

*Alvin G. & Co.™*

# PUNCHY the GLOW



OPERATIONS MANUAL  
SEPTEMBER 1993 MAN-020

# PUNCHY THE CLOWN

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**WARNING!**

The user is cautioned that any changes or modifications not expressly approved by Alvin G. & Co. who is responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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Part No. MAN-020

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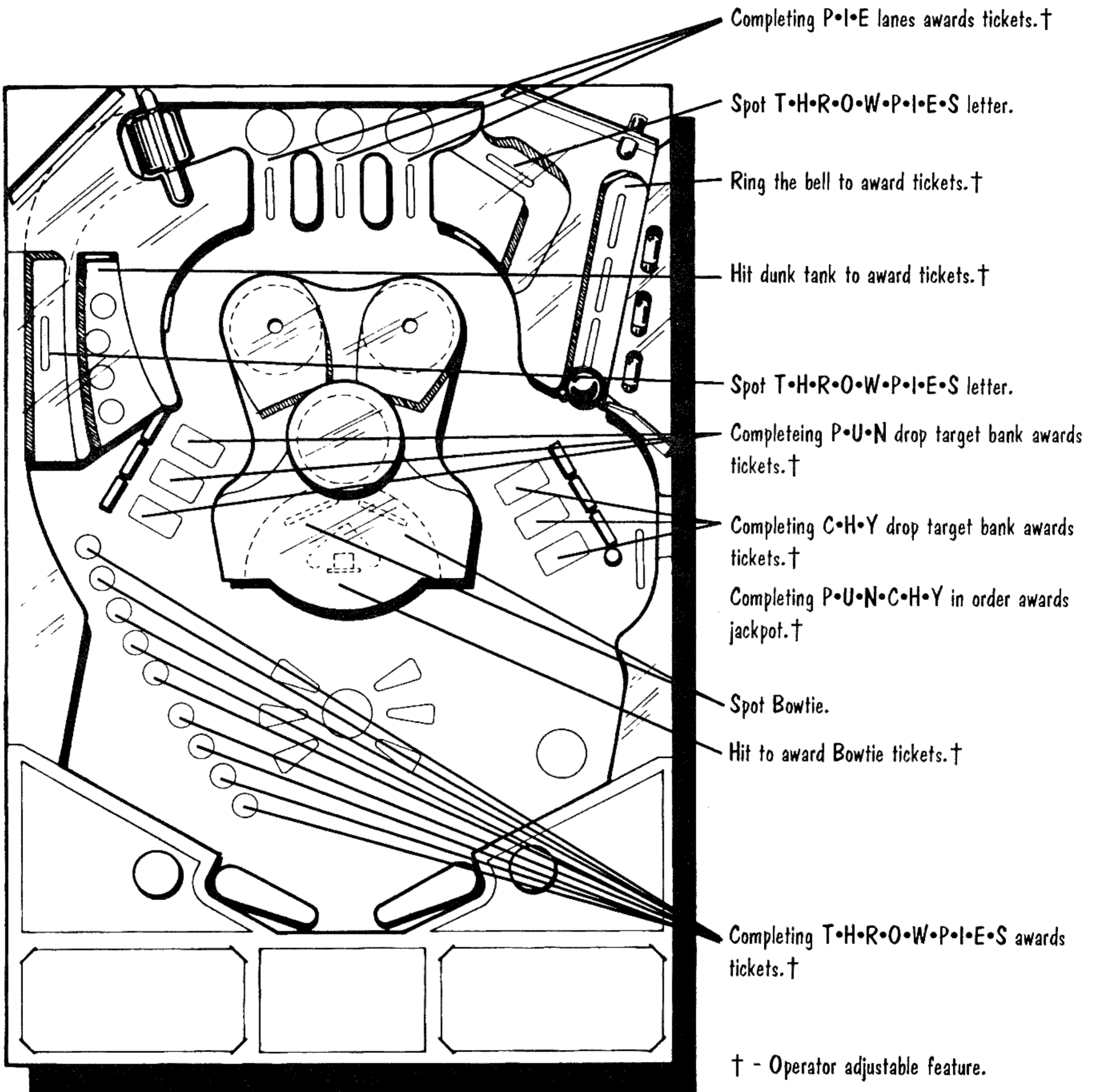
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## ASSEMBLY INSTRUCTIONS FOR PUNCHY THE CLOWN

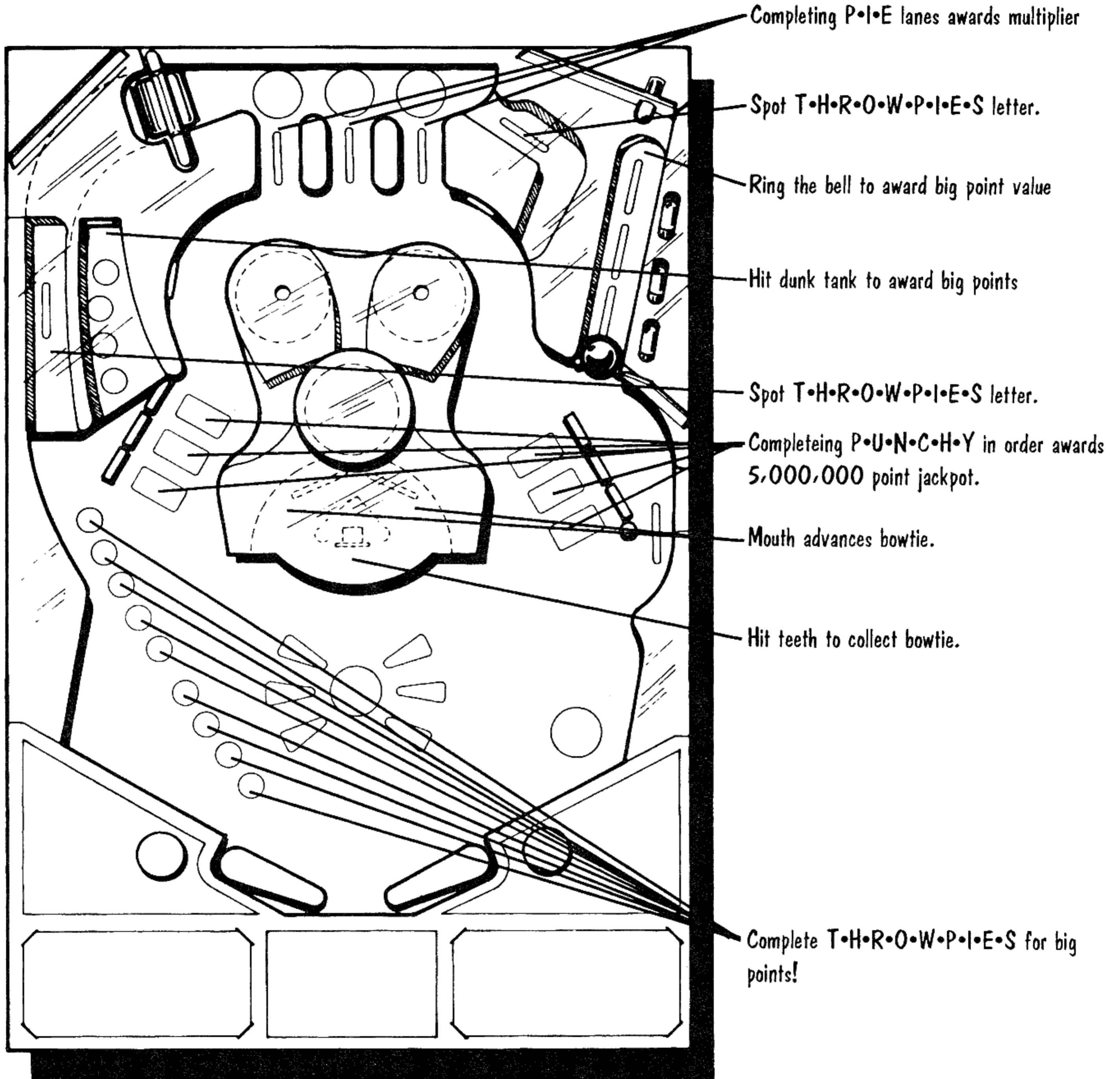
- 1.> Open shipping container and remove staples. < to prevent staples from scratching the side of the cabinet.>
- 2.> Pull game out by the black hold down strap.
- 3.> Remove leg box from in front of the backbox.
- 4.> Remove cash box from filler section.
- 5.> Slide game out of shipping container.
- 6.> Set shipping container aside.
- 7.> In the cash box please find:

4 - Leg levelers	4 - Leg leveler lock nuts
8 - Leg bolts	2 - Backbox bolts
2 - backbox bolt washers	2 - pinballs
1 - Spare parts bag	
- 8.> Screw a leg leveler lock nut to the bottommost portion of each leg leveler.
- 9.> Screw in a leg leveler into each of the legs approximately  $\frac{2}{3}$  the length of the screw.
- 10.> Place the cabinet on a support and attach the front legs using the leg bolts.
- 11.> Remove support and attach the rear legs using the leg bolts.
- 12.> Remove coin door and backbox keys from behind masking tape on the coin door.
- 13.> Put backbox into the upright position and hold in place with the backbox clamp.
- 14.> Remove backglass by unlocking it with the backbox keys.
- 15.> Remove speaker and display mount by lifting up and pulling towards the coin door.
- 16.> Using the two backbox bolts and washers screw in a bolt in both holes in the backbox.
- 17.> Tighten each bolt using a  $\frac{9}{16}$ " wrench.
- 18.> Open coin door
- 19.> Remove front molding out of lock down channel.
- 20.> Pull glass out and install 1 pinball into upper right captive hole and 1 in the outhole.
- 21.> Level game and adjust to  $5\frac{1}{2}^{\circ}$  pitch.
- 22.> Install plumbob tilt and adjust to desired level.
- 23.> Push glass back to operating position.
- 24.> Replace front molding into lock down channel.
- 25.> Insert empty cash box.
- 26.> Close and lock coin door.
- 27.> Allow game parts and electronics to warm to room temperature.
- 28.> Plug game in, turn it on, and let the money roll in!

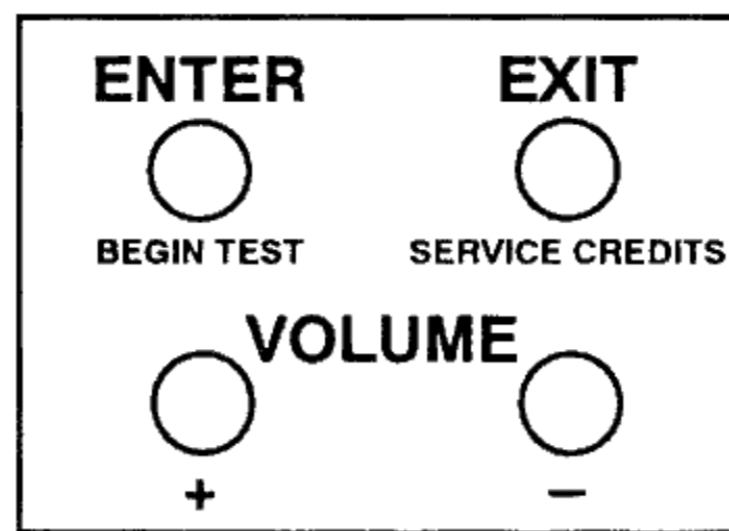
# PUNCHY REDEMPTION GAME INSTRUCTIONS



# PUNCHY PINBALL GAME INSTRUCTIONS



# COIN DOOR SWITCHES



## Normal function

**Begin test** - This switch changes the function of the coin door switch from normal to test and starts the operator control menu system.

**Service Credits** - This switch adds a credit to the game. This will be recorded as a service credit and not be recorded as a player credit.

**Volume +** - This switch raises the sound level of the game.

**Volume -** - This switch lowers the sound level of the game.

For each closure of the corresponding volume button the volume will increase or decrease accordingly one volume unit.

## Test function

**Enter** - This switch allows the operator to go to a sub-menu or lock in an adjustment choice.

**Exit** - This switch allows the operator to go back one sub-menu or exit the test function.

**Volume +** - This switch allows the operator to cycle forward through the menu selection or adjustment.

**Volume -** - This switch allows the operator to cycle backward through the menu selection or adjustment.




# MENU SYSTEM

The menu is divided into three main categories, Adjustments, Bookkeeping, and Testing. the first category is Adjustments. Adjustments allow the operator to conform the operation of the game with the location. The second category is Bookkeeping. Bookkeeping allows the operator to get vital information such as earnings, player statistics, and high score information. The last category is Tests. Tests allow the operator to troubleshoot the game if a problem occurs.

To start the menu press Enter and "MAIN MENU A ADJUSTMENTS" will appear on the Display. press The + or - button to cycle forward or backward through the main categories. Once the category is displayed on the display press Enter to select that sub-menu. If the wrong Sub-menu has been selected press Exit to go back to the Main menu. Use the + or - button to cycle forward or backward through the sub-menu. Once the correct choice is displayed, press Enter to "Adjust" or "Test" the choice depending on the Sub-menu that was selected before. Bookkeeping is information that cannot be set. The adjustments may be reset to factory by using, **A507 Factory reset** which will reset everything to manufacturers suggested setting. **Note:** when factory reset is enabled the game will be set to redemption. To reset all bookkeeping audits except for coins use **A501 Clear audits**- this will reset all audits to 0 except for the coins which will be left unchanged.


















# ADJUSTMENTS

*Note: the pointer  by each adjustment denotes the factory setting for redemption mode. The pointer  by each adjustment denotes the setting for regular play mode. If **A507 Factory Reset** is enabled the setting will equal the item to the right of the pointer . The factory reset settings are listed on page 27.*

## A Adjustments

### 1 Standard

- 01 Game style** - The operator may set the style of game being played. *Note: when either choice is made the HSTD is reset.* Changing setting does not incur a factory reset. The items adjusted are: **A103 Replay type**, **A107 Balls per game**, **A108 Match percent**, **204 Tickets allowed**, and **A405 Backup HSTD**. The choices are:
-  Redempt - The game is set in the redemption mode. All items with  are set back to the  pointer setting.
  - Regular - The game is set in standard pinball mode. All items with  are set to that setting.
- 02 Replay at** - The operator may set the replay starting value. The range of this setting is 0 or 1,000,000 to 50,000,000 in steps of 1,000,000.
-  15,000,000
- 03 Replay type** - The operator may set what is awarded when the replay level is achieved. The choices are:
-  None
  -  Credit
  - Tickets
- 04 Replay ticket** - The operator may set the number of tickets that a player may receive for replay. The range of this setting is 0 to 99 in steps of 1.
-  10
- 05 Replay percent** - The operator may set the percentage of replays the player is able to earn when auto replay is used. The range of this setting is fixed or 1 to 50 in steps of 1.
-  10
- 06 Max free games** - The operator may set the number of free games that a player may receive. The range of this setting is 0 to 9 in steps of 1.
-  1
- 07 Replay boost** - The operator may set auto boost™ which will temporarily increase the replay scores each time the replay level is achieved or exceeded. The range of this setting is 0 or 10% to 50% in steps of 10%.
-  20%
- 08 Balls per game** - The operator may set the amount of balls per game. The range of this setting is 1 to 5 in steps of 1.
-  1
  -  3
- 09 Match percent** - The operator may set the percentage of matches given during the total amount of games played. *Note: match% is only active when **A104 Replay type** is set to credit.* The range of this setting is 0 to 10 in steps of 1.
-  10%
- 10 Language** - The operator may set the language that is displayed on the alphanumeric display. The choices are:
-  English
  - German
  - French

**A 1 11 Attract mode** - The operator may set the game to attempt to attract a person to play the game every time the setting has been reached. The choices are:

- ☞ 5 Minutes
- 10 Minutes
- 15 Minutes
- Never

**12 Tilt warnings** - The operator may set how many warnings a player may receive before the game tilts. The range of this setting is 0 to 3 in steps of 1.

- ☞ 2 Warnings.

**A 2 Feature**

**01 Ticket payout** - The operator may set the values for **A202 Max Tickets**, **A203 Min Tickets**, **A206 Teeth tickets**, **A207 PUN/CHY tickets**, **A208 Dunk tickets**, **A209 Bell tickets**, **A210 PIE lane tickets**, **A211 THROWPIES tickets**, and **A214 Jackpot limit** all at the same time. *Note: Ticket payout is only active when A101 Game style is set to redempt.* The choices are :

	Ex. Easy	Easy	Med	Hard	Ex. Hard
A202 Max tickets	28	24	20	16	12
A203 Min tickets	8	6	5	2	0
A206 Teeth tickets	3	3	2	1	0
A207 PUN/CHY tickets	2	1	1	0	0
A208 Dunk tickets	5	4	3	2	1
A209 Bell tickets	2	2	2	1	0
A210 PIE lanes tickets	2	1	1	0	0
A2111 THROWPIES tickets	7	6	5	3	1
A214 JKPT limit	1,000	700	500	300	100

**02 Max. tickets** - The operator may set the maximum amount of tickets able to be won in one game. This value is based on a 1 coin game. *Note: if 5 coins were inserted this value would be multiplied by 5. If this is set to 0 no tickets will be awarded. This feature is active during regular play if A103 Replay type is set to tickets and A204 Tickets allowed is set to yes. Note: jackpot tickets is not counted in this setting.* The range of this setting is 0 - 99 in steps of 1.

- ☞ 20 Tickets

**03 Min. tickets** - The operator may set the minimum amount of tickets able to be won in one game. This value is based on a 1 coin game. *Note: if 5 coins were inserted this value would be multiplied by 5. This feature is active during regular play if A103 Replay type are set to tickets and A204 Tickets allowed is set to yes.* The range of this setting is 0 - 20 in steps of 1.

- ☞ 5 Tickets

**04 Tickets allowed** - The operator may set whether the game awards tickets or not. The choices are :

- ☞ Yes - The game will award tickets
- No - The game will not award tickets

**05 Coins per game** - The operator may set the maximum coins per game. This means for each ticket won the coins played will determine how many tickets will be awarded. *Note: this feature is only used in Redempt. For each game started credits will be deducted by this setting. Example: player inserts 7 coins and presses start. The game will deduct 5 credits from the display, which will leave the player with two credits for the next game. Example: Player inserts 5 coins. Player hits the bell target (which awards 3 tickets per coin). He will receive 15 tickets.* The range of this setting is 1 - 10 in steps of 1.

- ☞ 5

- A 2 06 Teeth tickets** - The operator may set the amount of tickets awarded for hitting the teeth target per mouth loop. *Note: this feature is only used in Redempt.* The range of this setting is 0 - 3 in steps of 1.  
 ☞ 2 Tickets
- 07 PUN / CHY tickets** - The operator may set the amount of tickets awarded for completing PUN or CHY. *Note: this feature is only used in Redempt.* The range of this setting is 0 - 5 in steps of 1.  
 ☞ 1 Tickets
- 08 Dunk tickets** - The operator may set the amount of tickets awarded for hitting dunk. *Note: this feature is only used in Redempt.* The range of this setting is 0 - 9 in steps of 1.  
 ☞ 3 Tickets
- 09 Bell tickets** - The operator may set the amount of tickets awarded. *Note: this feature is only used in Redempt.* The range of this setting is 0 - 9 in steps of 1.  
 ☞ 2 Tickets
- 10 PIE tickets** - The operator may set the amount of tickets awarded for completing the PIE lanes. *Note: this feature is only used in Redempt.* The range of this setting is 0 - 9 in steps of 1.  
 ☞ 1 Tickets
- 11 THROWPIE tickets** - The operator may set the amount of tickets awarded for completing all letter in THROWPIES. *Note: this feature is only used in Redempt.* The range of this setting is 0 - 9 in steps of 1.  
 ☞ 5 Tickets
- 12 Service voice** - The operator may set to speak aloud to notify the operator if there is a problem with Punchy. Punchy will say "Service to Punchy the Clown" in this mode. *Note: this feature is only active if tickets are to be awarded. This feature will only notify the operator if tickets are out or tickets are jammed.* The choices are:  
 ☞ Yes - The game will speak aloud to notify the operator if a problem occurs with Punchy.  
 No - The game will not speak aloud to notify the operator if a problem occurs with Punchy.
- 13 Recall bonus X** - The operator may set whether the game recalls the player's bonus multiplier. The choices are:  
 ☞ Yes - Bonus multiplier is recalled.  
 No - Bonus multiplier is not recalled.
- 14 JKPT TCKT limit** - The operator may set the Jackpot Ticket limit. The jackpot is awarded when a player completes the PUNCHY drop targets in order. *Note: When the jackpot is won it will reset to 25 then increase by 1 for each coin up to the A205 JKPT TCKT limit. Note: this feature is only used in redempt. Jackpot feature is not limited by A202 Max tickets.* The range of this setting is Off, 100 - 1000 in steps of 100.  
 ☞ 500 tickets

## A 3 Pricing

**01 Game pricing** - The operator may set the cost of a game from a standard pricing menu or by installing custom pricing. The choices are:

Antilles	Finland	Hungary	Swiss
Argentina	FR 5/10 FR	Italy	Taiwan
Australia	FR 7/10 FR	Japan	U Kingdom
Austria	FR 7/20 FR	Korea	USA 4/¢1
Belgium	FR 9/20 FR	Netherland	USA 3/¢1
Canada 1	FR 11/20 FR	N Zealand	USA 2/¢1
Canada 2	GER 6/5 DM	Norway	† Custom
Chile	GER 7/5 DM	Spain	Pricing table is on page 26
Denmark	Greece	Sweden	

† - The custom setting requires a value of coin units in the left, center, right, and extra coin chutes.  
Items 01a - 01f can only be made if custom is selected in the pricing menu.

*THE ENTER BUTTON IN THIS MENU SAVES THE CURRENT INFORMATION DISPLAYED. THE EXIT BUTTON WILL EXIT OUT OF THE SUBMENU AND USE ALL CURRENTLY SAVED INFORMATION. CHANGES TO PREVIOUS ITEMS MAY ONLY BE MADE BY EXITING BACK TO CUSTOM AND PRESSING ENTER TO EDIT CHOICES.*

- 01A Left coin units** - The operator may specify the number of units purchased by a coin passing through the left coin slot. The range of this setting is 0 to 99 in steps of 1.
- 01B Center coin units** - The operator may specify the number of units purchased by a coin passing through the center coin slot. The range of this setting is 0 to 99 in steps of 1.
- 01C Right coin units** - The operator may specify the number of units purchased by a coin passing through the right coin slot. The range of this setting is 0 to 99 in steps of 1.
- 01D Extra coin units** - The operator may specify the number of units purchased by a coin passing through the extra coin slot. The range of this setting is 0 to 99 in steps of 1.
- 01E Coin units / Credits** - The operator may specify how many units it takes to award one credit. The range of this setting is 0 - 99 in steps of 1.
- 01F Coin units / Bonus** - The operator may specify how many units are awarded when the bonus is reached. The range of this setting is 0 - 99 in steps of 1.
- 02 Maximum credits** - The operator may set the maximum allowed credits in the game. The range of this setting is 4 - 40 in steps of 1.
  - ☞ 20 Credits
- 03 Free play** - The operator may set whether a player plays for free or needs to pay to play. The choices are:
  - Yes - The player does not need to pay to play.
  - ☞ No - The player needs to purchase a credit to play.
- 04 Display credits** - The operator may set the credits displayed. The choices are:
  - ☞ Yes - The player can see the amount of credits.
  - No - The player cannot see the amount of credits.
- 05 Meter counts** - The operator may set the game meter to record coins, credits, or tickets. The choices are:
  - ☞ Coins - The game meter records total coins through coin chutes.
  - Earnings - The game meter records total earnings through chutes.
  - Tickets - The game meter records total tickets awarded.

#### A 4 High scores

- 01 HSTD allowed** - The operator may set whether the game allows HSTD. The choices are:
- Yes - Game allows HSTD
  - No - No high scores are recorded
- 02 Credits HSTD 1** - The operator may set the number of credits awarded whenever a player exceeds the previous highest score. The range of this setting is 0 - 2 in steps of 1.
- 1
- 03 Credits HSTD 2** - The operator may set the number of credits to be awarded whenever a player exceeds the second highest score. The range of this setting is 0 - 1 in steps of 1.
- 0
- 04 Reset HS every** - The operator may set the number of games to be played before the High Scores will reset. The range of this is OFF (disabled) or 100 to 5000 in steps of 100.
- 700
- 05 Backup HSTD** - The operator may set the backup high scores when the **A404 Reset HS every** is enabled. The range of this setting is 0 or 1,000,000 to 75,000,000 in steps of 1,000,000.
- 8,000,000
  - 25,000,000

#### A 5 Utility

- 01 Clear audits** - The operator may clear audits by pressing the enter button. The choices are:
- Yes - Clear all audits. (Note this will not clear **B102 Grand total coins**, **B104 Grand tickets**, or **B2 earning audits**.)
  - No - Do not change audits.
- 02 Clear coins** - The operator may clear coins by pressing the enter button. The choices are:
- Yes - Clear earning audits. *NOTE - ENABLING THIS CHOICE WILL NOT RESET GRAND TOTAL COINS.*
  - No - Do not change audits.
- 03 Reset HSTD** - The operator may reset high score to date by pressing the enter button. The choices are:
- Yes - Reset high scores to date
  - No - Do not change high score to date.
- 04 Clear tickets** - The operator may clear all ticket audits except **B104 Grand tickets**.
- Yes - Clear ticket audits.
  - No - Do not change audits.
- 05 Clear credits** - The operator may clear credits by pressing the enter button. The choices are:
- Yes - Clear credits
  - No - Do not clear credits.
- 06 Custom message** - The operator may change the message that appears in the display during the game over mode. The choices are:
- Off - Factory message displayed.
  - On - Custom message displayed and start new display.
  - Change - Edit the old display.

Press the enter button when "Change" appears in the display to start the custom message processor. Use the "+" or "-" button to rotate letters. The ">" shows a space. The "<" goes back one space. Press the enter button to lock in the desired letters. When finished push enter at the last space; this will lock in the message. If at any time the exit key is pressed the last message that was saved will be displayed.

- A 5 07 Factory reset** - The operator may do a factory reset by pressing enter. The factory reset settings are located on page 27. The choices are:
- Yes - Set to factory settings.
  - No - Do not set to factory settings.
- 08 Install country** - The operator may set which country the game will be placed at. This adjusts **A109 Language**, and **A301 Game pricing**. The choices are:
- U.S.A.
  - Germany
  - France
  - U.K.
- 09 Flasher intensity** - The operator may set the intensity of the flashers. The choices are:
- Off
  - Dimmer
  - Dim
  - Normal
- 10 Tournament** - The operator may set the game for tournament mode. During this mode no replay or tickets will be awarded. The choices are:
- Yes - The game is set for tournament play.
  - No - The game is not set for tournament play.

## BOOKKEEPING

### B Bookkeeping

**B 1 Main** - These audits will also appear in other groups but are the most important, and are grouped here for easier access.

- 01 Recent coins** - The total amount of coins through each slot since last **A502 Clear coin audits**, or **A507 Factory reset**.
- 02 Grand tot coins** - The total amount of coins through each slot. May be reset by using **A507 Factory reset**.
- 03 Recent tickets** - The total amount of tickets awarded since last **A504 Clear tickets**, or **A507 Factory reset**.
- 04 Grand tickets** - The total amount of tickets awarded. May be reset by using **A507 Factory reset**.
- 05 Av. ticket / game** - The average amount of tickets awarded per game.
- 06 Av. ticket / coin** - The average amount of tickets awarded per coin.
- 07 Av. game time** - The average time of one game.
- 08 Av. ball time** - The average time of one ball.
- 09 Replay percent** - The percent of the total amount of replays awarded over total games played.

### B 2 Earning

- 01 Coins L slot** - The total amount of coins that passed through the left coin slot.
- 02 Coins C slot** - The total amount of coins that passed through the center coin slot.
- 03 Coins R slot** - The total amount of coins that passed through the right coin slot.
- 04 Coins E slot** - The total amount of coins that passed through the extra coin slot.
- 05 Coin no credit** - The total amount of coins that did not receive a credit.  
No credit means "The purchase of a 1/2 credit" not "A coin that the coin acceptor would not accept."
- 06 Paid credits** - The total amount of credits given out.
- 07 Service credits** - The total amount of service credits.

### **B 3 Standard**

- 01 Total games** - The total number of games played.
- 02 Free games** - The total number of free games awarded.
- 03 Free percent** - The percent of the total amount of free games played over total games played.
- 04 Replay awards** - The total number of replays awarded.
- 05 Replay percent** - The percent of the total amount of replays awarded over total games played.
- 06 Hiscore awards** - The total number of high scores achieved.
- 07 Hiscore percent** - The percent of the total amount of high scores awarded over total games played.
- 08 Match awards** - The total number of matches awarded.
- 09 Match percent** - The percent of the total amount of matches played over total games played.
- 10 Balls played** - The total number of balls played.
- 11 1 player game** - The total number of 1 player games.
- 12 2 player game** - The total number of 2 player games.
- 13 3 player game** - The total number of 3 player games.
- 14 4 player game** - The total number of 4 player games.
- 15 Times HSTD reset** - The total amount of times the high score to date has been reset.
- 16 1 Coin game** - The total amount of 1 coin games.
- 17 2 Coin game** - The total amount of 2 coin games.
- 18 3 Coin game** - The total amount of 3 coin games.
- 19 4 Coin game** - The total amount of 4 coin games.
- 20 5 Coin game** - The total amount of 5 coin games.
- 21 6 Coin game** - The total amount of 6 coin games.
- 22 7 Coin game** - The total amount of 7 coin games.
- 23 8 Coin game** - The total amount of 8 coin games.
- 24 9 Coin game** - The total amount of 9 coin games.
- 25 10 Coin game** - The total amount of 10 coin games.
- 26 Burnin cycles** - The total amount of burnin cycles.

### **B 4 Feature**

- 01 Tckt = Teeth** - The total amount of tickets that have been awarded by achieving the teeth target.
- 02 Tckt = PUN/CHY** - The total amount of tickets that have been awarded by achieving PUN or CHY drop targets.
- 03 Tckt = Dunk** - The total amount of tickets that have been awarded by achieving the Dunk target.
- 04 Tckt = Bell** - The total amount of tickets that have been awarded by achieving the Bell target (captive ball).
- 05 Tckt = PIE lanes** - The total amount of tickets that have been awarded by completing PIE (PIE lanes).
- 06 Tckt = THROWPIES** - The total amount of tickets that have been awarded by completing THROWPIES (Top left rollover).
- 07 Tckt = Gratis** - The total amount of "Mercy" tickets that have been awarded.
- 08 Tckt = Jackpot** - The total amount of tickets that have been awarded by completing P•U•N•C•H•Y in order.
- 09 Tckt = Replay** - The total amount of tickets that have been awarded by achieving the Replay level.
- 10 Tckt = Hiscores** - The total amount of tickets awarded for achieving a hiscore level
- 11 Jackpots earned** - The total amount of jackpots earned.

### **B 5 Historiography**

- 01 Scores < 10M** - The total number of scores under 10,000,000.
- 02 Scores 10M- 19M** - The total number of scores between 10,000,000 and 19,999,990.
- 03 Scores 20M - 29M** - The total number of scores between 20,000,000 and 29,999,990.
- 04 Scores 30M - 39M** - The total number of scores between 30,000,000 and 39,999,990.
- 05 Scores 40M - 49M** - The total number of scores between 40,000,000 and 49,999,990.
- 06 Scores 50M >** - The total number of scores over 50,000,000.

# TESTS

## Tests

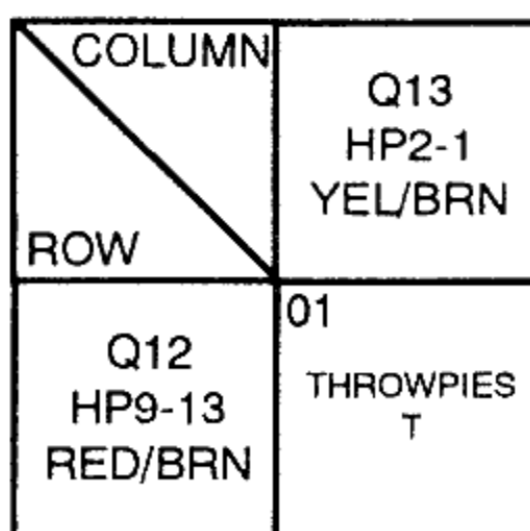
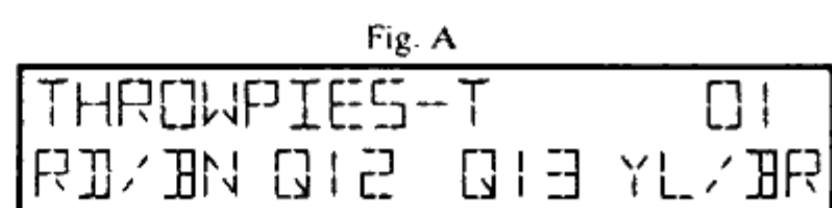
- 01 Service phone** - A contiguous United States toll free number is displayed. If there is a game problem or question give our service department a call. We are here to work with you to solve technical problems in any Alvin G. & Co. product. We will also be able to answer any general game question you may have.
- 02 Information** - This test aids in diagnosing problems by indicating a stuck switch or missing pinball. If the test finds no problems "ALL OK" will be displayed.
- 03 Matrix lamps** - This test causes all the controlled lamps to flash simultaneously. The display will read "ON" and "OFF" alternatively. All controlled lamps should flash. If any other result is indicated the system has detected a problem.
- 04 Single lamp** - This tests each lamp circuit individually. Press the "+" or "-" button to cycle through this test. The display will tell the operator which lamp should be lit. Refer to page 16 on "Understanding the matrices."
- 05 Display test** - This test will cycle through all display circuits. Each segment will light in sequence, followed by a fully lit digit. If a segment or digit did not light or stays lit all the time, the system has detected a problem. Press the "+" or "-" button to display the next segment.
- 06 Stuck switches** - This test finds all switches that are detected closed. The name, number, and wire color of each switch that is stuck will be displayed and for each closure a beep will be heard. If there are no switches closed the display will flash "NONE".
- 07 Inactive switch** - This displays each switch on the game that has not been activated within the past 25 games.
- 08 Switch test** - This test isolates a particular switch by blocking signals from all other switches. When a switch is closed it will show on the display the name, number, and wire color for approximately 2 seconds.
- 09 Cycle flashers** - This tests the flashlamp circuitry. The test will cycle through all the flashlamp circuits one at a time. To end flashlamp test press the enter button, all flashlamps should be off. If a flashlamp is on the system has detected an error.
- 10 Cycle solenoids** - This tests the solenoid circuitry. The test will cycle through all the solenoid circuits one at a time.
- 11 Single coils** - This tests each coil in the coil table. Use the "+" or "-" button to select the coil you wish to check. Press the enter button to check. For each closure of the enter button a flashlamp or solenoid should activate.
- 12 Sound test** - This tests the sound board. Use the "+" or "-" button to select the sound you wish to check. The choices are: Music, Voice, Sound.
- 13 Burnin cycles** - This tests the life of all the working parts in the game. This helps in finding intermittent problems. The burnin cycle alternates on and off of: all lamps, solenoids, G.I.s', alphanumeric display, flashers, and sounds. If one of the preceding items does not work the system has detected a problem.



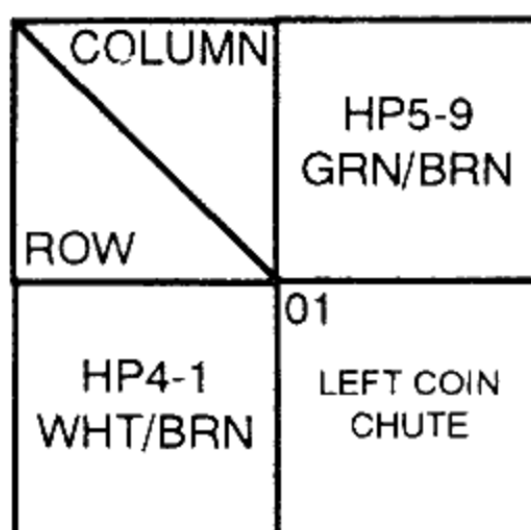
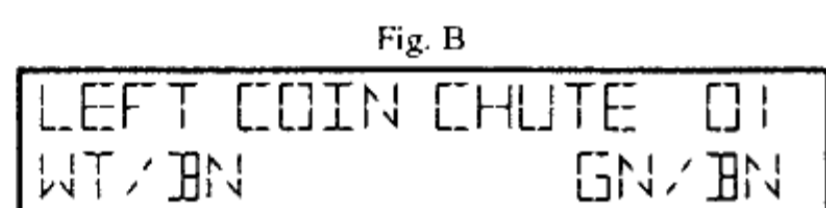
## UNDERSTANDING THE MATRICES

The matrices on the following pages are written for maximum understanding. Most of the words have been abbreviated in order to allow space for all the necessary component identifications. Each matrix, playfield location diagram, schematic drawing, and the alphanumeric display uses the exact same wording so there is no confusion on a given part. For example "Cannon" is used in the coil matrix, playfield location diagram, schematic diagram and displayed on the alphanumeric display. All of these when displayed or read will be seen exactly the same < spelling, word usage, and order. >

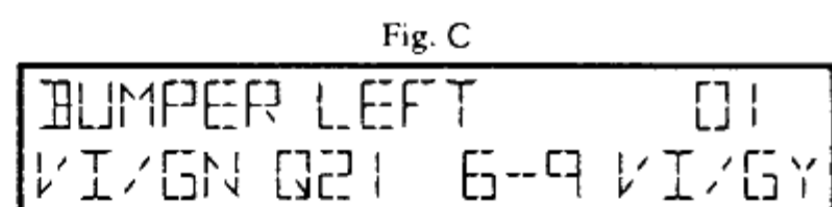
In the alphanumeric display there are various abbreviations displayed < see illustration below. >



THROWPIES-T	= Lamp name
01	= Matrix location
RD/BN	= Row wire color
YL/BR	= Column wire color
Q12	= Row MOSFET driver
Q13	= Column MOSFET driver



LEFT COIN CHUTE	= Switch name
01	= Matrix location
WT/BN	= Strobe wire color
GN/BN	= Return wire color



F## 01 Bumper left Q21 Vio/Grn Vio/Gry H6-9 CLL-006  
 F## 02 Bumper cen Q22 Vio/Grn Vio/Red H6-8 CLL-006  
 F## 03 Bumper right Q23 Vio/Grn Vio/Org H6-7 CLL-006  
 F## 04 Sling left Q24 Vio/Blk Vio/Yel H6-5 CLL-006

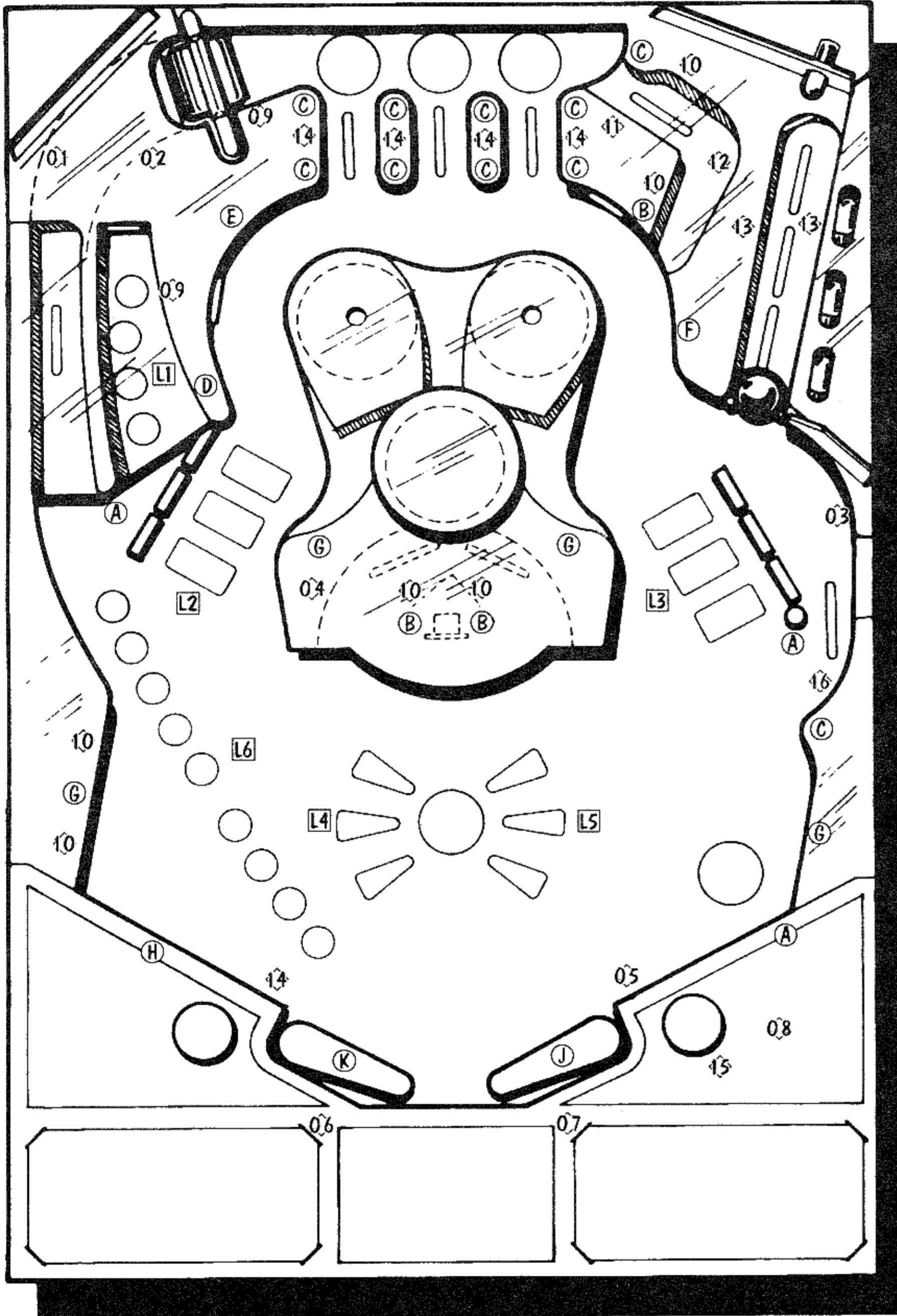
BUMPER LEFT	= Coil name
01	= Table location
VI/GRN	= Power wire color
Q21	= MOSFET driver
6-9	= CPU location connector HP6 pin 1
VI/GY	= Return wire color

The wire color is always displayed with the solid color and then the tracer. For example Wht/Blk is a white wire with a black tracer. A solid wire has the same color for the wire color and the tracer. For example red/red is a solid red wire. This means that the wire color is red and the tracer color is red.

The first first column in the chart below are wire colors that are displayed in the alphanumeric display. The second column are wire colors that are shown in the matrices, location diagrams, and schematics.

BN BRN = BROWN	BL BLU = BLUE
RD RED = RED	VI VIO = VIOLET
OR ORG = ORANGE	GY GRY = GRAY
YL YEL = YELLOW	WT WHT = WHITE
GN GRN = GREEN	BK BLK = BLACK

# BALL GUIDES, LAMP BOARDS, PLASTICS, & RUBBER RING LOCATIONS

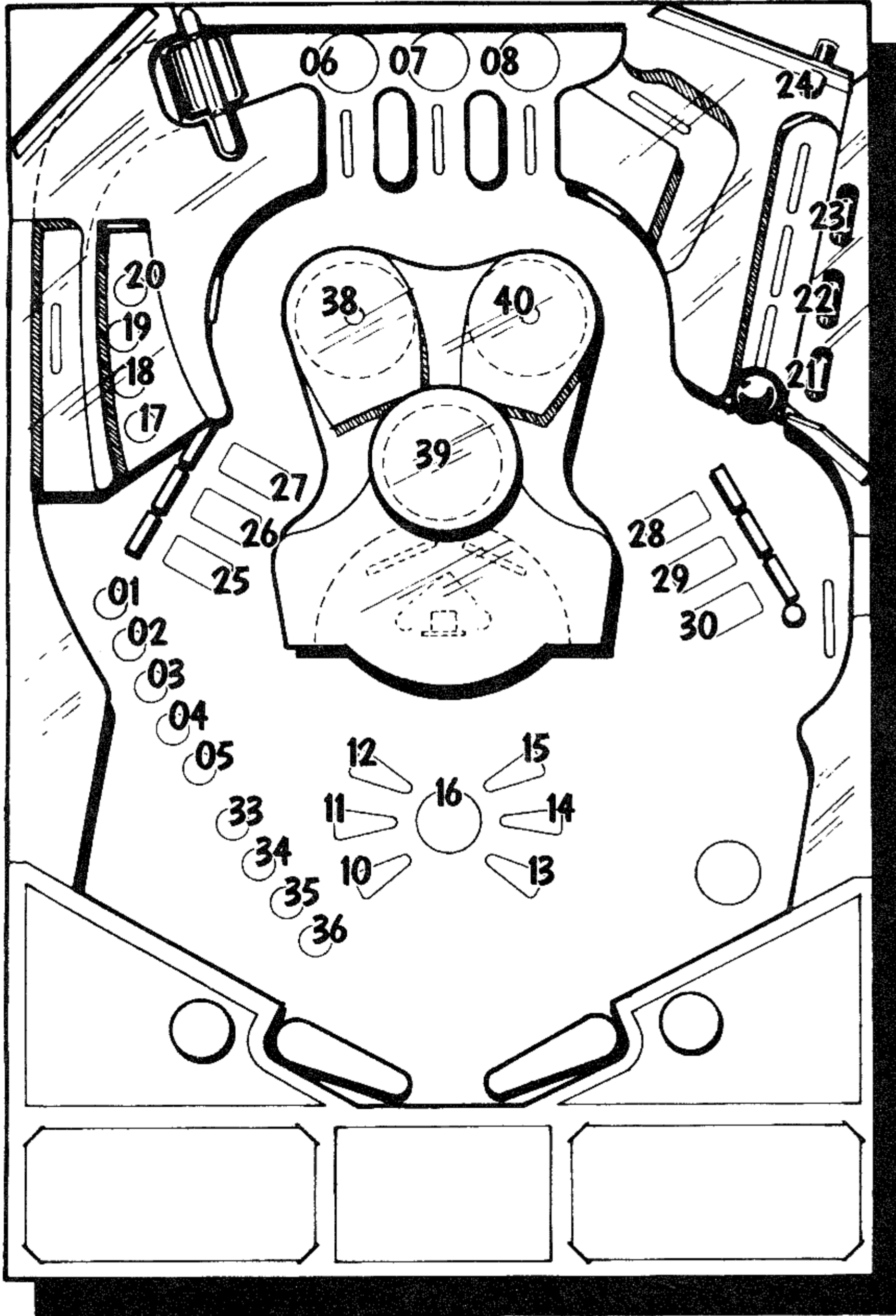


Description	Part No.	Qty.
<b>○ RUBBER RINGS</b>		
A Mini rubber bumper	RBR-017	3
B Black rubber bumper	RBR-012	3
C 7/16" Rubber ring	RBR-026	10
D 1" Rubber ring	RBR-020	1
E 1 1/4" Rubber ring	RBR-021	1
F 1 1/2" Rubber ring	RBR-022	1
G 2 1/2" Rubber ring	RBR-024	4
H 3" Rubber ring	RBR-027	1
J Flipper rubber red	RBR-007	1
K Flipper rubber blue	RBR-008	1
<b>◇ BALL GUIDES &amp; RAILS</b>		
01 Ball guide #19-6	ABG-019-6	1
02 Ball guide #17	ABG-017	1
03 Ball guide # 3-6T	ABG-003-6T	1
04 Ball guide # 1-6	ABG-001-6	1
05 Ball guide # 8	ABG-008	1
06 Ball guide # 6-6	ABG-006-6	1
07 Ball guide # 5	ABG-005	1
08 Ball guide # 6	ABG-006	1
09 Wire form 3 1/8"	WGS-025	2
10 Wire form 1"	WGS-008	6
11 Wire form 2"	WGS-016	1
12 Wire form curved short	WGB-005	1
13 Wire form curved long 3/4"	WGB-004	2
14 Wire form curved long 4 5/8"	WGS-006	7
15 Wire form curved long	WGL-037	1
16 Ball guide # 3-6B	ABG-003-6B	1
<b>□ LAMP BOARDS</b>		
L1 Dunk strobe lamp board, 4 pos.	PCA-015	1
L2 PUN lamp board, 3 pos.	PCA-010	1
L3 CHY lamp board, 3 pos.	PCA-010	1
L4 Left bowtie lamp board, 3 pos.	PCA-010	1
L5 Right bowtie lamp board, 3 pos.	PCA-010	1
L6 THROWPIES lamp board, 9 pos.	PCA-012	1
Punchy plastics set	BUT-006	1
Dunk Punchy	BUT-A06	1
Punchy's Piano	BUT-B06	1
Punchy's Nose	BUT-C06	1
Punchy The Clown key fob	BUT-D06	1
Ring the bell	BUT-E06	1
Punchy's Face	BUT-F06	1
Cloud	BUT-G06	1
Lane cover	BUT-H06	1
Lane cover	BUT-J06	1
Splash	BUT-K06	1
Stregh lamps	BUT-L06	1
WOW	BUT-M06	1
Back panel	BUT-N06	1
Gorilla	BUT-P06	1

# LAMP MATRIX

COLUMN ROW	Q13 HP2-1 YEL/BRN	Q14 HP2-2 YEL/RED	Q15 HP2-3 YEL/ORG	Q16 HP2-4 YEL/BLK	Q17 HP2-5 YEL/GRN	Q18 HP2-6 YEL/BLU	Q19 HP2-8 YEL/VIO	Q20 HP2-9 YEL/GRY
Q12 HP9-13 RED / BRN	01 THROWPIES T	02 THROWPIES H	03 THROWPIES R	04 THROWPIES O	05 THROWPIES W	06 PIE LANE P	07 PIE LANE I	08 PIE LANE E
Q11 HP9-11 RED / BLK	09 NOT USED	10 BOWTIE LEFT BOT	11 BOWTIE LEFT CEN	12 BOWTIE LEFT TOP	13 BOWTIE RIGHT BOT	14 BOWTIE RIGHT CEN	15 BOWTIE RIGHT TOP	16 BOWTIE CENT
Q10 HP9-10 RED / ORG	17 DUNK TANK BOT	18 DUNK TANK #2	19 DUNK TANK #3	20 DUNK TANK TOP	21 WIMPY	22 NOT BAD	23 GOOD TRY	24 BELL TARGET
Q9 HP9-9 RED / YEL	25 PUNCHY P	26 PUNCHY U	27 PUNCHY N	28 PUNCHY C	29 PUNCHY H	30 PUNCHY Y	31 NOT USED	32 GAME START
Q8 HP9-8 RED / GRN	33 THROWPIES P	34 THROWPIES I	35 THROWPIES E	36 THROWPIES S	37 NOT USED	38 BUMPER LEFT	39 BUMPER CENTER	40 BUMPER RIGHT
Q7 HP9-7 RED / BLU	41 NOT USED	42 NOT USED	43 NOT USED	44 NOT USED	45 NOT USED	46 NOT USED	47 NOT USED	48 NOT USED
Q6 HP9-6 RED / VIO	49 NOT USED	50 NOT USED	51 NOT USED	52 NOT USED	53 NOT USED	54 NOT USED	55 NOT USED	56 NOT USED
Q5 HP9-5 RED / GRY	57 NOT USED	58 NOT USED	59 NOT USED	60 NOT USED	61 NOT USED	62 NOT USED	63 NOT USED	64 NOT USED
Q4 HP9-4 GRY / RED	65 NOT USED	66 NOT USED	67 NOT USED	68 NOT USED	69 NOT USED	70 NOT USED	71 NOT USED	72 NOT USED
Q3 HP9-3 GRY / BLK	73 BACK #1	74 BACK #2	75 BACK #3	76 BACK #4	77 BACK #5	78 BACK #6	79 BACK #7	80 BACK #8
Q2 HP9-2 GRY / YEL	81 BACK #9	82 NOT USED	83 NOT USED	84 NOT USED	85 NOT USED	86 NOT USED	87 NOT USED	88 NOT USED
Q1 HP9-1 GRY / GRN	89 NOT USED	90 NOT USED	91 NOT USED	92 NOT USED	93 NOT USED	94 NOT USED	95 NOT USED	96 NOT USED

# LAMP LOCATIONS



Description	Lamp No.	Socket Part No.
01 THROWPIES T	#555	LBK-011
02 THROWPIES H	#555	LBK-011
03 THROWPIES R	#555	LBK-011
04 THROWPIES O	#555	LBK-011
05 THROWPIES W	#555	LBK-011
06 PIE lane P	#44	LBK-010
07 PIE lane I	#44	LBK-010
08 PIE lane E	#44	LBK-010
09 <i>Not used</i>		
10 Bowtie left bot	#555	LBK-011
11 Bowtie left cen	#555	LBK-011
12 Bowtie left top	#555	LBK-011
13 Bowtie right bot	#555	LBK-011
14 Bowtie right cen	#555	LBK-011
15 Bowtie right top	#555	LBK-011
16 Bowtie center	#44	LBK-010
17 Dunk tank bot	#555	LBK-011
18 Dunk tank #2	#555	LBK-011
19 Dunk tank #3	#555	LBK-011
20 Dunk tank top	#555	LBK-011
21 Wimpy	#44	LBK-004
22 Not Bad	#44	LBK-004
23 Good Try	#44	LBK-004
24 Bell target	#44	LBK-016
25 PUNCHY P	#555	LBK-011
26 PUNCHY U	#555	LBK-011
27 PUNCHY N	#555	LBK-011
28 PUNCHY C	#555	LBK-011
29 PUNCHY H	#555	LBK-011
30 PUNCHY Y	#555	LBK-011
31 <i>Not used</i>		
32 Game start	#555	
33 THROWPIES P	#555	LBK-011
34 THROWPIES I	#555	LBK-011
35 THROWPIES E	#555	LBK-011
36 THROWPIES S	#555	LBK-011
37 <i>Not used</i>		
38 Bumper left	#555	
39 Bumper center	#555	
40 Bumper right	#555	
41 <i>Not used</i>		
- <i>Thru</i>		
72 <i>Not used</i>		
73 Back #1	#555	
74 Back #2	#555	
75 Back #3	#555	
76 Back #4	#555	
77 Back #5	#555	
78 Back #6	#555	
79 Back #7	#555	
80 Back #8	#555	
81 Back #9	#555	

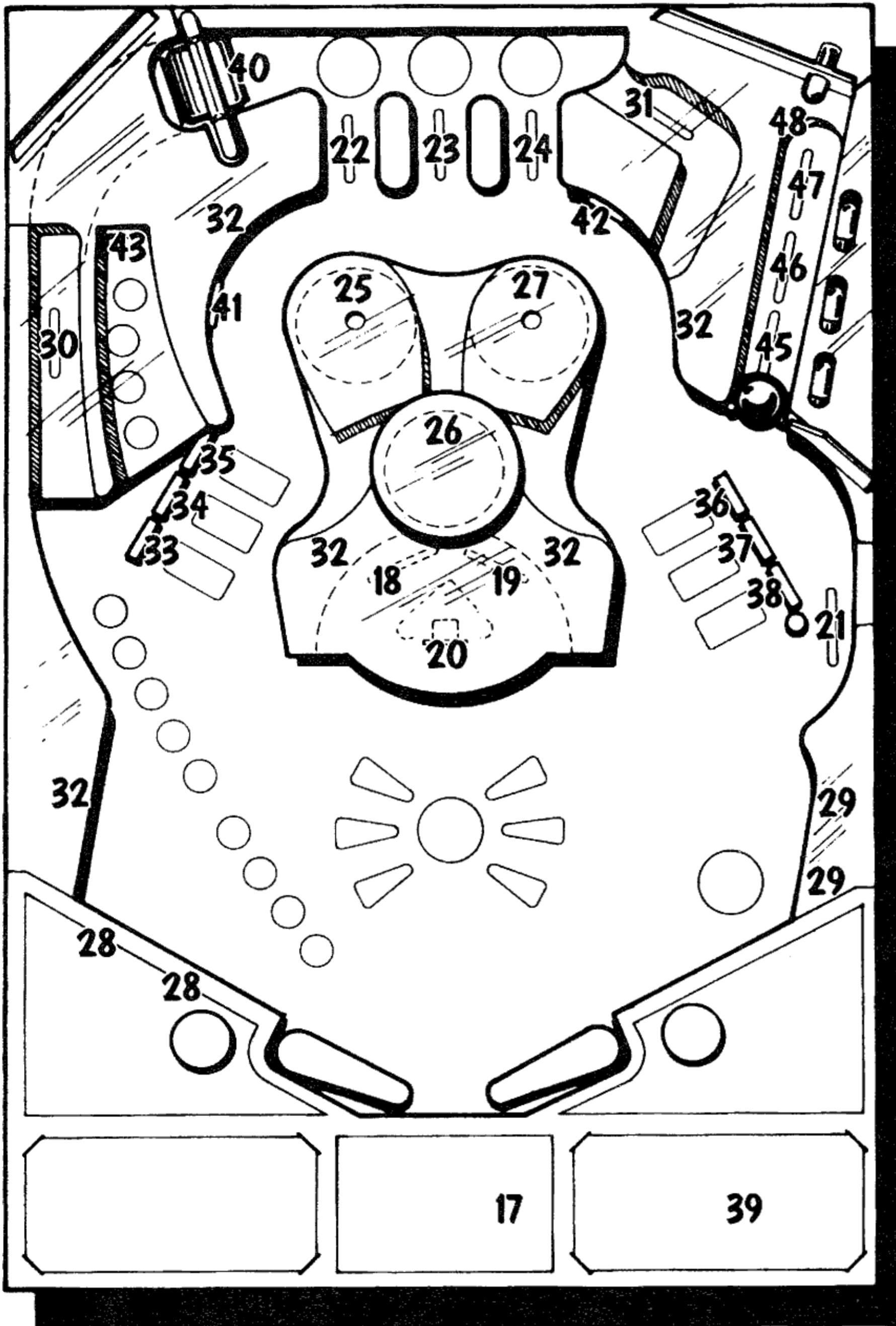
#44 Lamp, bayonet base  
 #555 Lamp, wedge base

Lamp Part No.  
 LMP-002  
 LMP-003

# SWITCH MATRIX

COLUMN ROW	HP5-9 GRN / BRN	HP5-7 GRN / RED	HP5-6 GRN / ORG	HP5-5 GRN / YEL	HP5-4 GRN / BLK	HP5-3 GRN / BLU	HP5-2 GRN / VIO	HP5-1 GRN / GRY
HP4-1 WHT / BRN	01 LEFT COIN CHUTE	02 RIGHT COIN CHUTE	03 CENTER COIN CHUTE	04 EXTRA COIN CHUTE	05 SLAM	06	07	08
HP4-2 WHT / RED	09 GAME START	10 TILT	11	12	13	14	15 TEST PLUS	16 TEST MINUS
HP4-3 WHT / ORG	17 OUTHOLE	18 MOUTH LEFT	19 MOUTH RIGHT	20 TEETH TARGET	21 GORILLA LANE	22 PIE LANE P	23 PIE LANE I	24 PIE LANE E
HP4-4 WHT / YEL	25 BUMPER LEFT	26 BUMPER CENTER	27 BUMPER RIGHT	28 SLING LEFT	29 SLING RIGHT	30 THROWPIES LANE	31 SLIDE LANE	32 REBOUNDERS
HP4-5 WHT / GRN	33 PUNCHY P	34 PUNCHY U	35 PUNCHY N	36 PUNCHY C	37 PUNCHY H	38 PUNCHY Y	39 CANNON	40 SPINNER
HP4-6 WHT / BLU	41 TARGET HA HA	42 TARGET HE HE	43 DUNK TANK	44	45 WIMPY	46 NOT BAD	47 GOOD TRY	48 BELL TARGET
HP4-7 WHT / VIO	49	50	51	52	53	54	55	56
HP4-8 WHT / GRY	57	58	59	60	61	62	63	64
HP4-9 ORG / RED	65	66	67	68	69	70	71	72
HP4-10 ORG / BLK	73	74	75	76	77	78	79	80
HP4-13 ORG / YEL	81	82	83	84	85	86	87	88
HP4-14 ORG / GRN	89	90	91	92	93	94	95	96

# SWITCH LOCATIONS



Description	Part No.
01 Left coin chute	
02 Right coin chute	
03 Center coin chute	
04 Extra coin chute	
05 Slam	SLM-001
06 Not used	
07 Not used	
08 Not used	
09 Game start	CBB-001
10 Tilt	PLM-001
11 Not used	
12 Not used	
13 Not used	
14 Not used	
15 Test plus	TSW-001
16 Test minus	TSW-001
17 Outhole	SBA-001
18 Mouth left	MSA-005
19 Mouth right	SBA-001
20 Teeth target	STR-002
21 Gorilla lane	SBA-001
22 PIE lane P	SBA-001
23 PIE lane I	SBA-001
24 PIE lane E	SBA-001
25 Bumper left	
26 Bumper center	
27 Bumper right	
28 Sling left < 2 >	STR-001
29 Sling right < 2 >	STR-001
30 THROWPIES lane	SBA-001
31 Slide lane	SBA-001
32 Rebounders < 5 >	STR-001
33 PUNCHY P	DTS-001
34 PUNCHY U	DTS-001
35 PUNCHY N	DTS-001
36 PUNCHY C	DTS-001
37 PUNCHY H	DTS-001
38 PUNCHY Y	DTS-001
39 Cannon	SBA-001
40 Spinner	SPS-001
41 Target Ha Ha	STR-004
42 Target He He	STR-004
43 Dunk tank	STR-004
44 Not used	
45 Wimpy	SBA-001
46 Not Bad	SBA-001
47 Good Try	SBA-001
48 Bell target	STR-002
49 Not used	
- Thru	
96 Not used	

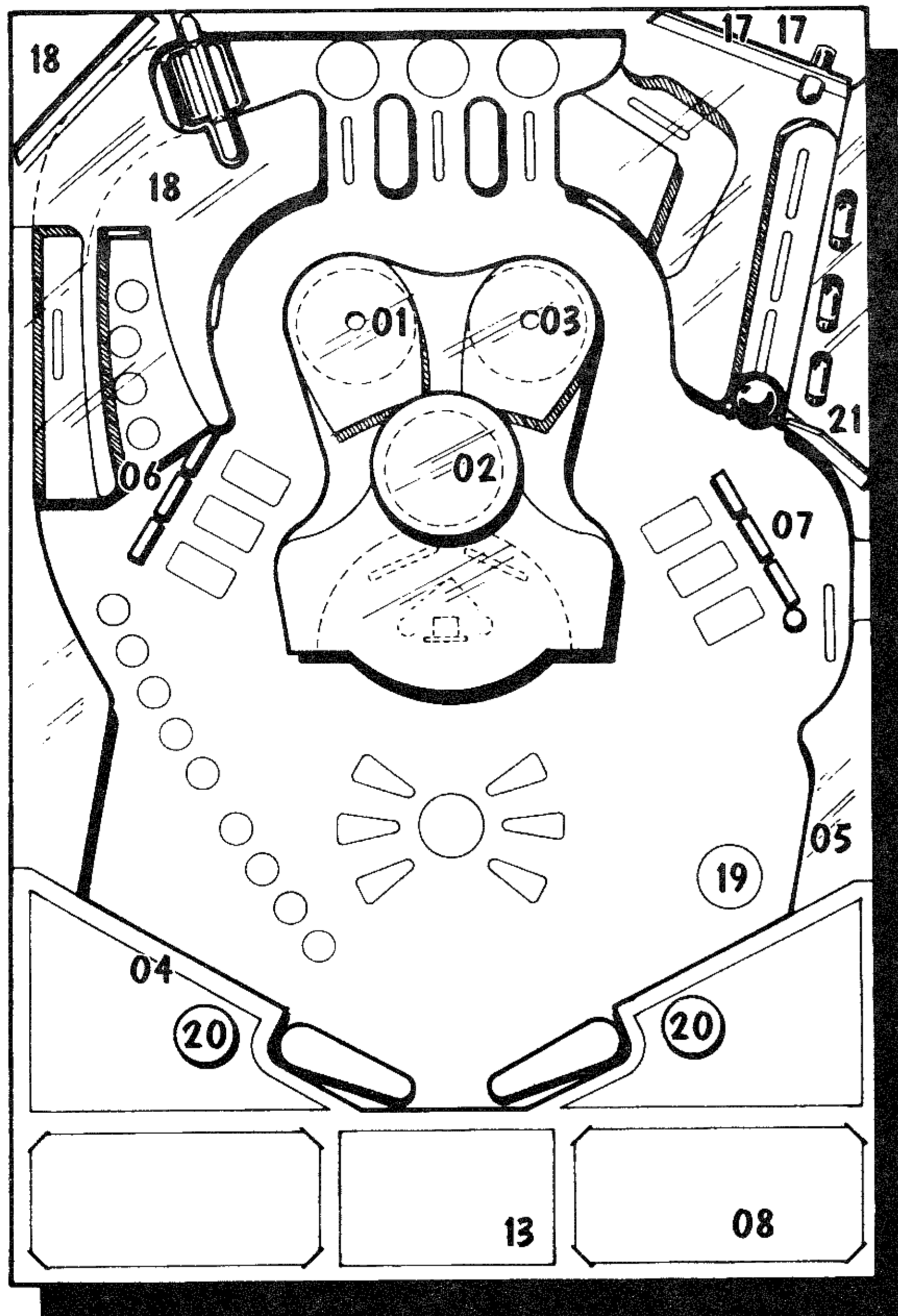
## COIL TABLE

Fuse	Coil No.	Description	Transistor	Power	Return	Connector	Part no.
F14	1	Bumper left	Q21	Vio/Grn	Vio/Gry	HP6-9	CLL-006
F14	2	Bumper center	Q22	Vio/Grn	Vio/Red	HP6-8	CLL-006
F14	3	Bumper right	Q23	Vio/Grn	Vio/Org	HP6-7	CLL-006
F15	4	Sling left	Q24	Vio/Blk	Vio/Yel	HP6-5	CLL-006
F15	5	Sling right	Q25	Vio/Blk	Vio/Grn	HP6-4	CLL-006
F13	6	PUN bank	Q26	Vio/Yel	Vio/Blu	HP6-3	CLL-004
F13	7	CHY bank	Q27	Vio/Yel	Vio/Blk	HP6-2	CLL-004
F14	8	Cannon	Q28	Vio/Grn	Vio/Brn	HP6-1	CLL-006
	9	< Not used >	Q29				
	10	< Not used >	Q30				
	11	< Not used >	Q31				
	12	< Not used >	Q32				
F15	13	Outhole	Q33	Vio/Blk	Brn/Grn	HP6-13	CLL-006
F15	14	Knocker	Q34	Vio/Blk	Brn/Blu	HP6-12	CLL-006
F18	15	Flasher relay	Q35	Red/Vio	Brn/Vio	HP6-11	PCA-007
F17	16	Playfield GI relay	Q36	Red/Grn	Brn/Gry	HP6-10	REL-001
F18	17	Flasher Bell < 2 >	Q37	Vio/Wht	Blk/Brn	HP7-8	#67
F18	18	Flasher Dunk < 2 >	Q38	Vio/Wht	Blk/Red	HP7-7	#67
F18	19	Flasher Cannon < 1 >	Q39	Vio/Wht	Blk/Org	HP7-6	#67
F18	20	Flasher bot arch < 2 >	Q40	Vio/Wht	Blk/Yel	HP7-5	#67
F18	21	Flasher Gorilla < 1 >	Q41	Vio/Wht	Blk/Grn	HP7-4	#67
F18	22	Flasher back 1 < 4 >	Q42	Vio/Wht	Blk/Blu	HP7-3	#906
F18	23	Flasher back 2 < 4 >	Q43	Vio/Wht	Blk/Vio	HP7-2	#906
F18	24	Flasher back 3 < 4 >	Q44	Vio/Wht	Blk/Gry	HP7-1	#906
	25	< Not used >	Q45				
	26	< Not used >	Q46				
F17	27	Flipper relay	Q47	Red/Grn	Blu/Vio	HP7-15	REL-003
	28	< Not used >	Q48				
F17	29	Backbox GI relay	Q49	Red/Grn	Blu/Brn	HP7-12	REL-001
	30	< Not used >	Q50				
F19	31	Tickets	Q51	Vio/Brn	Blu/Org	HP7-10	TDA-001
	32	< Not used >	Q52				

*These coils are not directly controlled by the CPU.*

F16		Flipper left		Vio/Org	Blu/Grn		CLL-002
F16		Flipper right		Vio/Org	Blu/Gry		CLL-002

# COIL LOCATIONS



Description	Assembly Part No.
01 Bumper left	ABM-004
02 Bumper center	ABM-004
03 Bumper right	ABM-004
04 Slings left	ABK-006
05 Slings right	ABK-006
06 PUN bank	ADT-001
07 CHY bank	ADT-001
08 Cannon	ABK-007
09 Not used	
10 Not used	
11 Not used	
12 Not used	
13 Outhole	ABK-007
14 Knocker	AKN-004
15 Flasher relay	PCA-007
16 Playfield GI relay	REL-001
17 Flasher Bell < 2 >	LBK-009 / LBK-015
18 Flasher Dunk < 2 >	LBK-015
19 Flasher Cannon < 1 >	LBK-014
20 Flasher bottom arch < 2 >	LBK-009
21 Flasher Gorilla < 1 >	LBK-009
22 Flasher back 1 < 4 >	
23 Flasher back 2 < 4 >	
24 Flasher back 3 < 4 >	
25 Not used	
26 Not used	
27 Flipper relay	REL-003
28 Not used	
29 Backbox GI relay	REL-001
30 Not used	
31 Tickets	TDA-001
32 Not used	

*These coils are not directly controlled by the CPU.*

Left flipper	AFF-L04
Right flipper	AFF-R04



## GAME ROM SUMMARY

board identification	socket #	type	part #	
CPU / driver board		U2 < program >	27C512	EPC-061
Sound board		U27 < program >	27C512	EPS-061
		SROMO < samples >	27C020	EPS-082

To order a replacement CPU, or sound rom< s> from an authorized Alvin G. & Co. distributor, specify the part number & information indicated on the rom label.

For Example the cpu eprom reads EPC-061-R01 which is divided into three seperate parts.

EPC = CPU EROM

061 = Game #6 Location #1

R01 = Revision 1

## COIL WINDINGS TABLE

Part No.	AWG	Turns	Diode	DCR	AWG	Turns	Diode	DCR	Color	Purpose
CLL-002	26	1700	1N4004	15Ω	30	2600		90Ω	Yellow	High power
CLL-004	28	1750	1N4004	24Ω					White	Med power
CLL-006	26	1305	1N4004	11.8Ω					White	Med power

## FUSE IDENTIFICATION TABLE

The Numbers in the first column are the fuse Identification numbers. In the second column the numbers are specific coil numbers, voltages and playfield & Backbox areas. The third column shows the proper fuse rating that should be installed. The fourth column shows the wire color connected to that fuse.

Fuse	Protects	Rating	Wire color
F1	Line Fuse	5A Slo-Blo	
F3	4.5 VAC	1A Slo-Blo	
F4	4.5 VAC	1A Slo-Blo	
F5	30 VAC	1A Slo-Blo	
F6	9 VAC	3A Slo-Blo	
F7	16 VAC	8A Slo-Blo	
F8	51 VAC	8A Slo-Blo	
F9	6 VAC	8A Slo-Blo	
F10	6 VAC	8A Slo-Blo	
F11	13.5 VAC	3A Slo-Blo	
F12	13.5 VAC	3A Slo-Blo	
F13	Solenoid # 06, 07	1A Slo-Blo	Vio / Yel
F14	Solenoid # 01, 02, 03, 08	1 1/2A Slo-Blo	Vio / Grn
F15	Solenoid # 04, 05, 13, 14	1 1/2A Slo-Blo	Vio / Blk
F16	Left & Right Flipper	4A Slo-Blo	Vio / Org
F17	Solenoid # 16, 27, 29	1/4A Slo-Blo	Red / Grn
F18	Solenoid #15	4A Slo-Blo	Red / Vio
F19	Ticket dispenser	3A Slo-Blo	Vio / Brn
F20	Playfield GIs'	4A Slo-Blo	Wht / Blu
F21	Playfield GIs'	4A Slo-Blo	Wht / Vio
F22	Insert GIs'	4A Slo-Blo	Wht / Brn
F23	Insert GIs'	4A Slo-Blo	Wht / Gry

## PRICING TABLE

Country	Left	Center	Right	Extra	Games / Coin	Display	a	b	c	d	e	f
Antilles	25¢		1G		1/25¢, 4/1 Guilder	ANTILLES	01	01	04	00	01	00
Argentina	10¢	10¢	10¢		1/1 token	ARGENTINA	01	01	01	00	01	00
Australia	\$2.00	\$1.00	20¢		1/\$1, 3/\$2	AUSTRALIA	10	05	01	00	05	10
Austria	5Sch	10Sch	10Sch		1/2X5Sch, 3/2X10Sch	AUSTRIA	01	02	02	00	02	04
Belgium	20Fr		50Fr		1/20, 3/50 Franc	BELGIUM	06	00	15	00	05	00
Canada 1	25¢		25¢		1/25¢, 4/\$1	CANADA 1	01	04	01	00	01	00
Canada 2	25¢		25¢		1/50¢, 2/75¢, 3/\$1	CANADA 2	03	12	03	00	04	00
Chile	Token		Token		1/1 Token	CHILE	01	04	01	00	01	00
Denmark	1Kr	5Kr	10Kr		1/2X1Kr, 3/5Kr, 7/10Kr	DENMARK	03	15	30	00	05	30
Finland	1Mk		5Mk		1/2X1Mka, 3/5Markka	FINLAND	03	00	15	00	05	00
France 1	1Fr	5Fr	10Fr		1/3X1Fr, 2/5Fr, 5/10Fr	FR 5/10 FR	02	10	20	00	05	20
France 2	1Fr	5Fr	10Fr		1/2Fr, 3/5Fr, 7/10Fr	FR 7/10 FR	03	15	30	00	05	30
France 3	5Fr	10Fr	10Fr		1/5Fr, 3/10Fr, 7/2X10Fr	FR 7/20 FR	03	06	12	00	02	12
France 4	5Fr	10Fr	10Fr		2/5Fr, 4/10Fr, 9/2X10Fr	FR 9/20 FR	02	04	08	00	01	08
France 5	5Fr	10Fr	10Fr		2/5Fr, 5/10Fr, 11/2X10Fr	FR 11/20 FR	05	10	20	00	02	20
Germany 1	1DM	2DM	5DM		1/1 DM, 2/2 DM, 6/5 DM	GER 6/5 DM	06	12	30	00	05	00
Germany 2	1DM	2DM	5DM		1/1 DM, 2/2 DM, 7/5 DM	GER 7/5 DM	06	12	30	00	05	30
Greece	10D	20D	50D		1/2X10D, 1/20D, 3/50 1/1	GREECE	03	06	15	00	05	00
Hungary	20F		20F		1/1X20F	HUNGARY	01	00	01	00	01	00
Italy	500L		500L		1/500 Lire	ITALY	01	00	01	00	01	00
Japan	100Y		100Y		1/100Y	JAPAN	01	00	01	00	01	00
Korea	100w		100w		1/100won	KOREA	01	00	01	00	01	00
Netherlands	1Fl		2.5Fl		1/1Hfl, 3/2.5 Holland	NETHERLAND	01	00	03	00	01	00
New Zealand	\$1		\$2		1/\$1, 3/2X\$1, 3/\$2	N ZEALAND	01	00	02	00	01	02
Norway	5Kr		10Kr		1/1X5, 2/1X10 Kroner	NORWAY	01	00	02	00	01	00
Spain	100Pta		500Pta		1/100, 5/500 Peseta	SPAIN	01	00	05	00	01	00
Sweden	5Kr	5Kr	5Kr		1/5 Krona	SWEDEN	01	01	01	00	01	00
Swiss	1Sfr	2Sfr	5Sfr		1/1 Fr, 3/2 Fr, 7/5 Fr	SWISS	01	02	05	00	01	00
Taiwan	25¢		25¢		1/50¢, 2/75¢, 3/\$1	TAIWAN	03	12	03	00	04	00
United Kingdom	10P	50P	£1	20P	1/5 X 10P, 1/50P, 3/£1	U Kingdom	01	05	10	02	05	10
United States 1	25¢		25¢		1/25, 4/\$1	USA 4/\$1	01	04	01	00	01	00
United States 2	25¢		25¢		1/50¢, 2/75¢, 3/\$1	USA 3/\$1	03	12	03	00	04	00
United States 3	25¢		25¢		1/75¢, 2/\$1	USA 2/\$1	01	04	01	00	02	00
Custom						CUSTOM	01	01	01	00	01	00

Columns marked a, b, c, d, e, & f represent the settings for the particular selection. These can be used as a reference to set the custom pricing menu choice. Each lettered column has a full description on page 11.

## FACTORY SETTINGS

Using A507 Factory reset will reset all the adjustments to the settings shown below.

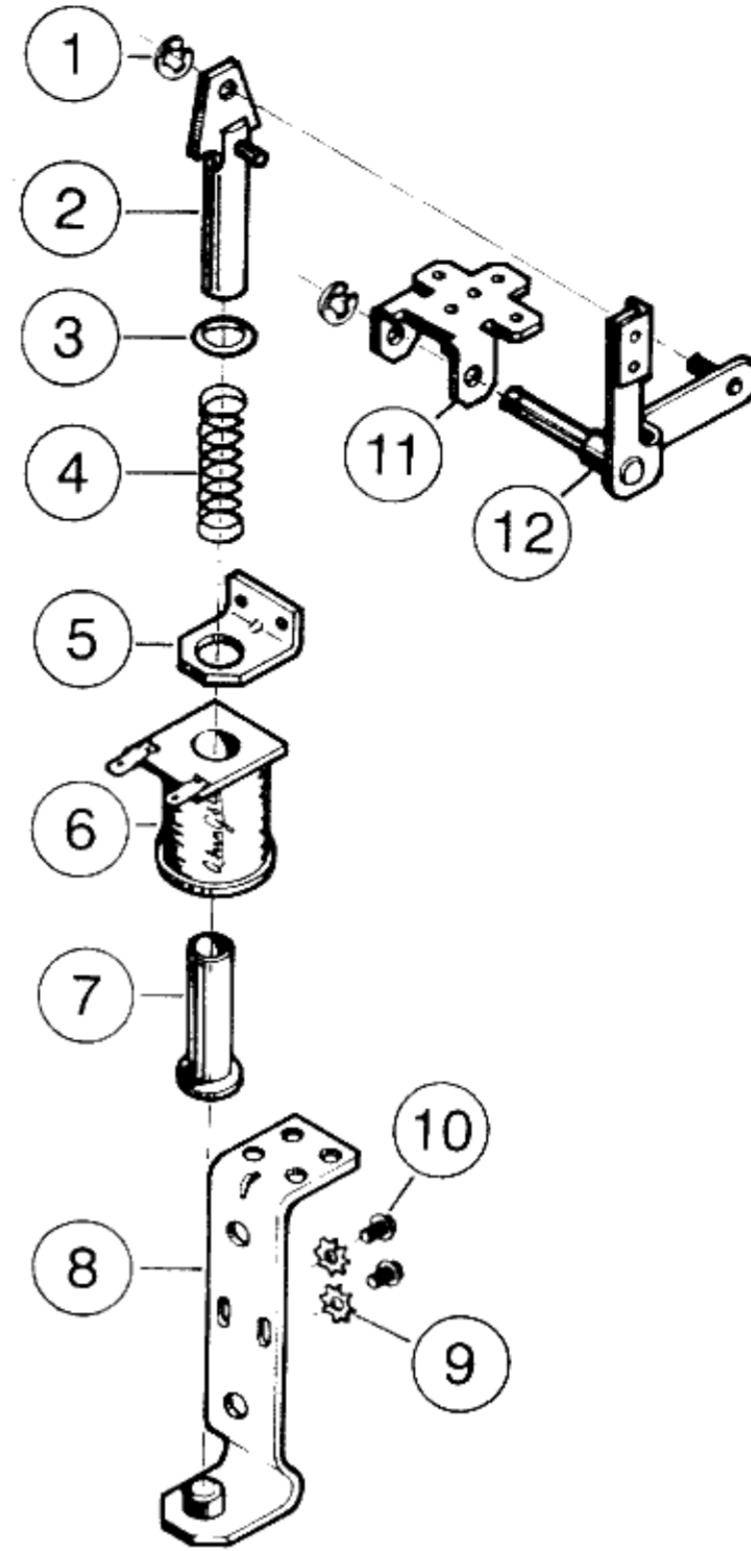
*Note: this also resets all the Bookkeeping features to 0 including B2 Earnings, B102 Grand total coins, and B104 Grand tickets.*

Menu #	Adjustment description	Setting
A101	Game style	Redempt
A102	Replay at	15,000,000
A103	Replay type	None
A104	Replay tickets	10
A105	Replay percent	10
A106	Max freegames	1
A107	Replay Boost	20%
A108	Ball per game	1
A109	Match percent	10
A110	Language	English
A111	Attract mode	5 Minutes
A112	Tilt warnings	2 warnings
A201	Ticket payout	Medium
A202	Max tickets	20
A203	Min tickets	5
A204	Tickets allowed	Yes
A205	Coins per game	5
A206	Teeth tickets	2
A207	PUN/CHY tickets	1
A208	Dunk tickets	3
A209	Bell tickets	2
A210	PIE tickets	1
A211	THROWPIES tickets	5
A212	Service voice	Yes
A213	Recall bonus	Yes
A214	JKPT TCKT limit	500

Menu #	Adjustment description	Setting
A301	Pricing	USA 4/\$1
A302	Maximum credits	20
A303	Free play	No
A304	Display credits	Yes
A305	Coin meter counts	Coins
A401	HSTD allowed	Yes
A402	Credits HSTD1	1
A403	Credits HSTD2	0
A404	Reset HS every	700
A405	Backup HSTD	8,000,000
A501	Clear audits	No
A502	Clear coins audits	No
A503	Reset HSTD	No
A504	Clear tickets	No
A505	Clear credits	No
A506	Custom message	ON
A507	Factory reset	No
A508	Install country	USA
A509	Flasher intensity	Normal
A510	Tournament	No

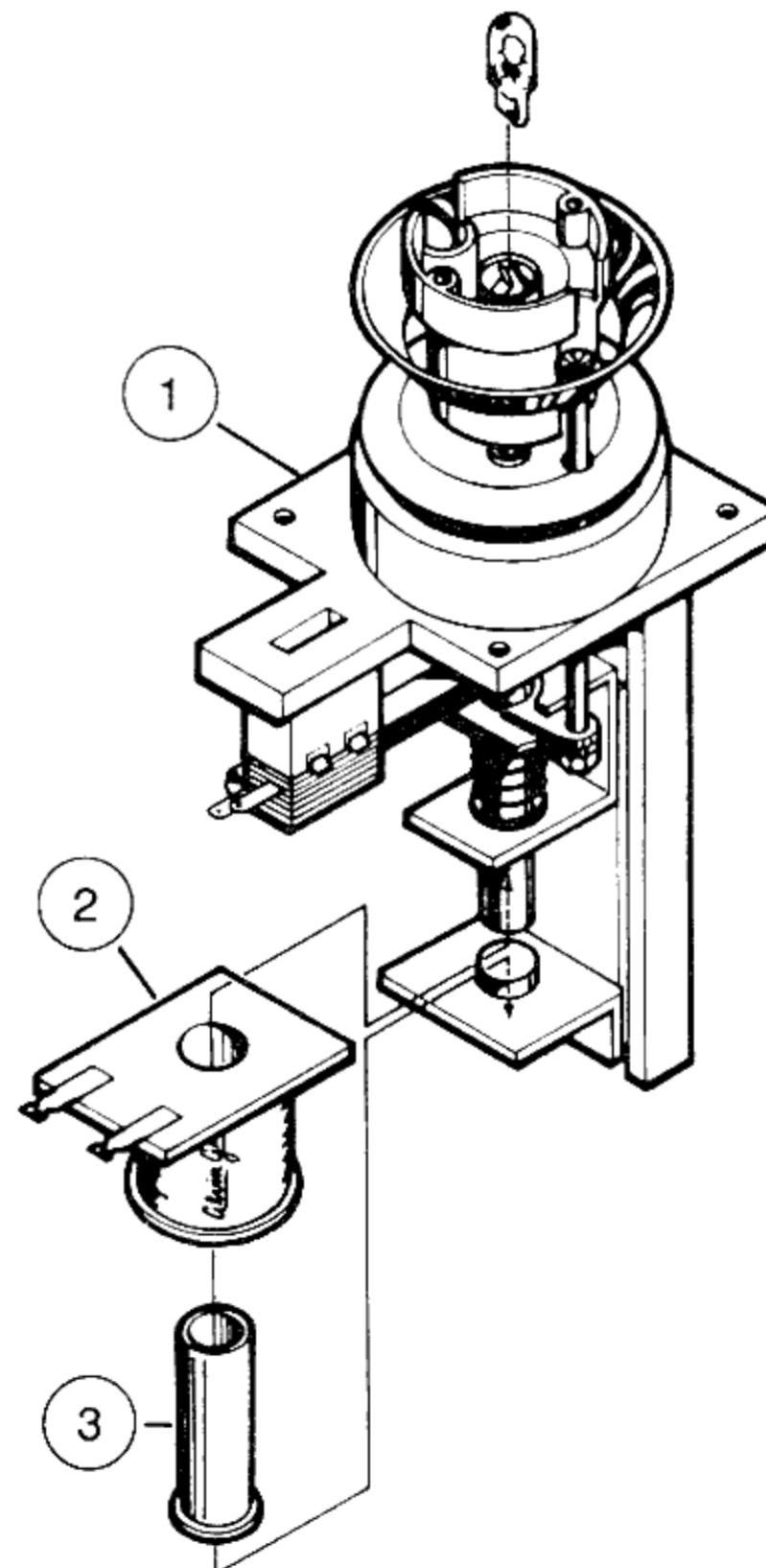
## ABK-007 KICKER ASSEMBLY

ITEM	DESCRIPTION	QTY	PART NO.
1	E-Ring 5144-21	2	HRG-002
2	Ling and plunger assembly	1	LAP-002
3	Cup washer	1	LWH-001
4	Spring	1	SRG-002
5	Coil mounting bracket	1	BSL-031
6	Coil	1	CLL-006
7	Sleeve	1	SLC-002
8	Stop stud assembly	1	ASS-003
9	#8 Ext tooth lock washer	2	HLW-006
10	#8-32 X 3/8 HWH	2	HMS-019
11	Fulcrum	1	SLF-001
12	Kicker arm	1	SLA-006

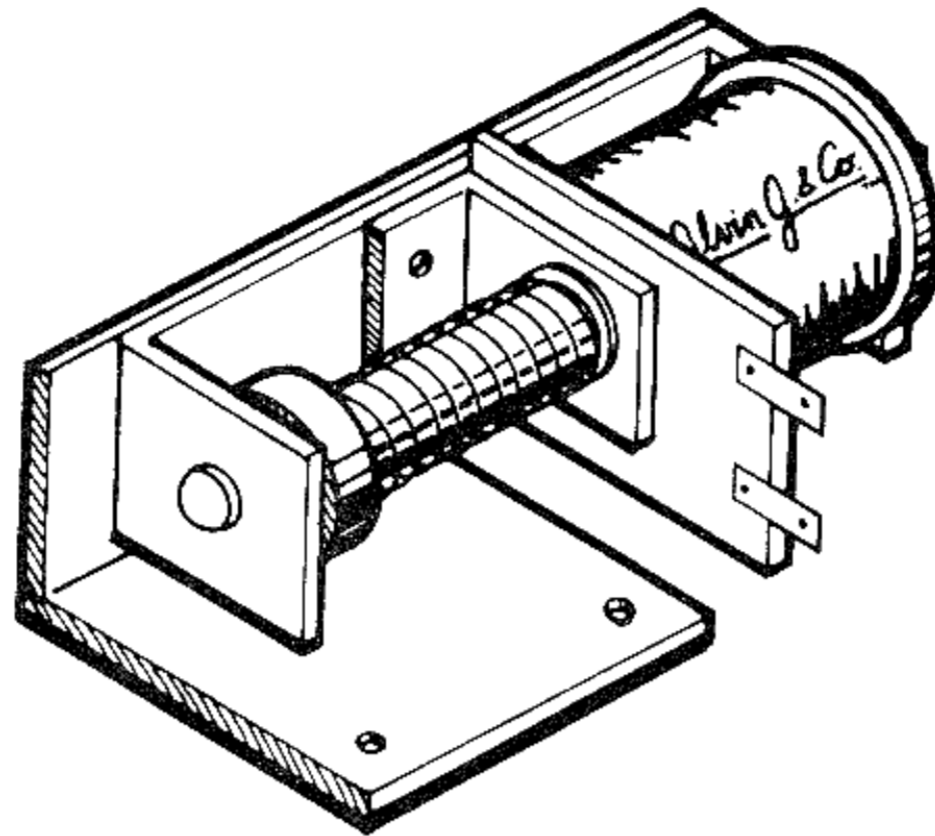


## ABM-004 POP BUMPER ASSEMBLY

ITEM	DESCRIPTION	QTY	PART NO.
1	Pop bumper assembly	1	ABM-004
2	Coil	1	CLL-006
3	Sleeve	1	SLC-008
	Wedge base bulb #555	1	LMP-003

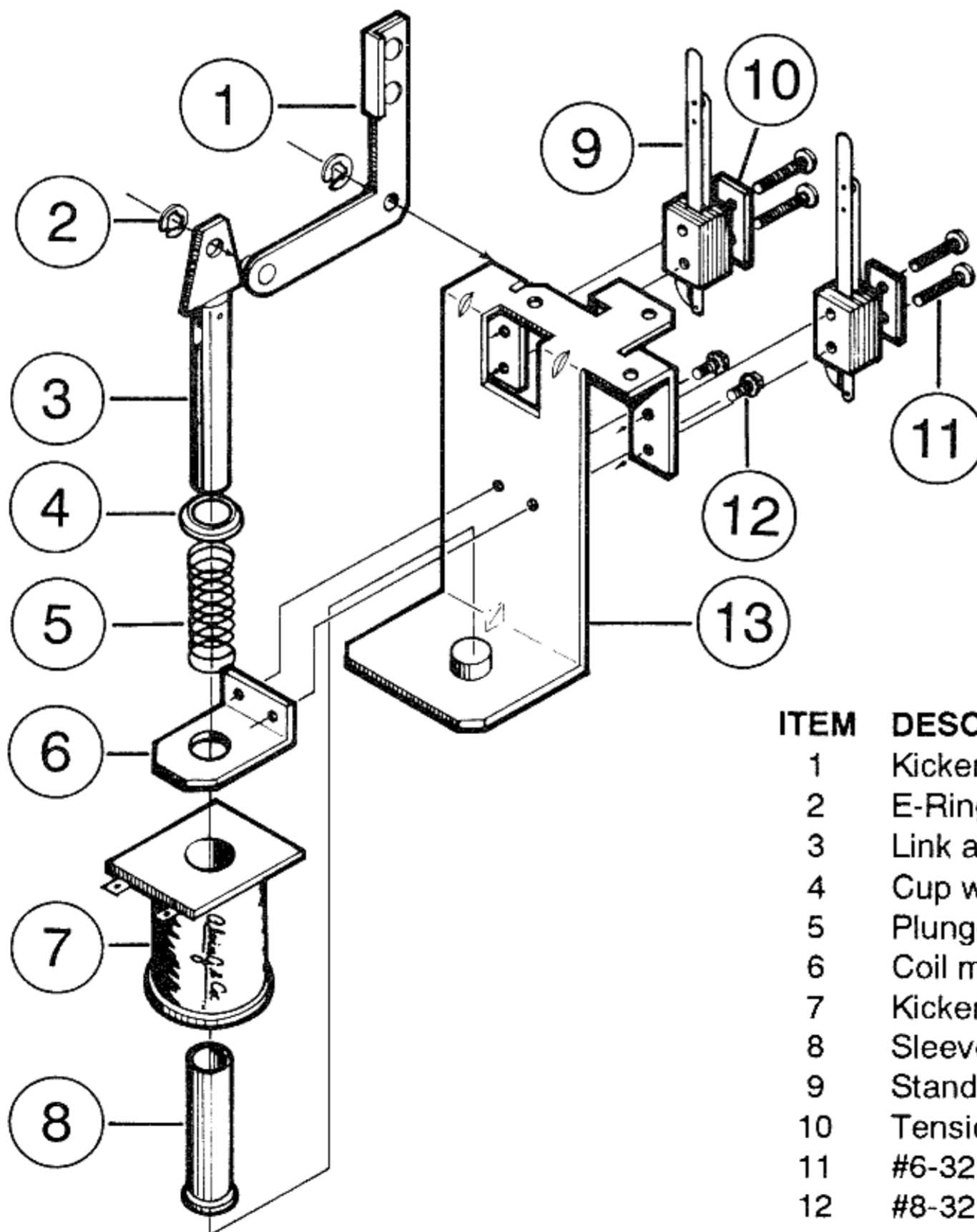


## KNR-001 KNOCKER ASSEMBLY



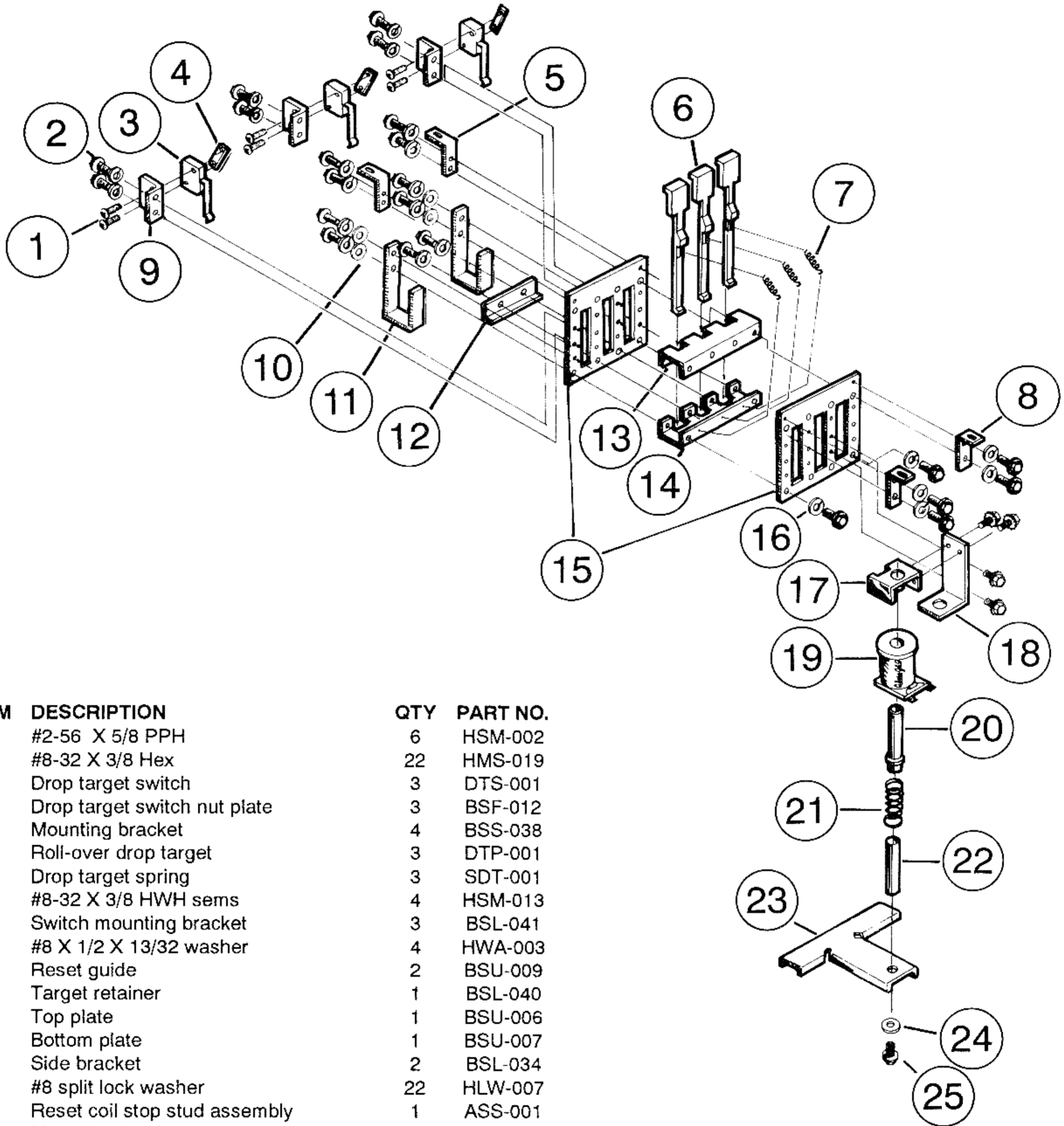
ITEM	DESCRIPTION	QTY	PART NO.
1	Knocker assembly	1	KNR-001
	Coil	1	CLL-006
	Sleeve	1	SLC-008

## ABK-006 SLINGSHOT ASSEMBLY



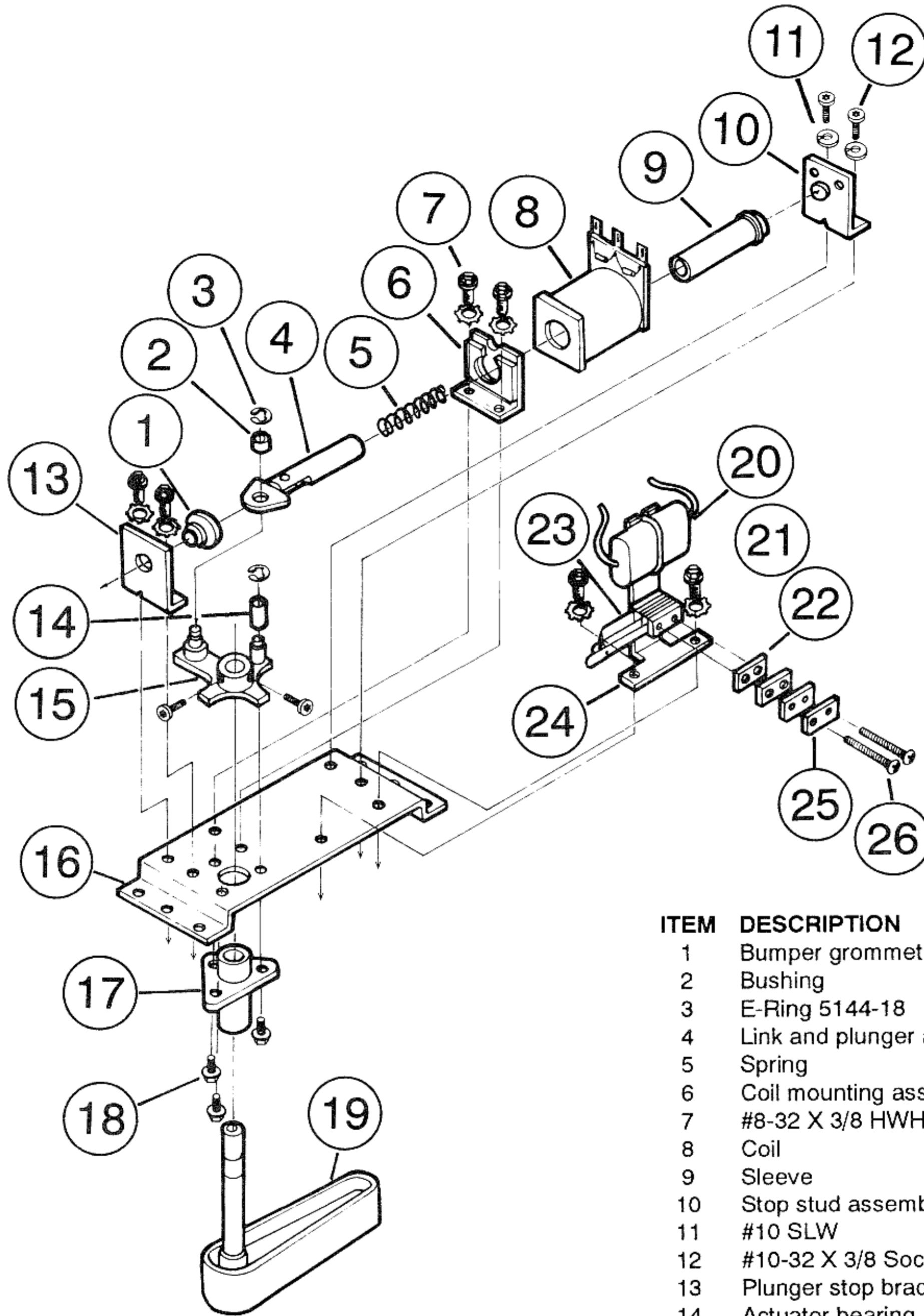
ITEM	DESCRIPTION	QTY	PART NO.
1	Kicker arm assembly	1	SLA-009
2	E-Ring 5144-18	2	HRG-001
3	Link and plunger assembly	1	LAP-002
4	Cup washer	1	CWH-001
5	Plunger spring	1	SRG-005
6	Coil mounting bracket	1	BSL-031
7	Kicker coil	1	CLL-006
8	Sleeve	1	SLC-006
9	Stand up switch	2	STR-001
10	Tension plate	2	SWP-001
11	#6-32 X 5/8 PPH	4	HMS-028
12	#8-32 X 3/8 Hex	2	HMS-019
13	Stop stud assembly	1	ASS-004

# ADT-001 DROP TARGET ASSEMBLY



ITEM	DESCRIPTION	QTY	PART NO.
1	#2-56 X 5/8 PPH	6	HSM-002
2	#8-32 X 3/8 Hex	22	HMS-019
3	Drop target switch	3	DTS-001
4	Drop target switch nut plate	3	BSF-012
5	Mounting bracket	4	BSS-038
6	Roll-over drop target	3	DTP-001
7	Drop target spring	3	SDT-001
8	#8-32 X 3/8 HWH sems	4	HSM-013
9	Switch mounting bracket	3	BSL-041
10	#8 X 1/2 X 13/32 washer	4	HWA-003
11	Reset guide	2	BSU-009
12	Target retainer	1	BSL-040
13	Top plate	1	BSU-006
14	Bottom plate	1	BSU-007
15	Side bracket	2	BSL-034
16	#8 split lock washer	22	HLW-007
17	Reset coil stop stud assembly	1	ASS-001
18	Mounting bracket	1	BSS-008
19	Drop target coil	1	CLL-004
20	Drop target sleeve	1	TRC-001
21	Reset coil spring	1	SRC-001
22	Reset coil plunger	1	PRC-001
23	Reset bracket	1	BSS-007
24	#8 X 7/16 x 1/32 washer	1	HWA-002
25	#8-32 X 3/8 hex	1	HMS-018

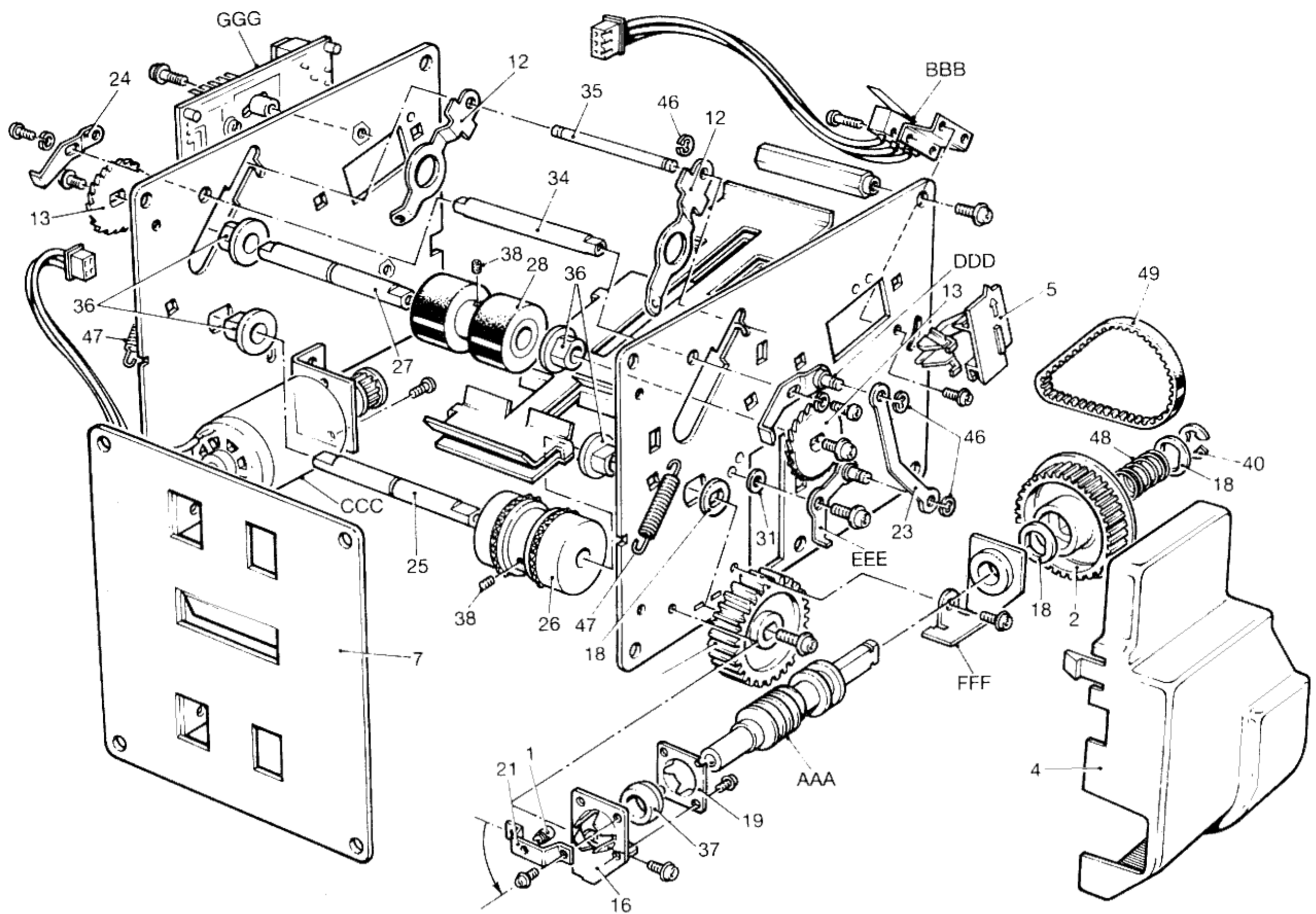
# AFF-L04, AFF-R04 FLIPPER ASSEMBLY



ITEM	DESCRIPTION	QTY	PART NO.
1	Bumper grommet	1	RBR-001
2	Bushing	1	BRG-001
3	E-Ring 5144-18	2	HRG-001
4	Link and plunger assembly	1	LAP-001
5	Spring	1	SRG-001
6	Coil mounting assembly	1	CBA-001
7	#8-32 X 3/8 HWH taptite	6	HTT-005
8	Coil	1	CLL-002
9	Sleeve	1	SLC-001
10	Stop stud assembly	1	ASS-002
11	#10 SLW	2	HLW-010
12	#10-32 X 3/8 Socket cap screw	4	HSP-003
13	Plunger stop bracket	1	BSL-027
14	Actuator bearing	1	SLv-001
15-L	Pivot yoke assembly left	1	PYA-L01
15-R	Pivot yoke assembly right	1	PYA-R01
16-L	Flipper base assembly left	1	FBA-L01
16-R	Flipper base assembly right	1	RBA-R01
17	Flipper shaft	1	FSB-001
18	#6-32 X 3/8 WHW taptite	3	HTT-004
19-L	Flipper bat left	1	AFT-L04
19-R	Flipper bat right	1	AFT-R04
20	Capacitor	1	CAP-001
21	#8 Ext tooth lock washer	6	HLW-004
22	EOS switch	1	FLS-002
23	Switich bracket	1	BSL-032
24	Fiber switch stack	2	SSS-001
25	Tension plate	2	SWP-001
26	#4-40 X 5/8 PPH	2	HMS-003



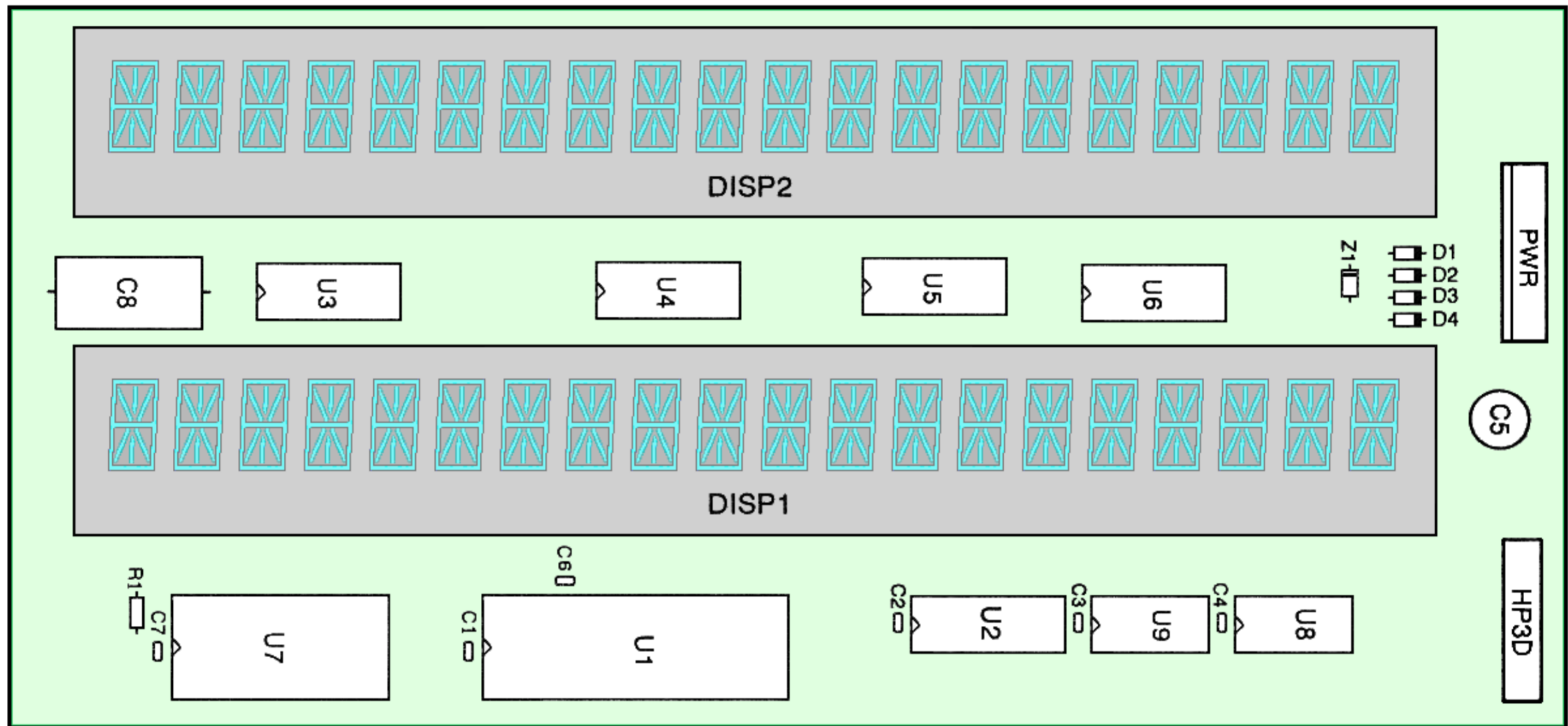
# ADT-002 TICKET DISPENSER



ITEM	DESCRIPTION	QTY	PART NO.	ITEM	DESCRIPTION	QTY	PART NO.
1	Thrust Plate	1	71-1031-1001	37	Ball Type Bushing	1	71-1031-5002
2	Large Pulley	1	71-1031-1002	38	M4 x 5mm Long Hex Set Screw	2	71-1031-6001
3	Worm Gear	1	71-1031-1003	40	4mm E-Ring	1	71-1031-6003
4	Gear Cover	1	71-1031-1004	46	2mm E-Ring	4	71-1031-6011
5	Adjuster Block	1	71-1031-1005	47	Action Spring	2	71-1031-7001
7	Face Plate	1	71-1031-2001	48	Adjustment Spring	1	71-1031-7002
12	Roller Slide Bracket	2	71-1031-2007	49	63 Tooth Timing Belt	1	71-1031-1301
13	Ratchet	3	71-1031-2008	<b>PARTS SUPPLIED AS SUB-ASSEMBLIES</b>			
18	Shaft Mounting Bracket Left	1	71-1031-2011	AAA	Worm Shaft and 3mm Ball Assembly	1	72-4001-00
18	Worm Gear Washer	1	71-1031-2017	BBB	MicroSwitch, Lead Wire, MicroSwitch Bracket and Screw Assembly	1	71-1001-00
19	Shaft Holder Plate	1	71-1031-2020	CCC	12 Volt D.C. Motor, Motor Lead Wire, 0.1M Capacitor, Motor Mounting Bracket, Screws and Small Pulley Assembly	1	72-2004-00
21	Thrust Holder Plate	1	71-1031-2022	DDD	Ratchet Dog Right and Stud Assembly	1	72-2001-00
23	Link	1	71-1031-2029	EEE	Lever Arm and Stud Assembly	1	72-2002-00
24	Ratchet Dog Left	1	71-1031-2030	FFF	Shaft Mounting Bracket and Bushing Assembly	1	72-2003-00
25	Main Shaft	1	71-1031-4001	GGG	P.C. Board Assembly with Spacers and Optical Switch Cover	1	72-5001-00
26	Main Roller	1	71-1031-4002				
27	Idler Shaft	1	71-1031-4003				
28	Idler Roller	1	71-1031-4004				
29	Worm Shaft	1	71-1031-4005				
31	Lever Arm Spacer	1	71-1031-4007				
34	Shaft for Ratchet Dog	1	71-1031-4010				
35	Pull Back Bar	1	71-1031-4011				
36	Shaft Bushing	4	71-1031-5001				

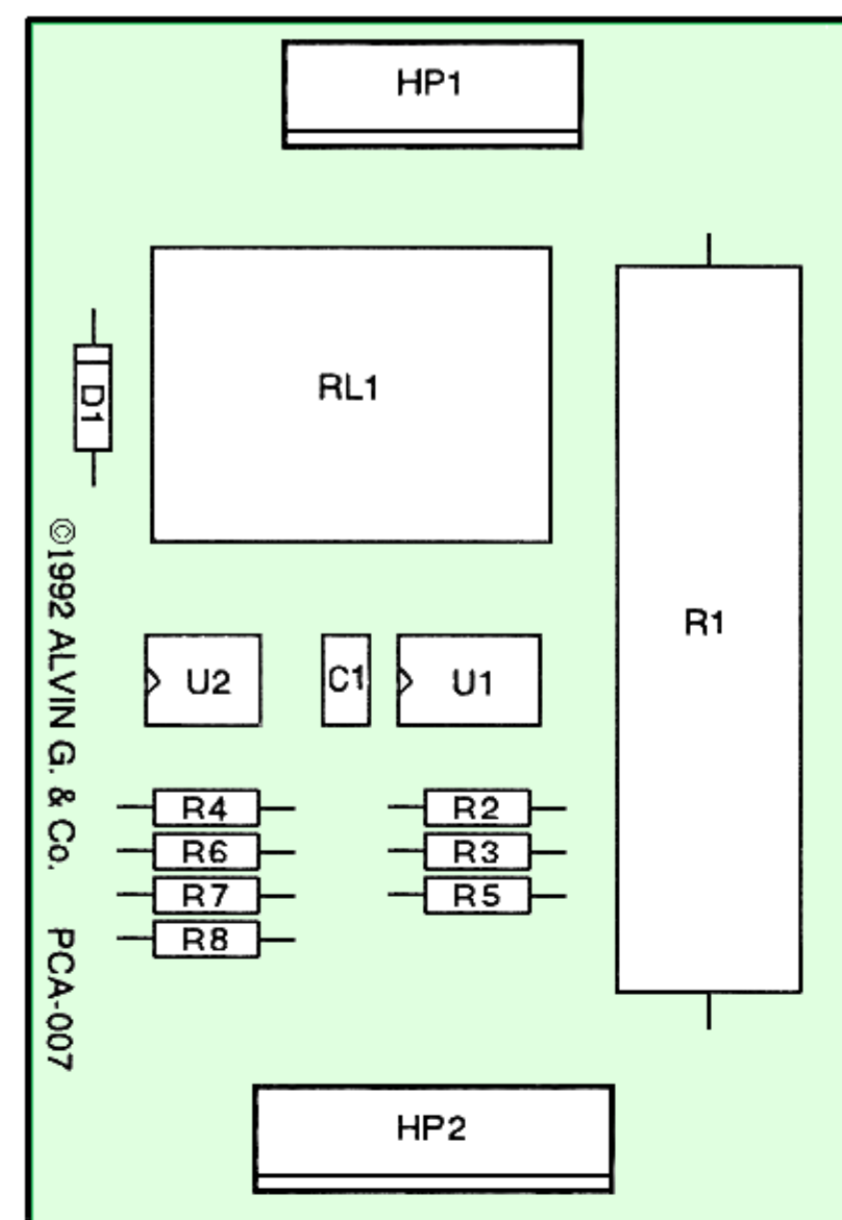
# PCA-003 ALPHANUMERIC DISPLAY BOARD

ITEM	DESCRIPTION	QTY	PART NO.	ITEM	DESCRIPTION	QTY	PART NO.
C1,C2,C6	Capacitor, .1 $\mu$ F	3	CAP-006	IC3,IC4	Integrated Circuit, UDN6118	2	EC-0006
C7,C8,C9	Capacitor, .1 $\mu$ F	3	CAP-006	IC5,IC6	Integrated Circuit, UDN6118	2	EC-0006
C3	Capacitor, 10 $\mu$ F	1	CAP-007	IC7	Integrated Circuit, TL5812	1	EC-0005
C4	Capacitor, 470 $\mu$ F	1	CAP-009	IC8	Integrated Circuit, 74LS32	1	EC-0003
C5,C10	Capacitor, 200pF	2	CAP-008	IC9	Integrated Circuit, 74LS14	1	EC-0001
D1,D2	Diode, 1N4401	2	DDS-004	P1	Panduit header .156" 8 pin	1	HDR-003
D3,D4	Diode, 1N4401	2	DDS-004	P2	Panduit header double row 20 pin	1	RBC-001
DIS1,DIS2	Alphanumeric display, FG2013A1	2	VTA-001	R1	Resistor, 4.7K $\Omega$	1	RST-005
IC1	Peripheral interface, 8255	1	EC-0004	R2	Resistor, 10K $\Omega$	1	RST-007
IC2	Integrated Circuit, 74LS273	1	EC-0002	Z1	Diode, Zener, 1N4739A	1	ZEN-001

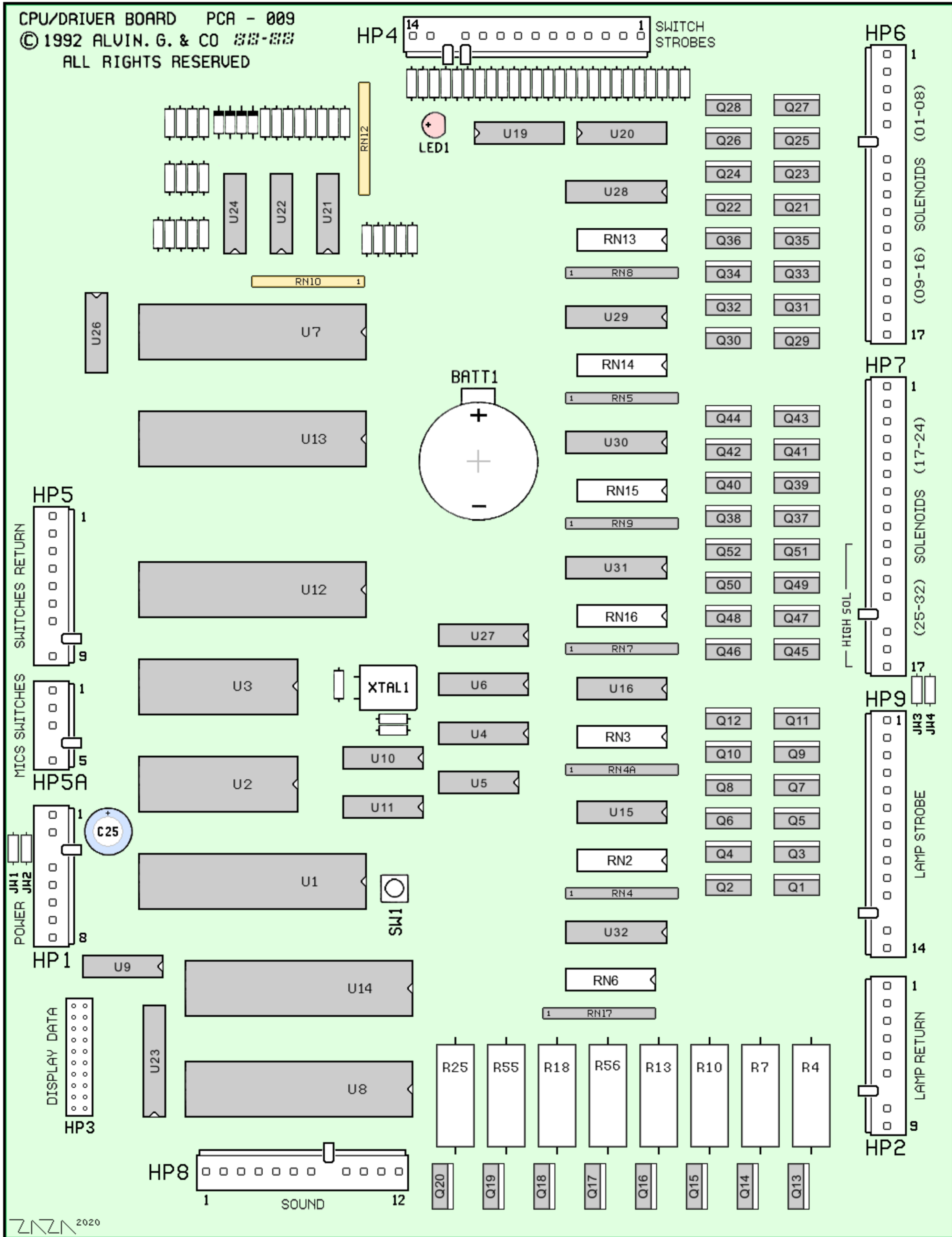


# PCA-007 FLASHER BOARD

ITEM	DESCRIPTION	QTY	PART NO.
C1	Capacitor, .1 $\mu$ F 50V	1	CAP-010
D1	Diode, 1N4004	1	DDS-001
HP1	Panduit header .156" 4 pin	1	CHP-001
HP2	Panduit header .156" 5 pin	1	CHP-002
R1	Resistor, .47 $\Omega$ , 10W, 5%	1	RST-016
R2	Resistor, 681 $\Omega$ , 1%	1	RST-021
R3	Resistor, 5.62k $\Omega$ , 1%	1	RST-020
R4	Resistor, 100k $\Omega$ , 5%	1	RST-018
R5	Resistor, 2.2k $\Omega$ , 5%	1	RST-010
R6	Resistor, 5.62k $\Omega$ , 1%	1	RST-020
R7	Resistor, 562, 1%	1	RST-019
R8	Resistor, 82.5, 1%	1	RST-017
RL1	Relay, 24V coil	1	REL-002
U1	LM358	1	EC-0031
U2	H11G3	1	EC-0032



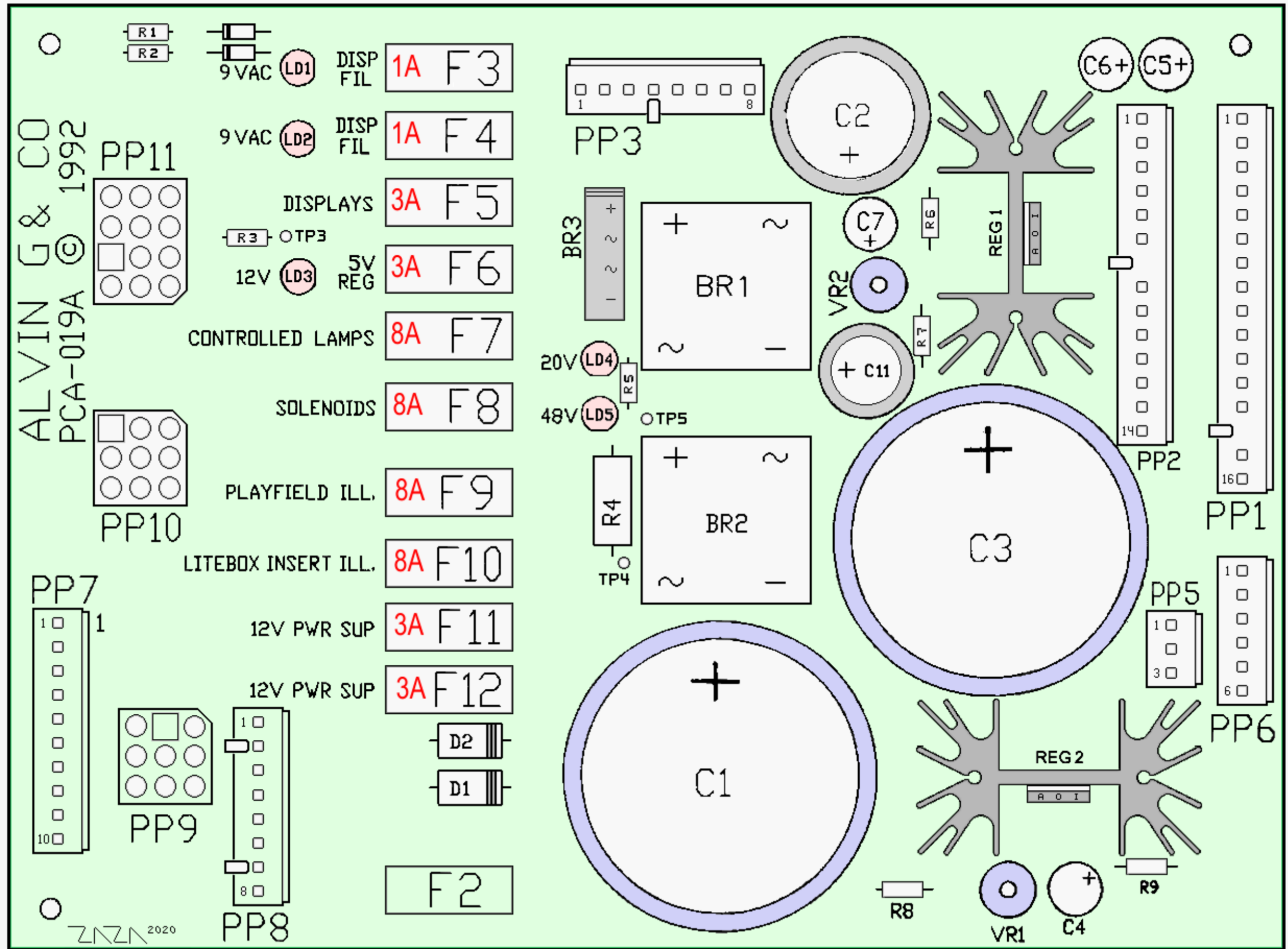
# PCA-009 CPU/COMB BOARD



## PCA-009 CPU/COMB BOARD

ITEM	DESCRIPTION	QTY	PART NO.	ITEM	DESCRIPTION	QTY	PART NO.
		1	BAT-001				
BATT1	Battery Lithium 3V	1	BAT-001	RN2-RN3	2 K $\Omega$ , Resistor, Dip package	1	SSR-003
C1-C24	0.1 $\mu$ F, 50V, 10%, Radial	1	CAP-010	RN4-RN5	2.7K $\Omega$ , Resistor, Dip package	1	SSR-002
C25	100 $\mu$ F, 25V, Elect., Radial	1	CAP-003	RN4A	2.7K $\Omega$ , Resistor, Dip package	1	SSR-002
C26-C28	0.1 $\mu$ F, 50V, 10%, Radial	1	CAP-010	RN6	2 K $\Omega$ , Resistor, Dip package	1	SSR-003
C29-C36	470pF, 50V, 10%, Radial	1	CAP-009	RN7-RN9	2.7K $\Omega$ , Resistor, Dip package	1	SSR-002
C37-C38	33pF, 50V, 10%, Radial	1	CAP-012	RN10-RN12	4.7K $\Omega$ , Resistor, Dip package	1	SSR-004
C39,C41	100pF, 50V, 10%, Radial	1	CAP-015	RN13-RN16	2 K $\Omega$ , Resistor, Dip package	1	SSR-003
C42-C43	0.1 $\mu$ F, 50V, 10%, Radial	1	CAP-010	RN17	2.7K $\Omega$ , Resistor, Dip package	1	SSR-002
C44-C54	470pF, 50V, 10%, Radial	1	CAP-009	SW1	Switch, SPST	1	RST-000
C55-C86	0.01 $\mu$ F, 50V, 10%, Radial	1	CAP-011	U1	40 pin socket	1	SKT-040
C87-C90	470pF, 50V, 10%, Radial	1	CAP-009	U1	65C02	1	EC-0009
D33-D36	1N4154	1	DDS-007	U2	28 pin socket	1	SKT-028
HP1	8 position header locking	1	HDR-003	U2	27C512	1	EPC-081
HP2	9 position header locking	1	HDR-010	U3	28 pin socket	1	SKT-028
HP3	20 position shrouded header	1	RBC-001	U3	6164	1	EC-0008
HP4	14 position header locking	1	HDR-005	U4	74LS138 / 74HCT138	1	EC-0014
HP5	9 position header locking	1	HDR-010	U5	74LS30 / 74HCT30	1	EC-0016
HP5A	5 position header locking	1	HDR-009	U6	74LS138 / 74HCT138	1	EC-0014
HP6-HP7	17 position header locking	1	HDR-008	U7	40 pin socket	1	SKT-040
HP8	12 position header locking	1	HDR-011	U7	65C22	1	EC-0010
HP9	14 position header locking	1	HDR-005	U8	40 pin socket	1	SKT-040
LED1	Light emitting diode	1	DDS-003	U8	65C22	1	EC-0010
Q1-Q12	IRF9530	1	TRZ-003	U9	74LS14	1	EC-0001
Q13-Q20	IRF530	1	TRZ-001	U10	74HCT04	1	EC-0025
Q21	IRF540	1	TRZ-002	U11	74LS74 / 74HCT74	1	EC-0017
Q22-Q28	IRF530	1	TRZ-001	U12	40 pin socket	1	SKT-040
Q29	IRF540	1	TRZ-002	U12	8255	1	EC-0018
Q30-Q44	IRF530	1	TRZ-001	U13	40 pin socket	1	SKT-040
Q45	IRF540	1	TRZ-002	U13	8255	1	EC-0018
Q46-Q47	IRF530	1	TRZ-001	U14	40 pin socket	1	SKT-040
Q48	IRF540	1	TRZ-002	U14	8255	1	EC-0018
Q49-Q52	IRF530	1	TRZ-001	U15-U16	ULN2003A	1	EC-0021
R1	1.5K $\Omega$ , 1/4W, 5%, Resistor	1	RST-001	U19-U20	ULN2003A	1	EC-0021
R2	3.3K $\Omega$ , 1/4W, 5%, Resistor	1	RST-014	U21-U22	LM339	1	EC-0019
R3	15K $\Omega$ , 1/4W, 5%, Resistor	1	RST-008	U23	74LS373 / 74HCT373	1	EC-0023
R4	3 $\Omega$ , 5W, 5%, Resistor	1	RST-013	U24	LM339	1	EC-0019
R6	4.7K, 1/4W, 5%, Resistor	1	RST-005	U26	74LS00	1	EC-0024
R7	3 $\Omega$ , 5W, 5%, Resistor	1	RST-013	U27	MAX691	1	EC-0022
R9	4.7K, 1/4W, 5%, Resistor	1	RST-005	U28-U32	UDN6118	1	EC-0020
R10	3 $\Omega$ , 5W, 5%, Resistor	1	RST-013	XTAL1	4MHz	1	CRY-001
R12	4.7K, 1/4W, 5%, Resistor	1	RST-005	BATT1	Battery Holder	1	BHD-001
R13	3 $\Omega$ , 5W, 5%, Resistor	1	RST-013	JW1-JW4	Zero ohm jumper	1	JMP-001
R15,R17	4.7K, 1/4W, 5%, Resistor	1	RST-005				
R18,R25	3 $\Omega$ , 5W, 5%, Resistor	1	RST-013				
R26	2.2K $\Omega$ , 1/4W, 5%, Resistor	1	RST-010				
R29-R38	4.7K, 1/4W, 5%, Resistor	1	RST-005				
R39-R41	2.2K $\Omega$ , 1/4W, 5%, Resistor	1	RST-010				
R42-R44	3.9K $\Omega$ , 1/4W, 5%, Resistor	1	RST-015				
R47-R48	2.2K $\Omega$ , 1/4W, 5%, Resistor	1	RST-010				
R49	3.9K $\Omega$ , 1/4W, 5%, Resistor	1	RST-015				
R50-R51	4.7K, 1/4W, 5%, Resistor	1	RST-005				
R52	3.3K $\Omega$ , 1/4W, 5%, Resistor	1	RST-014				
R53-R54	2.2K $\Omega$ , 1/4W, 5%, Resistor	1	RST-010				
R55-R56	3 $\Omega$ , 5W, 5%, Resistor	1	RST-013				
R60-R68	2.2K $\Omega$ , 1/4W, 5%, Resistor	1	RST-010				
R69-R80	560 $\Omega$ , 1/4W, 5%, Resistor	1	RST-025				

# PCA-019A POWER SUPPLY BOARD



ITEM	DESCRIPTION	QTY	PART NO.	ITEM	DESCRIPTION	QTY	PART NO.
BR1-BR2	25A, Bridge rectifier	1	REC-001	PP1	16 position header .156"	1	HDR-006
BR3	4A, Bridge rectifier	1	REC-004	PP2	14 position header .156"	1	HDR-005
C1	33,000 $\mu$ F, Capacitor	1	CAP-005	PP3	8 position header .156"	1	HDR-003
C2	15,000 $\mu$ F, Capacitor	1	CAP-024	PP5	3 position header .156"	1	HDR-001
C3	33,000 $\mu$ F, Capacitor	1	CAP-005	PP6	6 position header .156"	1	HDR-002
C4	22 $\mu$ F, Capacitor	1	CAP-002	PP10	9 position Molex connector	1	CNN-M05
C5-C6	100 $\mu$ F, Capacitor	1	CAP-003	PP11	12 position	1	CNN-M04
C7	22 $\mu$ F, Capacitor	1	CAP-002	R1	330 $\Omega$ , Resistor	1	RST-003
C8-C10	0.1 $\mu$ F, Capacitor	1	CAP-010	R2	8.2K $\Omega$ , Resistor	1	RST-034
C11	330 $\mu$ F, Capacitor	1	CAP-025	R3	820 $\Omega$ , Resistor	1	RST-006
C12	0.1 $\mu$ F, Capacitor	1	CAP-010	R4	12K $\Omega$ , 1W, Resistor	1	RST-022
D1-D2	1N5404, Diode	1	DDS-002	R5	1.5K $\Omega$ , Resistor	1	RST-001
D3-D4	1N4004, Diode	1	DDS-001	R6	220 $\Omega$ , Resistor	1	RST-002
F3-F4	1A, Slo-Blo	1	FUS-004	R7	390 $\Omega$ , Resistor	1	RST-004
F5	3A, Slo-Blo	1	FUS-008	R8	1.5K $\Omega$ , Resistor	1	RST-001
F6-F10	8A, Slo-Blo	1	FUS-002	R9	220 $\Omega$ , Resistor	1	RST-002
F11-F12	3A, Slo-Blo	1	FUS-008	R10	0.47 $\Omega$ , 3W, Resistor	1	RST-035
LD1-LD5	Light emitting diode	1	DDS-003	VR1	1K $\Omega$ , Potentiometer	1	PTM-001
REG1	LM350, Voltage regulator	1	PVR-001	VR2	1K $\Omega$ , Potentiometer	1	PTM-001
REG2	LM350, Voltage regulator	1	PVR-001				

## BASIC MAINTENANCE

Regular maintenance is necessary to prolong the life, quality and earnings of your Alvin G. & Co. amusement game.

Cleaning - the pinball machine should be cleaned during every collection for great game action, playfield life and return on investment.

The playfield should be fully checked over for nicks or scratches and repaired immediately to resist further damage to playfield. The playfield should be wiped down at each collection to remove any dust build up with a lint free cloth.

The pinballs should be cleaned and looked over for any nicks or chips. If present, replace damaged pinballs immediately to prevent any damage to the playfield surface.

The playfield should be waxed with a non petroleum distillate playfield wax. A carnauba based wax is acceptable.

The playfield glass should be cleaned thoroughly with a lemon base glass cleaner < do not use any ammonia based cleaners. >

The playfield plastics can be cleaned with the same wax which is used for the playfield.

The playfield should be leveled and pitch set to  $5 \frac{1}{2}^{\circ}$

The rubber rings can be cleaned with the playfield wax. Replace rubber rings if worn, cracked, or damaged.

Game legs and cabinet should be cleaned with a damp cloth.

Leaf switch Contacts - Leaf switch contacts are coated with a gold flashing material to resist corrosion. If corrosion is present, the leaf switch should be replaced.

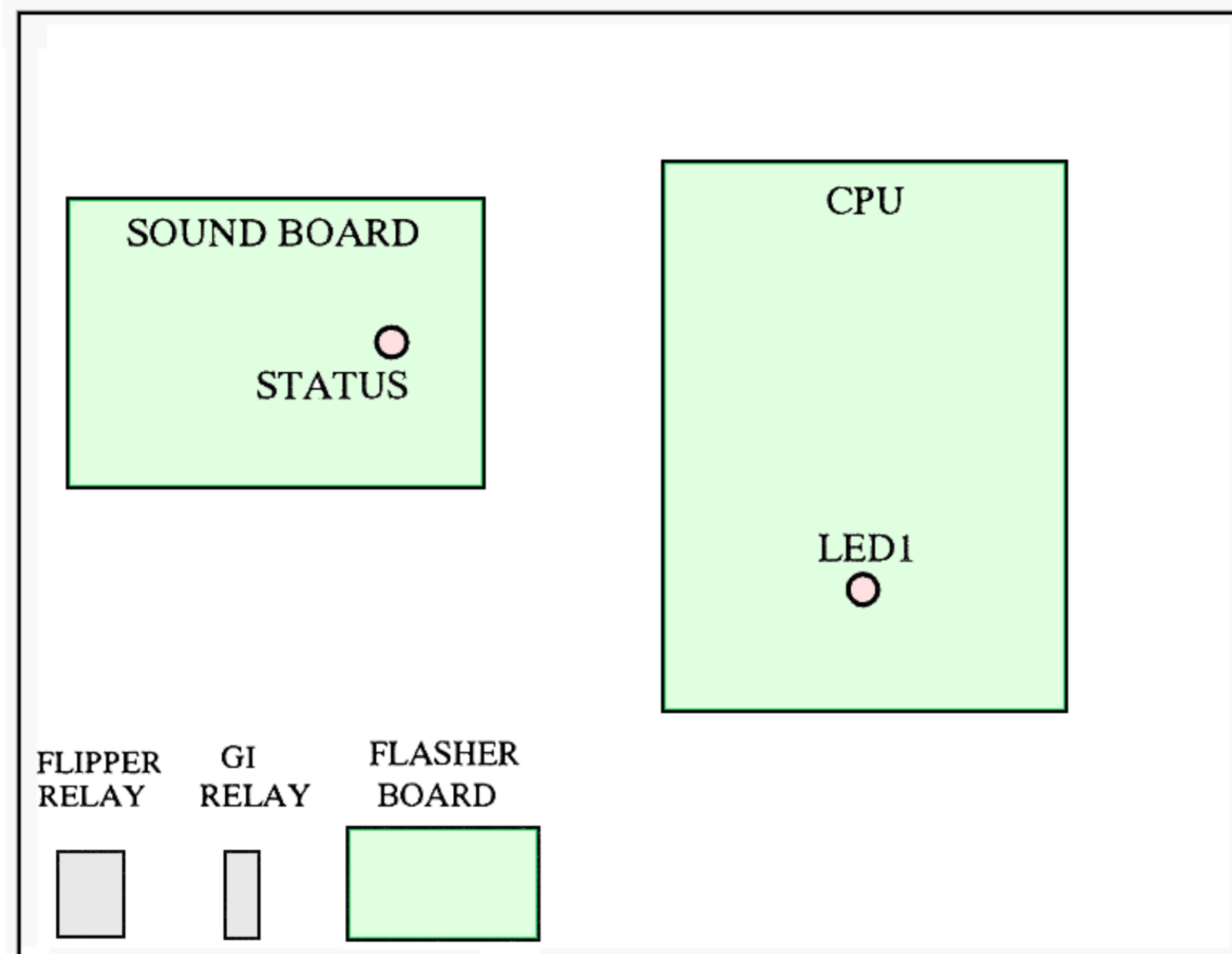
Contacts may be cleaned by using a business card or coarse paper between closed contacts and pulling the paper from the contacts.

Proper gap for these switches is  $\frac{1}{16}$ ", .0625" or 1.5 mm.

Lamps - All burnt out lamps should be replaced immediately with the appropriate replacement lamp.

## L.E.D. LOCATION AND OPERATION

C.P.U.	LED 1 = 1 flash per second	
Power supply	LED 3 = on all the time	+5vdc
	LED 4 = on all the time	+20vdc
	LED 5 = on all the time	+48vdc
Sound board	LED status = 2 flashes per second	



## C.P.U. L.E.D. FLASHES INTERMITTENTLY

To help in diagnosing errors in the C.P.U. the L.E.D. will flash a code to help determine where the problem is coming from. If the L.E.D. is flashing at a normal rate of 1 flash per second, the C.P.U. is functioning properly.

- 2 quick flashes and stops - R.O.M. error
- 3 quick flashes and stops - switch returns or U7, 6522
- 4 quick flashes and stops - 4 direct switches or U7, 6522
- 5 quick flashes and stops - U8, 6522
- On all the time - EPROM missing or bad.

# SMART DOT™ MESSAGES

This Alvin G. & Co. game program includes Smart Dot™ which alerts the service person or collector that a problem exists in the pinball machine. This is achieved without letting the player know that a problem exists.

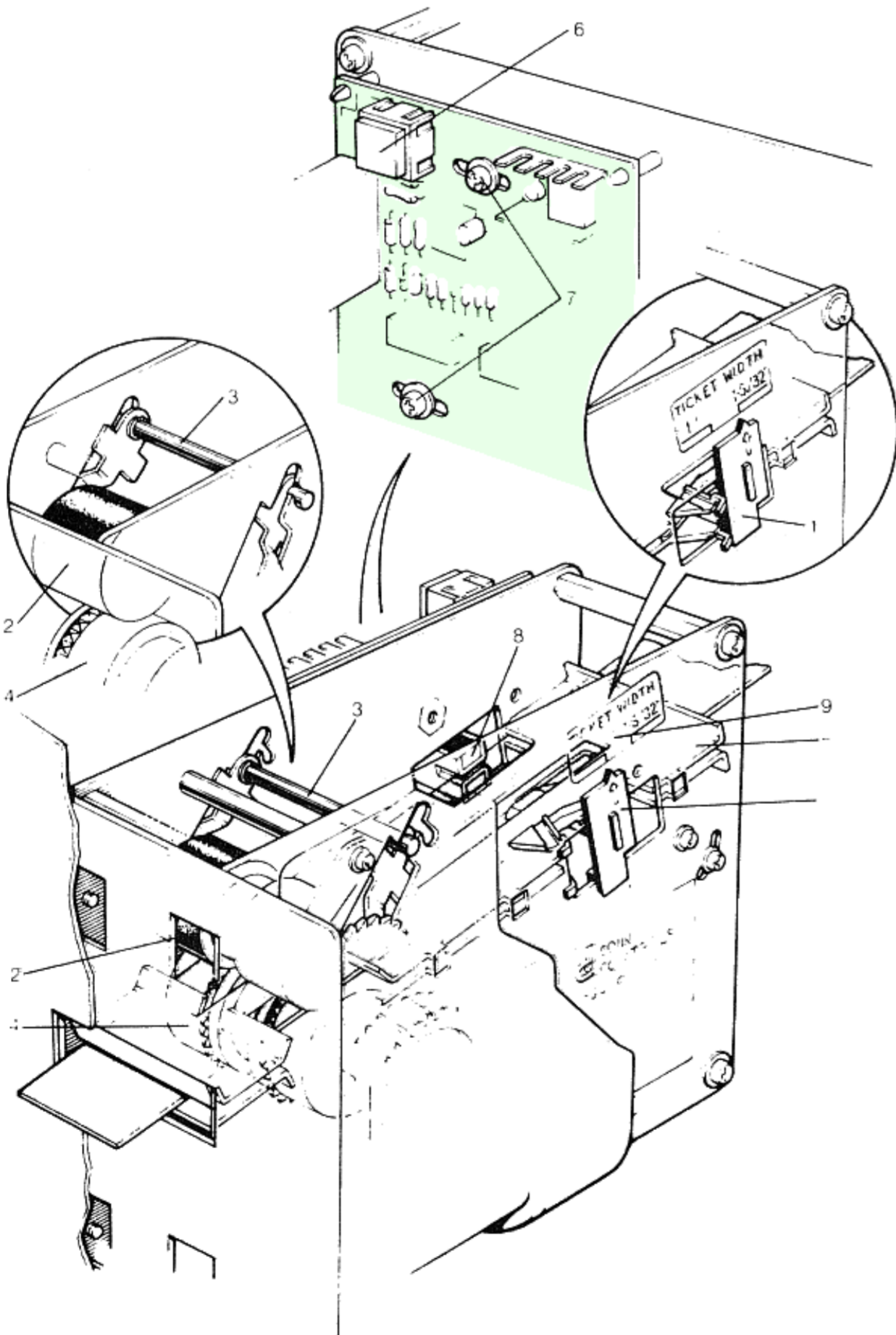
Smart Dot™ works by displaying a "DOT" in the lower left or right corner of the alphanumeric display only when the "CREDITS" are displayed during the attract mode.

**Left "SMART DOT™":** A dot appearing in the lower left corner of the display means a pinball is missing or pinballs are missing. To verify this problem use test "T2 INFORMATION" and press enter in the diagnostic mode. The display will read "MISSING PINBALL". This message informs the service person that a ball is trapped or an outhole switch is malfunctioning.

**RIGHT "SMART DOT™":** A dot appearing in the lower right corner of the display means a playfield switch is stuck closed or has not been activated for the past 25 games. This message is for playfield switches only. To verify a specific problem, use test "T2 INFORMATION" and press enter in the diagnostic mode. The display will read check for bad switch. Use test "T6 STUCK SWITCH" Or "T7 INACTIVE SWITCH" to determine specific switch problems.

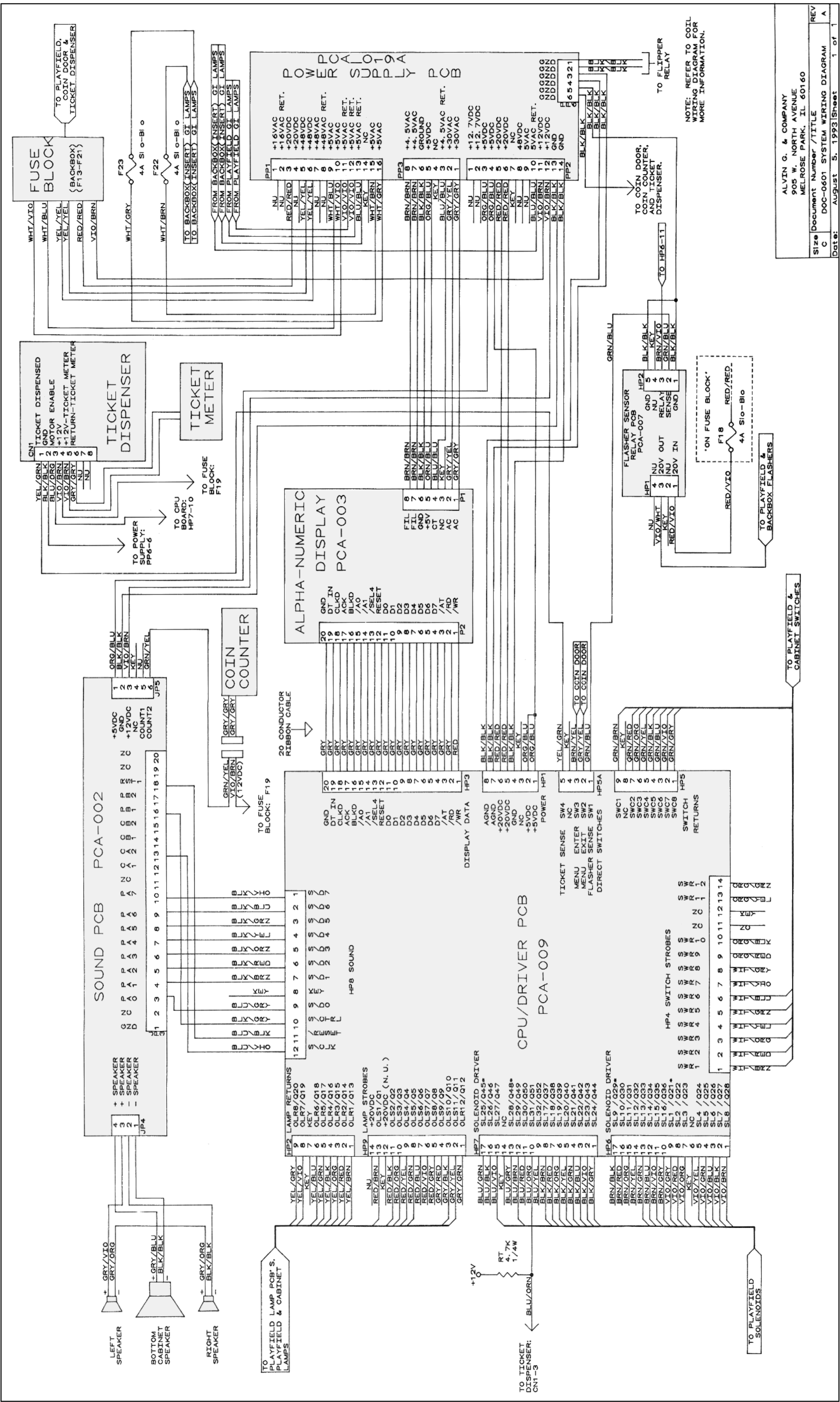
## TICKET DISPENSER

**Loading tickets** - Select the ticket width by positioning the arrow on the tab < 1 > to either the 1" or 1 5/32" as indicated. Lift the upper rollers < 2 > by pulling up the locking bar < 3 > until it falls into the unlock position. The upper rollers are now disengaged from the knurled drive rollers < 4 > . Slide the tickets between the guide plates < 5 > until the tickets are located between the upper and knurled drive rollers. Release the locking bar < 3 > to allow the upper rollers < 2 > to re-engage with the knurled drive rollers < 4 > . The tickets should now be locked so that it is not possible to pull them through the unit. Depress the auto advance button < 6 > momentarily to advance the tickets. **Ticket stop adjustment** - To adjust the length of ticket protruding from the front plate, turn the two phillips pan head screws < 7 > on the circuit board one quarter of a turn counter clockwise. Move the board forward or backward to the appropriate position. Re-tighten the screws.

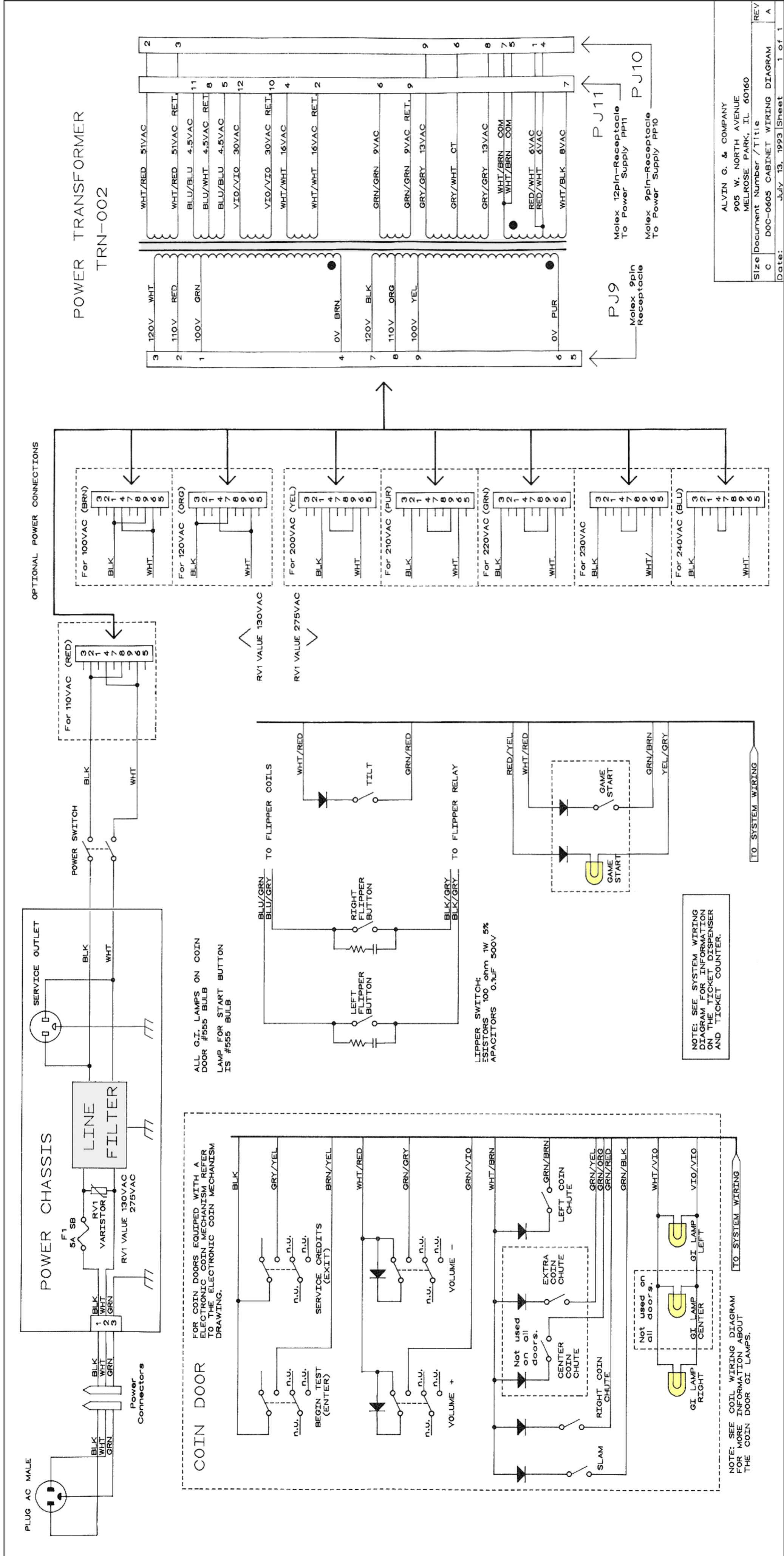


**Clearing jams** - Lift the upper rollers < 2 > by pulling the locking bar < 3 > until it drops into the unlock position. Push the tickets away from the black slide-selector switch < 1 > towards the optic sensor < 8 > . Gently pull the tickets toward the rear of the unit. If necessary apply pressure to the tickets in the free flow channel < 9 > with a small screw driver, < or narrow bladed implement. > Tear off the damaged tickets and slide the remaining tickets between the guide plates < 5 > until the tickets are located between the upper rollers < 2 > and the knurled drive rollers < 4 > . Release the locking bar < 3 > to re-engage the upper rollers. Depress the auto advance button < 6 > to advance the tickets.





NOTE: REFER TO COIL WIRING DIAGRAM FOR MORE INFORMATION.

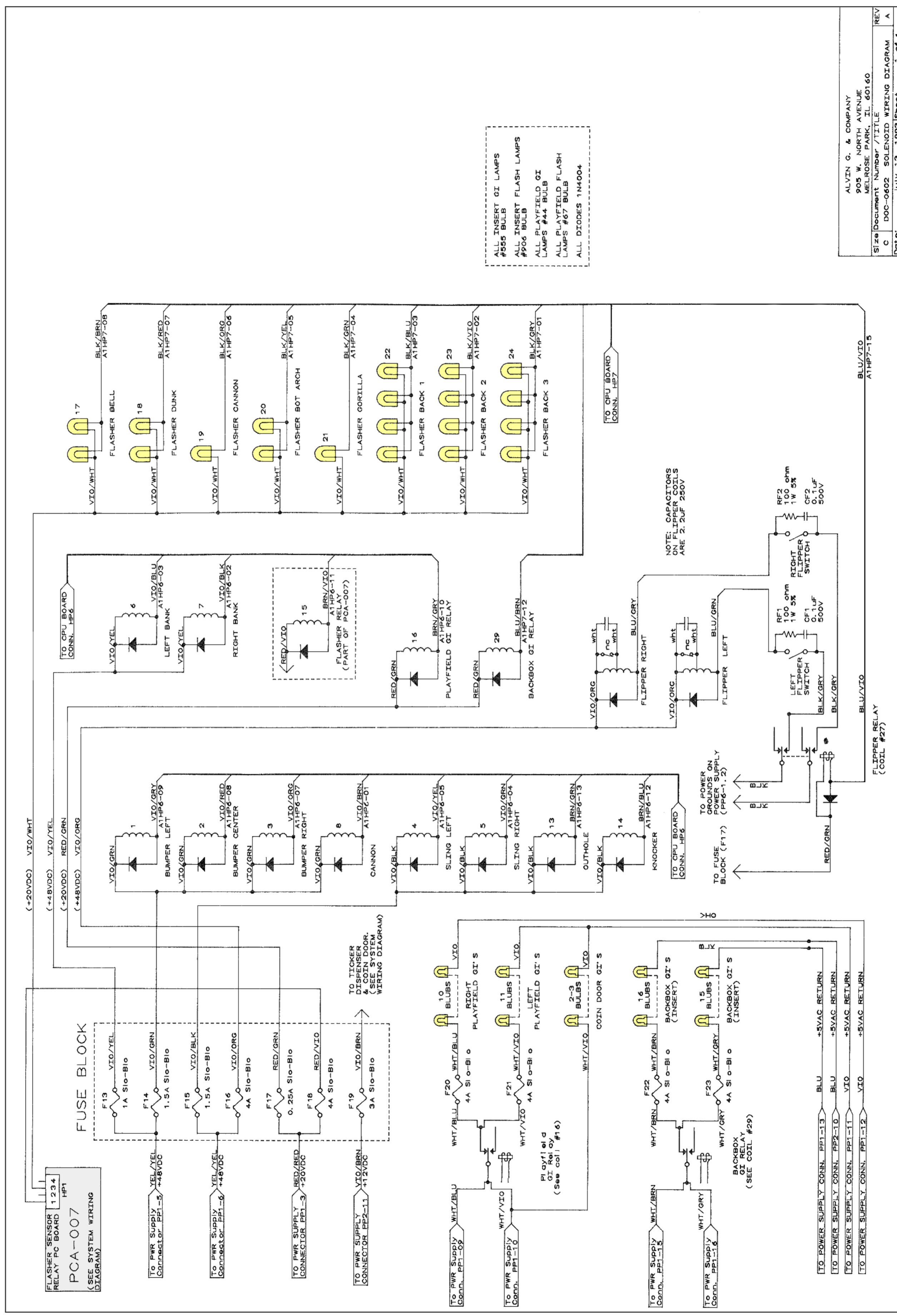


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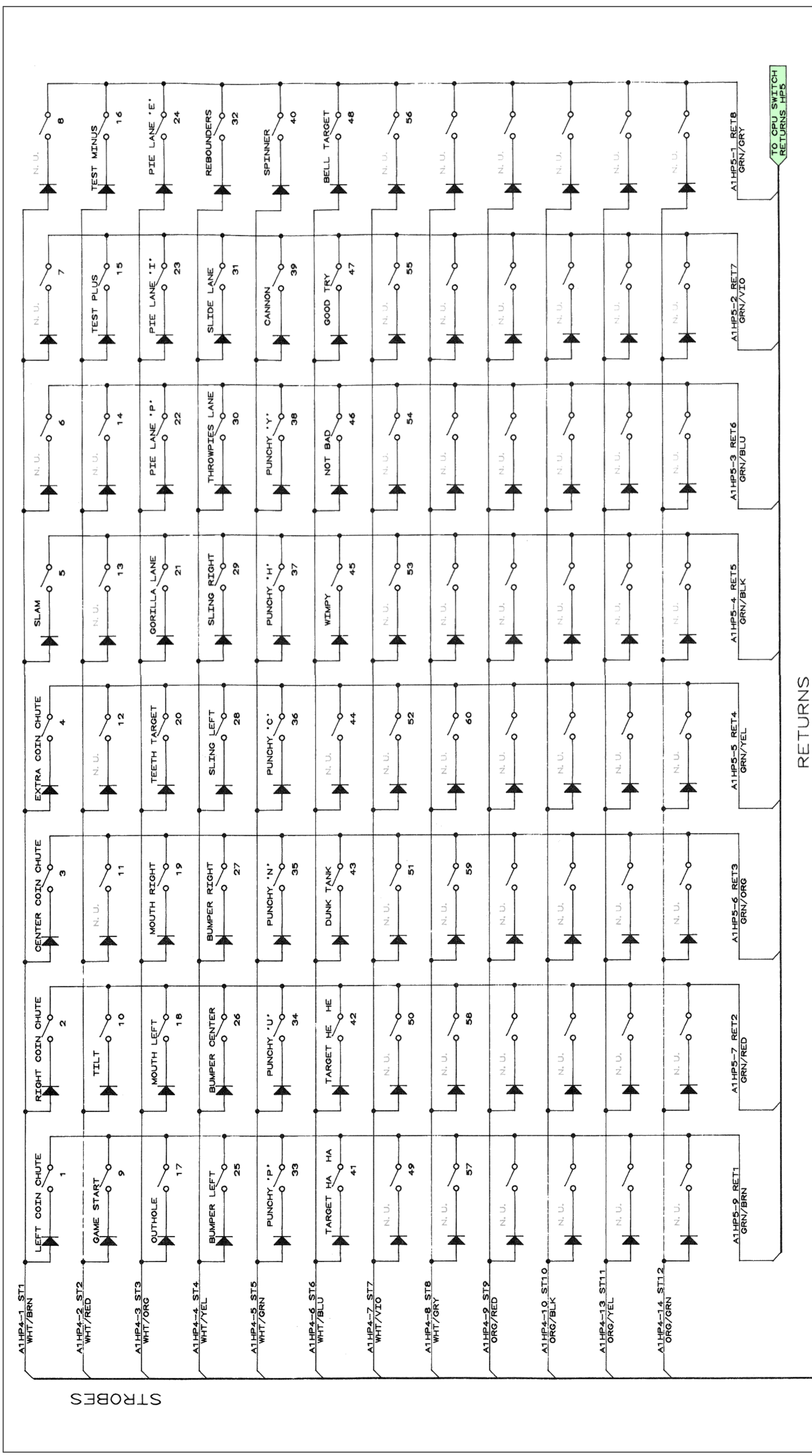
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 C DOC-0605 CABINET WIRING DIAGRAM

Date: July 13, 1993 Sheet 1 of 1

REV A



ALL INSERT GI LAMPS  
 #555 BULB  
 ALL INSERT FLASH LAMPS  
 #906 BULB  
 ALL PLAYFIELD GI  
 LAMPS #44 BULB  
 ALL PLAYFIELD FLASH  
 LAMPS #67 BULB  
 ALL DIODES 1N4004



STROBES

RETURNS

\* ALL DIODES 1N4004

TO CPU SWITCH STROBES\_HP4

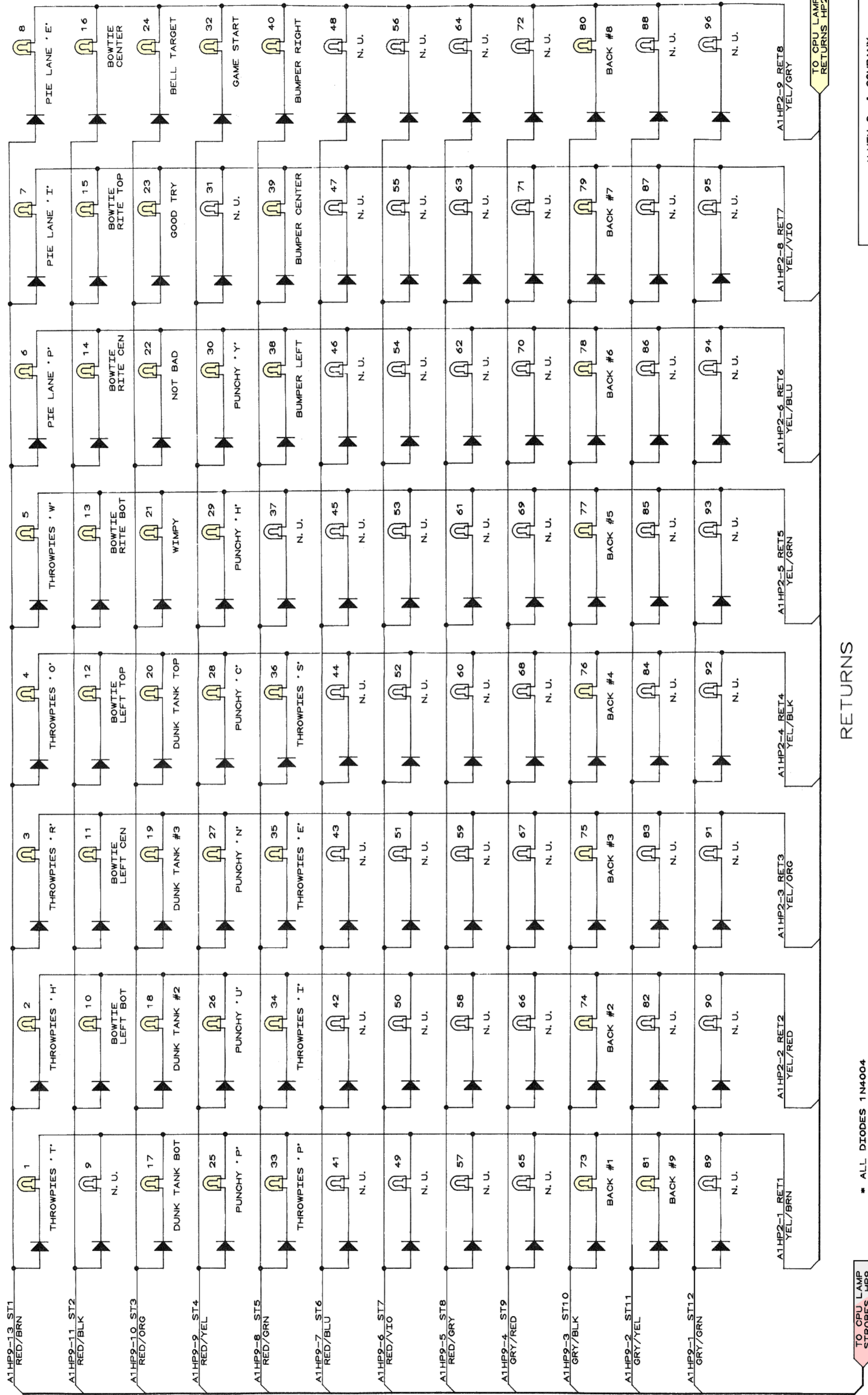
TO CPU SWITCH RETURNS\_HP5

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Size Document Number / TITLE  
 D DOC-0603 SWITCH WIRING DIAGRAM A

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STROBES



RETURNS

\* ALL DIODES 1N4004

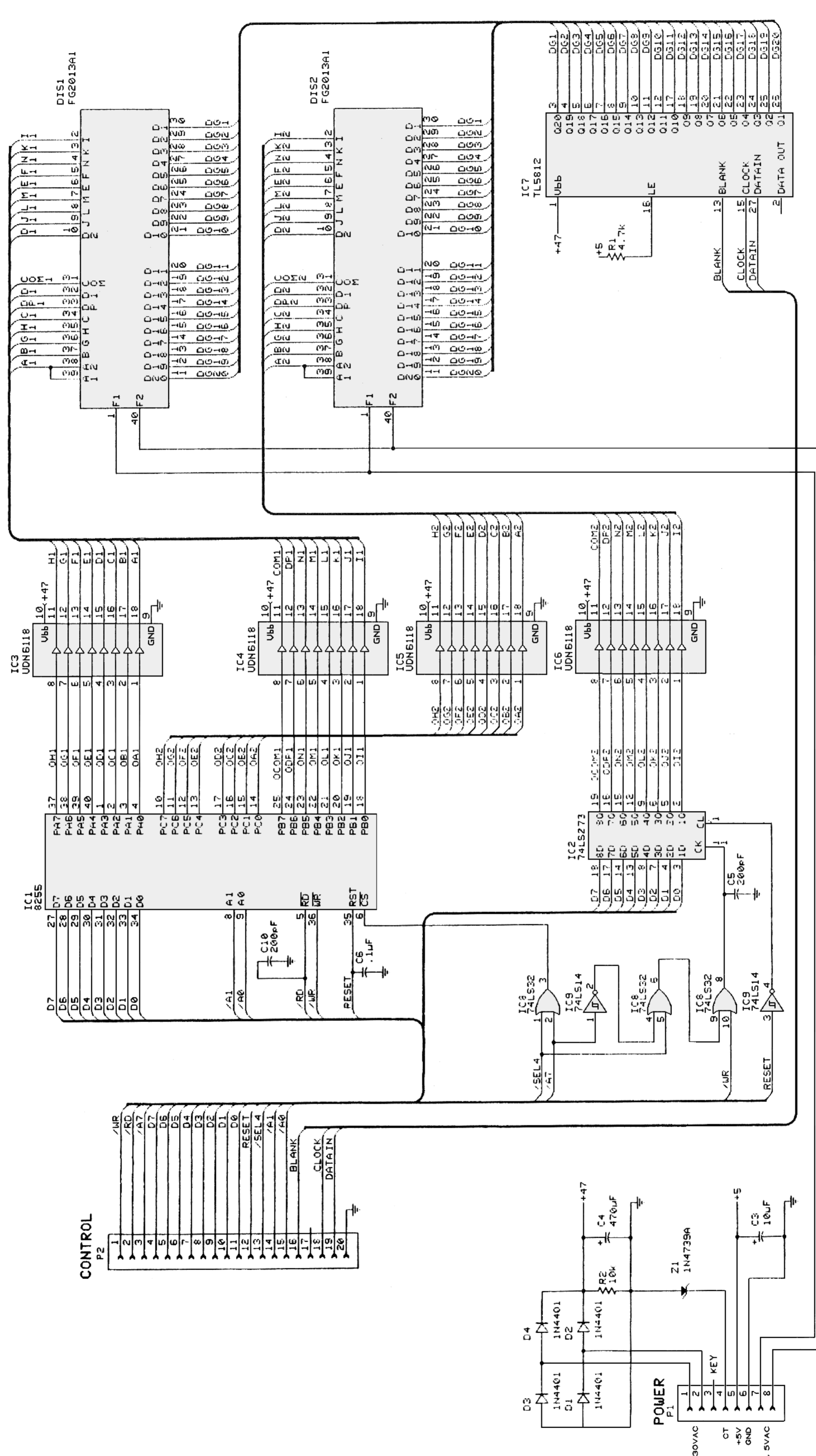
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TO CPU LAMP RETURNS HP2

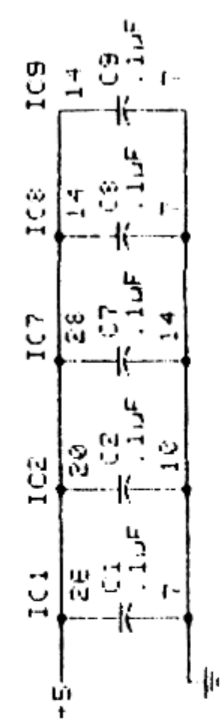
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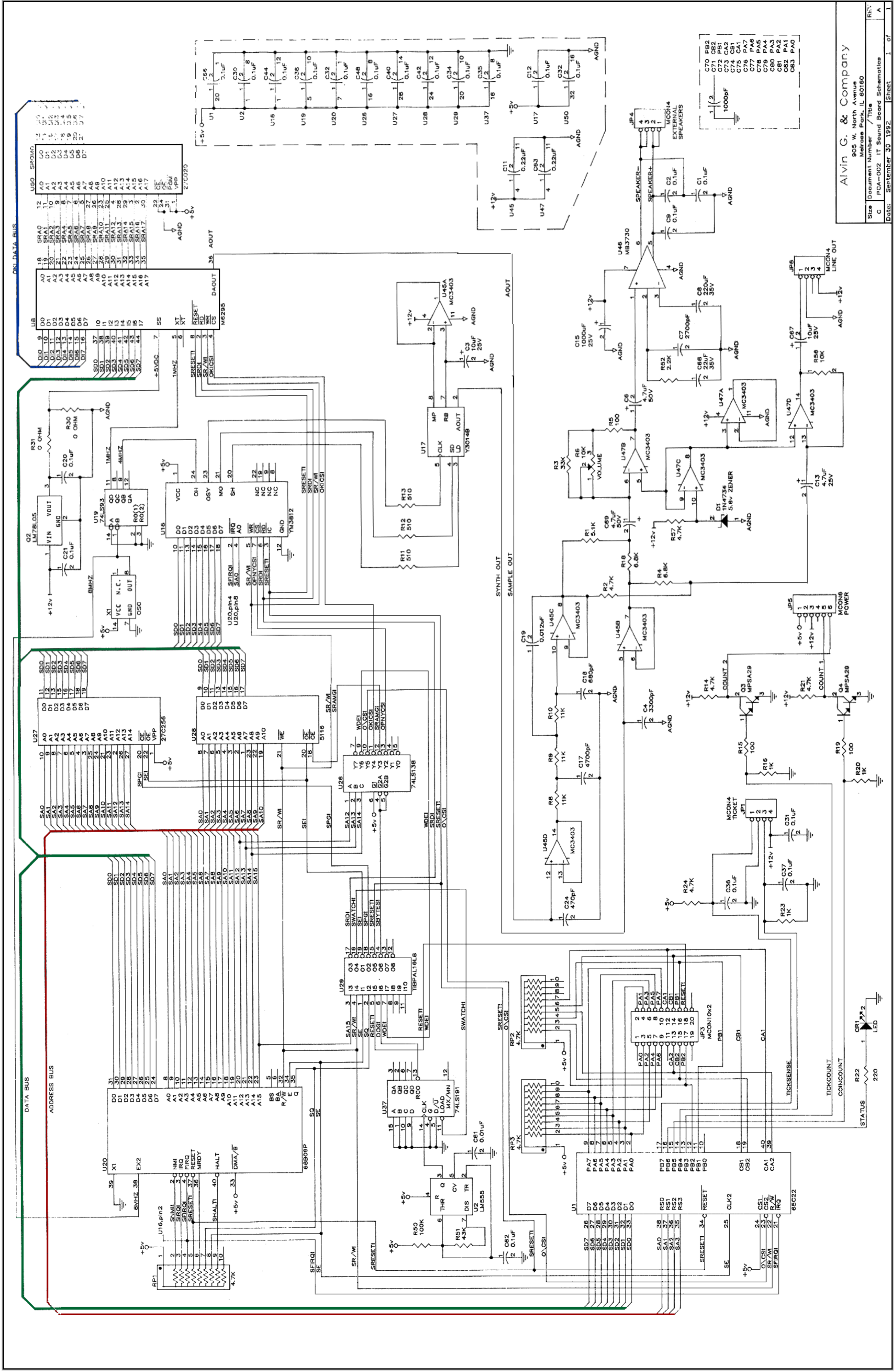
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REV A

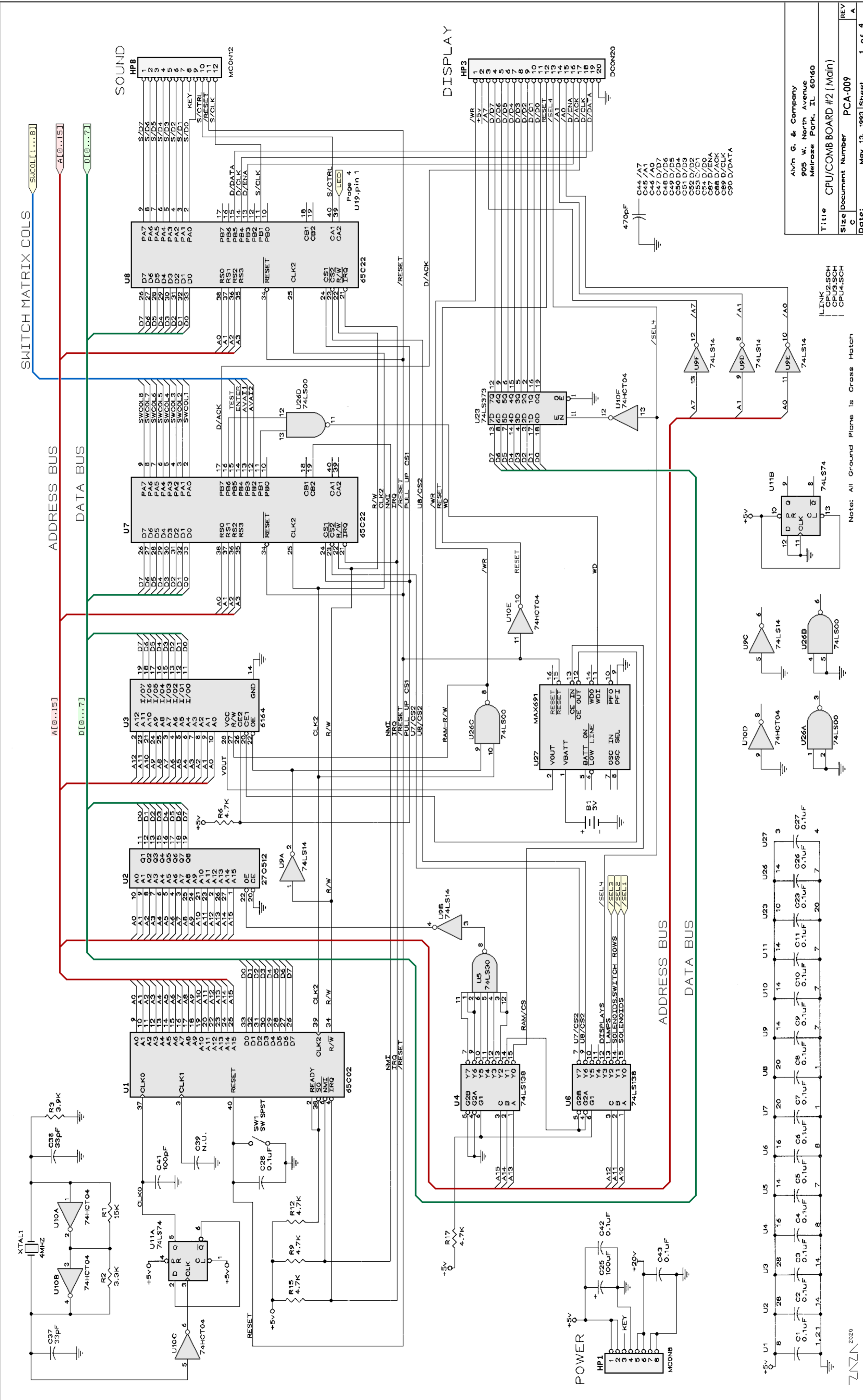


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 Size: Document Number: PCB-002 II Sound Board Schematics  
 Date: September 30, 1992 Sheet: 1 of 1

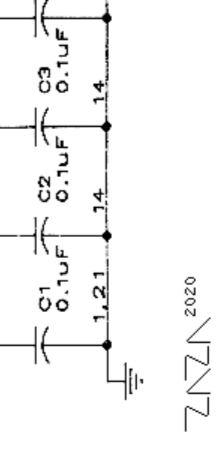
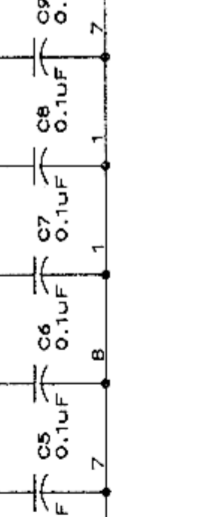
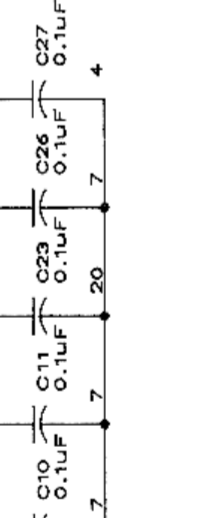
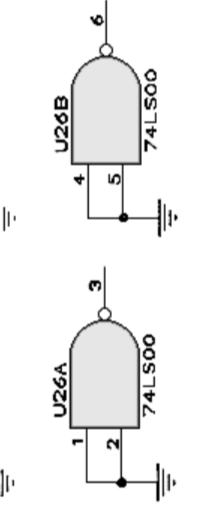


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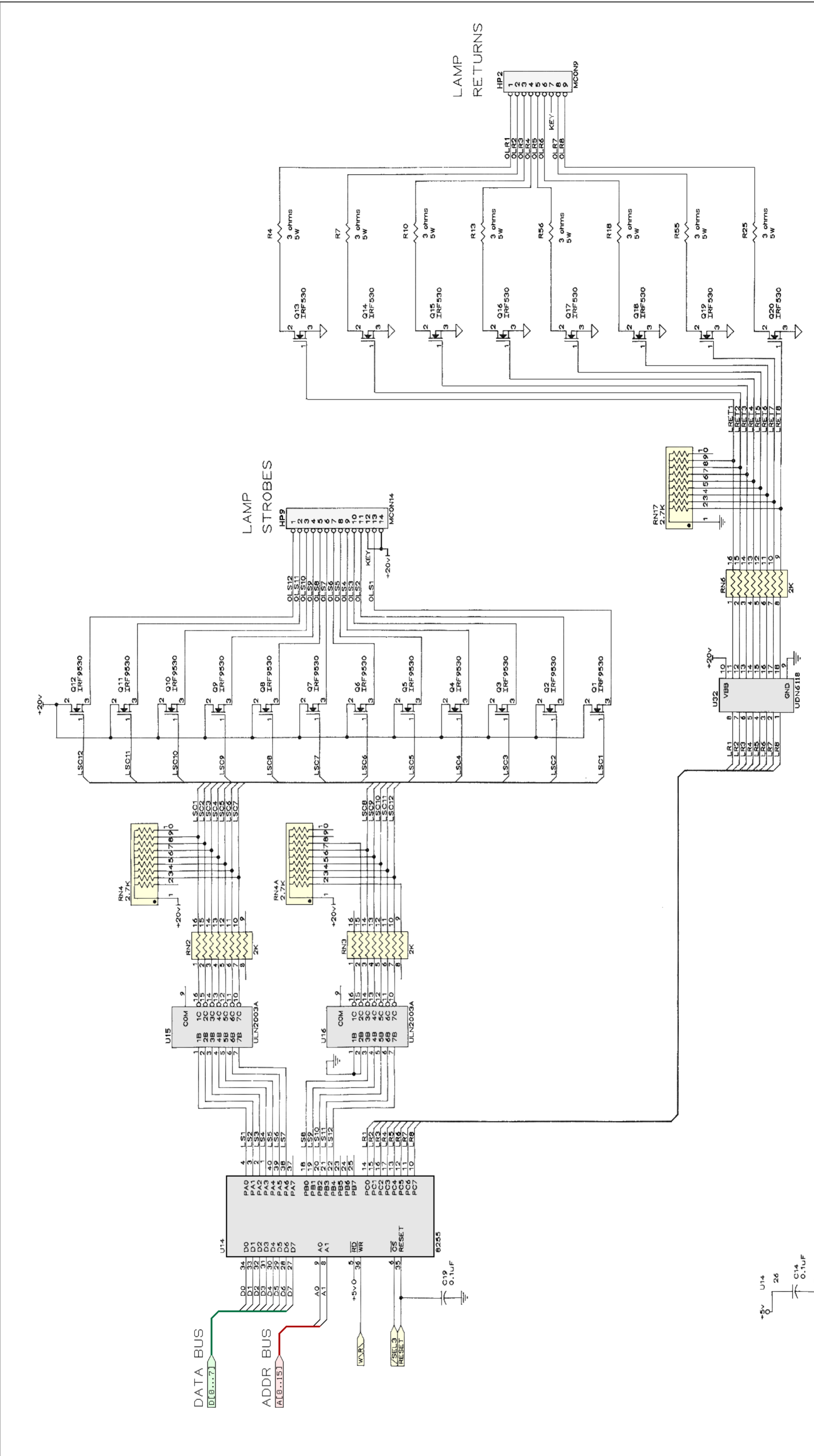
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 Size Document Number PCA-009  
 Date: May 13, 1993 Sheet 1 of 4

LINK  
 CPU2.SCH  
 CPU3.SCH  
 CPU4.SCH

Note: All Ground Plane Is Cross Hatch

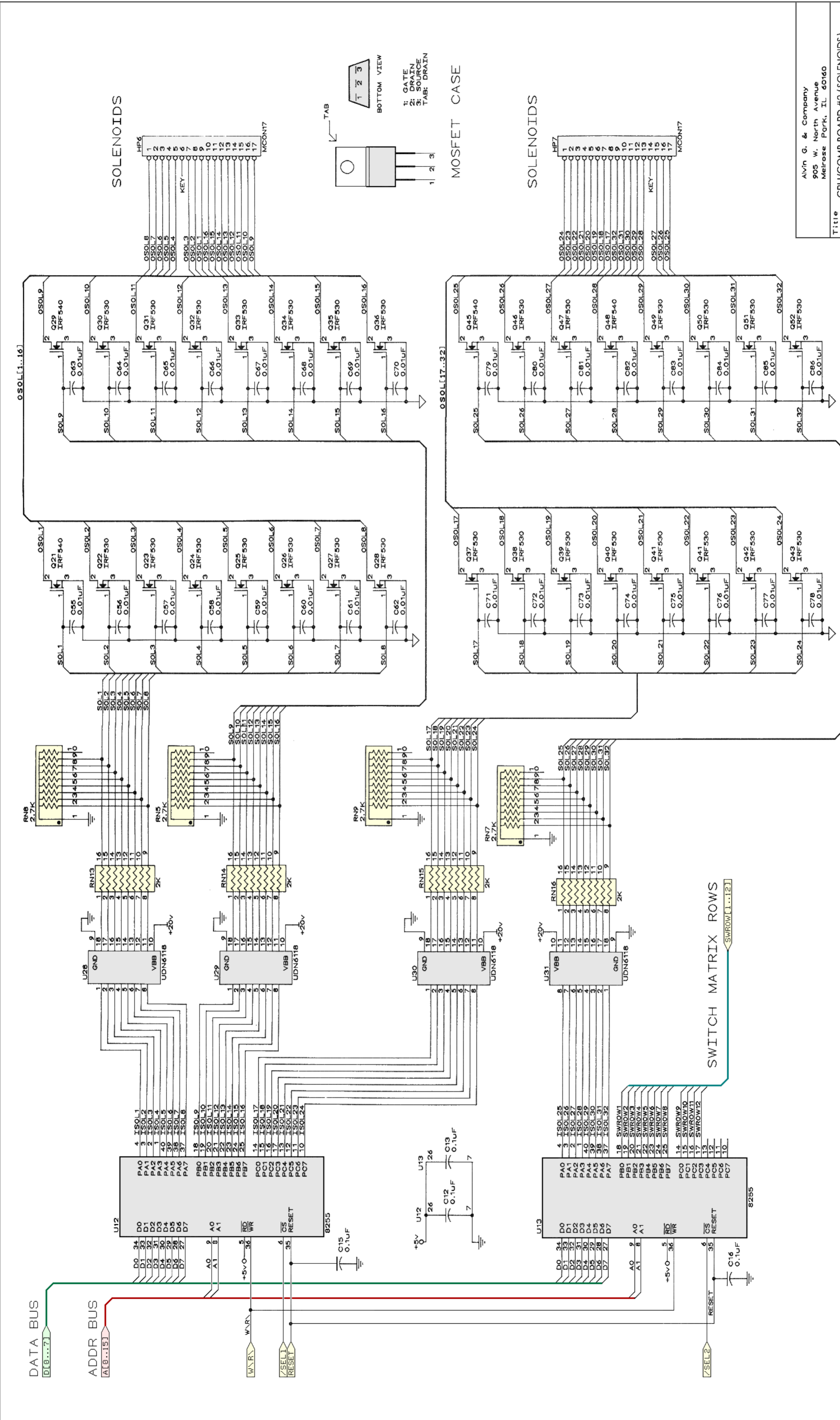






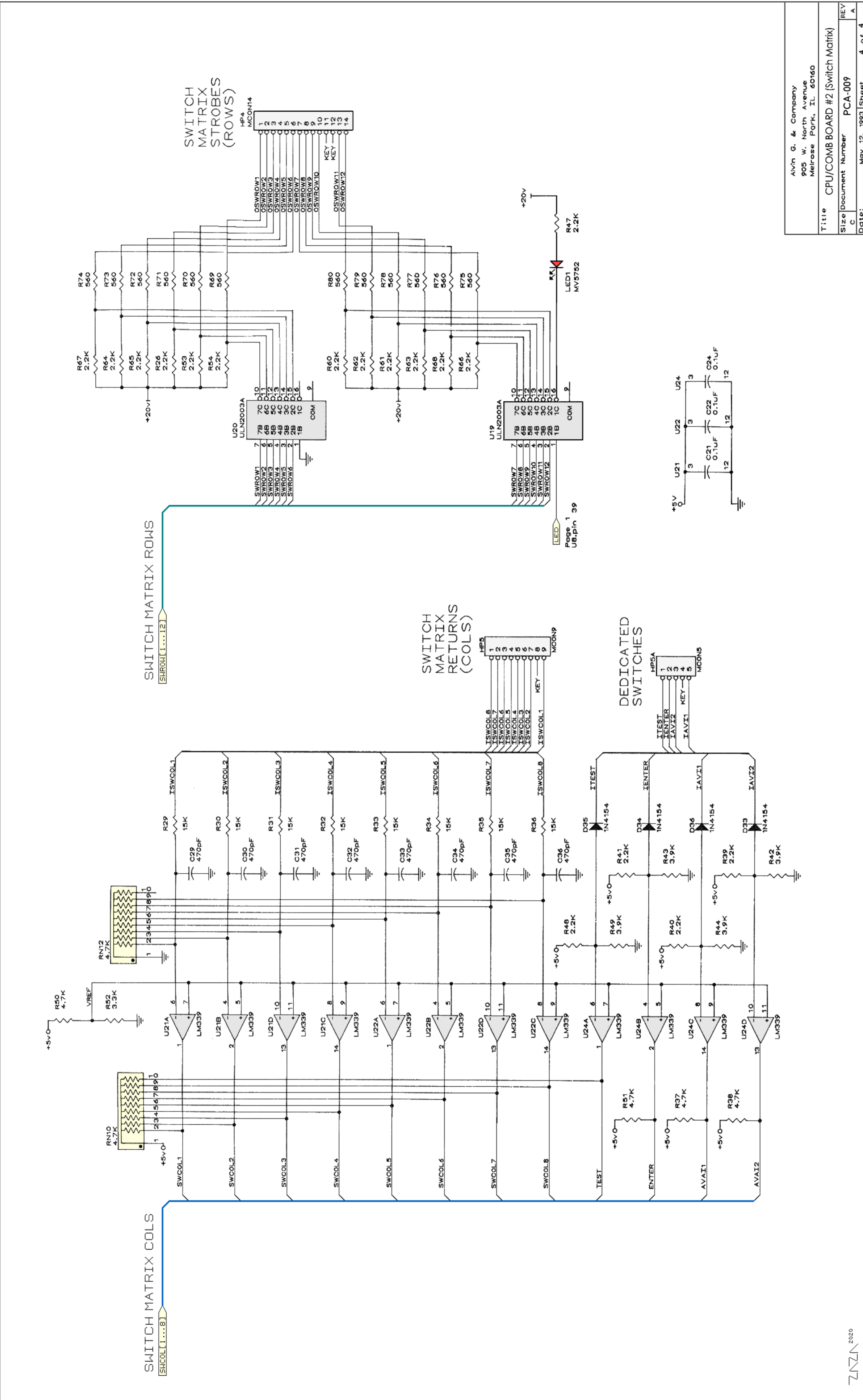
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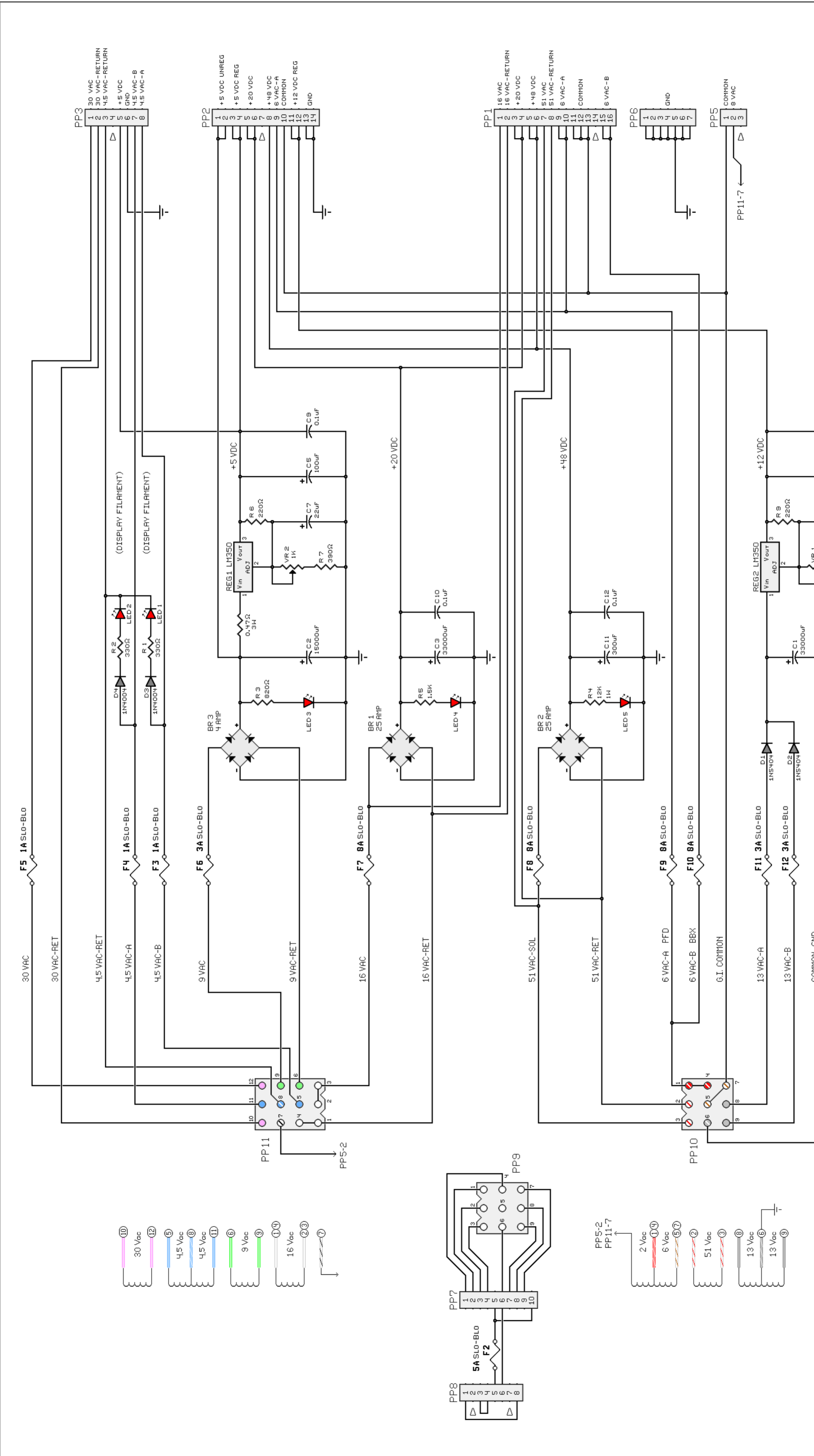
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Title CPU/COMB BOARD #2 (SOLENOIDS)  
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 Date: February 3, 1993 Sheet 3 of 4





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Title POWER SUPPLY BOARD  
 Size Document Number PCA-019 / 019A  
 Date: August 4, 1993 Sheet 1 of 1