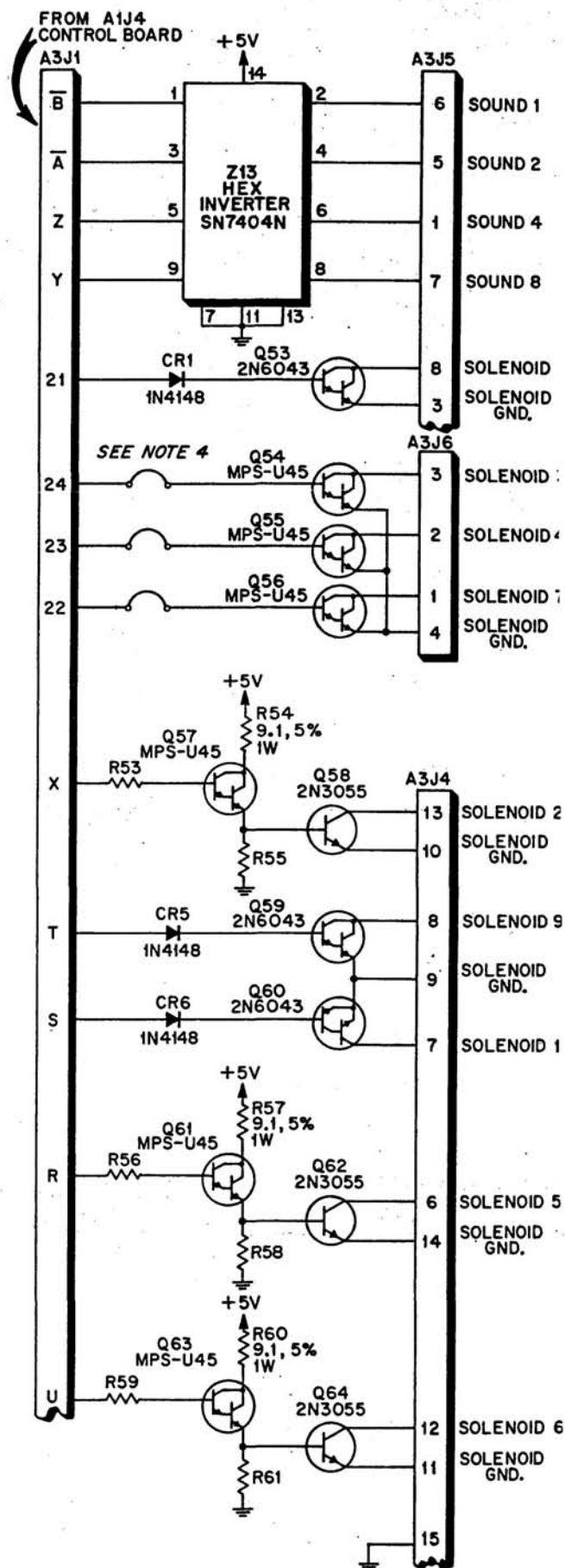
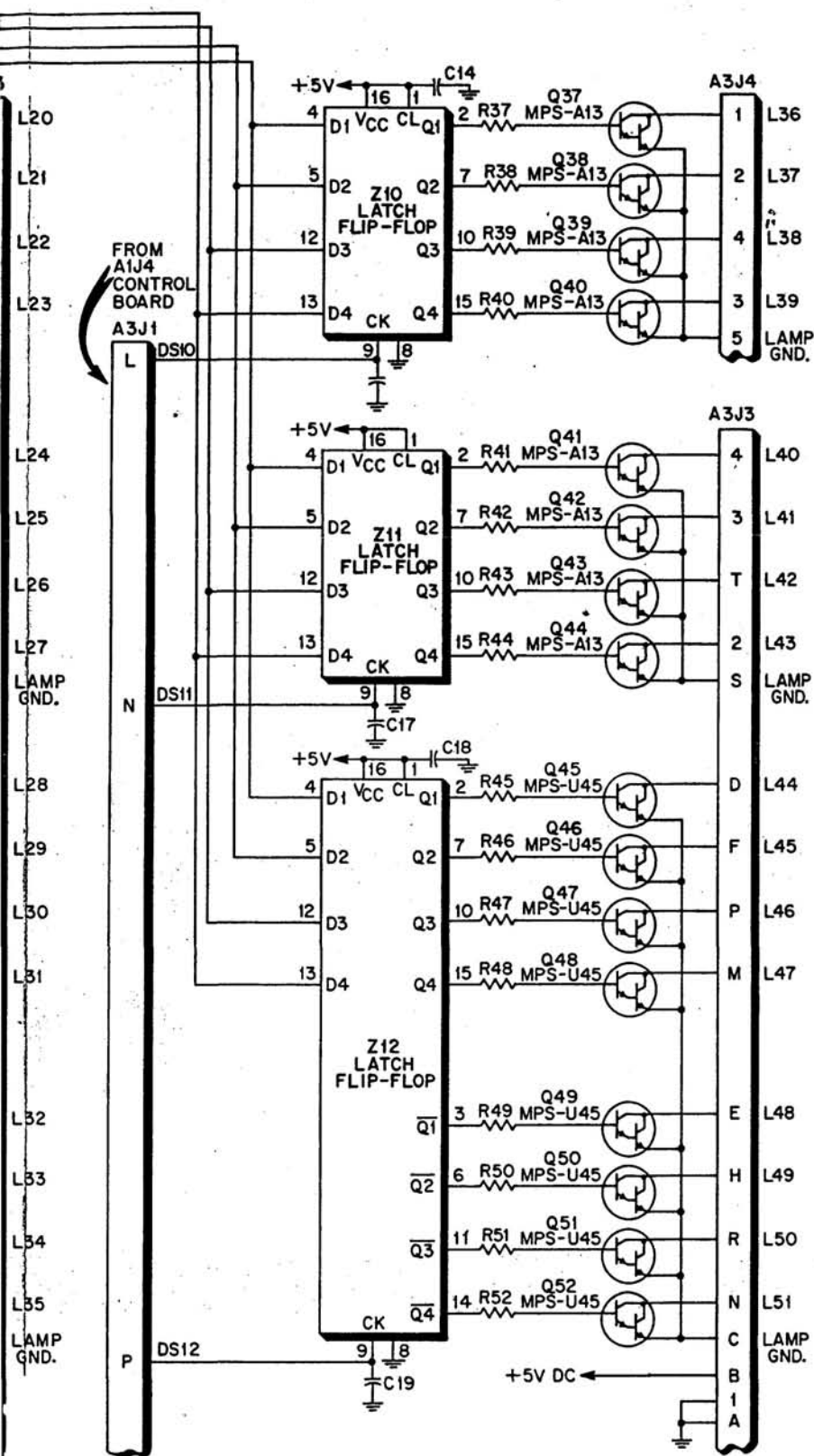
1. JUMPER WIRES REPLACED DIODES CR2, CR3 AND CR4 FOR SYSTEM 80A GAMES.
2. TRANSISTOR TYPES MPS-U45 AND NDS-U45 ARE INTERCHANGEABLE.

FROM
A1J4
CONTROL
BOARD
A3J1

7 LD1
6 LD2
4 LD3
5 LD4
C DS1
3 DS2
E DS3
D DS4
H DS5

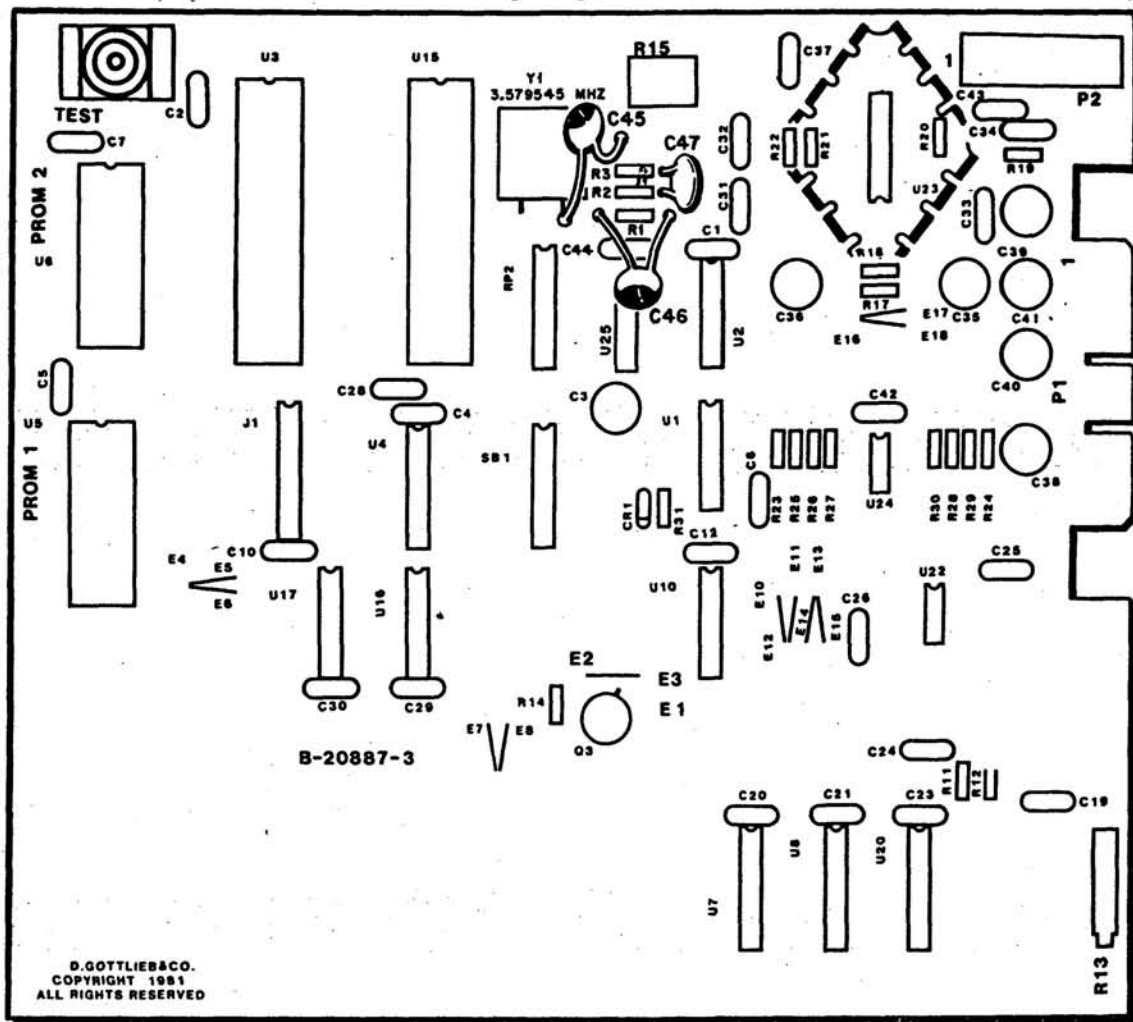
X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS





D. GOTTLIEB & CO.			
TITLE DRIVER BOARD (A3)			
USED ON			
DRAWN BAH	APPROVED DATE 12-12-80	E-20915	

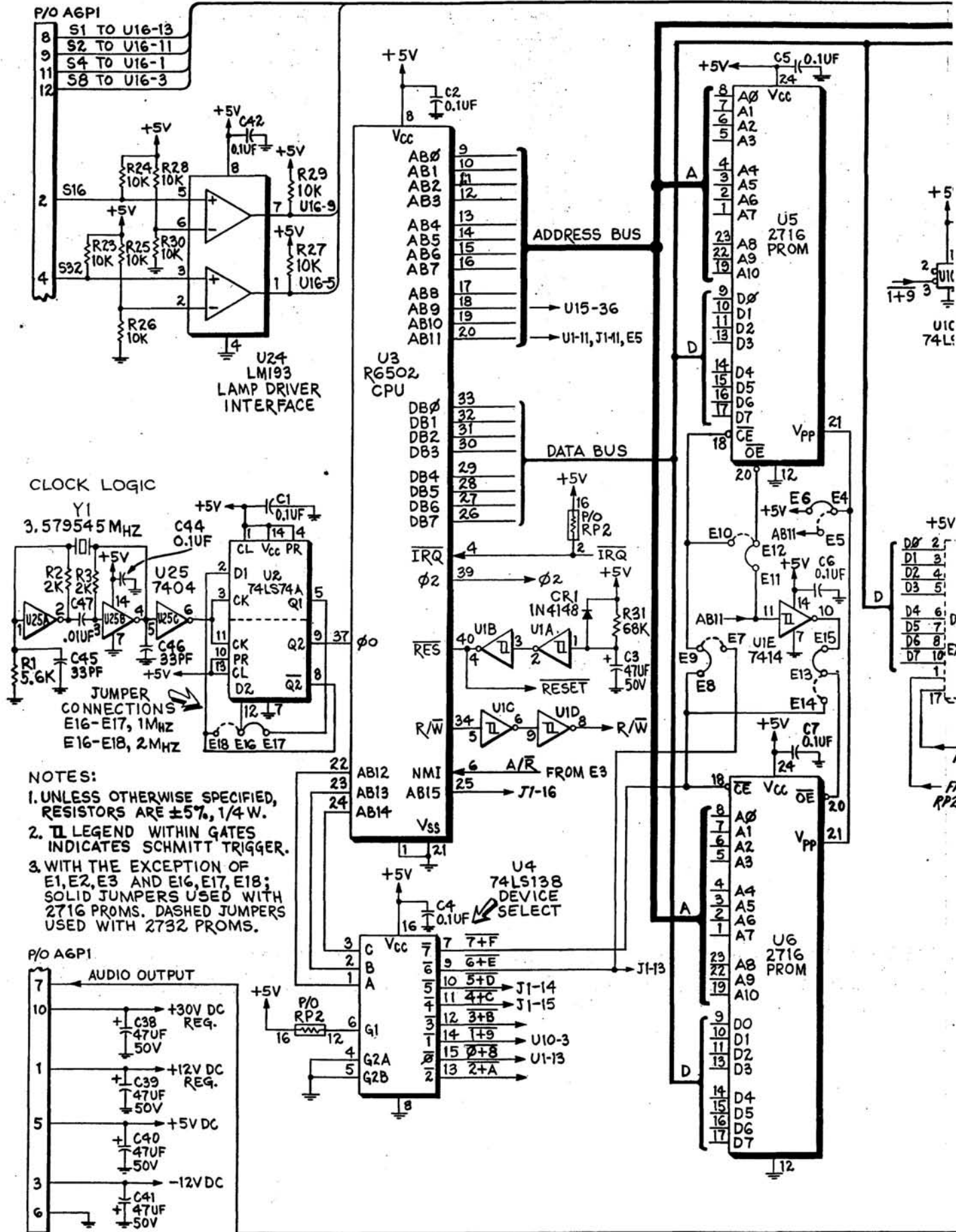
X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS **SOUND BOARD ASSY. (A6), COMPONENT LOCATION**

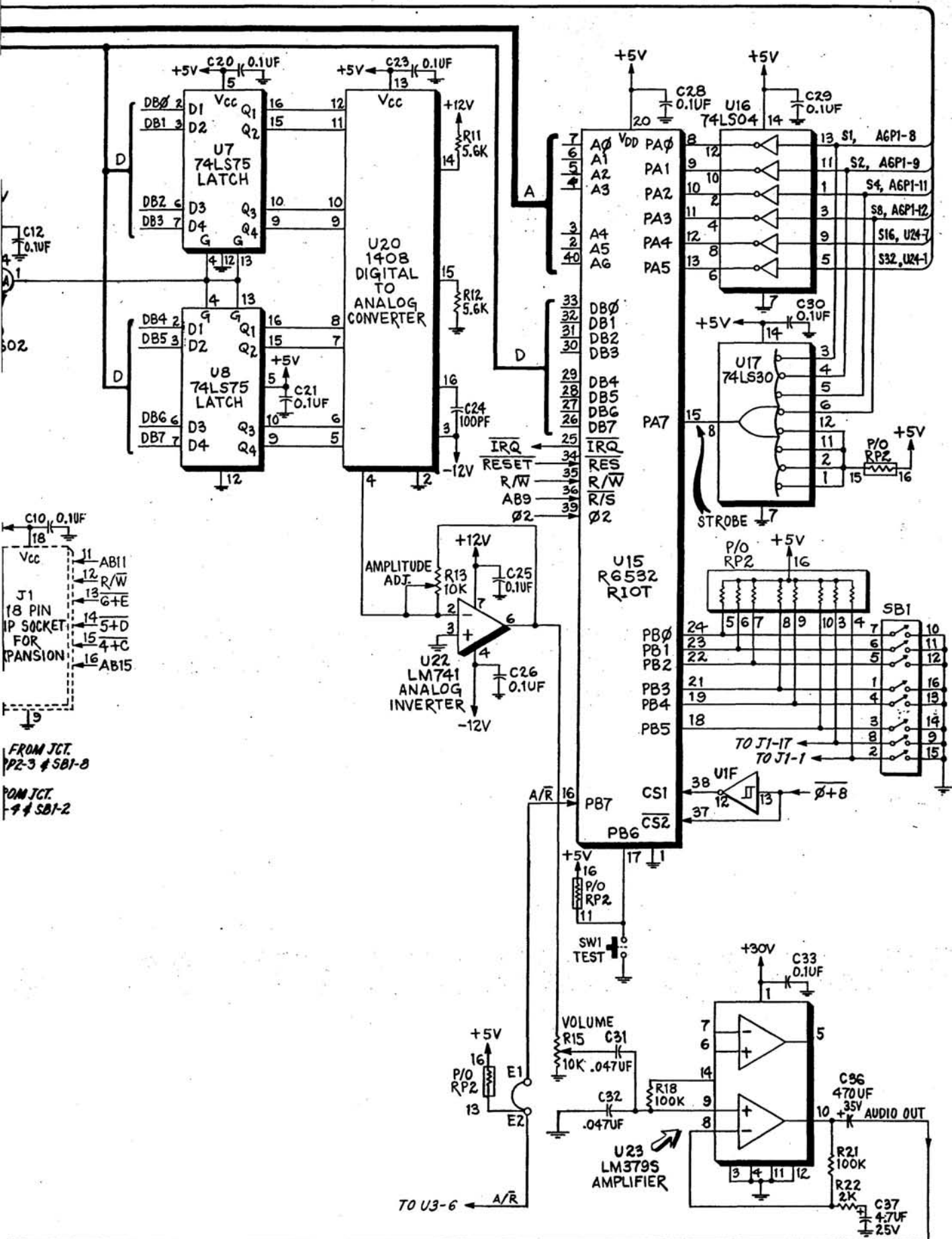


SOUND BOARD ASSY. (A6), PARTS LIST

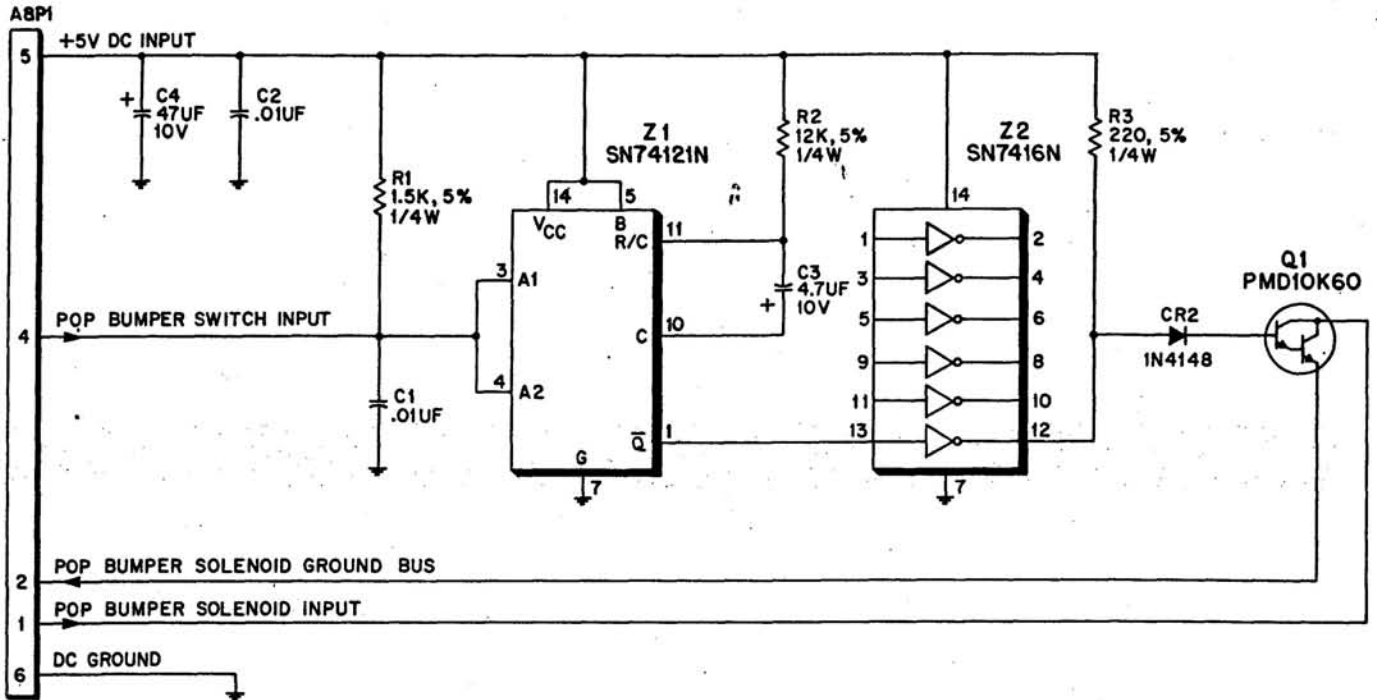
REFERENCE	DESCRIPTION	PART NUMBER
C1, C2	Sound Board Assembly	MA-309
C4-C7, C10	Capacitor, 0.1UF, 25V	XO-248
C12, C20, C21		
C23, C25, C26		
C28, C29, C30		
C33, C42, C44		
C31, C32	Capacitor, .047UF, 25V	XO-222
C37	Capacitor, 4.7UF, 35V	XO-291
C3, C38-C41	Capacitor, 47UF, 50V	XO-210
C24	Capacitor, 100PF	XO-223
C36	Capacitor, 470UF, 35V	XO-284
C45, C46	Capacitor, 33PF	XO-277
C47	Capacitor, .01UF, 100V	XO-202
CR1	Diode, 1N4148	XO-261
R1, R11, R12	Resistor, 5.6K ohm, 5%, 1/4W	XO-19
R2, R3	Resistor, 2K ohm, 5%, 1/4W	XO-14
R13	Potentiometer, 10K ohm	XO-108
R23-R30	Resistor, 10K ohm, 5%, 1/4W	XO-18
R15	Potentiometer, 10K ohm	XO-109
R18, R21	Resistor, 100K ohm, 5%, 1/4W	XO-45
R22	Resistor, 2K ohm, 5%, 1/4W	XO-14
R31	Resistor, 68K ohm, 5%, 1/4W	XO-189
RP2	Resistor, DIP	XO-168
SB1	Switch, DIP	XO-505
SW1	Switch, Momentary Pushbutton	XO-515
U1	IC, 7414	XO-397
U2	IC, SN74LS74N	XO-434
U3	CPU, R6502-13	XO-360
U4	IC, SN74LS138N	XO-437
U5, U6	EPROM, 2716	PR-53
U7	IC, SN74LS75	XO-394
U10	IC, SN74LS02N	XO-428
U15	RR10T, R6532-18	XO-361
U16	IC, SN74LS04N	XO-418
U17	IC, SN74LS30N	XO-432
U20	Converter, PMI, 1408A-6P	XO-416
U22	IC, LM741CP	XO-393
U23	IC, LM379S	XO-395
U24	IC, Dual Comparitor, LM193	XO-396
U25	Inverter, 7404	XO-402
Y1	Crystal, 3.579545MHZ	XO-456
	Socket, 22 Pin DIP	XO-467
	Socket, 24 Pin (2)	XO-529
	Socket, 40 Pin (2)	XO-530

X. WIRING AND SCHEMATIC



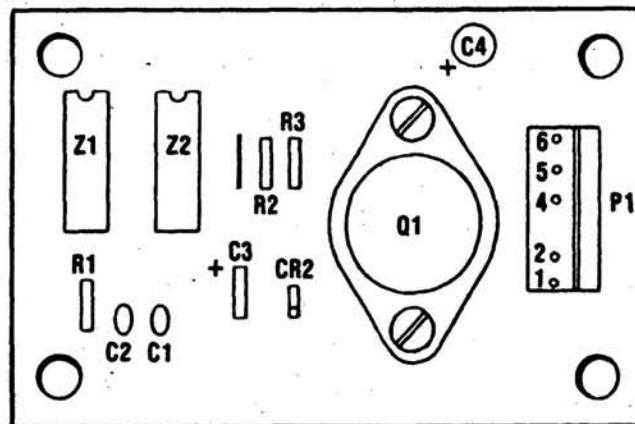


X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



D. GOTTLIEB & CO.			
TITLE POP BUMPER DRIVER BOARD (A8)			
USED ON			
DRAWN	APPROVED	DATE	D-20923

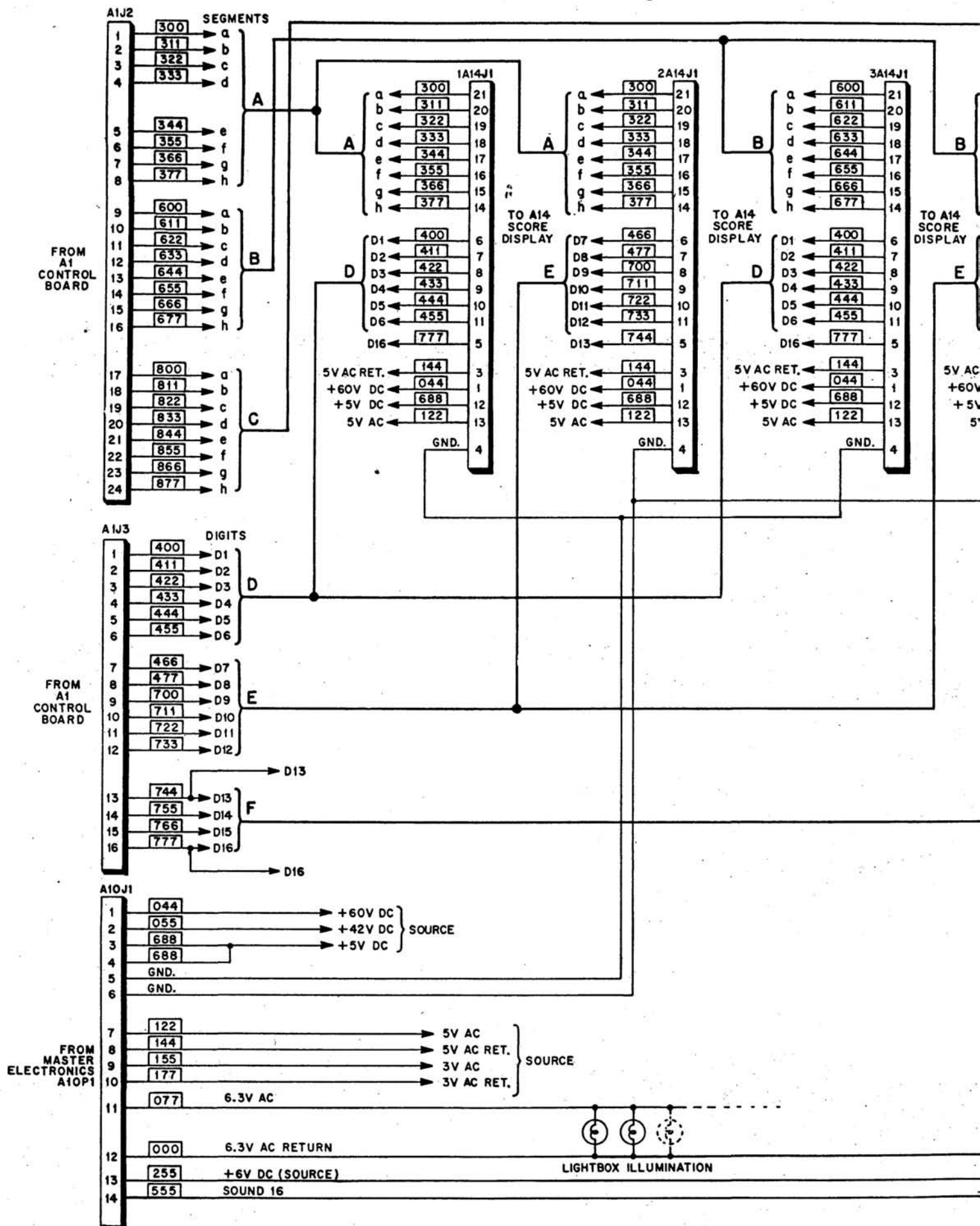
POP BUMPER DRIVER BOARD (A8) COMPONENT LOCATION

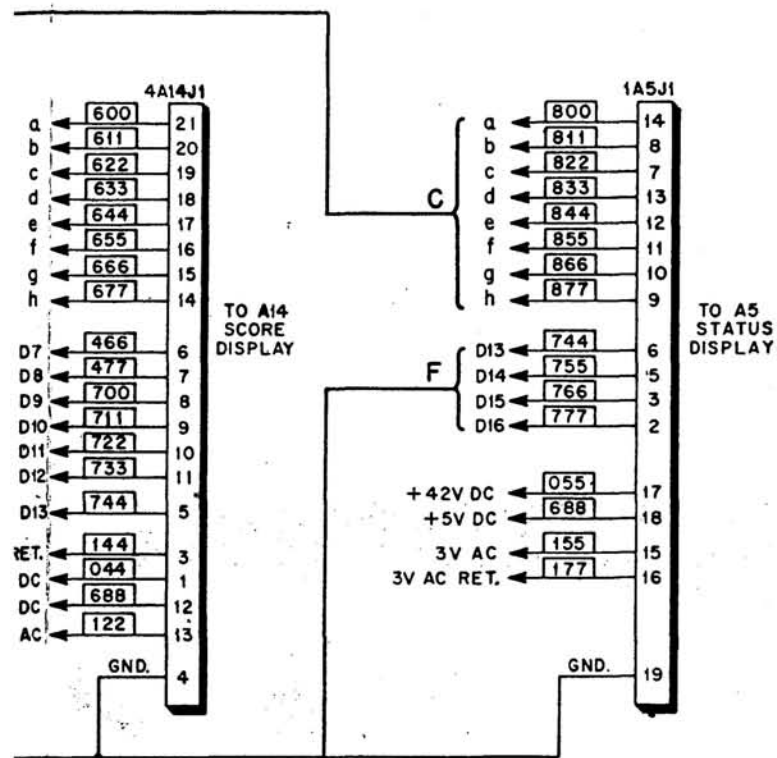


POP BUMPER DRIVER BOARD (A8) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	POP BUMPER DRIVER BOARD	A-19741
C1, C2	Capacitor, .01 mfd., 100V	XO-202
C3	Capacitor, 4.7 mfd., 10%, 10V, Tantalum, Axial	XO-226
C4	Capacitor, 47 mfd., 10V	XO-227
CR2	Diode 1N4148	XO-261
P1	Connector 09-65-1061	XO-502
R1	Resistor, 1.5K ohm, 5%, 1/4W	XO-20
R2	Resistor, 12K ohm, 5%, 1/4W	XO-9
R3	Resistor, 220 ohm, 5% 1/4W	XO-21
Q1	Transistor-Lambda PMD10K60	XO-311X
Z1	IC SN74121N	XO-417X
Z2	IC SN7416N	XO-405X

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

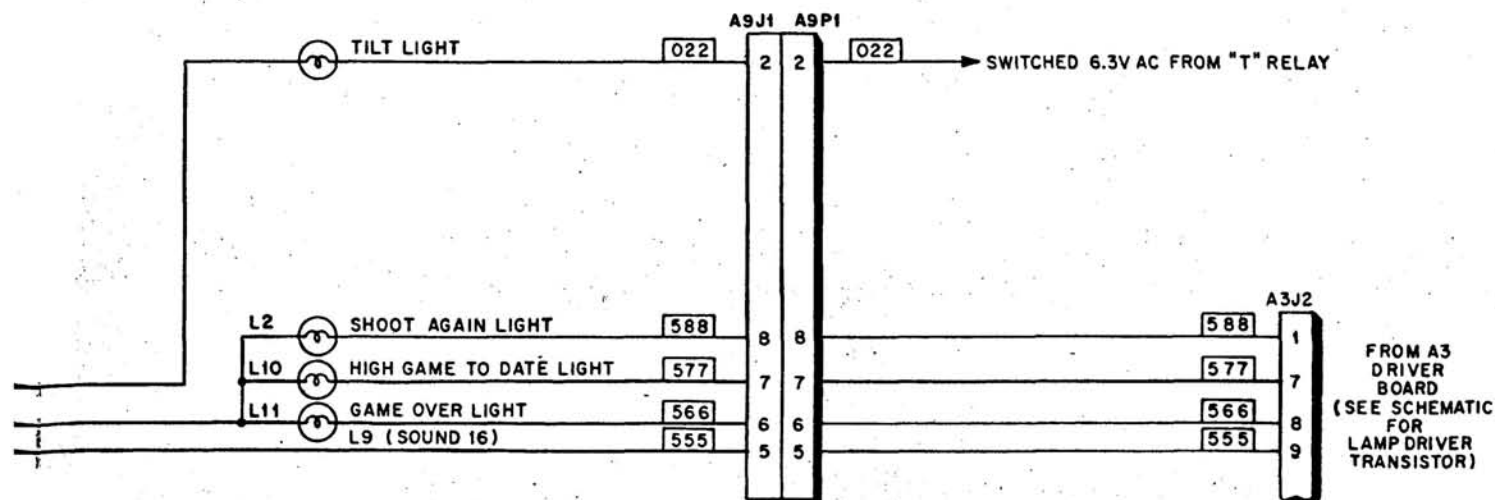
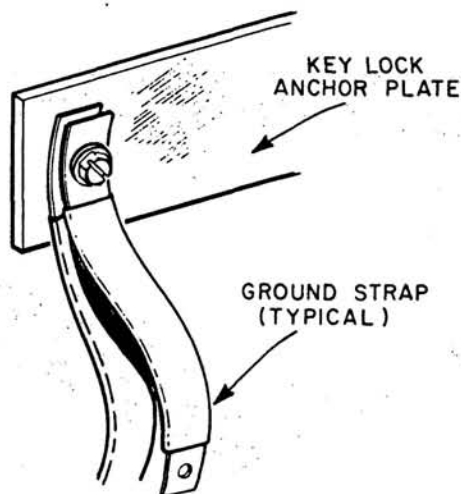


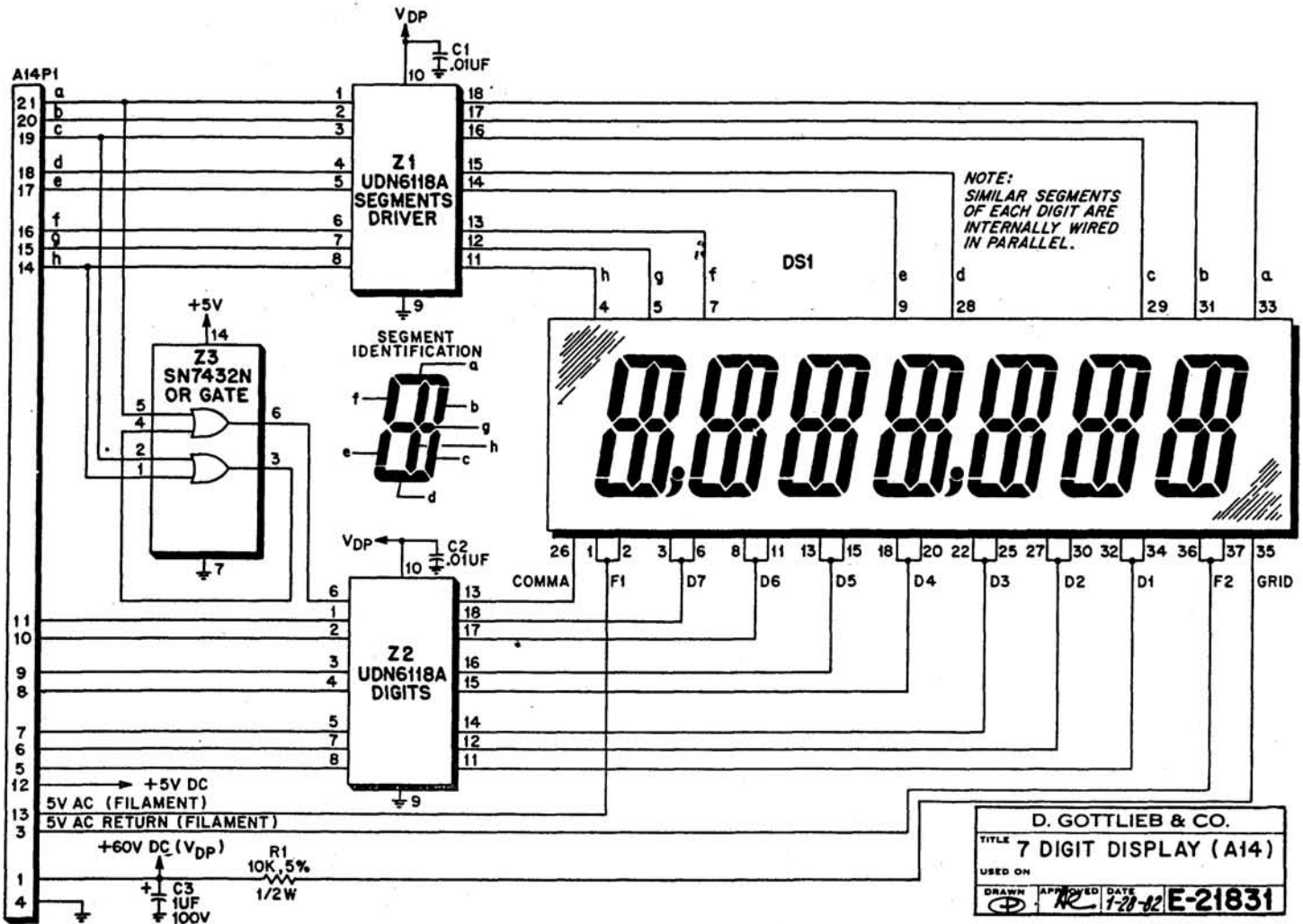


COLOR CODE			
0	BLACK	5	GREEN
1	BROWN	6	BLUE
2	RED	7	PURPLE
3	ORANGE	8	SLATE
4	YELLOW	9	WHITE

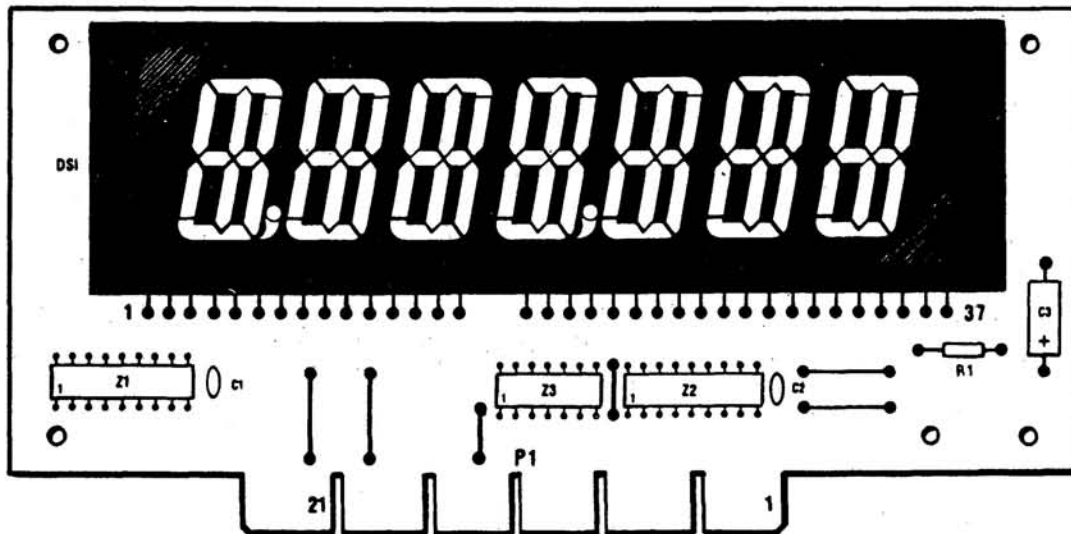
NOTE:

1. XXX INDICATES WIRE COLOR.
2. GROUND WIRE IS #522, 18GA.
3. NAME AND SCENE LAMPS ARE #44 OR #455 FLASHING.



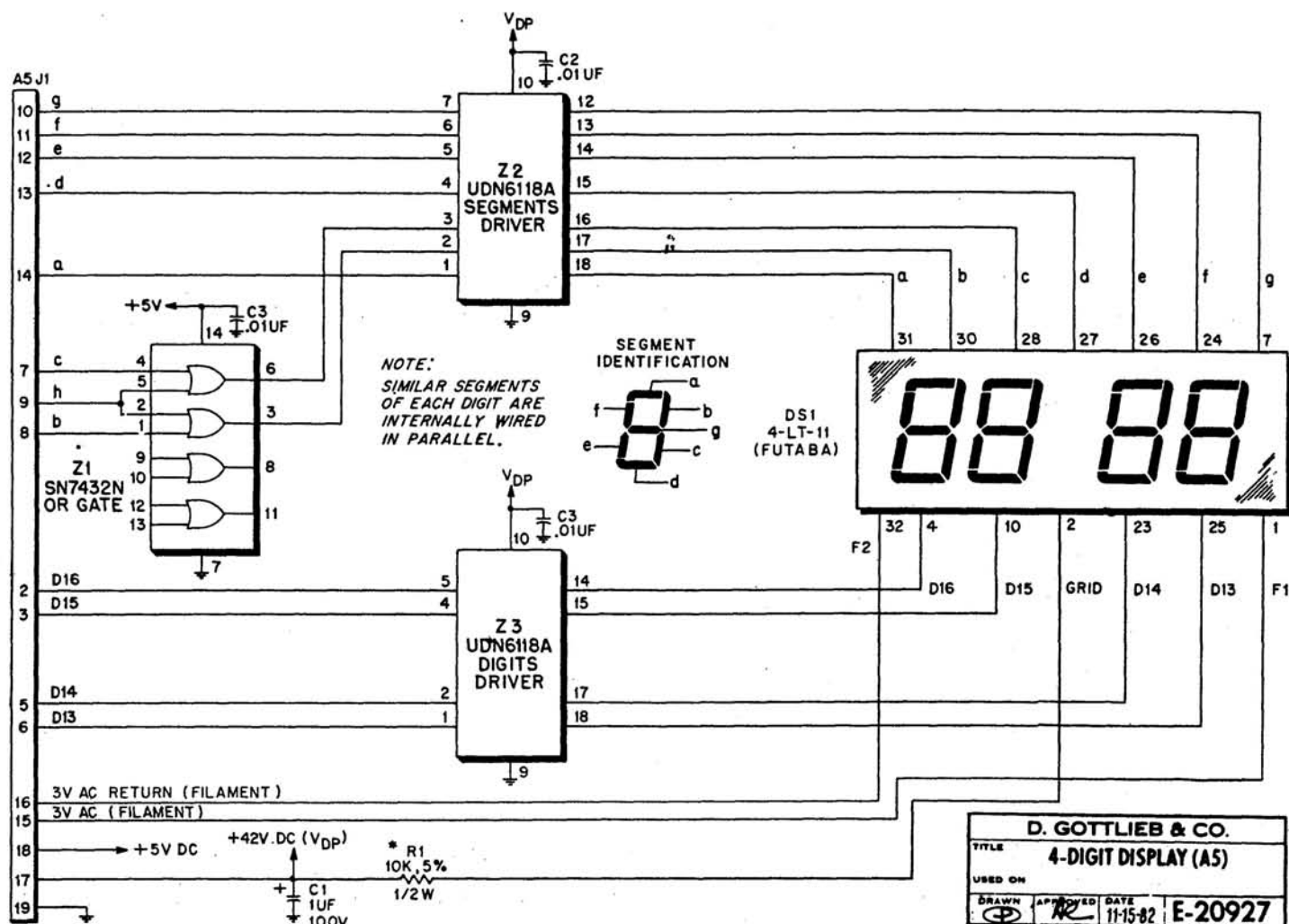


7-DIGIT DISPLAY (A14) COMPONENT LOCATION

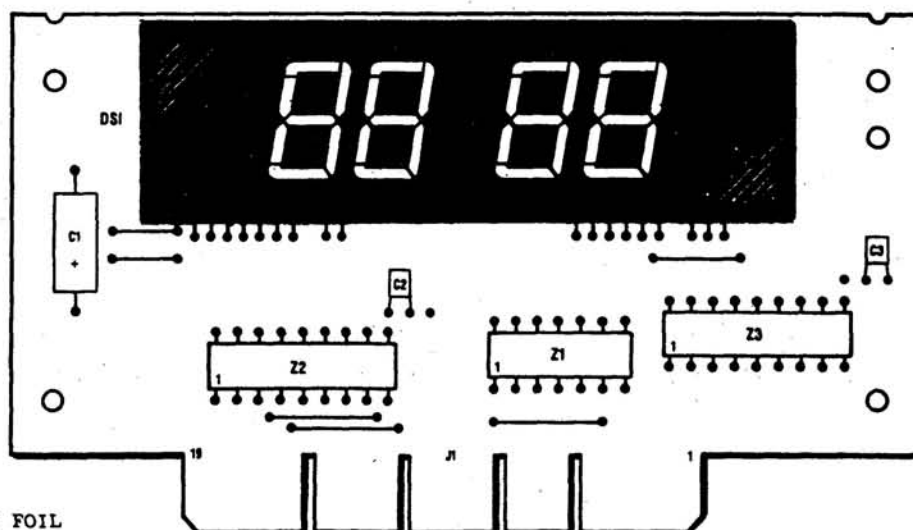


7-DIGIT DISPLAY (A14) PARTS LIST

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



4-DIGIT DISPLAY (A5) COMPONENT LOCATION

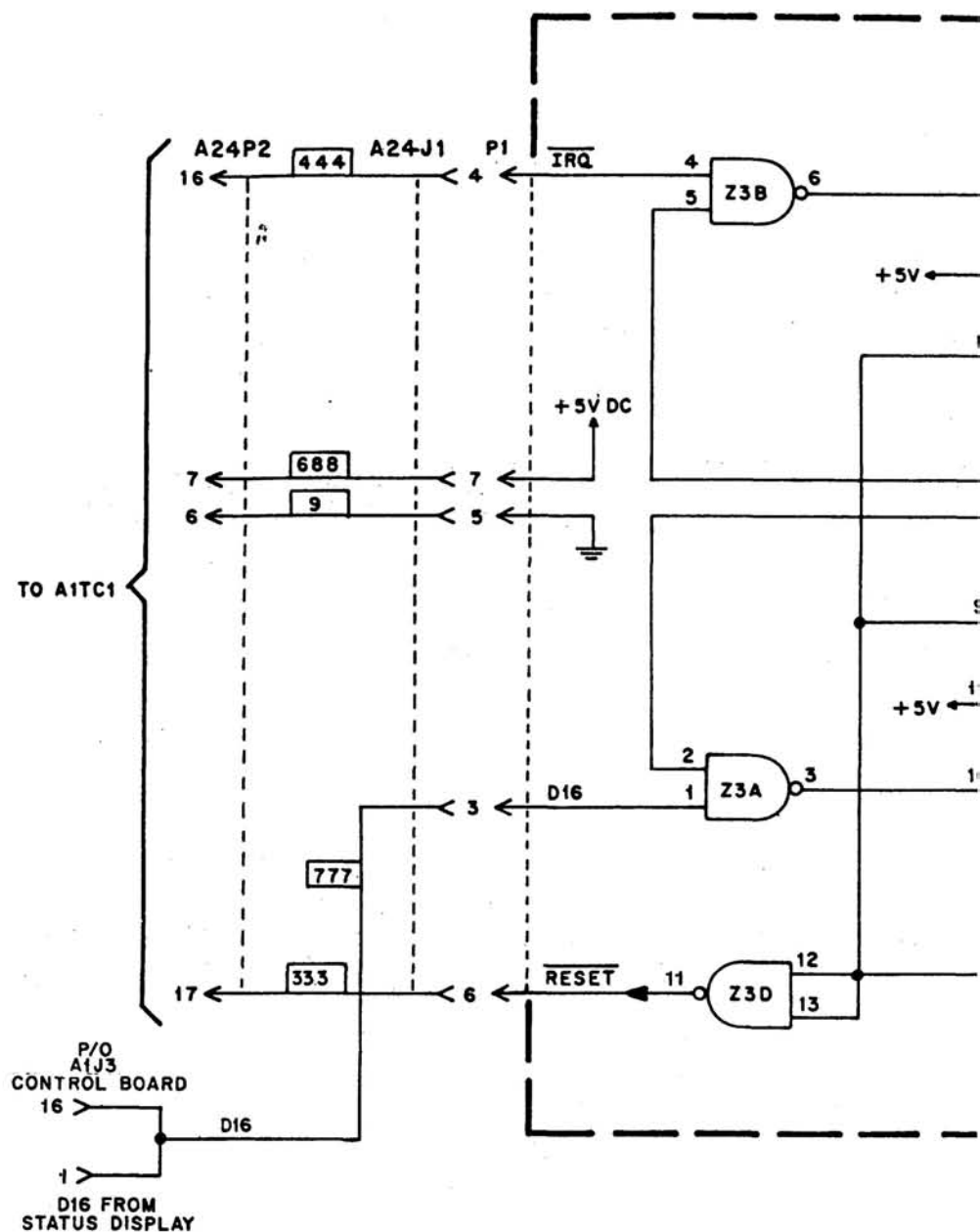


*NOTE:
R1 MOUNTED ON FOIL
SIDE OF BOARD.

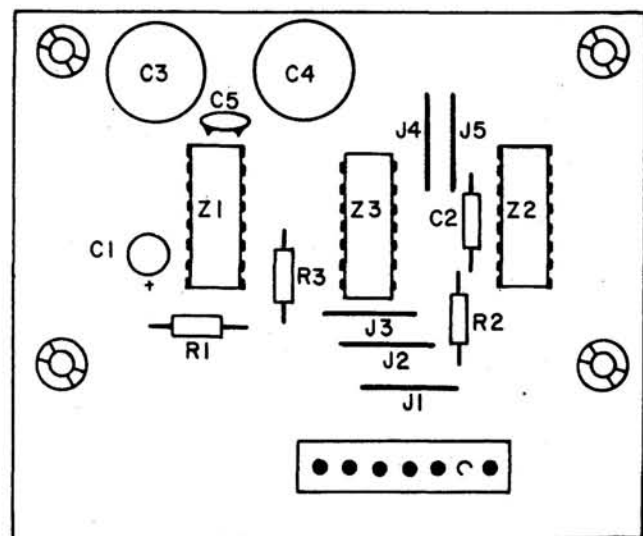
4-DIGIT DISPLAY (A5) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER
	4 DIGIT DISPLAY	MA-115
C1	Capacitor, 1 mfd., 100V Sprague TE1400	XO-206
C2, C3	Capacitor, .01 mfd., 100V Kemet C320C103MIR5CA	XO-202
DS1	4-Digit Display Tube-Futaba 4-LT-11	XO-455X
* R1	Resistor, 10K Ohm, 5%, 1/2W	XO-62
Z1	IC-Quad or Gate—T.I. SN7432N	XO-407
Z2, Z3	IC-Fluorescent Display Driver— Sprague UDN6118A	XO-415

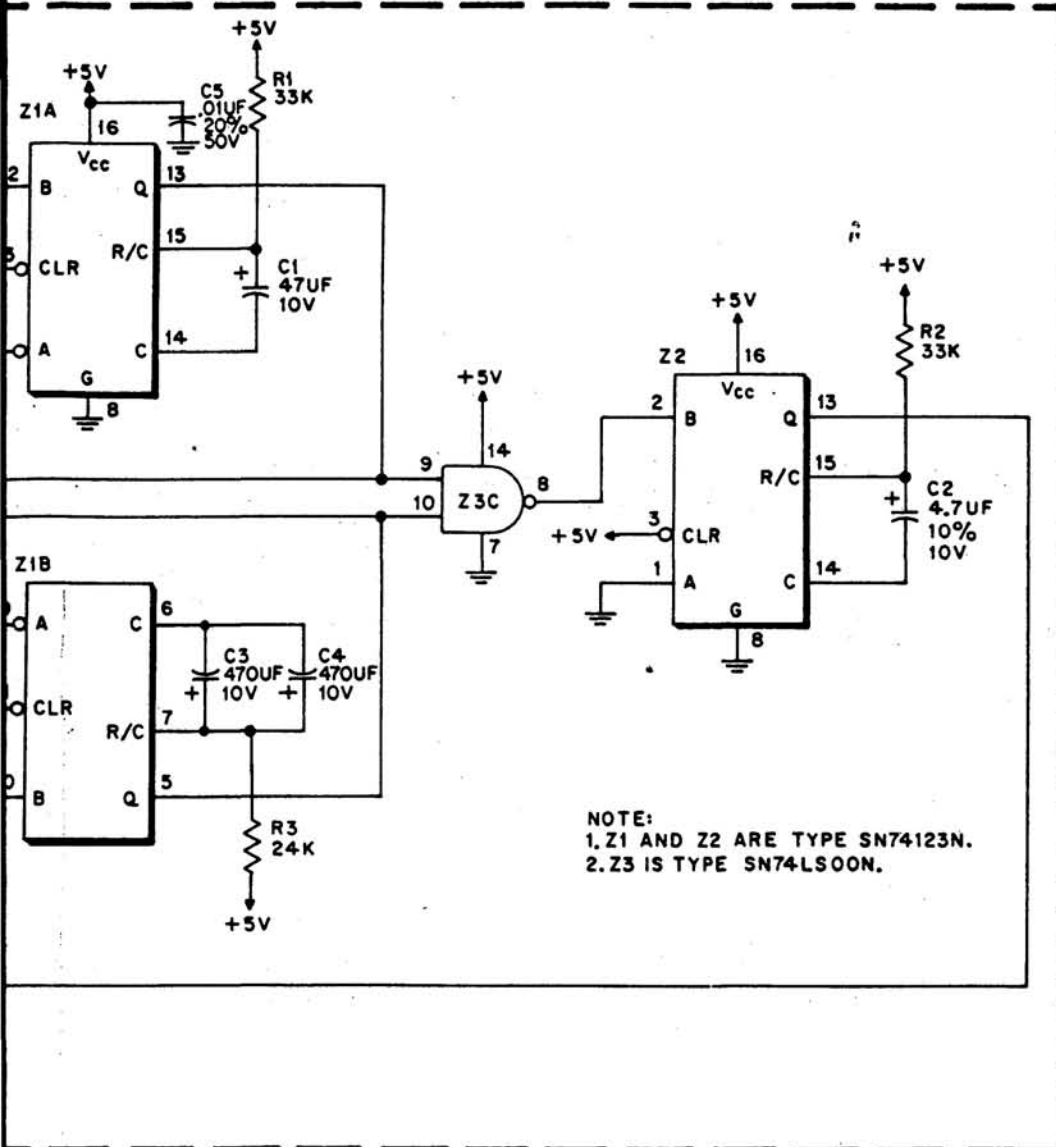
X. WIRING AND SCHEMA



RESET BOARD (A24) COMPONENT LOCATION



ATIC DIAGRAMS, PARTS LISTS



D. GOTTLIEB & CO.			
TITLE			
RESET CIRCUIT BOARD			
USED ON			
DRAWN	APPROVED	DATE	C-21063
	BAM	4-2-81	

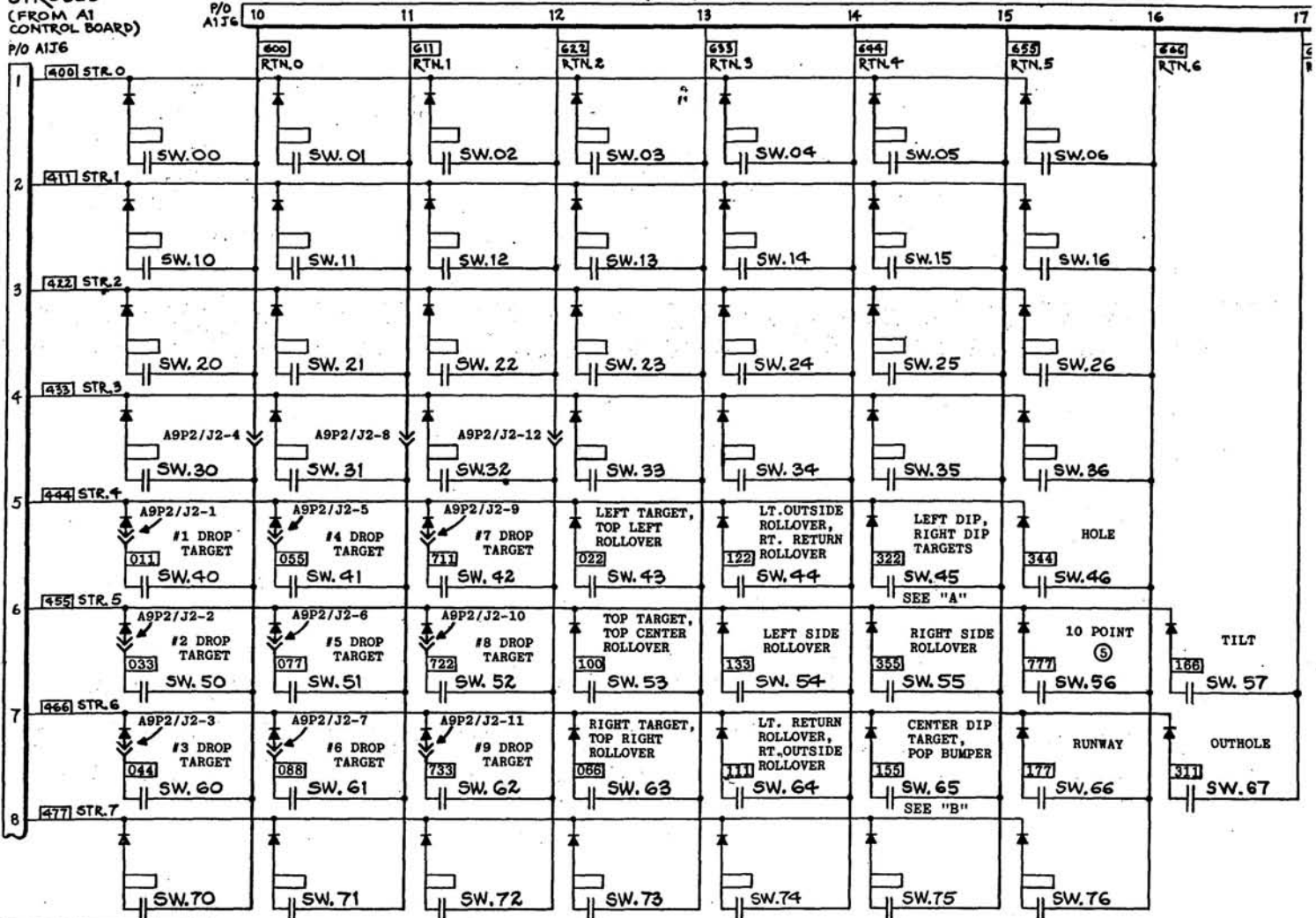
RESET BOARD (A24) PARTS LIST

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 μ fd., 10V.	XO-227
C2	Capacitor 4.7 μ fd., 10V.	XO-226
C3, C4	Capacitor 470 μ fd., 16V.	XO-214
C5	Capacitor .01 μ fd., 50V.	XO-229
Z1, Z2	IC 74123N	XO-398
Z3	IC 74LS00N	XO-427
	7 Pin Connector	XO-526

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

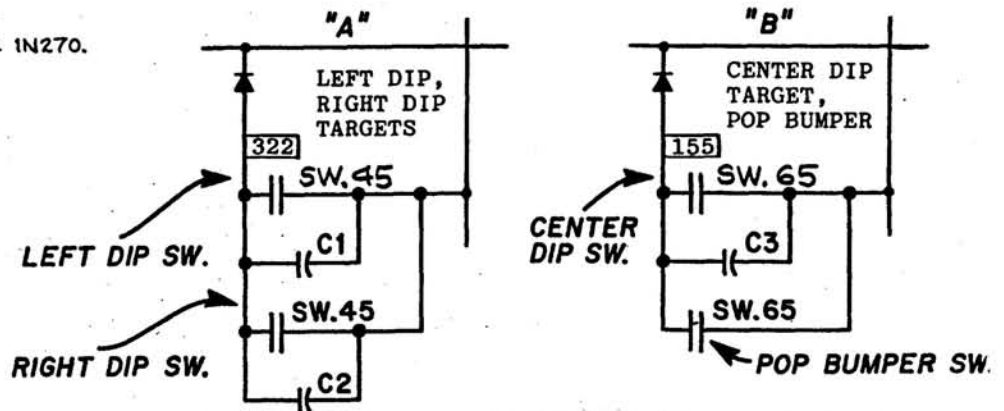
STROBES
(FROM A1
CONTROL BOARD)
P/O A1J6

RETURNS (TO A1 CONTROL BOARD)



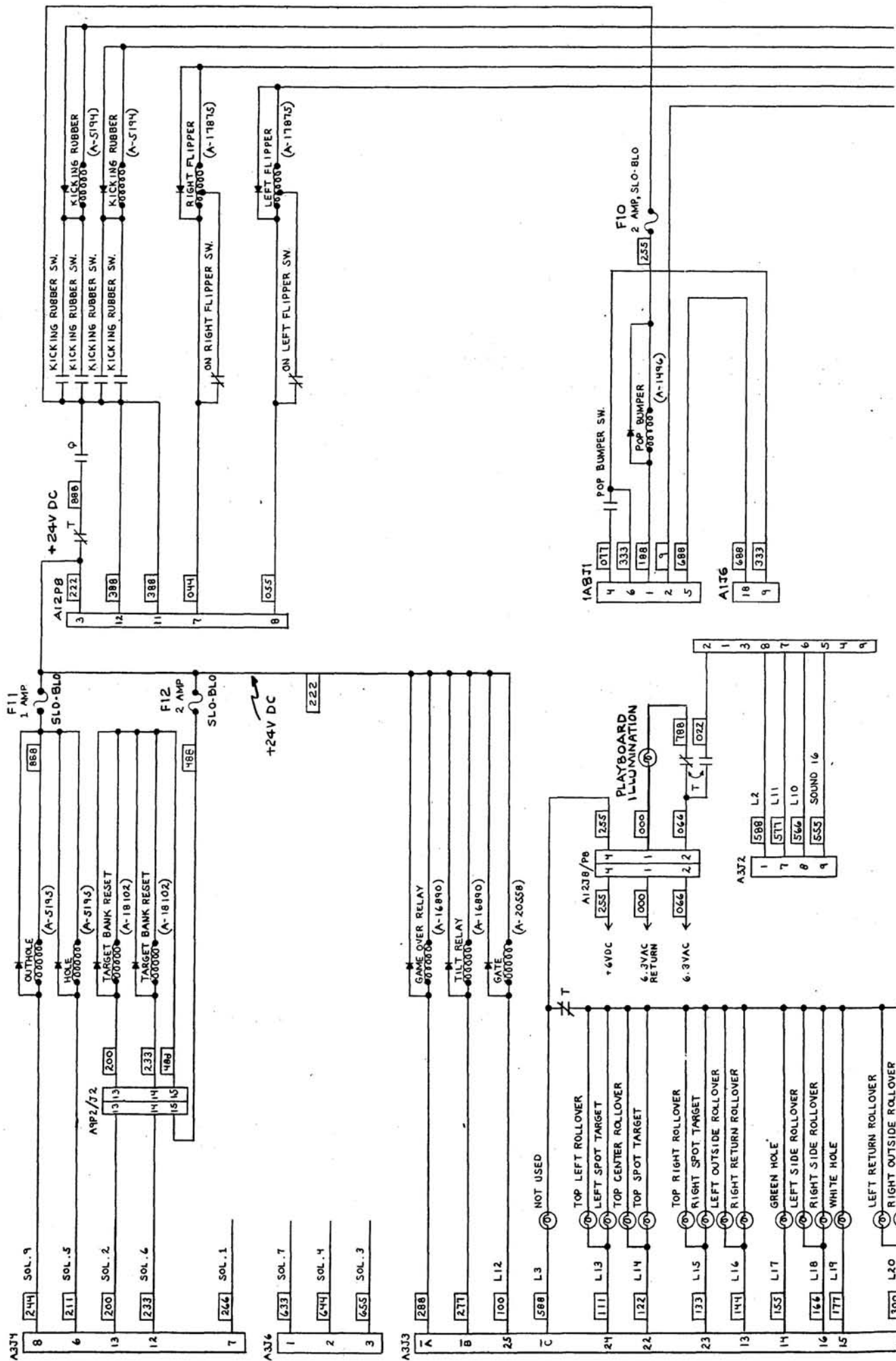
COLOR CODE			
0	BLACK	5	GREEN
1	BROWN	6	BLUE
2	RED	7	PURPLE
3	ORANGE	8	SLATE
4	YELLOW	9	WHITE

NOTE:
1. ALL DIODES ARE 1N270.

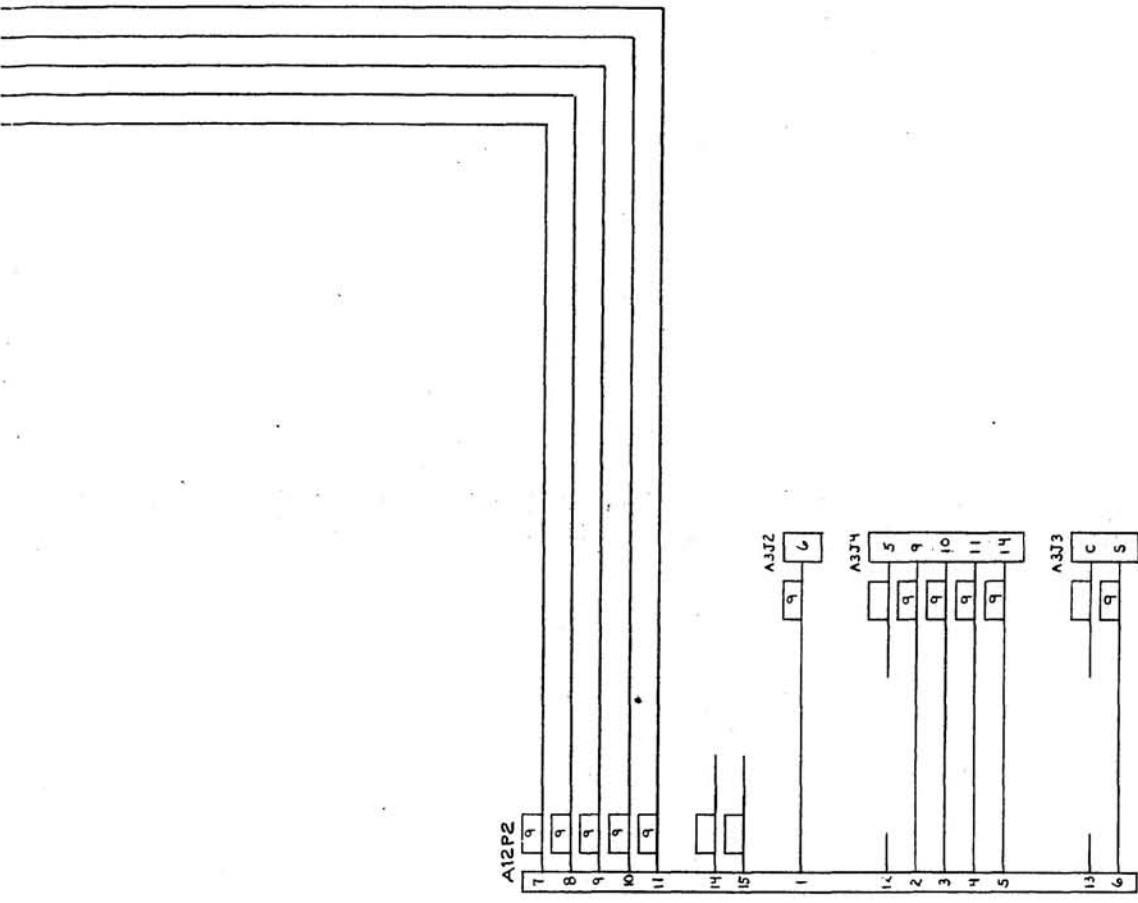


C1, C2 AND C3
0.47UF, 50V

D. GOTTLIEB & CO.	
TITLE	SWITCH MATRIX
USED ON	GAME #681
DRAWN	APPROVED: DATE
AC	9-FEB-83 E-2289



C DIAGRAMS, PARTS LIST



D. GOTTLIEB & CO.

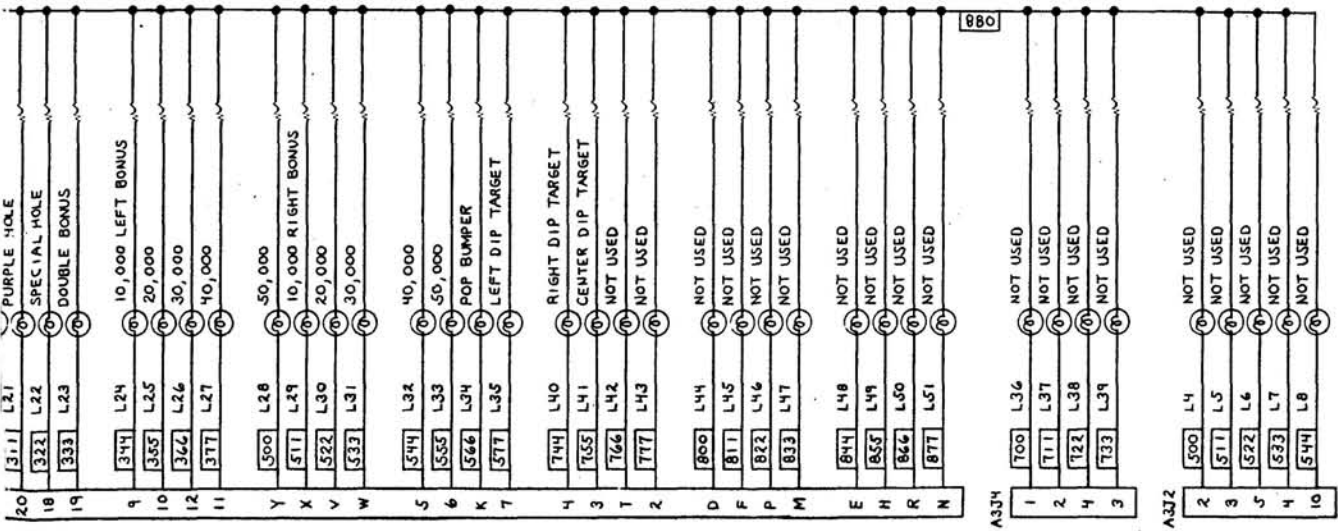
TITLE
PLAYFIELDS

SOLENOIDS AND ILLUMINATION

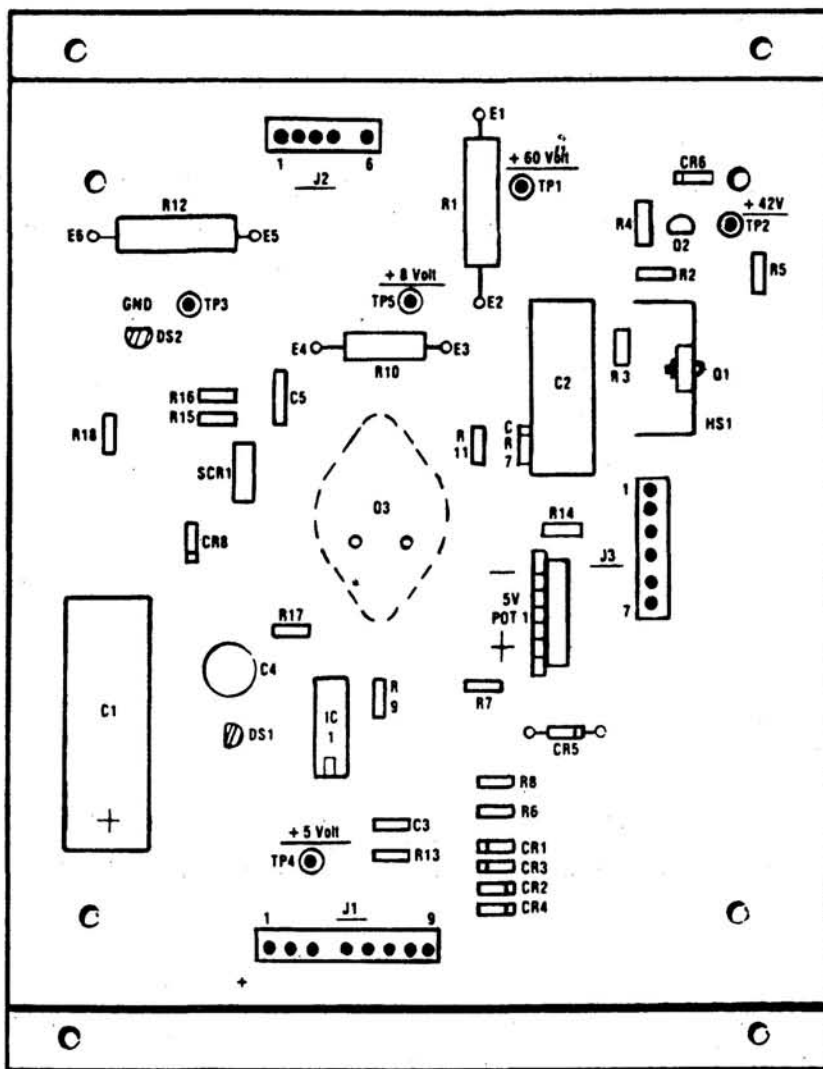
USED ON
GAME #681

DATE
9-FEB-83

E-22893

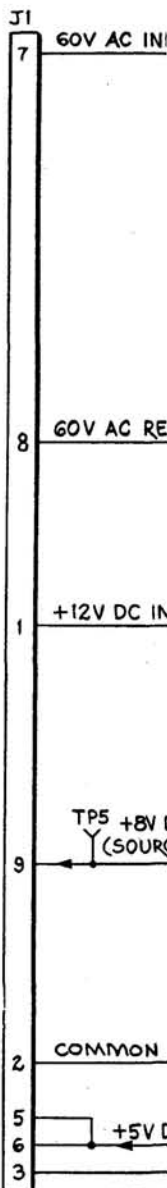


POWER SUPPLY (A2) COMPONENT LOCATION



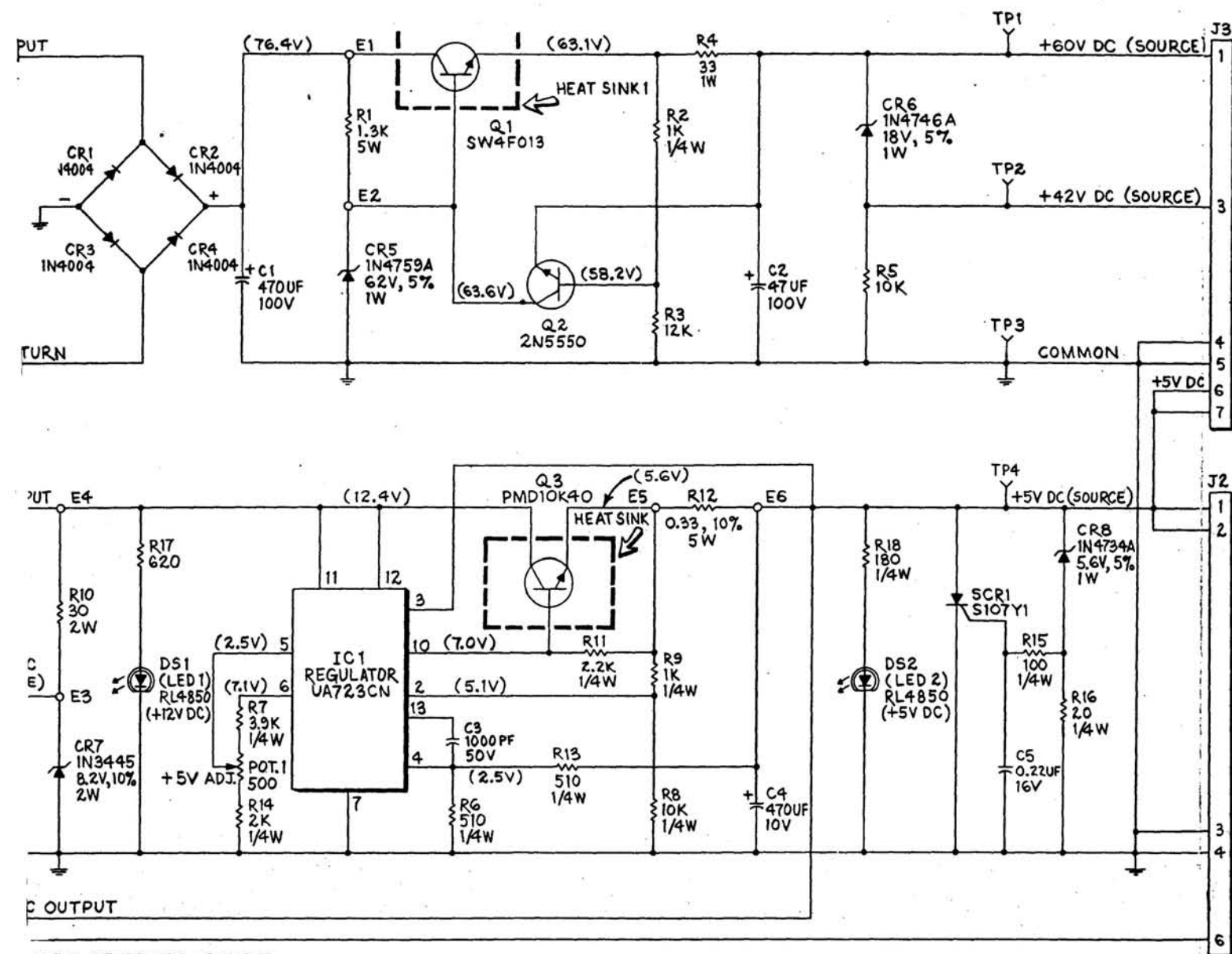
POWER SUPPLY (A2) PARTS LIST

REFERENCE	DESCRIPTION	PART NUMBER	REFERENCE	DESCRIPTION	PART NUMBER
	POWER SUPPLY BOARD	MA-114	R3	Resistor, 12K ohm, 5%, 1/2W	XO-63
C1	Capacitor, 470 mfd., 100V	XO-233	R4	Resistor, 33 ohm, 5%, 1W	XO-159
C2	Capacitor, 47 mfd., 100V	XO-231	R5	Resistor, 10K ohm, 5%, 1/2W	XO-62
C3	Capacitor, 1000 Picofarad, 50V	XO-232	R6, R13	Resistor, 510 ohm, 5%, 1/4W	XO-25
C4	Capacitor, 470 mfd., 10V	XO-279	R7	Resistor, 3.9K ohm, 5%, 1/4W	XO-39
C5	Capacitor, .2 mfd., +80%, -20%, 16V	XO-205	R8	Resistor, 10K ohm, 5%, 1/4W	XO-18
CR1-CR4	Diode 1N4004	XO-254	R10	Resistor, 30 ohm, 5%, 2W	XO-155
CR5	Diode Zener, 62V, 5%, 1W 1N4759A	XO-267	R11	Resistor, 2.2K ohm, 5%, 1/4W	XO-27
CR6	Diode Zener, 18V, 5%, 1W 1N4746A	XO-258	R12	Resistor, .33 ohm, 10%, 5W (wirewound)	XO-154
CR7	Diode Zener, 8.2V, 10%, 2W 1N3445	XO-266	R14	Resistor, 2K ohm, 5%, 1/4W	XO-14
CR8	Diode Zener, 5.6V, 5%, 1W 1N4734A	XO-255	R15	Resistor, 100 ohm, 5%, 1/4W	XO-28
DS1, DS2	Diode, Light Emitting CM4-22	XO-268	R16	Resistor, 20 ohm, 5%, 1/4W	XO-29
IC1	IC-14 Pin Dip UA723CN	XO-422	R17	Resistor, 620 ohm, 5%, 1/2W	XO-66
J1	Connector, 9 Pin, Molex	XO-527	R18	Resistor, 180 ohm, 5%, 1/4W	XO-24
J2	Connector, 6 Pin, Molex	XO-525	SCR1	Silicon Controlled Rectifier S107Y1	XO-451
J3	Connector, 7 Pin, Molex	XO-526		Eyelet G52-3	XO-524
POT1	Potentiometer, 500 ohm, CTS 115R501A	XO-101		Heat Sink, Thermalloy	XO-528
Q1	Transistor, NPN, 5W4F013	XO-307		Insulator, INS-3	XO-522
Q2	Transistor, NPN, 2N5550	XO-314		Insulator, DM 111	XO-523
Q3	Transistor, Darlington, Lambda PMD10K40	XO-315		Spacer — 6-32 Thread x 5/32	XO-518
R1	Resistor, 1.3K ohm, 10%, 5W	XO-156		Spacer — 6-32 Thread x 1/8	XO-519
R2, R9	Resistor, 1K ohm, 5%, 1/4W	XO-5			



NOTE: 1. RESISTOR
2. VOLTAGE
3. ALL VOLTAGES

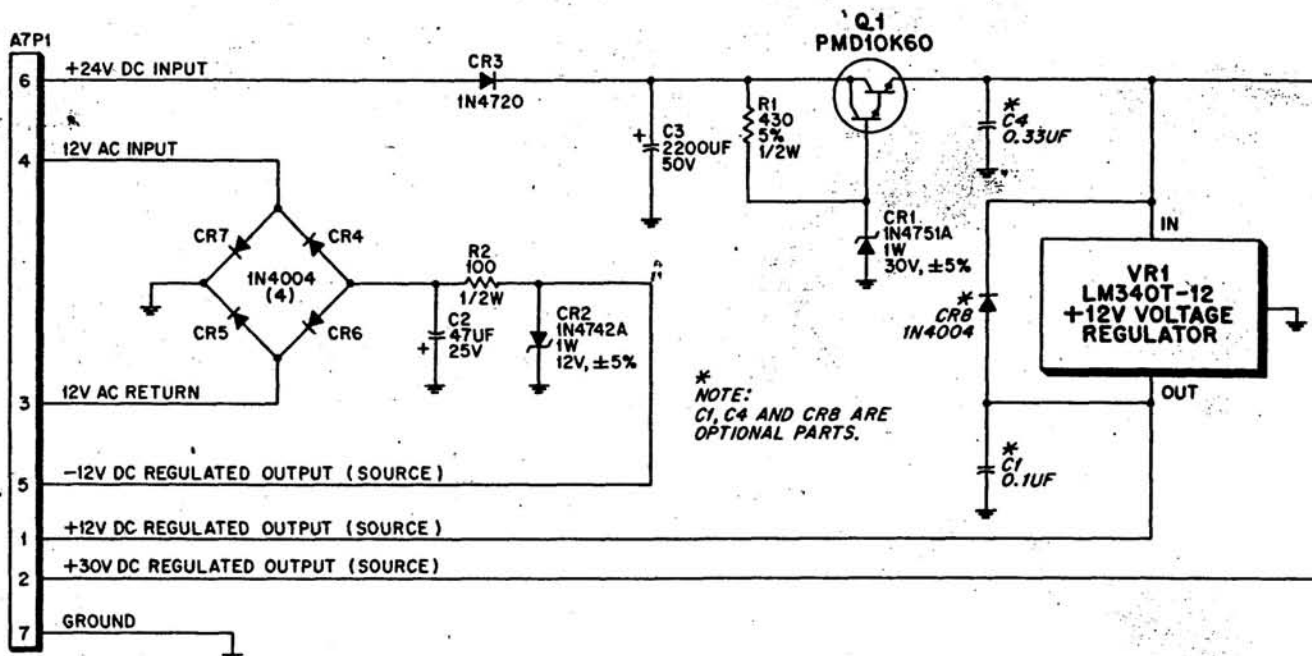
DIAGRAMS, PARTS LISTS



UNLESS OTHERWISE SPECIFIED,
RESISTORS ARE $\pm 5\%$, 1/2W.
VOLTAGES ARE DC WITH RESPECT TO CIRCUIT GROUND.
VOLTAGES ARE AT NOMINAL LINE VOLTAGE (115V AC).

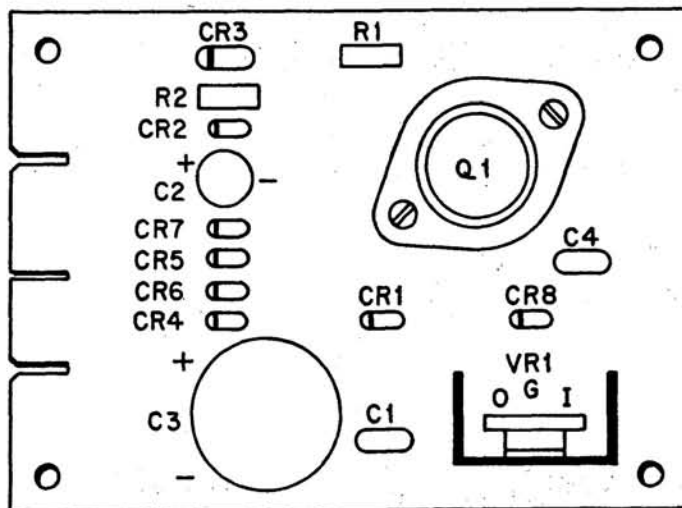
D. GOTTLIEB & CO.			
TITLE		POWER SUPPLY (A2)	
USED ON			
DRAWN	APPROVED	DATE	E-209.22
	BAM	2-3-81	

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



D. GOTTLIEB & CO.			
TITLE	SOUND/SPEECH BOARD POWER SUPPLY A7		
USED ON			
DRAWN	APPROVED	DATE	D-21343

SOUND/SPEECH POWER SUPPLY (A7) COMPONENT LOCATION

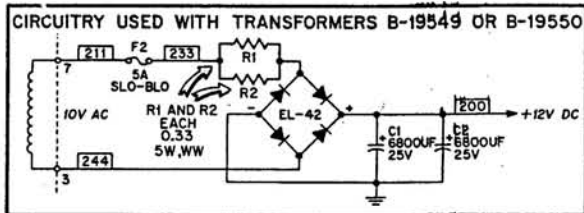


SOUND/SPEECH POWER SUPPLY (A7) PARTS LIST

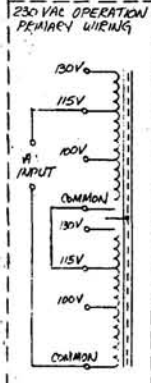
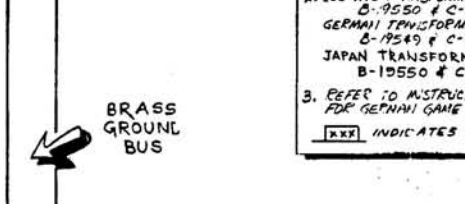
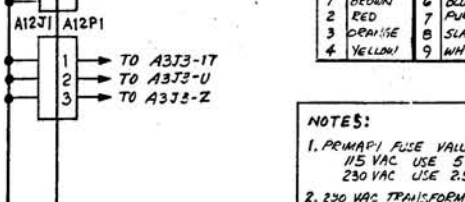
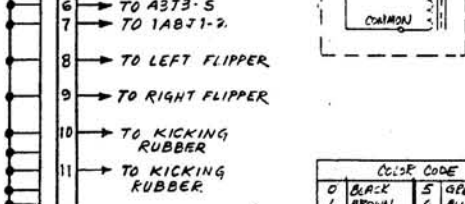
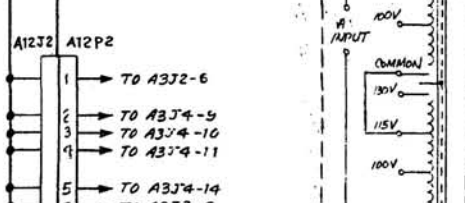
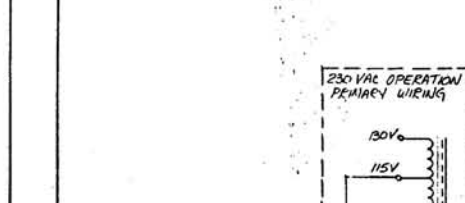
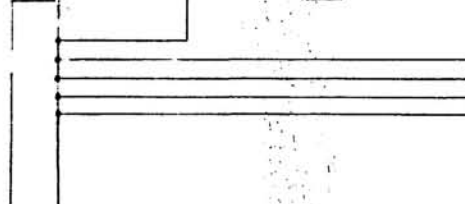
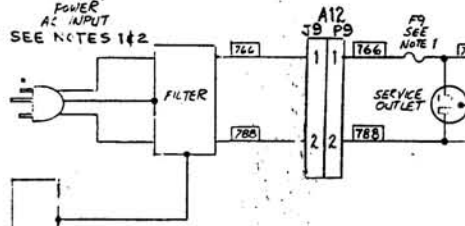
REFERENCE	DESCRIPTION	PART NO.
	SOUND/SPEECH POWER SUPPLY BOARD	MA-188
C1	Capacitor 0.1UF, 50V	XO-230
C2	Capacitor 47UF, 25V	XO-219
C3	Capacitor 2200 UF, 50V	XO-290
C4	Capacitor 0.33 UF	XO-250
CR1	Diode, Zener 30V, 5%, 1W 1N4751A	XO-271
CR2	Diode, Zener 12V, 5%, 1W 1N4742A	XO-257
CR3	Diode 1N4720	XO-260
CR4, CR5, CR6, CR7, CR8	Diode 1N4004	XO-254
R1	Resistor 430 ohm, 5%, 1/2 Watt	XO-54
R2	Resistor 100 ohm, 5%, 1/2 Watt	XO-52
Q1	Transistor, Darlington Pair PMD10K60	XO-311
VR1	+12 Volt Voltage Regulator LM 340T-12	XO-473

X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS

A12J



PRIMARY
POWER
AC INPUT
SEE NOTES 1 & 2

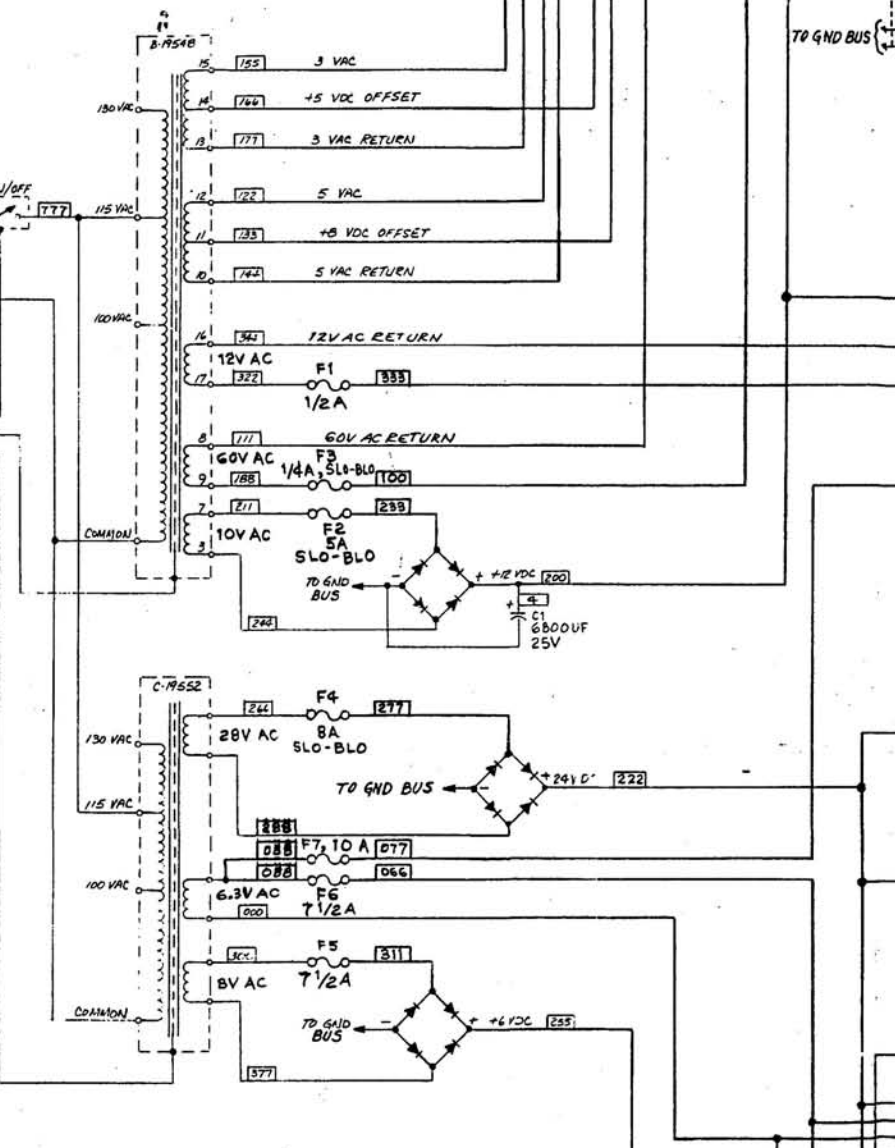


COLOR CODE			
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1	BROWN	6	BLUE
2	RED	7	PURPLE
3	ORANGE	8	SLATE
4	YELLOW	9	WHITE

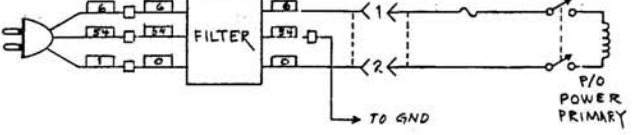
NOTES:

1. PRIMARY FUSE VALUES:
115 VAC USE 5 AMP SLO-BLO
230 VAC USE 2.5 AMP SLO-BLO
2. 230 VAC TRANSFORMERS:
B-19550 & C-19554
GERMAN TRANSFORMERS:
B-19549 & C-19553
JAPAN TRANSFORMERS:
B-19550 & C-19554
3. REFER TO INSTRUCTION MANUAL
FOR GERMAN GAME VARIATIONS.
XXX INDICATES WIRE COLOR

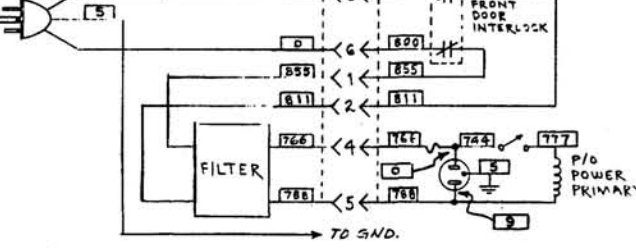
BRASS
GROUND
BUS



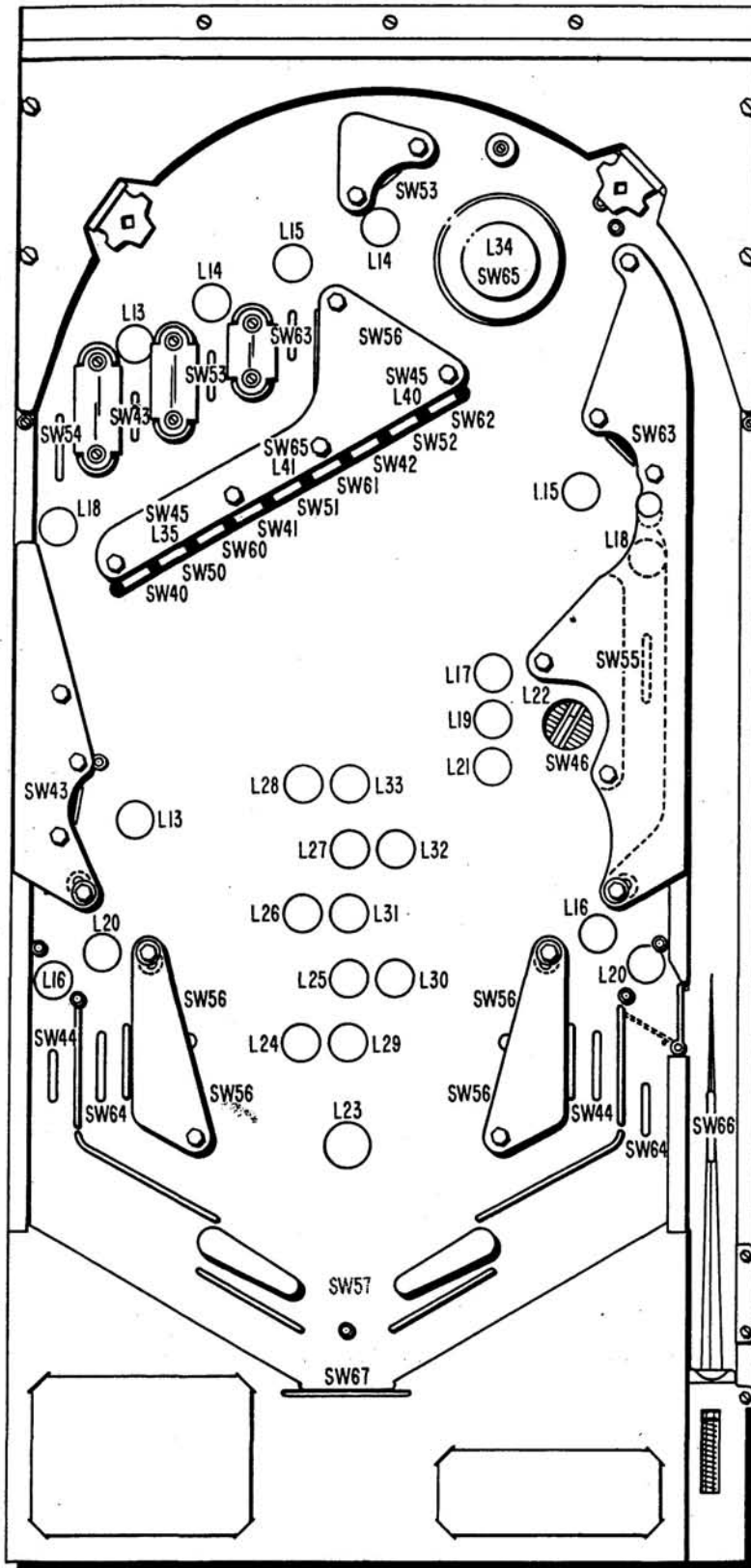
5. GERMAN WIRING, 220V AC.



6. JAPANESE WIRING, 100V AC



X. WIRING AND SCHEMATIC DIAGRAMS, PARTS LISTS



PLAYBOARD SWITCH AND LAMP ASSIGNMENTS

LAMP NO.	LAMP ASSIGNMENT
L13	Top Left Rollover
L14	Left Spot Target
L15	Top Center Rollover
L16	Top Spot Target
L17	Top Right Rollover
L18	Right Spot Target
L19	Left Outside Rollover
L20	Right Return Rollover
L21	Green Hole
L22	Left Side Rollover
L23	Right Side Rollover
L24	Amber Hole
L25	Left Return Rollover
L26	Right Outside Rollover
L27	Red Hole
L28	Special Hole
L29	Double Bonus
L30	10,000 Left Bonus
L31	20,000 Left Bonus
L32	30,000 Left Bonus
L33	40,000 Left Bonus
L34	50,000 Left Bonus
L35	10,000 Right Bonus
L36	20,000 Right Bonus
L37	30,000 Right Bonus
L38	40,000 Right Bonus
L39	50,000 Right Bonus
L40	Pop Bumper
L41	Left DIP Target
L42	Right DIP Target
L43	Center DIP Target

SWITCH MATRIX NO.	SWITCH ASSIGNMENT	PART NO.
40	#1 Drop Target	B-18094
41	#4 Drop Target	B-18094
42	#7 Drop Target	B-18094
43	Left Target	B-20867
44	Top Left Rollover	B-18892
45	Left Outside Rollover	B-18892
46	Right Return Rollover	B-19754
47	Left DIP Target	B-22820
48	Right DIP Target	B-22820
49	Hole	B-19857
50	#2 Drop Target	B-18095
51	#5 Drop Target	B-18095
52	#8 Drop Target	B-18095
53	Top Target	B-20867
54	Top Center Rollover	B-18892
55	Left Side Rollover	B-18892
56	Right Side Rollover	B-18892
57	10 points (5)	(4 Lower) B-22224 (Upper) B-22227
58	Tilt	B-9141
59	#3 Drop Target	B-18093
60	#6 Drop Target	B-18093
61	#9 Drop Target	B-18093
62	Right Target	B-20867
63	Top Right Rollover	B-19388
64	Left Return Rollover	B-18892
65	Right Outside Rollover	B-18892
66	Center DIP Target	B-22820
67	Pop Bumper	B-21353
68	Runway	B-19754
69	Outhole	B-18892

XI. PARTS INFORMATION

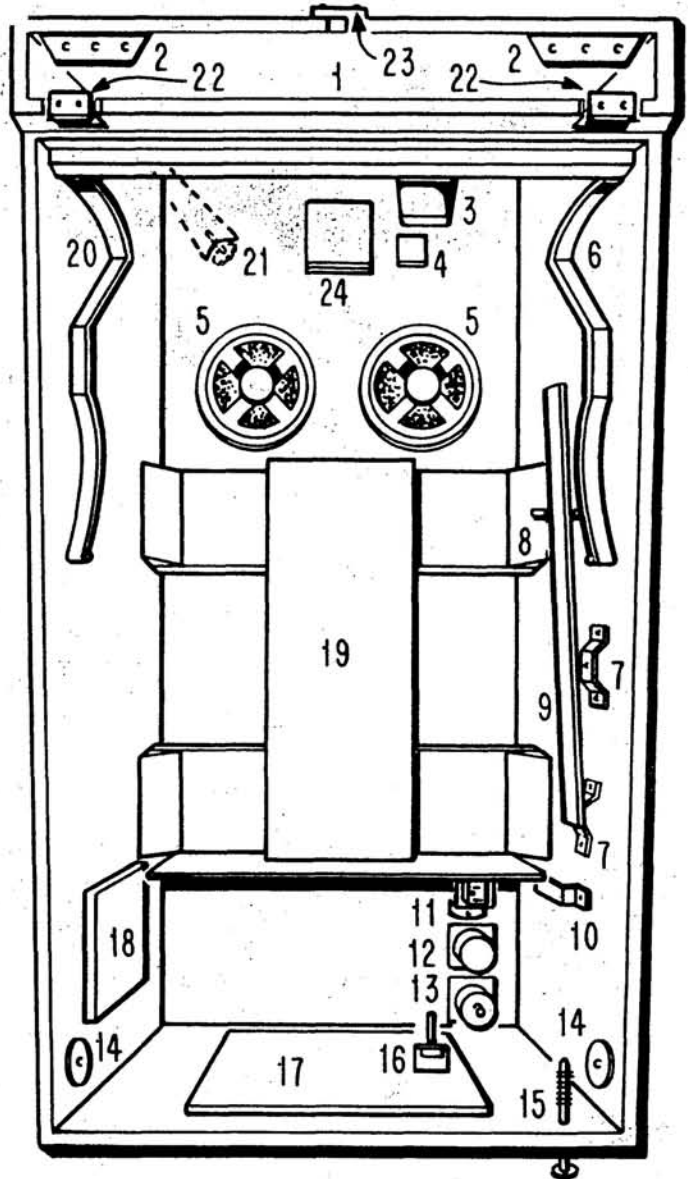
TABLE OF CONTENTS

	PAGE
CABINET PARTS.....	45
PLAYBOARD PARTS.....	46

XI. PARTS INFORMATION

CABINET PARTS

ITEM	DESCRIPTION	PART NO.
1.	Cabinet	Specify Game
2.	Lightbox Mounting Bracket (2)	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.	Pot and Mounting Bracket	MA-185
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
	F2, 5 Amp SLO-BLO Fuse	EL-8
	F3, 1/4 Amp SLO-BLO Fuse	EL-5
	F4, 8 Amp SLO-BLO Fuse	EL-26
	F5, 7 1/2 Amp Fuse	EL-22
	F6, 7 1/2 Amp Fuse	EL-22
	F7, 10 Amp Fuse	EL-23
	F8, 1 Amp SLO-BLO Fuse	EL-6
20.	Left Playboard Support	D-19931
21.	Cabinet Leg (4)	D-4337
	3" Leg Adjuster	MH-21
22.	Hinge (shown for reference only-P/O Lightbox)	B-22734
23.	Latch Bar	A-22733
	Latch Assembly (P/O Lightbox)	A-21969
24.	Ground Strap Bracket	B-22156



XI. PARTS INFORMATION

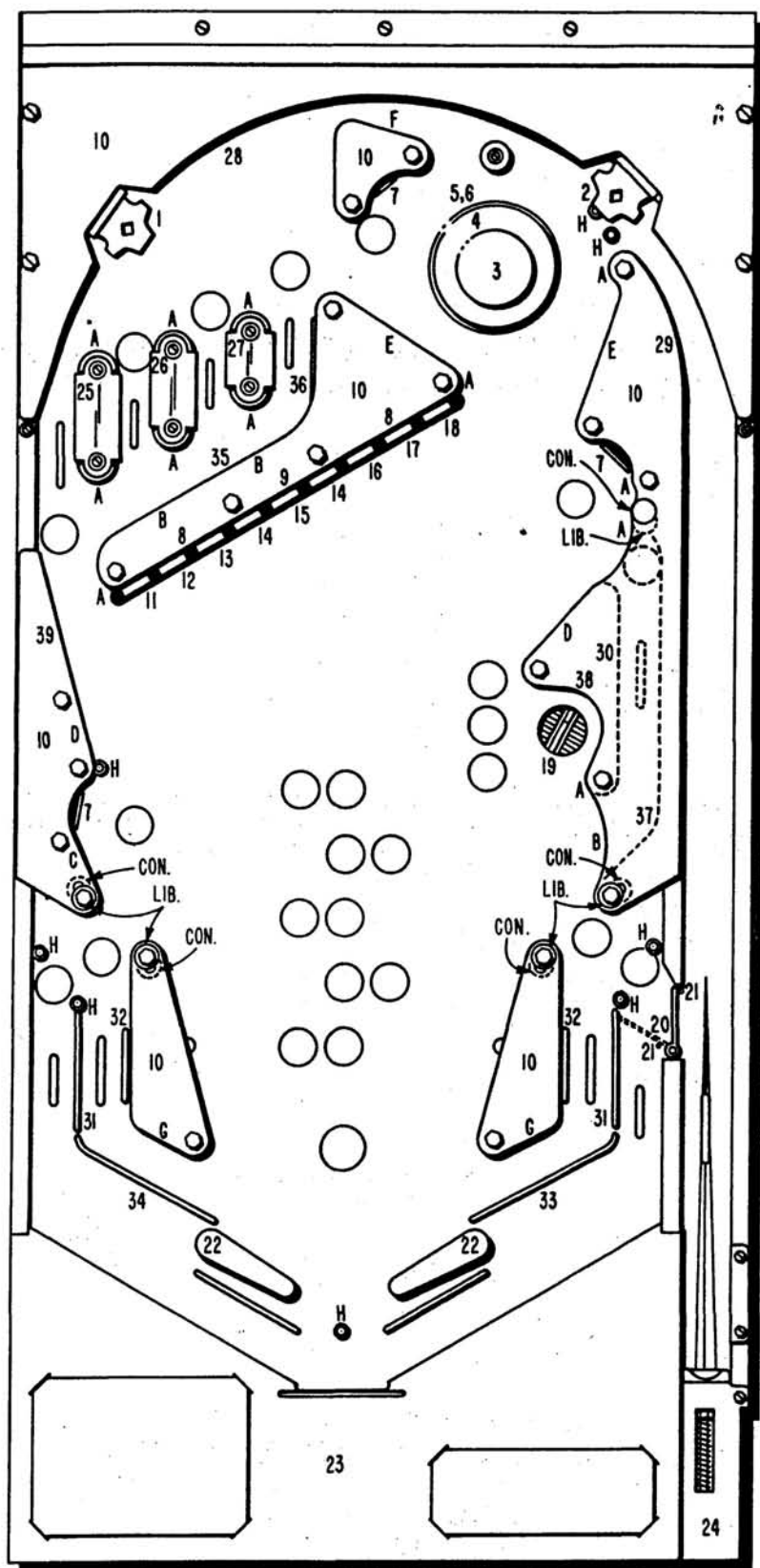
PLAYBOARD PARTS

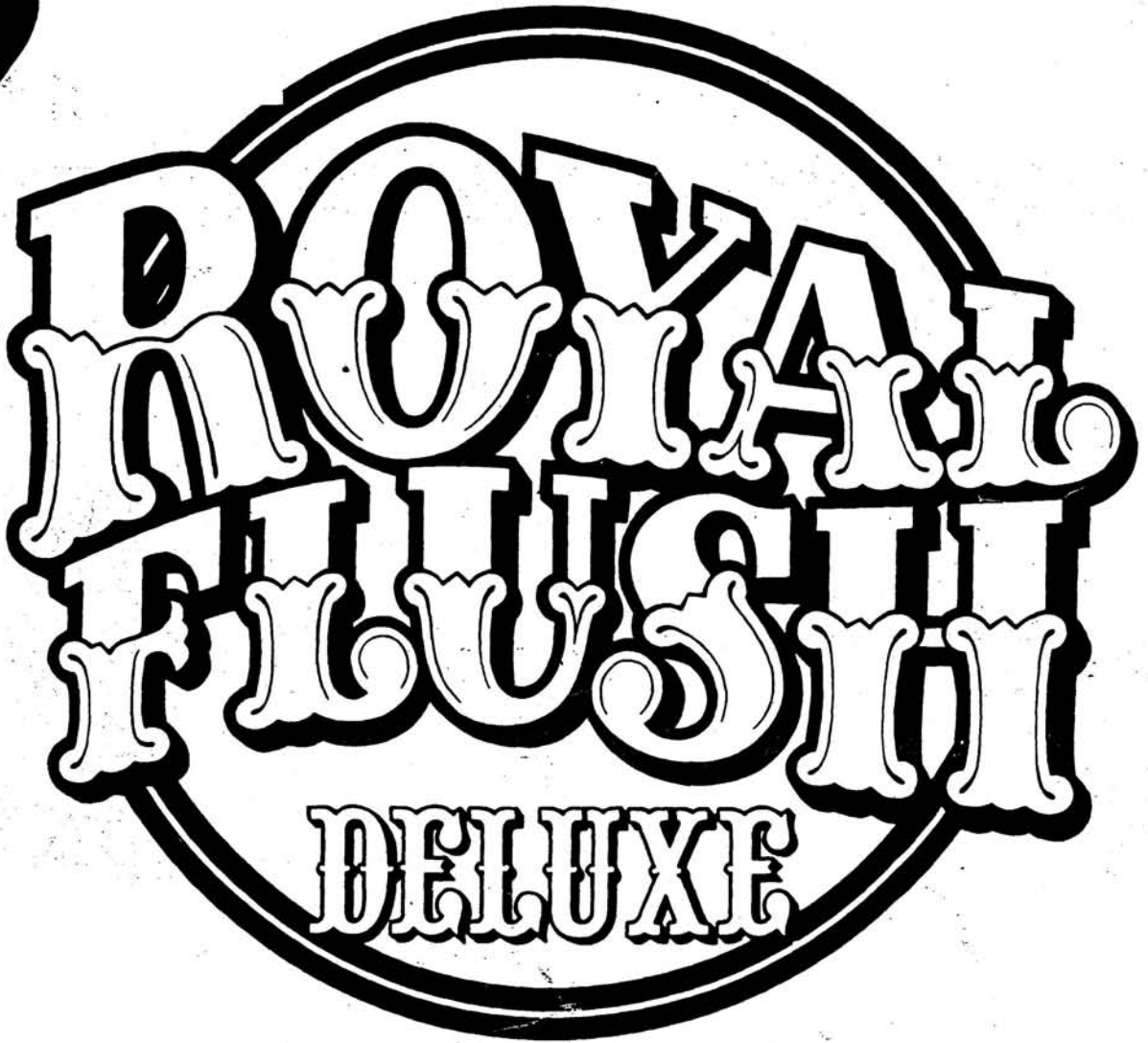
RUBBER RINGS

A	A-10217	5/16"	(12)
B	A-10218	1/2"	(3)
C	A-10219	1"	(1)
D	A-10220	1-1/2"	(2)
E	A-10221	2"	(2)
F	A-10222	2-1/2"	(1)
G	A-10223	3"	(2)
H	A-15705	Mini	(8)

PARTS LIST

1.	A-19646	Arch Rebound
2.	A-19645	Arch Gate
3.	A-16883	Pop Bumper Cap, White
4.	C-10435Z	Pop Bumper Body, White
5.	C-10433Z	Pop Bumper Skirt, White
6.	B-8246	Pop Bumper Trim Platter
7.	A-9374Z	Target, White (3)
8.	A-15747W	DIP Target, Blue (2)
9.	A-15749U	DIP Target, Red
10.	D-22803	Plastic Shield Set
11.	A-13449U	Drop Target, Red
12.	A-13448Y	Drop Target, Black
13.	A-13448U	Drop Target, Red
14.	A-13447Y	Drop Target, Black (2)
15.	A-13447U	Drop Target, Red
16.	A-13446U	Drop Target, Red
17.	A-13446Y	Drop Target, Black
18.	A-13445U	Drop Target, Red
19.	A-11151	Hole Liner
20.	A-13652	Gate Wireform
21.	A-10542	Pin (2)
22.	C-13150	Flipper, White (2)
23.	D-13647	Cardholder
24.	C-9767	Ball Shooter Gauge
25.	A-9398Z	Rollover Guide, White
26.	A-9396Z	Rollover Guide, White
27.	A-9394Z	Rollover Guide, White
28.	D-22747	Arch Shield Retainer
29.	A-4831	Ball Guide Rail
30.	A-4833	Ball Guide Rail
31.	A-4832	Ball Guide Rail (2)
32.	A-6612	Ball Guide Rail (2)
33.	A-14571	Ball Guide Rail
34.	A-14572	Ball Guide Rail
35.	A-12570	Ball Guide Rail
36.	A-17106	Ball Guide Rail
37.	A-8688	Metal Flat Rail
38.	A-5867	Metal Shield
39.	A-22818	Metal Flat Rail
	A-14792	Mini Post Screw (11)
	C-11561PX	Plastic Post (37)





GottliebTM

AMUSEMENT GAMES

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(312) 562-7400 Telex 72-8463

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